US20070055628A1 *	1999-04-23	2007-03-08	First Data Corporation	Authorizing transactions associated with accounts
US7076465B1 *	1998-04-24	2006-07-11	First Data Corporation	Methods for processing a group of accounts corresponding to different products
US20030171992A1 *	1999-04-23	2003-09-11	First Data Corporation	System and methods for redeeming rewards associated with accounts
US7050996B1 *	1998-04-24	2006-05-23	First Data Corporation	Method for linking accounts corresponding to different products together to create a group
US20030212620A1 *	1999-04-23	2003-11-13	First Data Corporation	Systems and methods for authorizing transactions
CA2403176A1 *	1999-04-23	2000-11-02	First Data Corporation	Methods for processing a group of accounts corresponding to different products
US6131811A	1998-05-29	2000-10-17	E-Micro Corporation	Wallet consolidator
US7660763B1	1998-11-17	2010-02-09	Jpmorgan Chase Bank, N.A.	Customer activated multi-value (CAM) card
CN1439142A	1998-12-23	2003-08-27	大通银行	System and method for integrating trading operations including the generation, processing and tracking of and trade documents
US20040260653A1 *	1999-04-19	2004-12-23	First Data Corporation	Anonymous transactions
US20040083184A1 *	1999-04-19	2004-04-29	First Data Corporation	Anonymous card transactions
US7058817B1	1999-07-02	2006-06-06	The Chase Manhattan Bank	System and method for single sign on process for websites with multiple applications and services
US9064281B2	2002-10-31	2015-06-23	Mastercard Mobile Transactions Solutions, Inc.	Multi-panel user interface
US7168615B2 *	2001-09-24	2007-01-30	E2Interactive, Inc.	Keycard for automating transaction requests
US8706638B2	1999-08-19	2014-04-22	E2Interactive, Inc.	System and method for securely authorizing and distributing stored-value card data
US8799160B2	1999-12-07	2014-07-29	Steve Sorem	System and method for processing transactions
CA2296997A1 *	2000-01-18	2001-07-18	Vasogen Ireland Limited	Treatment of congestive heart failure
US7117211B2	2000-01-21	2006-10-03	American Express Travel Related Services Company, Inc.	Public/private dual card system and method
US7822656B2	2000-02-15	2010-10-26	Jpmorgan Chase Bank, N.A.	International banking system and method
US7865414B2 *	2000-03-01	2011-01-04	Passgate Corporation	Method, system and computer readable medium for web site account and e-commerce management from a central location
TWI504778 *	2000-03-01	2003-09-01	Passgate Corp	Method, system and computer readable medium for Web site account and e-commerce management from a central location
WO2001067355A2	2000-03-07	2001-09-13	American Express Travel Related Services Company, Inc.	System for facilitating a transaction
AU2001243658B2	2000-03-15	2005-12-15	Mastercard International Incorporated	Method and system for secure payments over a computer network
US6990470B2	2000-04-11	2006-01-24	Mastercard International Incorporated	Method and system for conducting secure payments over a computer network
EP1275262A4 *	2000-03-16	2006-04-19	Harex Infotech Inc	Optical payment transceiver and system using the same
US8504438B2	2000-03-21	2013-08-06	James D. Bennett	Online purchasing system supporting lenders with affordability screening
US7542922B2 *	2000-03-21	2009-06-02	Bennett James D	Online purchasing system supporting sellers with affordability screening
US7539628B2	2000-03-21	2009-05-26	Bennett James D	Online purchasing system supporting buyer affordability screening
US7725385B2 *	2000-03-29	2010-05-25	American Express Travel Related Services Company, Inc.	System and method for facilitating the handling of a dispute using disparate architectures
US7177848B2	2000-04-11	2007-02-13	Mastercard International Incorporated	Method and system for conducting secure payments over a computer network without a pseudo or proxy account number
US7379919B2	2000-04-11	2008-05-27	Mastercard International Incorporated	Method and system for conducting secure payments over a computer network
AU2007216920B2 *	2000-04-11	2011-12-01	Mastercard International Incorporated	An improved method and system for conducting secure payments over a computer network
AU5350201A	2000-04-14	2001-10-30	American Express Travel	A system and method for using loyalty points

IPR2025-00645 Page 02177

			Relate	
US7698217B1	2000-04-20	2010-04-13	Christopher Phillips	Masking private billing data by assigning other billing data to use in commerce with businesses
US6805288B2	2000-05-15	2004-10-19	Larry Routhenstein	Method for generating customer secure card numbers subject to use restrictions by an electronic card
US7725427B2	2001-05-25	2010-05-25	Fred Bishop	Recurrent billing maintenance with radio frequency payment devices
US7499872B1	2000-06-02	2009-03-03	Tuition Fund, Llc	Methods and systems for applying rebates to higher education
US7469233B2 *	2000-07-24	2008-12-23	American Express Travel Related Services Company, Inc.	Method and system for facilitating the anonymous purchase of goods and services from an e-commerce website
WO2002011019A1 *	2000-08-01	2002-02-07	First Usa Bank, N.A.	System and method for transponder-enabled account transactions
US8364583B1 *	2000-08-14	2013-01-29	West Corporation	Method and apparatus for processing a cardholder's inquiry or dispute about a credit/charge card
US20020032662A1 *	2000-08-30	2002-03-14	Maclin Roland Martin	System and method for servicing secure credit/debit card transactions
US20050038715A1 *	2000-09-25	2005-02-17	Ecardless Bancorp Ltd.	Customer processing for purchasing on the internet using verified order information
US6915279B2 *	2001-03-09	2005-07-05	Mastercard International Incorporated	System and method for conducting secure payment transactions
US7403907B1 *	2000-09-28	2008-07-22	International Business Machines Corporation	Customer checkout accelerator
US8521643B2 *	2000-10-13	2013-08-27	William H. Wisecarver, III	System and method for on-line payment transactions
US7398226B2	2000-11-06	2008-07-08	American Express Travel Related Services Company, Inc.	System and method for networked loyalty program
WO2002037386A1	2000-11-06	2002-05-10	First Usa Bank, N.A.	System and method for selectable funding of electronic transactions
US20020065716A1 *	2000-11-30	2002-05-30	Kuschill James E.	Methods and system for processing loyalty transactions
US6883692B2 *	2000-12-01	2005-01-04	Benedor Corporation	Method and apparatus to provide secure purchase transactions over a computer network
JP2002203191A *	2000-12-28	2002-07-19	Web Money:Kk	Electronic payment device, its method, and storage medium
US7529698B2 *	2001-01-16	2009-05-05	Raymond Anthony Joao	Apparatus and method for providing transaction history information, account history information, and/or charge-back information
US20140089120A1	2005-10-06	2014-03-27	C-Sam, Inc.	Aggregating multiple transaction protocols for transacting between a plurality of distinct payment acquiring devices and a transaction acquirer
WO2007044500A2	2005-10-06	2007-04-19	C-Sam, Inc.	Transactional services
US10176476B2	2005-10-06	2019-01-08	Mastercard Mobile Transactions Solutions, Inc.	Secure ecosystem infrastructure enabling multiple types of electronic wallets in an ecosystem of issuers, service providers, and acquires of instruments
US8805739B2	2001-01-30	2014-08-12	Jpmorgan Chase Bank, National Association	System and method for electronic bill pay and presentment
US7584149B1	2001-02-26	2009-09-01	American Express Travel Related Services Company, Inc.	System and method for securing data through a PDA portal
US7222101B2	2001-02-26	2007-05-22	American Express Travel Related Services Company, Inc.	System and method for securing data through a PDA portal
GB2372904B *	2001-03-02	2004-09-08	Nokia Mobile Phones Ltd	Electronic transactions
US7983987B2 *	2002-01-30	2011-07-19	Mastercard International Incorporated	System and method for conducting secure payment transaction
US7292999B2 *	2001-03-15	2007-11-06	American Express Travel Related Services Company, Inc.	Online card present transaction
US7398225B2	2001-03-29	2008-07-08	American Express Travel Related Services Company, Inc.	System and method for networked loyalty program
US20030078844A1 *	2001-03-30	2003-04-24	Sunao Takatori	Charging system
US8849716B1	2001-04-20	2014-09-30	Jpmorgan Chase Bank, N.A.	System and method for preventing identity theft or misuse by restricting

IPR2025-00645 Page 02178

				access
US7739162B1 *	2001-05-04	2010-06-15	West Corporation	System, method, and business method for setting micropayment transaction to a pre-paid instrument
US7313546B2	2001-05-23	2007-12-25	Jp Morgan Chase Bank, N.A.	System and method for currency selectable stored value instrument
IES20010524A2 *	2001-06-01	2002-12-11	Mainline Corporate Holdings	A secure on-line payment system
AU2002312381A1	2001-06-07	2002-12-16	First Usa Bank, N.A.	System and method for rapid updating of credit information
US7814014B2 *	2001-06-25	2010-10-12	International Business Machines Corporation	Providing dual number access electronic wallet
US7403908B1 *	2001-07-06	2008-07-22	Hothand, Inc.	Devices, systems, and methods for solving challenges in telecom and sales marketing
US7360689B2	2001-07-10	2008-04-22	American Express Travel Related Services Company, Inc.	Method and system for proffering multiple biometrics for use with a FOB
US7925535B2	2001-07-10	2011-04-12	American Express Travel Related Services Company, Inc.	System and method for securing RF transactions using a radio frequency identification device including a random number generator
US7705732B2	2001-07-10	2010-04-27	Fred Bishop	Authenticating an RF transaction using a transaction counter
US7735725B1	2001-07-10	2010-06-15	Fred Bishop	Processing an RF transaction using a routing number
US7503480B2	2001-07-10	2009-03-17	American Express Travel Related Services Company, Inc.	Method and system for tracking user performance
US8538863B1 *	2001-07-10	2013-09-17	American Express Travel Related Services Company, Inc.	System and method for facilitating a transaction using a revolving use account associated with a primary account
US8284025B2	2001-07-10	2012-10-09	Xatra Fund Mx, Llc	Method and system for auditory recognition biometrics on a FOB
US7668750B2	2001-07-10	2010-02-23	David S Bonalle	Securing RF transactions using a transactions counter
US9454752B2	2001-07-10	2016-09-27	Chartoleaux Kg Limited Liability Company	Reload protocol at a transaction processing entity
US8001054B1	2001-07-10	2011-08-16	American Express Travel Related Services Company, Inc.	System and method for generating an unpredictable number using a seeded algorithm
US7996324B2	2001-07-10	2011-08-09	American Express Travel Related Services Company, Inc.	Systems and methods for managing multiple accounts on a RF transaction device using secondary identification indicia
US8548927B2	2001-07-10	2013-10-01	Xatra Fund Mx, Llc	Biometric registration for facilitating an RF transaction
US8960535B2	2001-07-10	2015-02-24	Iii Holdings 1, Llc	Method and system for resource management and evaluation
US7239226B2	2001-07-10	2007-07-03	American Express Travel Related Services Company, Inc.	System and method for payment using radio frequency identification in contact and contactless transactions
US7746215B1	2001-07-10	2010-06-29	Fred Bishop	RF transactions using a wireless reader grid
US7119659B2	2001-07-10	2006-10-10	American Express Travel Related Services Company, Inc.	Systems and methods for providing a RF transaction device for use in a private label transaction
US7886919B2	2001-07-10	2011-02-15	Xatra Fund Mx, Llc	Authorizing payment subsequent to RF transactions
US8635131B1	2001-07-10	2014-01-21	American Express Travel Related Services Company, Inc.	System and method for managing a transaction protocol
US9024719B1	2001-07-10	2015-05-05	Xatra Fund Mx, Llc	RF transaction system and method for storing user personal data
US8294552B2 *	2001-07-10	2012-10-23	Xatra Fund Mx, Llc	Facial scan biometrics on a payment device
US9031880B2	2001-07-10	2015-05-12	Iii Holdings 1, Llc	Systems and methods for non-traditional payment using biometric data
US20040236699A1	2001-07-10	2004-11-25	American Express Travel Related Services Company, Inc.	Method and system for hand geometry recognition biometrics on a fob
US7762457B2	2001-07-10	2010-07-27	American Express Travel Related Services Company, Inc.	System and method for dynamic fob synchronization and personalization

IPR2025-00645 Page 02179

US7805378B2	2001-07-10	2010-09-28	American Express Travel Related Servicex Company, Inc.	System and method for encoding information in magnetic stripe format for use in radio frequency identification transactions
US7493288B2	2001-07-10	2009-02-17	Xatra Fund Mx, Llc	RF payment via a mobile device
US7303120B2	2001-07-10	2007-12-04	American Express Travel Related Services Company, Inc.	System for biometric security using a FOB
US7249112B2 *	2002-07-09	2007-07-24	American Express Travel Related Services Company, Inc.	System and method for assigning a funding source for a radio frequency identification device
US20050160003A1 *	2001-07-10	2005-07-21	American Express Travel Related Services Company, Inc.	System and method for incenting rfid transaction device usage at a merchant location
US7266839B2	2001-07-12	2007-09-04	J P Morgan Chase Bank	System and method for providing discriminated content to network users
US7021531B2 *	2001-07-13	2006-04-04	Yves De Myttenaere	Payment device
US7089517B2 *	2001-07-17	2006-08-01	American Wagering, Inc.	Remote wagering system
AU2002327322A1	2001-07-24	2003-02-17	First Usa Bank, N.A.	Multiple account card and transaction routing
US8020754B2 *	2001-08-13	2011-09-20	Jpmorgan Chase Bank, N.A.	System and method for funding a collective account by use of an electronic tag
US20030037153A1 *	2001-08-16	2003-02-20	Ouchi Norman Ken	Information transfer protocol system and private exchange
US7195154B2 *	2001-09-21	2007-03-27	Privasys, Inc.	Method for generating customer secure card numbers
US7103576B2 *	2001-09-21	2006-09-05	First Usa Bank, Na	System for providing cardless payment
MXPA04002541A	2001-09-24	2004-05-31	E2Interactive Inc	System and method for supplying communication service.
US7054842B2 *	2001-10-03	2006-05-30	First Data Corporation	Stored value cards and methods for their issuance
DK1443475T3 *	2001-10-26	2005-07-18	Servicios Para Medios De Pago	Universal mobile payment activator
US20030083933A1 *	2001-10-29	2003-05-01	Mcalear James A.	Systems and methods for providing rewards benefits to account holders
CA2364142A1 *	2001-11-30	2003-05-30	Ibm Canada Limited-Ibm Canada Limitee	Authorizing multiple categories of card based financial transactions
US7987501B2	2001-12-04	2011-07-26	Jpmorgan Chase Bank, N.A.	System and method for single session sign-on
US7577585B2 *	2001-12-07	2009-08-18	American Express Travel Related Services Company, Inc.	Method and system for completing transactions involving partial shipments
US6901387B2	2001-12-07	2005-05-31	General Electric Capital Financial	Electronic purchasing method and apparatus for performing the same
US7805376B2 *	2002-06-14	2010-09-28	American Express Travel Related Services Company, Inc.	Methods and apparatus for facilitating a transaction
US20090177563A1 *	2001-12-07	2009-07-09	American Express Travel Related Services Company, Inc.	Authorization refresh system and method
US7159180B2 *	2001-12-14	2007-01-02	America Online, Inc.	Proxy platform integration system
US6811078B2 *	2002-01-17	2004-11-02	Monica L. Workens	Point-of-transaction machine with improved versatility and related method
US20030144942A1 *	2002-01-30	2003-07-31	Sobek Michael F.	Methods and systems for facilitating investment transactions and accounting for banks and credit unions
US7797233B2 *	2002-01-30	2010-09-14	Store Financial Services, Llc	Methods and systems for processing, accounting, and administration of stored value cards
US20030144935A1 *	2002-01-30	2003-07-31	Sobek Michael F.	Methods and systems for processing, accounting, and administration of stored value cards
US7716165B2 *	2002-02-12	2010-05-11	Mantas, Inc.	Analysis of third party networks
US7620567B2 *	2002-02-19	2009-11-17	First Data Corporation	Systems and methods for operating loyalty programs
US7725404B2 *	2002-02-27	2010-05-25	Imagineer Software, Inc.	Secure electronic commerce using mutating identifiers
CA2479219A1 *	2002-03-22	2003-10-02	British Telecommunications Public Limited Company	Transaction authentication

IPR2025-00645 Page 02180

US20180165441A1	2002-03-25	2018-06-14	Glenn Cobeum Everhart	Systems and methods for multifactor authentication
US7899753B1	2002-03-25	2011-03-01	Jpmorgan Chase Bank, N.A	Systems and methods for time variable financial authentication
AU2003230751A1	2002-03-29	2003-10-13	Bank One, Delaware, N.A.	System and process for performing purchase transaction using tokens
US20040210498A1 *	2002-03-29	2004-10-21	Bank One, National Association	Method and system for performing purchase and other transactions using tokens with multiple chips
US7162475B2 *	2002-04-17	2007-01-09	Ackerman David M	Method for user verification and authentication and multimedia processing for interactive database management and method for viewing the multimedia
US7680688B2 *	2002-05-28	2010-03-16	American Express Travel Related Services Company, Inc.	System and method for exchanging loyalty points for acquisitions
US20070239614A1 *	2002-07-10	2007-10-11	Union Beach, L.P.	System and method for the storage of data in association with financial accounts
US7254548B1	2002-07-10	2007-08-07	Union Beach, L.P.	System and method for the administration of financial accounts using profiles
US8543423B2	2002-07-16	2013-09-24	American Express Travel Related Services Company, Inc.	Method and apparatus for enrolling with multiple transaction environments
US20040019543A1 *	2002-07-25	2004-01-29	First Data Corporation	Systems and methods for non-account based liability reporting
US20040230489A1 *	2002-07-26	2004-11-18	Scott Goldthwaite	System and method for mobile payment and fulfillment of digital goods
WO2004088641A2 *	2003-03-26	2004-10-14	Way Systems, Inc.	System and method for securely storing, generating, transferring and printing electronic prepaid vouchers
US20040127256A1 *	2002-07-30	2004-07-01	Scott Goldthwaite	Mobile device equipped with a contactless smart card reader/writer
US8229855B2 *	2002-08-27	2012-07-24	Jean Huang	Method and system for facilitating payment transactions using access devices
US20040049452A1 *	2002-09-09	2004-03-11	First Data Corporation	Multiple credit line presentation instrument
US6880528B2	2002-09-12	2004-10-19	American Express Travel Related Services Company, Inc.	System and method for converting a stored value card to a credit card
US7809595B2	2002-09-17	2010-10-05	Jpmorgan Chase Bank, Na	System and method for managing risks associated with outside service providers
US20070094129A1 *	2003-12-19	2007-04-26	E2Interactive, Inc. D/B/A E2Interactive, Inc.	System and method for adding value to a stored-value account using provider specific pin
US7058660B2 *	2002-10-02	2006-06-06	Bank One Corporation	System and method for network-based project management
US8301493B2	2002-11-05	2012-10-30	Jpmorgan Chase Bank, N.A.	System and method for providing incentives to consumers to share information
US20040098351A1 *	2002-11-15	2004-05-20	Ibgc Corporation	Interest bearing gift card and related methods and systems
WO2004049318A2 *	2002-11-25	2004-06-10	Pal Dharam	An on-line credit information system
US20040111329A1 *	2002-12-10	2004-06-10	First Data Corporation	Restricted-use transaction systems
US10311412B1	2003-03-28	2019-06-04	Jpmorgan Chase Bank, N.A	Method and system for providing bundled electronic payment and remittance advice
US20040215573A1 *	2003-04-23	2004-10-28	Gift Cards Llc	Method and system for authorizing the use of merchant specific gift cards
US8429041B2	2003-05-09	2013-04-23	American Express Travel Related Services Company, Inc.	Systems and methods for managing account information lifecycles
US20050065876A1 *	2003-05-12	2005-03-24	Pulkit Kumar	Airbank, pay to anyone from the mobile phone
US8306907B2	2003-05-30	2012-11-06	Jpmorgan Chase Bank N.A.	System and method for offering risk-based interest rates in a credit instrument
US20040243467A1 *	2003-06-02	2004-12-02	American Express Travel Related Services Company, Inc.	System and method for facilitating distribution of incentives from a merchant to a parent
SG120112A1 *	2003-08-06	2006-03-28	Oneempower Pte Ltd	Transaction method and system
US8370220B1 *	2003-09-05	2013-02-05	Ncr Corporation	Method of completing a transaction using wirelessly transferred payment information

US7949594B2	2003-09-26	2011-05-24	First Data Corporation	Systems and methods for participant controlled communications regarding financial accounts
US7653692B2 *	2003-11-06	2010-01-26	Visa U.S.A. Inc.	Centralized electronic commerce card transactions
US8015085B2	2003-11-14	2011-09-06	First Data Corporation	System for distributing funds
WO2005057688A2 *	2003-12-09	2005-06-23	Intelleflex Corporation	Battery activation circuit
WO2005059690A2 *	2003-12-12	2005-06-30	Michael Stockton	Method and system configured for facilitating management of international trade receivables transactions
US7814003B2	2003-12-15	2010-10-12	Jp Morgan Chase	Billing workflow system for crediting charges to entities creating derivatives exposure
US7099838B2 *	2003-12-18	2006-08-15	Capital One Financial Corporation	System and method for redeeming rewards and incentives
KR10043943781 *	2003-12-18	2004-07-09	주식회사 교원나라	Bank transaction system for linked accounts via common account
US20050177466A1 *	2003-12-31	2005-08-11	Willins Bruce A.	Method and apparatus for aggregation reconciliation through hierarchical tag checksums
US20050144122A1 *	2003-12-31	2005-06-30	Creveling Lorrie A.	System for reducing disputes of credit transactions
WO2005091846A2 *	2004-02-27	2005-10-06	Richard Postrel	Method and system for implementing a search engine with reward components and payment components
US7413112B2 *	2004-03-16	2008-08-19	American Express Travel Related Services Company, Inc.	Method and system for manual authorization
US7539860B2 *	2004-03-18	2009-05-26	American Express Travel Related Services Company, Inc.	Single use user IDS
US20050216424A1 *	2004-03-23	2005-09-29	Star Systems, Inc.	Transaction system with special handling of micropayment transaction requests
US8190517B1	2004-04-07	2012-05-29	American Express Travel Related Services Company, Inc.	System and method for transferring a line of credit balance to a cash account
US8175938B2	2004-04-13	2012-05-08	Ebay Inc.	Method and system for facilitating merchant-initiated online payments
US20050279827A1 *	2004-04-28	2005-12-22	First Data Corporation	Methods and systems for providing guaranteed merchant transactions
US7472827B2 *	2004-05-17	2009-01-06	American Express Travel Related Services Company, Inc.	Limited use PIN system and method
US20050259801A1 *	2004-05-19	2005-11-24	Bullard Charles C	Machine and process for accepting customer payments and placing orders
US11062412B2	2004-05-19	2021-07-13	Touchpay Holdings, Llc	Machines and process for managing a service account
US7021532B2 *	2004-06-02	2006-04-04	American Express Travel Related Services Company, Inc.	Transaction authorization system and method
US20050269401A1 *	2004-06-03	2005-12-08	Tyfone, Inc.	System and method for securing financial transactions
WO2005119607A2 *	2004-06-03	2005-12-15	Tyfone, Inc.	System and method for securing financial transactions
US8522039B2 *	2004-06-09	2013-08-27	Apple Inc.	Method and apparatus for establishing a federated identity using a personal wireless device
US20050278216A1 *	2004-06-10	2005-12-15	E2Interactive, Inc. D/B/A E2Interactive, Inc.	System and method for distributing an identifier redeemable for a plurality of products
US20060015402A1 *	2004-06-10	2006-01-19	Graves Phillip C	Using multiple PINs for redemption through multiple distribution channels
US7781057B2	2005-06-14	2010-08-24	Siemens Energy, Inc.	Seeding resins for enhancing the crystallinity of polymeric substructures
US20050278426A1 *	2004-06-15	2005-12-15	First Data Corporation	Systems and methods for merging communications
US8554673B2	2004-06-17	2013-10-08	Jpmorgan Chase Bank, N.A.	Methods and systems for discounts management
US8001047B2 *	2004-06-18	2011-08-16	Paradox Technical Solutions Llc	Method and apparatus for effecting payment
US8121944B2	2004-06-24	2012-02-21	Jpmorgan Chase Bank, N.A.	Method and system for facilitating network transaction processing
WO2006004727A2	2004-06-29	2006-01-12	Citicorp Credit Services, Inc.	Methods and systems for managing consumer transactional accounts

IPR2025-00645 Page 02182

US7366504B2 *	2004-07-01	2008-04-22	American Express Travel Related Services Company, Inc.	Method and system for keystroke scan recognition biometrics on a smartcard
US7318550B2	2004-07-01	2008-01-15	American Express Travel Related Services Company, Inc.	Biometric safeguard method for use with a smartcard
FR2872984B1 *	2004-07-12	2007-01-12	Prosodie Sa	SERVER AND CONNECTING INTERFACE FOR ESTABLISHING AND CONTROLLING IP COMMUNICATION
US7014107B2 *	2004-07-20	2006-03-21	Irek Singer	Wireless payment processing system
US7512236B1 *	2004-08-06	2009-03-31	Mark Iv Industries Corporation	System and method for secure mobile commerce
US7549054B2 *	2004-08-17	2009-06-16	International Business Machines Corporation	System, method, service method, and program product for managing entitlement with identity and privacy applications for electronic commerce
US7506812B2 *	2004-09-07	2009-03-24	Semtek Innovative Solutions Corporation	Transparently securing data for transmission on financial networks
US20060064391A1 *	2004-09-20	2006-03-23	Andrew Petrov	System and method for a secure transaction module
US20110071949A1 *	2004-09-20	2011-03-24	Andrew Petrov	Secure pin entry device for mobile phones
US7717872B1	2004-09-30	2007-02-20	West Corporation	Methods, computer-readable media, and computer program product for intelligent selection of items encoded onto portable machine-playable entertainment media
US7865448B2 *	2004-10-19	2011-01-04	First Data Corporation	Methods and systems for performing credit transactions with a wireless device
US7822682B2	2005-06-08	2010-10-26	Jpmorgan Chase Bank, N.A.	System and method for enhancing supply chain transactions
US8049594B1	2004-11-30	2011-11-01	Xatra Fund Mx, Llc	Enhanced RFID instrument security
US10248951B2 *	2004-12-01	2019-04-02	Metavante Corporation	E-coupon settlement and clearing process
US7578438B2 *	2004-12-06	2009-08-25	First Date Corporation	Loyalty program enrollment systems and methods
US20060151598A1 *	2005-01-13	2006-07-13	Yen-Fu Chen	Categorization based spending control
US20060168051A1 *	2005-01-21	2006-07-27	Searete Llc, A Limited Liability Corporation Of The State Delaware	Limited-use instant messaging accounts
US8738707B2 *	2005-01-21	2014-05-27	The Invention Science Fund I, Llc	Limited-life electronic mail accounts
US8831991B2	2005-01-21	2014-09-09	The Invention Science Fund I, Llc	Limited-life electronic mail account as intermediary
US20060168050A1 *	2005-01-21	2006-07-27	Searete Llc, A Limited Liability Corporation Of The State Of Delaware	Interface for creation of limited-use electronic mail accounts
US8700729B2 *	2005-01-21	2014-04-15	Robin Dua	Method and apparatus for managing credentials through a wireless network
US8740069B2 *	2005-01-26	2014-06-03	Heng Kah Choy	Fraud-free payment for internet purchases
US8863962B1	2005-02-02	2014-01-28	Nexus Payments, LLC	System and method for accessing an online user account registry via a thin-client unique user code
US8768838B1	2005-02-02	2014-07-01	Nexus Payments, LLC	Financial transactions using a rule-module nexus and a user account registry
US7392935B2	2005-02-10	2008-07-01	Wells Fargo Bank, N.A.	Method and apparatus for accepting check deposits via the internet using browser-based technology
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US20060195527A1 *	2005-02-25	2006-08-31	Searete Llc, A Limited Liability Corporation Of The State Of Delaware	Limited-operation electronic mail accounts with set functions
US7472822B2 *	2005-03-23	2009-01-06	E2Interactive, Inc.	Delivery of value identifiers using short message service (SMS)
US8474694B2 *	2005-03-23	2013-07-02	E2Interactive, Inc.	Radio frequency identification purchase transactions
US20060226217A1 *	2005-04-07	2006-10-12	Tyfone, Inc.	Sleeve for electronic transaction card
US20060248011A1 *	2005-04-27	2006-11-02	Robert Hecht-Nielsen	Secure commerce systems
US7451481B2	2005-04-29	2008-11-11	Merchant Link, Llc	Database system and method for encryption and protection of confidential information

IPR2025-00645 Page 02183

US7604178B2 *	2005-05-11	2009-10-20	Intelleflex Corporation	Smart tag activation
DE502006007568D1 *	2005-05-12	2009-08-06	Swisscom Ag	Method and system for secure transmission of data via an NFC interface
US7401731B1	2005-05-27	2008-07-22	Jpmorgan Chase Bank, Na	Method and system for implementing a card product with multiple customized relationships
US20070005416A1 *	2005-06-30	2007-01-04	Jackson S B	Systems, methods, and computer readable media for managing loyalty programs
US8477940B2 *	2005-07-15	2013-07-02	Tyfone, Inc.	Symmetric cryptography with user authentication
US8189878B2 *	2005-07-15	2012-05-29	Tyfone, Inc.	Hybrid symmetric/asymmetric cryptography with user authentication
US7805615B2 *	2005-07-15	2010-09-28	Tyfone, Inc.	Asymmetric cryptography with user authentication
US8248211B2 *	2005-07-20	2012-08-21	Intelleflex Corporation	Selective RF device activation
US20070037552A1 *	2005-08-11	2007-02-15	Timothy Lee	Method and system for performing two factor mutual authentication
US20070050251A1 *	2005-08-29	2007-03-01	Microsoft Corporation	Monetizing a preview pane for ads
US8762263B2 *	2005-09-06	2014-06-24	Visa U.S.A. Inc.	System and method for secured account numbers in proximity devices
US8925823B2 *	2005-09-22	2015-01-06	E2Interactive, Inc.	Activation number generation and association
US8256682B2 *	2005-09-22	2012-09-04	E2Interactive, Inc.	Foldable data card assembly and method
US20070106897A1 *	2005-11-07	2007-05-10	Michael Kulakowski	Secure RFID authentication system
US7575152B2 *	2005-11-15	2009-08-18	E2Interactive, Inc.	Temporary value card method and system
US8548098B2 *	2005-12-15	2013-10-01	Intelleflex Corporation	Clock-free activation circuit
US7813963B2	2005-12-27	2010-10-12	The Pen	Interactive electronic desktop action method and system for executing a transaction
US7784692B1 *	2005-12-29	2010-08-31	United Services Automobile Association (Usaa)	Single access vehicle
US8333764B2 *	2006-01-25	2012-12-25	American Express Travel Related Services Company, Inc.	Fraud control when granting instant credit
WO2007092715A2 *	2006-02-06	2007-08-16	Solidus Networks, Inc.	Method and system for providing online authentication utilizing biometric data
US8345931B2 *	2006-02-10	2013-01-01	The Western Union Company	Biometric based authorization systems for electronic fund transfers
US20090012901A1 *	2007-02-14	2009-01-08	Mpower Mobile, Inc.	Multifactor authentication system for "cash back" at the point of sale
US9135469B2 *	2006-02-28	2015-09-15	Paypal, Inc.	Information protection system
US20070266131A1 *	2006-05-12	2007-11-15	Simpera Inc.	Obtaining and Using Primary Access Numbers Utilizing a Mobile Wireless Device
US9070128B1 *	2006-05-19	2015-06-30	Qurio Holdings, Inc.	Methods, systems, and products for verifying account transactions
US7770367B2	2006-05-25	2010-04-27	Buchheit Brian K	Web based conversion of non-negotiable credits associated with an entity to entity independent negotiable funds
US8668146B1	2006-05-25	2014-03-11	Sean I. Mcghie	Rewards program with payment artifact permitting conversion/transfer of non-negotiable credits to entity independent funds
US10062062B1	2006-05-25	2018-08-28	Jbshbm, Llc	Automated teller machine (ATM) providing money for loyalty points
US8684265B1	2006-05-25	2014-04-01	Sean I. Mcghie	Rewards program website permitting conversion/transfer of non-negotiable credits to entity independent funds
US8376224B2	2006-05-25	2013-02-19	Sean I. Mcghie	Self-service stations for utilizing non-negotiable credits earned from a game of chance
US8162209B2	2006-05-25	2012-04-24	Buchheit Brian K	Storefront purchases utilizing non-negotiable credits earned from a game of chance
US8342399B1	2006-05-25	2013-01-01	Mcghie Sean I	Conversion of credits to funds
US9704174B1	2006-05-25	2017-07-11	Sean I. Mcghie	Conversion of loyalty program points to commerce partner points per terms of a mutual agreement
WO2007139867A2 *	2006-05-26	2007-12-06	Total System Services, Inc.	Credit account management
US20070288313A1 *	2006-06-09	2007-12-13	Mark Brodson	E-Coupon System and Method

IPR2025-00645 Page 02184

US20070294403A1 *	2006-06-20	2007-12-20	Verona Steven N	Third party database security
TW200820109A *	2006-07-26	2008-05-01	Joseph Sally	Method for managing multiple credit accounts
US20080040262A1 *	2006-08-10	2008-02-14	Integra Micro Systems (P) Ltd	Voice authenticated financial transaction
US7849436B2 *	2006-08-11	2010-12-07	Dongbu Hitek Co., Ltd.	Method of forming dummy pattern
US7762471B2 *	2006-09-07	2010-07-27	Mastercard International, Inc.	Proximity payment card with cost-effective connection between user-actuatable input switch and RFID IC
US20080077528A1 *	2006-09-27	2008-03-27	Neff C A	Mechanism for fraud-resistant consumer transactions
CN101554005A	2006-10-11	2009-10-07	国际商证服务协会	Method and system for processing micropayment transactions
US10068220B2	2006-10-11	2018-09-04	Visa International Service Association	Systems and methods for brokered authentication express seller links
US8769275B2 *	2006-10-17	2014-07-01	Verifone, Inc.	Batch settlement transactions system and method
US7900924B2	2006-10-27	2011-03-22	American Express Travel Related Services Company, Inc.	Wireless transaction medium having combined magnetic stripe and radio frequency communications
WO2008052592A1 *	2006-10-30	2008-05-08	Telecom Italia S.P.A.	High security use of bank cards and system therefore
US7991158B2	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging
US7836424B2 *	2006-12-20	2010-11-16	Verizon Patent And Licensing Inc.	Adaptive routing of resource requests for multiple back-end systems
US7606766B2 *	2006-12-21	2009-10-20	American Express Travel Related Services Company, Inc.	Computer system and computer-implemented method for selecting invoice settlement options
US8606670B2	2007-01-02	2013-12-10	First Data Corporation	Integrated communication solution
JP2010516002A	2007-01-09	2010-05-13	ビザ ユー．エス．エー．インコーポレイテッド	Contactless transaction
US8566240B2	2007-01-16	2013-10-22	E2Interactive, Inc.	Systems and methods for the payment of customer bills utilizing payment platform of biller
US7933835B2	2007-01-17	2011-04-26	The Western Union Company	Secure money transfer systems and methods using biometric keys associated therewith
US8818904B2	2007-01-17	2014-08-26	The Western Union Company	Generation systems and methods for transaction identifiers having biometric keys associated therewith
US20080183588A1 *	2007-01-30	2008-07-31	International Business Machines Corporation	Method and system for validating consumer preferences and purchase items at point of sale
US7866551B2 *	2007-02-15	2011-01-11	Visa U.S.A. Inc.	Dynamic payment device characteristics
US8504473B2	2007-03-28	2013-08-06	The Western Union Company	Money transfer system and messaging system
US20080244208A1 *	2007-03-30	2008-10-02	Narendra Siva G	Memory card hidden command protocol
US7784685B1	2007-04-26	2010-08-31	United Services Automobile Association (Usaa)	Secure card
US8109438B1	2007-04-26	2012-02-07	United Services Automobile Association (Usaa)	Secure card
US7959076B1 *	2007-04-26	2011-06-14	United Services Automobile Association (Usaa)	Secure card
US7953653B2 *	2007-05-16	2011-05-31	Jpmorgan Chase Bank, N.A.	System and method for combined reconciliation of co-branded card promotion and settlement of private label card accounts
US7835988B2	2007-06-05	2010-11-16	Mastercard International, Inc.	Methods and apparatus for preventing fraud in payment processing transactions
EP2015262A1 *	2007-06-11	2009-01-14	Richard Mervyn Gardner	Advance remote payment authority for real and virtual world transactions
US20080313079A1 *	2007-06-14	2008-12-18	Motorola, Inc.	System and method for proximity payment transaction between a wireless communication device and a point of sale terminal in conjunction with a trusted party
CH700860B1 *	2007-06-18	2012-02-29	Creations Horlogeres De Lully Sa	Assembly including a watch and its case.
US8121956B2	2007-06-25	2012-02-21	Visa U.S.A. Inc.	Cardless challenge systems and methods

IPR2025-00645 Page 02185

US7739169B2	2007-06-25	2010-06-15	Visa U.S.A. Inc.	Restricting access to compromised account information
DE602007012538D1 *	2007-07-27	2011-03-31	Ntt Docomo Inc	Method and apparatus for performing delegated transactions
JP2009053805A *	2007-08-24	2009-03-12	Brother Ind Ltd	Radio tag for auction bid, radio tag communication system, auction system, server for auction bid
US8219533B2	2007-08-29	2012-07-10	Enpulz Llc	Search engine feedback for developing reliable whois database reference for restricted search operation
US8055671B2	2007-08-29	2011-11-08	Enpulz, Llc	Search engine using world map with whois database search restriction
US8316236B2 *	2007-08-31	2012-11-20	Cisco Technology, Inc.	Determining security states using binary output sequences
US9292850B2 *	2007-09-10	2016-03-22	Visa U.S.A. Inc.	Host capture
US7937324B2	2007-09-13	2011-05-03	Visa U.S.A. Inc.	Account permanence
US7792748B1	2007-09-19	2010-09-07	Capital One Financial Corporation	Method and system for performing a financial transaction using a user interface
EP2040413B1 *	2007-09-21	2013-06-19	Nokia Siemens Networks Oy	Subscription and advice of charge control
US8549279B1 *	2007-10-23	2013-10-01	United Parcel Service Of America, Inc.	Encryption and tokenization architectures
US7938319B2	2007-11-13	2011-05-10	Steve Newmark	Tradesmans card system
US9741027B2 *	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US20090170559A1 *	2007-12-27	2009-07-02	Simon Phillips	Mobile telephone with two antennas for use in contactless payments
US7776624B1	2007-12-31	2010-08-03	Jpmorgan Chase Bank, N.A.	System and method for processing transactions using a multi-account transactions device
US8622308B1	2007-12-31	2014-01-07	Jpmorgan Chase Bank, N.A	System and method for processing transactions using a multi-account transactions device
US20090198572A1 *	2008-02-05	2009-08-06	Wachovia Corporation	System and method for rewards optimization in a computer system
US20090199094A1 *	2008-02-05	2009-08-06	Wachovia Corporation	System and method for rewards integration in a computer system
US8693737B1 *	2008-02-05	2014-04-08	Bank Of America Corporation	Authentication systems, operations, processing, and interactions
US8078528B1	2008-02-21	2011-12-13	Jpmorgan Chase Bank, N.A.	System and method for providing borrowing schemes
US8972047B1	2008-04-18	2015-03-03	Capital One Services, Llc	Systems and methods for performing a purchase transaction using rewards points
CA2722949A1 *	2008-04-29	2009-11-05	Visa U.S.A. Inc.	Device including user exclusive data tag
US20090272802A1 *	2008-05-01	2009-11-05	Simon Phillips	Payment transactions initiated via a user's shoe
US20090276347A1 *	2008-05-01	2009-11-05	Kargman James B	Method and apparatus for use of a temporary financial transaction number or code
US20090276835A1 *	2008-05-05	2009-11-05	Damon Charles Hougland	Method and system for transaction processing
US11080678B2	2008-05-09	2021-08-03	Verient, Inc.	Payment processing platform
US9953313B2	2008-05-09	2018-04-24	Verient, Inc.	System and method for distributed payment products
US20120271757A9 *	2008-05-09	2012-10-25	Shakkarwar Rajesh G	Systems and methods for managing accounts payable
US8224911B2	2008-05-13	2012-07-24	Enpulz, Llc	Network search engine utilizing client browser activity information
US8171041B2	2008-05-15	2012-05-01	Enpulz, L.L.C.	Support for international search terms
US20090287471A1	2008-05-16	2009-11-19	Bennett James D	Support for international search terms - translate as you search
US8280083B2	2008-05-16	2012-08-21	Enpulz, Llc	Support for international search terms—translate as you crawl
US20100004989A1 *	2008-05-20	2010-01-07	American Express Travel Related Services Company, Inc.	Systems, methods, apparatus and computer program products for interfacing payment systems to a network associated with a referral
US7885878B2	2008-05-28	2011-02-08	First Data Corporation	Systems and methods of payment account activation
US8651374B2 *	2008-06-02	2014-02-18	Sears Brands, L.L.C.	System and method for payment card industry enterprise account number elimination
US8190623B2	2008-06-05	2012-05-29	Enpulz, L.L.C.	Image search engine using image analysis and categorization

IPR2025-00645 Page 02186

US8180788B2	2008-06-05	2012-05-15	Enpulz, L.L.C.	Image search engine employing image correlation
WO2010005681A1	2008-06-16	2010-01-14	Visa U.S.A. Inc.	System and method for authorizing financial transactions with online merchants
US8768829B2 *	2008-07-06	2014-07-01	Anthony Jeremiah Bayne	System and method for providing transactional credit
US8886562B1 *	2008-07-11	2014-11-11	Google Inc.	Robust payment settlements using distributed and potentially unreliable computer systems
US10861104B1	2008-07-21	2020-12-08	Wells Fargo Bank, N.A.	System and method for configuring payment coupon processing
DE102008035391A1 *	2008-07-29	2010-02-04	Deutsche Telekom Ag	Procedure for authentication
US8219489B2	2008-07-29	2012-07-10	Visa U.S.A. Inc.	Transaction processing using a global unique identifier
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US8965811B2 *	2008-10-04	2015-02-24	Mastercard International Incorporated	Methods and systems for using physical payment cards in secure E-commerce transactions
BRPI0921124A2	2008-11-06	2016-09-13	Visa Int Service Ass	system for authenticating a consumer, computer implemented method, computer readable medium, and server computer
US20100125512A1 *	2008-11-19	2010-05-20	Microsoft Corporation	Network-accessible virtual shopping cart
US8196813B2 *	2008-12-03	2012-06-12	Ebay Inc.	System and method to allow access to a value holding account
US10853816B1 *	2009-02-02	2020-12-01	United Services Automobile Association (Usaa)	Systems and methods for authentication of an individual on a communications device
US9280771B2 *	2009-02-13	2016-03-08	International Business Machines Corporation	Secure personal information profile
EP2401708A4 *	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US9230259B1 *	2009-03-20	2016-01-05	Jpmorgan Chase Bank, N.A.	Systems and methods for mobile ordering and payment
US20100258620A1 *	2009-04-10	2010-10-14	Denise Torreyson	Methods and systems for linking multiple accounts
US8332675B2 *	2009-04-28	2012-12-04	Visa International Service Association	Verification of portable consumer devices
US9715681B2	2009-04-28	2017-07-25	Visa International Service Association	Verification of portable consumer devices
US9297705B2	2009-05-06	2016-03-29	Asm America, Inc.	Smart temperature measuring device
US9038882B2	2009-05-15	2015-05-26	Visa International Service Association	Verification of portable consumer devices
US8889396B2	2009-05-15	2014-11-25	Visa International Service Association	Secure Communication of payment information to merchants using a verification token
US8533464B2	2009-05-15	2013-09-17	Ayman Hammad	Integration of verification tokens with mobile communication devices
US10846683B2	2009-05-15	2020-11-24	Visa International Service Association	Integration of verification tokens with mobile communication devices
US7891563B2 *	2009-05-15	2011-02-22	Visa International Service Association	Verification of portable consumer devices
US9105027B2	2009-05-15	2015-08-11	Visa International Service Association	Verification of portable consumer device for secure services
US8602293B2	2009-05-15	2013-12-10	Visa International Service Association	Integration of verification tokens with portable computing devices
US10140598B2	2009-05-20	2018-11-27	Visa International Service Association	Device including encrypted data for expiration date and verification value creation
JP5387147B2	2009-06-03	2014-01-15	日本電気株式会社	Pathological image diagnostic system, pathological image processing method, pathological image diagnostic program
US20100332351A1 *	2009-06-30	2010-12-30	Ebay Inc.	Same screen quick pay button
US20110029432A1 *	2009-07-30	2011-02-03	Hildred Richard N	Computer-implemented methods of processing payments for a merchant selling goods or services to a consumer
US9516017B2	2009-10-23	2016-12-06	Apriva, Llc	System and device for consolidating SIM, personal token, and associated

IPR2025-00645 Page 02187

				applications for electronic wallet transactions
US9544303B2 *	2009-10-23	2017-01-10	Apriva, Llc	System and device for consolidating SIM, personal token, and associated applications for selecting a transaction settlement entity
US9111285B2	2009-10-23	2015-08-18	Apriva, Llc	System and device for facilitating a wireless transaction by consolidating SIM, personal token, and associated applications
US8280788B2	2009-10-29	2012-10-02	Visa International Service Association	Peer-to-peer and group financial management systems and methods
US8676639B2	2009-10-29	2014-03-18	Visa International Service Association	System and method for promotion processing and authorization
US8332325B2	2009-11-02	2012-12-11	Visa International Service Association	Encryption switch processing
US20110137740A1	2009-12-04	2011-06-09	Ashmit Bhattacharya	Processing value-ascertainable items
US10255591B2	2009-12-18	2019-04-09	Visa International Service Association	Payment channel returning limited use proxy dynamic value
CN105243313B	2010-01-12	2018-12-25	维萨国际服务协会	For the method whenever confirmed to verifying token
US10255601B2	2010-02-25	2019-04-09	Visa International Service Association	Multifactor authentication using a directory server
US9245267B2	2010-03-03	2016-01-26	Visa International Service Association	Portable account number for consumer payment account
US8688515B1 *	2010-03-26	2014-01-21	Bank Of America Corporation	Self-service terminal limited access personal identification number ("PIN")
US8447641B1	2010-03-29	2013-05-21	Jpmorgan Chase Bank, N.A	System and method for automatically enrolling buyers into a network
US8346671B2	2010-04-01	2013-01-01	Merchant Link, Llc	System and method for point-to-point encryption with adjunct terminal
US8332322B2 *	2010-05-07	2012-12-11	Milcard Limited	Method of establishing identity validation based on an individual's ability to access multiple secure accounts
US10068287B2	2010-06-11	2018-09-04	David A. Nelsen	Systems and methods to manage and control use of a virtual card
US8548857B2	2010-07-10	2013-10-01	William Jennings STEVISON	Method and system for detection of credit card fraud
US9342832B2	2010-08-12	2016-05-17	Visa International Service Association	Securing external systems with account token substitution
EP2426652A1 *	2010-09-06	2012-03-07	Gemalto SA	Simplified method for customising a smart card and associated device
US8762241B2	2010-09-10	2014-06-24	Ebay Inc.	Online quick key pay
US20120072346A1 *	2010-09-16	2012-03-22	Yomir Sp	System and method for securing and authenticating purchase transactions
US8898086B2	2010-09-27	2014-11-25	Fidelity National Information Services	Systems and methods for transmitting financial account information
US8589288B1	2010-10-01	2013-11-19	Jpmorgan Chase Bank, N.A.	System and method for electronic remittance of funds
US9483786B2	2011-10-13	2016-11-01	Gift Card Impressions, LLC	Gift card ordering system and method
US9031869B2	2010-10-13	2015-05-12	Gift Card Impressions, LLC	Method and system for generating a teaser video associated with a personalized gift
US8849893B2	2010-10-21	2013-07-30	Bmi Productions, Inc.	Multi-account payment consolidation system
US10176477B2	2010-11-16	2019-01-08	Mastercard International Incorporated	Methods and systems for universal payment account translation
IL210169D0	2010-12-22	2011-03-31	Yehuda Binder	System and method for routing-based internet security
AU2012220669A1	2011-02-22	2013-05-02	Visa International Service Association	Universal electronic payment apparatuses, methods and systems
US10223730B2	2011-09-23	2019-03-05	Visa International Service Association	E-wallet store injection search apparatuses, methods and systems
US10043229B2 *	2011-01-26	2018-08-07	Eyelock Llc	Method for confirming the identity of an individual while shielding that individual's personal data
US20120197691A1 *	2011-01-31	2012-08-02	Bank Of America Corporation	Mobile wallet payment vehicle preferences
US10586227B2	2011-02-16	2020-03-10	Visa International Service Association	Snap mobile payment apparatuses, methods and systems
AU2013214801B2	2012-02-02	2018-06-21	Visa International Service	Multi-source, multi-dimensional, cross-entity, multimedia database platform

IPR2025-00645 Page 02188

			Association	apparatuses, methods and systems
US8751381B2	2011-02-23	2014-06-10	Mastercard International Incorporated	Demand deposit account payment system
CN107967602A	2011-03-04	2018-04-27	维萨国际服务协会	Ability to pay is bound to the safety element of computer
US8612289B2 *	2011-03-04	2013-12-17	Billec, Inc.	Methods and systems for paying with loyalty currency during online payment
US10453062B2	2011-03-15	2019-10-22	Capital One Services, Llc	Systems and methods for performing person-to-person transactions using active authentication
US20120239572A1 *	2011-03-15	2012-09-20	Ing Bank, Fsb (Dba Ing Direct)	Systems and methods for performing financial transactions using active authentication
US10089612B2	2011-03-15	2018-10-02	Capital One Services, Llc	Systems and methods for performing ATM fund transfer using active authentication
US20120246071A1 *	2011-03-21	2012-09-27	Nikhil Jain	System and method for presentment of nonconfidential transaction token identifier
US20120278236A1 *	2011-03-21	2012-11-01	Qualcomm Incorporated	System and method for presentment of nonconfidential transaction token identifier
US8543504B1	2011-03-30	2013-09-24	Jpmorgan Chase Bank, N.A	Systems and methods for automated invoice entry
US8543503B1	2011-03-30	2013-09-24	Jpmorgan Chase Bank, N.A.	Systems and methods for automated invoice entry
US20120253989A1 *	2011-03-30	2012-10-04	CPS Holdings, LLC	System and method for payment by virtual credit card
US20120254025A1 *	2011-03-31	2012-10-04	Ebay Inc.	Online payment for offline purchase
US9280765B2	2011-04-11	2016-03-08	Visa International Service Association	Multiple tokenization for authentication
US10325265B2	2011-05-26	2019-06-18	Facebook, Inc.	Methods and systems for facilitating E-commerce payments
US9582598B2	2011-07-05	2017-02-28	Visa International Service Association	Hybrid applications utilizing distributed models and views apparatuses, methods and systems
AU2012278963B2	2011-07-05	2017-02-23	Visa International Service Association	Electronic wallet checkout platform apparatuses, methods and systems
US8620806B2 *	2011-07-13	2013-12-31	Mastercard International Incorporated	Merchant data cleansing in clearing record
WO2013019567A2	2011-07-29	2013-02-07	Visa International Service Association	Passing payment tokens through an hop/sop
US20130036051A1 *	2011-08-02	2013-02-07	Bank Of America Corporation	Non-near field communication point of sale experience
US10242358B2	2011-08-18	2019-03-26	Visa International Service Association	Remote decoupled application persistent state apparatuses, methods and systems
US10825001B2	2011-08-18	2020-11-03	Visa International Service Association	Multi-directional wallet connector apparatuses, methods and systems
US9355393B2	2011-08-18	2016-05-31	Visa International Service Association	Multi-directional wallet connector apparatuses, methods and systems
US9710807B2	2011-08-18	2017-07-18	Visa International Service Association	Third-party value added wallet features and interfaces apparatuses, methods and systems
US9165294B2	2011-08-24	2015-10-20	Visa International Service Association	Method for using barcodes and mobile devices to conduct payment transactions
US9460436B2 *	2012-03-16	2016-10-04	Visa International Service Association	Systems and methods to apply the benefit of offers via a transaction handler
IN2014KN00998A	2011-10-12	2015-09-04	C Sam Inc	
US20130173364A1 *	2012-01-04	2013-07-04	Spark Commerce, Inc.	Credit card rewards program
RU2017131424A	2012-01-05	2019-02-06	Виза Интернэшнл Сервис Ассосиэйшн	TRANSFER DATA PROTECTION
US9830595B2	2012-01-26	2017-11-28	Visa International Service Association	System and method of providing tokenization as a service
US9014963B1 *	2012-02-03	2015-04-21	Ubetterknowme.com Inc.	System and method for providing a virtual presence while securely managing and applying user profile data
US9672504B2	2012-02-16	2017-06-06	Paypal, Inc.	Processing payment at a point of sale with limited information

IPR2025-00645 Page 02189

US10282724B2	2012-03-06	2019-05-07	Visa International Service Association	Security system incorporating mobile device
US10535064B2	2012-03-19	2020-01-14	Paynet Payments Network, Llc	Systems and methods for real-time account access
BR112014023264A2 *	2012-03-19	2019-08-13	Paynet Payments Network Llc	computer systems and methods for processing network payment transactions
US20130290184A1 *	2012-04-30	2013-10-31	VSPC INC. Delaware	Virtual specific purchasing card
US20130297501A1	2012-05-04	2013-11-07	Justin Monk	System and method for local data conversion
US20130297509A1 *	2012-05-07	2013-11-07	Infosys Limited	Mobile payment using dynamic authorization code and multi-payer shared card number
US9524501B2	2012-06-06	2016-12-20	Visa International Service Association	Method and system for correlating diverse transaction data
US9547769B2	2012-07-03	2017-01-17	Visa International Service Association	Data protection hub
US9846861B2	2012-07-25	2017-12-19	Visa International Service Association	Upstream and downstream data conversion
US9256871B2	2012-07-26	2016-02-09	Visa U.S.A. Inc.	Configurable payment tokens
US9665722B2	2012-08-10	2017-05-30	Visa International Service Association	Privacy firewall
US8925805B2 *	2012-08-15	2015-01-06	Bank Of America Corporation	Pre-set readable indicia to facilitate payment during a transaction with a merchant when there is limited network connectivity
WO2014043278A1	2012-09-11	2014-03-20	Visa International Service Association	Cloud-based virtual wallet nfc apparatuses, methods and systems
KR101451214B1 *	2012-09-14	2014-10-15	주식회사 엘지씨엔에스	Payment method, server performing the same, storage media storing the same and system performing the same
US20140108233A1 *	2012-10-12	2014-04-17	Mastercard International Inc.	Social payment method and apparatus
WO2014066559A1	2012-10-23	2014-05-01	Visa International Service Association	Transaction initiation determination system utilizing transaction data elements
KR20140060849A *	2012-11-12	2014-05-21	주식회사 케이티	System and method for card payment
US9911118B2	2012-11-21	2018-03-06	Visa International Service Association	Device pairing via trusted intermediary
WO2014087381A1	2012-12-07	2014-06-12	Visa International Service Association	A token generating component
US9741051B2	2013-01-02	2017-08-22	Visa International Service Association	Tokenization and third-party interaction
US10740731B2	2013-01-02	2020-08-11	Visa International Service Association	Third party settlement
US10223710B2	2013-01-04	2019-03-05	Visa International Service Association	Wearable intelligent vision device apparatuses, methods and systems
US9947007B2	2013-01-27	2018-04-17	Barry Greenbaum	Payment information technologies
US9355841B1 *	2013-01-31	2016-05-31	Intuit Inc.	Deferred account reconciliation during service enrollment
US9558511B2	2013-02-15	2017-02-14	Gift Card Impressions, LLC	Gift card presentation devices
US10970778B1	2013-03-13	2021-04-06	Jpmorgan Chase Bank, N. A.	System and method for using a financial services website
US10607209B2 *	2013-03-15	2020-03-31	TGALLISON Technologies, LLC	System and method for transferring payments and documents with a web-based management system
US10217107B2	2013-05-02	2019-02-26	Gift Card Impressions, LLC	Stored value card kiosk system and method
US11055710B2	2013-05-02	2021-07-06	Visa International Service Association	Systems and methods for verifying and processing transactions using virtual currency
AU2014266529B2	2013-05-15	2019-05-16	Visa International Service Association	Mobile tokenization hub
US10878422B2	2013-06-17	2020-12-29	Visa International Service Association	System and method using merchant token
US20150006384A1 *	2013-06-28	2015-01-01	Zahid Nasiruddin Shaikh	Device fingerprinting
CN105874495B	2013-07-24	2021-08-10		System and method for ensuring data transfer risk using tokens

IPR2025-00645 Page 02190

			维萨国际服务协会	
WO2018011655A1	2013-07-26	2018-01-29	Visa International Service Association	Provisioning payment credentials to a consumer
EP3028227B1	2013-07-29	2020-03-18	ExxonMobil Research and Engineering Company	System and method to purchase and dispense fuel and other products using a mobile device with improved user experience
US10496988B2	2013-08-08	2019-12-03	Visa International Service Association	Multi-network tokenization processing
WO2015021420A1	2013-08-08	2015-02-12	Visa International Service Association	Methods and systems for provisioning mobile devices with payment credentials
EP2838060A1 *	2013-08-14	2015-02-18	Facebook, Inc.	Methods and systems for facilitating e-commerce payments
US20150073822A1 *	2013-09-09	2015-03-12	Primacea, Inc.	Automated systems and methods to manage compliance of contracts between professionals and third parties
WO2015048723A1 *	2013-09-30	2015-04-02	Gu Ding	Savings network system, method and electronic payment device
US10515370B2	2013-10-09	2019-12-24	The Toronto-Dominion Bank	Systems and methods for providing tokenized transaction accounts
CN106464492B	2013-10-11	2020-02-07	维萨国际服务协会	Network token system
US9978094B2	2013-10-11	2018-05-22	Visa International Service Association	Tokenization revocation list
US10515388B2	2013-10-18	2019-12-24	Visa International Service Association	Contextual transaction token methods and systems
US20150109101A1 *	2013-10-20	2015-04-23	VenGo, LLC	System and Method for Reading Multiple RFIDs
US20150109106A1 *	2013-10-20	2015-04-23	VenGo, LLC	System for Holding an RFID within a Slotted Wearable Device
US20150109107A1 *	2013-10-20	2015-04-23	VenGo, LLC	System for Holding Multiple RFIDs in a Wearable Device
US10489779B2	2013-10-21	2019-11-26	Visa International Service Association	Multi-network token bin routing with defined verification parameters
US10366387B2	2013-10-29	2019-07-30	Visa International Service Association	Digital wallet system and method
US20150186861A1 *	2013-11-12	2015-07-02	Xtt Llc	Lockable POS Device, Method for Distributing Lockable POS Devices, and Method for Locking a Lockable POS Device
US9898626B1	2013-11-13	2018-02-20	Jpmorgan Chase Bank, N.A.	System and method for financial services device usage
CN104636916A *	2013-11-15	2015-05-20	腾讯科技（深圳）有限公司	Mobile payment method and system and related equipment
WO2015077247A1	2013-11-19	2015-05-28	Visa International Service Association	Automated account provisioning
US9922322B2	2013-12-19	2018-03-20	Visa International Service Association	Cloud-based transactions with magnetic secure transmission
RU2686014C1	2013-12-19	2019-04-23	Виза Интернэшнл Сервис Ассосиэйшн	Methods and systems of cloud transactions
US20150178722A1 *	2013-12-20	2015-06-25	International Business Machines Corporation	Temporary passcode generation for credit card transactions
US20150186872A1 *	2014-01-01	2015-07-02	Bank Of America Corporation	Temporary virtual card
US10438128B2	2014-01-07	2019-10-01	Visa International Service Association	Methods and systems for provisioning multiple devices
CN104765999B *	2014-01-07	2020-06-30	腾讯科技（深圳）有限公司	Method, terminal and server for processing user resource information
US20150199702A1 *	2014-01-11	2015-07-16	Toshiba Global Commerce Solutions Holdings Corporation	Systems and methods for using transaction data associated with a loyalty program identifier to conduct a purchase transaction
US9846878B2	2014-01-14	2017-12-19	Visa International Service Association	Payment account identifier system
US9208301B2	2014-02-07	2015-12-08	Bank Of America Corporation	Determining user authentication requirements based on the current location of the user in comparison to the users's normal boundary of location
US9721248B2	2014-03-04	2017-08-01	Bank Of America Corporation	ATM token cash withdrawal
US9406065B2	2014-03-04	2016-08-02	Bank Of America Corporation	Customer token preferences interface
US10002352B2 *	2014-03-04	2018-06-19	Bank Of America Corporation	Digital wallet exposure reduction

IPR2025-00645 Page 02191

US9424572B2	2014-03-04	2016-08-23	Bank Of America Corporation	Online banking digital wallet management
US10050787B1 *	2014-03-25	2018-08-14	Amazon Technologies, Inc.	Authentication objects with attestation
US10049202B1	2014-03-25	2018-08-14	Amazon Technologies, Inc.	Strong authentication using authentication objects
US10026087B2	2014-04-08	2018-07-17	Visa International Service Association	Data passed in an interaction
US9942043B2	2014-04-23	2018-04-10	Visa International Service Association	Token security on a communication device
US10679151B2	2014-04-28	2020-06-09	Altair Engineering, Inc.	Unit-based licensing for third party access of digital content
US10262346B2	2014-04-30	2019-04-16	Gift Card Impressions, Inc.	System and method for a merchant onsite personalization gifting platform
US9680942B2	2014-05-01	2017-06-13	Visa International Service Association	Data verification using access device
CN111062720A	2014-05-05	2020-04-24	维萨国际服务协会	System and method for token domain control
US9519802B2	2014-05-07	2016-12-13	American Express Travel Related Services Company, Inc.	Systems and methods for document and data protection
US10846694B2	2014-05-21	2020-11-24	Visa International Service Association	Offline authentication
EP3086704A4 *	2014-05-28	2017-04-26	Emmanuel Gonzalez	User profile parameters for financial accounts
US11023890B2	2014-06-05	2021-06-01	Visa International Service Association	Identification and verification for provisioning mobile application
US9264419B1	2014-06-26	2016-02-16	Amazon Technologies, Inc.	Two factor authentication with authentication objects
US20160027000A1 *	2014-07-23	2016-01-28	Bank Of America Corporation	Mobile one-time bank card number generator for digital wallet
US9292849B2	2014-07-23	2016-03-22	Bank Of America Corporation	Mobile one-time card number generator for ATM usage
US9780953B2	2014-07-23	2017-10-03	Visa International Service Association	Systems and methods for secure detokenization
US10484345B2	2014-07-31	2019-11-19	Visa International Service Association	System and method for identity verification across mobile applications
US10055725B2 *	2014-08-13	2018-08-21	Google Llc	Simple in-store payments
US9775029B2	2014-08-22	2017-09-26	Visa International Service Association	Embedding cloud-based functionalities in a communication device
US10140615B2	2014-09-22	2018-11-27	Visa International Service Association	Secure mobile device credential provisioning using risk decision non-overrides
CN105516063B	2014-09-26	2019-06-04	阿里巴巴集团控股有限公司	Correlating method, the device of information exchange and human body biological characteristics data and account
ES2732564T3	2014-09-26	2019-11-25	Visa Int Service Ass	Remote server encrypted data provisioning system and procedures
US10510072B2 *	2014-09-29	2019-12-17	The Toronto-Dominion Bank	Systems and methods for administering mobile applications using pre-loaded tokens
CA2906889A1	2014-09-29	2016-03-29	The Toronto-Dominion Bank	Systems and methods for generating and administering mobile applications using pre-loaded tokens
CN104318437B *	2014-10-11	2017-12-01	上海众人网络安全技术有限公司	Payment system and its method of payment in a kind of virtual prepayment card line
US10671980B2 *	2014-10-20	2020-06-02	Mastercard International Incorporated	Systems and methods for detecting potentially compromised payment cards
US10015147B2	2014-10-22	2018-07-03	Visa International Service Association	Token enrollment system and method
GB201419016D0	2014-10-24	2014-12-10	Visa Europe Ltd	Transaction Messaging
US10332526B2	2014-11-25	2019-06-18	Visa International Service Association	Systems communications with non-sensitive identifiers
US10825718B2	2014-12-12	2019-04-09	Visa International Service Association	Automated access data provisioning
US20180082321A1 *	2014-12-19	2018-03-22	Fabrizio Boccardi	Intelligent system and method of payment, finance, and social commerce
US20160180302A1 *	2014-12-22	2016-06-23	Drew N. Bagot, JR.	System and method for processing multiple recurring payments

US10187363B2	2014-12-31	2019-01-22	Visa International Service Association	Hybrid integration of software development kit with secure execution environment
US10096009B2	2015-01-20	2018-10-09	Visa International Service Association	Secure payment processing using authorization request
WO2016126729A1	2015-02-03	2016-08-11	Visa International Service Association	Validation identity tokens for transactions
US10977657B2	2015-02-09	2021-04-13	Visa International Service Association	Token processing utilizing multiple authorizations
US20160260077A1 *	2015-03-06	2016-09-08	Lg Electronics Inc.	Terminal and operating method thereof
US10164996B2	2015-03-12	2018-12-25	Visa International Service Association	Methods and systems for providing a low value token buffer
US20160292805A1 *	2015-04-06	2016-10-06	Altair Engineering, Inc.	Sharing content under unit-based licensing
CN107438992B	2015-04-10	2020-12-01	维萨国际服务协会	Integration of browser and password
US9998978B2	2015-04-16	2018-06-12	Visa International Service Association	Systems and methods for processing dormant virtual access devices
US10552834B2	2015-04-30	2020-02-04	Visa International Service Association	Tokenization capable authentication framework
US11068889B2	2015-10-15	2021-07-20	Visa International Service Association	Instant token issuance
EP3163528A1 *	2015-10-30	2017-05-03	Mastercard International Incorporated	Methods, devices and systems for authorising an age-restricted interaction
EP3910908A1	2015-12-04	2021-11-17	Visa International Service Association	Unique code for token verification
EP3400669B1	2016-01-07	2020-05-13	Visa International Service Association	Systems and methods for device push provisioning
AU2017214412A1	2016-02-01	2018-06-28	Visa International Service Association	Systems and methods for code display and use
US10313321B2	2016-04-07	2019-06-04	Visa International Service Association	Tokenization of co-network accounts
US10460367B2	2016-04-29	2019-10-29	Bank Of America Corporation	System for user authentication based on linking a randomly generated number to the user and a physical item
US9979782B1	2016-05-17	2017-10-17	Visa International Service Association	Systems and methods for transferring resource access
KR20190006011A	2016-06-03	2019-01-16	비자 인터내셔널 서비스 어소시에이션	Sub token management system for connected devices
US11068899B2	2016-06-17	2021-07-20	Visa International Service Association	Token aggregation for multi-party transactions
US10268635B2	2016-06-17	2019-04-23	Bank Of America Corporation	System for data rotation through tokenization
US10361856B2	2016-06-24	2019-07-23	Visa International Service Association	Unique token authentication cryptogram
WO2018017068A1	2016-07-19	2018-01-25	Visa International Service Association	Method of distributing tokens and managing token relationships
US10509779B2	2016-09-14	2019-12-17	Visa International Service Association	Self-cleaning token vault
US11074584B2 *	2016-09-23	2021-07-27	Raise Marketplace, Llc	Authorizing exchange item redemption in an exchange item marketplace network
US10915899B2	2017-03-17	2021-02-09	Visa International Service Association	Replacing token on a multi-token user device
US10902418B2	2017-05-02	2021-01-26	Visa International Service Association	System and method using interaction token
US10789579B2 *	2017-06-16	2020-09-29	Mastercard International Incorporated	Systems and methods for use in facilitating purchases
US10511692B2	2017-06-22	2019-12-17	Bank Of America Corporation	Data transmission to a networked resource based on contextual information
US10313480B2	2017-06-22	2019-06-04	Bank Of America Corporation	Data transmission between networked resources

IPR2025-00645 Page 02193

US10692165B2	2017-06-22	2019-12-31	Bank Of America Corporation	Dynamic utilization of alternative resources based on token association
US10491389B2	2017-07-14	2019-11-26	Visa International Service Association	Token provisioning utilizing a secure authentication system
US10462156B2 *	2017-10-13	2019-10-29	Bank Of America Corporation	Multicomputer processing of user data with centralized event control
US10956049B2	2017-12-12	2021-03-23	E2Interactive, Inc.	Viscous liquid vessel for gifting
US10715323B2	2017-12-29	2020-07-14	Ebay Inc.	Traceable key block-chain ledger
US10896418B2	2017-12-29	2021-01-19	Ebay Inc.	Secure management of data files using a blockchain
US11144892B2 *	2018-05-18	2021-10-12	Jpmorgan Chase Bank, N.A.	Methods for facilitating funds disbursements and devices thereof
US10410207B1 *	2018-06-21	2019-09-10	Capital One Services, Llc	Systems for providing and processing surprise conditional gifts
US10846677B2	2019-01-11	2020-11-24	Merchant Link, Llc	System and method for secure detokenization

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
US7627531B2	2009-12-01	System for facilitating a transaction
US7448538B2	2008-11-11	Limited use pin system and method
US20170061430A1	2017-03-02	System and method for reconciliation of non-currency related transaction account spend
US8738521B2	2014-05-27	Method and system for processing internet payments using the electronic funds transfer network
US6704714B1	2004-03-09	Virtual private lock box
US10185936B2	2019-01-22	Method and system for processing internet payments
US20130317984A1	2013-11-28	Method and system for processing internet payments using the electronic funds transfer network
US20070179865A1	2007-08-02	Method for anonymous purchase of goods by providing a pluarlity of non-activated account numbers
AU2004201231B2	2007-03-08	Method and system for processing internet payments using the electronic funds transfer network

Priority And Related Applications

Priority Applications (6)

Application	Priority date	Filing date	Title
US18762000P	2000-03-07	2000-03-07	*US Provisional Application*
US60/187,620		2000-03-07	
US20062500P	2000-04-28	2000-04-28	*US Provisional Application*
US60/200,625		2000-04-28	
US21332300P	2000-06-22	2000-06-22	*US Provisional Application*
US60/213,323		2000-06-22	

Applications Claiming Priority (1)

Application	Filing date	Title
AU4347301A	2001-03-07	System for facilitating a transaction

Legal Events

Date	Code	Title	Description
2001-09-13	AK	Designated states	**Kind code of ref document:** A2

IPR2025-00645 Page 02194

			Designated state(s): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
2001-09-13	AL	Designated countries for regional patents	**Kind code of ref document:** A2 **Designated state(s):** GH GM KE LS MW MZ SD SL SZ TZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
2001-11-07	121	Ep: the epo has been informed by wipo that ep was designated in this application	
2001-12-06	DFPE	Request for preliminary examination filed prior to expiration of 19th month from priority date (pct application filed before 20040101)	
2003-02-20	REG	Reference to national code	**Ref country code:** DE **Ref legal event code:** 8642
2003-05-07	122	Ep: pct application non-entry in european phase	
2004-12-10	NENP	Non-entry into the national phase	**Ref country code:** JP
2012-10-26	DPE2	Request for preliminary examination filed before expiration of 19th month from priority date (pct application filed from 20040101)	

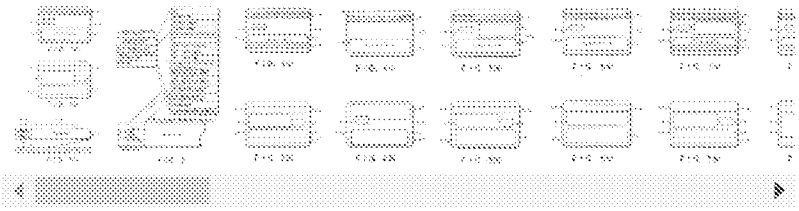
Data provided by IFI CLAIMS Patent Services

Electronic bankbook and cash transaction information processing system using the same

Abstract

The object of the present invention is to propose an account bankbook, a money transfer card, a receipt file, and a checkbook utilizing an optical card, an IC card, or a hybrid optical/IC card. On the surface of a resin card base board 1 are formed an IC chip 11, an optical recording sheet 13, a magnetic stripe 14, and an embossment 12. In a semiconductor memory within the IC chip 11 are written validation keys, search keys, payee information, the upper limit amount of a check, and a program for processing transaction data. Access restrictions corresponding to various applications are imposed upon these data. The history of various cash transactions is recorded in the optical recording sheet 13. These records are of write-once type and rewriting or deletion thereof is impossible.

Images (29)



Classifications

G07F7/1008 Active credit-cards provided with means to personalise their use, e.g. with PIN-introduction/comparison system

View 5 more classifications

EP0720102A1

European Patent Office

Download PDF Find Prior Art Similar

Other languages: German, French

Inventor: Nobuo NTT Data Communications Sys Corp.
FURUHASHI, Kenichiro NTT Data Communications Sys Corp.
INOUE, Tomoo NTT Data Communications Systems Corp
TAKEDA, Sigefumi NTT Data Communications Sys C.
TAKAHASHI, Atsumi NTT Data Communications Sys Corp.
TOKUMASU, Takafumi NTT Data Communications Sys C.
KOBAYASHI, Noriyuki NTT Data Communications Sys Corp.
IWASE

Current Assignee : NTT Data Corp

Worldwide applications

1995 EP CN WO US 1999 US

Application EP95925144A events

1994-07-18 Priority to JP16566794

1995-07-18 Application filed by NTT Data Communications Systems Corp

1996-07-03 Publication of EP0720102A1

1997-09-03 Publication of EP0720102A4

Status Ceased

Show all events

Info: Patent citations (25), Non-patent citations (2), Cited by (148), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, EPO GPI, EP Register, Global Dossier, Discuss

Claims (30)

Hide Dependent

1. An electronic bankbook having a rewritable storage medium, a write-once storage medium and at least one magnetic stripe which are disposed in predetermined regions of the same card base plate, said bankbook comprising:
   a search information recording region provided in said rewritable storage medium for storing payee information and search key information;
   a region provided in said write-once storage medium for storing detailed bankbook information of which address is specified by said search key information; and
   a region provided in said magnetic stripe for storing bankbook information including a security code, a bank code, and a bank account number.

2. An electronic bankbook according to Claim 1, further comprising an IC chip including a semiconductor memory as said rewritable storage medium.

3. An electronic bankbook according to either one of Claim 1 and 2, further comprising a write-once type optical storage medium as said write-once storage medium.

4. An electronic bankbook according to any one of Claim 1 through Claim 3, further comprising a proud-indented portion formed upon a predetermined region of said card base board for exhibiting either of specific letter, figure and codes;
   wherein said rewritable storage medium, said write-once storage medium and said magnetic stripe are disposed in regions of said card base board which avoid the predetermined region on which said proud-indented portion is formed.

5. An electronic bankbook according to any one of Claim 1 through Claim 3, further comprising a proud-indented portion formed upon predetermined region of said card base board for exhibiting either of specific letters, figures and codes;
   wherein said rewritable storage medium and said write-once storage medium are disposed in regions which do not come into contact with a reading and writing means for said magnetic stripe.

6. An electronic bankbook for which writing and reading transaction data are performed by an automatic teller machine, comprising:
   a payee information storage section capable of being read by said automatic teller machine for storing one or a plurality of items of payee information determined

IPR2025-00645 Page 02196

by a customer; and

a transaction data storage section provided separately from said payee information storage section for storing the transaction data.

7. A system for money transfer processing using an automatic teller machine and an electronic bankbook, wherein the automatic teller machine comprises:

a means, operational when said electronic bankbook having a transaction data storage section and a payee information storage section separate from the transaction data storage section, for reading out payee information registered in advance from the payee information storage section;

a selection means for selecting a payee item intended by a customer from among the payee information registered in advance; and

a mean for executing money transfer processing using the payee item which has been read out by said means for reading and selected by said selection means.

8. A system of money transfer processing according to Claim 7, further comprising a payee entry device, separate from said automatic teller machine, for writing one or a plurality of items of payee information determined by the customer into said payee information storage section of said electronic bankbook.

9. A device for payee entry into an electronic bankbook having a transaction data storage section and a payee information storage section separate from the transaction data storage section, said device being separate from an automatic teller machine for writing and reading of the transaction data storage area in said electronic bankbook, said device comprising:

an electronic bankbook read and write means for reading and writing information in said electronic bankbook;

a customer input means for inputting payee item as determined by a the customer; and

a control means for controlling said electronic bankbook read and write means so as to write payee item from said customer input means into the payee information storage section of said electronic bankbook.

10. A method for payee entry into an electronic bankbook having a transaction data storage section and a payee information storage section separate from the transaction data storage section, comprising the steps of:

setting said electronic bankbook accessibly to a payee entry device which is a separate unit from an automatic teller machine which performs writing and reading of transaction data in said electronic bankbook;

inputting payee information as determined by a customer into said payee entry device; and

writing the payee information which has been input, from said payee entry device into the payee storage section in said electronic bankbook.

11. A transaction information processing device which is used with an electronic bankbook in which information containing transaction type codes related to transactions executed in the past is recorded as transaction history, said device comprising:

a type selection means for selecting one or more transaction types which are desired by a customer;

a history querying means for selectively reading out from said electronic bankbook only the transaction history which is relevant to the transaction types selected by said type selection means, based upon the transaction type codes; and

a query result presentation means for presenting to the customer the transaction history which has been read out by said history querying means.

12. A transaction information processing device for an electronic bankbook according to Claim 11, further comprising:

a code/character conversion means for converting said transaction type codes in the transaction history read out into character images;

wherein said query result presentation means presents to the customer the transaction types of the transaction history read out using the character images converted.

13. A transaction information processing device for an electronic bankbook according to Claim 11 or Claim 12, further comprising:

a means connectable to a bank host computer for performing on-line transactions;

wherein said means for performing the on-line transactions and said history querying means are operational in parallel with one another.

14. A transaction information processing device for an electronic bankbook according to any one of Claim 11 through Claim 13:

wherein said history querying means has a balance querying means for selectively reading balance amounts from within the transaction history stored in said electronic bankbook; and

wherein said query result presentation means has a balance progress presentation means for presenting to the customer information showing a progress over time of the balance amounts read out.

15. A transaction information processing device for an electronic bankbook according to any one of Claim 11 through Claim 13:

wherein said history querying means has an asset analysis means for reading out at least a partial items among the transaction history stored in said electronic bankbook to perform a predetermined analysis for asset employment; and

wherein said query result presentation means has an analysis result presentation means for presenting to the customer a result of the analysis performed by said asset analysis means.

16. A transaction information processing device for an electronic bankbook according to Claim 15, wherein the predetermined analysis includes, based upon a minimum balance amount among the transaction data in said electronic bankbook, calculating profits to be obtained by different manner uses of the minimum balance amount.

17. A transaction information processing device for an electronic bankbook according to Claim 15, wherein said analysis result presentation means, in response to the result of the analysis from said asset analysis means, uses an advice message conversion table which is prepared in advance to present to the customer an advice message corresponding to the result of the analysis.

18. A transaction information processing device for an electronic bankbook according to any one of Claim 11 through Claim 15, comprising:

a time period designation means for designating a time period according to the customer;

wherein said history querying means reads out from said electronic bankbook only the transaction history within the range of the time period designated, based upon dates and times of transaction history which are recorded in said electronic bankbook.

19. A transaction information processing device for an electronic bankbook according to Claim 18, comprising:

a history signal receiving means capable of signal transmission with a bank host computer for, when the time period designated exceeds the time period of transaction history which is stored in said electronic bankbook, receiving from said bank host computer another transaction history for at least a exceeding portion of the time period designated.

20. A method of transaction information processing which uses an electronic bankbook in which information including transaction type codes related to transactions executed in the past is recorded as transaction history code, said method comprising the steps of:

inputting one or more transaction types which are desired by a customer,

selectively reading out from said electronic bankbook only the transaction history which is relevant to the transaction types which have been selected, based upon

IPR2025-00645 Page 02197

the transaction type codes; and

presenting to the customer the transaction history selectively read out.

21. An electronic receipt file card comprising:

a recording medium for electronically recording receipt data indicating a recipient, a payment amount, a payment date/time, and a validation code for checking the legitimacy of the receipt data;

wherein said recording medium is of write-once type, and

wherein said validation code is generated based upon at least one of the payment amount and the payment date/time, and also upon a secret key which is specific to the recipient.

22. An electronic receipt entry device for electronically writing upon a recording medium receipt data indicating a recipient, a payment amount, a payment date and time, said device comprising:

a means for generating a validation code for checking the legitimacy of the receipt data, based upon at least one of the payment amount and the payment date/time, and also upon a secret key which is specific to the recipient; and

a means for writing the validation code together with the receipt data upon said recording medium.

23. A method for electronically writing upon a recording medium receipt data indicating a recipient, a payment amount, and a payment date/time, said method comprising the steps of:

generating a validation code for checking the legitimacy of the receipt data, based upon at least one of the payment amount and the payment date/time, and also upon a secret key which is specific to the recipient; and

writing the validation code together with the receipt data upon said recording medium.

24. An electronic receipt read out device for reading out from a recording medium receipt data indicating a recipient, a payment amount, a payment date/time, and a validation code for checking the legitimacy of the receipt, said device comprising:

a first calculation means for calculating a secret key which is specific to the recipient, based upon the recipient which is read out from said recording medium and also upon a predetermined validation secret code;

a second calculation means for calculating a reference validation code based upon the secret key specific to the recipient and also upon at least one of the payment amount and the payment date/time;

and a comparison means for comparing the reference validation code with the validation code in the receipt data to decide upon the legitimacy of the receipt data.

25. An electronic receipt read out method for reading out from a recording medium receipt data indicating a recipient, a payment amount, a payment date/time, and a validation code for checking the legitimacy of the receipt data, said method comprising the steps of:

calculating a secret key which is specific to the recipient based upon the recipient which is read out from said recording medium and also upon a predetermined validation secret key;

calculating a reference validation code based upon the secret key specific to the recipient and also upon at least one of the payment amount and the payment date/time; and

comparing the reference validation code with the validation code in the receipt data to decide upon the legitimacy of said receipt data.

26. An electronic check system for issuing an electronic check of the form of electronic data, comprising:

an IC card having an IC chip in which are stored an usable money amount and an set money amount which defines the upper limit for the usable money amount,

a card issue device for writing the set money amount in the IC chip of said IC card; and

a payment processing device for input a payment amount thereinto and for, only if the payment amount input does not exceed the usable money amount in said IC card, accepting the issue of an electronic check of said payment amount from said IC card and subtracting the payment amount from the usable money amount in said IC card;

wherein the IC chip of said IC card imposes a rewrite restriction with respect to the set money amount, and maintains the rewrite restriction unless a rewrite authority key which only a payer knows is used.

27. An electronic check system according to Claim 26, wherein the IC chip imposes another rewrite restriction with respect to the usable money amount, and maintains the another rewrite restriction against devices other than said card issue device and than said payment processing device.

28. An electronic check system according to Claim 26:

wherein said IC card further having an auxiliary recording medium for unerasably storing an issue history including at least a payment amount of an electronic check which has been issued; and

wherein said payment processing device, when accepting the issue of the electronic check, writes the issue history of the electronic check which has been issued into said auxiliary recording medium.

29. An IC card for functioning as a book of electronic checks in the form of electronic data, comprising:

an IC chip for storing an usable money amount which defines the upper limit for the face value of a single electronic check which can be issued, and an set money amount which defines the upper limit value for the usable money amount;

wherein said IC chip imposes a rewrite restriction with respect to the set money amount, and maintain the rewrite restriction unless a rewrite authority key which only a payer knows is used.

30. A payment processing device for accepting the issue of an electronic check in the form of electronic data from an IC card which has an IC chip for storing an usable money amount and a set money amount, the usable money amount defining the upper limit for the face value of a single electronic check which can be issued, the set money amount defining the upper limit value for the usable money amount, said device comprising:

a means for inputting a payment amount and for, only if the payment amount does not exceed the usable money amount in said IC card, accepting the issue of an electronic check of the payment amount from said IC card; and

a means for subtracting the payment amount from the usable money amount in said IC card.

Description

1. Field of the Invention

IPR2025-00645 Page 02198

[0001] The present invention relates to an electronic bankbook which combines on the same resin base board an IC card, an optical storage medium, and a magnetic stripe and embossing, and which has the functions of a money transfer card, a cash card, and a deposit account bankbook; and which further provides added value by combining these functions. And, in addition, the present invention also relates to a system which processes financial transaction information using an electronic bankbook.

2. Background of the Invention

[0002] The computerization of financial work has progressed in recent years, and the demand is increasing for conversion from the paper bankbooks which are used in banks to electronic cards. IC cards and optical cards are proposed as cards which can correspond to these sorts of demands. IC cards, as is known, are ones in which IC chips including semiconductor memory are arranged in predetermined regions upon a card base board made of resin, and they combine both high security characteristics and also potential capacity several times or more that of magnetic stripes; and, on the other hand, optical cards are ones in which an optical storage medium is disposed in stripe form or rectangular form upon a card base board made of resin, and, while they have low security characteristics, the feature is outstanding that they can ensure storage capacities in units of megabytes. Furthermore, recently, various proposals have been made for hybrid type cards in which IC chips and an optical storage medium are disposed in combination on the same card base board, in order to make the most of the beneficial features of them both more efficiently.

[0003] In the conversion from paper bankbooks to electronic cards, not only high security characteristics, but also the absolute accuracy of the recorded detailed bankbook information which includes a history of transactions must be ensured. That is to say, because the customer cannot in any way tamper with the detailed bankbook information once it has been recorded, a paper bankbook functions as a certificate which is objective evidence of the transaction history of cash depositing and payment and the like; and, furthermore, as an original, it also functions as a security for evidence ability. Accordingly, it is necessary for these functions also to be supported by a electronic card, and there should be no possibility of rewriting the detailed bankbook information which has been stored on the various storage mediums. Accordingly, it is necessary for the recording medium upon the card base plate which is to be used as an electronic bankbook to be of a non rewritable category, such as an optical storage medium of the write-once type.

[0004] From a different angle, it often happens recently that the same person carries a plurality of cash cards and/or money transfer cards. Further, the number of paper bankbooks and the number of transaction slips on which detailed bankbook information is printed increase along with the increase of card transactions. However, since a considerable cost is entailed when producing these cards, paper bankbooks, and transaction slips, the burden of expense to the banks is immense. On the other hand, for the customers as well, carrying a plurality of cards, paper bankbooks, and the like becomes inconvenient from the management point of view. Accordingly, it would be convenient from the point of view of the bank and also from the point of view of the customer if it were possible to combine into one card the functions of this plurality of cards and paper bankbooks, but in the prior art nothing has existed which has combined the functions of such a plurality of cards, due to the above described restrictions related to the storage medium and also due to the diversity of detailed bankbook information and the increasing amount thereof and the like. As described above, in the conversion from paper bankbooks to electronic cards, the implementation of the combination together of the functions of several cards has been extremely difficult, even independently of the fact that the demands of society are high, due to the existence of problems such as those described below, mainly in the way in which the detailed bankbook information should be recorded upon the cards.

(1) With IC cards, the above described stable security characteristic can be planned for, and moreover they have the beneficial feature that since the storage regions are constituted by semiconductor memory the recording and the reading out of information can be performed at high speed; but the down side is that the recording capacity of low cost cards is insufficient even for just simply recording the detailed bankbook information, and high capacity cards have the defect that the production cost becomes high. As described above, when considering the point that it should be impossible to tamper with the detailed bankbook information (which must not be done) and also the point that it is necessary to issue bankbooks in large amounts, the cost rapidly becomes high when using IC cards as electronic bankbooks, and cannot be said to be practicable.

(2) Further, with optical storage mediums, although it is possible to obtain high capacity ones at comparatively low cost, it is normal to perform the management of the recorded information based upon management information within the optical storage medium, without distinction of rewritable type and write-once type.

Due to this, if the quantity of the detailed bankbook information which is recorded is great, a long time period is required for referring thereto. Further, with the write-once type, there is the problem that recording capacity is expended uselessly when correcting the addresses or the like which serve as the keys for searching.

(3) Magnetic stripes are cheap in cost in correspondence with their low recording capacity, but are limited in their application to use for specified transactions, and by themselves are not suitable for service as electronic bankbooks.

(4) At least at the present moment, for cash cards and the like, proud-indented portions (embossing) are essential for displaying specific letters, digits, and symbols for personalization of these cards. However, the positions for the regions for formation (engraving) of this embossing are limited to specific regions of the card, and moreover they occupy wide areas. For this reason, it has not been possible to combine a plurality of storage mediums upon the same card base board with currently existing card layouts. In particular, with optical cards which have an optical storage medium, even forming this embossing has been an impossibility.

3. Objects of the Invention

[0005] An object of the present invention is to resolve these problems, and to provide an electronic bankbook which combines several functions upon one card.

[0006] Another object of the present invention is to provide novel techniques for performing the management of financial transactions in convenient terms from the point of view of the customer, using an electronic bankbook.

[0007] A further object of the present invention is to provide techniques for utilizing an electronic bankbook as a tool for various aspects of the financial activities of the customer.

4. Summary of the Invention

4.1 The Basic Construction of the Electronic Bankbook

[0008] The present invention provides an electronic bankbook comprising; a rewritable storage medium, for example a semiconductor memory upon an IC chip; a unrewritable storage medium, for example a write-once type optical storage medium; and at least one magnetic stripe which are disposed in predetermined regions of the same card base plate. In the rewritable storage medium, there is provided a search information recording region for storing payee information and search key information. In the unrewritable storage medium, there is provided a region for storing detailed bankbook information whose storage address is specified by the search key information. Further, in the magnetic stripe there is provided a region for storing bankbook information including a security code, a bank code, and for each type handled a bank account number and the like.

[0009] The present invention also provides an electronic bankbook of another construction comprising; a proud-indented type embossing being formed upon a predetermined region of the card base board; and the rewritable and unrewritable storage mediums and the magnetic stripe being disposed in regions which avoid the embossments on the card base board.

[0010] The present invention further provides an electronic bankbook of yet another construction comprising, a proud type embossing being formed upon predetermined region of the card base board; and the rewritable and unrewritable storage mediums disposed in regions which do not come into contact with a reading and writing device for the magnetic stripe.

[0011] With these electronic bankbooks of this invention, the search information recording region is provided in the rewritable storage medium, and the payee information and the search key information are stored in this region. The payee information contains bank account numbers and account names and so on of payees, and, since these data are freely rewritable according to requirements, the same functions are realized as with a prior art money transfer card.

IPR2025-00645 Page 02199

[0012] The search key information is a directory of the detailed bankbook information which is the object of search, and indicates for example the deposit or withdrawal type and the transaction type and the like for each of the transaction records. Since this search key information is also rewritable according to requirements, it is possible to record various suitable extra items of information.

[0013] Further, the region for storing the detailed bankbook information is provided in the unrewritable storage medium which is disposed upon the same card, and the storage address of this region is specified according to the above described search key information. Since this storage region cannot be rewritten, it never happens that detailed bankbook information which has once been stored is ever falsified, and the transaction history of the customer becomes an objective entity. Accordingly, it is possible to guarantee functioning as a certificate basically identical to that of a paper bankbook. Further, even if a large quantity of detailed bankbook information is stored upon this unrewritable recording region, since their storage addresses are specified by the data in the rewritable recording region, searching for the whereabouts of the various items of detailed bankbook information becomes extremely easy.

[0014] In particular, when the rewritable storage medium (or the rewritable recording region) is constituted by a semiconductor memory in an IC chip, the storage and replaying of the detailed bankbook information can be performed at high speed, and further it is possible to encryption and to impart a validation code during storage, so that the security characteristic is elevated. In addition, when the unrewritable storage medium (or the unrewritable storage region) is constituted by a write-once type optical storage medium, it becomes possible to put together the high speed accessibility and the high security characteristic of the semiconductor memory and the high storage capacity of the optical storage medium, so that it is possible to cause the latter to operate as extended memory for the former.

[0015] Furthermore, the magnetic stripe is provided on this card,
and the magnetic stripe has a storage region for bankbook information such as a security code, a bank code, and a bank account number for each of handled items and the like. Therefore, in addition to functions identical to those of a paper bankbook, this card also offers functions as a cash card and/or a card for card loans. Since also in the case of use for this sort of application the transaction history is stored as detailed bankbook information in the unrewritable storage region via the rewritable storage region, thereby it is possible to count upon so called apportionment of function.

[0016] Moreover, in the case that the proud-indented type embossing is formed upon the predetermined region of the card, the rewritable and unrewritable storage mediums and the magnetic stripe are disposed in the regions which avoid the appropriate embossments of the card, and in the case that the proud type embossing is formed, the rewritable and unrewritable storage mediums are disposed in the regions which do not come into contact with a reading and writing device for the magnetic stripe. Therefore, without receiving influence from the reading and writing device for each of the storage mediums, reading out of the inscribed information of the embossing can be performed in the manner of the prior art.

4.2 Improvements for Making Money Transfer Procedures More Convenient

[0017] The electronic bankbook according to the present invention which has been improved with regard to money transfers comprises a payee information storage section for storing one or a plurality of items of payee information determined by a customer at his option, which is capable of being read out by an ATM, and this payee information storage section is provided separately from a transaction data storage section for storing transaction data.

[0018] Here, "ATM" is an abbreviation for an "automatic teller machine", and is used in this specification also to include a dedicated machine for money transfer.

[0019] Further, a system for money transfer processing according to the present invention uses the above described improved electronic bankbook and the ATM, and this ATM comprises; a device for reading out the payee information registered in advance from the payee information storage section of the electronic bankbook; a selection device for selecting the payee items intended by a customer from among the payee information which is registered; and a device for executing money transfer processing using the payee items which has been read out by the reading out device and selected by the selection device.

[0020] This money transfer processing system may further comprise a payee entry device separate from the ATM, for writing one or a plurality of payee items determined by the customer into the payee information storage section of the electronic bankbook. In a preferred embodiment, this payee entry device is a personal computer or an electronic notebook, which is for the sole use of the customer.

[0021] A payee entry device for use with an electronic bankbook according to the present invention is constituted as a device separate from an ATM, and this entry device comprises; an electronic bankbook read/write device for reading and writing information in the electronic bankbook; a customer input device for inputting a payee items determined by the customer; and a control device for controlling the electronic bankbook read/write device so as to write the input payee items into the payee information storage section of the electronic bankbook.

[0022] A method for payee entry for an electronic bankbook according to the present invention uses the payee input device which is provided as a separate unit from an ATM, and this method comprises the steps of, setting the electronic bankbook to be accessible in the entry device; inputting a payee items determined by the customer using the entry device; and writing the payee items input from the payee entry device into the payee information storage section in the electronic bankbook.

[0023] With the electronic bankbook improved as described above according to the present invention, it is possible to register the payee information in the area separate from the transaction data storage section in advance. The payee items to be registered is not limited to the contents of the past transaction data which has been stored in the transaction data storage section, but can be determined by the free will of the customer. Accordingly, it is also possible to register data for future payees to whom money has not been transferred as yet. Further, since the payee information storage section is separate from the transaction data storage section which records transaction data, no influence is exerted upon bank transactions or the like even when performing the entry of payee information.

[0024] When performing a money transfer from an ATM using this electronic bankbook, according to the money transfer system of the present invention, since the ATM automatically reads out the payee information which is recorded in the electronic bankbook, if the customer performs only the selection of the intended payee items using the ATM, then the ATM executes money transfer processing using this selected payee items. Accordingly the trouble of inputting the payee items into the ATM is eliminated, and also there are almost no input errors.

[0025] According to the payee entry device and method according to the present invention, using an entry device which is separate from the ATM, it is possible to register payee items in the electronic bankbook in advance at a time which is convenient. Accordingly, it is not necessary to perform troublesome input operation in front of the ATM. In particular, with the preferred embodiment, since the entry device is a device for the personal use of the customer, the customer can enter the payee items even without attending the financial institution and moreover not necessarily during the working hours of the financial institution, at a time and place which are convenient. Further, since this entry device performs writing only into the payee information storage section of the electronic notebook and does not perform writing into other transaction data storage sections or the like, it never happens that hindrance is caused to bank transactions or the like.

[0026] Further, for this entry device, a numeric key pad will be sufficient to serve as input keys to achieve the objective of inputting payee items, and it is not necessary for it to have any touch panel like an ATM. Further, since this entry device does not perform writing into any regions of the transaction data storage section of the electronic bankbook which may exert any influence upon bank transactions, it can exist independently without any link with the host computer of the financial institution, and it is not necessary to connect it using a signal circuit with the host computer, of the financial institution, like an ATM. Accordingly, it is possible to propose this entry device as a device for the personal use of the customer, and further it also is possible to make it sufficiently compact for it to be portable; thus, for example, it is possible to realize this entry device so as to be generally serviceable, by taking advantage of a device to the use of which the customer is accustomed such as a personal computer or an electronic notebook. Due to this, it is possible to so arrange matters that it is possible to use the entry device at a time and place which suit the convenience of the customer without his being limited to the working place or hours of the financial institution, and from the point of view of the customer this is extremely convenient.

4.3 Improvements for Making Reference Procedures for Recordings in the Electronic Bankbook More Convenient

[0027] A transaction information processing device according to the present invention comprises; a type selection device for selecting one or more transaction types which are desired by a customer; a history querying device, responsive to codes of the transaction types in the electronic bankbook, for selectively reading out

IPR2025-00645 Page 02200

from the electronic bankbook only the transaction history which is relevant to the transaction types selected by the type selection means; and a query result presentation device for presenting to the customer the transaction history read out by the history querying means.

[0028] This transaction information processing device can be provided further with a code/character conversion means for converting the codes of the transaction types in the transaction history read out from the electronic bankbook, into character images. In this case, the transaction types are presented to the customer in a form of character images.

[0029] Further, this transaction information processing device can be provided further with a device connected to a bank host computer for performing on-line transactions, and it can be arranged so that this on-line transaction device and the above described history querying device operate in parallel with one another.

[0030] Further, in this transaction information processing device, it is also possible further to provide a device for obtaining the progress over time of the balance amount, and a device for performing asset analysis, based upon the transaction history which is recorded in the electronic bankbook.

[0031] The above described improved transaction information processing device, using as key the codes of the transaction types in the transaction history recorded in the electronic bankbook, selectively reads out from the electronic bankbook and presents to the customer only the transaction history which is relevant to the transaction types which have been selected by the customer. Accordingly, it is possible for the customer to obtain from a very large transaction history just the transaction history which he requires.

[0032] In the case that the code/character conversion device is further provided, the codes of the transaction types in the transaction history which was read out are converted into character images and presented to the customer. Accordingly, the customer can easily distinguish the presented types of the transaction history, and even if he has received a presentation of all of the transaction types it is easy to tell them apart.

[0033] In the case that an on-line transaction device is further provided and that the on-line transaction device and the history querying device can operate in parallel, then the burden in terms of time upon the customer is lightened, because the querying of the transaction history is also being performed while the on-line transaction is being performed.

[0034] In the case that the device for obtaining the balance progress or the device for performing asset analysis is further provided, then not only can the transaction history which has been read out from the electronic bankbook be presented just as it is, but also it can be presented to the customer after being processed so as to be helpful for asset employment.

4.4 Improvements for Making Cards More Convenient as Electronic Receipt Files

[0035] An electronic receipt file card according to the present invention has a recording medium for electronically recording receipt data including data which show a recipient (a payee), a payment amount, a payment date and time, and a validation code for checking the legitimacy of a receipt. This recording medium is one in which the receipt data can be written only once(for example, an optical recording medium). And the above described validation code is generated based upon at least one of the payment amount and payment date and time, and also upon a secret key specific to the recipient.

[0036] An electronic receipt entry device according to the present invention, which is that for electronically writing upon the recording medium the receipt data including the data which show a recipient, a payment amount and a payment date and time, comprises; a device for generating the validation code for checking the legitimacy of the receipt, based upon at least one of the payment amount and payment date and time, and also upon a secret key specific to the recipient; and a device for writing this validation code together with the receipt data upon the recording medium

[0037] An electronic receipt read out device according to the present invention, which is that for reading out the receipt data including data which show a recipient, a payment amount, a payment date and time, and a validation code for checking the legitimacy of the receipt, from a recording medium upon which the receipt data are electronically recorded, comprises; a first calculation device for calculating a secret key which is specific to the recipient based upon the data read out from the recording medium showing the recipient and also upon a predetermined secret key for validation; a second calculation device for calculating a reference validation code based upon the secret key which is specific to the recipient and also upon at least one of the payment amount and payment date and time which have been read out from the above described recording medium; and a comparison device which compares together the reference validation code and the above described validation code, and for checking whether or not these two codes agree.

[0038] In the electronic receipt file card of the present invention there are electronically recorded data which show the recipient, the payment amount, the payment date and time, and the validation code for checking the legitimacy of a receipt (Here, "to electronically record" means to record in a data form which can be processed electronically by machines, and includes various recording methods such as magnetically, optically, magneto-optically and the like). The receipt data showing the recipient, the payment amount, and payment date and time can be read out from this card, and this card can be utilized for formal accounting processing instead of the prior art paper receipts, since, by utilizing the validation code included therein, it is possible to check whether or not the receipt data is something legitimate which is fitting as evidence, that is to say, whether or not it is falsified or counterfeit.

[0039] Here, the validation code is generated based upon at least one of the payment amount and the payment date and time, and also upon the secret key specific to the recipient. For this reason, in particular, falsification or faking of the amount of payment or the date and time of payment, which are the most important features, becomes difficult, accordingly a high reliability is obtained for the receipt data. It may even be said that the reliability is higher than that of prior art paper receipts.

[0040] Further, since generally a card which has an electronic recording medium can record quite a large amount of data, it is possible to accumulate data representing a large number of receipts upon a single card, and processing them all together is easy.

[0041] Furthermore, since the electronic receipt data can be handed over to the person processing the receipts by an electronic signal transmission method, no troublesome management operations like those for prior art paper receipts are required.

[0042] For the recording medium upon the card, that of write-once type such as an optical recording medium is used. By this, phy al falsification of the receipt data becomes difficult, and a further level of safety is added.

[0043] With the electronic receipt entry device according to the present invention, the validation code is generated based upon at least one of the payment amount and the payment date and time, and also upon the secret key specific to the recipient; and this validation code is recorded in the electronic receipt file card together with the data which show the amount of the payment and the date and time of the payment. Since this validation code becomes a code which is specific to at least one of the amount of the payment and the date and time of the payment, and also to the recipient, when the receipt data are read out from this card, using this validation code makes it possible to check the legitimacy with respect to the payment amount, the payment date and time, and the recipient, which are the most important items upon the receipt. In other words, the fitness of the receipt data as evidence is assured.

[0044] With an electronic receipt read out device according to the present invention, when reading out the receipt data from the electronic receipt file card, first the secret key specific to the recipient is calculated based upon the data of the recipient in this receipt data and upon the predetermined secret key for validation, and next the reference validation code is calculated based upon the secret key specific to the recipient and upon at least one of the payment amount and the payment date and time in the receipt data. The reference validation code indicates that which the validation code should be when the receipt data read out is absolutely legitimate. Then, next, the reference validation code and the validation code which has been read out from the card are compared together. From the result of this comparison, it is checked whether or not the receipt data which have been read out from the card are legitimate.

4.5 Improvements for Issuing Electronic Checks in the Form of Electronic Data from IC Cards

[0045] A system for issuing electronic checks according to the present invention comprises; an IC card having an IC chip in which are stored an usable money amount and a set money amount which determines the upper limit for the usable money amount; a card issue device for writing the set money amount in the IC chip of this IC card; and a payment processing device responsive to a payment amount which is input thereinto, for accepting the issue of an electronic check of the payment amount from the IC card and subtracting the payment amount from the usable money amount in the IC card only if the payment amount does not exceed the usable money amount in the IC card. And a rewrite restriction is set in the IC chip of the IC card with respect to the set money amount, and this rewrite restriction can not be lifted unless a rewrite authority key which only the payer knows is used.

IPR2025-00645 Page 02201

[0046] It is desirable that an additional rewrite restriction is set in the IC chip with respect to the usable money amount, and this additional rewrite restriction never be lifted for any devices other than the card issue device and then the payment processing device.

[0047] It is also desirable that the IC card further comprises an auxiliary recording medium for unerasably storing an issue history including at least the payment amounts of electronic checks which have been issued, and that the payment processing device, when accepting the issue of the electronic check, writes the issue history of this issued electronic check into the auxiliary recording medium of the IC card.

[0048] According to the present invention, the usable money amount and the set money amount are stored in the IC chip of the IC card. The usable money amount represents the upper limit for the face value of a single electronic check which can be issued from this IC card. The set money amount represents the upper limit value for the usable money amount. And this set money amount cannot be rewritten by any person other than the payer.

[0049] The payer first writes the set money amount into the IC chip of the IC card using the card issue device, then the payer can hand over this IC card to another person to request him to do shopping and pay the bill by electronic check. The person who receives the request (the payment deputy) may make the shopping in accordance with the request, and can issue an electronic check by setting the IC card into the payment processing device which is provided in the shop and by inputting the amount for payment. At this time, the payment processing device receives the issue of an electronic check of this payment amount, only if the input payment amount is less than or equal to the usable money amount in the IC card. Then the payment processing device subtracts the payment amount from the usable money amount in the IC card.

[0050] Accordingly, each time an electronic check is issued, the usable money amount in the IC card is reduced by calculation. And the face value of a single electronic check is limited to being less than or equal to this reduced usable money amount. Further, the upper limit for the usable money amount is limited to being less than or equal to the set money amount which is written in the IC card in the beginning by the payer. As a result, the total value of the face values of the electronic checks which can be issued from this IC card comes to be limited to be less than or equal to the set money amount. Moreover, this set money amount can be rewritten only by the payer, and cannot be rewritten by the payment deputy.

[0051] As a result, the burden of danger upon the payer cannot exceed the set money amount which he has set in the beginning. On the other hand, it is very convenient from the point of view of the payment deputy, because it is not necessary ever to use cash, since it is possible to issue electronic checks with face values which match the amounts for payment on a case by case basis, provided that they are within the range of the usable money amount.

[0052] In the case that the additional rewrite restriction is imposed upon the usable money amount, the safety level is further elevated, since the payment deputy also cannot rewrite this amount at his own convenience. Further, if it is so arranged that the transaction history is unerasably stored into an auxiliary recording medium, then the degree of safety is even further elevated, since comparing together this history and the usable money amount makes it possible to check whether the check issues have been performed according to the requests.

5. Brief Description of the Drawings

[0053] Fig. 1(a) is a front view of an electronic bankbook according to one embodiment of the present invention, Fig. 1(b) is a rear view thereof, and Fig. 1(c) is an explanatory figure showing the detailed bankbook information which is recorded in this electronic bankbook;

Fig. 2 is a data structure diagram for explanation of the relationship in this embodiment between search information storage regions and detailed bankbook information storage regions;

Fig. 3(a) is a front view of an electronic bankbook according to a second embodiment of the present invention, and Fig. 3(b) is a rear view thereof;

Fig. 4(a) is a front view of an electronic bankbook according to a third embodiment of the present invention, and Fig. 4(b) is a rear view thereof;

Fig. 5(a) is a front view of an electronic bankbook according to a fourth embodiment of the present invention, and Fig. 5(b) is a rear view thereof;

Fig. 6(a) is a front view of an electronic bankbook according to a fifth embodiment of the present invention, and Fig. 6(b) is a rear view thereof;

Fig. 7(a) is a front view of an electronic bankbook according to a sixth embodiment of the present invention, and Fig. 7(b) is a rear view thereof;

Fig. 8(a) is a front view of an electronic bankbook according to a seventh embodiment of the present invention, and Fig. 8(b) is a rear view thereof;

Fig. 9(a) is a front view of an electronic bankbook according to a eighth embodiment of the present invention, and Fig. 9(b) is a rear view thereof;

Fig. 10 is a memory map showing the relationship between an address table in an IC storage section of an electronic bankbook according to a tenth embodiment of the present invention and an optical storage section;

Fig. 11 is a memory map showing the area division of the storage section of the same electronic bankbook;

Fig. 12 is a memory map showing a concrete example of information registered in a payee information area in the same optical storage section;

Fig. 13 is a block diagram showing the construction of a payee entry device according to an embodiment of the present invention;

Fig. 14 is a flow chart showing the control operation of a calculation processing section of the same payee entry device;

Fig. 15 is a memory map showing a transaction history storage area of an optical storage section of an electronic bankbook according to a twelfth embodiment of the present invention;

Fig. 16 is a figure showing the correspondence between types of transaction in the transaction history which is stored in the electronic bankbook and their codes;

Fig. 17 is a block diagram showing the relationship between a transaction information processing device according to a thirteenth embodiment of the present invention and a bank host computer;

Fig. 18 is a block diagram showing the construction of the same transaction information processing device;

Fig. 19 is a flow chart showing the processing operation for transaction history query performed by the same transaction information processing device;

Fig. 20 is a flow chart showing the processing operation for asset analysis performed by the same transaction information processing device;

Fig. 21 is a figure showing an exemplary fee query result display from the same transaction information processing device;

Fig. 22 is a figure showing an exemplary fee query result printout from the same transaction information processing device;

Fig. 23 is a figure showing an exemplary balance progress query and asset analysis result display from the same transaction information processing device;

Fig. 24 is an overall organizational diagram showing an electronic receipt processing system according to a fourteenth embodiment of the present invention;

Fig. 25 is a structural diagram showing exemplary receipt data contents recorded in an electronic receipt slip card used by the same system;

Fig. 26 is a figure showing the flow of processing for receipt issuing shop validation code generation by an electronic receipt filling out device for the same system;

Fig. 27 is a figure showing the flow of receipt issuing shop validation code replay processing of an electronic receipt reading out device for the same system;

Fig. 28 is a block diagram showing the overall organization of an electronic checking system according to a fifteenth embodiment of the present invention;

Fig. 29 is a flow chart showing a summary of the flow of the procedure for this system from the issue of a card up to the completion of payment;

Fig. 30 is a plan view showing the overall construction of an IC/optical hybrid card which is used as an electronic checkbook;

Fig. 31 is a block diagram showing the internal construction of an IC chip of the same card; and

Fig. 32 is a flow chart showing the flow of the processing performed by a payment processing device when generating an electronic check.

6. The Preferred Embodiments

6.1 The Basic Construction of the Electronic Bankbook

IPR2025-00645 Page 02202

[0054] Fig. 1(a) is a front view of an electronic bankbook according to one embodiment of the present invention, and Fig. 1(b) is a rear view thereof. In this electronic bankbook 1, an IC chip 11 is disposed in a region which is between an embossment 12 of a card base board 10 made of resin and a magnetic stripe 14, and which is to the left side of the card base board 10 when the magnetic stripe 14 is at the top thereof. An optical recording medium 13 is disposed upon the generally central section of the rear of the card base board 10, that is to say in a position which avoids the rear sides of the IC chip 11, the inscribed portion of the embossment 12, and the magnetic stripe 14.

[0055] The IC chip 11 is, for example, a conventional S type chip for IC card use which has a CPU and a semiconductor memory such as an EEPROM or the like, and in this semiconductor memory there is provided a search key information storage regions for storing payee information and search key information. The embossment 12 is formed in order to personalize the card.

[0056] The optical recording medium 13 consists of write-once type of megabyte units in which storage regions for a detailed bankbook information are provided, and their storage addresses are specified according to the above described search key information.

[0057] Fig. 1(c) shows the storage format for the items 101 to 107 ... of the detailed bankbook information actually stored in this storage region, and the data structure of one individual item 103 of detailed bankbook information.

[0058] Referring to Fig. 1(c), this individual item 103 of detailed bankbook information is made up of an address code 103a and detailed data 103b which show the particulars of an actual transaction, and the address code 103a is specified based upon the search key information which is stored in the semiconductor memory.

[0059] Fig. 2 shows the relationship between the search key information storage regions and the detailed bankbook information storage regions. In this embodiment, as search key information storage regions, there are provided a customer management information area, a payee information area, a detailed bankbook information address area, and a free area. The information recorded in the detailed bankbook information address area is used as search key information.

[0060] In the customer management information area there is recorded information related to the customer, for example the card ID and the name, the residence address, and the telephone number of the customer.

[0061] In the payee information area there is recorded information related to the payee, for example the payee financial institution code, the payee financial institution branch code, the payee classification code, the payee account name, the payee account number, the date and time of registration, and the like.

[0062] In the detailed bankbook information address area there is recorded address management information for detailed bankbook information about each individual transaction, for example the leading address of the details registered for each month, the final address of the details registered for each month, the leading address of the details registered for each key, the final address of the details registered for each key, and the like.

[0063] In the free area there is recorded any information determined by the customer or the company to which the customer belongs, such as for example customer memos, customer management information or the like.

[0064] The information stored in each area can be rewritten in any manner desired, and is managed by a programmed CPU on the IC chip 11. For example, every time when a money transfer to a new payee is performed, the payee information of the relevant payee can be added to or updated in the payee information area. By doing this, it is possible to realize the function of a prior art money transfer card.

[0065] As the leading address of the details registered for each month and the final address of the details registered for each month, there are respectively stored the storage addresses of the transaction entries for the first and the last date/time of the relevant month. Moreover, it would also be possible to omit the final address of the details registered for each month.

[0066] Further, for each type such as deposit, withdrawal, ATM, automatic payment, gas bill payment, electricity bill payment, rent payment, loan instalment payment, etc., the storage address in the detailed bankbook information storage region is stored as the leading address of the details registered for each key and the final address of the details registered for each key, and for each item of detailed bankbook information its type code and an address of one address before are added. The final address of the details registered for each key is updated each time detailed bankbook information corresponding to the relevant type code is entered, and the leading address of the details registered for each key is automatically stored when detailed bankbook information corresponding to the relevant type code is first entered.

[0067] Therefore, since the semiconductor memory of the IC chip 11 and the optical recording medium 13 are logically linked via the address information, it is possible to use the latter as a large capacity extended memory for the former. Further, it is possible to specify directly the storage addresses in the optical recording medium 13 of the detailed bankbook information just by referring to the detailed bankbook information address area of the IC chip 11, so that convenience when referring to the information and the like can be relied upon.

[0068] Although in the Fig. 2 example only one set of the leading and final addresses of the details registered for each key presented, in actual fact, the same number of the set of the addresses as that of the transaction types is stored, then it is possible to make additions of the set one by one each time the number of the types increases. Further, although not shown in the figures, of course it is possible to also use the registration address details for each classification or other address information, as search key information.

[0069] Referring again to Fig. 1, in the magnetic stripe 14 storage regions are provided for such information as stored in the conventional cash cards, loan cards and the like, and for the bankbook information such as the security codes (PINs), the bank codes, the bank account numbers for each handling item, the period of validity, the payable money amount, and so on.

Accordingly, this electronic bankbook 1 can also be used as a cash card. Moreover, the detailed bankbook information, which is generated when this card is used for the above mentioned services, is recorded in the detailed bankbook information storage region of the optical recording medium 13 via the search information storage region in the IC chip 11.

[0070] In this manner, the electronic bankbook 1 of this embodiment offers the functions for the management of the information specific to the customer and the payee information and the like, for the tallying of several tens of times as much transaction history as in the case of a prior art paper bankbook, and for the querying of the tally information by high speed search, and also it can be used as a cash card or a loan card just as it stands. Accordingly, the following merits are brought to the bank and to the customer.

(1) The Merits from the Point of View of the Bank

[0071] (A) Whereas in the past an inflating cost was entailed on the host computer side storage device for accumulating the bankbook data which have not yet been written in the bankbooks, it can be so arranged that the not yet written bankbook data is automatically written into the electronic bankbook 1 every time a card transaction is performed; therefore there is no necessity to preserve not yet written bankbook data for a long time period, and a considerable reduction in the cost of system resources can be anticipated.

(B) At the present, with many banks, the service is performed of printing the accumulated and not yet written bankbook data upon paper sheets and sending it to the customer, and the postal cost thereof has a tendency to increase; but with this electronic bankbook 1 this service no longer needs to be performed at all, if the not yet written bankbook data is reduced.

(C) The reduction in the cost for issuing money transfer cards, bankbooks, cash cards and the like is a serious problem with which all of the banks are concerned, but this problem can be easily resolved since the electronic bankbook 1 possesses all of these functions. Though at the present time the cost of issuing a single such electronic bankbook 1 is about twice the cost of issuing a paper bankbook or the like, its benefit is tremendous because it can store the same amount of information upon the optical recording medium 13 as in thirty or more paper bankbooks, and because it is not necessary to issue any money transfer card or cash card.

(D) Since when the electronic bankbook 1 is used the time required for bankbook updating by an ATM (automatic transaction machine) can be shortened to a great extent (can be shortened to about 1/3), therefore the turnover rate of customers is increased, and it is possible to reduce the number of ATM units.

IPR2025-00645 Page 02203

(2) The Merits from the Point of View of the Customer

[0072] (A) Since a cash card, a money transfer card, and a bankbook are unified, card management is extremely easy to perform, and further, since the bankbook is automatically updated when performing a card transaction, it is no longer necessary to be concerned about the bankbook, and it becomes possible to grasp each detail of all the transactions.

(B) It is possible to use the information in the electronic bankbook 1 as a data base related to one's own assets, and it is also possible to receive various added value services which the bank is prepared to offer from its own side with regard to this accumulated information.

[0073] In this manner, by disposing the IC chip 11, the embossment 12, the optical recording medium 13, and the magnetic stripe 14 as shown in Fig. 1, there is no need greatly to change the construction of a card according to the ISO/JISII standard, and moreover it is possible to realize the electronic bankbook 1 while counting upon interchangeability with systems which are already in existence. However, with the electronic bankbook of the present invention, while it is desirable to individually dispose the various recording mediums 11, 13, and 14 in regions which avoid the appropriate regions of formation of the embossment 12 on the card base board 10 so as not to suffer any influence from the corresponding reading out and writing means (card reader/writer), the construction is not necessarily limited to that shown in Fig. 1, and it is also possible to follow the constructions of Fig. 3 through Fig. 9.

[0074] Referring to Fig. 3 through Fig. 9, in each of them (a) is a front view of the electronic bankbook 2 through 8, while (b) is a rear view thereof. Further, 20, 30, 40, 50, 60, 70, and 80 are card base boards made of resin. Again, 21, 31, 41, 51, 61, 71, and 81 are IC chips, 22, 32, 42, 52, 62, 72, and 82 are embossments, 23, 33, 43, 53, 63, 73, and 83 are write-once type optical recording mediums, and 24, 25, 34, 44, 54, 64, 65, 74, 75, and 84 are magnetic stripes; and these respectively are elements which have the same functions as the IC chip 11, the embossment 12, the optical recording medium 13, and the magnetic stripe 14 which were shown in Fig. 1.

[0075] Among these electronic bankbooks 2 through 8, the ones shown in Fig. 3 through Fig. 7 are examples of the arrangement in the case that the embossments 22, 32, 42, 52, and 62 are formed as proud-indented configurations, while the ones shown in Fig. 8 and Fig. 9 are examples of the arrangement in the case that the embossments 72 and 82 are formed by decoration as proud configurations. In the case of the latter, the IC chips 71 and 81 and the optical recording mediums 73 and 83 are arranged in regions so as not to come into contact with the reading/writing device (reader/writer) for the magnetic stripes 74, 75, and 84.

[0076] Since by doing this it is possible efficiently to utilize the empty space on the card base boards 70 and 80, there is the beneficial point that it is possible for the capacity of the optical storage mediums 73 and 83 to be increased.

[0077] The electronic bankbook of this invention is not limited to the construction of the above described embodiments; constructional changes are possible within the range of non deviation from its fundamental principles. For example, the type of search key information and the structure of the address code 103a shown in Fig. 2 were exemplary, and these are not limited to the ones shown in the figure. Further, in these embodiments, a distinction was drawn between the payee information and the search key information, but it is also possible for the payee information to serve the same function as the search key information, and for detailed money transfer information to be stored upon the optical storage medium as detailed bankbook information.

6.2 Improvements for Making Money Transfer Procedures More Convenient

[0078] Fig. 10 shows a memory map of an electronic bankbook according to an embodiment of the present invention which is improved with regard to its money transfer functions. This electronic bankbook is an optical/IC (integrated circuit) hybrid card, and as storage devices, as shown in Fig. 10, it is equipped with a write-once type optical storage section 111 (hereinafter termed the "optical storage section") and a rewritable type storage section 113 within the IC (hereinafter termed the "IC storage section").

[0079] Fig. 11 shows a memory map of the optical storage section 111. In the optical storage section 111 there are written various items which are required for bank transactions, for example customer, type, payee, transaction data, and information related to other items (customer specification information, type information, payee information, transaction data, multi-objective information, etc.). For this reason, as shown in Fig. 11, with respect to the above described items, the optical storage section 111 is divided into a customer specification information area 115, a type information area 117, a payee information area 119, a transaction data area 121, and a multi objective information area 123. And, as shown in Fig. 10, it is so arranged that a plurality of entries (data) are written in each of these areas 115 through 123 for each item (for example, item A is customer specification, item B is type, item C is payee ...).

[0080] Fig. 12 concretely shows the entries which are stored in the payee information area 119 of Fig. 11 (the area C of Fig. 10), and in a single unit entry there are included a bank code 125, a branch code 127, an account number 129, and an error correction code 131 for a single payee. Moreover, this payee information area 119 is the one and only area within the optical storage section 111 upon which a payee entry device to be described hereinafter is permitted to write, and it is not possible for this payee entry device to perform writing upon the other areas 115, 117, 121, and 123.

[0081] As shown in Fig. 10, in the IC storage section 113 of the electronic bankbook there is provided a address table which establishes a correspondence between the keys which designate the above described items A, B, C, ... and the addresses of the information areas for the items A, B, C, ... within the optical storage section 111. This address table is provided for reference in order to obtain the address of the information area which is to be accessed, when an ATM or the payee entry device accesses the optical storage section 111 of this electronic bankbook.

[0082] Fig. 13 is a block diagram showing the overall construction of the payee entry device which is used for an electronic bankbook of the above described structure according to this embodiment.

[0083] This payee entry device may be realized by the use of a personal computer or an electronic notebook which are possessed by various customers, or may be a dedicated item of hardware (desirably a small size unit which can be carried around) with which the customer can freely enter the payee information into the electronic bankbook, regardless of the time or the place. This payee entry device, as will be described hereinafter, only performs writing into the payee information area 119 of the optical storage section 111 of the electronic bankbook, and since it unequivocally does not perform writing into the information areas which exert influence upon other bank transactions; therefore even if the customer uses it freely, no hindrance to bank transactions ever occurs, and accordingly it can exist quite independently of the bank computer system, and it is not necessary for it to be connected to any bank host computer like an ATM via any transmission line. For this reason, this payee entry device can be entirely for the personal use of the customer, and moreover it may be constructed as a small sized and portable device like an electronic notebook.

[0084] As shown in Fig. 13, this payee entry device is equipped with a data input device 141 for customer use, a display 143 for customer use, an electronic bankbook read/write device 145, a RAM 147, and a processing unit 149.

[0085] The data input device for customer use 141 is for inputting the payee information (i.e., the bank code, the branch code, and the account number and so on shown in Fig. 12) to the processing unit 149, and for this objective the provision of a numeric key pad will suffice, or of course a keyboard of a personal computer or an electronic notebook may be used just as it stands.

[0086] The display for customer use 143 is a device which exhibits, under the control of the processing unit 149, a display which invites the customer to input the bank code, the branch code, the account number and so on, or a display of the codes and/or numbers which have been input, or various error displays and the like, as described hereinafter.

[0087] The electronic bankbook read/write device 145 is that into which the electronic bankbook can be set, and which, under the control of the processing unit 149, accesses the IC and the optical storage section 111 of the electronic bankbook which is set, and writes payee information into the payee information area 119 (refer to Fig. 12) within its optical storage section 111.

[0088] The RAM 147 principally functions as a work area for the processing unit 149, and it temporarily stores the payee information which is input, retains the write point which specifies the address in the electronic bankbook at which this payee information is to be written, and is utilized for various other applications.

[0089] The processing unit 149 is a programmed microprocessor, and performs control operations as will be described hereinafter, in order to write the payee information which is input by the customer into the payee information area 119 within the electronic bankbook.

[0090] Fig. 14 shows the control operations performed by the processing unit 149.

IPR2025-00645 Page 02204

[0091] As shown in Fig. 14, first it is checked that the electronic bankbook is inserted into the electronic bankbook read/write device 145 (the step S41), and next the leading address of the payee information area 119 in the electronic bankbook is obtained from the electronic bankbook, and this leading address is substituted into the write point within the work area of the RAM 147 (the step S43).

[0092] In this step S43, the processing for obtaining the leading address of the payee information area 119 is performed as follows. First, a key which designates the term "payee information" which is programmed in advance is sent to the IC of the electronic bankbook. Then, since the leading address of the payee information area 119 is read out from the address table in the IC storage section 113 shown in Fig. 10, this leading address is received from the electronic bankbook.

[0093] When the write point has been set to the leading address of the payee information area 119, next the entry in the address within the optical storage section 111 which is designated by this write point is checked as to whether it is not yet written or whether writing therein has been completed (the step S45). If the result is that writing therein has been completed (the step S47), then a constant which is the number of bytes for a single entry is added to the write point (the step S49) in order to check the next entry, and the step S45 is repeated.

[0094] In this repetitive loop, if the value of the write point exceeds the last address of the payee information area 119 which is programmed in advance (the step S51), then, since the payee information area 119 is filled by this already recorded payee information, it is determined that further writing therein cannot be performed, and error processing such as display of an error message is performed (the step S53).

[0095] On the other hand, if in the above described repetitive loop the entry arrives at an address which has not yet been written in (the step S47), then first a message is displayed inviting the input of the bank code, and when the bank code is input by the customer it is retained in the work area of the RAM 147 (the step S55).

[0096] Next, a message is displayed inviting the input of the branch code, and when the branch code is input it is retained in the work area (the step S57), and next input of the account number is received in the same manner, and it is retained in the work area (the step S59).

[0097] When the above described input procedure has been completed, next the addresses of the payee information area 119 in which writing has been completed are searched, and it is checked as to whether an entry has not already been written which is identical with the bank code, the branch code, and the bank account number which have now been input (the step S61). If the result is that no identical entry is discovered, then the bank code, the branch code, and the account number which are being retained in the work area are written into the payee information area 119 from the address which is designated by the entry point (the step S63).

[0098] When the step S63 has been completed, the electronic bankbook is ejected from the electronic bankbook read/write device 145 (the step S65), and the payee entry processing is terminated

[0099] it should be noted that the payee entry device is programmed so as not to write any information in areas other than the payee information area 119 of the optical storage section 111.

[0100] After recording the payee information as described above, when using this electronic bankbook to perform money transfer from an ATM, the customer sets the electronic bankbook into the ATM and selects "money transfer" from the console menu. Then the ATM refers to the address table of the IC storage section 113 of the electronic bankbook and obtains the leading address of the payee information area 119, and scans the payee information area 119 from this leading address and displays upon the console a list of the payee information which is registered therein. Next, when the customer has selected the intended payee from within this list, the ATM considers this selected payee information as inputted information, and executes procedures for this payee.

[0101] By the customer using the payee entry device in the above described manner at home or the like, he can register all of the possible payee information in the electronic bankbook in advance. Due to this, when in front of the ATM, even in the case of making a money transfer for the first time, it is possible to input to the ATM the payee information just by the simple operation of selecting a payee who has been already registered, and it is possible completely to eliminate the troublesome input work of the prior art in respect of the ATM. Further, mistaken input of the payee information is almost eliminated, and it is also very simple to perform money transfers to a plurality of payees. As a result, there is the merit from the point of view of the customer of being able to perform money transfer in a short time period, while from the point of view of the financial enterprise there is the merit that the working ratio of its ATMs and of its outlets is elevated.

[0102] Further, proficiency in the operation of the payee entry device is easy since it is ready to the hand of the customer, and in particular, if a personal computer or an electronic notebook is used, proficiency is all the more easy since it is of general applicability, and moreover it can be utilized at a time and place which suit the convenience of the customer. For these reasons, the operation of inputting payee information into the electronic bankbook using this payee entry device is extremely efficient as compared to the operation according to the prior art for inputting the payee information using an ATM which can only be used in an outlet of a financial institution during its working hours, and the burden upon the customer is small.

[0103] Now, the above description is related to one embodiment of the present invention, but of course the present invention is not limited to the above description.

[0104] For example, whereas in the above described embodiment the bank code, the branch code, and the account number and so on were limited to ones which were able to be inputted from a numeric key pad as payee information, it would also be favorable to arrange for it to be possible also to register index information in order to make it possible for the customer simply to distinguish the name of the payee; and, further, it would also be favorable to arrange for it to be possible to register a date for money transfer and/or an amount of money as well, in order to perform a money transfer of a fixed amount of money at a fixed interval. If this is done, the merits are obtained that it becomes very easy to select the intended payee from the list of payee information which is displayed upon the console of the ATM, and further that forgetting to perform a money transfer is reduced, and yet further that the process for inputting the amount of money can be eliminated.

[0105] Further, whereas in the above described embodiment the payee information was all inputted from the payee entry device, it would also be possible to add the function of reading out the payee information from the past transaction history in the transaction data area 121 of the optical storage section 111, or of reading out payee information the entry of which has been completed from the payee information area 119, and of writing this, just as it is or corrected, into the payee information area 119. By doing this, if the electronic bankbook has been used for some time, the merit is obtained that the trouble entailed by redundant input is eliminated in the case of then wishing to register a payee from the past using the payee entry device, or in the case of then wishing to register payee information which only differs by the account number from an item of payee information which is already registered, or the like.

[0106] For the ATM, it would also be favorable to arrange for the function to be added of, after a money transfer procedure has been executed, not only writing the money transfer history in the transaction data area of the electronic bankbook, but also writing this payee information in the payee information area of the electronic bankbook, automatically or alternatively upon the command of the customer, in the event that this item of payee information is one which has not previously been registered in the electronic bankbook. By doing this, it is possible to register a payee who has temporarily been input via an ATM in the electronic bankbook, even without using the payee entry device.

[0107] Further, it would also be favorable to endow the ATM, or the payee entry device, with the function of being able selectively to delete payee information from the payee information area, in consideration of the situation when the payee information area of the electronic bankbook has become full.

6.3 Improvements for Making Query Procedures for Recordings in the Electronic Bankbook More Convenient

[0108] Fig. 15 is a memory map of an optical storage section which is fitted to an electronic bankbook according to an embodiment of the present invention which has been improved with regard to queries of recordings.

[0109] This electronic bankbook is a hybrid optical/IC card, and is equipped with a write-once type optical storage section 151 (hereinafter termed the "optical storage section") for storing transaction history, which can be written but cannot be rewritten.

[0110] As shown in Fig. 15, in an area for transaction history of the optical storage section 151, the transaction history is written item by item for each transaction, which includes items such as a date 153, a time 155, a bank code 157, a branch code 159, a classification code 161, a service type 163, an automatic payment type 165, an amount handled 167, a balance amount 169, and an error correction code 171. This transaction history is recorded in the date and time order in which the transactions were executed.

IPR2025-00645 Page 02205

[0111] Herein, the service type 163 and the automatic payment type 165 (which hereinafter will be termed the "transaction type" when referred to together) are, before stored in the electronic bankbook, classified and encoded by the bank host computer in detail as shown in Fig. 16.

[0112] Fig. 17 is a system structure diagram showing the relationship between a transaction information processing device for this electronic bankbook and a bank host computer.

[0113] Referring to Fig. 17, the transaction information processing device 181, for example an ATM, is connected along a dedicated line and via a terminal controller 179 to a bank host computer 177.

[0114] The transaction information processing device 181, in addition to the functions of a prior art ATM, is endowed with the function of querying the transaction history from the electronic bankbook, and the function of asset analysis based upon the transaction history which has been queried. The result of querying the transaction history or the result of the asset analysis can be exhibited upon the display or can be printed out. When doing so, in order to display the types of transactions in the form of character images, the code/character conversion table 180 is provided so as to convert the codes for transaction types, of which the detailed classification was shown in Fig. 16, into character images.

[0115] The bank host computer 177 is a device which performs processing so as to execute bank transactions of deposit, withdrawal, money transfer and the like for the account in response to demands from the transaction information processing device 181, sends the history of the transactions which have been executed to the transaction information processing device 181, sends past transaction history which has been requested to the transaction information processing device 181, and the like. In the event that the host computer 177 has executed a transaction with the transaction information processing device 181 on line, every time this happens, the transaction history is sent from the host computer 177 to the transaction information processing device 181 and is written into the electronic bankbook.

[0116] The terminal controller 179 functions as an interface for communicating between the host computer 177 and the transaction information processing device 181. A code/character conversion table 178 is also provided in this terminal controller 179. Principally, this code/character conversion table 178 is used, in connection with a transaction history which is sent to the transaction information processing device 181 from the host computer 177 in order to be printed into a prior art paper account bankbook, for changing the code of the transaction type into the character images; and, since the transaction history cannot be printed in characters in a paper bankbook with a detailed classification as shown in Fig. 16 and can only be printed with a more rough classification, in this table 178 the classification of the character images is more rough, as compared with the table of the transaction information processing device 181.

[0117] Fig. 18 is a block diagram showing the internal construction of the transaction information processing device 181.

[0118] As shown in Fig. 18, the transaction information processing device 181 is equipped with a signal transmission device 191, a cash deposit and withdrawal device 193, a printer 195, a touch panel (input device) 197, a display for customer use 199, an electronic bankbook read/write device 201, a transaction data work memory 203, and a processing unit 205.

[0119] The signal transmission device 191 is a device which is directly linked (on line) to the bank host computer 177 by communicating with the terminal controller 179 under the control of the processing unit 205 based upon a predetermined protocol, and which performs signal transmission control operations, such as exchanging various data which are necessary for this on line processing with the bank host computer 177, and releasing the on line state after the on line processing is completed, and the like.

[0120] The touch panel 197 is integrated as a single unit with the display 199, and is used by the customer to input transaction execution orders, information required for executing transactions, orders for queries about transaction history, methods of query, and the like upon an input screen which is presented by the display 199.

[0121] The display 199 is a device which presents to the customer an screen for input using the touch panel 197, and display screens for the results of transaction execution, the results of queries about transaction history, the results of asset analysis, and the like.

[0122] The printer 195 prints upon paper sheets the results of queries about transaction history and the results of asset analysis and the like.

[0123] The electronic bankbook read/write device 201 performs, under the control of the processing unit 205, writing and reading operations in relation to the electronic bankbook, such as setting the electronic bankbook, writing the transaction history which has been sent from the host computer 177 into the electronic bankbook, reading out transaction history which is stored in the electronic bankbook, and the like.

[0124] The cash deposit and withdrawal device 193 performs, under the control of the processing unit 205, the operations of receiving cash from the customer and of handing over cash, when executing transactions which are accompanied by the giving or receiving of cash.

[0125] The processing unit 205 is a programmed microprocessor which is connected to the various sections described above, and performs processing of information which is necessary for executing on-line transactions, queries relating to transaction history, asset analysis, and the like, and also performs control of the various sections described above.

[0126] The transaction data work memory 203 is used as a work memory by the processing unit 205, and temporarily stores the contents of transactions which have been input from the touch panel 197 when on-line transactions are being performed, transaction history which has been sent from the bank host computer 177, transaction history which has been read out from the electronic bankbook, the results of asset analysis, and the like. In addition, the code/character conversion table 180 which was shown in Fig. 16 and a margin/advice message conversion table which will be described hereinafter are also stored in this transaction data work memory 203.

[0127] Fig. 19 shows the flow of query processing for transaction history which is performed by the transaction information processing device 181 constructed as described above.

[0128] As shown in Fig. 19, for the transaction information processing device 181, first the electronic bankbook is inserted into the electronic bankbook read/write device 201 (the step S61), next it checks that the security number has been input correctly via the touch panel 197 (the step S62), and next it enters into selection processing for the query mode (the step S63). In this query mode selection processing a query mode selection menu is displayed upon the display 199, and the customer selects one of the query modes from this menu by using the touch panel 197.

[0129] Now, although it is not so shown in the figures, simultaneously with this selection of the query mode, or before or after it, the selection of whether or not an on-line transaction is to be performed is also performed by using the touch panel 197. And, if an on-line transaction has been selected, in parallel with the processing shown in the figure from the step S63 downwards, the processing of the on-line transaction is also executed. However, since the processing of the on-line transaction is identical to that performed in the prior art and is something for which special explanation is not required for a person skilled in the relevant art, explanation thereof will be curtailed.

[0130] Anyway, in the selection of query mode in the step S63, it is possible to select any of the following nine query modes.

(1) Normal type query mode

[0131] All of the transaction history written in the electronic bankbook is queried. That is to say, all of the items 153 through 169 (refer to Fig. 15) in the range of all of the service types 00 through 05 (refer to Fig. 16) are queried.

(2) Balance progress query mode

[0132] Within the range of all of the service types 00 through 05, the balance amount 169 and the other accompanying items (the date and time 153 and 155, the bank code 157, the branch code 159, etc.) are queried.

(3) Cash deposit query mode

[0133] For the service type 00 (cash deposit), all of the items 153 through 169 are queried.

(4) Salary or bonus query mode

[0134] For the service type 01 (salary or bonus), all of the items 153 through 169 are queried.

(5) Payment query mode

IPR2025-00645 Page 02206

[0135] For the service type 02 (Payment), all of the items 153 through 169 are queried.

(6) Cash withdrawal query mode

[0136] For the service type 03 (cash withdrawal), all of the items 153 through 169 are queried.

(7) Automatic payment query mode

[0137] For the service type 04 (automatic payment), all of the items 153 through 169 are queried.

(8) Fee query mode

[0138] For the service type 05 (card fee), all of the items 153 through 169 are queried.

(9) Asset analysis mode

[0139] This can be selected when the balance progress query mode has been selected, or when performing an on-line transaction. The least balance amount from all of the transaction history (that is, the amount which the customer has not made use of even once) is calculated along with the interest respectively in the case for this being a normal deposit account and in the case for this being a fixed term deposit account, the difference amount between these two interest values is obtained, and an advice message corresponding to this difference amount together with a balance progress result or a transaction result is offered to the customer.

[0140] When one has been selected from among these nine query modes, next a check is made as to whether or not the selected query mode is the automatic payment query mode (the step S64). If the result is that it is not the automatic payment query mode, then next a menu screen is displayed (the step S65) for selection of the period which it is desired to query. On this menu, for example, it may be possible to designate the last month, the last three months, or a free period.

[0141] On the other hand, if the selected query mode is the automatic payment query mode, then next selection processing is entered upon for the type of automatic payment (the step S70). That is to say, a menu screen is displayed in order to select the type which it is desired to query from among the seven kinds of automatic payment type shown in Fig. 16, and any one of the types is selected by the customer via the touch panel 197. On this selectable menu there are available eight choices: one in which all of the payment types are queried, and seven others in each of which an individual one of the seven types of automatic payment is individually queried.

[0142] When this selection of the automatic payment type has been completed, next a menu screen for selection of the period is displayed (the step S71), in the same way as in the case of the step S65. However, in consideration of the fact that automatic payment are usually performed every month, on the menu this time it may for example be possible to designate the last three months, the last one year, or a free period.

[0143] Next, it is checked as to whether the customer has selected from the touch panel 197 the designation of a free period or whether he has designated a fixed period like three months or one year (the step S66), and in the case of designation of a free period a period input screen is displayed and the customer inputs the period which he desires to query (the step S67).

[0144] After this, within the range of the transaction types which correspond to the query mode which the customer has selected and within the range of the selected period, the transaction history is read out from the optical storage section 111 of the electronic bankbook, and is temporarily stored in the transaction data work memory 203 (the step S68).

[0145] Next, along with displaying this read out transaction history upon the display 199, the customer is questioned as to whether or not he requires it to be printed, and if the customer so requires then it is printed using the printer 195 (the step S69). At this time, the service type 163 and the automatic payment type 165 in the transaction history which is read out from the electronic bankbook are converted from codes to character images according to the code/character conversion table 180 in the transaction information processing device 181, and are displayed and printed. By doing this, it is possible for the customer clearly to recognize the types of transactions in the transaction history which he has queried.

[0146] Now, if this query was made in parallel with an on-line transaction, the result of the on-line transaction is also displayed and/or printed, together with the transaction history which was queried. In this case, the transaction type of the on-line transaction result is also converted from code to character images.

[0147] Further, if the time period which was designated by the customer exceeds the time period range of the transaction history which is recorded in the electronic bankbook, then if the query was made in the on-line state this on-line state is taken advantage of, or if on the other hand the query was made in the off-line state automatically connection is established with the bank host computer 177 and the on-line state is established, and at least the transaction history for the portion of the time period which has exceeded is caused to be transmitted from the bank host computer 177 and received. By doing this, querying of the transaction history can be performed not only for the time period range which is recorded in the electronic bankbook, but also for the time period range for which service by the bank host computer 177 is possible. In this case, although it would be possible to so arrange matters that only the transaction history for the type of transaction corresponding to the query mode was selected from the side of the bank host computer 177 and was transmitted to be received, it is more desirable to transmit and receive the transaction history for all of the transaction types from the bank host computer 177, and, having stored it in the transaction data work memory 203 of the transaction information processing device 181, to select only the type of transaction corresponding to the query mode and display and/or print it, because this lightens the processing burden upon the bank host computer 177, and moreover enables the on-line state to be released more quickly, and furthermore makes it possible thereafter freely to change the query mode at the free will of the customer.

[0148] Incidentally, when the asset analysis query mode was selected in the step S63 of Fig. 19, in the processing in the step S68 of Fig. 19, after reading out from the electronic bankbook the balance amount for the designated period, further special processing is performed for asset analysis. Fig. 20 shows the flow of this special processing for this asset analysis.

[0149] First, a search is performed for the least balance amount from the balance amount list which has been read out (the step S81), and the interest is calculated for the case that this least balance amount is in a normal deposit account (the step S82). Next, the interest is calculated for the case that this least balance amount is in a fixed term deposit account (the step S83), and the amount of difference between the amount of interest for the case of a normal deposit account and the amount of interest for the case of a fixed term deposit account is calculated (the step S84). And an advice message is selected based upon this amount of interest difference (the step S85), based upon an interest difference amount/advice message conversion table which has been previously prepared in the transaction data work memory 203; and this message is exhibited upon the display 199, and/or, if the customer so requests, it is printed out via the printer 195 (the step S86). By presenting an advice message to the customer in this manner, it is possible to contribute effectively to improvement of the manner in which the customer employs his assets, as compared to simply presenting the result of calculation of the amount of interest difference.

[0150] Fig. 21 and Fig. 22 respectively shows an exemplary display of the result of a transaction history query and an exemplary printout thereof. The examples shown in these figures are for the case of the fee enquiry mode, but, as will be understood from these examples, only the transaction history for the type of transaction which is selected by the customer is presented, and moreover, since the queried transaction type is shown in character images, from the point of view of the customer only the necessary information is obtained without anything useless, which is very convenient.

[0151] Fig. 23 shows an exemplary display (or an exemplary printout) of the results, when a balance progress query and an asset analysis have together been performed. As shown in the figure, when the balance progress query is performed, along with showing the balance by a line graph 211, when further the asset analysis is performed, an advice message 213 which is the result of the analysis is displayed. By doing this, along with the customer being able to apprehend the progress of his balance at a glance, moreover it is very convenient because he can also receive advice for the employment of his assets. Furthermore, when performing asset analysis together with an on-line transaction, the result of the on-line transaction is displayed in the same manner.

[0152] Since, according to the above described embodiment, as has been explained above, it is arranged that the transaction history which is desired by the customer is selected and displayed and/or printed out from among the transaction history recorded in the electronic bankbook by using the codes of the detailed transaction types which are included therein, therefore no difficulty is required for selecting information which is necessary to the customer from among an immense transaction history, and searching of the transaction history becomes easy.

IPR2025-00645 Page 02207

[0153] Further, since querying of the transaction history or asset analysis can be performed in parallel with an on-line transaction, therefore from the point of view of the customer it is possible to receive these services without suffering any burden in time terms.

[0154] Further, by taking advantage of the on-line service, queries are also possible for time period ranges which are not recorded in the electronic bankbook.

[0155] Yet further, since it is so arranged that the codes for the detailed transaction types are converted into character images and displayed and/or printed, thereby, along with the customer himself being able to check what are the transaction types which he has queried, it also becomes easy for the customer to tell apart the enquiry results for each of the transaction types and to pick out only the specified transaction type, even if he has made a query for all of the transaction types taken together. Additionally, since the code/character conversion table is provided in the transaction information processing device, the transaction types can be converted into character images without any dependence upon the terminal controller.

[0156] Furthermore, also the feature is convenient from the point of view of the customer that not only can he simply make queries relating to transaction history, but also he can query balance progress and asset analysis, and can obtain help with employment of his assets.

[0157] Now, the transaction information processing device of the present invention may also be constituted as a device for use by a customer who is an individual user and who employs a personal computer or the like. Further, the specifics of the asset analysis could also be arranged to be specifics which were more complicated, multifarious, and diverse than those of the above described embodiment.

6.4 Electronic Receipt Files

[0158] Fig. 24 shows the overall organization of an electronic receipt processing system to which the present invention is applied. In the same figure, the shop issuing the receipt corresponds to the money recipient of the present invention, and the person approving the receipt is the subject who has authority to decide upon the legitimacy of the receipt, such as the tax office or the like.

[0159] An electronic receipt filling out device 226 in the shop is made up of a POS terminal 221 and an optical card reader writer 222 which is connected thereto.

[0160] On the other hand, an electronic receipt read out device 227 which is on the side of the person who is to approve the receipt is made up of a receipt processing device 225 and an optical card reader writer 224. The POS terminal 221 and the receipt processing device 225 may be dedicated devices, or may be devices such as personal computers constructed from general use hardware.

[0161] The optical card 223 corresponds to an electronic receipt file card according to the present invention, and is provided upon its surface with an optical recording medium in which receipt data is electronically recorded. Since the data is recorded upon this optical recording medium by digging minute holes or so called pits therein, only once writing data thereto is possible, while rewriting is not possible. This optical card 223 is carried by the payer who has made purchases or the like in the shop, and is set into the optical card reader writer 222 in the shop in order to write receipt data therein; and further, on the side of the person who is to approve the receipt, is set into the optical card reader writer 224 in order to read out the receipt data

[0162] Now, it would also be acceptable to use, instead of the optical card 223, an IC card or a hybrid optical/IC card. However, from the point of view of preventing phy al falsification of the receipt data, it is preferable to record the receipt data upon an optical card or upon the optical recording medium of a hybrid card, since in this case rewriting the data is impossible, rather than to write the receipt data upon an IC card or into the IC memory of a hybrid card.

[0163] Fig. 25 shows the concrete contents of the receipt data recorded in this optical card 223. In this figure, the receipt data contains the name of the shop which issues the receipt, the address of the shop, the telephone number of the shop, the amount paid, the date and time of payment, the reason for payment, the shop ID, the shop validation code, and a check code for error checking. Here, the shop ID is an identification code, unique to the shop, which is given in advance to the shop which issues the receipt. Further, as will be described hereinafter, the shop validation code is produced using a prescribed encryption algorithm in the shop which issues the receipt, based upon a shop individual key which is previously registered in the terminal of the shop (a secret key which is only known to that shop) and also upon the purchase amount and the purchase date and time, therefore the validation code is individual to the purchase amount, the purchase date and time, and the shop which issues the receipt. The above described shop individual key which is used when creating the shop validation code, as will be described hereinafter, is produced using a prescribed encryption algorithm, based upon a prescribed key for the person giving approval (a secret key which is only known to the person who has authority to authorize the receipt, like the receipt authorizing person) and upon the above described shop ID.

[0164] Next, the operation of this system will be explained.

[0165] First, when the payment is to be performed in the shop, the optical card 223 of the payer is set into the optical card reader writer 222 at the shop. Then the receipt data, which contains the items such as the shop ID, the amount of the payment, the date and time of purchase and the like, is set up in the POS terminal 221 and is recorded unerasably on the optical card 223 by the optical card reader writer 222.

[0166] When setting up this receipt data, the above described shop validation code is generated according to a processing flow as shown in Fig. 26. Namely, when the amount of the purchase has been input to the POS terminal 221, this purchase amount and the purchase date and time are linked together, and this linked data 231 is input into an encryption algorithm 233. The encryption algorithm 233 generates the shop validation code 234 using the shop individual key 232 which is registered in advance and the above described linked purchase amount and date and time data 231.

[0167] As will be clear from this procedure, the shop validation code 234 is created as a code which is unique to the amount of the payment, the date and time of purchase, and the shop which issues the receipt. Accordingly it is possible to check whether the receipt data related to the purchase amount, the purchase date and time, and the receipt issuing shop is legitimate or not by utilizing this validation code 234. For example, if the payer makes an attempt to falsify receipt data in the card 223 by using his own personal computer, even if he tries to fabricate fake receipt data and to enter it into the card 223, he cannot manufacture a shop validation code 234 which matches the falsified or faked amount of payment and the date and time of payment and the receipt issuing shop, since the payer does not know the shop individual key 232. As a result, it is possible to detect that this falsification or faking has been performed, by the shop validation code 234 being checked afterwards on the side of the person who is to approve the receipt. Now, with regard to falsification, the fact that the optical card 223 can only be unerasably written makes falsification yet more difficult.

[0168] By doing the above, the receipt data is written into the optical card 223. Thereafter, if the payer for example files a tax return application, this optical card 223 or its reproduction is sent to the person who id to approve the receipts (for example, the tax office), together with the application document. This optical card 223 is then set into the optical card reader writer 224 by the person who is to approve the receipts, and the receipt data in the optical card 223 is electronically read out via the optical card reader writer 224 into the receipt processing device 225 as receipt data, and may be exhibited upon a display, may be printed out, or may be transferred to any required calculation process. For example, it is possible in a single operation to execute the bookkeeping process such as reading out all of the receipt data carried upon this card which falls within a fixed time period, and then calculating the total amount of the payments thereof, or the like. Moreover, it would also be acceptable for the optical card 223 not to be directly handed over to the person who is to approve the receipts, but for the required receipt data to be read out on the side of the payer and to be sent via a communication network to the processing device 225 on the side of the person who is to approve the receipts.

[0169] In this connection, when the receipt processing device 225 has read out the receipt data, checking processing is performed by a procedure as shown in Fig. 27 in order to verify the legitimacy of this receipt data.

[0170] First, a key 242 for the person giving approval, which is a secret key which is registered in advance in the receipt processing device 225, and the shop ID 241, which is included in the receipt data which has been read out from the card 223, are transferred to an encryption algorithm 243. This encryption algorithm 243 generates an shop individual key 244, using the key 242 for the person giving approval and the shop ID. This shop individual key 244 is identical with the shop individual key (denoted in Fig. 26 by the reference number 232) which is specific to the shop designated by the shop ID.

[0171] Next, the shop individual key 244 which has just been made and the linked purchase amount and purchase date and time data 245 included in the receipt data which were read out are transferred to an encryption algorithm 246. Here, although it is not necessary for this encryption algorithm 246 to be the same as the above described encryption algorithm 243, it is the same as the encryption algorithm 233 of Fig. 26. This encryption algorithm 246 generates a reference shop validation code 247, using the shop individual key 244 and the linked purchase amount and purchase date and time data 245.

IPR2025-00645 Page 02208

[0172] This reference validation code 247 should be identical with the shop validation code included in the receipt data, if the amount of payment and the date and time of payment and the shop ID in the read out receipt data are correct.

[0173] Next, this reference shop validation code 247 and the shop validation code 234 contained in the read out receipt data are compared by a comparison processor 248. If the result is that they agree, then it is judged that this receipt data item is a legitimate one, and may be used as evidence; but if the result is that they do not agree, then it is judged that this receipt data item is an incorrect one that has been falsified or faked, and may not be used as evidence.

[0174] As described above, checking processing can be performed with regard to the receipt data that has been read out from the optical card 223 so as to determine whether or not it is legitimate, and since it is possible to extract only the legitimate receipt data, this receipt data can be used in formal accounting processing in place of the prior art paper receipts. Moreover, it can even be said that the reliability is higher than that of paper receipts.

[0175] Now, although in the above described embodiment the shop validation code was generated from the amount of payment and the date and time of payment which were the most important items among the receipt data, it would alternatively also be acceptable to add other information, and further it would also be acceptable to use only one of the amount of payment and the date and time of payment, if there were no problem from the point of view of suitability for evidence.

[0176] Further, although in the validation processing the shop individual key was first generated and then based upon this key the reference validation code was generated, it would also be acceptable to generate the reference validation code by a different algorithm.

6.5 A System for Issuing Electronic Checks

[0177] Fig. 28 shows the overall organization of a system for issuing and processing checks in the form of electronic data (hereinafter termed "electronic checks") according to an embodiment of the present invention.

[0178] As subjects who deal with electronic checks, there may exist three persons: the payer, the payment deputy, and the payee. Here, the payer is the person who substantially pays money for settlement of the electronic check. The payment deputy is the person who is requested by the payer to take the procedure of issue of the electronic check. And the payee is the shop or person who receives the electronic check from the payment deputy, and who, according to the settlement procedure therefor, receives the actual money from the payer.

[0179] The IC/optical hybrid card 301 (hereinafter simply termed the "card") is prepared as a medium for the issue of electronic checks. This card 301, if considered as paper checks, performs the function of an unwritten checkbook, and the payer issues it and the payment deputy carries it away.

[0180] This card 301, as will be explained in detail hereinafter, is equipped on its surface with an IC chip 311 which has an excellent security function, and with an optical recording medium 313 of high capacity. Moreover, it is not absolutely necessary that the medium for issue of the electronic check of the present invention should be such a hybrid IC/optical card 301, it will be acceptable if only an IC chip which has an excellent security function is provided, or if it is a IC card in the narrow sense or a hybrid IC/magnetic card or the like. That is, if it is an IC card in the broad sense, anything will do.

[0181] A card issue device 303 is provided for the payer for writing on the card 301 the information which is necessary for issuing the electronic check. And a contents checking device 305 is provided for the payment deputy for checking the contents recorded upon the card 301. Further, a payment processing device 307 is provided for the payee for receiving the issue of the electronic checks from the card 301 and performing processing for settlement of the electronic checks which have been received.

[0182] The card issue device 303, the contents checking device 305, and the payment processing device 307 may of course be constituted as dedicated devices, or they may be constituted as general purpose devices like personal computers to which card reader/writers have been connected, with the appropriate application software being installed thereon. Since their concrete construction can be easily realized from publicly known art by one skilled in the relevant art, the detailed description thereof will be curtailed.

[0183] Fig. 29 shows a summary of the flow of the procedure in this system from the issue of a card up to the completion of settlement of a check.

[0184] First, the payer inserts the card 301 into the card issue device 303 (S1), and certain required items are written from the card issue device 303 into the IC chip 311 of the card 301 (S2). Among these required items which are written here, there are at least three items - the set money amount, a rewrite authority key, and the initial value of the usable money amount. The set money amount denotes the upper limit value for the total of the face values of the electronic checks which can be issued from this card 301. The usable money amount denotes the upper limit value for the face value of a single electronic check which can be issued at the present time point, and as will be described hereinafter it diminishes by the issued amount each time an electronic check is issued. And the initial value of usable money amount is the initial value for the usable money amount which is set when the card is issued, and a suitable amount is set less than or equal to the set money amount. The rewrite authority key is a secret code known only to the payer, and as will be described hereinafter, as long as this secret code is not input, the IC chip 311 will not permit the rewriting of the set money amount. When the writing of these required items has been completed, the card 301 is ready to be issued as an electronic checkbook.

[0185] Next, this card 301 may be handed over to the payment deputy (S3). The payment deputy carries the card 301 about and proceeds to the shop of the payee (S4), and in compliance with the request for example purchases some goods. And he pays this purchase amount by an electronic check in the following manner. That is to say, first, he inserts the card 301 into the payment processing device 307 (S5), and next he inputs the amount for payment (the amount of the purchase) into the payment processing device 307 (S6). Next, a decision is made by the payment processing device 307 according to a procedure which will be explained in detail hereinafter as to whether or not it is possible to issue an electronic check for this payment amount, based upon the set money amount and the usable money amount which are recorded in the card 301, and upon the payment amount which has been input. If the result is that it is possible, then an electronic check for this payment amount is issued from the card 301 with respect to the payment processing device 307 (S7).

[0186] When this electronic check is received, the payment processing device 307 rewrites the usable money amount in the IC chip 311 to be the remaining amount of money by subtracting the payment amount from its original amount, and also writes an electronic check issue history including the shop code, the date of issue, the amount of payment, and the like upon the optical recording medium 303 of the card 301, and next ejects the card 301. Thereafter it is possible to perform settlement by cash (S8) by transmitting this received electronic check at a desired time from the payment processing device 307 to a processing device of the payer (or a settlement financial establishment).

[0187] Furthermore, after once a payment was performed by electronic check, the payment deputy can repeat the payment by electronic check using the card 301 continually, if necessary. In this case, the usable money amount recorded upon the card 301 is reduced every time the electronic check is issued, and when it becomes zero this card 301 can no longer be used as an electronic checkbook. The payment deputy can read out from the card 301 and check (S10) the current usable money amount and the history of use up to the present by inserting the card 301 into the contents checking device 305 (S9).

[0188] when the usable money amount is zero or the remainder has become too small, or a requirement has arisen to change the set money amount, or the like, according to requirements, the payment deputy can return the card 301 to the payer (S11). The payer inserts this card 301 into the card issue device 303 (S12), and inputs the rewrite authority key. When he does this, comparison is performed (S13) between the rewrite authority key which is input in the IC chip 311 of the card 301 and the initially registered one, and if they agree then the rewrite restriction for the set money amount is unlocked.

[0189] Next, according to requirements, the payer can freely increase or diminish by rewriting the value of the set money amount or of the initial value for the usable money amount (S14)

When this rewriting has been completed, the card 301 comes to be reissued as an electronic checkbook with the new set value.

[0190] Fig. 30 shows the overall construction of a card 301 which is used as an electronic checkbook, and Fig. 31 shows the internal construction of an IC chip 311 thereof.

[0191] As shown in Fig. 30, an IC chip 311 and an optical recording medium 313 are provided on the face of this card 301. Since the optical recording medium 313 is of a type upon which information is recorded by digging minute holes or so called pits formed by a laser beam or the like, it cannot be rewritten, although it can freely be read out and added to. As described above, the history of issue of electronic checks, i.e. the shop codes and days of issue and amounts of money paid

IPR2025-00645 Page 02209

and the like are recorded upon this optical recording medium 313. The payer or the payment deputy can check whether or not the issue of the electronic check was correctly performed by reading out this issue history. In this case, there is no fear that falsification of such history as has become disadvantageous from the point of view of the payer will be performed, since rewriting is an impossibility.

[0192] As shown in Fig. 31, the IC chip 311 is a one chip type microcomputer including a serial interface 411, a CPU 413, a mask ROM 415, a work RAM 417, an EEPROM 419, a data bus 421, and an address bus 423. The serial interface 411 is an interface for the card issue device 303 and the contents checking device 305 and the payment processing device 307 (hereinafter termed "terminal devices").

[0193] The operating program for the CPU 413 is stored in the mask ROM 415. In this operating program there are included programs for performing access control when the terminal devices 303, 305, and 307 are being accessed to the EEPROM 419, a program for memory management, a program for checking procedures, and the like.

[0194] Further, the work RAM 417 is a work area for the CPU 413. A common information file 425 and an application file 427 are provided in the EEPROM 419. The common information for all the various applications which this card 301 can utilize is stored in the common information file 425, and, further, application specific information is stored in the application file 427. The service of issuing electronic checks is one of the various applications for which this card 301 can be used, and therefore the above described set money amount, rewrite authority key, and usable money amount and the like are recorded in an area for electronic check service within the application file 427

[0195] Herein, very important is the security function of the IC chip 311. There is provided both a security function in terms of hardware and the one in terms of software.

[0196] As for the security function in terms of hardware, the IC chip 311 is made as a single chip, and it is arranged that the reading out of information from the EEPROM 419 and from the mask ROM 415 is impossible unless the CPU 413 is functioning normally. That is, if either an attempt is made to read out information to the outside directly from the memories 419 and 415 and not via the CPU 413, or even an attempt is made to rewrite this information, this is impossible.

[0197] As for the security function in terms of software, it is possible to impose various types of access restriction such as a reading out restriction or a rewrite restriction for specified areas in the EEPROM 419 and the mask ROM 415, in a manner so that this restriction absolutely cannot be lifted, or alternatively in a manner so that this restriction cannot be lifted unless a specified secret key is used.

[0198] In concrete terms, by imposing such a read out restriction, the program within the mask ROM 415, and the rewrite authority key within the EEPROM 419 absolutely cannot be read out from the IC chip 311. In other words, these items of information can only be used internally to the IC chip 311, and cannot be known to the outside. Further, by imposing a rewrite restriction upon the set money amount and upon the rewrite authority key within the EEPROM 419, these rewrite restrictions cannot be lifted as long as the same key is not input as the above described rewrite authority key. Further, by imposing a different rewrite restriction also upon the usable money amount which is renewed each time an electronic check is issued, it is not possible for the payment deputy to lift this rewrite restriction using the contents checking device 305.

[0199] By this sort of access restriction, the set money amount can only be rewritten by the payer, while it cannot be changed by the payment deputy or by the payee. Further, whenever as well the usable money amount is changed, the payment deputy cannot change it according to his own convenience. Yet further, since the history of the optical recording section 313 cannot be falsified, by comparing together this history and the set money amount and the usable money amount and so on, the accuracy of these data items can be checked, so that a yet further high security level is guaranteed.

[0200] In this manner, with the card 301, ingenious access restrictions are imposed in relation to the set money amount and the usable money amount. And when an electronic check is issued from this card 301, by performing processing as will be described hereinafter, the electronic check is issued safely in such a way that unexpected loss to the payer does not occur, and moreover from the point of view of the payment deputy the merit is obtained that the issue of an electronic check corresponding to the payment amount is possible.

[0201] Fig. 32 shows the flow of the processing performed by the payment processing device 307 when generating an electronic check.

[0202] When the card 301 is inserted (S21), the set money amount and the usable money amount (the first time, the initial value for the usable money amount) are read out from the IC chip 311 (S22). And, first, it is checked as to whether or not the usable money amount does not exceed the set money amount, and if it does exceed it then the card 301 is ejected as an error (S30).

[0203] If the usable money amount is less than or equal to the set money amount, then the amount for payment input by the payment deputy is received (S24), and this amount for payment and the usable money amount are compared (S25). If the result is that the amount for payment exceeds the usable money amount, then the card 301 is ejected as an error (S30).

[0204] On the other hand, if the amount for payment is less than or equal to the usable money amount, then it is decided that it will be acceptable to issue an electronic check, and an electronic check is issued including information such as the shop code, the date of issue, the amount for payment, etc. (S26).

[0205] Next, the amount of payment is subtracted from the usable money amount to calculate the usable money amount for next time (S27), and this usable money amount is rewritten into the IC chip 311 of the card 301 (S28). Next, the issue history is written cumulatively upon the optical recording medium 313 of the card (S29), and finally the card 301 is ejected.

[0206] According to the above processing, the face value of any single electronic check is always limited to being less than or equal to the usable money amount, and moreover the value of the sum of the face values of all of the electronic checks which can be issued is limited to being less than or equal to the set money amount. And the set money amount cannot be rewritten by any person other than the payer. Because of these features, the payer cannot suffer any loss which exceeds the set money amount, even if the card 301 has been used improperly. Furthermore, it is convenient from the point of view of the payment deputy, because without ever having cash a check of face value which matches the amount for payment can be issued, provided that the amount is within the range of the usable money amount.

[0207] Now, in the processing of Fig. 32, particularly for the steps S22, S23, S25, S27, and S28, by the IC chip 311 being informed of the amount for payment by the payment processing device 307, if it is so arranged that these steps are performed internally to the IC chip 311, since the set money amount and the usable money amount are no longer handled by the payment processing device 307, they come to be certainly only handled by the payer, and the level of safety is yet further elevated.

Patent Citations (25)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US4341951A *	1980-07-02	1982-07-27	Benton William M	Electronic funds transfer and voucher issue system
US4630201A *	1984-02-14	1986-12-16	International Security Note & Computer Corporation	On-line and off-line transaction security system using a code generated from a transaction parameter and a random number
JPS6154564A *	1984-08-24	1986-03-18	Kyoto Shinyou Kinko	Card transaction system
US4755115A *	1984-11-21	1988-07-05	Atsugi Motor Parts Company, Limited	Shaft seal assembly for compressor
JPH0721899B2 *	1985-03-15	1995-03-08	大日本印刷株式会社	Light card
JP2502501B2 *	1985-03-16	1996-05-29	日立マクセル株式会社	information recording system
JPS62128368A *	1985-11-29	1987-06-10	Omron Tateisi Electronics Co	ic card system

IPR2025-00645 Page 02210

FR2592510B1 *	1985-12-31	1988-02-12	Bull Cp8	METHOD AND APPARATUS FOR CERTIFYING SERVICES OBTAINED USING A PORTABLE MEDIUM SUCH AS A MEMORY CARD
JPS6324728A *	1986-07-17	1988-02-02	Matsushita Electric Ind Co Ltd	Multiplex wavelength transmission equipment
JPS6332658A *	1986-07-28	1988-02-12	Casio Comput Co Ltd	ic card system
JPS6324728U *	1986-07-30	1988-02-18		
JPS63247866A *	1987-04-02	1988-10-14	Casio Comput Co Ltd	Firm banking system
JP2969457B2 *	1988-01-06	1999-11-02	カシオ計算機株式会社	Financial graph display controller
JPH01195573A *	1988-01-29	1989-08-07	Patoroma Res Kk	Decentralized processors for transfer in banking organ
FR2639742B2 *	1988-05-30	1992-03-13	Dassault Electronique	TRANSACTION SYSTEM OF THE MIXED ELECTRONIC PURSE TYPE
JPH02220191A *	1989-02-22	1990-09-03	Fuji Electric Co Ltd	Automatic cashless vending machine system
JP2993005B2 *	1989-03-20	1999-12-20	株式会社日立製作所	Automatic transaction equipment
JPH07524608B2 *	1989-04-03	1995-06-05	日本電信電話株式会社	Electronic cash implementation method and apparatus
JPH0351956A *	1989-07-19	1991-03-06	Omron Corp	Automatic teller machine
US5221838A *	1990-12-24	1993-06-22	Motorola, Inc.	Electronic wallet
US5221832A *	1991-09-13	1993-06-22	Ncr Corporation	Raster variation method for omnidirectional optical scanners
JPH0577593A *	1991-09-24	1993-03-30	Olympus Optical Co Ltd	information recording card
JPH05282506A *	1992-04-02	1993-10-29	Hitachi Ltd	ic card with optical memory and card processor
US5530232A *	1993-12-22	1996-06-25	Datamark Services, Inc.	Multi-application data card
US5577121A *	1994-06-09	1996-11-19	Electronic Payment Services, Inc.	Transaction system for integrated circuit cards

* Cited by examiner, † Cited by third party

Non-Patent Citations (2)

Title
No further relevant documents disclosed *
See also references of WO9602890A1 *

* Cited by examiner, † Cited by third party

Cited By (148)

Publication number	Priority date	Publication date	Assignee	Title
EP0767440A2 *	1995-10-02	1997-04-09	Kabushiki Kaisha Nippon Conlux	Card read/write apparatus
US5903880A *	1996-07-19	1999-05-11	Biffar, Peter C.	Self-contained payment system with circulating digital vouchers
GB2329499A *	1997-04-26	2000-11-01	Silver Reader Inc	Optical recording medium structure having a memory chip
DE10208112A1 *	2002-02-26	2003-09-18	Kastriot Merlaku	Automatic cash machine or statement printer machine with an additional floppy drive to allow customers to record a bank statement directly to a floppy disk for use on a personal computer
EP0984402A3 *	1998-08-31	2004-06-02	Citicorp Development Center, Inc.	Stored value card terminal
US10586797SB2	2005-10-04	2020-02-18	Hoffberg Family Trust 2	Multifactorial optimization system and method
Family To Family Citations				
US7010507B1	1995-10-04	2006-03-07	Block Financial Corporation	System providing funds to electronic tax filers prior to receipt of refund
ES2114488B1 *	1996-04-18	1999-01-01	Univ Madrid Politecnica	SECURITY SYSTEM FOR ACCESS, IDENTIFICATION AND PRESENCE CONTROL IN HOUSES, PREMISES, AND COMMERCIAL SURFACES, WHICH CAN PERFORM

IPR2025-00645 Page 02211

				ELECTRONIC TRANSACTIONS THROUGH A SMART CARD.
GB2319644B *	1996-11-23	2000-01-12	Central Research Lab Ltd	A record carrier
US6796488B1 *	1997-03-27	2004-09-28	Electronic Data Systems Corporation	Automated system and method for check amount encoding at a point-of-sale
US20010044864A1 *	1997-06-18	2001-11-22	Kabushiki Kaisha Optrom	Disk storage system having an electronic circuit mounted on the surface of the disk and control method thereof
JP3895830B2	1997-06-18	2007-03-22	インテリジェントディスク株式会社	Storage medium having electronic circuit
JPH1117296A	1997-06-18	1999-01-12	Oputoromu:Kk	Storage medium having electronic circuit and speech synthesizer having the storage medium
TW389894B	1997-06-19	2000-05-11	Optrom Kk	Device for exchanging information with storage medium having electronic circuit and the electronic circuit, and system including the same
CN1246941A *	1997-08-13	2000-03-08	松下电器产业株式会社	Mobile electronic commerce system
SG118132A1	1997-11-13	2006-01-27	Hyperspace Communications Inc	File transfer system
JP3866851B2 *	1998-03-03	2007-01-10	株式会社日立製作所	Point management system
JP4176180B2 *	1998-03-13	2008-11-05	富士通株式会社	Electronic check system, financial information management system, electronic check management device, computer-readable recording medium recording a financial information management program, and computer-readable recording medium recording an electronic check management program
US6840446B2 *	1998-03-18	2005-01-11	Citicorp Development Center, Inc.	Apparatus and system for optical card reading and method of use
JP2000099401A *	1998-09-22	2000-04-07	Sony Corp	Recording medium, recording method and recorder
JP4320481B2 *	1999-03-05	2009-08-26	ソニー株式会社	Electronic money system
US6527173B1 *	1999-03-30	2003-03-04	Victor Company Of Japan, Ltd.	System of issuing card and system of certifying the card
US7177829B1 *	1999-07-16	2007-02-13	H & R Block Tax Services, Inc.	Tax refund system
WO2001013316A1 *	1999-08-18	2001-02-22	Fujitsu Limited	Balance tallying automatic processing system
WO2001043404A1	1999-12-10	2001-06-14	Ntt Docomo, Inc.	Mobile communication terminal and card information reader
US7870065B2	2000-01-05	2011-01-11	Unitellier Financial Services, Inc.	Money-transfer techniques
US6938013B1	2000-01-05	2005-08-30	Unitellier Financial Services, Inc.	Money-transfer techniques
US7720754B1	2000-01-05	2010-05-18	Unitellier Financial Services, Inc.	Money-transfer techniques
US7127425B1	2000-01-14	2006-10-24	H & R Block Tax Services, Inc.	System and method for providing a loan to a taxpayer based on a pre year-end tax refund
US7072862B1	2000-01-14	2006-07-04	H&R Block Tax Services, Inc.	Spending vehicles for payments
US7159241B1	2000-06-15	2007-01-02	Hitachi, Ltd.	Method for the determination of soundness of a sheet-shaped medium, and method for the verification of data of a sheet-shaped medium
JP2001357377A	2000-06-15	2001-12-26	Hitachi Ltd	Sheet-like medium, method and device for judging authenticity, and certificate issuing machine
US7302467B2 *	2000-08-07	2007-11-27	Sony Corporation	Information processing device and information processing method, service providing system, and computer-executable program for the same
US6674852B1	2000-08-31	2004-01-06	Cisco Technology, Inc.	Call management implemented using call routing engine

US6690789B1	2000-08-31	2004-02-10	Cisco Technology, Inc.	Fault tolerant telephony control
US7242921B2 *	2000-12-29	2007-07-10	Intel Corporation	Anonymous electronic transactions
US6601771B2 *	2001-04-09	2003-08-05	Smart Card Integrators, Inc.	Combined smartcard and magnetic-stripe card and reader and associated method
US7480634B1 *	2001-04-17	2009-01-20	Cornelius Marketing	Method and system for saving and investing through use of a money management card and pooled investment accounts
US7779600B1 *	2001-04-26	2010-08-24	Nasser Saebi	Method of constructing a composite roof
US6749114B2 *	2001-05-15	2004-06-15	Inadam Corporation	Universal authorization card system and method for using same
US7810735B2	2001-05-15	2010-10-12	Inadam Corporation	Computer readable universal authorization card system and method for using same
US8403228B2	2001-05-15	2013-03-26	Inadam Corporation	Computer readable universal authorization card system and method for using same
US20020174064A1 *	2001-05-17	2002-11-21	Heng Li	System and method for internet cash payment
US20030083945A1 *	2001-10-26	2003-05-01	Jimmy Ng Kee Hooi	Transaction authorization method, system and device
US7415471B1	2001-11-30	2008-08-19	Midland Loan Services, Inc.	Methods and systems for automated data collection and analysis for use in association with asset securitization
US6857565B2	2001-12-14	2005-02-22	Damon Eugene Smith	Electronic traveler's checks
US7860781B1	2002-01-04	2010-12-28	Midland Loan Services, Inc.	Methods and systems for asset/loan management and processing
US8190532B2	2002-01-30	2012-05-29	Visa U.S.A. Inc.	Method and system for providing multiple services via a point-of-sale portal architecture
JP2003281388A *	2002-03-25	2003-10-03	Hitachi Ltd	Automatic transaction device
US8229855B2	2002-08-27	2012-07-24	Jean Huang	Method and system for facilitating payment transactions using access devices
US7280981B2 *	2002-08-27	2007-10-09	Visa U.S.A. Inc.	Method and system for facilitating payment transactions using access devices
US7765162B2 *	2002-10-07	2010-07-27	Mastercard International Incorporated	Method and system for conducting off-line and on-line pre-authorized payment transactions
TWI872268 *	2002-12-26	2004-05-11	Min-Jie Su	Card verification and authorization system and method thereof
US9830784B1	2003-01-27	2016-04-12	The Pnc Financial Services Group, Inc.	Visual asset structuring tool
US7827077B2 *	2003-05-02	2010-11-02	Visa U.S.A. Inc.	Method and apparatus for management of electronic receipts on portable devices
US20050021480A1 *	2003-05-16	2005-01-27	Hyperspace Communications, Inc.	Method and apparatus for creating and validating an encrypted digital receipt for third-party electronic commerce transactions
US20040251308A1 *	2003-06-12	2004-12-16	Tue Nguyen	Dual format medium
US20050097046A1	2003-10-30	2005-05-05	Singfield Joy S.	Wireless electronic check deposit scanning and cashing machine with web-based online account cash management computer application system
US9626655B2 *	2004-02-19	2017-04-18	Intellectual Ventures I Llc	Method, apparatus and system for regulating electronic mail
US20050269401A1 *	2004-06-03	2005-12-08	Tyfone, Inc.	System and method for securing financial transactions
EP1842124A4 *	2004-10-19	2008-04-16	Veritec Inc	Secure cards and methods
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US20100325044A1 *	2005-05-10	2010-12-23	Sean Macguire	System and Method for Accessing the Maximum Available Funds in an Electronic Financial Transaction
US20060259440A1 *	2005-05-13	2006-11-16	Keycorp	Method and system for electronically signing a document
US7731084B2 *	2005-05-23	2010-06-08	Seiko Epson Corporation	Devices and methods for monitoring transaction data from point-of-sale devices
TWI290439B *	2005-11-09	2007-11-21	Min-Chieh Su	Mobile communication terminal verification authorization system and method thereof

IPR2025-00645 Page 02213

JP2007317114A *	2006-05-29	2007-12-06	Oki Data Corp	Communication terminal device
US7885451B1	2006-10-31	2011-02-08	United Services Automobile Association (Usaa)	Systems and methods for displaying negotiable instruments derived from various sources
US8799147B1	2006-10-31	2014-08-05	United Services Automobile Association (Usaa)	Systems and methods for remote deposit of negotiable instruments with non-payee institutions
US8351677B1	2006-10-31	2013-01-08	United Services Automobile Association (Usaa)	Systems and methods for remote deposit of checks
US8708227B1	2006-10-31	2014-04-29	United Services Automobile Association (Usaa)	Systems and methods for remote deposit of checks
US7876949B1	2006-10-31	2011-01-25	United Services Automobile Association	Systems and methods for remote deposit of checks
US7873200B1	2006-10-31	2011-01-18	United Services Automobile Association (Usaa)	Systems and methods for remote deposit of checks
US7991158B2 *	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging
US8959033B1	2007-03-15	2015-02-17	United Services Automobile Association (Usaa)	Systems and methods for verification of remotely deposited checks
US10380559B1	2007-03-15	2019-08-13	United Services Automobile Association (Usaa)	Systems and methods for check representment prevention
US20080244208A1 *	2007-03-30	2008-10-02	Narendra Siva G	Memory card hidden command protocol
US8538124B1	2007-05-10	2013-09-17	United Services Auto Association (USAA)	Systems and methods for real-time validation of check image quality
US8433127B1	2007-05-10	2013-04-30	United Services Automobile Association (Usaa)	Systems and methods for real-time validation of check image quality
CN101059858B *	2007-06-11	2012-02-15	飞天诚信科技股份有限公司	Method and device for inquiring conveniently electronic transaction history record
DE602007012538D1 *	2007-07-27	2011-03-31	Ntt Docomo Inc	Method and apparatus for performing delegated transactions
US9058512B1	2007-09-28	2015-06-16	United Services Automobile Association (Usaa)	Systems and methods for digital signature detection
US20100250436A1 *	2007-10-17	2010-09-30	The Western Union Company	Mobile customer service centers with a mobile pickup model
US20090265272A1 *	2007-10-17	2009-10-22	The Western Union Company	Money transfers utilizing a unique receiver identifier
US20090106152A1 *	2007-10-17	2009-04-23	The Western Union Company	Money transfers utilizing unique receiver identifier
SG170674A1 *	2007-10-22	2011-04-29	Microlatch Pty Ltd	A transmitter for transmitting a secure access signal
US9898778B1	2007-10-23	2018-02-20	United Services Automobile Association (Usaa)	Systems and methods for obtaining an image of a check to be deposited
US9892454B1	2007-10-23	2018-02-13	United Services Automobile Association (Usaa)	Systems and methods for obtaining an image of a check to be deposited
US8358826B1	2007-10-23	2013-01-22	United Services Automobile	Systems and methods for receiving and orienting an image of one or more checks

IPR2025-00645 Page 02214

			Association (Usaa)	
US9159010B1	2007-10-23	2015-10-13	United Services Automobile Association (Usaa)	Image processing
US8046301B1	2007-10-30	2011-10-25	United Services Automobile Association (Usaa)	Systems and methods to modify a negotiable instrument
US8001051B1	2007-10-30	2011-08-16	United Services Automobile Association (Usaa)	Systems and methods to modify a negotiable instrument
US7996314B1	2007-10-30	2011-08-09	United Services Automobile Association (Usaa)	Systems and methods to modify a negotiable instrument
US7996316B1	2007-10-30	2011-08-09	United Services Automobile Association	Systems and methods to modify a negotiable instrument
US7996315B1	2007-10-30	2011-08-09	United Services Automobile Association (Usaa)	Systems and methods to modify a negotiable instrument
US8320657B1	2007-10-31	2012-11-27	United Services Automobile Association (Usaa)	Systems and methods to use a digital camera to remotely deposit a negotiable instrument
US8290237B1	2007-10-31	2012-10-16	United Services Automobile Association (Usaa)	Systems and methods to use a digital camera to remotely deposit a negotiable instrument
US7896232B1	2007-11-06	2011-03-01	United Services Automobile Association (Usaa)	Systems, methods, and apparatus for receiving images of one or more checks
US7900822B1	2007-11-06	2011-03-08	United Services Automobile Association (Usaa)	Systems, methods, and apparatus for receiving images of one or more checks
US20090138400A1 *	2007-11-28	2009-05-28	Smith Damon E	Electronic traveler's check
US9741027B2 *	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US10380562B1	2008-02-07	2019-08-13	United Services Automobile Association (Usaa)	Systems and methods for mobile deposit of negotiable instruments
US8351678B1	2008-06-11	2013-01-08	United Services Automobile Association (Usaa)	Duplicate check detection
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US8448112B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US8422758B1	2008-09-02	2013-04-16	United Services Automobile Association (Usaa)	Systems and methods of check re-presentment deterrent
US10504185B1 *	2008-09-08	2019-12-10	United Services Automobile Association (Usaa)	Systems and methods for live video financial deposit
US8275710B1	2008-09-30	2012-09-25	United Services Automobile Association (Usaa)	Systems and methods for automatic bill pay enrollment
US7974899B1	2008-09-30	2011-07-05	United Services	Atomic deposit transaction

IPR2025-00645 Page 02215

			Automobile Association (Usaa)	
US7885880B1	2008-09-30	2011-02-08	United Services Automobile Association (Usaa)	Atomic deposit transaction
US7962411B1	2008-09-30	2011-06-14	United Services Automobile Association (Usaa)	Atomic deposit transaction
US8391599B1	2008-10-17	2013-03-05	United Services Automobile Association (Usaa)	Systems and methods for adaptive binarization of an image
US7970677B1	2008-10-24	2011-06-28	United Services Automobile Association (Usaa)	Systems and methods for financial deposits by electronic message
US7949587B1	2008-10-24	2011-05-24	United States Automobile Association (USAA)	Systems and methods for financial deposits by electronic message
US8483468B1	2009-02-18	2013-05-28	United Services Automobile Association (Usaa)	Systems and methods of check detection
EP2401708A4 *	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US10956728B1	2009-03-04	2021-03-23	United Services Automobile Association (Usaa)	Systems and methods of check processing with background removal
US8542921B1	2009-07-27	2013-09-24	United Services Automobile Association (Usaa)	Systems and methods for remote deposit of negotiable instrument using brightness correction
US9779392B1	2009-08-19	2017-10-03	United Services Automobile Association (Usaa)	Apparatuses, methods and systems for a publishing and subscribing platform of depositing negotiable instruments
US8977571B1	2009-08-21	2015-03-10	United Services Automobile Association (Usaa)	Systems and methods for image monitoring of check during mobile deposit
US8699779B1	2009-08-28	2014-04-15	United Services Automobile Association (Usaa)	Systems and methods for alignment of check during mobile deposit
JP2011060649A *	2009-09-11	2011-03-24	Toyota Motor Corp	Electrode active material layer, all solid battery, manufacturing method for electrode active material layer, and manufacturing method for all solid battery
US20110145082A1	2009-12-16	2011-06-16	Ayman Hammad	Merchant alerts incorporating receipt data
US8429048B2	2009-12-28	2013-04-23	Visa International Service Association	System and method for processing payment transaction receipts
US9129340B1	2010-06-08	2015-09-08	United Services Automobile Association (Usaa)	Apparatuses, methods and systems for remote deposit capture with enhanced image detection
US20120023008A1	2010-07-22	2012-01-26	The Western Union Company	N to n money transfers
US10043180B2	2010-09-30	2018-08-07	The Western Union Company	System and method for secure transactions at a mobile device
CN102446525B *	2010-09-30	2015-04-22	山东新北洋信息技术股份有限公司	Magnetic recording method and equipment
JP5720236B2 *	2010-12-24	2015-05-20	沖電気工業株式会社	Automatic transaction equipment
US8447667B1 *	2011-07-27	2013-05-21	Intuit Inc.	Methods, systems and articles for facilitating loans using income tax refunds

US10380565B1	2012-01-05	2019-08-13	United Services Automobile Association (Usaa)	System and method for storefront bank deposits
US20130254074A1 *	2012-03-22	2013-09-26	Bank Of America Corporation	Gift card exchange marketplace
US20140023227A1 *	2012-07-17	2014-01-23	Cubic Corporation	Broken mag ticket authenticator
EP2915103B1	2012-10-31	2019-05-22	Entrust Datacard Corporation	In-line quality assurance
US10552810B1	2012-12-19	2020-02-04	United Services Automobile Association (Usaa)	System and method for remote deposit of financial instruments
US20140188726A1 *	2012-12-28	2014-07-03	Wal-Mart Stores, Inc.	Payment validation systems and methods
US20140188700A1 *	2012-12-28	2014-07-03	Wal-Mart Stores, Inc.	Online payment systems and methods
US11113857B1	2013-09-09	2021-10-05	United Services Automobile Association (Usaa)	Systems and methods for remote deposit of currency
US9286514B1	2013-10-17	2016-03-15	United Services Automobile Association (Usaa)	Character count determination for a digital image
JP6092797B2 *	2014-02-20	2017-03-08	京セラドキュメントソリューションズ株式会社	Ink set for ink jet recording and ink jet recording method
US10402790B1	2015-05-28	2019-09-03	United Services Automobile Association (Usaa)	Composing a focused document image from multiple image captures or portions of multiple image captures
PH22016000120U1 *	2016-03-02	2016-03-18	United Sun Holdings Ltd	An integrated circuit device suitable for use in a financial transaction processing system
US9715793B1	2016-04-15	2017-07-25	Bank Of America Corporation	Banking systems controlled by data bearing records
US9747758B1	2016-04-15	2017-08-29	Bank Of America Corporation	Banking systems controlled by data bearing records
US9792752B1 *	2016-04-15	2017-10-17	Bank Of America Corporation	Banking systems controlled by data bearing records
US20200175491A1 *	2017-05-29	2020-06-04	Felica Networks, Inc.	Information processing apparatus and information processing method
US11103752B1	2018-04-27	2021-06-08	United Services Automobile Association (Usaa)	System, computing device, and method for document detection

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
US6029887A	2000-02-29	Electronic bankbook and processing system for financial transaction information using electronic bankbook
TWI574677B	2004-02-01	Automatic transaction device
US5120945A	1992-06-09	Transaction recording system and method
US4877947A	1989-10-31	Transaction processing system
US7216093B2	2007-05-08	Automated transaction machine digital signature system and method
US6138907A	2000-10-31	Electronic transaction processing system and method for operating same

IPR2025-00645 Page 02217

US8479984B2	2013-07-09	Automated banking machine that operates responsive to data bearing records
EP1125261B1	2005-09-07	Smart card with consolidation means and method of operating the smart card
KR100971132B1	2010-07-20	Smart Card for Virtual Account
US7413116B2	2008-08-19	Banking system, automated teller machine, financial transaction method, and a recording medium recording a financial transaction program readable by computer
JP3926521B2	2007-06-06	Terminal and system
US20030088514A1	2003-05-08	Automated teller machine check printing
JP2979518B2	1999-11-15	Unbooked data output device, unbooked data recording method, and unbooked data display method
JPH10111900A	1998-04-28	Information management system
JPH07334587A	1995-12-22	Transaction information processor of electronic bankbook
JPH08202774A	1996-08-09	Electronic receipt filing card and device for performing access to this card
JP2003196621A	2003-07-11	Data recording to ic card
JP3616883B2	2005-02-02	Automated trading system
JP2006350938A	2006-12-28	Expiration date management system, center device, and terminal unit
JPH0830702A	1996-02-02	Electronic bankbook
JPH07325873A	1995-12-12	Electronic bankbook, transfer processing system using the electronic bankbook, device for entering transfer destination to the electronic bankbook and method therefor
JPH0850620A	1996-02-20	Data recording system for electronic bankbook
JP2003132395A	2003-05-09	Automatic transaction device corresponding to card with ic chip
JP3914801B2	2007-05-16	Automatic machine
JP2003132399A	2003-05-09	Automatic transaction device corresponding to card with ic chip

Priority And Related Applications

Priority Applications (7)

Application	Priority date	Filing date	Title
JP16566794		1994-07-18	
JP16566794A	1994-07-18	1994-07-18	Electronic bankbook
JP1871595A	1995-01-11	1995-01-11	Electronic check system
JP1871595		1995-01-11	
JP2621295A	1995-01-20	1995-01-20	Electronic receipt filing card and device for performing access to this card
JP2621295		1995-01-20	
PCT/JP1995/001427	1994-07-18	1995-07-18	Electronic bankbook and cash transaction information processing system using the same

Legal Events

Date	Code	Title	Description
1996-05-17	PUAI	Public reference made under article 153(3) epc to a published international application that has entered the european phase	**Free format text:** ORIGINAL CODE: 0009012
1996-07-03	AK	Designated contracting states	**Kind code of ref document:** A1 **Designated state(s):** DE FR GB
1996-07-03	17P	Request for examination filed	**Effective date:** 19960216

IPR2025-00645 Page 02218

1997-08-27	RHK1	Main classification (correction)	**Ipc:** G06K 17/00
1997-09-03	A4	Supplementary search report drawn up and despatched	
1997-09-03	AK	Designated contracting states	**Kind code of ref document:** A4 **Designated state(s):** DE FR GB
2000-01-26	17Q	First examination report despatched	**Effective date:** 19991210
2000-12-19	GRAG	Despatch of communication of intention to grant	**Free format text:** ORIGINAL CODE: EPIDOS AGRA
2001-10-05	STAA	Information on the status of an ep patent application or granted ep patent	**Free format text:** STATUS: THE APPLICATION HAS BEEN REFUSED
2001-11-21	18R	Application refused	**Effective date:** 20010621

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

IPR2025-00645 Page 02219

Patents 6159601

Electronic cards capable of being read by a magnetic stripe reader and methods for their use

Classifications

G07F7/1008 Active credit-cards provided with means to personalise their use, e.g. with PIN-introduction/comparison system

View 6 more classifications

AU6159601A

Australia

Find Prior Art Similar

Inventor: Jacob Y Wong, Roy L Anderson, William R Bryant Jr, Joan M Ziegler

Current Assignee : PrivaSys

Worldwide applications

2001 AU WO

Application AU6159601A events

2000-05-15 Priority to US09/571,707

2001-05-15 Application filed by PrivaSys

2001-11-26 Publication of AU6159601A

Status Pending

Show all events

Info: Patent citations (3), Cited by (31), Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Patent Citations (3)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US4918631A *	1984-09-07	1990-04-17	Casio Computer Co., Ltd.	Compact type electronic information card
US5590038A *	1994-06-20	1996-12-31	Pitroda; Satyan G.	Universal electronic transaction card including receipt storage and system and methods of conducting electronic transactions
US6163771A *	1997-08-28	2000-12-19	Walker Digital, Llc	Method and device for generating a single-use financial account number

* Cited by examiner, † Cited by third party

Cited By (31)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US6131811A	1998-05-29	2000-10-17	E-Micro Corporation	Wallet consolidator
US7660793B1	1998-11-17	2010-02-09	Jpmorgan Chase Bank, N.A.	Customer activated multi-value (CAM) card
US10185993B2	2000-06-22	2019-01-22	Jpmorgan Chase Bank, N.A.	Method and system for processing internet payments
US8849716B1	2001-04-20	2014-09-30	Jpmorgan Chase Bank, N.A.	System and method for preventing identity theft or misuse by restricting access
US7103576B2	2001-09-21	2006-09-05	First Usa Bank, Na	System for providing cardless payment
US7899753B1	2002-03-25	2011-03-01	Jpmorgan Chase Bank, N.A	Systems and methods for time variable financial authentication

US20180165441A1	2002-03-25	2018-06-14	Glenn Coboum Everhart	Systems and methods for multifactor authentication
US20040210498A1	2002-03-29	2004-10-21	Bank One, National Association	Method and system for performing purchase and other transactions using tokens with multiple chips
US7058660B2	2002-10-02	2006-06-06	Bank One Corporation	System and method for network-based project management
KR100476876B1 *	2002-11-06	2005-03-17	박정웅	Card provided with a password input key
US7588178B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US8583926B1	2005-09-19	2013-11-12	Jpmorgan Chase Bank, N.A.	System and method for anti-phishing authentication
US7966263B2	2006-05-04	2011-06-21	First Data Corporation	Wireless phone RF presentation instrument with sensor control
US9466057B2	2006-05-04	2016-10-11	First Data Corporation	RF presentation instrument with sensor control
US8793490B1	2006-07-14	2014-07-29	Jpmorgan Chase Bank, N.A.	Systems and methods for multifactor authentication
US20080017704A1 *	2006-07-24	2008-01-24	First Data Corporation	Contactless Electronic Wallet Payment Device
US7991692B2	2006-10-09	2011-08-02	First Data Corporation	Electronic payment instrument and packaging
US7991158B2	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging
US8315718B2	2007-10-19	2012-04-17	First Data Corporation	Manufacturing system to produce contactless devices with switches
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US20090160617A1 *	2007-12-24	2009-06-25	Dynamics Inc.	Credit, security, debit cards and the like with buttons
US7886878B2	2008-05-28	2011-02-08	First Data Corporation	Systems and methods of payment account activation
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US9608826B2	2009-06-29	2017-03-28	Jpmorgan Chase Bank, N.A.	System and method for partner key management
US9419957B1	2013-03-15	2016-08-16	Jpmorgan Chase Bank, N.A.	Confidence-based authentication
US10148726B1	2014-01-24	2018-12-04	Jpmorgan Chase Bank, N.A.	Initiating operating system commands based on browser cookies
CN107209846A	2014-12-19	2017-09-26	卡德赛博私人有限公司	Method for generating the method and component in magnetic field and manufacturing component
EP3035230A1	2014-12-19	2016-06-22	Cardlab ApS	A method and an assembly for generating a magnetic field
EP3082071A1	2015-04-17	2016-10-19	Cardlab ApS	Device for and method of outputting a magnetic field

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
AU6159601A	2001-11-26	Electronic cards capable of being read by a magnetic stripe reader and methods for their use
GB2382458B	2003-05-14	Magnetic card reader
AU2002358177A8	2003-07-24	Adaptor for magnetic stripe card reader
AU2003304672A1	2005-06-17	Information processing device having non-contact reader and/or writer and coil antenna for magnetic connection
EP1435057A4	2010-03-17	Stored value cards and methods for their issuance
AU8287001A	2002-02-18	A smart card for and method of executing transactions
GB2384203B	2003-03-26	A data card holder and reader therefor
AU1554180	2004-05-13	IC card reader and writer
PL345726A1	2001-08-13	Magnetic card authorising apparatus

DE60205166D1	2005-09-01	Card reader for magnetic stripe and IC cards
TW383119U	2000-02-21	IC card/magnetic card compound reading machine
DE601380651D1	2009-04-30	Magnetic card reader and playback and demodulation method
IL138323D0	2009-02-11	Smart magnetic card
GB0202550D0	2002-03-20	IC card recording and/or reproducing device
GB2358505B	2001-12-05	Magnetic card reader and method of demodulating magnetic data
EP1152367A4	2004-03-10	Method of measuring coercive force of a magnetic card
PL368325A1	2005-03-21	Reading unit and marking card for optical mark reader
AU2003264702A1	2004-03-11	Device for reading out/recording smart cards and magnetic tickets
EP1195747A3	2004-09-22	Support structure of a magnetic head and magnetic card reader
GB0001062D0	2000-03-08	Improved smart card and reader/writer
AU2001261596A1	2001-11-26	Electronic cards capable of being read by a magnetic stripe reader and methods for their use
DE60031612T8	2007-12-27	Headgear mechanism in a magnetic card reader
SG109628A1	2005-12-26	Magnetic recording/reading apparatus
AU4471701A	2002-01-30	Card having cash paying function and spent amount recording method
GB2349047B	2000-12-27	Magnetic tag reader

Priority And Related Applications

Priority Applications (8)

Application	Priority date	Filing date	Title
US09/571,707	2000-05-15	2000-05-15	Anonymous electronic card for generating personal coupons useful in commercial and security transactions
US61985900A	2000-07-20	2000-07-20	*US Provisional Application*
US66708200A	2000-09-21	2000-09-21	*US Provisional Application*
US66708100A	2000-09-21	2000-09-21	*US Provisional Application*
US66703800A	2000-09-21	2000-09-21	*US Provisional Application*
US66783500A	2000-09-21	2000-09-21	*US Provisional Application*
US09/667,039	2000-05-15	2000-09-21	Method for storing data in payment card transaction
PCT/US2001/015612	2000-05-15	2001-05-15	Electronic cards capable of being read by a magnetic stripe reader and methods for their use

Data provided by IFI CLAIMS Patent Services

Patents au2002366416

Communication station for inventorizing transponders by means of selectable memory areas of the transponders

Classifications

G06K19/0723 Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards also with resonating or responding marks without active components with integrated circuit chips the record carrier comprising an arrangement for non-contact communication, e.g. wireless communication circuits on transponder cards, non-contact smart cards or RFIDs

View 4 more classifications

AU2002366416A1
Australia

Find Prior Art Similar

Inventor: Franz Amtmann, Michael Cernusca

Current Assignee : Koninklijke Philips NV

Worldwide applications

2002 AU WO DE JP KR AT EP CN US 2005 US

Application AU2002366416A events

2001-12-17 Priority to EP01000760.7

2001-12-17 Priority to EP01000760

2002-12-11 Application filed by Koninklijke Philips Electronics NV

2002-12-11 Priority to PCT/IB2002/005345

2003-06-30 Publication of AU2002366416A1

Status Abandoned

Info: Patent citations (16), Cited by (17), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Patent Citations (16)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US4656463A *	1983-04-21	1987-04-07	Intelli-Tech Corporation	LIMIS systems, devices and methods
CA2074702C *	1991-07-29	1996-11-19	Donald J. Urbas	Programmable transponder
US5499017A *	1992-12-02	1996-03-12	Avid	Multi-memory electronic identification tag
DE4205567A1 *	1992-02-22	1993-08-26	Philips Patentverwaltung	METHOD FOR CONTROLLING ACCESS TO A STORAGE AND ARRANGEMENT FOR IMPLEMENTING THE METHOD
US5673037A *	1994-09-09	1997-09-30	International Business Machines Corporation	System and method for radio frequency tag group select
US6172596B1 *	1994-09-09	2001-01-09	Intermec Ip Corp.	System method and apparatus for identifying and communicating with a plurality of types of radio frequency communication devices
US5942987A *	1994-09-09	1999-08-24	Intermec Ip Corp.	Radio frequency identification system with write broadcast capability
EP0704815A3 *	1994-09-30	1997-04-09	Hughes Identification Devices	High field programmable transponder system and method
US5600708A *	1995-08-04	1997-02-04	Nokia Mobile Phones Limited	Over the air locking of user identity modules for mobile telephones
US5889941A *	1996-04-15	1999-03-30	Ubiq Inc.	System and apparatus for smart card personalization
US6130602A *	1996-05-13	2000-10-10	Micron Technology, Inc.	Radio frequency data communications device
US5929779A *	1996-05-31	1999-07-27	Lucent Technologies Inc.	Read/write protocol for radio frequency identification tags
JPH10214232A *	1997-01-30	1998-08-11	Rohm Co Ltd	Ic card, and ic card operating method

JP4085478B2 *	1998-07-28	2008-05-14	ソニー株式会社	Storage medium and electronic device system
CN1244048C *	2000-03-21	2006-03-01	皇家菲利浦电子有限公司	Data carrier having address mode extension means and command extension means
WO2002007993A2 *	2000-07-26	2002-01-31	Bridgestone/Firestone, Inc.	Electronic tire management system

* Cited by examiner, † Cited by third party

Cited By (17)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
EP1728355B1	2003-10-29	2009-09-02	Nxp B.V.	Communication partner appliance with automatic send mode activation
AT501680T *	2003-11-14	2011-03-15	Nxp Bv	ELECTRONIC CIRCUIT ELECTRIC ACOUSTIC TRANSFORMER
US8035489B2	2005-01-12	2011-10-11	British Telecommunications Public Limited Company	Radio frequency identification transponder security
AT480836T	2005-01-12	2010-09-15	British Telecomm	SAFETY SYSTEMS FOR RFID LABELS
GB0428377D0 *	2004-12-24	2005-02-02	British Telecomm	Radio frequency identification tag security
JP4691987B2 *	2004-12-28	2011-06-01	株式会社日立製作所	Wireless tag and portable terminal
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US7307531B2 *	2005-05-20	2007-12-11	Xerox Corporation	Coupler board for wireless communication with multiple memory devices
WO2006134563A2 *	2005-06-14	2006-12-21	Nxp B.V.	Transponder system for transmitting key-encrypted information and associated keys
US20080307197A1 *	2007-06-05	2008-12-11	Calvin Duane A	System and Method for Persistent Hardware System Serial Numbers
US7770966B2 *	2007-11-12	2010-08-10	Be Aerospace, Inc.	Convertible passenger seat assembly
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
JP5101378B2 *	2008-04-16	2012-12-19	ソニー株式会社	Reader / Writer, Communication Processing Device, Communication Processing Method, Data Management System, and Communication System
US8485122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
AU2002337354A1	2003-07-24	Antenna system
AU2002321653A1	2003-07-03	Antenna system
AU2002247355A1	2002-10-03	Techniques for inductive communication systems
AU2002323242A1	2003-03-24	Internet-deployed wireless system
GB0102816D0	2001-03-14	Radio communication system
AU2002349486A1	2003-06-10	Radio communication system
GB0104610D0	2001-04-11	Radio communication system
AU2002366416A1	2003-06-30	Communication station for inventorizing transponders by means of selectable memory areas of the transponders
GB0104830D0	2001-04-18	Radio communication system
GB0108381D0	2001-05-23	Radio communication system

AU2002357521A1	2003-07-24	Along-optical-fiber radio communication system
AU2002251211A1	2002-10-21	Antenna system
AU2002356371A1	2003-07-30	Communication system
AU2002246077A1	2003-02-20	Transmitter-receiver system
GB0128669D0	2002-01-23	Radio communication system
AU2002348567A1	2003-06-17	Radar antenna
GB0109991D0	2001-02-28	Radio communication system
AU2002255216A1	2002-11-05	Radio communication system
AU2002228273A1	2002-09-04	Radio communication system
AU2002211015A1	2003-03-10	Radio communication system
AU2001296020A1	2003-03-10	Radio communication system
AU2002220984A1	2002-07-24	Radio communication system
AU2002341288A1	2003-04-28	Radio communication system
AU2002339585A1	2003-05-12	Radio communication system
AU2002226450A1	2002-08-06	Antenna system

Priority And Related Applications

Priority Applications (3)

Application	Priority date	Filing date	Title
EP01000760.7		2001-12-17	
EP01000760		2001-12-17	
PCT/IB2002/005345	2001-12-17	2002-12-11	Communication station for inventorizing transponders by means of selectable memory areas of the transponders

Legal Events

Date	Code	Title	Description
2004-09-16	MK6	Application lapsed section 142(2)(f)/reg. 8.3(3) - pct applic. not entering national phase	

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17021347
Filing Date	2020-09-15
First Named Inventor	Siva G. Narendra
Art Unit	2876
Examiner Name	Kristy A HAUPT
Attorney Docket Number	18.P115.001US9.10

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7384000	B2	2008-06-10	Anders et al.	Entire Document
	2	7480582	B2	2009-01-20	Chen	Entire Document
	3	8050405	B2	2011-11-01	Camp Jr. et al.	Entire Document
	4	8451122	B2	2013-05-28	Narendra et al.	Entire Document
	5	9311766	B2	2016-04-12	Jain et al.	Entire Document
	6	9741027	B2	2017-08-22	Narendra et al.	Entire Document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17021347
Filing Date	2020-09-15
First Named Inventor	Siva G. Narendra
Art Unit	2876
Examiner Name	Kristy A HAUPT
Attorney Docket Number	18.P115.001US9.10

	1			

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	100527159C	CN	C	2009-08-12	Li et al.	Entire Document	
	2	101040240	CN	A	2007-09-19	Masayuki Ebara et al.	Entire Document	
	3	1959377	EP	A1	2008-08-20	Fujita et al.	Entire Document	
	4	2401708	EP	A4	2012-08-15	Narendra et al.	Entire Document	
	5	2006106897	JP	A	2006-04-20	Ihi et al.	Entire Document	
	6	2006172121	JP	A	2006-06-29	Ito et al.	Entire Document	
	7	2006209643	JP	A	2006-08-10	Irisawa et al.	Entire Document	
	8	2007317170	JP	A	2007-12-06	Mizushima et al.	Entire Document	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17021347
	Filing Date	2020-09-15
	First Named Inventor	Siva G. Narendra
	Art Unit	2876
	Examiner Name	Kristy A HAUPT
	Attorney Docket Number	18.P115.001US9.10

	9	2008017440	JP	A	2008-01-24	Kakimoto et al.	Entire Document	
	10	2008046923	JP	A	2008-02-28	Ito et al.	Entire Document	
	11	3805347	JP	B2	2006-08-02	MORIMOTO YASUKAZU et al.	Entire Document	
	12	4192981	JP	B2	2008-12-10	SAWAI ATSUSHI et al.	Entire Document	
	13	4345850	JP	B2	2009-10-14	WASHIRO MASANORI	Entire Document	
	14	4403431	JP	B2	2010-01-27	WASHIRO MASANORI	Entire Document	
	15	4766666	JP	B2	2011-09-07	FUKAZAWA NOBUAKI	Entire Document	
	16	4864346	JP	B2	2012-02-01	AOKI SADATAKA et al.	Entire Document	
	17	4931912	JP	B2	2012-05-16	SUENAGA HIROSHI et al.	Entire Document	
	18	100596410	KR	B1	2006-07-03	PARK YOUNG SOO et al.	Entire Document	
	19	20100126850	KR	A	2010-12-02	MOSHIR SEAN et al.	Entire Document	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17021347
	Filing Date	2020-09-15
	First Named Inventor	Siva G. Narendra
	Art Unit	2876
	Examiner Name	Kristy A HAUPT
	Attorney Docket Number	18.P115.001US9.10

	20	I323424	TW	B	2010-04-11	Lee et al.	Entire Document	
	21	I433560	TW	B	2014-04-01	Narendra et al.	Entire Document	
	22	2006052815	WO	A3	2006-10-26	Soderstrom	Entire Document	
	23	2006057049	WO	A1	2006-06-01	Fujimoto	Entire Document	
	24	2007139909	WO	A2	2007-12-06	Moshir et al.	Entire Document	

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17021347
Filing Date	2020-09-15
First Named Inventor	Siva G. Narendra
Art Unit	2876
Examiner Name	Kristy A HAUPT
Attorney Docket Number	18.P115.001US9.10

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Usman Mughal/	Date (YYYY-MM-DD)	2022-01-10
Name/Print	Usman Mughal	Registration Number	62887

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

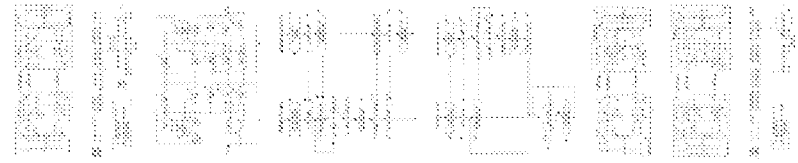
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Patents 4931912

Signal transmission method, transmission / reception apparatus, and communication system

Images (28)



Classifications

H04L25/14 Channel dividing arrangements in which a single bit stream is divided between several baseband channels and reassembled at the receiver

JP4931912B2
Japan

Download PDF Find Prior Art Family

Other languages: Japanese

Inventor: 貴 末永, 修 栄田, 義行 齋藤, 徹 岩田, 豪朗 武田, 貴治 吉田

Worldwide applications

2007 JP CN US EP WO TW

Application JP2008513094A events

2006-04-26 Priority to JP2006121459

2007-02-20 Application filed by パナソニック株式会社

2009-09-10 Publication of JPWO2007125670A1

2012-05-16 Application granted

2012-05-16 Publication of JP4931912B2

Status Active

2027-02-20 Anticipated expiration

Show all events

Info: Patent citations (48), Cited by (18), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (24)

Hide Dependent

1. The receiving side and the transmitting side transmit and receive data divided into a plurality of data fragments via at least two transmission lines,
The transmitting side transmits a first data fragment of the plurality of data fragments via a first transmission line of the transmission lines, and includes header information and second data having the same bit length as the first data fragment. Transmitting a data packet including a fragment and footer information via a second transmission line other than the first transmission line, and transmitting the first data fragment and the second data fragment synchronously;
In a time slot that is an interval between the first data fragments adjacent to each other on the first transmission line, an interrupt signal for controlling the transmission side is transmitted from the reception side to the transmission side,
Signal transmission method.

    2. Either the header information or the footer information is added to the first data fragment,
    The signal transmission method according to claim 1.

    3. The interrupt signal is a signal for stopping transmission of the first data fragment and the data packet,
    The signal transmission method according to claim 1.

4. Data is divided into a plurality of data fragments, a first data fragment is generated from the plurality of data fragments, a data packet including header information, a second data fragment having the same bit length as the first data fragment, and footer information A data generation unit to generate;
The first data fragment and the second data fragment are synchronized, and the first data fragment is sent to the data packet other than the first transmission line via the first transmission line among at least two transmission lines. A data transmission unit for transmitting to the reception side via the second transmission line;
An interrupt signal receiving unit that receives an interrupt signal from the receiving side in a time slot that is an interval between adjacent first data fragments of the first transmission line; and
A transmission / reception apparatus comprising:

    5. In response to receiving the interrupt signal, further includes a response transmission unit that transmits a response to the receiving side,
    The interrupt signal is a signal for stopping transmission of the first data fragment and the data packet;
    The data transmission unit completes transmission of the first data fragment and the data packet transmitted via the first and second transmission lines when the interrupt signal reception unit receives the interrupt signal. And
    The response transmission unit transmits a response to the reception side after completion of transmission of the first data fragment and the data packet,
    The transmission / reception apparatus according to claim 4.

IPR2025-00645 Page 02232

6. A transmission / reception device that receives data transmitted by being divided into a plurality of data fragments from a transmission side,
The first data fragment of the plurality of data fragments is transmitted through the first transmission line among at least two transmission lines, the header information, the second data fragment having the same bit length as the first data fragment, and the footer information. A data receiving unit that receives a data packet from the transmitting side via a second transmission line other than the first transmission line;
A time slot acquisition unit for acquiring a start position and a time slot length of a time slot that is an interval between adjacent first data fragments of the first transmission line;
An interrupt signal generator for generating an interrupt signal for controlling the transmission side based on the time slot length,
In the time slot, based on the start position of the time slot, an interrupt signal transmission unit that transmits the interrupt signal to the transmission side;
The first data fragment and the second data fragment are transmitted synchronously,
Transmitter / receiver.

7. A communication system including the transmission / reception device according to claim 4 and the transmission / reception device according to claim 6.

8. The receiving side and the transmitting side transmit and receive data divided into multiple data fragments via the transmission line,
The receiving side transmits the first clock to the transmitting side via the clock signal transmission path,
The transmitting side transmits the data fragment to the receiving side based on the first clock via the transmission line,
The receiving side stops transmitting the first clock to the transmitting side in order to stop transmitting the data fragment from the transmitting side ,
The transmission line is at least two or more,
The receiving side, after stopping transmission of the first clock to the transmitting side, transmits an interrupt signal for controlling the transmitting side to the transmitting side via the first transmission line among the transmission lines. And transmitting a second clock to the transmission side via a second transmission line other than the first transmission line,
The transmitting side receives the interrupt signal based on the second clock .
Signal transmission method.

9. The interrupt signal is a signal for stopping transmission of the data fragment,
The signal transmission method according to claim 8 .

10. The reception side outputs an interrupt request to control the transmission side after stopping transmission to the transmission side of the first clock,
The transmission side has an internal clock whose count value is reset by reception of the first clock, and the count value of the internal clock exceeds a predetermined value due to the stop of transmission of the first clock. Recognizing the interrupt request,
The signal transmission method according to claim 8.

11. The interrupt request is a request for stopping transmission of the data fragment,
The signal transmission method according to claim 10 .

12. A data generator that generates data fragments by dividing the data into a plurality of data;
A first clock receiving unit for receiving a first clock for transmitting the data fragment from the receiving side via a clock signal transmission path;
A data transmission unit for transmitting the data fragment to the reception side based on the first clock via a transmission line;
Transmission of the first clock from the receiving side is stopped, and the data transmission unit stops transmission of the data fragment to the receiving side ;
The transmission line is at least two or more,
The data transmission unit transmits the data fragment to the reception side based on the first clock via the at least two transmission lines,
A second clock receiving unit for receiving a second clock from the receiving side via a second transmission line among the transmission lines;
An interrupt signal receiving unit for receiving an interrupt signal for controlling the transmitting side from the receiving side via the first transmission line among the transmission lines based on the second clock;
After the transmission of the first clock from the receiving side is stopped, the second clock receiving unit receives the second clock, and the interrupt signal receiving unit receives the interrupt based on the second clock. Receiving a signal ,
Transmitter / receiver.

13. In response to reception of the interrupt signal, further comprising a response transmission unit that transmits a response to the reception side,
The transmission / reception apparatus according to claim 12 .

14. An internal clock count unit that counts a count value of an internal clock that is reset by receiving the first clock;
Based on the count value of the internal clock, an interrupt request recognition unit that recognizes the reception side interrupt request;
Further including
The interrupt request recognizing unit recognizes the interrupt request based on a count value of the internal clock exceeding a predetermined value when transmission of the first clock is stopped.
The transmission / reception apparatus according to claim 12 .

15. According to the recognition of the interrupt request, further comprising a response transmission unit that transmits a response to the receiving side,
The transmission / reception apparatus according to claim 14 .

16. A transmission / reception device that receives data transmitted by being divided into a plurality of data fragments from a transmission side,
A first clock transmitting unit that transmits a first clock used by the transmitting side to transmit the data fragment to the transmitting side via a clock signal transmission path;
A data receiving unit for receiving the data fragment from the transmission side based on the first clock via a transmission line;
The first clock transmission unit stops transmission of the first clock to the transmission side in order to stop transmission of the data fragment from the transmission side ,
The transmission line is at least two or more,
The data receiving unit receives the data fragment from the transmission side based on the first clock via the at least two transmission lines;
An interrupt signal generator for generating an interrupt signal for controlling the transmission side,
An interrupt signal transmitter for transmitting the interrupt signal to the transmission side via the first transmission line of the transmission lines;
A second clock transmission unit that transmits a second clock to the transmission side via a second transmission line among the transmission lines;
After the first clock transmission unit stops transmitting the first clock to the transmission side, the interrupt signal transmission unit transmits the interrupt signal to the transmission side via the first transmission line. The second clock transmission unit transmits a second clock to the transmission side via the second transmission line .
Transmitter / receiver.

IPR2025-00645 Page 02233

17. It further includes an interrupt request notifying unit for notifying the transmitting side of an interrupt request for controlling the transmitting side by controlling the first clock transmitting unit to stop transmission of the first clock. Characterized by the
The transmission / reception apparatus according to claim 16 .

18. A communication system including the transmission / reception device according to claim 12 and the transmission / reception device according to claim 16 .

19. The receiving side and the transmitting side transmit and receive data divided into multiple data fragments via the transmission line,
The reception side changes the signal amplitude of the transmission line in order to notify the transmission side of an interrupt request for controlling the transmission side between the adjacent data fragments of the transmission line,
The transmission side detects a change in the signal amplitude,
Signal transmission method.

20. The interrupt request is a request for stopping transmission of the data fragment,
The signal transmission method according to claim 19 .

21. A data generator that divides the data into a plurality of pieces and generates a plurality of data fragments;
A data transmission unit for transmitting the data fragment to a reception side via a transmission line;
Between the data fragments adjacent to the transmission line, by detecting a change in the signal amplitude of the transmission line, an interrupt request recognition unit that recognizes an interrupt request from the reception side,
A transmission / reception apparatus comprising.

22. According to the recognition of the interrupt request, further comprising a response transmission unit that transmits a response to the receiving side,
The transmission / reception apparatus according to claim 21 .

23. A data receiving unit for receiving a plurality of data fragments obtained by dividing the data from the transmission side via a transmission line;
Between the adjacent data fragments of the transmission line, by changing the signal amplitude of the transmission line, an interrupt request notification unit for notifying the transmission side of an interrupt request for controlling the transmission side;
A transmission / reception apparatus comprising·

24. A communication system including the transmission / reception device according to claim 21 and the transmission / reception device according to claim 23 .

Description

The present invention relates to a signal transmission method, a transmission / reception apparatus, and a communication system in data transmission

Communication systems that perform data transmission between transmission / reception apparatuses include one or more data signals between transmission / reception apparatuses, as represented by USB (Universal Serial Bus) and IEEE (Institut of Electrical and Electronics Engineers) 1394. There is a communication system having a transmission line (hereinafter referred to as a data signal transmission line) and a communication system having both a data signal transmission line and a control signal transmission line (hereinafter referred to as a control signal transmission line). In the former communication system, data is transmitted between transmission / reception devices via a data signal transmission line, and various control signals such as data transmission start and end are transmitted via a control signal transmission line. In some cases, data transmission is performed using both the control signal transmission line and the data signal transmission line in order to increase the efficiency of data transmission.

An example of such a communication system is disclosed in Patent Document 1. In this communication system, data transmission is continuously performed using a data signal transmission line or using both a data signal transmission line and a control signal transmission line. In Patent Document 1, a technique for transmitting an interrupt request signal, which is a control signal, from a data reception side to a transmission side using a time division multiplexing transmission method on a transmission line through which data is continuously transmitted in this manner. Is disclosed. In the time division multiplex transmission method, a period in which a transmission line can be used is allocated to a plurality of transmission / reception devices, and a transmission line for data signals and a transmission line for control signals are used alternately on the transmission side and the reception side. be able to. Here, when the interrupt request signal is transmitted to the transmitting side while the receiving side is receiving data from the transmitting side, the period between the data from the transmitting side, that is, the period allocated to the receiving side is set. Use it to send an interrupt request signal to the sender. Therefore, the receiving side can transmit the interrupt request signal to the transmitting side as needed and immediately.
Japanese Patent No. 2733242

However, in the time division multiplex transmission method of Patent Document 1, in order to transmit an interrupt request signal to the transmission side at any time and immediately, a period for transmitting the interrupt signal is set between the data from the transmission side and the data. It is necessary to secure in between. That is, it is necessary to ensure a period corresponding to the bit length of the interrupt signal or a bit length longer than that between the data from the transmission side. As a result, the efficiency of data transmission from the transmission side will be reduced, and this will become a major issue in the future where the speed of data transmission will continue to increase.
Accordingly, an object of the present invention is to provide a signal transmission method, a transmission / reception apparatus, and a communication system that can suppress a decrease in data transmission efficiency due to transmission of an interrupt signal.

In order to solve the above-described problem, in the invention 1, the receiving side and the transmitting side divide data into a plurality of data fragments via at least two or more transmission lines, and transmit and receive the data. The first data fragment is transmitted through the first transmission line of the transmission lines, the header information, the second data fragment having the same bit length as the first data fragment, and the footer information. Including the data packet via a second transmission line other than the first transmission line, and transmitting the first data fragment and the second data fragment synchronously, and adjacent to the first transmission line. In a time slot that is an interval between the first data fragments, an interrupt signal for controlling the transmission side is transmitted from the reception side to the transmission side. Characterized in that it provides a signal transmission method.
In the present invention, header information and footer information are not added to the first data fragment. The transmission side uses the header information and the footer information of the data packet on the second transmission line, and transmits the first data fragment and the second data fragment of the data packet in synchronization to the reception side. At this time, the time slot between the adjacent first data fragments of the first transmission line is formed longer than the interval between the data packets of the second transmission line by the length of the bit length of the footer information and the header information. The In the present invention, since the interrupt signal is transmitted using this time slot, a separate period to be secured for transmitting the interrupt signal is not required, or the separate period can be shortened. Therefore, it is possible to suppress a decrease in data transmission efficiency caused by transmitting an interrupt signal using a time slot.
Further, since the time slot is a period during which no data fragment is transmitted, loss of the data fragment can be prevented.

IPR2025-00645 Page 02234

The present invention can be applied, for example, when the receiving side and the transmitting side are a host terminal and a removable memory device. For example, when the host terminal reads read data from the removable memory device via the first and second transmission lines, the host terminal transmits an interrupt signal to the removable memory device using the time slot of the first transmission line. It is applicable to. When the removable memory device receives and stores write data from the host terminal via the first and second transmission lines, an interrupt signal is sent to the host terminal using the time slot of the first transmission line. It can also be applied to transmission.

A second aspect of the present invention provides the signal transmission method according to the first aspect, wherein either the header information or the footer information is added to the first data fragment.

When footer information is added to the first data fragment adjacent to the first transmission line, the time slot is formed longer than the interval between the data packets by the length corresponding to the bit length of the header information. When header information is added to the first data fragment, the time slot is formed longer than the interval between data packets by the length of the bit length of the footer information. Since the interrupt signal is transmitted using this time slot, a separate period to be secured for transmitting the interrupt signal is not required, or the separate period can be shortened. Therefore, it is possible to suppress a decrease in data transmission efficiency caused by transmitting an interrupt signal using a time slot.

A third aspect of the present invention provides the signal transmission method according to the first aspect, wherein the interrupt signal is a signal for stopping transmission of the first data fragment and the data packet.

The transmission of the first data fragment and the data packet from the transmission side can be stopped while suppressing a decrease in data transmission efficiency. Invention 4 divides data into a plurality of data fragments, generates a first data fragment from the plurality of data fragments, and includes header information, a second data fragment having the same bit length as the first data fragment, and footer information. A data generation unit that generates a data packet including the first data fragment and the second data fragment are synchronized, and the first data fragment is transmitted through the first transmission line among at least two transmission lines. In a time slot that is an interval between a data transmission unit that transmits the data packet to a reception side via a second transmission line other than the first transmission line, and the first data fragment adjacent to the first transmission line An interrupt signal receiving unit for receiving an interrupt signal from the receiving side. Providing transceiver.

The present invention has the same effects as the first aspect.

A fifth aspect of the present invention further includes a response transmission unit that transmits a response to the reception side in response to the reception of the interrupt signal according to the fourth aspect, wherein the interrupt signal is a transmission of the first data fragment and the data packet. The data transmission unit transmits the first data via the first and second transmission lines when the interrupt signal reception unit receives the interrupt signal. Provided is a transmission / reception device, wherein transmission of a fragment and the data packet is completed, and the response transmission unit transmits a response to the receiving side after completion of transmission of the first data fragment and the data packet .

By completing the transmission of the first data fragment and data packet transmitted at the time of receiving the interrupt signal, the transmission of the first data fragment and data packet being transmitted is prevented from being incomplete and destroyed. be able to.

A sixth aspect of the present invention is a transmission / reception apparatus that receives data transmitted by being divided into a plurality of data fragments from a transmission side, wherein the first data fragment of the plurality of data fragments is the first of at least two transmission lines. The transmission of the data packet including the header information, the second data fragment having the same bit length as the first data fragment, and the footer information through the second transmission line other than the first transmission line. A data receiving unit for receiving from the side, a time slot acquiring unit for acquiring a time slot start position and a time slot length, which are intervals between adjacent first data fragments of the first transmission line, and the time slot length An interrupt signal generator for generating an interrupt signal for controlling the transmission side based on the time slot, and the time slot In response to the start position of the time slot, the interrupt signal transmitting unit that transmits the interrupt signal to the transmitting side, and the first data fragment and the second data fragment are transmitted in synchronization with each other. A transmission / reception device is provided.

The present invention has the same effects as the first aspect.

A seventh aspect of the present invention provides a communication system according to the sixth aspect, comprising the transmission / reception apparatus according to the fourth aspect and the transmission / reception apparatus according to the sixth aspect.

The present invention has the same effects as the first aspect.

In the invention 8, the receiving side and the transmitting side transmit and receive data by dividing the data into a plurality of data fragments via the transmission line, and the receiving side sends the first clock to the transmitting side via the clock signal transmission line. The transmission side transmits the data fragment to the reception side based on the first clock via the transmission line, and the reception side stops transmission of the data fragment from the transmission side. Therefore, a signal transmission method is provided, wherein transmission of the first clock to the transmission side is stopped.

The transmission side transmits the data fragment to the reception side based on the first clock transmitted from the reception side. Here, since the receiving side stops supplying the first clock, the transmitting side cannot transmit the data fragment to the receiving side. In this way, the reception side can control the stop of transmission of the data fragment from the transmission side.

The invention 9 is the invention 8, wherein the number of the transmission lines is at least two, and the reception side interrupts the transmission to the transmission side of the first clock, and then interrupt signals for controlling the transmission side is transmitted to the transmission side via the first transmission line among the transmission lines, and a second clock is transmitted to the transmission side via a second transmission line other than the first transmission line, and the transmission side Receives the interrupt signal based on the second clock, and provides a signal transmission method.

According to the above invention, when the receiving side stops supplying the first clock to the transmitting side, the transmission of the data fragment from the transmitting side stops. In this way, the reception side controls the transmission stop of the data fragment, and transmits the interrupt signal and the second clock to the transmission side. That is, the receiving side can transmit the interrupt signal and the second clock at an arbitrary time, and there is no need to provide a period for transmitting the interrupt signal and the second clock between data fragments in advance. Therefore, the interval between data fragments can be shortened, and a decrease in data transmission efficiency can be suppressed. In addition, after the transmission of the data fragment from the transmission side is stopped, the interrupt signal and the second clock are transmitted through the transmission line on which the data fragment was transmitted. Therefore, loss of data fragments can be prevented.

A data packet in which footer information and header information are added to a data fragment may be transmitted via a transmission line. Also in this case, the interval between the data packets can be shortened for the reason described above, and a decrease in data transmission efficiency can be suppressed.

In addition, the present invention can be applied, for example, when the reception side and the transmission side are a host terminal and a removable memory device. For example, when the host terminal reads the read data from the removable memory device via the transmission line, the host terminal stops supplying the first clock to the removable memory device. Thereafter, the host terminal is applicable when transmitting an interrupt signal to the removable memory device via the first transmission line and transmitting a second clock to the removable memory device via the second transmission line.

A tenth aspect of the present invention provides the signal transmission method according to the ninth aspect, wherein the interrupt signal is a signal for stopping transmission of the data fragment.

The transmission of the data fragment from the transmission side can be stopped while suppressing the decrease in the data transmission efficiency.

IPR2025-00645 Page 02235

in an eleventh aspect of the invention, in the eighth aspect of the invention, the reception side outputs an interrupt request to control the transmission side after stopping transmission of the first clock to the transmission side. Has an internal clock that is reset upon reception of the first clock, and recognizes the interrupt request based on the count value of the internal clock exceeding a predetermined value due to the stop of transmission of the first clock. A signal transmission method is provided.
According to the above invention, when the receiving side stops supplying the first clock to the transmitting side, the transmission of the data fragment from the transmitting side stops. In this way, the receiving side controls the transmission stop of the data fragment, whereby the transmitting side recognizes the interrupt request. in other words, the receiving side can cause the transmitting side to recognize an interrupt request at an arbitrary time, and it is not necessary to provide a period for recognizing the interrupt request between data fragments in advance. Therefore, the interval between data fragments can be shortened, and a decrease in data transmission efficiency can be suppressed.

A data packet in which footer information and header information are added to a data fragment may be transmitted via a transmission line. Also in this case, the interval between the data packets can be shortened for the reason described above, and a decrease in data transmission efficiency can be suppressed
Further, the frequency of the internal clock on the transmission side is set lower than the frequency of the first clock.
In addition, the present invention can be applied, for example, when the reception side and the transmission side are a host terminal and a removable memory device. For example, when the host terminal is reading read data from the removable memory device via the transmission line, the present invention can be applied to the case where the removable memory device recognizes the interrupt request by stopping the supply of the first clock.
A twelfth aspect of the present invention provides the signal transmission method according to the eleventh aspect, wherein the interrupt request is a request for stopping transmission of the data fragment.

The transmission of the data fragment from the transmission side can be stopped while suppressing the decrease in the data transmission efficiency.
A thirteenth aspect of the present invention receives a data generation unit that generates data fragments by dividing data into a plurality of data, and a first clock for transmitting the data fragments to the reception side from the reception side via a clock signal transmission line. A first clock receiving unit that transmits the data fragment to the receiving side based on the first clock via a transmission line, and the transmission of the first clock from the receiving side is stopped. The data transmission unit stops transmission of the data fragment to the reception side, and provides a transmission / reception apparatus.
The present invention has the same effects as the eighth aspect.

A fourteenth aspect of the invention is the invention according to the thirteenth aspect, wherein the transmission line includes at least two transmission lines, and the data transmission unit receives the data fragment via the at least two transmission lines based on the first clock. A second clock receiving unit that receives the second clock from the receiving side via the second transmission line of the transmission lines, and the first transmission line of the transmission lines based on the second clock. Via an interrupt signal receiving unit for receiving an interrupt signal for controlling the transmission side from the reception side, and after the transmission of the first clock from the reception side is stopped, A two-clock receiving unit receives the second clock, and the interrupt signal receiving unit receives the interrupt signal based on the second clock.
The present invention has the same effects as the ninth aspect.

A fifteenth aspect of the present invention provides the transmission / reception device according to the fourteenth aspect, further comprising a response transmission unit that transmits a response to the reception side in response to reception of the interrupt signal.
A sixteenth aspect of the invention relates to the thirteenth aspect of the invention, wherein an internal clock count unit that counts a count value of an internal clock that is reset upon reception of the first clock, and an interrupt request on the receiving side based on the count value of the internal clock. An interrupt request recognizing unit that recognizes the interrupt request, and the interrupt request recognizing unit recognizes the interrupt request based on a count value of the internal clock exceeding a predetermined value when transmission of the first clock is stopped. Provided is a transmission / reception device.
The present invention has the same effects as the eleventh aspect.
A seventeenth aspect of the invention provides a transmission / reception apparatus according to the sixteenth aspect, further comprising a response transmission unit that transmits a response to the reception side in response to recognition of the interrupt request.

A eighteenth aspect of the present invention is a transmission / reception apparatus that receives data transmitted by being divided into a plurality of data fragments from a transmission side, wherein a first clock used by the transmission side for transmission of the data fragment is transmitted via a clock signal transmission line. A first clock transmission unit that transmits to the transmission side, and a data reception unit that receives the data fragment from the transmission side based on the first clock via a transmission line, and the first clock transmission unit includes: In order to stop the transmission of the data fragment from the transmission side, the transmission to the transmission side of the first clock is stopped.
The present invention has the same effects as the eighth aspect.
A nineteenth aspect of the invention is the invention according to the eighteenth aspect, wherein the transmission line includes at least two transmission lines, and the data receiving unit transmits the data fragment via the at least two transmission lines based on the first clock. And an interrupt signal generator for generating an interrupt signal for controlling the transmission side, and an interrupt for transmitting the interrupt signal to the transmission side via the first transmission line among the transmission lines A signal transmission unit; and a second clock transmission unit configured to transmit a second clock to the transmission side via a second transmission line of the transmission lines, wherein the first clock transmission unit transmits the first clock. After stopping transmission to the interrupt signal transmitter, the interrupt signal transmitter transmits the interrupt signal to the transmitter via the first transmission line, and the second clock transmitter transmits the second transmission line. Send via And transmitting the second clock, to provide a transmitting and receiving device.

The present invention has the same effects as the ninth aspect.
A twentieth aspect of the invention is the invention of the eighteenth aspect, wherein the first clock transmission unit is controlled so as to stop the transmission of the first clock, whereby an interrupt request for controlling the transmission side is notified to the transmission side. There is provided a transmission / reception apparatus characterized by further including an insertion request notification unit.
The present invention has the same effects as the eleventh aspect.
A twenty-first aspect of the present invention provides a communication system including the transmission / reception device according to the thirteenth aspect and the transmission / reception device according to the eighteenth aspect.
The present invention has the same effects as the eighth aspect.
In the invention 22, the receiving side and the transmitting side transmit and receive data divided into a plurality of data fragments via the transmission line, and the receiving side transmits the transmitting side between the data fragments adjacent to the transmission line. A signal transmission method characterized by changing a signal amplitude of the transmission line in order to notify the transmission side of an interrupt request for controlling the transmission, and the transmission side detects a change in the signal amplitude. I will provide a.

According to the above invention, the data transmission side can recognize the interrupt request from the reception side by monitoring the change in the signal amplitude of the transmission line. Here, the reception side notifies an interrupt request by changing the signal amplitude between adjacent data fragments. in order to transmit an interrupt signal for controlling the transmitting side from the receiving side to the transmitting side, a period as long as the bit length of the interrupt signal is required between data fragments. According to the notification method, it is not necessary to provide a period as long as the bit length of the interrupt signal between data fragments. Therefore, it is possible to suppress a decrease in data transmission efficiency due to notification of an interrupt request. Further, since the data fragment is a

period in which no data fragment is transmitted, loss of the data fragment can be prevented.
As a method of changing the signal amplitude in the transmission line, for example, a method of changing the termination resistance of the transmission line from the first resistance value to the second resistance value on the receiving side can be mentioned.

In addition, header information and / or footer information may be added to the data fragment.
In addition, the present invention can be applied, for example, when the reception side and the transmission side are a host terminal and a removable memory device. For example, when the host terminal is reading read data from a removable memory device via a transmission line, the present invention can be applied to a case where an interrupt request is notified to the removable memory device between data fragments. Further, when the removable memory device receives write data from the host terminal via the transmission line and stores it, the present invention can also be applied when notifying the host terminal of an interrupt request using between data fragments. .
A twenty-third aspect of the present invention provides the signal transmission method according to the twenty-second aspect, wherein the interrupt request is a request for stopping transmission of the data fragment.

The transmission of the data fragment from the transmission side can be stopped while suppressing the decrease in the data transmission efficiency.
The invention 24 includes a data generation unit that divides data into a plurality of data and generates a plurality of data fragments, a data transmission unit that transmits the data fragments to a reception side via a transmission line, and the data adjacent to the transmission line There is provided a transmission / reception apparatus including an interrupt request recognition unit that recognizes an interrupt request from the receiving side by detecting a change in signal amplitude of the transmission line between fragments.
The present invention has the same effects as the twenty-second aspect.
The interrupt request recognition unit of the present invention recognizes an interrupt request by comparing the signal amplitude value of the transmission line with a predetermined reference amplitude value. For example, when the signal amplitude value of the transmission line is larger than a predetermined reference amplitude value, the interrupt request recognition unit does not recognize the interrupt request. On the other hand, when the signal amplitude value of the transmission line is smaller than the predetermined reference amplitude value, the interrupt request recognition unit recognizes the interrupt request.

The data transmission unit transmits the data fragment to the reception side using a predetermined clock. Here, the interrupt request recognition unit detects a change in the signal amplitude using a clock having the same frequency as a predetermined clock.
A twenty-fifth aspect of the invention provides a transmission / reception apparatus according to the twenty-fourth aspect, further comprising a response transmission unit that transmits a response to the reception side in response to recognition of the interrupt request.
In a twenty-sixth aspect, the signal amplitude of the transmission line is changed between a data receiving unit that receives a plurality of data fragments obtained by dividing data from the transmission side via the transmission line, and the data fragment adjacent to the transmission line. And an interrupt request notification unit that notifies the transmission side of an interrupt request for controlling the transmission side.

The present invention has the same effects as the twenty-second aspect.
The interrupt request notification unit changes the signal amplitude in the transmission line by changing the termination resistance of the transmission line on the receiving side from the first resistance value to the second resistance value, for example.
A twenty-seventh aspect of the present invention provides a communication system including the transmission / reception device according to the twenty-fourth aspect and the transmission / reception device according to the twenty-sixth aspect.
The present invention has the same effects as the twenty-second aspect.

ADVANTAGE OF THE INVENTION According to this invention, the signal transmission method, transmission / reception apparatus, and communication system which can suppress the fall of the data transmission efficiency by transmitting an interruption signal can be provided.

Hereinafter, embodiments of the present invention will be described with reference to the drawings.
<First embodiment>
(1) Overview FIG. 1 is an explanatory diagram showing the overall configuration of a communication system according to a first embodiment of the present invention. In this communication system, a transmission / reception device that is a host terminal 101 and a transmission / reception device that is an SD (Secure Digital) memory card 102 are connected via a transmission line. The transmission lines include a clock signal transmission line 105, a control signal transmission line 106, and a data signal transmission line 107. The clock signal transmission line 105 is used to transmit a clock CLKH (described later) used for communication between the host terminal 101 and the SD memory card 102 from the host terminal 101 to the SD memory card 102. The control signal transmission line 106 is used to transmit / receive a command related to data read / write, an interrupt command described later, and a response to the command between the host terminal 101 and the SD memory card 102. The data signal transmission line 107 is used for transmitting and receiving data between the host terminal 101 and the SD memory card 102.

FIG. 2 is a time chart showing a state of data transmission at the time of reading. The communication system of this embodiment is a handshake type communication system. When data is transmitted, first, various commands such as a read command (ReadCMD in FIG. 2) and a write command and responses to the command (in FIG. 2). , Res) is transmitted / received between the host terminal 101 and the SD memory card 102, and then data (DATA in FIG. 2) is transmitted.
Further, in the communication system of this embodiment, for the purpose of improving the transmission efficiency of data access, not only the data signal transmission line 107 but also the control signal transmission line 106 is used for data transmission as shown in FIG. Use. The data is divided into a plurality of data fragments and transmitted. However, header information and footer information are added before and after the first data fragment in the first data fragment transmitted through the control signal transmission line 106. Absent. On the other hand, the second data fragment transmitted through the data signal transmission line 107 has header information and footer information added thereto. That is, the data signal transmission line 107 transmits a data packet including header information, second data fragment, and footer information. The bit length of the first data fragment is the same as the bit length of the second data fragment, and the first data fragment and the second data fragment are transmitted in synchronization. The difference in transmission line length between the control signal transmission line 106 and the data signal transmission line 107 is assumed to be negligible.

Here, the header information and the footer information are information different from the data fragment. The header information includes information such as a synchronization bit string and a start bit for adjusting the reception timing of the data packet, and the footer information includes information such as an end bit indicating the end of the data packet. ing. The information included in the header information and footer information is not limited to these, and may include other various information. Further, the data fragment may include information for detecting a transmission error of each data fragment such as a CRC (Cyclic Redundancy Check) bit.
In the present embodiment, the data fragment reception side to the transmission side using the interval between the first data fragments from the transmission side transmitted adjacently on the control signal transmission line 106 (hereinafter referred to as the first time slot). An interrupt signal (ITRPT (for example, a read interrupt command to be described later) in FIG. 2) is transmitted. Since header information and footer information are not added to the first data fragment, the first time slot is defined by the interval between the first data fragment transmitted first and the first data fragment transmitted later. The In addition, a basic time slot to be described later is defined by an interval between a data packet transmitted first and a data packet transmitted later in adjacent data packets including header information and footer information.

IPR2025-00645 Page 02237

The number of data signal transmission lines 107 is not limited to one, and a plurality of data signal transmission lines 107 may be provided.
(2) Hardware Configuration Hereinafter, the hardware configuration of the host terminal 101 and the SD memory card 102 will be described with reference to FIG. 1 again The host terminal 101 and the memory card 102 realize various functions to be described later in cooperation with the hardware configuration illustrated in FIG. 1 and the functional configuration of the CPU 110 illustrated in FIG. 3 described later.
(2-1) Host Terminal (a) CPU 110: Controls other RAM 111, buffer 112, card interface unit 113, I / O buffer, and the like of the host terminal 101. Various functions to be described later such as data reading and writing in the host terminal 101 are realized based on various programs.

(B) RAM 111: Stores various data transmitted to and received from the SD memory card 102.
(C) Buffer 112, card interface unit 113: Writes data read from the SD memory card 102 to the RAM 111 and reads data written to the SD memory card 102 from the RAM 111.
(D) I / O buffer: Inputs and outputs data such as commands, responses, and data. The I / O buffer includes a data / command output 114a, a data / response input 114b, a data output 114c, a data input 114d, a driver 115a, a receiver 115b, a driver 115c, and a receiver 115d, which are connected as shown in FIG.

(E) Driver 116: Sends the clock CLKH to the SD memory card 102 via the clock signal transmission line 105.
(2-2) SD Memory Card (a) CPU 130: Realizes various functions to be described later such as data reading and writing in the SD memory card 102 based on various programs.
(B) Flash memory 131a: Stores various data transmitted to and received from the host terminal 101
(C) Flash memory interface unit 131b, buffer 132, host interface unit 133: Write data read from the host terminal 101 to the flash memory 131a, and read data written to the host terminal 101 from the flash memory 131a. .

(D) I / O buffer: Inputs and outputs data such as commands, responses, and data. The I / O buffer includes a data / response output 134a, a data / command input 134b, a data output 134c, a data input 134d, a driver 135a, a receiver 135b, a driver 135c, and a receiver 135d, which are connected as shown in FIG.
(E) Receiver 136: Receives the clock CLKH from the host terminal 101.
(3) Functional Configuration FIG. 3 is a functional configuration diagram of the CPU 110 of the host terminal 101 and the CPU 130 of the SD memory card 102.
(3-1) Functional Configuration of CPU of Host Terminal (a) Clock Generation Unit, Clock Transmission Unit The clock generation unit 150 is a basic clock CLKH for transmitting and receiving data between the host terminal 101 and the SD memory card 102. Is generated. Since the clock generation unit 150 controls various functional units of the CPU 110 by the clock CLKH, the clock transmission unit 151, the timing control unit 152, the command transmission unit 156, the response reception unit 158, the read data reception unit 160, and the write data transmission unit 162. Etc. to send the clock CLKH. The clock transmission unit 151 transmits the clock CLKH to the SD memory card 102 via the clock signal transmission line 105.

(B) Timing control unit, first time slot acquisition unit, parameter storage unit The parameter storage unit 154 stores header length, footer length, and basic time slot length information defined as communication standards. Here, the header length and footer length are the length of the header and footer defined by the number of bits. The basic time slot length is the length of a basic time slot that is an interval between data packets defined by the number of bits.
The first time slot acquisition unit 153 calculates and acquires the first time slot length that is the interval between the first data fragments based on the header length, footer length, and basic time slot length acquired from the parameter storage unit 154 . The first data fragment is continuously transmitted from the SD memory card 102 via the control signal transmission line 106. Here, the first time slot length is calculated by footer length + basic time slot length + header length. The first time slot acquisition unit 153 transmits the first time slot length to the command generation unit 155.

Further, the timing control unit 152 and the first time slot acquisition unit 153 receive a data packet from the read data receiving unit 160 described later via the data signal transmission line 107, and the second data included in the header information of the data packet. Get the bit length of the fragment. Here, the bit length of the first data fragment and the bit length of the second data fragment are the same. The first time slot acquisition unit 153 sequentially counts the header length, the bit length of the second (or first) data fragment, and the first time slot length based on the clock CLKH, thereby determining the start position of the first time slot. To grasp. Then, the first time slot acquisition unit 153 transmits the start position of the first time slot to the command transmission unit 156. In addition, the timing control unit 152 sequentially counts the header length, the bit length of the second (or first) data fragment, the footer length, and the basic time slot length based on the clock CLKH, and sends the count value to the read data receiving unit 160. Send.

Note that the start position of the time slot may be acquired based on the count value from the timing control unit 152 instead of from the time slot acquisition unit 153.
(C) Command generation unit, command transmission unit The command generation unit 155 is a read command for reading read data such as video and audio stored in the SD memory card 102, and a write for writing data to the SD memory card 102. Various commands such as a command and a read interrupt command for stopping reading of read data from the SD memory card 102 are generated.
Here, at the time of reading, the host terminal 101 continuously transmits the first data fragment via the control signal transmission line 106, and continuously transmits the data packet via the data signal transmission line 107, and the SD memory card 102. Read data is being received from. In such a case, the read interrupt command is a command (interrupt signal) that is transmitted to the SD memory card 102 using the first time slot between adjacent first data fragments and stops transmission of the read data. . The command generation unit 155 determines the status of the host terminal 101, for example, writing of read data transmitted from the SD memory card 102 to the RAM 111 is delayed, and determines whether to transmit a read interrupt command. . When transmitting the read interrupt command, the command generation unit 155 generates the read interrupt command so that the bit length of the read interrupt command does not exceed the first time slot length.

The command transmission unit 156 transmits various commands such as a read command and a write command to the SD memory card 102 via the control signal transmission line 106 based on the clock CLKH. Note that the command transmission unit 156 transmits the read interrupt command based on the start position of the first time slot so that the read interrupt command can be transmitted in the first time slot.
(D) Response receiving unit The response receiving unit 158 receives a response to the command transmitted from the host terminal 101 from the SD memory card 102. The response receiving unit 158 determines whether or not a write interrupt response, a so-called busy signal is received from the SD memory card 102, and notifies the write data transmitting unit 162 of whether or not a write interrupt response has been received.

(E) Read Data Receiving Unit, Read Data Generating Unit The read data receiving unit 160 receives the first data fragment and data packet from the SD memory card 102 based on the clock CLKH. Here, the read data receiving unit 160 receives the first data fragment via the control signal transmission line 106 and the data packet via the data signal transmission line 107. Further, the read data receiving unit 160 receives a count value obtained by sequentially counting the header length, the bit length of the second (or first) data fragment, the footer length, and the basic time slot length from the timing control unit 152. Based on this count value, the read data receiving unit 160 can accurately receive the first data fragment and the second data fragment in the data packet without loss. The first data fragment of the control signal transmission line 106 is transmitted based on the header information and footer information of the data packet of the data signal transmission line 107, and the first data fragment and the second data fragment of the data packet are transmitted. And are synchronized.

The read data generation unit 159 generates read data from the plurality of first and second data fragments and stores the read data in the RAM 111.
(F) Transmission Data Generation Unit, Write Data Transmission Unit When a write command is generated, the transmission data generation unit 161 reads write data to be written to the SD memory card 102 from the RAM 111, and a plurality of first data fragments and data Generate a packet. The first data fragment is generated without adding header information and footer information. On the other hand, the data packet is generated so as to include header information, second data fragment, and footer

IPR2025-00645 Page 02238

information. In addition, the bit lengths of the first data fragment and the second data fragment transmitted synchronously are the same.
The write data transmitting unit 162 transmits the first data fragment via the control signal transmission line 106 based on the clock CLKH, and transmits the data packet via the data signal transmission line 107 to the SD memory card 102. Send to. The write data transmission unit 162 transmits the first data fragment of the control signal transmission line 106 based on the header information and footer information of the data packet of the data signal transmission line 107. Therefore, the first data fragment and the second data fragment of the data packet are synchronized.

Further, the write data transmission unit 162 receives the presence / absence of reception of the write interrupt response from the response reception unit 158. When the write interrupt response is received, the write data transmission unit 162 stops transmitting the first data fragment and the data packet. On the other hand, when the write interrupt response is not received, the transmission of the first data fragment and the data packet is continued, and when the write interrupt response is canceled, the transmission is resumed.
Here, the write data transmission unit 162 transmits the first data fragment and the data packet when the response reception unit 158 receives the write interrupt response, and transmits the first data fragment and the data packet. Complete sending. By completing the transmission of the first data fragment and data packet transmitted at the time of receiving the write interrupt response in this way, the transmission of the first data fragment and data packet being transmitted is incomplete and destroyed. Can be prevented.

(3-2) Functional Configuration of CPU of SD Memory Card (a) Clock Receiving Unit The clock receiving unit 170 receives the clock CLKH from the host terminal 101. Note that the clock CLKH changes to the card clock CLKS due to a delay in transmission from the host terminal 101 to the SD memory card 102. The clock receiving unit 170 transmits the card clock CLKS to the timing control unit 172, the command receiving unit 177, the response transmitting unit 178, the read data transmitting unit 179, the write data receiving unit 181 and the like.
(B) Timing control unit, first time slot acquisition unit, parameter storage unit The parameter storage unit 174 stores information on a header length, a footer length, and a basic time slot length defined as communication standards.

The first time slot acquisition unit 173 calculates a first time slot length that is an interval between adjacent first data fragments based on the header length, footer length, and basic time slot length acquired from the parameter storage unit 174. get. The first time slot acquisition unit 173 transmits the first time slot length to the response generation unit 175.
Further, the timing control unit 172 and the first time slot acquisition unit 173 receive a data packet from a write data reception unit 181 described later, and acquire the bit length of the second data fragment included in the header information of the data packet. The first time slot acquisition unit 173 sequentially counts the header length, the bit length of the second (or first) data fragment, and the first time slot length based on the card clock CLKS, and acquires the start position of the first time slot. To do. Then, the first time slot acquisition unit 173 transmits the start position of the first time slot to the response transmission unit 178. Note that the bit lengths of the first data fragment and the second data fragment transmitted synchronously are the same.

Further, the timing control unit 172 sequentially counts the header length, the bit length of the second (or first) data fragment, the footer length, and the basic time slot length based on the card clock CLKS, and the count value is the write data receiving unit 181. Send to.
(C) Command Receiving Unit The command receiving unit 177 receives various commands including a read interrupt command from the host terminal 101 via the control signal transmission line 106 based on the card clock CLKS.
(D) Response generation unit, response transmission unit The response generation unit 175 generates responses to various commands from the host terminal 101. In addition, the response generation unit 175 also generates a write interrupt response that stops writing of write data

Here, at the time of writing, the SD memory card 102 continuously receives the first data fragment from the host terminal 101 via the control signal transmission line 106 and receives the write data. In such a case, the write interrupt response is a response (interrupt signal) that is transmitted to the host terminal 101 using the first time slot between adjacent first data fragments and stops transmission of the write data. The response generation unit 175 determines the status of the SD memory card 102, for example, writing of the write data transmitted from the host terminal 101 to the flash memory 131a is delayed, and determines whether or not to transmit a write interrupt response. to decide. When transmitting a write interrupt response, the response generation unit 175 generates a write interrupt response so that the bit length of the write interrupt response does not exceed the first time slot length.

When the command reception unit 177 receives various commands from the host terminal 101, the response transmission unit 178 transmits a response to the host terminal 101 via the control signal transmission line 106. Further, the response transmission unit 178 transmits the write interrupt response based on the start position of the first time slot so that the write interrupt response can be transmitted in the first time slot. The write interrupt response is generated until the write data can be written to the flash memory 131 a and transmitted to the host terminal 101 .
As will be described later, when the read data transmission unit 179 transmits the first data fragment and the data packet to the host terminal 101 when the read interrupt command is received, the response transmission unit 178 After these transmissions are completed, a response is transmitted to the host terminal 101.

(E) Write Data Receiving Unit, Write Data Generating Unit The write data receiving unit 181 receives the first data fragment and data packet from the host terminal 101 based on the card clock CLKS. Here, the write data receiving unit 181 receives the first data fragment via the control signal transmission line 106 and the data packet via the data signal transmission line 107. The write data receiving unit 181 receives a count value obtained by sequentially counting the header length, the bit length of the second (or first) data fragment, the footer length, and the basic time slot length from the timing control unit 172. Based on this count value, the write data receiving unit 181 can accurately receive the first data fragment and the second data fragment in the data packet without loss. The first data fragment is transmitted based on the header information and footer information of the data packet, and the first data fragment and the second data fragment of the data packet are synchronized.

The write data generation unit 182 generates write data from the plurality of first and second data fragments and stores the write data in the flash memory 131a.
(F) Transmission Data Generation Unit, Read Data Transmission Unit When the command reception unit 177 receives a read command from the host terminal 101, the transmission data generation unit 180 reads the read data to be transmitted to the host terminal 101 from the flash memory 131a. Generating a plurality of first data fragments and data packets; The data packet is generated including header information, second data fragment, and footer information. The number of bits of the first data fragment and the second data fragment transmitted in synchronism is the same.
Based on the card clock CLKS, the read data transmission unit 179 transmits the first data fragment via the control signal transmission line 106 to the host terminal 101, and transmits the data packet to the host terminal 101 via the data signal transmission line 107. Send. The read data transmission unit 179 transmits the first data fragment based on the header information and footer information of the data packet. Therefore, the first data fragment and the second data fragment of the data packet are synchronized.

In addition, when the read data transmission unit 179 transmits the first data fragment and the data packet when the read interrupt command is received, the read data transmission unit 179 completes the transmission of the first data fragment and the data packet. By completing the transmission of the first data fragment and data packet transmitted at the time of receiving the read interrupt command in this way, the transmission of the first data fragment and data packet being transmitted is incomplete and destroyed. Can be prevented.
(4) Process Flow In the process described below, the clock CLKH is transmitted from the host terminal 101 to the SD memory card 102.
(4-1) Reading Time FIG. 4 is a flowchart illustrating an example of a processing flow at the time of reading in the communication system of the present embodiment.

Steps S1 and S2: The command generation unit 155 of the host terminal 101 generates a read command for reading the read data from the SD memory card 102. The command transmission unit 156 of the host terminal 101 transmits a read command to the SD memory card 102 via the control signal transmission line 106 (step S1). The command receiving unit 177 of the SD memory card 102 receives the read command (step S2).
Steps S3 and S4: The response transmission unit 178 of the SD memory card 102 transmits a response to the read command to the host terminal 101 via the control signal transmission line 106 (step S3). The response receiving unit 158 of the host terminal 101 receives the response (step S4).
Steps S5 and S6: The transmission data generation unit 180 of the SD memory card 102 reads the read data from the flash memory 131a and generates a first data fragment and a data packet in response to reception of the read command. The read data transmission unit 179 of the SD memory card 102 transmits the first data fragment to the host terminal 101 via the control signal transmission line 106 and transmits the data packet to the host terminal 101 via the data signal transmission line 107. (Step S5). The read data receiving unit 160 of the host terminal 101 receives the first data fragment and the data packet from the SD memory card 102 (step S6). At this time, the timing control unit 152 of the host terminal 101 sequentially counts the header length, the bit length of the second (or first) data fragment, the footer length, and the basic time slot length, and sends the count value to the read data receiving unit 160. Sending.

Thereafter, the read data generation unit 159 generates read data from the first and second data fragments and stores the read data in the RAM 111.
Steps S7 and S8: The command generation unit 155 of the host terminal 101 determines whether or not to transmit a read interrupt command, and generates a read interrupt command when transmitting (Yes) (step S7). At this time, the first time slot acquisition unit 153 of the host terminal 101 calculates the first time slot length based on the header length, footer length, and basic time slot length. The command generation unit 155 of the host terminal 101 generates a read interrupt command so as not to exceed the first time slot length (step S8). When the read interrupt command is not transmitted (Nc), the read data receiving unit 160 of the host terminal 101 further receives the first data fragment and the data packet.

Step S9: The first time slot acquisition unit 153 of the host terminal 101 sequentially counts the header length, the bit length of the second (or first) data fragment, and the first time slot length based on the clock CLKH, and the first time Get the start position of the slot.
Steps S10 and S11: The command transmission unit 156 of the host terminal 101 transmits a read interrupt command to the SD memory card 102 based on the start position of the first time slot via the control signal transmission line 106 (Step S10).). The command receiving unit 177 of the SD memory card 102 receives a read interrupt command from the host terminal 101 (step S11).
Steps S12 and S13: The response transmission unit 178 of the SD memory card 102 transmits a response to the read interrupt command to the host terminal 101 via the control signal transmission line 106 (step S12). When the read data transmission unit 179 transmits the first data fragment and the data packet when receiving the read interrupt command, the response transmission unit 178 transmits a response after completing the transmission.

The response receiving unit 158 of the host terminal 101 receives a response from the SD memory card 102 (step S13).
Step S14: The read data transmission unit 179 of the SD memory card 102 stops transmitting the first data fragment and the data packet.
Thereafter, when a read command is transmitted again from the host terminal 101 to the SD memory card 102, the SD memory card 102 transmits the first data fragment and the data packet via the control signal transmission line 106 and the data signal transmission line 107. To resume.
(4-2) Write Time FIG. 5 is a flowchart illustrating an example of a process flow at the time of writing in the communication system of the present embodiment.

Step S21: The command generation unit 155 and command transmission unit 156 of the host terminal 101 generate and transmit a write command for writing write data to the SD memory card 102 (step S21). The command receiving unit 177 of the SD memory card 102 receives the write command (step S22).
Step S23: The response transmission unit 178 of the SD memory card 102 and the response reception unit 158 of the host terminal 101 transmit and receive a response to the write command.
Steps S25 and S26: The transmission data generation unit 161 and the write data transmission unit 162 of the host terminal 101 read the write data from the RAM 111 in response to the reception of the write command, generate the first data fragment and the data packet, and the SD memory It transmits to the card ¦ curd 102 (step S25). The write data receiving unit 181 of the SD memory card 102 receives the first data fragment and the data packet from the host terminal 101 (step S26). At this time, the timing control unit 172 of the SD memory card 102 sequentially counts the header length, the bit length of the second (or first) data fragment, the footer length, and the basic time slot length, and writes the count value to the write data receiving unit 181. is sending to.

Thereafter, the write data generation unit 182 generates write data from the first data fragment and the data packet, and stores the write data in the flash memory 131a.
Steps S27 and S28: The response generation unit 175 of the SD memory card 102 determines whether or not to transmit a write interrupt response, and when transmitting (Yes), generates a write interrupt response (step S27). . At this time, the first time slot acquisition unit 173 of the SD memory card 102 calculates the first time slot length based on the header length, footer length, and basic time slot length. The response generation unit 175 of the SD memory card 102 generates a write interrupt response so as not to exceed the first time slot length (step S28). When the write interrupt response is not transmitted (No), the write data receiving unit 181 of the SD memory card 102 further receives the first data fragment and the data packet.

Step S29: The first time slot acquisition unit 173 of the SD memory card 102 sequentially counts the header length, the bit length of the second (or first) data fragment, and the first time slot length based on the card clock CLKS. Get the start position of one time slot.
Step S30: The response transmission unit 178 of the SD memory card 102 transmits a write interrupt response to the host terminal 101 based on the start position of the first time slot via the control signal transmission line 106 (step S30).
Steps S31 and S32: The response receiving unit 158 of the host terminal 101 determines whether or not a write interrupt response, so-called busy signal is received from the SD memory card 102 (step S31). When the write interrupt response has not been received (No), in step S25, the write data transmission unit 162 generates and transmits the first data fragment and the data packet.

On the other hand, when the write interrupt response is received (Yes), the write data transmission unit 162 of the host terminal 101 transmits the first data fragment and data via the control signal transmission line 106 and the data signal transmission line 107. The packet transmission is stopped (step S32). Then, when the reception of the write interrupt response is canceled, the write data transmission unit 162 resumes generating and transmitting the first data fragment and the data packet in step S25.
(5) Effects In the present invention, header information and footer information are not added to the first data fragment of the control signal transmission line 106. The transmission side uses the header information and the footer information of the data packet of the data signal transmission line 107 to synchronize the first data fragment and the second data fragment of the data packet and transmit it to the reception side. At this time, the first time slot between the adjacent first data fragments of the control signal transmission line 106 is longer than the interval between the data packets of the data signal transmission line 107 by the bit length of the footer information and the header information. It is formed so long. In the present invention, an interrupt signal such as a read interrupt command or a write interrupt response is transmitted using the first time slot. Therefore, a separate period to be secured for transmitting a read interrupt command, a write interrupt response, or the like is not required, or the separate period can be shortened. Therefore, it is possible to suppress a decrease in data transmission efficiency caused by transmitting an interrupt signal using the first time slot. Further, since the first time slot is a period in which no data fragment is transmitted, loss of the data fragment can be prevented.

(6) Modification (6-1)
In the above, neither the header information nor the footer information is added to the first data fragment transmitted through the control signal transmission line 106. However, either header information or footer information may be added to the first data fragment. For example, when header information is added before the first data fragment, the first time slot is determined by the interval between the first data fragment transmitted first and the header information of the first data fragment

transmitted later. Defined. Alternatively, when footer information is added after the first data fragment, the first time slot is defined by an interval between the footer information of the first data fragment transmitted first and the first data fragment transmitted later. Is done. By using such a first time slot, an extra time slot can be secured by the length of the header or footer, and a decrease in transmission efficiency can be suppressed.

(6-2)
In the SD memory card 102, data is processed in units of 8 bits. Therefore, the first time slot length calculated by footer length + basic time slot length + header length is preferably a multiple of 8.
(6-3)
For example, a switching time t1 of several clocks is required until the transmission of data from the transmission side is completed and the reception side can normally output a command to the transmission side. Further, for example, a switching time t2 of several clocks is required before the transmission of the interrupt signal from the reception side is completed and the transmission side can start data transmission again. Therefore, the first time slot length is preferably a bit length including the switching times t1 and t2. That is, the first time slot length, which is the interval between the first data fragments, is calculated by the footer length of the data packet + the number of bits of the switching time t1 + the number of bits of the command + the switching time t2 + the header length of the data packet. Also, the first time slot length expressed as described above is preferably a multiple of 8.

(6-4)
In the above description, the case where the receiving side transmits a read interrupt command or a write interrupt response to the transmitting side while receiving data from the transmitting side has been described. The present embodiment is also applicable to a case where various signals for delaying transmission for a certain period or instructing retransmission of data are transmitted to the transmission side when data is received from the transmission side.
(6-5)
In the above, the data packet is formed so as to include header information, data packet, and footer information in order, but the order of these is not limited to the above.
(6-6)
In the above, this embodiment demonstrated the communication system which has a control signal transmission line and a data signal transmission line. However, this embodiment can also be applied to a communication system that does not have a control signal transmission line and has only a data signal transmission line. For example, the first data fragment to which header information and footer information are not added is transmitted in any of the data signal transmission lines. Then, a read interrupt command, a write interrupt response, and the like are transmitted using the first data fragment that is transmitted adjacent to the data signal transmission line.

(6-7)
In the above description, the header length, footer length, and basic time slot length are defined as communication standards. However, for example, the header length, the footer length, and the basic time slot length are different for each SD memory card, and these pieces of information may be mutually acquired when communication between the host terminal 101 and the SD memory card 102 is started.
(6-8)
The control signal transmission line 106 and the data signal transmission line 107 may be a pair of two differential transmission lines.
(6-9)
In the above description, the configuration in which the bit length of each data fragment is described in the header information has been described. However, the bit length of each data fragment may be fixed according to the communication standard. In this case, the bit length of the data fragment may be stored in the parameter storage unit, and it is not necessary to acquire the bit length of the data fragment as needed from the header length of the second data packet.

(6-10)
Since it is preferable that transmission of data is immediately stopped by transmission of the interrupt signal, the interrupt signal is preferably transmitted using one first time slot. However, for example, when the bit length of the interrupt signal exceeds the first time slot length, the interrupt signal may be divided into a plurality of pieces and transmitted using a plurality of first time slots.
(6-11)
In the above description, the SD memory card, which is a removable memory device, has been described as an example. However, the present invention is applicable to any portable removable memory device that transmits read data to the host terminal using a clock supplied from the host terminal. The applicable range is not limited to the SD memory card. Other examples include CompactFlash (registered trademark), smart media, multimedia cards, and memory sticks. In addition, the memory on which the removable memory device can be mounted is not limited to the flash memory, but includes non-volatile memories such as MRAM and FeRAM.

(6-12)
A computer program that causes a computer to execute the method described above and a computer-readable recording medium that records the program are included in the scope of the present invention. Here, examples of the computer-readable recording medium include a flexible disk, hard disk, CD-ROM, MO, DVD, DVD-ROM, DVD-RAM, BD (Blue-ray Disc), and semiconductor memory. .
The computer program is not limited to the one recorded on the recording medium, and may be transmitted via an electric communication line, a wireless or wired communication line, a network represented by the Internet, or the like.
<Second Embodiment>
6 and 7 are overall configuration diagrams of the communication system according to the first and second examples of the second embodiment of the present invention. In this communication system, a transmission / reception device as a host terminal 201 and a transmission / reception device as an SD (Secure Digital) memory card 202 are connected via a transmission line. The transmission lines include a clock signal transmission line 205, a control signal transmission line 206, and a data signal transmission line 207. The clock signal transmission line 205 is used to transmit a first clock CLKH1 (described later) used for communication between the host terminal 201 and the SD memory card 202 from the host terminal 201 to the SD memory card 202. The control signal transmission line 206 is used for transmitting and receiving commands related to data reading and writing and responses to the commands between the host terminal 201 and the SD memory card 202. The data signal transmission line 207 is used for transmitting and receiving data between the host terminal 201 and the SD memory card 202.

FIG. 8 is a time chart showing a state of data transmission at the time of reading. The communication system according to the present embodiment is a handshake communication system. When data is transmitted, first, various commands such as a read command (ReadCMD in FIG. 8) and a write command, an interrupt command, and a response to the command (In FIG. 8, Res) is transmitted and received between the host terminal 201 and the SD memory card 202, and then data (DATA in FIG. 8) is transmitted.
In the communication system of this embodiment, for the purpose of improving the transmission efficiency of data access, not only the data signal transmission line 207 but also the control signal transmission line 206 is used for data transmission as shown in FIG. Use. Data is divided into a plurality of data fragments and transmitted, and header information and footer information are added to the data fragments transmitted through the control signal transmission line 206 and the data signal transmission line 207. That is, the control signal transmission line 206 and the data signal transmission line 207 transmit data packets including header information, data fragments, and footer information. All data packets are configured with the same bit length.

IPR2025-00645 Page 02241

Here, the header information and the footer information are information different from the data fragment. The header information includes information such as a synchronization bit string and a start bit for adjusting the reception timing of the data packet, and the footer information includes information such as an end bit indicating the end of the data packet. ing. The information included in the header information and footer information is not limited to these, and may include other various information. Further, the data fragment may include information for detecting a transmission error of each data fragment such as a CRC (Cyclic Redundancy Check) bit. In the present embodiment, the reception side transmits the first clock CLKH1 to the transmission side via the clock signal transmission line. Further, the transmission side transmits a data packet to the reception side based on the first clock CLKH1. At this time, the reception side stops transmission of the first clock CLKH1 to the transmission side in order to stop transmission of the data packet from the transmission side. Therefore, the transmitting side cannot transmit a data packet to the receiving side. In this way, the receiving side can control the stop of transmission of the data packet from the transmitting side.

The number of data signal transmission lines 207 is not limited to one, and a plurality of data signal transmission lines 207 may be provided.
Below, the 1st example and the 2nd example are explained below as an example of this embodiment.
(First embodiment)
(1) Outline FIG. 9 is a time chart showing a state of data transmission at the time of reading in the first embodiment. In the first embodiment, the host terminal 201 stops transmission of the first clock CLKH1 (see period A (stop time slot) in FIG. 9). Thereby, transmission of the data packet from the SD memory card 202 is stopped. Thereafter, an interrupt signal (ITRPT (for example, a read interrupt command described later) in FIG. 9) is transmitted from the host terminal 201 to the SD memory card 202 via the control signal transmission line 206. Also, a second clock CLKH2 different from the first clock CLKH1 is transmitted to the SD memory card 202 via the data signal transmission line 207. The SD memory card 202 receives an interrupt command based on the second clock CLKH2.

(2) Hardware Configuration Hereinafter, the hardware configuration of the host terminal 201 and the SD memory card 202 will be described using FIG. 6 again. The host terminal 201 and the SD memory card 202 realize various functions to be described later in cooperation with the hardware configuration illustrated in FIG. 6 and the functional configuration of the CPU 210 illustrated in FIG.
(2-1) Host Terminal (a) CPU 210: Controls the other RAM 211, buffer 212, card interface unit 213, I / O buffer, etc. of the host terminal 201. Various functions to be described later such as data reading and writing in the host terminal 201 are realized based on various programs.

(B) RAM 211: Stores various data transmitted / received to / from the SD memory card 202.
(C) Buffer 212, card interface unit 213: Writes data read from the SD memory card 202 to the RAM 211 and reads data written to the SD memory card 202 from the RAM 211.
(D) I / O buffer: Inputs and outputs data such as commands, responses, and data. The I / O buffer includes a data / command output 214a, a data / response input 214b, a data output 214c, a data input 214d, a driver 215a, a receiver 215b, a driver 215c, and a receiver 215d, which are connected as shown in FIG. Note that the driver 215 c transmits the second clock CLKH 2 to the SD memory card 202 via the data signal transmission line 207.

(E) Driver 216: Transmits the clock CLKH1 to the SD memory card 202 via the clock signal transmission line 205 .
(2-2) SD Memory Card (a) CPU 230: Realizes various functions to be described later such as data reading and writing in the SD memory card 202 based on various programs.
(B) Flash memory 231a: Stores various data transmitted / received to / from the host terminal 201
(C) Flash memory interface unit 231b, buffer 232, host interface unit 233: Write data read from the host terminal 201 to the flash memory 231a, and read data written to the host terminal 201 from the flash memory 231a. .

(D) I / O buffer: Inputs and outputs data such as commands, responses, and data. The I / O buffer includes a data / response output 234a, a data / command input 234b, a data output 234c, a data input 234d, a driver 235a, a receiver 235b, a driver 235c, and a receiver 235d, which are connected as shown in FIG. The receiver 235d receives the second clock CLKH2 from the host terminal 201 via the data signal transmission line 207.
(E) Receiver 236: Receives the first clock CLKH1 from the host terminal 201.
(F) Interrupt memory circuit 237: The interrupt memory circuit 237 of the SD memory card 202 includes an output line 235bl of the receiver 235b that receives an input from the control signal transmission line 206 and a receiver that receives an input from the data signal transmission line 207. It is connected to the output line 235dl of 235d. Further, the interrupt memory circuit 237 receives an interrupt memory circuit Enable signal from the CPU 230 and outputs an interrupt detection signal to the CPU 230. Here, in the data packet transmitted adjacent to the control signal transmission line 206 and the data signal transmission line 207, the interval between the data packet transmitted first and the data packet transmitted later is defined as a basic time slot. Say (see FIG. 9). Further, a period in which the supply of the first clock CLKH1 is stopped is referred to as a stop time slot (see FIG. 9). In the stop time slot, since the first clock CLKH1 is not supplied, the transmission of data packets from the SD memory card 202 to the host terminal 201 is stopped. The interrupt storage circuit Enable signal is activated only in the basic time slot and the stop time slot. Therefore, the interrupt memory circuit 237 can operate only in the basic time slot and the stop time slot in response to the input of the interrupt memory circuit Enable signal

When the supply of the first clock CLKH1 is stopped, the transmission of the data packet to the host terminal 201 is stopped. Thereafter, as shown in FIG. 9, in the stop time slot (period A in FIG. 9), the interrupt storage circuit 237 receives the second clock CLKH2 from the host terminal 201 via the data signal transmission line 207. Then, an interrupt command (ITRPT in FIG. 9) is received via the control signal transmission line 206. The interrupt storage circuit 237 latches the interrupt command using the second clock CLKH2 as a trigger, and outputs an interrupt detection signal to the CPU 230. Note that the second clock CLKH2 is changed to the second card clock CLKS2 due to a delay in transmission from the host terminal 201 to the SD memory card 202 . Therefore, actually, the interrupt storage circuit 237 receives the interrupt command based on the second card clock CLKS2.

(3) Functional Configuration FIG. 10 is a functional configuration diagram of the CPU 210 of the host terminal 201 and the CPU 230 of the SD memory card 202.
(3-1) Functional configuration of CPU of host terminal (a) First clock generation unit, first clock transmission unit The first clock generation unit 250a transmits and receives data between the host terminal 201 and the SD memory card 202. A basic first clock CLKH1 is generated. The first clock generation unit 250a controls various functional units of the CPU 210 with the first clock CLKH1, and thus the first clock transmission unit 251a, the timing control unit 252, the command transmission unit 256, the response reception unit 258, and the read data reception unit 260. The first clock CLKH1 is transmitted to the write data transmission unit 262 and the like. The first clock transmission unit 251a transmits the first clock CLKH1 to the SD memory card 202 via the clock signal transmission line 205.

Further, the first clock transmission unit 251a stops the transmission of the first clock CLKH1 to the SD memory card 202 under the control of the command generation unit 255.
(B) Second Clock Generation Unit, Second Clock Transmission Unit The second clock generation unit 250b generates a second clock CLKH2 that is different from the first clock CLKH1. The second clock transmission unit 251 b transmits the second clock CLKH 2 to the SD memory card 202 via the data signal transmission line 207 based on the control of the command generation unit 255.
(C) Timing control unit, parameter storage unit The parameter storage unit 254 stores information on a header length, a footer length, and a basic time slot length defined as communication standards. Here, the header length and footer length are the length of the header and footer defined by the number of bits. The basic time slot length is the length of a basic time slot that is an interval between data packets defined by the number of bits.

IPR2025-00645 Page 02242

The timing control unit 252 receives a data packet from a read data receiving unit 260 described later, and acquires the bit length of the data fragment included in the header information of the data packet. The timing control unit 252 sequentially counts the header length, the bit length of the data fragment, the footer length, and the basic time slot length based on the first clock CLKH1, and transmits the count value to the read data receiving unit 260.
(D) Command generation unit, command transmission unit The command generation unit 255 is a read command for reading read data such as video and audio stored in the SD memory card 202, and a write for writing data to the SD memory card 202. Various commands such as a command and a read interrupt command for stopping reading of read data from the SD memory card 202 are generated. The command transmission unit 256 transmits various commands such as a read command and a write command to the SD memory card 202 via the control signal transmission line 206 based on the first clock CLKH1.

At the time of reading, the host terminal 201 continuously receives data fragments from the SD memory card 202 via the control signal transmission line 206 and the data signal transmission line 207, and receives read data. In such a case, the read interrupt command is a command (interrupt signal) that is transmitted to the SD memory card 202 and stops transmission of read data. The command generation unit 255 determines the status of the host terminal 201, for example, writing of read data transmitted from the SD memory card 202 to the RAM 211 is delayed, and determines whether to transmit a read interrupt command. . When the command generation unit 255 determines that the transmission of the read interrupt command is necessary, the command generation unit 255 controls the first clock transmission unit 251a to stop transmission of the first clock CLKH1 to the SD memory card 202, and the second clock The second clock transmission unit 251b is controlled to start transmission of CLKH2 to the SD memory card 202. Further, after the transmission of the first clock CLKH 1 is stopped, the command transmission unit 256 transmits a read interrupt command to the SD memory card 202 via the control signal transmission line 206.

(E) Response receiving unit The response receiving unit 258 receives a response to the command transmitted from the host terminal 201 from the SD memory card 202.
(F) Read Data Receiving Unit, Read Data Generating Unit The read data receiving unit 260 receives a data packet from the SD memory card 202 based on the first clock CLKH1 via the control signal transmission line 206 and the data signal transmission line 207. Receive. Further, the read data receiving unit 260 receives a count value obtained by sequentially counting the header length, the bit length of the data fragment, the footer length, and the basic time slot length from the timing control unit 252. Based on the count value, the read data receiving unit 260 can accurately receive the data fragment in the data packet without loss.

The read data generation unit 259 generates read data from the data fragment in the data packet and stores it in the RAM 211.
(G) Transmission Data Generation Unit, Write Data Transmission Unit When a write command is generated, the transmission data generation unit 261 reads write data to be written to the SD memory card 202 from the RAM 211, and includes header information, data fragment, and footer information. A plurality of data packets including are generated.
The write data transmission unit 262 transmits the data packet to the SD memory card 202 via the control signal transmission line 206 and the data signal transmission line 207 based on the first clock CLKH1.
(3-2) Functional Configuration of CPU of SD Memory Card (a) First Clock Receiving Unit, Second Clock Receiving Unit The first clock receiving unit 270a is connected to the first from the host terminal 201 via the clock signal transmission line 205. The clock CLKH1 is received. The second clock receiving unit 270 b receives the second clock CLKH 2 from the host terminal 201 via the data signal transmission line 207. The first clock CLKH1 is changed to the first card clock CLKS1 and the second clock CLKH2 is changed to the second card clock CLKS2 due to a delay in transmission from the host terminal 201 to the SD memory card 202. The first clock receiver 270a transmits the first card clock CLKS1 to the timing controller 272, command receiver 277, response transmitter 278, read data transmitter 279, write data receiver 281 and the like. The second clock receiving unit 270b transmits the second card clock CLKS2 to the command receiving unit 277.

(B) Timing control unit, parameter storage unit The parameter storage unit 274 stores information on a header length, a footer length, and a basic time slot length defined as communication standards.
The timing control unit 272 receives a data packet from a write data receiving unit 281 described later, and acquires the bit length of the data fragment included in the header information of the data packet. The timing control unit 272 sequentially counts the header length, the bit length of the data fragment, the footer length, and the basic time slot length based on the first card clock CLKS1, and transmits the count value to the write data reception unit 281.
(C) Command Receiving Unit The command receiving unit 277 receives various commands from the host terminal 201 based on the first card clock CLKS1 via the control signal transmission line 206. The command receiving unit 277 receives a read interrupt command based on the second card clock CLKS2.

(D) Response generation unit, response transmission unit The response generation unit 275 generates responses to various commands from the host terminal 201. When the command reception unit 277 receives various commands from the host terminal 201, the response transmission unit 278 transmits a response to the host terminal 201 via the control signal transmission line 206.
(E) Write Data Receiving Unit, Write Data Generating Unit The write data receiving unit 281 uses the control signal transmission line 206 and the data signal transmission line 207 to transfer the data packet from the host terminal 201 to the first card clock CLKS1. Receive based on. The write data receiving unit 281 receives a count value obtained by sequentially counting the header length, the bit length of the data fragment, the footer length, and the basic time slot length from the timing control unit 272. Based on this count value, the write data receiving unit 281 can accurately receive the data fragment in the data packet without loss.

The write data generation unit 282 generates write data from a plurality of data fragments and stores the write data in the flash memory 231a.
(F) Transmission Data Generation Unit, Read Data Transmission Unit When the command reception unit 277 receives a read command from the host terminal 201, the transmission data generation unit 280 reads the read data to be transmitted to the host terminal 201 from the flash memory 231a. Generate a plurality of data packets. The data packet is generated including header information, data fragment, and footer information.
The read data transmission unit 279 transmits the data packet to the host terminal 201 via the control signal transmission line 206 and the data signal transmission line 207 based on the first card clock CLKS1.

(4) Process Flow When the process described below is started, the first clock CLKH1 is transmitted from the host terminal 201 to the SD memory card 202 .
(4-1) Reading Time FIG. 11 is a flowchart illustrating an example of a processing flow at the time of reading in the communication system of the first embodiment.
Steps S <b> 1 and S <b> 2: The command generation unit 255 of the host terminal 201 generates a read command for reading read data from the SD memory card 202. The command transmission unit 256 of the host terminal 201 transmits a read command to the SD memory card 202 via the control signal transmission line 206 (step S1). The command receiving unit 277 of the SD memory card 202 receives a read command (step S2).

Steps S3 and S4: The response transmission unit 278 of the SD memory card 202 transmits a response to the read command to the host terminal 201 via the control signal transmission line 206 (step S3). The response receiving unit 258 of the host terminal 201 receives the response (step S4).
Steps S5 and S6: The transmission data generation unit 280 of the SD memory card 202 reads the read data from the flash memory 231a and generates a data packet in response to reception of the read command. The read data transmission unit 279 of the SD memory card 202 transmits a data packet to the host terminal 201 via the control signal transmission line 206 and the data signal transmission line 207 (step S5). The read data receiving unit 260 of the host terminal 201 receives a data packet from the SD memory card 202 (step S6). At this time, the timing control unit 252 of the host terminal 201 sequentially counts the header length, the bit length of the data fragment, the footer length, and the basic time slot length, and transmits the count value to the read data receiving unit 260.

Thereafter, the read data generation unit 259 generates read data from the data fragment and stores the read data in the RAM 211.
Steps S7 and S8: The command generation unit 255 of the host terminal 201 determines whether or not to transmit a read interrupt command, and generates a read interrupt command when transmitting (Yes). When the read interrupt command is not transmitted (No), the read data receiving unit 260 of the host terminal 201 further

IPR2025-00645 Page 02243

receives a data packet.
Steps S9 to S11: The command generation unit 255 of the host terminal 201 stops transmitting the first clock CLKH1 to the SD memory card 202 (Step S9), and sends the second clock CLKH2 and the read interrupt command to the SD memory card 202. (Steps S10 and S11).

Steps S12 and S13: The command receiving unit 277 of the SD memory card 202 receives the read interrupt command based on the second card clock CLKS2.
Steps S14 and S15: The response transmission unit 278 of the SD memory card 202 transmits a response to the read interrupt command to the host terminal 201 via the control signal transmission line 206 (step S14). The response receiving unit 256 of the host terminal 201 receives a response from the SD memory card 202 (step S15).
Step S16: The read data transmission unit 279 of the SD memory card 202 stops data packet transmission (step S16).
Thereafter, when the read command is transmitted again from the host terminal 201 to the SD memory card 202, the SD memory card 202 resumes the transmission of the data packet via the control signal transmission line 206 and the data signal transmission line 207.

(5) Effects According to the first embodiment, when the host terminal 201 stops supplying the first clock CLKH1 to the SD memory card 202, the transmission of data packets from the SD memory card 202 is stopped. In this way, the host terminal 201 stops transmission of the data packet, and transmits a read interrupt command and the second clock CLKH2 to the SD memory card 202. That is, it is possible for the host terminal 201 to transmit the read interrupt command and the second clock CLKH2 at an arbitrary time, and a period for transmitting the read interrupt command and the second clock CLKH2 between data packets is set in advance. There is no need to provide it. Therefore, the interval between data packets can be shortened, and a decrease in data transmission efficiency can be suppressed. In addition, after the transmission of the data packet from the SD memory card 202 is stopped, the read interrupt command and the second clock are transmitted through the transmission line on which the data packet was transmitted. Therefore, loss of data fragments in the data packet can be prevented.

(Second embodiment)
(1) Outline FIG. 12 is a time chart showing a state of data transmission at the time of reading in the second embodiment. In the second embodiment, the host terminal 201 stops transmission of the first clock CLKH1 (see period A (stop time slot) in FIG. 12). Thereby, the host terminal 201 notifies the SD memory card 202 of an interrupt request (for example, a read interrupt request described later). At this time, transmission of the data packet from the SD memory card 202 is stopped due to the stop of transmission of the first clock CLKH1.
(2) Hardware Configuration The hardware configuration of the host terminal 201 and the SD memory card 202 will be described below with reference to FIG. The host terminal 201 and the SD memory card 202 realize various functions to be described later in cooperation with the hardware configuration illustrated in FIG. 7 and the functional configuration of the CPU 210 illustrated in FIG.

(2-1) Host Terminal The hardware configuration of the host terminal 201 of the second embodiment is the same as that of the host terminal 201 of the first embodiment except that the CPU 210 transmits only the first clock CLKH1 to the SD memory card 202. Since it is the same, description is abbreviate | omitted.
(2-2) SD Memory Card Since the hardware configuration of the SD memory card 202 of the second embodiment is the same as that of the SD memory card 202 of the first embodiment except for the interrupt detection counter 337, the interrupt detection counter Descriptions other than 337 are omitted.
The interrupt detection counter 337 receives an internal clock from the CPU 230 and also receives a card clock CLKS, and outputs an interrupt detection signal. The internal clock is a clock possessed by the SD memory card 202, is a clock different from the clock based on the first clock CLKH1, the card clock CLKS, and the first clock CLKH1, and is generated by dividing the clock from the first clock CLKH1, etc. It's not a clock. Therefore, even if the supply of the first clock CLKH1 is stopped, the internal clock is not stopped. The internal clock is a clock having a frequency lower than that of the first clock CLKH1.

The interrupt detection counter 337 counts the internal clock, and the count value is reset by supplying the first clock CLKH1. That is, the card clock CLKS based on the first clock CLKH1 is input to the interrupt detection counter 337, and the count value of the internal clock is reset by the card clock CLKS. However, when the supply of the first clock CLKH1 is stopped, the count value of the internal clock is counted up without being reset.
Here, a period in which the supply of the first clock CLKH1 is stopped is referred to as a stop time slot (period A in FIG. 12). In the stop time slot, since the first clock CLKH1 is not supplied, the transmission of data packets from the SD memory card 202 to the host terminal 201 is stopped. The length of this stop time slot is determined in advance by the communication standard, and is notified from the host terminal 201 to the SD memory card 202 at the start of communication, for example. In the data packet transmitted adjacent to the control signal transmission line 206 and the data signal transmission line 207, the interval between the data packet transmitted first and the data packet transmitted later is called a basic time slot. Shall.

In FIG. 12, the host terminal 201 supplies the first clock CLKH1 to the SD memory card 202 during the period excluding the stop time slot. Therefore, the count value of the internal clock by the interrupt detection counter 337 is reset to "0" by the supply of the first clock CLKH1. On the other hand, in the stop time slot, the host terminal 201 stops supplying the first clock CLKH1. Therefore, the count value of the internal clock is counted up and becomes larger than "0". This count value is transmitted to the CPU 230 as an interrupt detection signal, and the CPU 230 recognizes that the host terminal 201 has output an interrupt request based on the count value exceeding a predetermined value.
(3) Functional Configuration FIG. 13 is a functional configuration diagram of the CPU 210 of the host terminal 201 and the CPU 230 of the SD memory card 202. In the second embodiment, the second clock generator 250b, the second clock transmitter 251b, and the second clock receiver 270b are not provided as in the first embodiment. Also, the same reference numerals as those in the first embodiment are the same functional configurations, and are the same as those in the first embodiment except for the functional configurations described below, so that the description thereof is omitted.

(3-1) Functional configuration of CPU of host terminal (a) First clock generation unit, first clock transmission unit The first clock generation unit 350 and the first clock transmission unit 351 of the second embodiment are the same as those of the first embodiment. The configuration of the first clock generation unit 250a and the first clock transmission unit 251a is the same as that of the first clock generation unit 250a. The first clock transmission unit 351 stops transmission of the first clock CLKH1 to the SD memory card 202 under the control of the interrupt request notification unit 356.
(B) Command Generation Unit The command generation unit 355 of the second embodiment has substantially the same configuration as the command generation unit 255 of the first embodiment, and will be briefly described below. The command generation unit 355 generates various commands such as a read command and a write command. Note that the command generation unit 355 does not generate an interrupt command such as a read interrupt command.

(C) Interrupt request notification unit The interrupt request notification unit 356 determines whether or not an interrupt is necessary for data transmission from the SD memory card 202 according to the situation of the host terminal 201, and the first clock CLKH1. Whether to stop transmission of.
Here, at the time of reading, the host terminal 201 continuously receives data packets from the SD memory card 202 and receives read data. Here, the interrupt request notifying unit 356 determines the status of the host terminal 201, for example, the writing of the read data transmitted from the SD memory card 202 to the RAM 211 is delayed, and reads the read data from the SD memory card 202. Whether the host terminal 201 needs to make a read interrupt request or not. When the interrupt request notifying unit 356 determines that it is necessary to stop the transmission of the read data, the interrupt request notifying unit 356 sends the SD clock card 202 of the first clock CLKH1 to the length of the stop time slot (period A in FIG. 9). The first clock transmission unit 351 is controlled so as to stop transmission. In addition, when the period A of the stop time slot has elapsed, the interrupt request notification unit 356 controls the first clock transmission unit 351 to resume transmission of the first clock CLKH1.

(3-2) Functional Configuration of CPU of SD Memory Card (a) First Clock Receiving Unit The first clock receiving unit 370 of the second embodiment is similar to the configuration of the first clock receiving unit 270a of the first embodiment. There is no explanation

(B) Internal Clock Count Unit, Interrupt Request Recognition Unit The internal clock count unit 384 generates an internal clock and transmits it to the interrupt detection counter 337. The internal clock is a clock different from the clock based on the first clock CLKH1, the card clock CLKS, and the first clock CLKH1, and is not a clock generated by frequency division from the first clock CLKH1 or the like. Further, the internal clock count unit 384 receives the length of the stop time slot (period A in FIG. 9) from the host terminal 201 at the start of communication. Based on the period A of the stop time slot and the internal clock, A predetermined value is determined. The predetermined value is a determination reference value for determining whether or not the supply of the first clock CLKH1 from the host terminal 201 to the SD memory card 202 is stopped.

Moreover, the internal clock count portion 384 receives an interrupt detection signal from the interrupt detection counter 337, the host terminal 201 detects whether or not to stop the transmission of the first clock CLKH 1. Here, the interrupt detection signal includes the count value of the internal clock. This count value, the interrupt detection counter 337 is reset by receiving the first input clock CLKH 1. Therefore, the internal clock count unit 384 determines whether or not the count value exceeds the above-described predetermined value, and determines that the supply of the first clock CLKH1 is stopped if it exceeds.
The interrupt request recognition unit 385 receives the determination result of the internal clock count unit 384. Here, when the determination result that the supply of the first clock CLKH1 is stopped is received, the interrupt request recognition unit 385 recognizes that the host terminal 201 is outputting a read interrupt request. The interrupt request recognition unit 385 transmits the recognition result to the read data transmission unit 379 and the response transmission unit 278.

(C) Read Data Transmitter The read data transmitter 379 transmits a data packet to the host terminal 201 via the control signal transmission line 206 and the data signal transmission line 207 based on the card clock CLKS. Further, when the read data transmission unit 379 receives a recognition result from the interrupt request recognition unit 385 that the host terminal 201 is outputting a read interrupt request, the read data transmission unit 379 stops the transmission of the read data to the host terminal 201.
(A) Process Flow When the process described below is started, the first clock CLKH1 is transmitted from the host terminal 201 to the SD memory card 202.
(4-1) Reading Time FIG. 14 is a flowchart illustrating an example of a processing flow at the time of reading in the communication system according to the second embodiment.

Steps S <b> 1 and S <b> 2: The command generation unit 355 of the host terminal 201 generates a read command for reading read data from the SD memory card 202. The command transmission unit 256 of the host terminal 201 transmits a read command to the SD memory card 202 via the control signal transmission line 206 (step S1). The command receiving unit 277 of the SD memory card 202 receives a read command (step S2).
Steps S3 and S4: The response transmission unit 278 of the SD memory card 202 transmits a response to the read command to the host terminal 201 via the control signal transmission line 206 (step S3). The response receiving unit 258 of the host terminal 201 receives the response (step S4).
Steps S5 and S6: The transmission data generation unit 280 of the SD memory card 202 reads the read data from the flash memory 231a and generates a data packet in response to reception of the read command. The read data transmission unit 379 of the SD memory card 202 transmits a data packet to the host terminal 201 via the control signal transmission line 206 and the data signal transmission line 207 (step S5). The read data receiving unit 260 of the host terminal 201 receives a data packet from the SD memory card 202 (step S6). At this time, the timing control unit 252 of the host terminal 201 sequentially counts the header length, the bit length of the data fragment, the footer length, and the basic time slot length, and transmits the count value to the read data receiving unit 260.

Thereafter, the read data generation unit 259 generates read data from the data fragment and stores the read data in the RAM 211.
Steps S7 and S8: The interrupt request notifying unit 356 of the host terminal 201 needs to stop transmission of read data from the SD memory card 202 as to whether or not the host terminal 201 needs to make a read interrupt request. Judge whether there is. When making a read interrupt request (Yes), the interrupt request notification unit 356 controls the first clock transmission unit 351 to stop the transmission of the first clock to the SD memory card 202. When a read interrupt request is not made (No), the read data receiving unit 260 of the host terminal 201 further receives a data packet.
Here, the length of the stop time slot (period A in FIG. 9) in which the host terminal 201 stops the transmission of the first clock CLKH1 is determined in advance by the communication standard. 202 is notified. The internal clock count unit 384 of the SD memory card 202 determines a predetermined value based on the period A of the stop time slot and the internal clock.

Steps S9 and S10: The internal clock count unit 384 receives the interrupt detection signal from the interrupt detection counter 337. The internal clock count unit 384 determines whether or not the count value of the internal clock included in the interrupt detection signal is equal to or greater than a predetermined value, and transmits the determination result to the interrupt request recognition unit 385. The interrupt request recognition unit 385 recognizes that the host terminal 201 is outputting a read interrupt request when the count value is equal to or greater than a predetermined value.
Steps S11 to S13: When the period A of the stop time slot elapses, the interrupt request notification unit 356 controls the first clock transmission unit 351 to resume transmission of the first clock CLKH1. The first clock transmission unit 351 resumes transmission of the first clock CLKH1 (step S11). When the response transmission unit 278 of the SD memory card 202 receives the recognition result that the host terminal 201 is outputting a read interrupt request, the response transmission unit 278 transmits a response to the host terminal 201 via the control signal transmission line 206 (Step S12). The response receiving unit 258 of the host terminal 201 receives a response from the SD memory card 202 (step S13).

Step S14: The read data transmission unit 379 of the SD memory card 202 stops the transmission of the data packet.
Thereafter, when the read command is transmitted again from the host terminal 201 to the SD memory card 202, the SD memory card 202 resumes the transmission of the data packet via the control signal transmission line 206 and the data signal transmission line 207.
(5) Effect According to the second embodiment, when the host terminal 201 stops supplying the first clock to the SD memory card 202, the transmission of the data packet from the SD memory card 202 is stopped. In this way, the host terminal 201 controls the stop of transmission of the data packet, whereby the SD memory card 202 recognizes the interrupt request. That is, the host terminal 201 can cause the SD memory card 202 to recognize an interrupt request at an arbitrary time, and there is no need to provide a period for recognizing the interrupt request between data packets in advance. Therefore, the interval between data packets can be shortened, and a decrease in data transmission efficiency can be suppressed.

(Modification)
(1)
In the first and second examples of the present embodiment, it is not necessary to add header information and footer information to all data packets transmitted through the control signal transmission line 206 and the data signal transmission line 207. It is also possible to add header information and footer information only to data fragments that are transmitted through one of the transmission lines, and to transmit only the data fragments through other transmission lines. At this time, only the data fragment may be transmitted based on the header information and footer information transmitted via any one of the transmission lines.
For example, the control data transmission line 206 transmits the first data fragment, but header information and footer information are not added before and after the first data fragment. On the other hand, the data signal transmission line 207 transmits a data packet including header information, second data fragment, and footer information. The bit length of the first data fragment is the same as the bit length of the second data fragment of the data packet. The first data fragment is transmitted using header information and footer information of the data packet. At this time, the first data fragment is transmitted in synchronization with the second data fragment.

(2)
In the first and second embodiments, the case where the transmission of the data packet from the transmission side is stopped when the data is received from the transmission side has been described. In the first and second embodiments, when data is received from the transmission side, various signals for delaying the

IPR2025-00645 Page 02245

transmission for a certain period or instructing retransmission of the data are transmitted to the transmission side. Applicable.
(3)
In the above, the data packet is formed so as to include header information, data packet, and footer information in order, but the order of these is not limited to the above.
(4)
In the above, this embodiment demonstrated the communication system which has a control signal transmission line and a data signal transmission line. However, this embodiment can also be applied to a communication system that does not have a control signal transmission line and has only a data signal transmission line. Moreover, this embodiment can be applied not only to data transmission via a plurality of transmission lines but also to data transmission via a single transmission line.

(5)
In the above, the data packet transmitted through the control signal transmission line and the data signal transmission line is transmitted in synchronization, but is not limited to the configuration in which transmission is performed in synchronization. What is necessary is just to be transmitted to each transmission line based on the header information and footer information of each data packet.
(6)
In the above description, the header length, footer length, and basic time slot length are defined as communication standards. However, for example, the header length, the footer length, and the basic time slot length are different for each SD memory card, and these pieces of information may be mutually acquired when communication between the host terminal 201 and the SD memory card 202 is started
(7)
The control signal transmission line 206 and the data signal transmission line 207 may be a pair of two differential transmission lines.

(8)
In the above description, the configuration in which the bit length of each data fragment is described in the header information has been described. However, the bit length of each data fragment may be fixed according to the communication standard. In this case, the bit length of the data fragment may be stored in the parameter storage unit, and it is not necessary to acquire the bit length of the data fragment as needed from the header length of the data packet.
(9)
In the first example of the present embodiment, since it is preferable that the transmission of data is immediately stopped by the transmission of the interrupt command, the interrupt command is transmitted using one first time slot. preferable. However, for example, when the bit length of the interrupt command exceeds the first time slot length, the interrupt command may be divided into a plurality of pieces and transmitted using a plurality of first time slots.

(10)
In the above description, the SD memory card, which is a removable memory device, has been described as an example. However, the present invention is applicable to any portable removable memory device that transmits read data to the host terminal using a clock supplied from the host terminal. The applicable range is not limited to the SD memory card. Other examples include CompactFlash (registered trademark), smart media, multimedia cards, and memory sticks. In addition, the memory on which the removable memory device can be mounted is not limited to the flash memory, but includes non-volatile memories such as MRAM and FeRAM.
(11)
A computer program that causes a computer to execute the method described above and a computer-readable recording medium that records the program are included in the scope of the present invention. Here, examples of the computer-readable recording medium include a flexible disk, hard disk, CD-ROM, MO, DVD, DVD-ROM, DVD-RAM, BD (Blue-ray Disc), and semiconductor memory. .

The computer program is not limited to the one recorded on the recording medium, and may be transmitted via an electric communication line, a wireless or wired communication line, a network represented by the Internet, or the like.
<Third Embodiment>
(1) Overview FIG. 15 is an overall configuration diagram of a communication system according to a third embodiment of the present invention. In this communication system, a transmission / reception device that is a host terminal 401 and a transmission / reception device that is an SD (Secure Digital) memory card 402 are connected via a pair of differential transmission lines. The communication system of the present embodiment has a general current-driven differential transmission system that transmits a signal when a predetermined potential difference is generated in a pair of differential transmission lines by a dynamic impedance circuit and an impedance circuit described later. It is used. The differential transmission line includes a clock signal transmission line 405, a control signal transmission line 406, and a data signal transmission line 407. The clock signal transmission line 405 is used to transmit a clock CLKH, which will be described later, used for communication between the host terminal 401 and the SD memory card 402 from the host terminal 401 to the SD memory card 402. The control signal transmission line 406 is used for transmitting and receiving commands related to data reading and writing and responses to the commands between the host terminal 401 and the SD memory card 402. The data signal transmission line 407 is used to transmit and receive data between the host terminal 401 and the SD memory card 402.

FIG. 16 is a time chart showing a state of data transmission at the time of reading. The communication system of the present embodiment is a handshake type communication system. When data is transmitted, first, various commands such as a read command (ReadCMD in FIG. 16) and a write command and responses to this command (in FIG. 16). , Res) is transmitted and received between the host terminal 401 and the SD memory card 402, and then data (DATA in FIG. 16) is transmitted. In the communication system of this embodiment, for the purpose of improving the transmission efficiency of data access, not only the data signal transmission line 407 but also the control signal transmission line 406 is used for data transmission as shown in FIG. Use. Data is divided into a plurality of data fragments and transmitted, and header information and footer information are added to the data fragments transmitted via the control signal transmission line 406 and the data signal transmission line 407. That is, the control signal transmission line 406 and the data signal transmission line 407 transmit data packets including header information, data fragments, and footer information. All data packets are configured with the same bit length.

Here, the header information and the footer information are information different from the data fragment. The header information includes information such as a synchronization bit string and a start bit for adjusting the reception timing of the data packet, and the footer information includes information such as an end bit indicating the end of the data packet. ing. The information included in the header information and footer information is not limited to these, and may include other various information. Further, the data fragment may include information for detecting a transmission error of each data fragment such as a CRC (Cyclic Redundancy Check) bit. In this embodiment, the reception side changes the signal amplitude of the control signal transmission line 406 between the data fragments in the data packet transmitted adjacently on the control signal transmission line 406. Thereby, an interrupt request (including a read interrupt request and a write interrupt request described later) is notified from the receiving side to the transmitting side. Here, the interval between the data fragments is defined by the interval between the data fragment of the data packet transmitted first and the data fragment of the data packet transmitted later, and is called an extended time slot in the following embodiment. It shall be (see FIG. 16). A basic time slot, which will be described later, is defined by an interval between a data packet transmitted first and a data packet transmitted later

The number of data signal transmission lines 407 is not limited to one, and a plurality of data signal transmission lines 407 may be provided.
(2) Hardware Configuration The hardware configuration of the host terminal 401 and the SD memory card 402 will be described below with reference to FIG. 15 again. The host terminal 401 and the SD memory card 402 realize various functions to be described later in cooperation with the hardware configuration illustrated in FIG. 15 and the functional configuration of the CPU 410 illustrated in FIG.

(2-1) Host Terminal (a) CPU 410: Controls the other RAM 411, buffer 412, card interface unit 413, I / O buffer, etc. of the host terminal 401. Various functions to be described later such as data reading and writing in the host terminal 401 are realized based on various programs.

(B) RAM 411. Stores various data transmitted to and received from the SD memory card 402.
(C) Buffer 412, card interface unit 413: Writes data read from the SD memory card 402 to the RAM 411 and reads data written to the SD memory card 402 from the RAM 411.
(D) I / O buffer: Inputs and outputs data such as commands, responses, and data. The I / O buffer includes a data / command output 414a, a data / response input 414b, a data output 414c, a data input 414d, a driver 415a, a receiver 415b, a driver 415c, a receiver 415d, a dynamic impedance circuit 417, an impedance circuit 418, and a potential difference detection circuit 419. These are connected as shown in FIG. The driver 415a, the receiver 415b, the driver 415c, and the receiver 415d are connected to the control signal transmission line 406 or the data signal transmission line 407, which are differential transmission lines.

The dynamic impedance circuit 417 is connected to each of the two differential transmission paths 406 a and 406 b of the control signal transmission line 406. The dynamic impedance circuit 417 changes the signal amplitude of the control signal transmission line 406 based on the interrupt request from the CPU 410. FIG. 17 is a configuration diagram of the dynamic impedance circuit 417. As shown in FIG. 17, the dynamic impedance circuit 417 has a set of a plurality of switch circuits SW and termination resistors, and a switch control circuit 417a. The switch control circuit 417a is controlled by an interrupt request described later, and is connected to a predetermined switch circuit SW and a set of termination resistors. As a result, the signal amplitude value of the control signal transmission line 406 configured by the differential transmission paths 406a and 406b changes. For example, the dynamic impedance circuit 417 controls the impedance to 100Ω when an interrupt request is not received, and controls the impedance to 10Ω when an interrupt request is received. Here, it is assumed that a constant current of 1 mA is driven by the driver 415 a connected to the control signal transmission line 406. When the impedance changes from 100Ω to 10Ω by receiving the interrupt request, the signal amplitude of the control signal transmission line 406 changes from a swing of ± 100 mV with respect to the common-mode potential Vcom to a swing of ± 10 mV.

The potential difference detection circuit 419 receives an input of a predetermined reference voltage Vref, detects a change in the signal amplitude of the control signal transmission line 406, and outputs an interrupt detection signal to the CPU 410 as a detection result. FIG. 18 is a configuration diagram of a potential difference detection circuit. The potential difference detection circuit 419 includes comparators 419a and 419b and an OR circuit 419c. The comparators 419a and 419b are connected to the two differential transmission lines 406a and 406b of the control signal transmission line 406, respectively, and are supplied with the reference voltage Vref and the clock CLKH. The comparators 419a and 419b detect whether the potentials of the differential transmission lines 406a and 406b are higher or lower than the reference voltage Vref using the clock CLKH as a trigger. The comparators 419a and 419b hold High when the potential of the differential transmission lines 406a and 406b is higher than the reference voltage Vref, and hold Low when the potential is low. The comparators 419a and 419b are connected to the OR circuit 419c, and the held value is input to the OR circuit 419c. The output of the OR circuit 419c is input to the CPU 410 as an interrupt detection signal. Here, for example, it is assumed that the reference voltage Vref is 50 mV higher than the common-mode potential Vcom. If the SD memory card 402 does not output an interrupt request and the signal amplitude of the control signal transmission line 406 is a swing of ± 100 mV, the potential of one of the differential transmission lines 406a and 406b is higher than the reference voltage Vref. Since it is high, the output of the OR circuit 419c is High. On the other hand, when the SD memory card 402 outputs an interrupt request and the signal amplitude of the control signal transmission line 406 swings ± 10 mV, the potentials of both the differential transmission lines 406a and 406b are the reference voltage Vref. Therefore, the output of the OR circuit is Low. Eventually, when the SD memory card 402 outputs an interrupt request and the signal amplitude of the control signal transmission line 406 decreases from ± 100 mV to ± 10 mV, the output of the OR circuit 419c changes from High to Low, and the interrupt detection signal As input to the CPU 410. The CPU 410 determines whether or not an interrupt request is output from the SD memory card 402 based on this change in the interrupt detection signal.

The impedance circuit 418 adjusts the impedance of the data signal transmission line 407.
(E) Driver 416: The clock CLKH is transmitted to the SD memory card 402 via the clock signal transmission line 405 which is a differential transmission line.
(2-2) SD Memory Card (a) CPU 430: Realizes various functions to be described later such as reading and writing of data in the SD memory card 402 based on various programs.
(B) Flash memory 431a: Stores various data transmitted to and received from the host terminal 401.
(C) Flash memory interface unit 431b, buffer 432, host interface unit 433: Write data read from the host terminal 401 to the flash memory 431a, and read data written to the host terminal 401 from the flash memory 431a. .

(D) I / O buffer. Inputs and outputs data such as commands, responses, and data. The I / O buffer includes a data / response output 434a, a data / command input 434b, a data output 434c, a data input 434d, a driver 435a, a receiver 435b, a driver 435c and a receiver 435d, a dynamic impedance circuit 437, an impedance circuit 438, and a potential difference detection circuit 439. These are connected as shown in FIG. The driver 435a, the receiver 435b, the driver 435c, and the receiver 435d are connected to the control signal transmission line 406 or the data signal transmission line 407, which are differential transmission lines.
The dynamic impedance circuit 437 is connected to each of the two differential transmission paths 406 a and 406 b of the control signal transmission line 406. The dynamic impedance circuit 437 changes the signal amplitude of the control signal transmission line 406 based on the interrupt request from the CPU 430. Since the configuration of the dynamic impedance circuit 437 is the same as that of FIG. 17 described above, description thereof will be omitted (refer to the reference numerals in parentheses in FIG. 17).

The potential difference detection circuit 439 receives a predetermined reference voltage Vref, detects a change in the signal amplitude of the control signal transmission line 406, and outputs a detection result to the CPU 430. Since the configuration of the potential difference detection circuit 439 is the same as that in FIG. 18 except that the clock CLKS is input, description thereof will be omitted (see reference numerals in parentheses in FIG. 18). When the host terminal 401 outputs an interrupt request and the signal amplitude of the control signal transmission line 406 decreases from ± 100 mV to ± 10 mV, the output of the OR circuit 439c of the potential difference detection circuit 439 changes from High to Low, and the interrupt occurs. The detection signal is input to the CPU 430. Based on this change in the interrupt detection signal, the CPU 430 determines whether or not an interrupt request is output by the host terminal 401.
The impedance circuit 438 adjusts the impedance of the data signal transmission line 407.

(E) Receiver 436, impedance circuit 440: The impedance circuit 440 controls the impedance of the clock signal transmission line 405, which is a differential transmission line, and the receiver 436 receives the clock CLKH via the clock signal transmission line 405. Receive from the host terminal 401.
(2-3) Operation when an interrupt request is output In this embodiment, when data packets are continuously transmitted from the transmission side to the reception side, the reception side interrupts in an extended time slot between data fragments. Output the request. The operation of the dynamic impedance circuit 417 and the potential difference detection circuit 439 will be described as an example when the host terminal 401 receives read data from the SD memory card 402 and the host terminal 401 outputs a read interrupt request. To do. 19 is a flowchart showing the state of the control signal transmission line 406 and the state of the interrupt detection signal when a read interrupt request is output, and FIG. 20 is a control signal transmission line 406, a dynamic impedance circuit 417, It is explanatory drawing explaining the output state etc. of the electric potential difference detection circuit 439 and an interruption detection signal.

(A) Reception of Data Packet Referring to FIG. 19, the host terminal 401 receives a data packet of read data from the SD memory card 402 via the control signal transmission line 406. At this time, the host terminal 401 does not output a read interrupt request, and the state of the control signal transmission line 406 is in the state of time t1 to t7 shown in FIG. From time t1 to time t7, the dynamic impedance circuit 417 controls the impedance to 100Ω as described above, and the signal amplitude of the control signal transmission line 406 is ± 100 mV with respect to the common-mode potential Vcom. Accordingly, in the potential difference detection circuit 439 of the SD memory card 402, the output of any of the comparators 439a and 439b is High (H), and the interrupt detection signal that is the output of the OR circuit 439c is

IPR2025-00645 Page 02247

High (H). In FIG. 19, only the control signal transmission line 406 is illustrated, but the host terminal 401 similarly receives a data packet via the data signal transmission line 407.

(B) Transmission of Read Interrupt Request Next, the CPU 410 of the host terminal 401 outputs a read interrupt request in order to stop the transmission of the data packet from the SD memory card 402. The state of the control signal transmission line 406 at this time corresponds to times t8 and t9 shown in FIG.
Note that the CPU 410 of the host terminal 401 outputs a read interrupt request in the extended time slot of the control signal transmission line 406. As shown in FIG. 19, the extended time slot is defined by the interval between the data fragment of the data packet transmitted first and the data fragment of the data packet transmitted later. Since the current-driven differential transmission method is used in the present embodiment, the basic time slot defined by the footer information of the data packet transmitted first and the header information of the data packet transmitted later (FIG. 19). Also in the reference), the control signal transmission line 406 is in a state of either High or Low.

The read interrupt request is input from the CPU 410 of the host terminal 401 to the dynamic impedance circuit 417 of the host terminal 401. As described above, the dynamic impedance circuit 417 changes the impedance from 1000 to 100 by receiving the lead interrupt request. At this time, as shown in FIGS. 19 and 20, the signal amplitude of the control signal transmission line 406 is changed from a swing of ± 100 mV (200 mV signal amplitude) with respect to the common-mode potential Vcom to a swing of ± 10 mV (signal of 20 mV). Amplitude). Therefore, in the potential difference detection circuit 439 of the SD memory card 402, the outputs of both the comparators 439a and 439b are Low (L), and the interrupt detection signal that is the output of the OR circuit 439c is Low (L). The interrupt detection signal that has changed from High to Low is input to the CPU 430 of the SD memory card 402. Based on the interrupt detection signal, the CPU 430 of the SD memory card 402 recognizes that the host terminal 401 has output a read interrupt request, and transmits a response (Res in FIG. 19) to the host terminal 401.

(3) Functional Configuration FIG. 21 is a functional configuration diagram of the CPU 410 of the host terminal 401 and the CPU 430 of the SD memory card 402.
(3-1) Functional Configuration of CPU of Host Terminal (a) Clock Generation Unit, Clock Transmission Unit The clock generation unit 450 is a basic clock CLKH for transmitting and receiving data between the host terminal 401 and the SD memory card 402. Is generated. Since the clock generation unit 450 controls various functional units of the CPU 410 with the clock CLKH, the clock transmission unit 451, the timing control unit 452, the command transmission unit 456, the response reception unit 458, the read data reception unit 460, and the write data transmission unit 462. The clock CLKH is transmitted to the interrupt request notifying unit 463, the interrupt request recognizing unit 464, and the like. The clock transmission unit 451 transmits the clock CLKH to the SD memory card 402 via the clock signal transmission line 405.

(B) Timing control unit, time slot acquisition unit, parameter storage unit The parameter storage unit 454 stores header length, footer length, and basic time slot length information defined as communication standards. Here, the header length and footer length are the length of the header and footer defined by the number of bits. The basic time slot length is the length of a basic time slot that is an interval between data packets defined by the number of bits.
The time slot acquisition unit 453 calculates and acquires the extended time slot length based on the header length, footer length, and basic time slot length acquired from the parameter storage unit 454. Here, the extended time slot length is calculated by footer length + basic time slot length + header length. The time slot acquisition unit 453 transmits the extended time slot length to an interrupt request notification unit 463 described later.

The timing control unit 452 and the time slot acquisition unit 453 receive a data packet from a read data reception unit 460, which will be described later, and acquire the bit length of the data fragment included in the header information of the data packet. The time slot acquisition unit 453 grasps the start position of the extended time slot by sequentially counting the header length, the bit length of the data fragment, and the extended time slot length based on the clock CLKH. Then, the time slot acquisition unit 453 transmits the start position of the time slot to the interrupt request notification unit 463. Further, the timing control unit 452 sequentially counts the header length, the bit length of the data fragment, the footer length, and the basic time slot length based on the clock CLKH, and transmits the count value to the read data receiving unit 460.
Note that the start position of the time slot may be acquired based on the count value from the timing control unit 452 instead of from the time slot acquisition unit 453.

(C) Command generation unit, command transmission unit The command generation unit 455 is a read command for reading read data such as video and audio stored in the SD memory card 402, and a write for writing data to the SD memory card 402. Generate various commands such as commands. The command transmission unit 456 transmits various commands to the SD memory card 402 via the control signal transmission line 406 based on the clock CLKH.
(D) Response receiving unit The response receiving unit 458 receives a response to the command transmitted from the host terminal 401 from the SD memory card 402.
(E) Read Data Receiving Unit, Read Data Generating Unit The read data receiving unit 460 receives the data packet from the SD memory card 402 based on the clock CLKH via the control signal transmission line 406 and the data signal transmission line 407. Receive. Further, the read data receiving unit 460 receives a count value obtained by sequentially counting the header length, the bit length of the data fragment, the footer length, and the basic time slot length from the timing control unit 452. Based on this count value, the read data receiving unit 460 can accurately receive the data fragment in the data packet without loss.

Note that the data packets constituting the read data are configured with the same bit length and transmitted synchronously in any transmission line. Here, as shown in FIG. 19, the period in which the header information and footer information of the data packet are transmitted is included in the period of the extended time slot. If the interrupt request notification unit 463 outputs a read interrupt request during the period in which the header information and the footer information are transmitted, the signal amplitude of the control signal transmission line 406 is reduced, and the header information and the footer information are accurately received. It may not be possible. However, since the data packet is transmitted synchronously in any transmission line as described above, the header information and the footer information are obtained from the data packet transmitted on the data signal transmission line 407 other than the control signal transmission line 406. Just receive it.
The read data generation unit 459 generates read data from a plurality of data packets and stores it in the RAM 411.

(F) Transmission Data Generation Unit, Write Data Transmission Unit When a write command is generated, the transmission data generation unit 461 reads write data to be written to the SD memory card 402 from the RAM 411, and header information, data fragment, and footer information A plurality of data packets including are generated.
The write data transmission unit 462 transmits the data packet to the SD memory card 402 so as to be synchronized in the control signal transmission line 406 and the data signal transmission line 407 based on the clock CLKH. When the write data transmission unit 462 receives a notification from the interrupt request recognition unit 464 that there is a write interrupt request, the write data transmission unit 462 stops transmitting the data packet to the SD memory card 402.
(G) Interrupt Request Notifying Unit, Interrupt Request Recognizing Unit The interrupt request notifying unit 463 generates various interrupt requests such as a read interrupt request for stopping reading of read data from the SD memory card 402. At the time of reading, the host terminal 401 continuously receives data packets from the SD memory card 402 via the control signal transmission line 406 and the data signal transmission line 407, and receives read data. In such a case, the read interrupt request is an interrupt request that is output using an extended time slot and stops transmission of read data. The interrupt request notification unit 463 determines the status of the host terminal 401, for example, whether the read data transmitted from the SD memory card 402 has been written to the RAM 411, and determines whether or not to output a read interrupt request. to decide. The interrupt request notification unit 463 determines a signal amplitude value to be changed, and determines a change period in which the signal amplitude is changed based on the extended time slot length. Then, the interrupt request notification unit 463 generates a read interrupt request based on the determined signal amplitude value and change period so that the bit length of the read interrupt request does not exceed the extended time slot length. Then, the interrupt request notification unit 463 outputs a read interrupt request to the dynamic impedance circuit 417 based on the start position of the extended time slot so that the read interrupt request can be output within the extended time slot.

IPR2025-00645 Page 02248

The interrupt request recognition unit 464 receives an interrupt detection signal from the potential difference detection circuit 419, and determines whether the SD memory card 402 has output a write interrupt request. The interrupt request recognition unit 464 transmits the presence / absence of a write interrupt request to the write data transmission unit 462.
(3-2) Functional Configuration of CPU of SD Memory Card (a) Clock Receiving Unit The clock receiving unit 470 receives the clock CLKH from the host terminal 401. Incidentally, the delay in transmission from the host terminal 401 to the SD memory card 402, the clock CLK H is changed to the card clock CLKS. The clock receiving unit 470 is connected to the timing control unit 472, the command receiving unit 477, the response transmitting unit 478, the read data transmitting unit 479, the write data receiving unit 481, the interrupt request notifying unit 483, the interrupt request recognizing unit 484, and the like. Send CLKS.

(B) Timing control unit, time slot acquisition unit, parameter storage unit The parameter storage unit 474 stores header length, footer length, and basic time slot length information defined as communication standards.
The time slot acquisition unit 473 calculates and acquires the extended time slot length based on the header length, footer length, and basic time slot length acquired from the parameter storage unit 474. The time slot acquisition unit 473 transmits the extended time slot length to the interrupt request notification unit 483.
Further, the timing control unit 472 and the time slot acquisition unit 473 receive a data packet from a write data reception unit 481 described later, and acquire the bit length of the data fragment included in the header information of the data packet. The time slot acquisition unit 473 grasps the start position of the extended time slot by sequentially counting the header length, the bit length of the data fragment, and the extended time slot length based on the card clock CLKS. Then, the time slot acquisition unit 473 transmits the start position of the time slot to the interrupt request notification unit 483. The timing control unit 472 sequentially counts the header length, the bit length of the data fragment, the footer length, and the basic time slot length based on the card clock CLKS, and transmits the count value to the write data receiving unit 481

Note that the start position of the time slot may be acquired based on the count value from the timing control unit 452 instead of from the time slot acquisition unit 453.
(C) Command Receiving Unit The command receiving unit 477 receives various commands from the host terminal 401 based on the card clock CLKS via the control signal transmission line 406.
(D) Response generation unit, response transmission unit The response generation unit 475 generates responses to various commands from the host terminal 401. The response transmission unit 478 transmits a response to the host terminal 401 via the control signal transmission line 406.
(E) Write Data Reception Unit, Write Data Generation Unit The write data reception unit 481 receives a data packet from the host terminal 401 based on the card clock CLKS. The write data receiving unit 481 receives a count value obtained by sequentially counting the header length, the bit length of the data fragment, the footer length, and the basic time slot length from the timing control unit 472. Based on the count value, the write data receiving unit 481 can accurately receive the data fragment in the data packet without loss.

Note that the data packets constituting the write data are configured with the same bit length and transmitted synchronously in any transmission line. Therefore, even if the write data receiving unit 481 cannot receive the header information and the footer information on the control signal transmission line 406, it may receive the header information and the footer information from another data signal transmission line 407.
The write data generation unit 482 generates write data from a plurality of data packets and stores the write data in the flash memory 431a.
(F) Transmission Data Generation Unit, Read Data Transmission Unit When the command reception unit 477 receives a read command from the host terminal 401, the transmission data generation unit 480 reads out read data to be transmitted to the host terminal 401 from the flash memory 431a. Generate a plurality of data packets.

The read data transmission unit 479 transmits the data packet to the host terminal 401 so as to synchronize with the control signal transmission line 406 and the data signal transmission line 407 based on the card clock CLKS. Further, when the read data transmission unit 479 receives a notification from the interrupt request recognition unit 484 that there is a read interrupt request, the read data transmission unit 479 stops transmission of the data packet to the host terminal 401.
(G) Interrupt Request Notifying Unit, Interrupt Request Recognizing Unit The interrupt request notifying unit 483 generates various interrupt requests such as a write interrupt request for stopping writing of write data from the host terminal 401. Here, at the time of writing, the SD memory card 402 continuously receives data packets from the host terminal 401 via the control signal transmission line 406 and the data signal transmission line 407, and receives write data. In such a case, the write interrupt request is an interrupt request that is output using an extended time slot and stops transmission of write data. The interrupt request notifying unit 483 determines the status of the SD memory card 402, for example, writing of the write data transmitted from the host terminal 401 to the flash memory 431a is delayed, and outputs a write interrupt request. Determine whether. The interrupt request notification unit 483 determines a signal amplitude value to be changed, and determines a change period in which the signal amplitude is changed based on the extended time slot length. Then, the interrupt request notification unit 483 generates a write interrupt request based on the determined signal amplitude value and change period so that the bit length of the write interrupt request does not exceed the extended time slot length. Then, the interrupt request notification unit 483 outputs a write interrupt request to the dynamic impedance circuit 437 based on the start position of the extended time slot so that the write interrupt request can be output within the extended time slot.

The interrupt request recognition unit 484 receives the interrupt detection signal from the potential difference detection circuit 439, and determines whether or not the host terminal 401 has output a read interrupt request. The interrupt request recognition unit 484 transmits the presence / absence of a read interrupt request to the read data transmission unit 479. The write interrupt request is generated until the write data can be written to the flash memory 431a and transmitted to the host terminal 401
.
(4) Process Flow In the process described below, the clock CLKH is transmitted from the host terminal 401 to the SD memory card 402.
(4-1) Reading FIG. 22 is a flowchart illustrating an example of a processing flow at the time of reading in the communication system of the present embodiment.

Steps S 1 and S 2: The command generation unit 455 of the host terminal 401 generates a read command for reading read data from the SD memory card 402. The command transmission unit 456 of the host terminal 401 transmits a read command to the SD memory card 402 via the control signal transmission line 406 (step S1). The command receiving unit 477 of the SD memory card 402 receives the read command (step S2).
Steps S3 and S4: The response transmission unit 478 of the SD memory card 402 transmits a response to the read command to the host terminal 401 via the control signal transmission line 406 (step S3) The response receiving unit 458 of the host terminal 401 receives the response (step S4).
Steps S5 and S6: The transmission data generation unit 480 of the SD memory card 402 reads the read data from the flash memory 431a and generates a data packet in response to reception of the read command. The read data transmission unit 479 of the SD memory card 402 transmits the data packet to the host terminal 401 via the control signal transmission line 406 and the data signal transmission line 407 (step S5). The read data receiving unit 460 of the host terminal 401 receives a data packet from the SD memory card 402 (step S6). At this time, the timing control unit 452 of the host terminal 401 sequentially counts the header length, the bit length of the data fragment, the footer length, and the basic time slot length, and transmits the count value to the read data receiving unit 460.

Thereafter, the read data generation unit 459 generates read data from the data packet and stores it in the RAM 411.
Steps S7 and S8: The interrupt request notifying unit 463 of the host terminal 401 determines whether or not to output a read interrupt request, and generates a read interrupt request when outputting (Yes) (step S7).). At this time, the time slot acquisition unit 453 of the host terminal 401 calculates the extended time slot length based on the header length, footer length, and basic time slot length. The interrupt request notification unit 463 of the host terminal 401 generates a read interrupt request so as not to exceed the extended time slot length (step S8). When the read interrupt request is not output (No), the read data receiving unit 460 of the host terminal 401 further receives a data packet.

Step S9: The time slot acquisition unit 453 of the host terminal 401 sequentially counts the header length, the bit length of the data fragment, and the extended time slot length based on the clock CLKH, and acquires the start position of the extended time slot.
Steps S10 and S11: The interrupt request notification unit 463 of the host terminal 401 outputs a read interrupt request to the dynamic impedance circuit 417 based on the start position of the extended time slot (step S10). The interrupt request recognition unit 484 of the SD memory card 402 recognizes that the host terminal 401 has output a read interrupt request based on an interrupt detection signal that changes according to the output of the read interrupt request (step S11).).
Steps S12 and S13: When the response transmission unit 478 of the SD memory card 402 receives the recognition result that the host terminal 401 is outputting a read interrupt request, the response transmission unit 478 transmits to the host terminal 401 via the control signal transmission line 406. A response is transmitted (step S12). The response receiving unit 458 of the host terminal 401 receives a response from the SD memory card 402 (step S13).

Step S14: The read data transmission unit 479 of the SD memory card 402 stops the transmission of the data packet.
Thereafter, when a read command is transmitted again from the host terminal 401 to the SD memory card 402, the SD memory card 402 resumes transmission of the data packet via the control signal transmission line 406 and the data signal transmission line 407.
(4-2) Write Time FIG. 23 is a flowchart illustrating an example of a process flow at the time of write in the communication system of the present embodiment.
Steps S21 and S22: The command generation unit 455 and the command transmission unit 456 of the host terminal 401 generate and transmit a write command for writing write data to the SD memory card 402 (step S21). The command receiving unit 477 of the SD memory card 402 receives the write command (step S22).

Step S23: The response transmission unit 478 of the SD memory card 402 and the response reception unit 458 of the host terminal 401 transmit and receive a response to the write command.
Steps S25 and S26: The transmission data generation unit 461 and the write data transmission unit 462 of the host terminal 401 read the write data from the RAM 411 according to the generation of the write command, generate a data packet, and transmit it to the SD memory card 402. (Step S25). The write data receiving unit 481 of the SD memory card 402 receives a data packet from the host terminal 401 (step S26). At this time, the timing control unit 472 of the SD memory card 402 sequentially counts the header length, the bit length of the data fragment, the footer length, and the basic time slot length, and transmits the count value to the write data receiving unit 481.

Thereafter, the write data generation unit 482 generates write data from the data packet and stores it in the flash memory 431a.
Steps S27 and S28: The interrupt request notifying unit 483 of the SD memory card 402 determines whether or not to output a write interrupt request, and if it outputs (Yes), generates a write interrupt request (step) S27). At this time, the time slot acquisition unit 473 of the SD memory card 402 calculates the extended time slot length based on the header length, footer length, and basic time slot length. The interrupt request notifying unit 483 of the SD memory card 402 generates a write interrupt request so as not to exceed the extended time slot length (step S28). When the write interrupt request is not output (No), the write data receiving unit 481 of the SD memory card 402 further receives a data packet.

Step S29: The time slot acquisition unit 473 of the SD memory card 402 sequentially counts the header length, the bit length of the data fragment, and the extended time slot length based on the card clock CLKS, and acquires the start position of the extended time slot.
Step S30: The interrupt request notifying unit 483 of the SD memory card 402 outputs a write interrupt request to the dynamic impedance circuit 437 based on the start position of the extended time slot.
Steps S31 and S32: The interrupt request recognition unit 464 of the host terminal 401 outputs the write interrupt request from the SD memory card 402 based on the interrupt detection signal that changes according to the output of the write interrupt request. It is determined whether or not (step S31). If the write interrupt request has not been output (No), the write data transmission unit 462 generates and transmits a data packet in step S25.

On the other hand, when the write interrupt request is output (Yes), the write data transmission unit 462 of the host terminal 401 stops the transmission of the data packet (step S32). When the output of the write interrupt request is canceled, the write data transmission unit 462 resumes generating and transmitting the data packet in step S25.
(5) Operational Effect According to the present embodiment, the data transmission side monitors the change in the signal amplitude of the transmission line, so that an interrupt request such as a read interrupt request or a write interrupt request from the reception side. Can be recognized. Here, the reception side notifies an interrupt request by changing the signal amplitude in an extended time slot between adjacent data fragments. In order to transmit an interrupt signal for controlling the transmission side from the reception side to the transmission side, a period as long as the bit length of the interrupt command is required between the data fragments. According to the notification method, it is not necessary to provide a period as long as the bit length of the interrupt command between data fragments. Therefore, it is possible to suppress a decrease in data transmission efficiency due to notification of an interrupt request. Moreover, since the extended time slot is a period in which no data fragment is transmitted, loss of the data fragment can be prevented.

(6) Modification (6-1)
The potential difference detection circuits 419 and 439 illustrated in FIG. 15 are not limited to the circuit illustrated in FIG. Another configuration of the potential difference detection circuit will be described with reference to FIGS. FIG. 24 is another configuration diagram of the potential difference detection circuit. FIG. 25 illustrates the control signal transmission line 406, the dynamic impedance circuit 417, the potential difference detection circuit 439 configured in FIG. 24, and the output state of the interrupt detection signal. It is another explanatory drawing to do. Since the configuration of the potential difference detection circuit 439 of the SD memory card 402 is the same as that of the potential difference detection circuit 419, description thereof is omitted.
The potential difference detection circuit 419 includes integration circuit portions 419d and 419e, comparators 419f and 419g, and an OR circuit 419h. The integrating circuit portions 419d and 419e are connected to the two differential transmission lines 406a and 406b of the control signal transmission line 406, respectively, and the in-phase potential Vcom of the differential signal and the reset signal are input thereto. The integration circuit units 419d and 419e receive the potentials of the differential transmission lines 406a and 406b, and calculate an integral value for each predetermined time with reference to the common-mode potential Vcom of the differential signal. The integration circuit units 419d and 419e reset the integration value at each edge timing of the reset signal shown in FIG. The comparators 419f and 419g compare the input integral value with a predetermined reference potential Vref, and output High (H) when the integral value is greater than Vref, and Low (L) when it is smaller. Here, as described above, when the interrupt request is not output, the signal amplitude of the control signal transmission line 406 has a swing of ± 100 mV, and when the interrupt request is output, the control signal transmission line 406 is output. The signal amplitude swings ± 10 mV. At this time, if no interrupt request is output, the integration value of any of the integration circuit units 419d and 419e exceeds the reference potential Vref, and any of the comparators 419f and 419g holds High (H). On the other hand, when an interrupt request is output, the integration values of both integration circuit units 419d and 419e are lower than the reference potential Vref, and both comparators 419f and 419g hold Low (L). Eventually, when the signal amplitude of the control signal transmission line 406 decreases from ± 100 mV to ± 10 mV due to the reception of the interrupt request, the output of the OR circuit 419h changes from High (H) to Low (L), and the interrupt detection signal As input to the CPU 410. CPU 410 determines whether or not an interrupt request is output based on this change in the interrupt detection signal.

(6-2)
in the present embodiment, the configuration shown in FIGS. 26 to 28 may be used as a method for notifying an interrupt request from the data packet receiving side to the transmitting side. FIG. 26 is an overall configuration diagram of a communication system according to a modification of the present embodiment, FIG. 27 is a configuration diagram showing the configuration of a comparator, and FIG. 28 is a control signal transmission line 406, a comparator 441, and a split. It is explanatory drawing explaining the output state etc. of a detection signal. Since the configuration other than the comparator 441 is the same as that of FIG. Further, the configuration

IPR2025-00645 Page 02250

of the comparator 443 of the SD memory card 402 is the same as that of the comparator 441, and thus description thereof is omitted.
The comparator 441 is connected to the input line 442a of the driver 415a and the output line 442b of the receiver 415b, and includes a delay element 441a to which the clock CLKH is input, an Ex-OR circuit 441b, and a D flip-flop 441c. Here, the driver 415a holds a signal output from the host terminal 401 to the control signal transmission line 406, and the receiver 415b holds a signal transmitted from the SD memory card via the control signal transmission line 406. Yes.

The operation of the comparator 441 will be described by taking as an example a case where the SD memory card 402 outputs a write interrupt request when the host terminal 401 is transmitting write data to the SD memory card 402. The host terminal 401 continuously transmits data packets to the SD memory card 402 via the control signal transmission line 406 and the data signal transmission line 407. When the CPU 430 of the SD memory card 402 outputs a write interrupt request to the dynamic impedance circuit 437, the differential amplitude of the control signal transmission line 406 decreases as described above. At this time, the impedance of the control signal transmission line 406 is lower than the amplitude level that can be discriminated by the receiver 415 b of the host terminal 401 connected to the control signal transmission line 406. The receiver 415b of the host terminal 401 cannot recognize the differential signal of the control signal transmission line 406 and cannot output a correct logic level. Therefore, the output line 442b of the receiver 415b is in an indefinite state of either High or Low (see the crosses in FIG. 28). Therefore, as shown in FIG. 28, the value of the interrupt detection signal that is the output of the comparator 441 shown in FIG. 27 is not necessarily Low (L) but may be High (H) (FIG. 28).) When the SD memory card 402 does not output a write interrupt request, the logic levels of the input line 442a of the driver 415a and the output line 442b of the receiver 415b are always equal. Therefore, the value of the interrupt detection signal that is the output of the comparator 441 is always Low. The CPU 410 of the host terminal 401 can recognize that the SD memory card 402 has output a write interrupt request by detecting such a change in the interrupt detection signal.

Note that the comparator is not limited to the configuration shown in FIG. 27 as long as the comparator operates as described above. In addition, the comparator 441 illustrated in FIG. 27 can be realized with a smaller area than the potential difference detection circuit 419 illustrated in FIG.
(6-3)
In the above description, the signal amplitude of the control signal transmission line 406 is changed in the extended time slot defined by the interval between the data fragment of the data packet transmitted first and the data fragment of the data packet transmitted later. However, it is between the data packet transmitted first and the data packet transmitted later, that is, between the footer information of the data packet transmitted first and the header information of the data packet transmitted later. in the basic time slot, the signal amplitude may be changed. Since the signal amplitude does not change during the transmission period of the header information and the footer information, it is possible to prevent the footer information and the header information from being received accurately. In this embodiment, since the current-driven differential transmission method is used, each transmission line including the control signal transmission line 406 is in a state of either High or Low even during the basic time slot. .
(6-4)
It is not necessary to add header information and footer information to all data packets transmitted through the control signal transmission line 406 and the data signal transmission line 407. It is also possible to add header information and footer information only to data fragments that are transmitted through one of the transmission lines, and to transmit only the data fragments through other transmission lines. At this time, only the data fragment may be transmitted based on the header information and footer information transmitted via any one of the transmission lines.

For example, the control data transmission line 406 transmits the first data fragment, but header information and footer information are not added before and after the first data fragment. On the other hand, the data signal transmission line 407 transmits a data packet including header information, second data fragment, and footer information. The bit length of the first data fragment is the same as the bit length of the second data fragment of the data packet, and the first data fragment is transmitted in synchronization with the second data fragment. Here, the signal amplitude of the control signal transmission line 406 is changed in a first time slot between the first data fragment and the first data fragment adjacent to each other in the control signal transmission line 406. As described above, by outputting an interrupt request during the above-described period, it is possible to prevent the loss of data fragment information while suppressing a decrease in data transmission efficiency.

Specifically, the time slot acquisition unit 453 calculates a first time slot length that is an interval between the first data fragments based on the header length, footer length, and basic time slot length acquired from the parameter storage unit 454. get. Here, the first time slot length is calculated by footer length + basic time slot length + header length. The time slot acquisition unit 453 transmits the first time slot length to the interrupt request notification unit 463. The interrupt request notification unit 463 determines a signal amplitude value to be changed, and determines a change period in which the signal amplitude is changed based on the first time slot length. Then, the interrupt request notification unit 463 generates a read interrupt request based on the determined signal amplitude value and change period. The timing controller 452 receives a data packet from the read data receiver 460 via the data signal transmission line 407, and acquires the bit length of the second data fragment included in the header information. The time slot acquisition unit 453 sequentially counts the header length, the bit length of the second data fragment, and the first time slot length based on the clock CLKH, and acquires the start position of the first time slot. Then, the time slot acquisition unit 453 transmits the start position of the first time slot to the interrupt request notification unit 463. The interrupt request notification unit 463 inputs a read interrupt request to the dynamic impedance circuit 417 based on the start position of the first time slot, and changes the signal amplitude of the control signal transmission line 406. The potential difference detection circuit 439 of the SD memory card 402 detects this change in signal amplitude, and the CPU 430 of the SD memory card 402 recognizes that the host terminal 401 has output a read interrupt request.

(6-5)
In the above description, the data packets transmitted through the control signal transmission line 406 and the data signal transmission line 407 are transmitted in synchronization, but are not limited to the configuration in which they are transmitted in synchronization. What is necessary is just to be transmitted to each transmission line based on the header information and footer information of each data packet.
(6-6)
In the above, data transmission is performed via the control signal transmission line and the data signal transmission line. However, the present embodiment can be applied not only to data transmission via a plurality of transmission lines but also to data transmission via a single transmission line.
(6-7)
In the above, when the interrupt request is not output, the signal amplitude of the transmission line is large, and when the interrupt request is output, the signal amplitude of the transmission line is small. However, it is sufficient that the interrupt request can be recognized by the change in the signal amplitude. When the interrupt request is not output, the signal amplitude of the transmission line is small, and when the interrupt request is output, the signal amplitude of the transmission line increases. May be.

(6-8)
In the SD memory card, data is processed in units of 8 bits. Therefore, the above extended time slot length calculated by footer length + basic time slot length + header length is preferably a multiple of 8.
(6-9)
For example, a switching time t1 of several clocks is required until the transmission of data from the transmission side is completed and the reception side can output an interrupt request. Further, for example, a switching time t2 of several clocks is required until the output of the interrupt request from the reception side is completed and the transmission side can start data transmission again. Therefore, the extended time slot length is preferably a bit length including the switching times t1 and t2. That is,

IPR2025-00645 Page 02251

the extended time slot length is calculated by footer length + number of bits of switching time t1 + number of bits of command + switching time t2 + header length. This extended time slot length is also preferably a multiple of eight.

(6-10)
The interrupt request is not limited to a read interrupt request and a write interrupt request, and may be a request for delaying data transmission from the transmission side for a certain period or instructing data retransmission.
(6-11)
In the above, the data packet is formed so as to include header information, data packet, and footer information in order, but the order of these is not limited to the above.
(6-12)
In the above, this embodiment demonstrated the communication system which has a control signal transmission line and a data signal transmission line. However, this embodiment can also be applied to a communication system that does not have a control signal transmission line and has only a data signal transmission line

(6-13)
In the above description, the header length, footer length, and basic time slot length are defined as communication standards. However, for example, the header length, the footer length, and the basic time slot length are different for each SD memory card, and these pieces of information may be mutually acquired at the start of communication between the host terminal and the SD memory card.
(6-14)
In the above description, the configuration in which the bit length of each data fragment is described in the header information has been described. However, the bit length of each data fragment may be fixed according to the communication standard. In this case, the bit length of the data fragment may be stored in the parameter storage unit, and it is not necessary to obtain the bit length of the data fragment as needed from the header length of the second data packet.

(6-15)
In the above description, the SD memory card, which is a removable memory device, has been described as an example. However, the present invention is applicable to any portable removable memory device that transmits read data to the host terminal using a clock supplied from the host terminal. The applicable range is not limited to the SD memory card. Other examples include CompactFlash (registered trademark), smart media, multimedia cards, and memory sticks. In addition, the memory on which the removable memory device can be mounted is not limited to the flash memory, but includes non-volatile memories such as MRAM and FeRAM.
(6-16)
A computer program that causes a computer to execute the method described above and a computer-readable recording medium that records the program are included in the scope of the present invention. Here, examples of the computer-readable recording medium include a flexible disk, hard disk, CD-ROM, MO, DVD, DVD-ROM, DVD-RAM, BD (Blue-ray Disc), and semiconductor memory. .

The computer program is not limited to the one recorded on the recording medium, and may be transmitted via an electric communication line, a wireless or wired communication line, a network represented by the Internet, or the like.

INDUSTRIAL APPLICABILITY The present invention can be used when realizing a reduction in data transmission efficiency while transmitting an interrupt signal in data transmission between transmitting and receiving apparatuses.

1 is an overall configuration diagram of a communication system according to a first embodiment of the present invention. The time chart which shows the mode of the data transmission at the time of a read. 2 is a functional configuration diagram of a CPU 110 of a host terminal 101 and a CPU 130 of an SD memory card 102. FIG. 6 is a flowchart illustrating an example of a processing flow at the time of reading in the communication system according to the present embodiment. 5 is a flowchart illustrating an example of a processing flow at the time of writing in the communication system according to the present embodiment. The whole block diagram of the communication system which concerns on 1st Example of 2nd Example of this invention. The whole block diagram of the communication system which concerns on 2nd Example of 2nd Example of this invention. The time chart which shows the mode of the data transmission at the time of a read. The time chart which shows the mode of the data transmission at the time of the read in 1st Example. 2 is a functional configuration diagram of a CPU 210 of a host terminal 201 and a CPU 230 of an SD memory card 202. FIG. The flowchart which shows an example of the flow of the process at the time of the read in the communication system of 1st Example. The time chart which shows the mode of the data transmission at the time of the read in 2nd Example. 2 is a functional configuration diagram of a CPU 210 of a host terminal 201 and a CPU 230 of an SD memory card 202. FIG. The flowchart which shows an example of the flow of the process at the time of the read in the communication system of 2nd Example. The whole block diagram of the communication system which concerns on the example of 3rd Embodiment of this invention. The time chart which shows the mode of the data transmission at the time of a read. The block diagram of the dynamic impedance circuit 417. FIG. The block diagram of a potential difference detection circuit. The flowchart which shows the state of the transmission line 406 for a control signal, and the state of an interruption detection signal when a read interruption request | requirement is output. Explanatory drawing explaining the output state of the transmission line 406 for control signals, the dynamic impedance circuit 417, the electric potential difference detection circuit 439, and an interruption detection signal. 2 is a functional configuration diagram of a CPU 410 of a host terminal 401 and a CPU 430 of an SD memory card 402. FIG. 6 is a flowchart illustrating an example of a processing flow at the time of reading in the communication system according to the present embodiment. 5 is a flowchart illustrating an example of a processing flow at the time of writing in the communication system according to the present embodiment. FIG. 3 is another configuration diagram of a potential difference detection circuit. 25 is another explanatory diagram for explaining the output state of the control signal transmission line 406, the dynamic impedance circuit 417, the potential difference detection circuit 439 configured in FIG. 24, and the interrupt detection signal. The whole communication system composition concerning the modification of this example of an embodiment. The block diagram which shows the structure of a comparator. Explanatory drawing explaining the output state of the transmission line 406 for control signals, the comparator 441, and an interruption detection signal.

Explanation of symbols

101, 201, 401: Host terminal
102, 202, 402: SD memory card
105, 205, 405: Transmission line for clock signal
106, 206, 406: Transmission line for control signal
107,207,407: Data signal transmission line
110, 130, 210, 230, 410, 430: CPU
150: Clock generator
151: Clock transmitter
152, 172, 252, 272, 452: Timing control unit
153, 173, 453, 473: Time slot acquisition unit
154, 174, 254, 274, 454, 474: Parameter storage unit
155, 175, 255, 275, 355, 455: command generation unit
156, 176, 256, 276, 456: Command transmission unit
157, 177, 257, 277, 457, 477: command receiving unit
158, 258, 458: Response receiver 178, 278, 478: Response transmitter

IPR2025-00645 Page 02252

159, 259, 459: read data generation unit
179, 279, 379, 479: read data transmission unit
160, 260, 460 : read data receiving unit
161, 180, 261, 280, 461, 480: transmission data generation unit
162, 262, 462: Write data transmission unit
170, 470: Clock receiver
181, 281, 481: Write data receiver
182, 282, 482: write data generation unit
237: Interrupt memory circuit
250a, 350: first clock generation unit
251a, 351: First clock transmission unit
250b. second clock generation unit
251b: Second clock transmission unit
270a, 370: first clock receiver
270b: second clock receiver
337: Interrupt detection counter
384: Internal clock count unit
385: Interrupt request recognition unit
406a, 406b: differential transmission path
419, 439: Potential difference detection circuit
463, 483: Interrupt request notification unit
484: Interrupt request recognition unit

Patent Citations (48)

Publication number	Priority date	Publication date	Assignee	Title
JP2733242B2 *	1988-03-28	1998-03-30	松下電工株式会社	Time division multiplex transmission method
JP2812537B2 *	1990-06-06	1998-10-22	日本放送協会	IC card system
JP2002183692A *	2000-12-14	2002-06-28	Sony Corp	ic card and ic card system
JP3690873B2 *	1996-06-07	2005-08-31	シチズン時計株式会社	Communication circuit for contactless memory card system
Family To Family Citations				
US4395756A *	1981-02-17	1983-07-26	Pitney Bowes Inc.	Processor implemented communications interface having external clock actuated disabling control
GB2097638B *	1981-03-07	1985-10-16	British Aerospace	Serial bus interface unit
US4467412A *	1981-05-18	1984-08-21	Atari, Inc.	Slave processor with clock controlled by internal ROM & master processor
JPS60225269A *	1984-04-24	1985-11-09	Casio Comput Co Ltd	Data transfer system
US5319752A *	1992-09-18	1994-06-07	3Com Corporation	Device with host indication combination
US5655131A *	1992-12-18	1997-08-05	Xerox Corporation	SIMD architecture for connection to host processor's bus
US5530875A *	1993-04-29	1996-06-25	Fujitsu Limited	Grouping of interrupt sources for efficiency on the fly
TW230808B *	1993-06-04	1994-09-21	Philips Electronics Nv	A two-line mixed analog/digital bus system and a station for use in such a system
JP2848784B2 *	1994-08-02	1999-01-20	沖電気工業株式会社	Packet switching method
US5671421A *	1994-12-07	1997-09-23	Intel Corporation	Serial interrupt bus protocol
JPH08328684A *	1995-05-30	1996-12-13	Toshiba Corp	Computer system
US5835779A *	1996-03-15	1998-11-10	Lucent Technologies Inc.	Message transmission among processing units using interrupt control technique
WO1997042597A1 *	1996-05-09	1997-11-13	Citizen Watch Co., Ltd.	Storage medium system using contactless memory card
WO1998043021A2 *	1997-03-25	1998-10-01	Intellidyne, Llc	Forced-air heater regulator of heating cycles
US5940485A *	1997-06-12	1999-08-17	Trivium Systems, Inc	Data interface connected in line between a keyboard and a keyboard port of a personal computer
KR100258361B1 *	1997-11-21	2000-06-01	김영환	The high speed dram system having output data revision device
US6081523A *	1997-12-05	2000-06-27	Advanced Micro Devices, Inc.	Arrangement for transmitting packet data segments from a media access controller across multiple physical links
US6262998B1 *	1997-12-24	2001-07-17	Nortel Networks Limited	Parallel data bus integrated clocking and control

US6532288B1 *	1999-01-26	2001-11-20	National Semiconductor Corporation	Serial IRQ slave controller with auto-synchronization
WO2000051281A2 *	1999-02-26	2000-08-31	Usar Systems, Inc.	Power conservation with a synchronous master-slave serial data bus
KR100342020B1 *	1999-03-12	2002-06-27	윤종용	Remote controlled computer system having identification number and management method of the same
JP2000293485A *	1999-04-08	2000-10-20	Matsushita Electric Ind Co Ltd	Communication interface
CN2478178Y *	2000-04-22	2002-02-20	杭州南望电力科技有限公司	Remote image monitoring service device
US6782486B1 *	2000-08-11	2004-08-24	Advanced Micro Devices, Inc.	Apparatus for stopping and starting a clock in a clock forwarded I/O system depending on the presence of valid data in a receive buffer
US6833325B2 *	2000-12-29	2004-12-14	Intel Corporation	Device on a source synchronous bus sending data in quadrature phase relationship and receiving data in phase with the bus clock signal
US7009580B1 *	2000-12-29	2006-02-21	Sprint Communications Company L.P.	Bandwidth boost using a wireless communication path
US7313715B2 *	2001-02-09	2007-12-25	Samsung Electronics Co., Ltd.	Memory system having stub bus configuration
JP3870717B2 *	2001-05-14	2007-01-24	セイコーエプソン株式会社	Data transfer control device and electronic device
US6654916B2 *	2001-06-12	2003-04-15	Qualcomm, Inc	Method and apparatus for transmitting real time data from aircraft to ground stations using a data protocol over a satellite system
DE10139883B4 *	2001-08-08	2006-03-30	Infineon Technologies Ag	Method and device for synchronous signal transmission between logic / memory modules
US7355971B2 *	2001-10-22	2008-04-08	Intel Corporation	Determining packet size in networking
US7200151B2 *	2002-06-28	2007-04-03	Manter Venitha L.	Apparatus and method for arbitrating among equal priority requests
KR100506529B1 *	2003-08-06	2005-08-03	삼성전자주식회사	Apparatus, system and method for path mtu discovery in data communication network
JP2005135109A *	2003-10-29	2005-05-26	Kyocera Mita Corp	Data transfer system
US7073146B2 *	2003-10-30	2006-07-04	Atrenta Inc.	Method for clock synchronization validation in integrated circuit design
WO2005094555A2 *	2004-03-25	2005-10-13	Washington University	Design and use of restartable clocks including crystal-based restartable clocks
US7362739B2 *	2004-06-22	2008-04-22	Intel Corporation	Methods and apparatuses for detecting clock failure and establishing an alternate clock lane
US7418528B2 *	2004-07-22	2008-08-26	Texas Instruments Incorporated	Multimode, multiline data transfer system and method of operating the same
CN1989747B *	2004-09-21	2011-06-08	株式会社日立制作所	Node device, packet control device, radio communication device, and transmission control method
US20080008183A1 *	2004-12-28	2008-01-10	Kelichi Takagaki	Communication Device, Storage Medium, Integrated Circuit, and Communication System
US20060143348A1 *	2004-12-29	2006-06-29	Wilson Matthew T	System, method, and apparatus for extended serial peripheral interface
EP1879333A1 *	2006-07-12	2008-01-16	Siemens Aktiengesellschaft	Method for transmitting packets in a network
JP2008022678A *	2006-07-14	2008-01-31	Matsushita Electric Ind Co Ltd	Electric motor drive unit and electric motor braking method
JP5217982B2 *	2008-12-04	2013-06-19	ソニー株式会社	Information processing apparatus and method, and program

* Cited by examiner, † Cited by third party

Cited By (18)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				

IPR2025-00645 Page 02254

US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US8332580B2 *	2007-08-13	2012-12-11	Rambus Inc.	Methods and systems for operating memory in two modes
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
EP2267467A4	2008-01-15	2014-10-29	Univ Nagasaki Nat Univ Corp	Frequency detection device, frequency detection method, circuit control device, circuit control method, delay circuit control method, and delay circuit system
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US8854806B2	2009-10-29	2013-10-01	Panasonic Corporation	Data transmission system capable of transmitting interrupt signal without interrupt gate period
JP5367539B2 *	2009-11-09	2013-12-11	シャープ株式会社	Interface device
WO2011061796A1 *	2009-11-18	2011-05-26	株式会社アドバンテスト	Receiving apparatus, testing apparatus, receiving method and testing method
JP5580786B2 *	2010-07-23	2014-08-27	パナソニック株式会社	Host device, peripheral device, communication system, and communication method
CN102142954B *	2010-11-30	2014-11-05	中兴通讯股份有限公司	Time synchronization method and equipment in rack
CN102087697B *	2011-02-25	2013-08-14	深圳市中兴长天信息技术有限公司	Data transmission method of reader and wireless tags
JP6029437B2 *	2012-11-30	2016-11-24	ルネサスエレクトロニクス株式会社	Semiconductor device and access restriction method
US20160124876A1 *	2014-08-22	2016-05-05	HGST Netherlands B.V.	Methods and systems for noticing completion of read requests in solid state drives
JP2017004404A *	2015-06-15	2017-01-05	ソニー株式会社	Communication device and control method
WO2018184536A1 *	2017-04-07	2018-10-11	Oppo广东移动通信有限公司	Data transmission method, and sending end device

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP4931912B2	2012-05-16	Signal transmission method, transmission / reception apparatus, and communication system
US7548736B2	2009-06-16	Transmitter, receiver, data transfer system, transmission method, reception method, computer program for transmission, computer program for reception, and recording medium
US9461937B2	2016-10-04	Method and device for a serial data transmission with additionally inserted data
JP4773787B2	2011-09-14	COMMUNICATION SYSTEM, COMMUNICATION DEVICE, AND FLOW CONTROL METHOD
JP5095892B2	2012-12-12	Packet data transmission system for transmitting wireless image data
JP4875832B2	2012-02-15	Transfer device, program, and computer-readable storage medium
JP2002359661A	2002-12-13	Transmission/reception circuit and transmission/reception method
JP4363404B2	2009-11-11	Receiving apparatus and method, and program
TW201717039A	2017-05-16	Method and system for USB 2.0 bandwidth reservation
JP2007101457A	2007-04-19	Transmitter, receiver, time notification method, and time setting method
EP3082282A1	2016-10-19	Method for time synchronization
EP3373507A1	2018-09-12	Key sharing device, key sharing system, key sharing method and computer-readable medium
JP2003122709A	2003-04-25	Data transfer device, data transfer system and data transfer method

IPR2025-00645 Page 02255

US20110255470A1	2011-10-20	Data processing device, system and method for data processing, recording medium with program recorded therein, data transfer device, system and method for data transfer, and recording medium with program recorded therein
WO2017000737A1	2017-01-05	Transmission checking method, node, system and computer storage medium
US10862830B2	2020-12-08	Real-time on-chip data transfer system
JP4157064B2	2008-09-24	Synchronization start signal detection device, detection method thereof, and program thereof
WO2015040838A1	2015-03-26	Communication device and control method of communication device
JP2008236178A	2008-10-02	Serial data receiving circuit
JP5958335B2	2016-07-27	Communication node and communication system
JP2006091955A	2006-04-06	Data transfer system and bus arbitration method
KR102016029B1	2019-08-29	Apparatus and method for distributing load of vehicle communication
JP2006303928A	2006-11-02	Filter device, communication processing device, communication processing system, and filtering method
JPH11177591A	1999-07-02	Transmission medium connection device and controller, operating cycle generation device and recording medium
US7716539B2	2010-05-11	Serial communication control system

Priority And Related Applications

Priority Applications (4)

Application	Priority date	Filing date	Title
JP2006121459		2006-04-26	
JP2006121459		2006-04-26	
JP2008513094A	2006-04-26	2007-02-20	Signal transmission method, transmission / reception apparatus, and communication system
PCT/JP2007/053010	2006-04-26	2007-02-20	Signal transmission method, transmission/reception device, and communication system

Applications Claiming Priority (1)

Application	Filing date	Title
JP2008513094A	2007-02-20	Signal transmission method, transmission / reception apparatus, and communication system

Legal Events

Date	Code	Title	Description
2009-11-20	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20091119
2009-11-20	A621	Written request for application examination	**Free format text**: JAPANESE INTERMEDIATE CODE: A621 **Effective date**: 20091119
2012-01-19	TRDD	Decision of grant or rejection written	
2012-01-25	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01 **Effective date**: 20120124
2012-01-26	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01
2012-02-23	A61	First payment of annual fees (during grant procedure)	**Free format text**: JAPANESE INTERMEDIATE CODE: A61 **Effective date**: 20120214
2012-02-24	R150	Certificate of patent or registration of utility model	**Ref document number**: 4931912 **Country of ref document**: JP **Free format text**: JAPANESE INTERMEDIATE CODE: R150 **Free format text**: JAPANESE INTERMEDIATE CODE: R150

IPR2025-00645 Page 02256

2012-02-27	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text:** PAYMENT UNTIL: 20150224 **Year of fee payment:** 3

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

IPR2025-00645 Page 02257

Patents 4345850

Communication system and communication apparatus

Classifications

H04B5/00 Near-field transmission systems, e.g. inductive loop type

View 5 more classifications

JP4345850B2

Japan

Download PDF Find Prior Art Similar

Other languages: Japanese

Inventor: 鷲典 和城

Worldwide applications

2007 JP EP TW KR US BR SG 2011 US

Application JP2007148673A events

2006-09-11	Priority to JP2006245615
2007-06-04	Application filed by ソニー株式会社
2007-06-04	Priority to JP2007148673A
2007-08-15	Priority claimed from CN200710142523XA
2008-04-24	Publication of JP2008099235A
2009-10-14	Application granted
2009-10-14	Publication of JP4345850B2
Status	Active
2027-06-04	Anticipated expiration

Info: Patent citations (34), Cited by (415), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (12)

Hide Dependent

1. A transmitter and receiver each including a communication circuit unit for processing high-frequency signals for transmitting data and a high-frequency coupler, and a surface wave propagation means,
The high-frequency coupler includes a transmission path for the high-frequency signal, a coupling electrode that is connected to one end of the transmission path and stores electric charge, and a high level that can be ignored with respect to the wavelength of the high-frequency signal facing the coupling electrode. A ground that is spaced apart and stores a mirror image charge with respect to the charge, and a resonance unit for increasing a current flowing into the coupling electrode through the transmission line, and the ground stored in the coupling electrode Forming a minute dipole consisting of a line segment connecting the center of the charge and the center of the mirror image charge stored in the ground.
The surface wave propagation means is made of a dielectric having a dielectric constant ε greater than the dielectric constant $\varepsilon_{0\ of}$ air, and an electric field that vibrates in a direction parallel to the direction in which the angle θ formed with the minute dipole is approximately 0 degrees . Provide a surface wave transmission line that transmits longitudinal wave components with low propagation loss.
A communication system characterized by the above.

2. The high-frequency signal is a UWB signal that uses an ultra-wideband.
The communication system according to claim 1.

3. The surface wave transmission line is composed of a dielectric having a larger dielectric constant toward the inner side.
The communication system according to claim 1.

4. The surface wave transmission line is embedded in another dielectric having a low dielectric constant.
The communication system according to claim 1.

5. The surface wave transmission line is composed of a magnetic material having a permeability μ larger than the permeability $\mu_{0\ of}$ air.
The communication system according to claim 1.

6. The surface wave transmission line is composed of a magnetic material having a larger permeability toward the inside,
The communication system according to claim 5.

7. The surface wave transmission line is embedded in another magnetic body having a lower magnetic permeability,
The communication system according to claim 5.

8. The surface wave transmission line is composed of a plurality of dielectric bodies (or magnetic bodies) separated in the middle,
The communication system according to claim 1.

9. The receiver rectifies the high-frequency signal received by the high-frequency coupler and generates power.
The communication system according to claim 1.

10. A device housing;
A communication circuit unit for processing a high-frequency signal for transmitting data, housed in the device housing, a transmission path for the high-frequency signal, a coupling electrode connected to one end of the transmission path for storing electric charge, and the coupling Opposite to the electrode for the high-frequency signal and spaced apart by a negligible height with respect to the wavelength of the high-frequency signal, and a large current flowing into the coupling electrode via the transmission line, and a ground for storing a mirror image charge for the charge A high-frequency coupler that forms a micro dipole consisting of a line segment connecting the center of the charge stored in the coupling electrode and the center of the mirror image charge stored in the ground ;
It is composed of a dielectric material having a dielectric constant ε larger than the dielectric constant ε_0 of air, and the longitudinal wave component of the electric field that vibrates in a direction parallel to the direction in which the angle θ formed with the minute dipole is approximately 0 degrees is low in propagation loss. Surface wave transmission line means for providing a surface wave transmission line for transmission at
A communication apparatus comprising;

11. The surface wave transmission line captures the surface wave radiated from the coupling electrode and guides it to a desired site on the surface of the housing.
The communication apparatus according to claim 10.

12. The resonance unit includes a series inductor and a parallel inductor.
The communication apparatus according to claim 10.

Description

The present invention relates to a communication system that performs large-capacity data communication between information devices, and in particular, data that does not interfere with other communication systems using an electrostatic field (quasi-electrostatic field) or an induced electric field between information devices. The present invention relates to a communication system that performs communication.

More particularly, the present invention relates to a communication system that realizes high-capacity transmission of high-frequency signals by electric field coupling, and in particular, by extending the distance between electrodes of a transmitter / receiver that performs electric field coupling. The present invention relates to a communication system that makes the design flexible.

Recently, when moving data between small information devices such as exchanging data such as images and music with a personal computer, it is possible to use a general-purpose cable such as an AV (Audio Visual) cable or a USB (Universal Serial Bus) cable. The use of a wireless interface is increasing instead of a method using a medium such as a connected data communication or a memory card. According to the latter, it is not necessary to change the connector and route the cable every time data is transmitted, which is convenient for the user. Many information devices equipped with various cableless communication functions have also appeared.

As a method of transmitting data between small devices without a cable, radio waves that transmit and receive wireless signals using an antenna, such as wireless LAN (Local Area Network) and Bluetooth (registered trademark) communication represented by IEEE 802.11, are used. Communication methods have been developed. For example, a built-in antenna is built in a position that is not covered by the hand holding the grip, and correct image data is received without the built-in antenna being covered by a hand, so an antenna for wireless communication is deployed inside the device Even so, there has been proposed a portable image recording apparatus in which the characteristics inherent to the antenna are exhibited as they are (see, for example, Patent Document 1).

Many of the conventional wireless communication systems adopt a radio communication system, and propagate signals using a radiation electric field generated when a current is passed through an antenna (antenna). In this case, since a radio wave is emitted from the transmitter side regardless of whether there is a communication partner, there is a problem that it becomes a generation source of an interference radio wave for a nearby communication system. Further, since the antenna on the receiver side receives not only the desired wave from the transmitter but also a radio wave arriving from a distance, it is easily affected by the surrounding interfering radio waves and causes a decrease in reception sensitivity. Further, when there are a plurality of communication partners, it is necessary to perform complicated settings in order to select a desired communication partner For example, when a plurality of sets of wireless devices perform wireless communication in a narrow range, it is necessary to perform communication by performing division multiplexing such as frequency selection in order to avoid mutual interference. In addition, since radio waves cannot communicate when their polarization directions are orthogonal, it is necessary for the antennas to have the same polarization direction between the transceivers.

For example, when considering a contactless data communication system at a close distance of several millimeters to several centimeters, the transmitter / receiver is strongly coupled at a short distance, while a signal is transmitted to a long distance to avoid interference with other systems. It is preferable not to arrive. In addition, it is desirable that the devices that perform data communication do not depend on each other's posture (orientation) when they are brought close to each other, and that they are coupled, that is, have no directivity. In addition, in order to perform large-capacity data communication, it is desirable that broadband communication is possible.

The wireless communication includes a communication method using an electrostatic field or an induction field in addition to the radio wave communication using the radiated electric field. For example, in an existing non-contact communication system mainly used for RFID (Radio Frequency IDentification), an electric field coupling method or an electromagnetic induction method is applied. The electrostatic field and the induction field are inversely proportional to the cube of the distance and the square of the distance with respect to the distance from the source Therefore, in this type of non-contact communication system, the transmission signal attenuates steeply according to the distance. Therefore, when there is no communication partner in the vicinity, a coupling relationship does not occur, so that other communication systems are not disturbed. Further, even when radio waves arrive from a distance, the coupler (coupler) does not receive radio waves, so that it is not necessary to receive interference from other communication systems.

For example, by forming a communication auxiliary body set in which RFID tags are positioned between a plurality of communication auxiliary bodies, and arranging RFID tags attached to a plurality of products so as to be sandwiched between the communication auxiliary bodies, RFID There has been proposed an RFID tag system that enables stable reading and writing of information even when tags are overlapped (see, for example, Patent Document 2).

In addition to the apparatus main body and a mounting means for mounting the apparatus main body on the body, the antenna coil and the data communication means for performing data communication with an external communication device through the antenna coil in a non-contact manner. A data communication device using an induction magnetic field in which an antenna coil and data communication means are arranged in an outer case provided on the upper portion of the device body has been proposed (for example, see Patent Document 3). .

In addition, an antenna coil for data communication with an external device is mounted on a memory card inserted into the portable information device, and an RFID antenna coil is disposed outside the memory card insertion slot of the portable information device. A proposal has been made on a mobile phone having an RFID that secures a communication distance without impairing portability (see, for example, Patent Document 4).

A conventional RFID system using an electrostatic field or an induction electric field uses a low frequency signal, and therefore has a low communication speed and is not suitable for a large amount of data transmission. On the other hand, the present inventors consider that high-capacity transmission is possible by transmitting a high-frequency signal by electric field coupling.

However, while the electric field strength of the radiated electric field attenuates gently in inverse proportion to the distance, the electric field strengths of the induction electric field and the electrostatic electric field attenuate sharply in inverse proportion to the square and third power of the distance, that is, the communication distance. Signal attenuation due to Further, since a propagation loss occurs according to the size of the propagation distance with respect to the wavelength, the problem of the propagation loss according to the distance between the electrodes becomes significant when a high frequency signal is propagated by electric field coupling. For this reason, it is necessary to make as close as possible between the coupling electrodes of the transmitter and the receiver. In order to bring the coupling electrodes close enough, it is necessary to perform delicate positioning between the electrodes, and the position must be maintained during data communication, which is not convenient for the user. In addition, it is not possible to perform direct communication between the transceivers at a long distance.

In addition, when mounting the coupling electrode in the housing of the communication device, it is necessary to place the electrode outside the housing as much as possible in order to reduce the inter-electrode distance during data communication. Will be limited. Of course, it is desirable that the coupling electrode be small and low in cost.

JP 2006-105612 A JP 2006-60283 A JP 2004-214879 A JP 2005-18671 A

An object of the present invention is to provide an excellent communication system capable of performing data communication without interference with other communication systems using an electrostatic field or an induction field between information devices.

A further object of the present invention is to provide an excellent communication system capable of realizing high-capacity data transmission of a high-frequency signal by a communication method using an electrostatic field or an induced electric field.

A further object of the present invention is to provide an excellent communication system capable of extending the distance between coupling electrodes of a transmitter / receiver to make the arrangement between the transmitter / receiver and the design of the communication device flexible.

The present invention has been made in view of the above problems, a transmitter circuit unit that generates a high-frequency signal for transmitting data, a transmitter including a high-frequency coupler that transmits the high-frequency signal as an electrostatic magnetic field,
A high-frequency coupler, and a receiver including a receiving circuit unit that receives and processes a high-frequency signal received by the high-frequency coupler;
Surface wave propagation means for providing a surface wave transmission line for transmitting surface waves radiated from the high frequency coupler on the transmitter side with low propagation loss,
It is a communication system characterized by comprising.

However, "system" here refers to a logical collection of a plurality of devices (or functional modules that realize specific functions), and each device or functional module is in a single housing. It does not matter whether or not (hereinafter the same).

If data such as images and music can be exchanged between personal computers, such as exchanging data with a personal computer, the convenience for the user is enhanced. However, in many wireless communication systems represented by wireless LAN, a radiated electric field generated when a current is passed through an antenna is used, so that radio waves are emitted regardless of whether there is a communication partner. Further, since the radiated electric field attenuates gently in inverse proportion to the distance from the antenna, the signal reaches a relatively long distance. For this reason, it becomes a source of jamming radio waves for nearby communication systems, and the reception sensitivity of the receiver-side antenna also decreases due to the influence of surrounding jamming radio waves. In short, in the radio wave communication system, it is difficult to realize wireless communication limited to a communication partner at a short distance.

On the other hand, in a communication system using an electrostatic field or an induced electric field, a coupling relationship does not occur when there is no communication partner nearby. In addition, the electric field strengths of the induction electric field and the electrostatic field are steeply attenuated in inverse proportion to the square and the cube of the distance, respectively. That is, an unnecessary electric field is not generated and the electric field does not reach far, so that it does not disturb other communication systems. Further, even when radio waves arrive from a distance, the coupling electrode does not receive radio waves, so that it is not necessary to receive interference from other communication systems.

In addition, the conventional contactless communication system using an electrostatic field or an induction electric field uses a low-frequency signal and thus is not suitable for a large amount of data transmission. However, the present inventors use this type of high-frequency signal. It is considered that large-capacity data transmission is possible even in this non-contact communication system.

However, the electric field strengths of the induction electric field and the electrostatic electric field are attenuated sharply in inverse proportion to the square and the third power of the distance, respectively, and there is a problem that the propagation loss is large due to the short wavelength when a high frequency signal is used. For this reason, the coupling electrodes of the transmitter and the receiver need to be as close as possible, and communication over a long distance cannot be performed. In addition, in order to bring the coupling electrodes sufficiently close to each other, it is necessary to perform delicate positioning between the electrodes, and since the position must be maintained during data communication, it is convenient for the user. Absent.

Therefore, the communication system according to the present invention employs a communication method for transmitting a high-frequency signal by electric field coupling, but the surface wave propagation means transmits the surface wave radiated from the coupling electrode on the transmitter side. Therefore, data transmission is possible without sufficiently bringing the electrodes of the transceiver close to each other or performing delicate positioning.

The surface wave propagation means is composed of, for example, a surface wave transmission line made of a linear member made of a dielectric material or a magnetic material, and along the traveling direction of the longitudinal wave among electromagnetic waves radiated from the coupling electrode on the transmitter side. Arranged. Such a surface wave transmission line efficiently propagates a surface wave through and through the surface of the transmission line. Therefore, compared to a case where a surface wave is propagated in a free space where no surface wave transmission line is disposed, Propagation loss can be reduced by interposing the surface wave transmission line between the couplers. Further, when performing non-contact transmission, the user does not have to directly contact the coupling electrodes with each other between the transceivers.

The surface wave transmission line is made of, for example, a dielectric having a dielectric constant ε larger than the dielectric constant ε_0 of air. In such a case, the surface wave of the dielectric travels parallel to the boundary surface, and complete reflection occurs at the boundary surface. Therefore, when a surface wave is incident on the inside of the dielectric at an appropriate angle, reflection is repeated at two boundaries, and the surface wave is efficiently propagated without loss.

IPR2025-00645 Page 02260

The surface wave transmission line is made of a dielectric material having a higher dielectric constant toward the inner side, such as covering the surface of a dielectric material having a higher dielectric constant with another dielectric layer having a lower dielectric constant. Also good. In such a case, it is possible to suppress the proportion of surface waves radiated to the outside as transmitted waves while propagating along the surface wave transmission line, and to transmit signals more efficiently. For example, the surface wave transmission line may be embedded in a rack made of another dielectric having a lower dielectric constant.

Alternatively, the surface wave transmission line can be made of, for example, a magnetic material having a permeability μ larger than the permeability μ_0 of air. In such a case, the surface wave of the magnetic material travels parallel to the boundary surface, and complete reflection occurs at the boundary surface. Therefore, when a surface wave is incident on the inside of the magnetic body at an appropriate angle, reflection is repeated at two boundaries, and the surface wave is efficiently propagated without loss.

By forming the surface wave transmission line with a dielectric material having a higher permeability toward the inside, such as covering the surface of a magnetic material having a high magnetic permeability with another magnetic material layer having a lower magnetic permeability, During propagation along the surface wave transmission line, the ratio of surface waves radiated to the outside as transmitted waves can be suppressed, and signals can be transmitted more efficiently. For example, the surface wave transmission line may be embedded in a rack made of another magnetic material having a lower magnetic permeability.

In addition, the surface wave transmission line can be constituted by a plurality of dielectric bodies (or magnetic bodies) separated in the middle instead of a single dielectric body (or magnetic body). That is, since the middle of the surface wave transmission line can be electrically disconnected and used in a non-contact state, it can be applied as non-contact communication in which there is no physical contact between devices or between a device and a member. In such a case, the separated dielectric bodies (or magnetic bodies) do not have to be in contact with each other, but in order to reduce loss, the distance between the dielectric bodies (or magnetic bodies) is small, and the signal is transmitted. It is desirable to be placed at a position where they face each other.

In addition, in the layout in the case where the transmitter / receiver circuit unit and the coupling electrode are mounted on the main board in the communication device, if nothing is placed in front of the electrode housed deep inside the case, radiation is emitted from the electrode. The signal is dispersed in the air in the housing and lost. On the other hand, by installing a dielectric or magnetic material to be a surface wave transmission line in front of the coupling electrode, the electromagnetic wave signal radiated from the coupling electrode is guided to the surface of the housing by the surface wave transmission line. Efficient signal transmission is possible.

Here, the transmitter connects a high-frequency signal transmission path for transmitting a high-frequency signal generated by the transmission circuit unit to a substantially center of the electrode of the high-frequency coupler through a resonance unit that resonates at a predetermined frequency. Yes. The receiver is connected to a high-frequency signal transmission path for transmitting a high-frequency signal to the receiving circuit section through a resonance section that resonates at a predetermined frequency at substantially the center of the electrode of the high-frequency coupler.

The resonating unit can be formed of a lumped constant circuit. Specifically, the resonance unit includes a parallel inductor connected between the signal line of the high-frequency transmission line and the ground, and a series inductor connected between the signal line and the electrode of the high-frequency transmission line. Alternatively, the resonance unit can be configured by a distributed constant circuit. Specifically, a conductor pattern (also referred to as "stub") having a length depending on the wavelength used is formed on a printed circuit board on which the coupler is mounted, and this acts as a resonance part

ADVANTAGE OF THE INVENTION According to this invention, the outstanding communication system which can perform data communication without interference with another communication system using an electrostatic field or an induction electric field between information apparatuses can be provided.

In addition, according to the present invention, it is possible to provide an excellent communication system capable of realizing high-capacity data transmission of a high-frequency signal by a communication method using an electrostatic field or an induced electric field.

Further, according to the present invention, it is possible to provide an excellent communication system capable of extending the distance between the coupling electrodes of the transceiver to make the arrangement between the transceivers and the design of the communication device flexible. .

In the communication system according to the present invention, the surface wave radiated from the coupling electrode on the transmitter side is efficiently transmitted by the surface wave propagation means with low propagation loss. There is no need to directly contact each other's coupling electrodes, and data communication by electric field coupling is possible even at a long distance.

Further, according to the communication system according to the present invention, it is not necessary to perform fine alignment between the electrodes in order to sufficiently bring the electrodes to be electrically coupled to each other, and the electrodes are disposed outside the housing in the housing of the communication device. This eliminates the need to do so, increasing the degree of freedom in housing layout design.

The communication system according to the present invention can be used in a non-contact state between the coupling electrode of the transceiver and the surface wave transmission line provided by the surface wave propagation means, or in the middle of the surface wave transmission line. Therefore, it can be applied as non-contact communication in which there is no physical contact between devices or between a device and a member.

In the communication device according to the present invention, the surface wave radiated from the coupling electrode can be guided to a position where it can be easily used by the surface wave transmission line. Therefore, it is not necessary to dispose the coupling electrode near the outside of the communication device casing, so that the degree of freedom in mounting components and designing the layout of the casing is increased.

Other objects, features, and advantages of the present invention will become apparent from more detailed description based on embodiments of the present invention described later and the accompanying drawings.

Hereinafter, embodiments of the present invention will be described in detail with reference to the drawings.

The present invention relates to a communication system that performs data transmission between information devices using an electrostatic field or an induced electric field. According to a communication method based on an electrostatic field or an induced electric field, when there is no communication partner nearby, there is no coupling relationship and no radio waves are emitted, so that other communication systems are not disturbed. Further, even when radio waves arrive from a distance, the coupler does not receive radio waves, so that it is not necessary to receive interference from other communication systems

In the conventional radio communication using an antenna, the electric field strength of the radiated electric field is inversely proportional to the distance, whereas in the induced electric field, the electric field strength is inversely proportional to the distance squared, and in the static electric field, the electric field strength is inversely proportional to the cube of the distance. Therefore, according to the communication method based on electric field coupling, it is possible to configure a weak radio having a noise level for other radio systems in the vicinity, and it is not necessary to obtain a license from the radio station.

An electrostatic field that varies with time may be referred to as a "quasi-electrostatic field". In this specification, however, the electrostatic field is collectively referred to as an "electrostatic field".

IPR2025-00645 Page 02261

Conventional communication using an electrostatic field or an induction field uses a low-frequency signal and is not suitable for transmitting a large amount of data. On the other hand, in the communication system according to the present invention, high-capacity transmission is possible by transmitting a high-frequency signal by electric field coupling. Specifically, by applying a communication method using a high frequency and a wide band, such as UWB (Ultra Wide Band) communication, to the electric field coupling, it is possible to realize weak data and large capacity data communication.

UWB communication uses a very wide frequency band of 3.1 GHz to 10.6 GHz, and can realize high-capacity wireless data transmission of about 100 Mbps despite a short distance. UWB communication is a communication technology originally developed as a radio wave communication method using an antenna. For example, in IEEE 802.15.3, a data transmission method having a packet structure including a preamble as an access control method for UWB communication. Has been devised. In addition, Intel Corporation is considering a wireless version of USB that is widely used as a general-purpose interface for personal computers as a UWB application.

In addition, UWB communication allows data transmission exceeding 100 Mbps without occupying a transmission band of 3.1 GHz to 10.6 GHz, and considering the ease of making an RF circuit, 3.1-4. A transmission system using a 9 GHz UWB low band is also actively developed. The present inventors consider that a data transmission system using UWB low band is one of effective wireless communication technologies installed in mobile devices. For example, it is possible to realize high-speed data transmission in a short-distance area such as an ultra-high-speed short-range DAN (Device Area Network) including a storage device.

According to the UWB communication system using an electrostatic field or an induced electric field, the present inventors can perform data communication using a weak electric field, and can transfer a large amount of data such as moving images and music data for one CD at high speed. I think it can be transferred in a short time.

FIG. 19 shows a configuration example of a contactless communication system using an electrostatic field or an induced electric field. The illustrated communication system includes a transmitter 10 that transmits data and a receiver 20 that receives data.

The transmitting and receiving electrodes 13 and 23 of the transmitter 10 and the receiver 20 are arranged to face each other with a distance of, for example, about 3 cm, and can be coupled to each other. The transmission circuit unit 11 on the transmitter side generates a high-frequency transmission signal such as a UWB signal based on transmission data when a transmission request is generated from a higher-order application, and the signal propagates from the transmission electrode 13 to the reception electrode 23. Then, the receiving circuit unit 21 on the receiver 20 side demodulates and decodes the received high-frequency signal and passes the reproduced data to the upper application.

According to a communication method using a high frequency and a wide band like UWB communication, it is possible to realize ultrahigh-speed data transmission of about 100 Mbps at a short distance. In addition, when UWB communication is performed by electric field coupling instead of radio wave communication, the electric field strength is inversely proportional to the cube of the distance or the square of the distance, so the electric field strength (radio wave strength) at a distance of 3 meters from the radio equipment is By suppressing the frequency to a predetermined level or less, it is possible to obtain a weak radio that does not require a radio station license, and a communication system can be configured at low cost. In addition, when data communication is performed at an extremely short distance by the electric field coupling method, the signal quality is not deteriorated by the reflecting objects present in the vicinity, and it is not necessary to consider the prevention of hacking and ensuring the confidentiality on the transmission line. There are advantages such as.

On the other hand, since the propagation loss increases according to the propagation distance with respect to the wavelength, it is necessary to sufficiently suppress the propagation loss when a high-frequency signal is propagated by electric field coupling. In a communication system that transmits a high-frequency wideband signal such as a UWB signal by electric field coupling, even ultra-short-distance communication of about 3 cm corresponds to about a half wavelength for the used frequency band of 4 GHz, so it is ignored. It is a length that cannot be done. In particular, the problem of characteristic impedance is more serious in a high-frequency circuit than in a low-frequency circuit, and the influence of impedance mismatch becomes apparent at the coupling point between the electrodes of the transceiver.

In conventional contactless communication using frequencies in the kHz or MHz band, the propagation loss in space is small, so the transmitter and receiver are equipped with a coupler consisting only of electrodes, and the coupling part simply operates as a parallel plate capacitor. Even in this case, desired data transmission can be performed. On the other hand, in the case of non-contact communication using a high frequency in the GHz band, the propagation loss in space increases, so it is necessary to suppress the reflection of signals between the coupling electrodes of the transceiver and improve the transmission efficiency. is there. In the communication system shown in FIG. 19, even if the high-frequency signal transmission line connecting the transmission circuit unit 11 and the transmission electrode 13 is a coaxial line with impedance matching of 50Ω, for example, if the impedance at the coupling portion between the coupling electrodes 23 on the receiving side is mismatched, the signal is reflected to cause a propagation loss.

Therefore, as shown in FIG. 20, the high-frequency couplers disposed in each of the transmitter 10 and the receiver 20 include plate-like coupling electrodes 13 and 23, parallel inductors 12A and 22A, and series inductors 12B and 22B. It is configured by connecting to a high-frequency signal transmission line. When such a high-frequency coupler is disposed facing each other as shown in FIG. 21, the two electrodes operate as one capacitor and operate like a band-pass filter as a whole. High-frequency signals can be efficiently transmitted between the two. Here, the high-frequency signal transmission line indicates a coaxial cable, a microstrip line, a coplanar line, or the like.

In the contactless communication system shown in FIG. 19, when transmitting a high-frequency signal such as UWB by electric field coupling, the essential conditions for the high-frequency coupler are as follows.

(1) There is an electrode for coupling by an electric field.
(2) There is a parallel inductor for coupling with a stronger electric field.
(3) In the frequency band used for communication, the inductor and capacitor constants are set so that impedance matching can be achieved when the coupler is placed face to face.

As shown in FIG. 21, the band-pass filter composed of a pair of high-frequency couplers whose electrodes face each other has its pass frequency f_0 determined by the inductance of the series inductor and the parallel inductor and the capacitance of the capacitor constituted by the electrodes. can do. FIG. 22 shows an equivalent circuit of a bandpass filter composed of a set of high frequency couplers. If the characteristic impedance R [Ω], the center frequency f_0 [Hz], the phase difference between the input signal and the passing signal is α [radian] ($\pi < \alpha < 2\pi$), and the capacitance of the capacitor constituted by the electrodes is C / 2. The constants of the parallel and series inductances L_1 and L_2 constituting the band-pass filter can be obtained by the following equations according to the operating frequency f_0.

Further, when the coupler alone functions as an impedance conversion circuit, an equivalent circuit thereof is as shown in FIG. In the illustrated circuit diagram, an impedance conversion circuit that converts the characteristic impedance from R_1 to R_2 by selecting the parallel inductance L_1 and the series inductance L_2 in accordance with the operating frequency f_0 so as to satisfy the following equation. Can be configured.

FIG. 24 shows the result of measuring the propagation loss while changing the distance by placing the antenna, the coupler (when there is a parallel inductor), and the coupler (when there is no parallel inductor) facing each other.

IPR2025-00645 Page 02262

The coupler (with a parallel inductor) is strongly coupled and has a small propagation loss at a short distance of up to about 1 cm. However, it has a characteristic that it rapidly attenuates as the distance increases and does not cause interference to the surroundings. It has become. In contrast, the propagation loss of the antenna does not increase as much as the coupler (with the parallel inductor) even when the distance is increased, and thus the antenna may become an interference signal to other wireless systems. Further, in a coupler that does not have a parallel inductor, the propagation efficiency is poor, and the propagation loss is large even when the communication partner is nearby.

The coupling electrode of the high frequency coupler is connected to a high frequency transmission line such as a coaxial cable, a microstrip line, or a coplanar line. The "high frequency coupler" referred to in the present specification solves a problem peculiar to a high frequency circuit.

As described above, in the non-contact communication system shown in FIG. 19, a communication device that performs UWB communication uses the high-frequency coupler shown in FIG. 20 instead of using an antenna in a conventional radio communication system wireless communication device. As a result, it is possible to realize ultra-short distance data transmission having unprecedented characteristics.

Here, the resonance part 12 (or high frequency transmission line) which consists of a series inductor etc. shall be connected to the center of the electrode 13 for transmission. This is because, by connecting a high-frequency transmission line to the center of the electrode, current flows evenly in the electrode 13, and unnecessary radio waves are not radiated on the front surface of the electrode 13 in a direction substantially perpendicular to the electrode surface (see FIG. 18A), when the resonance part 12 is connected to a position having an offset from the center of the electrode 13, an unequal current flows in the electrode 13 and operates like a microstrip antenna to radiate unnecessary radio waves. (See FIG. 18B).

FIG. 25 shows an actual configuration example of the high-frequency coupler shown in FIG. In the illustrated example, the high frequency coupler on the transmitter 10 side is shown, but the receiver 20 side is similarly configured. In the figure, an electrode 13 is disposed on the upper surface of a cylindrical dielectric 15 and is electrically connected to a signal line on a printed circuit board 17 through a through hole 16 penetrating through the dielectric 15. In the illustrated high-frequency coupler, for example, after a through hole is formed in a cylindrical dielectric having a desired height, a conductor pattern to be a coupling electrode is formed on the upper end surface of the cylinder, and a through hole is formed in the through hole. It can be manufactured by filling the conductor with a conductor and mounting the dielectric on the printed circuit board by reflow soldering or the like

By appropriately adjusting the height from the circuit mounting surface of the printed circuit board 17 to the electrode 13, that is, the length of the through-hole 16, according to the wavelength used, the through-hole 16 has an inductance, and is substituted for the series inductor 12B. Can do. The signal line is connected to the ground 18 via a chip-like parallel inductor 12A. Although not shown, the parallel inductance can be replaced with a wiring pattern on a printed board instead of a chip. This type of inductance consists of a distributed constant circuit and is also referred to below as a "stub".

The dielectric 15 and the through hole 16 have a role of avoiding the coupling between the electrode 13 and the ground 18 and a role of forming the series inductor 12B. By taking a sufficient height from the circuit mounting surface of the printed circuit board 17 to the electrode 13 to constitute an inductance equivalent to the series inductor 12B, electric field coupling between the ground 18 and the electrode 13 can be avoided, and a high frequency coupler can be obtained. The function (that is, the electric field coupling action with the high frequency coupler on the receiver side) is secured. However, when the height of the dielectric 15 is large, that is, when the distance from the circuit mounting surface of the printed circuit board 17 to the electrode 13 becomes a length that cannot be ignored with respect to the wavelength used, the series inductor 12B, that is, the resonance unit 12 acts as an antenna. Has the harmful effect of emitting radio waves. In this case, the radiated radio wave due to the behavior of the antenna in the resonance unit 12 of the high frequency coupler is less attenuated with respect to the distance than the electrostatic field or the induced electric field, so that the electric field strength at a distance of 3 meters from the radio equipment is below a predetermined level. It becomes difficult to suppress to weak radio. Therefore, the height of the dielectric 15 avoids coupling with the ground 18 and sufficiently obtains the characteristics as a high-frequency coupler, configures the series inductor 12B necessary for acting as a resonance circuit, The condition is that the resonance part composed of the series inductor 12B does not increase the function as an antenna.

In general, metal prevents the antenna from efficiently radiating radio waves, so that a metal such as a ground cannot be disposed in the vicinity of the radiating element of the antenna. On the other hand, in the communication system according to the present embodiment, the high frequency coupler does not deteriorate in characteristics even if a metal is disposed on the back side of the electrode 13. Further, by appropriately selecting the constants of the series inductor 12B and the parallel inductor 12A, it can be made smaller than the conventional antenna. In addition, since the electrostatic field does not have a polarization like an antenna, a certain communication quality can be ensured even if the direction is changed.

In the field of radio wave communication, as shown in FIG. 5, a "capacitance loaded type" antenna is widely known in which a metal is attached to the tip of an antenna element to provide a capacitance and the height of the antenna is shortened. At first glance, the coupler is similar in structure to the coupler shown in FIG. Here, the difference between the coupler used in the transceiver in this embodiment and the capacity loaded antenna will be described.

The capacity loaded antenna shown in FIG. 5 radiates radio waves in the directions B_1 and B_2 around the radiating element of the antenna, but the A direction is a null point that does not radiate radio waves. When the electric field generated around the antenna is examined in detail, the radiation electric field attenuated in inverse proportion to the distance from the antenna, the induced electric field attenuated in inverse proportion to the square of the distance from the antenna, and the distance from the antenna 3 An electrostatic field that decays in inverse proportion to the power is generated. Since the induced electric field and the electrostatic field are attenuated more rapidly depending on the distance than the radiated electric field, only the radiated electric field is discussed in a normal wireless system, and the induced electric field and the electrostatic field are often ignored. Therefore, even the capacitively loaded antenna shown in FIG. 5 generates an induced electric field and an electrostatic field in the direction A, but is rapidly used in radio communication because it attenuates quickly in the air. Absent.

Next, consider the electromagnetic field generated at the coupling electrode on the transmitter side. FIG. 16 shows an electromagnetic field generated by a minute dipole. In FIG. 26, this electromagnetic field is mapped onto the coupling electrode. As shown in the figure, the electromagnetic field is roughly divided into an electric field component (transverse wave component) E_θ that vibrates in a direction perpendicular to the propagation direction and an electric field component (longitudinal wave component) E_R that vibrates in a direction parallel to the propagation direction. . In addition, a magnetic field $H_{i\phi}$ is generated around the minute dipole. The following equation represents the electromagnetic field due to a small dipole, but since an arbitrary current distribution can be considered as a continuous collection of such small dipoles, the electromagnetic field induced thereby has similar properties (for example, (See, "Antenna / Radio Wave Propagation" by Yasuto Mushiaki (Corona, pages 16-18)).

As can be seen from the above equation, the transverse wave component of the electric field includes a component that is inversely proportional to the distance (radiated electric field), a component that is inversely proportional to the square of the distance (induced electric field), and a component that is inversely proportional to the cube of the distance (electrostatic field).). Further, the longitudinal wave component of the electric field is composed of only a component inversely proportional to the square of the distance (inductive electric field) and a component inversely proportional to the cube of the distance (electrostatic field), and does not include the component of the radiated electromagnetic field. Further, the electric field E_θ becomes maximum in the direction in which $|\cos\theta| = 1$, that is, in the direction of the arrow in FIG.

IPR2025-00645 Page 02263

in the radic communications are widely used in wireless communication, radio wave emitted from an antenna is a transverse wave E_{theta} oscillating in the perpendicular direction its traveling direction, the radio wave can not communicate with the direction of polarization is orthogonal In contrast, electromagnetic waves emitted from the coupling electrode in a communication system utilizing an electrostatic field or an induced electric field, in addition to the transverse wave $E_{theta,}$ including longitudinal wave E_R which oscillates in the traveling direction. The longitudinal wave E_R is also called "surface wave". A surface wave can also propagate through the inside of a medium such as a conductor, a dielectric material, or a magnetic material (described later).

In a non-contact communication system, a signal can be transmitted via any component of a radiated electric field, an electrostatic field, and an induced electric field. However, a radiated electric field that is inversely proportional to distance can cause interference to other systems that are relatively far away. Therefore, to suppress the component of the radiation field, in other words, while suppressing the transverse wave E_{theta} comprising the components of the radiation field, the non-contact communication is preferred utilizing longitudinal wave E_R not containing component of the radiation field.

From the viewpoint described above, the high frequency coupler according to the present embodiment has the following devices. First, it can be seen from the above-described three equations showing the electromagnetic field that $E_\theta = 0$ and the E_R component takes a maximum value when $\theta = 0°$. That is, E_θ is maximized in a direction perpendicular to the direction of current flow, and E_R is maximized in a direction parallel to the direction of current flow. Therefore, to maximize E_R perpendicular front direction with respect to the electrode surface, it is desirable to increase the vertical direction of the current component to the electrode. On the other hand, when the feeding point is offset from the center of the electrode, the current component in the direction parallel to the electrode increases due to this offset. Then, the front direction of the E_{theta} component of the electrode according to the current component is increased. Therefore, in the high-frequency coupler according to the present embodiment, the feeding point substantially at the center position of the electrode as shown in FIG. 18A (described above), is the E_R component is set to be maximum.

Of course, not only the radiated electric field but also the static electric field and the induced electric field are generated in the conventional antenna, and the electric field coupling occurs when the transmitting and receiving antennas are brought close to each other. However, most of the energy is emitted as the radiated electric field, which is efficient for non-contact communication. Not right. In contrast, the high-frequency coupler shown in Figure 20, to enhance transmission efficiency create a stronger electric field E_R at a predetermined frequency, the electrode and the resonance unit for coupling is formed

When the high frequency coupler shown in FIG. 20 is used alone on the transmitter side, a longitudinal wave electric field component E_R is generated on the surface of the coupling electrode, but the transverse wave component E_θ including the radiation electric field is changed to E_R. Since it is relatively small, almost no radio waves are emitted. That is, no disturbing wave to other neighboring systems is generated. Also, most of the signal input to the high frequency coupler is reflected by the electrode and returns to the input end.

On the other hand, when one set of high-frequency couplers is used, that is, when the high-frequency couplers are arranged at a short distance between the transceivers, the coupling electrodes are coupled mainly by a quasi-electrostatic field component to form one capacitor. It works like a bandpass filter and is in a state where impedance matching is achieved. Therefore, most of the signal / power is transmitted to the other party in the passing frequency band, and the reflection to the input end is small. The "short distance" here is defined by the wavelength λ, and corresponds to the distance d between the coupling electrodes being $d << \lambda / 2\pi$. For example, when the use frequency f_0 is 4 GHz, the distance between the electrodes is 10 mm or less.

Also, when placing the EFC medium distance between the transmitter and the receiver are on the periphery of the coupling electrode of the transmitter, the electrostatic field is attenuated, the longitudinal wave electric field E_R mainly composed of an induced electric field is generated . Longitudinal wave electric field E_R is received by the coupling electrode of the receiver, the signal is transmitted. However, in comparison with the case where both couplers are arranged at a short distance, in the high frequency coupler on the transmitter side, the ratio of the input signal reflected by the electrode and returning to the input end becomes higher. The "medium distance" here is defined by the wavelength λ, the distance d between the coupling electrodes is about 1 to several times larger than $\lambda / 2\pi$, and the distance between the electrodes is 10 to 40 mm when the use frequency f_0 is 4 GHz. At the time.

By the way, in a communication system using an electrostatic field or an induction field, the electric field strength is rapidly attenuated in inverse proportion to the cube of the distance and the square of the distance, so that the communication range is limited to an extremely short distance. . Further, when a high-frequency signal such as UWB communication is used, the problem of a large propagation loss due to the short wavelength is further added. For this reason, it is necessary to make the transmitter and receiver electrodes (couplers) as close as possible, and communication over a long distance cannot be performed. Further, in order to bring the electrodes sufficiently close to each other, it is necessary to perform delicate alignment between the electrodes, and the position must be maintained during data communication, which is not convenient for the user.

On the other hand, in the communication system according to the present invention, a surface wave transmission line made of a dielectric or magnetic material is disposed between the coupling electrode on the transmitter side and the coupling electrode on the receiver side, Among the electromagnetic waves radiated from the coupling electrode, the surface wave can be efficiently propagated through and inside the surface wave transmission line. Therefore, even if the coupling electrodes of the transmitter and the receiver are separated from each other by a relatively long distance, the surface wave radiated by the electric field coupling can be transmitted with low propagation loss, and data communication can be performed. It is no longer necessary to make the bonding electrodes directly contact each other.

Of the transmission waves using an electromagnetic field, those having a phase velocity v smaller than the light velocity c are called slow waves, and those having a larger phase velocity v are called fast waves. Surface waves are equivalent to the former slow waves. In an infinitely long transmission line with a slow wave structure, energy is concentrated in the transmission line, and no external radiation is generated (for example, "New Millimeter Wave" written by Tsuyoshi Teshirogi, edited by Tsutomu Yoneyama) Technology "(see Ohm, P119). Here the surface wave to say, among the electric field generated from the coupling electrode, which corresponds to a longitudinal wave E_R which is a component that vibrates in the direction of propagation and parallel to the direction (above).

A mechanism in which electromagnetic waves propagate along the surface of a conductor, dielectric, or magnetic material is known as, for example, "Gobo Line" or "G Line" (for example, US Pat. No. 2,685,068, US Pat. No. 2,921,277). See the description).

For example, Japanese Patent Laid-Open No. 2003-115707 discloses a surface wave transmission line using a dielectric made of a thermoplastic polymer as a medium. Japanese Laid-Open Patent Publication No. 7-175987 discloses a surface wave transmission line in which a dielectric or dielectric fiber with low high-frequency loss is brought together with a predetermined periodic structure so that the electromagnetic field distribution range can be controlled to some extent. Proposals have been made. For details of the mechanism of the surface wave transmission line for propagating electromagnetic waves, refer to, for example, Masamitsu Nakajima "Microwave Engineering" (Morokushi Publishing, pages 182 to 190).

In addition, electromagnetic surface waves propagating through one ferrite rod magnetized in the axial direction have been extensively studied, and there are three types of surfaces. "dynamic", "surface (surface mode)", and "volume (stereoscopic mode)". It has already been clarified that a wave mode exists. The dynamic mode exists in a frequency range where the ferrite can be regarded as a mere dielectric, and is a forward wave. On the other hand, the surface mode and the three-dimensional mode are

IPR2025-00645 Page 02264

modes in which electric power is collected near the surface of the ferrite rod or in the center, respectively, and is mainly backwave. Of these modes, the surface mode is applied to the resonator, and the three-dimensional mode is applied to the delay line and Faraday rotator (Study on surface waves propagating through two parallel ferrite rods by Toshiaki Akira "checking).

FIG. 3 shows a configuration example of a non-contact communication system in which a surface wave transmission line is interposed between high-frequency coupling electrodes of a transceiver. The illustrated communication system includes a transmitter 10 that transmits data, a receiver 20 that receives data, and a surface wave transmission line that transmits surface waves radiated from a transmitting electrode 13 on the transmitter 10 side with low propagation loss. 30. The surface wave transmission line 30 is made of a dielectric material or a magnetic material, and is disposed along the traveling direction of the surface wave radiated from the transmitting electrode 13.

The transmission circuit unit 11 on the transmitter 10 side generates a high-frequency transmission signal such as a UWB signal based on transmission data when a transmission request is issued from a higher-level application. The signal output from the transmission circuit unit 11 resonates at the resonance unit 12 and is radiated from the transmitting electrode 13 as a surface wave in the front direction from the electrode.

The surface wave radiated from the transmitting electrode 13 is efficiently propagated through the surface wave transmission line 30 and is input from the receiving electrode 23 on the receiver 20 side to the receiving circuit unit 21 via the resonance unit 22. . The receiving circuit unit 21 demodulates and decodes the received high-frequency signal and passes the reproduced data to the upper application.

When the surface wave emitted from the transmitting electrode 13 is incident from the end face of the surface wave transmission line 30, it propagates to the receiving side without loss while repeating reflection every time it reaches the boundary surface with the outside (described later). . Therefore, the signal can efficiently propagate from the transmitting electrode 13 to the receiving electrode 23 due to the intervention of the surface wave transmission line 30. Further, in order to increase the incident angle of the surface wave radiated from the transmitting electrode 13 and reduce the ratio of the transmitted wave radiated to the outside, the end face of the surface wave transmission line 30 made of a dielectric or magnetic material is used for the transmission. Desirably, the electrode 13 is disposed on the front surface so as to be substantially perpendicular to the electrode surface.

In FIG. 4, the structural example of the surface wave transmission part (high frequency coupler) of the transmitter 10 is shown. It should be understood that the configuration of the surface wave receiving portion on the receiver 20 side is the same

As shown in the figure, a resonance portion and an electrode of a linear conductor having a predetermined length are attached to the tip portion of the high-frequency signal line made of a coaxial cable. The resonance unit 12 and the transmitting electrode 13 as a whole are designed to have a length of a quarter wavelength of a predetermined frequency, thereby resonating at a predetermined frequency and generating a surface wave of that frequency. be able to. Normally, the generated surface wave is abruptly attenuated in the air as the distance increases. However, the resonance part 12 is connected to the center of the transmitting electrode 13 at the tip, and the radiation surface of the electrode is almost at the front of the electrode. By installing the surface wave transmission line 30 made of a dielectric or magnetic material in the vertical direction, the surface wave transmitted from the transmitting electrode 13 is captured by the surface wave transmission line 30 made of a dielectric or magnetic material, and the surface wave is transmitted. it can be a transmitter (or a high frequency coupler).

A surface wave transmission line 30 made of a dielectric material or a magnetic material is disposed in front of the transmitting electrode 13 where the strength of the induced electric field and the electrostatic field is large, at a position perpendicular to the electrode surface. Then, when the induction electromagnetic field and the electrostatic field generated in the vicinity of the electrode 13 are captured by the end face of the surface wave transmission line 30, they propagate through the transmission line 30 and are input to the receiving electrode 23 on the receiver 20 side. The That is, by transmitting the electromagnetic field radiated from the electrode 13 on the transmitter 10 side as a surface wave in the surface wave transmission line 30, data communication using the surface wave can be enabled.

FIG. 6 shows another configuration example of the surface wave transmission portion of the transmitter 10. It should be understood that the configuration of the surface wave receiving portion on the receiver 20 side can be similarly configured.

The surface wave transmitting part and the receiving part are each provided with a resonance part 12 by a lumped constant circuit using a coil or a capacitor instead of a linear conductor. In the example illustrated in FIG. 6, the resonance unit 12 includes a parallel inductor 12 </ b> A connected between the signal line of the high-frequency transmission line from the transmission circuit unit 11 and the ground, and a series inductor 12 </ b> B connected between the signal line and the electrode. Therefore, a strong electric field is generated in front of the electrode, and surface waves can be generated efficiently.

In a transceiver, when a pair of high-frequency couplers as shown in FIG. 6 are arranged facing each other with a surface wave transmission line interposed, two electrodes operate as one capacitor, and the bandpass as a whole. ・ It works like a filter. Here, by adjusting the constant of the series inductor 12B, the constant of the parallel inductor 12A, and the constant of the capacitor formed of the electrodes 13 and 23, it is possible to design the impedance in the coupling portion to be continuous. (As described above).

The surface wave incident on the surface acoustic wave transmission line made of a dielectric is promoted in the propagation direction (that is, the receiver side) while being repeatedly reflected every time it reaches the boundary surface with the outside. FIG. 1 illustrates how a surface wave propagates inside a surface wave transmission line made of a dielectric. However, it is assumed that the dielectric constant ε of the dielectric is larger than the dielectric constant ε $_0$ of the air surrounding the surface wave transmission line.

When electromagnetic waves (surface waves) enter the boundary between two media having different dielectric constants, refraction similar to that in optics occurs. When the incident angle θ $_i$ becomes equal to the critical angle θc expressed by the following equation, the refraction angle θ $_t$ becomes equal to π / 2, and the transmitted wave of the dielectric travels parallel to the boundary surface. When the incident angle θ $_i$ is larger than that, complete reflection occurs at the boundary surface. Therefore, when an electromagnetic wave is incident on the inside of the dielectric plate at an appropriate angle, the electromagnetic wave (surface wave) is propagated efficiently without being repeatedly reflected at the two boundaries.

FIG. 2 illustrates how a surface wave propagates in a surface wave transmission line made of a magnetic material. However, it is assumed that the magnetic permeability μ of the magnetic material is larger than the magnetic permeability μ $_0$ of the air surrounding the surface wave transmission line. When electromagnetic waves (surface waves) are incident on the boundary between two media having different magnetic permeability, refraction similar to that in optics occurs. That is, when the incident angle θ $_i$ becomes equal to the critical angle θ $_c$ expressed by the following equation, the refraction angle θ $_t$ becomes equal to π / 2, and the transmitted wave travels parallel to the boundary surface. When the incident angle θ $_i$ is larger than that, complete reflection occurs at the boundary surface. Therefore, when an electromagnetic wave is incident on the inside of the magnetic plate at an appropriate angle, the electromagnetic wave (surface wave) is repeatedly reflected at the two boundaries and propagates efficiently without loss as in the case shown in FIG. is done.

As shown in FIG. 27, the present inventors perform high-frequency signal transmission by interposing a surface wave transmission line made of a dielectric (or magnetic material) between two opposing high-frequency couplers 1 and 2. The electromagnetic field distribution generated around the surface wave transmission line was obtained by simulation using the finite element method. However, the surface wave transmission line is assumed to be a dielectric having a relative permittivity of 10, a

IPR2025-00645 Page 02265

relative permeability of 10, and an electric conductivity of 0 [Siemens / m], and its cross-sectional area is 6 mm × 6 mm and the length is 49.6 mm. The gap between both end faces of the surface wave transmission line and the coupling electrode was set to 50 mm, and the operating frequency was 4.5 GHz. The high-frequency coupler is composed of a coupling electrode having an area of 20 mm × 42 mm, a thickness of 0.8 mm, a dielectric constant of 3.4, and an area of 11 mm × 11 mm and a height of 3 mm. It is composed of a stub (described above) having a width of 20 mm and a width of 3 mm. The longitudinal direction of the surface wave transmission line, that is, the signal transmission direction is taken as the z axis, and the plane parallel to the electrode of the coupling electrode is taken as the xy plane.

28A to 28F show changes in the electric field distribution in the zx plane when the high-frequency signal is transmitted through the surface wave transmission line in the configuration shown in FIG. Show. As shown in the figure, it can be seen that a surface wave having an amplitude in the direction perpendicular to the surface of the surface wave transmission line made of a dielectric propagates from the high frequency coupler 1 toward the high frequency coupler 2.

In addition, it is known that a magnetic field is generated by a temporal change of an electric field. FIGS. 29A to 29F show changes in the magnetic field distribution in the xy plane when the high frequency signal is transmitted through the surface wave transmission line in the configuration shown in FIG. Show.

FIG. 30 schematically shows an electric field distribution and a magnetic field distribution generated around the surface acoustic wave transmission line made of a dielectric based on FIGS. As described above, the surface wave propagating through the transmission line includes a surface mode in which energy is collected near the surface of the transmission line and a three-dimensional mode in which energy is collected in the center of the transmission line. As can be seen from FIG. 30, the energy of the surface wave propagating through the surface acoustic wave transmission line made of a dielectric is near the central axis (solid mode) where the longitudinal wave component propagates and near the surface (surface) where the transverse wave component propagates. Mode). That is, an electric field perpendicular to the surface of the dielectric is generated near the surface of the dielectric, and a longitudinal electric field (including the above-described total reflection component) that vibrates in a direction substantially parallel to the traveling direction in the central portion of the dielectric. Further, a signal propagates by generating a magnetic field so as to be wound around the central axis of the dielectric in accordance with these two types of electric field changes.

At this time, when the direction and strength of current and magnetism change (alternating current) and a suitable magnetic field that interacts with the electric field is generated, the magnetic field is generated when there is an electric field, and the electric field is generated when there is a magnetic field Thus, it is expected that the surface wave signal propagates far away while alternately changing the form of energy between the electric field and the magnetic field. On the other hand, in the case of a magnetic substance having a relative dielectric constant of 1 for the surface wave transmission line, only the electric field component is generated from the high-frequency coupler, making it difficult to capture the signal.

FIG. 31 shows a state where a longitudinal wave electric field E_R generated on the surface of the coupling electrode of the high frequency coupler is transferred as a surface wave at the end of the surface wave transmission line made of a dielectric. When the longitudinal wave electric field E_R generated on the surface of the coupling electrode is incident from the end face of the surface wave transmission line, the longitudinal wave component propagates in a three-dimensional mode near the central axis of the surface wave transmission line as shown in FIG. 31A. When a longitudinal wave electric field E_R generated on the surface of the coupling electrode is perpendicularly incident from the outer periphery near the end of the surface wave transmission line, the transverse wave component is generated near the surface of the surface wave transmission line as shown in FIG. 31B. Propagate by surface mode.

Thus, when a surface wave propagates on a surface wave transmission line made of a dielectric, both a three-dimensional mode and a surface mode exist, and energy is transmitted by both the three-dimensional mode and the surface mode. Therefore, in order to receive the surface wave emitted from the high frequency coupler without loss, the size of the end face of the surface wave transmission line (the thickness of the transmission line) is sufficiently larger than the size of the coupling electrode. It is thought that it is preferable.

Figure 32, in the configuration shown in FIG. 27 shows the results of the propagation loss S_{21} when changing the size of the transceiver each coupling electrode was determined by simulation using the finite element method. However, the surface wave transmission line is assumed to be a dielectric having a relative permittivity of 10, a relative permeability of 10, and an electric conductivity of 0 [Siemens / m], and its cross-sectional area is 6 mm × 6 mm and the length is 49.6 mm. The gap between both end faces of the surface wave transmission line and the coupling electrode was set to 50 mm, and the operating frequency was 4.5 GHz. The high-frequency coupler is composed of a square coupling electrode having an area of 20 mm × 42 mm, a thickness of 0.8 mm, and a dielectric constant of 3.4 mm, and a height of 3 mm. The resonance part is 20 mm long and has a width. The length of one side of the coupling electrode is variable. From the figure, it can be said that the propagation loss S_{21} is substantially constant when the thickness of the surface wave transmission line does not change.

Further, in FIG. 33, in the configuration shown in FIG. 27, the propagation loss S_{21} when varying the thickness of the surface-wave transmission line shows the results obtained in the simulation by the finite element method. However, the frequency used is 4.5 GHz. The surface wave transmission line is assumed to be a dielectric having a relative permittivity of 10, a relative permeability of 10, and an electric conductivity of 0 [Siemens / m], and its length is 49.6 mm. And the gap between the coupling electrodes was set to 50 mm, and the cross-sectional area was variable. The high-frequency coupler is composed of a coupling electrode having an area of 20 mm × 42 mm, a thickness of 0.8 mm, and a dielectric constant of 3.4, and an area of 11 mm × 11 mm and a height of 3 mm. It is assumed that the stub is composed of 20 mm and a width of 3 mm (described above). From the figure, it can be seen that the propagation loss S_{21} changes depending on the thickness of the surface wave transmission line.

In addition, FIG. 34 shows a result obtained by simulating the propagation loss S_{21} when the relative permittivity and the relative permeability of the surface wave transmission line are changed in the configuration shown in FIG. 27 by a finite element method simulation. . However, the frequency used is 4.5 GHz, and the high-frequency coupler is a coupling electrode having an area of 20 mm × 42 mm, a thickness of 0.8 mm, and a dielectric constant of 3.4 on an area of 11 mm × 11 mm and a height of 3 mm. It is assumed that the resonance part is composed of a stub (described above) having a length of 20 mm and a width of 3 mm. The surface wave transmission line has a cross-sectional area of 6 mm × 6 mm and a length of 49.6 mm, and the gap between both end faces of the surface wave transmission line and the coupling electrode is set to 50 mm. From the figure, it can be seen that the propagation loss S_{21} changes depending on the relative permittivity and relative permeability of the surface wave transmission line.

Propagation loss S_{21} of the surface wave transmission line made of a dielectric depends on the frequency, the relative permittivity of the transmission line, the relative permeability, and the thickness of the surface wave transmission line. In consideration of the simulation results shown in FIGS. 32 to 34, for example, when the frequency is 4.5 GHz, the relative permittivity is 10, the relative permeability is 10, and the thickness of the surface wave transmission line is about 6 mm × 6 mm The signal propagates efficiently with little loss.

It is known that a surface wave propagates through the surface of a conductor such as a metal wire in addition to the inside of a dielectric or magnetic material. When a surface acoustic wave transmission line made of a magnetic material is used, only the electric field component is generated from the high frequency coupler, and a magnetic material with a relative dielectric constant of 1 cannot capture a signal, so the propagation loss of the surface wave is large. However, a surface acoustic wave can be efficiently transmitted with a magnetic material having a relative dielectric constant greater than 1. Further, when a surface acoustic wave transmission line made of a dielectric is used, an electric field perpendicular to the surface of the dielectric, and an electric field of a longitudinal wave that vibrates in a direction parallel to the

IPR2025-00645 Page 02266

traveling direction generated in the central portion of the dielectric, A signal propagates by a magnetic field generated so as to wrap around the central axis of the dielectric.

FIG. 17A shows the relationship between the transmission line length and the propagation loss S_{21} when PPS (polyphenylene sulfide resin) as the dielectric, NiZn ferrite as the magnetic material, and a magnet are used for the surface wave transmission line. Yes. However, PPS has a dielectric constant of 5 to 12, a dielectric loss tangent of 0.002 and a diameter of 10 mm, NiZn ferrite has a diameter of 9 mm (inner diameter of 5 mm), and a magnet has a diameter of 6 mm (see FIG. 17B). The propagation loss S_{21} of the surface wave transmission line is a surface wave from the high frequency signal line (Port 1) on the transmitter side to the high frequency signal line (Port 2) on the receiver side when the surface wave transmission line is sandwiched between the electrodes. Is a loss in propagation (see FIG. 17C). From FIG. 17A, it can be understood that the propagation loss is reduced by the presence of the surface wave transmission line between the couplers of the transmitter and the receiver as compared with the case where the surface wave is propagated without placing the free space, that is, the surface wave transmission line. Like.

The shape of the surface wave transmission line 30 made of a dielectric or magnetic material is not particularly limited. For example, it may be any of a plate shape as shown in FIG. 7, a belt shape as shown in FIG. 8, and a line shape as shown in FIG. In addition, if the surface wave transmission line is shaped like a spindle as shown in FIG. 10 and its apex is directed to a specific receiver, the surface wave captured on the bottom surface is propagated from the coupling electrode on the transmitter side. Therefore, efficient propagation can be realized. For example, in the case of performing one-way communication from one communication device to the other communication device, such a transmission line configuration is advantageous.

As shown in FIG. 11, the surface wave transmission line 30 may be configured to cover the surface of a dielectric having a high dielectric constant with an outer layer 31 of another dielectric having a lower dielectric constant. By doing so, even if the surface wave is transmitted without reflecting the surface of the dielectric having a high dielectric constant, it is reflected on the surface of another dielectric covering the surface and pulled back to the center dielectric layer. It is. That is, the ratio of surface waves radiated to the outside as transmitted waves in the course of propagation through the surface wave transmission line 30 can be suppressed, and signals can be transmitted more efficiently.

Needless to say, the same effect can be obtained by forming two or more outer layers having different dielectric constants ε (or magnetic permeability μ) as shown in FIG. . In addition, the dielectric constant ε (or magnetic permeability μ) does not change stepwise according to the distance r from the center, but is continuously changed according to the distance r from the center as shown in FIG. Alternatively, even if the magnetic permeability μ) changes, the ratio of surface waves radiated to the outside of the surface wave transmission line 30 as transmitted waves can be similarly suppressed.

FIG. 13 shows an object made of a dielectric having a high dielectric constant ε (or magnetic permeability μ) and another dielectric (or magnetic substance) having a low dielectric constant ε (or magnetic permeability μ) as the surface wave transmission line 30. It shows a state where it was buried inside. Further, another object that fills a dielectric having a high dielectric constant ε (or magnetic permeability μ) can be configured, for example, as a rack or a member for positioning the coupling electrodes 13 and 23 of the transmitter 10 and the receiver 20. .

FIG. 14 shows an example in which the surface acoustic wave transmission line 30 is composed of a plurality of dielectric bodies (or magnetic bodies) separated in the middle rather than a single dielectric body (or magnetic body). Since the middle of the surface wave transmission line 30 can be cut off and used in a non-contact state, the communication system according to the present embodiment is applied as non-contact communication in which there is no physical contact between devices or between a device and a member. can do. The separated dielectrics do not have to be in contact with each other, but in order to keep the loss small, the distance between the dielectrics is small, and it is desirable that the surfaces where signals are transmitted face each other face each other. .

FIG. 15 shows a configuration example of a non-contact communication device using a surface wave transmission line. In the illustrated example, the transmission / reception circuit unit and the coupling electrode are mounted on the main circuit board in the non-contact communication device. If nothing is placed in front of the electrode housed deep inside the housing, the signal radiated from the electrode is dispersed in the air inside the housing and lost. On the other hand, according to the configuration of the communication device shown in FIG. 15, a dielectric or magnetic material serving as a surface wave transmission line is installed in front of the coupling electrode, and the electromagnetic field radiated from the coupling electrode is An efficient signal transmission is possible by inducing a signal to a desired part of the surface of the housing by the transmission line.

So far, in the communication system shown in FIG. 3, a mechanism for transmitting a signal between a pair of high-frequency couplers by interposing a surface wave transmission line has been described. Here, when a signal is transmitted between two devices, energy transfer is inevitably involved. Therefore, this type of communication system can be applied to power transmission. As described above, the electric field E_R generated by the high frequency coupler on the transmitter side propagates on the surface wave transmission line as a surface wave. On the receiver side, the signal received by the high-frequency coupler can be rectified and stabilized to extract power.

FIG. 35 shows a configuration example when the communication system shown in FIG. 3 is applied to power transmission.

In the illustrated system, a charger connected to an AC power source and a high-frequency coupler incorporating a wireless communication device can perform power transmission and charging to the wireless communication device via a surface wave transmission line placed between them. it can. However, the high frequency coupler is used only for power transmission.

When the receiving high-frequency coupler is not near the transmitting high-frequency coupler, most of the power input to the transmitting high-frequency coupler is reflected and returns to the DC / AC inverter side, so that unnecessary radio waves are sent to the outside. Radiating or consuming more power than necessary can be suppressed.

Moreover, although the example which performs charge to a radio | wireless communication apparatus was given in the figure, you may make it perform the non-contact electric power transmission not only to a radio | wireless machine but the music player or a digital camera, for example.

FIG. 36 shows another configuration example in which the communication system shown in FIG. 3 is applied to power transmission. The illustrated system is configured to use a high-frequency coupler and a surface wave transmission line for both power transmission and communication.

Switching of the timing for performing communication and power transmission is performed by a communication / transmission (reception) switching signal sent from the transmission circuit unit. For example, communication and power transmission may be switched at a predetermined cycle. At this time, the power transmission output can be kept optimal by adding the charging state to the communication signal and feeding back to the charger side. For example, when charging is completed, the information is sent to the charger side, and the power transmission output is set to zero. Or you may make it superimpose communication data on electric power.

The system shown in the figure is configured so that the charger is connected to an AC power source. However, the system is used for other purposes such as sharing power from another mobile phone to a mobile phone having a low battery, for example. Also good.

The present invention has been described in detail above with reference to specific embodiments. However, it is obvious that those skilled in the art can make modifications and substitutions of the embodiment without departing from the gist of the present invention.

IPR2025-00645 Page 02267

In the present specification, the embodiment applied to a communication system in which a UWB signal is data-transmitted by electric field coupling in a cableless manner has been mainly described, but the gist of the present invention is not limited to this. For example, the present invention can be similarly applied to a communication system that uses a high-frequency signal other than the UWB communication method and a communication system that performs data transmission by electric field coupling using a relatively low frequency signal.

In the present specification, the embodiment in which the present invention is applied to a system that performs data communication between a pair of high-frequency couplers by interposing a surface wave transmission line has been mainly described. Since transmission of a signal necessarily involves energy transfer, this type of communication system can naturally be applied to power transmission.

In short, the present invention has been disclosed in the form of exemplification, and the description of the present specification should not be interpreted in a limited manner. In order to determine the gist of the present invention, the claims should be taken into consideration.

FIG. 1 is a diagram illustrating a state in which a surface wave propagates in a surface wave transmission line made of a dielectric material. FIG. 2 is a diagram showing how a surface wave propagates in a surface wave transmission line made of a magnetic material. FIG. 3 is a diagram illustrating a configuration example of a communication system according to an embodiment of the present invention. FIG. 4 is a diagram illustrating a configuration example of a surface wave transmission portion of the transmitter 10. FIG. 5 is a diagram illustrating a configuration example of a capacity loaded antenna. FIG. 6 is a diagram illustrating another configuration example of the surface wave transmission portion of the transmitter 10. FIG. 7 is a diagram illustrating an example of a surface wave transmission line configured in a plate shape. FIG. 8 is a diagram showing an example of a surface acoustic wave transmission line configured in a band shape. FIG. 9 is a diagram illustrating an example of a surface acoustic wave transmission line configured in a linear shape. FIG. 10 is a diagram showing an example of a surface wave transmission line configured in a spindle shape. FIG. 11 is a diagram showing a configuration example in which the surface of a dielectric having a high dielectric constant as a surface wave transmission line is covered with another dielectric layer having a lower dielectric constant. FIG. 12 is a diagram illustrating a configuration example of a surface acoustic wave transmission line whose permittivity continuously changes according to the distance r from the center. FIG. 13 is a diagram showing a state in which a dielectric having a high dielectric constant is embedded as another surface acoustic wave transmission line in another dielectric having a low dielectric constant. FIG. 14 is a diagram illustrating an example in which the surface acoustic wave transmission line is configured by a plurality of dielectric bodies (or magnetic bodies) separated in the middle instead of a single dielectric body (or magnetic body). FIG. 15 is a diagram illustrating a configuration example of a contactless communication device using a surface wave transmission line. FIG. 16 is a diagram showing an electric field component (longitudinal wave component) E_R that vibrates in a direction parallel to the propagation direction. FIG. 17A is a diagram showing the relationship between the transmission line length and the propagation loss when PPS (polyphenylene sulfide resin) is used as the dielectric, or NiZn ferrite and a magnet are used as the surface acoustic wave transmission line. FIG. 17B is a diagram illustrating a material used as a surface acoustic wave transmission line. FIG. 17C is a diagram for explaining the propagation loss. FIG. 18A is a diagram illustrating a state of a current flowing through an electrode when a high-frequency transmission line is connected to the center of the electrode of the high-frequency coupler. FIG. 18B is a diagram illustrating a state in which an unequal current flows in the electrode and radiates unnecessary radio waves when the high-frequency transmission line is connected to a position having an offset from the center of the electrode of the high-frequency coupler. FIG. 19 is a diagram illustrating a configuration example of a contactless communication system using an electrostatic field or an induction field. FIG. 20 is a diagram illustrating a configuration example of a high-frequency coupler disposed in each of the transmitter 10 and the receiver 20. FIG. 21 is a diagram showing a state in which the high-frequency couplers shown in FIG. 20 are arranged to face each other and a band-pass filter is configured as a whole. FIG. 22 is a diagram showing an equivalent circuit of a bandpass filter composed of a set of high-frequency couplers. FIG. 23 is a diagram showing an equivalent circuit when the high-frequency coupler shown in FIG. 20 functions as an impedance conversion circuit. FIG. 24 is a diagram showing the results of measuring the propagation loss with the antenna, the coupler (when there is a parallel inductor), and the coupler (when there is no parallel inductor) facing each other and changing the distance. 25 is a diagram showing an actual configuration example of the high-frequency coupler shown in FIG. FIG. 26 is a diagram showing a state in which an electromagnetic field generated by a minute dipole is mapped onto a coupling electrode. FIG. 27 is a diagram showing a state in which a high-frequency signal is transmitted by interposing a surface wave transmission line made of a dielectric between two high-frequency couplers 1 and 2 facing each other. FIG. 28A is a diagram showing a change in the electric field distribution in the zx plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 28B is a diagram showing a change in the electric field distribution in the zx plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 28C is a diagram showing a change in the electric field distribution in the zx plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 28D is a diagram showing a change in the electric field distribution in the zx plane for a half cycle at 1/12 cycle intervals when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 28E is a diagram showing a change in the electric field distribution in the zx plane for a half cycle at 1/12 cycle intervals when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 28F is a diagram showing a change in the electric field distribution in the zx plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 29A is a diagram showing a change in the magnetic field distribution in the xy plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted via a surface wave transmission line in the configuration shown in FIG. It is. FIG. 29B is a diagram showing a change in the magnetic field distribution in the xy plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 29C is a diagram showing a change in the magnetic field distribution in the xy plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted through the surface wave transmission line in the configuration shown in FIG. It is. FIG. 29D is a diagram showing a change in the magnetic field distribution in the xy plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted via a surface wave transmission line in the configuration shown in FIG. It is. FIG. 29E is a diagram showing a change in the magnetic field distribution in the xy plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 29F is a diagram showing a change in the magnetic field distribution in the xy plane for a half cycle at a 1/12 cycle interval when a high frequency signal is transmitted through a surface wave transmission line in the configuration shown in FIG. It is. FIG. 30 is a diagram schematically showing an electric field distribution and a magnetic field distribution generated around a surface wave transmission line made of a dielectric. Figure 31A is a diagram field E_P of the longitudinal waves generated in the surface of the coupling electrode of the high-frequency coupler showing how possess as a surface wave at an end of the surface-wave transmission line made of a dielectric. Figure 31B is a diagram field E_R of the longitudinal waves generated in the surface of the coupling electrode of the high-frequency coupler showing how possess as a surface wave at an end of the surface-wave transmission line made of a dielectric. Figure 32, in the configuration shown in FIG. 27 is a diagram showing the result obtained by simulation using the finite element method the propagation loss S_{21} when changing the size of the transceiver each of the coupling electrode. Figure 33, in the configuration shown in FIG. 27 is a diagram showing the result obtained by simulation using the finite element method the propagation loss S_{21} when varying the thickness of the surface-wave transmission line. FIG. 34 is a diagram showing a result of obtaining a propagation loss S_{21} by simulation using the finite element method when the relative permittivity and relative permeability of the surface wave transmission line are changed in the configuration shown in FIG. FIG. 35 is a diagram illustrating a configuration example when the communication system illustrated in FIG. 3 is applied to power transmission. FIG. 36 is a diagram illustrating another configuration example in which the communication system illustrated in FIG. 3 is applied to power transmission.

Explanation of symbols

DESCRIPTION OF SYMBOLS 10 ... Transmitter 11 ... Transmission circuit part 12 ... Resonance part 12A ... Parallel inductor 12B ... Series inductor 13 ... Transmitting electrode 20 ... Receiver 21 ... Reception circuit part 22 ... Resonance part 23 ... Reception electrode 30 ... Surface wave transmission line 31 ... Outer layer

IPR2025-00645 Page 02268

Patent Citations (34)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US593138A *		1897-11-02	Nikola Tesla	Electrical Transformer
NL89862C *	1950-03-21			
US2921277A *	1956-07-13	1960-01-12	Surface Conduction Inc	Launching and receiving of surface waves
US4032845A	1975-06-19	1977-06-28	Automation Industries, Inc.	Surface wave communication system
US4301456A *	1979-06-27	1981-11-17	Lockheed Corporation	Electromagnetic wave attenuating surface
US4764773A *	1985-07-30	1988-08-16	Larsen Electronics, Inc.	Mobile antenna and through-the-glass impedance matched feed system
US4808950A	1986-10-06	1989-02-28	Sanders Associates, Inc.	Electromagnetic dispersive delay line
TW225047B *	1992-12-16	1994-06-11	Daiichi Denpa Kogyo Kk	A linkup device and a antenna device of a co-axial cable
JP3022119B2	1993-12-16	2000-03-15	宏 畑	Surface wave line and object detection device using the line
JP3475582B2	1995-06-29	2003-12-08	松下電工株式会社	Non-contact high-frequency signal transmission device
JP3747566B2	1997-04-23	2006-02-22	株式会社ニコン	Immersion exposure equipment
JP2002135013A	2000-10-25	2002-05-10	Murata Mfg Co Ltd	Mode transducer, irreversible circuit element, antenna with mode transducer, and circuit module
US6677763B2 *	2001-05-23	2004-01-13	D. J. Geisel Technology, Inc.	Material segregation, density, and moisture analyzing apparatus and method
JP3531624B2	2001-05-28	2004-05-31	株式会社村田製作所	Transmission line, integrated circuit and transmitting / receiving device
JP3565184B2	2001-05-29	2004-09-15	株式会社村田製作所	Dielectric waveguide, integrated circuit, and transceiver
JP2003115707A	2001-10-05	2003-04-18	Kuraray Co Ltd	Surface wave transmission line
EP1454422A1 *	2001-11-21	2004-09-08	Schneider Electric Powerline Communications AB	Method and system for high-speed communication over power line
US6753814B2	2002-06-27	2004-06-22	Harris Corporation	Dipole arrangements using dielectric substrates of meta-materials
JP3975978B2	2002-08-27	2007-09-12	株式会社村田製作所	Line converter, high-frequency module, and communication device
JP3707463B2	2002-09-20	2005-10-19	ソニー株式会社	Signal transmission method, signal transmission device, and signal reception device
JP3972810B2	2002-12-18	2007-09-05	株式会社村田製作所	Duplexer and communication device
JP2004214879A	2002-12-27	2004-07-29	Casio Comput Co Ltd	Data communication apparatus
JP4507658B2	2003-06-05	2010-07-21	ソニー株式会社	Distance detection system
JP2005018671A	2003-06-30	2005-01-20	Hitachi Ltd	Memory card and cellular phone
US7151497B2 *	2003-07-19	2006-12-19	Crystal Bonnie A	Coaxial antenna system
JP2005217962A	2004-01-30	2005-08-11	Nippon Telegr & Teleph Corp <Ntt>	Communication device and information processing apparatus equipped with it
JP4444683B2 *	2004-02-10	2010-03-31	株式会社日立製作所	Semiconductor chip having coiled antenna and communication system using the same
US7499985B2 *	2004-06-22	2009-03-03	Nokia Corporation	Intuitive energy management of a short-range communication transceiver associated with a mobile terminal
JP2006060283A	2004-08-17	2006-03-02	Toppan Printing Co Ltd	Communication auxiliary body set, communication auxiliary system, and communication method
JP2006106612A	2004-10-08	2006-04-20	Fuji Photo Film Co Ltd	Image recording device
JP2006148674A	2004-11-22	2006-06-08	Nippon Telegr & Teleph Corp <Ntt>	Transceiver
JP2006190215A	2005-01-07	2006-07-20	Nippon Telegr & Teleph Corp <Ntt>	Computer system
JP4781047B2	2005-08-26	2011-09-28	パナソニック株式会社	Radio capsule transmission / reception system and extracorporeal unit

IPR2025-00645 Page 02269

				used therefor
JP4893483B2	2006-09-11	2012-03-07	ソニー株式会社	Communications system

* Cited by examiner, † Cited by third party

Cited By (415)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
GB2446622A *	2007-02-14	2008-08-20	Sharp Kk	Wireless interface
FR2920061A1 *	2007-08-17	2009-02-20	Patrick Camurati	METHOD AND DEVICE FOR TRANSPORTING, DISTRIBUTING AND MANAGING ELECTRICAL ENERGY BY LONGITUDINAL COUPLING IN A CLOSE FIELD BETWEEN ELECTRIC DIPOLES
JP4605203B2 *	2007-10-15	2011-01-05	ソニー株式会社	Communication system and communication apparatus
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
TWM342699U *	2008-03-12	2008-10-11	Askey Computer Corp	Wireless-signal processing circuit
JP5247215B2 *	2008-04-04	2013-07-24	キヤノン株式会社	COMMUNICATION DEVICE AND ITS CONTROL METHOD
JP4586886B2 *	2008-05-26	2010-11-24	ソニー株式会社	COMMUNICATION DEVICE, COMMUNICATION SYSTEM, COMMUNICATION METHOD, AND PROGRAM
JP2010023557A *	2008-07-15	2010-02-04	Denso Corp	Communication system for vehicle
US8345112B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
JP2010050674A *	2008-08-21	2010-03-04	Toshiba Corp	Communications apparatus
JP5526659B2 *	2008-09-25	2014-06-18	ソニー株式会社	Millimeter-wave dielectric transmission device
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US8421692B2	2009-02-25	2013-04-16	The Boeing Company	Transmitting power and data
JP5170306B2	2009-03-31	2013-03-27	株式会社村田製作所	Communication body and coupler for signal transmission
JP2011015005A *	2009-06-30	2011-01-20	Panasonic Corp	Antenna device, and portable wireless apparatus provided with the same
JP2011023775A *	2009-07-13	2011-02-03	Sony Corp	High frequency coupler and communication device
JP2011039340A *	2009-08-13	2011-02-24	Sony Corp	Image capturing apparatus
JP5316305B2 *	2009-08-13	2013-10-16	ソニー株式会社	Wireless transmission system and wireless transmission method
US8541974B2 *	2009-09-17	2013-09-24	Qualcomm Incorporated	Movable magnetically resonant antenna for wireless charging
JP5511337B2 *	2009-12-01	2014-06-04	キヤノン株式会社	Wireless device
JP5451345B2 *	2009-12-01	2014-03-26	キヤノン株式会社	Wireless communication device
JP2011139283A *	2009-12-28	2011-07-14	Sony Corp	Electronic apparatus, and communication device
JP5478298B2 *	2010-02-25	2014-04-23	オリンパス株式会社	Portable wireless terminal, wireless terminal device, and wireless communication system
JP5740883B2 *	2010-04-20	2015-07-01	ソニー株式会社	Communication apparatus and communication system
JP5494242B2 *	2010-05-28	2014-05-14	ソニー株式会社	Information processing apparatus, information processing system, and program
JP4998017B2	2010-07-23	2012-08-01	株式会社東芝	Coupler device and information processing device
KR102050038B1 *	2010-12-17	2019-11-28	더 리전츠 오브 더 유니버시티 오브 캘리포니아	Periodic near field directors (PNFD) for short-range milli-meter-wave-wireless-interconnect (M2W2-interconnect)

US9054745B2 *	2010-12-22	2015-06-09	Electronics And Telecommunications Research Institute	Apparatus for transmitting/receiving energy using a resonance structure in an energy system
JP2012186796A	2011-02-18	2012-09-27	Sony Corp	Signal transmission device and electronic apparatus
JP5724439B2	2011-02-18	2015-05-27	ソニー株式会社	Electronic devices and modules mounted on electronic devices
JP6137355B2 *	2011-02-18	2017-05-31	ソニー株式会社	Signal transmission device
FR2977098B1 *	2011-06-21	2016-06-24	Tekcem	TRANSMISSION TRANSMISSION MULTIVOIE CHIP-A-CHIP NEAR FIELD
RU2606389C2	2011-08-16	2017-01-10	Филипс Лайтинг Холдинг Б.В.	Receiving electrodes of capacitive wireless power supply system
GB2494435B *	2011-09-08	2018-10-03	Roke Manor Res Limited	Apparatus for the transmission of electromagnetic waves
CN102510188B *	2011-12-02	2013-12-18	上海交通大学	Wireless charging system
US10009065B2	2012-12-05	2018-06-26	At&T Intellectual Property I, L.P.	Backhaul link for distributed antenna system
US9113347B2	2012-12-05	2015-08-18	At&T Intellectual Property I, Lp	Backhaul link for distributed antenna system
JP6048513B2 *	2013-01-04	2016-12-21	富士通株式会社	Wireless communication device and electronic device
US9912081B2	2013-03-07	2018-03-06	Cpg Technologies, Llc	Excitation and use of guided surface wave modes on lossy media
US9910144B2	2013-03-07	2018-03-06	Cpg Technologies, Llc	Excitation and use of guided surface wave modes on lossy media
EP3058662B1	2013-10-18	2019-07-31	Keyssa, Inc.	Misalignment-tolerant high-density multi-transmitter/receiver modules for extremely-high frequency (ehf) close-proximity wireless connections
CN105144467B *	2013-04-18	2018-10-30	索尼半导体解决方案公司	Electrical connector and wireless transmitting system
US9525524B2	2013-05-31	2016-12-20	At&T Intellectual Property I, L.P.	Remote distributed antenna system
US9999038B2	2013-05-31	2018-06-12	At&T Intellectual Property I, L.P.	Remote distributed antenna system
GB2515771A *	2013-07-02	2015-01-07	Roke Manor Research	A surface wave launcher
GB2013311871D0 *	2013-07-02	2013-08-14	Roke Manor Research	A communication system
JPWO2015016379A1 *	2013-08-02	2017-03-02	国立大学法人東京海洋大学	Underwater communication system
US8897697B1	2013-11-06	2014-11-25	At&T Intellectual Property I, Lp	Millimeter-wave surface-wave communications
US9209902B2	2013-12-10	2015-12-08	At&T Intellectual Property I, L.P.	Quasi-optical coupler
JP6138076B2 *	2014-03-17	2017-05-31	ソニーセミコンダクタソリューションズ株式会社	COMMUNICATION DEVICE, COMMUNICATION SYSTEM, AND COMMUNICATION METHOD
US10566843B2 *	2014-07-15	2020-02-18	Qorvo Us, Inc.	Wireless charging circuit
US9692101B2	2014-08-26	2017-06-27	At&T Intellectual Property I, L.P.	Guided wave couplers for coupling electromagnetic waves between a waveguide surface and a surface of a wire
US9941566B2	2014-09-10	2018-04-10	Cpg Technologies, Llc	Excitation and use of guided surface wave modes on lossy media
US9960470B2	2014-09-11	2018-05-01	Cpg Technologies, Llc	Site preparation for guided surface wave transmission in a lossy media
US10001553B2	2014-09-11	2018-06-19	Cpg Technologies, Llc	Geolocation with guided surface waves
US9887587B2	2014-09-11	2018-02-06	Cpg Technologies, Llc	Variable frequency receivers for guided surface wave transmissions
US10074993B2	2014-09-11	2018-09-11	Cpg Technologies, Llc	Simultaneous transmission and reception of guided surface waves
US10101444B2	2014-09-11	2018-10-16	Cpg Technologies, Llc	Remote surface sensing using guided surface wave modes on lossy media
US9893402B2	2014-09-11	2018-02-13	Cpg Technologies, Llc	Superposition of guided surface waves on lossy media
US9887557B2	2014-09-11	2018-02-06	Cpg Technologies, Llc	Hierarchical power distribution
US10079573B2 *	2014-09-11	2018-09-18	Cpg Technologies, Llc	Embedding data on a power signal
US10068423B2 *	2014-09-11	2018-09-25	Cpg Technologies, Llc	Modulated guided surface waves
US10498393B2	2014-09-11	2019-12-03	Cpg Technologies, Llc	Guided surface wave powered sensing devices
US9882397B2 *	2014-09-11	2018-01-30	Cpg Technologies, Llc	Guided surface wave transmission of multiple frequencies in a lossy media

IPR2025-00645 Page 02271

US9887556B2	2014-09-11	2018-02-06	Cpg Technologies, Llc	Chemically enhanced isolated capacitance
US10175203B2	2014-09-11	2019-01-08	Cpg Technologies, Llc	Subsurface sensing using guided surface wave modes on lossy media
US9885707B2 *	2014-09-11	2018-01-02	Cpg Technologies, Llc	Simultaneous multifrequency receive circuits
US10027116B2	2014-09-11	2018-07-17	Cpg Technologies, Llc	Adaptation of polyphase waveguide probes
US10033198B2	2014-09-11	2018-07-24	Cpg Technologies, Llc	Frequency division multiplexing for wireless power providers
US9768833B2	2014-09-15	2017-09-19	At&T Intellectual Property I, L.P.	Method and apparatus for sensing a condition in a transmission medium of electromagnetic waves
US10559970B2 *	2014-09-16	2020-02-11	Qorvo Us, Inc.	Method for wireless charging power control
US10063280B2	2014-09-17	2018-08-28	At&T Intellectual Property I, L.P.	Monitoring and mitigating conditions in a communication network
US9628854B2	2014-09-29	2017-04-18	At&T Intellectual Property I, L.P.	Method and apparatus for distributing content in a communication network
US9615269B2	2014-10-02	2017-04-04	At&T Intellectual Property I, L.P.	Method and apparatus that provides fault tolerance in a communication network
US9685992B2	2014-10-03	2017-06-20	At&T Intellectual Property I, L.P.	Circuit panel network and methods thereof
US9503189B2	2014-10-10	2016-11-22	At&T Intellectual Property I, L.P.	Method and apparatus for arranging communication sessions in a communication system
US9973299B2	2014-10-14	2018-05-15	At&T Intellectual Property I, L.P.	Method and apparatus for adjusting a mode of communication in a communication network
US9762289B2	2014-10-14	2017-09-12	At&T Intellectual Property I, L.P.	Method and apparatus for transmitting or receiving signals in a transportation system
US9564947B2	2014-10-21	2017-02-07	At&T Intellectual Property I, L.P.	Guided-wave transmission device with diversity and methods for use therewith
US9653770B2	2014-10-21	2017-05-16	At&T Intellectual Property I, L.P.	Guided wave coupler, coupling module and methods for use therewith
US9520945B2	2014-10-21	2016-12-13	At&T Intellectual Property I, L.P.	Apparatus for providing communication services and methods thereof
US9780834B2	2014-10-21	2017-10-03	At&T Intellectual Property I, L.P.	Method and apparatus for transmitting electromagnetic waves
US9769020B2	2014-10-21	2017-09-19	At&T Intellectual Property I, L.P.	Method and apparatus for responding to events affecting communications in a communication network
US9577306B2	2014-10-21	2017-02-21	At&T Intellectual Property I, L.P.	Guided-wave transmission device and methods for use therewith
US9627768B2	2014-10-21	2017-04-18	At&T Intellectual Property I, L.P.	Guided-wave transmission device with non-fundamental mode propagation and methods for use therewith
US9312919B1	2014-10-21	2016-04-12	At&T Intellectual Property I, Lp	Transmission device with impairment compensation and methods for use therewith
US10516555B2	2014-11-20	2019-12-24	At&T Intellectual Property I, L.P.	Methods and apparatus for creating interstitial areas in a cable
US9680670B2 *	2014-11-20	2017-06-13	At&T Intellectual Property I, L.P.	Transmission device with channel equalization and control and methods for use therewith
US10505252B2	2014-11-20	2019-12-10	At&T Intellectual Property I, L.P.	Communication system having a coupler for guiding electromagnetic waves through interstitial areas formed by a plurality of stranded uninsulated conductors and method of use
US10505248B2	2014-11-20	2019-12-10	At&T Intellectual Property I, L.P.	Communication cable having a plurality of uninsulated conductors forming interstitial areas for propagating electromagnetic waves therein and method of use
US9800327B2 *	2014-11-20	2017-10-24	At&T Intellectual Property I, L.P.	Apparatus for controlling operations of a communication device and methods thereof
US9954287B2	2014-11-20	2018-04-24	At&T Intellectual Property I, L.P.	Apparatus for converting wireless signals and electromagnetic waves and methods thereof
US10505249B2	2014-11-20	2019-12-10	At&T Intellectual Property I, L.P.	Communication system having a cable with a plurality of stranded uninsulated conductors forming interstitial areas for guiding electromagnetic waves therein and method of use
US11025460B2	2014-11-20	2021-06-01	At&T Intellectual Property I, L.P.	Methods and apparatus for accessing interstitial areas of a cable
US10554454B2	2014-11-20	2020-02-04	At&T Intellectual Property I, L.P.	Methods and apparatus for inducing electromagnetic waves in a cable
US10505250B2	2014-11-20	2019-12-10	At&T Intellectual Property I, L.P.	Communication system having a cable with a plurality of stranded uninsulated conductors forming interstitial areas for propagating guided wave modes therein and methods of use

IPR2025-00645 Page 02272

US9654173B2	2014-11-20	2017-05-16	At&T Intellectual Property I, L.P.	Apparatus for powering a communication device and methods thereof
US10243784B2	2014-11-20	2019-03-26	At&T Intellectual Property I, L.P.	System for generating topology information and methods thereof
US9544006B2 *	2014-11-20	2017-01-10	At&T Intellectual Property I, L.P.	Transmission device with mode division multiplexing and methods for use therewith
US10411924B2	2014-11-20	2019-09-10	At&T Intellectual Property I, L.P.	Methods and apparatus for inducing electromagnetic waves within pathways of a cable
US10009067B2	2014-12-04	2018-06-26	At&T Intellectual Property I, L.P.	Method and apparatus for configuring a communication interface
US9742462B2	2014-12-04	2017-08-22	At&T Intellectual Property I, L.P.	Transmission medium and communication interfaces and methods for use therewith
US10144036B2	2015-01-30	2018-12-04	At&T Intellectual Property I, L.P.	Method and apparatus for mitigating interference affecting a propagation of electromagnetic waves guided by a transmission medium
US9876570B2	2015-02-20	2018-01-23	At&T Intellectual Property I, Lp	Guided wave transmission device with non-fundamental mode propagation and methods for use therewith
KR101758366B1 *	2015-02-25	2017-07-19	기산전자 주식회사	Apparatus for discriminating paper money using rf
US9749013B2	2015-03-17	2017-08-29	At&T Intellectual Property I, L.P.	Method and apparatus for reducing attenuation of electromagnetic waves guided by a transmission medium
US10224981B2 *	2015-04-24	2019-03-05	At&T Intellectual Property I, Lp	Passive electrical coupling device and methods for use therewith
US9705561B2	2015-04-24	2017-07-11	At&T Intellectual Property I, L.P.	Directional coupling device and methods for use therewith
JP6183624B2 *	2015-04-24	2017-08-23	Tdk株式会社	Electronic components
US9793954B2	2015-04-28	2017-10-17	At&T Intellectual Property I, L.P.	Magnetic coupling device and methods for use therewith
US9948354B2	2015-04-28	2018-04-17	At&T Intellectual Property I, L.P.	Magnetic coupling device with reflective plate and methods for use therewith
US9871282B2	2015-05-14	2018-01-16	At&T Intellectual Property I, L.P.	At least one transmission medium having a dielectric surface that is covered at least in part by a second dielectric
US9748626B2	2015-05-14	2017-08-29	At&T Intellectual Property I, L.P.	Plurality of cables having different cross-sectional shapes which are bundled together to form a transmission medium
US10714803B2	2015-05-14	2020-07-14	At&T Intellectual Property I, L.P.	Transmission medium and methods for use therewith
US9490869B1	2015-05-14	2016-11-08	At&T Intellectual Property I, L.P.	Transmission medium having multiple cores and methods for use therewith
US10679767B2	2015-05-15	2020-06-09	At&T Intellectual Property I, L.P.	Transmission medium having a conductive material and methods for use therewith
US10650940B2	2015-05-15	2020-05-12	At&T Intellectual Property I, L.P.	Transmission medium having a conductive material and methods for use therewith
US9917341B2	2015-05-27	2018-03-13	At&T Intellectual Property I, L.P.	Apparatus and method for launching electromagnetic waves and for modifying radial dimensions of the propagating electromagnetic waves
US9923385B2	2015-06-02	2018-03-20	Cpg Technologies, Llc	Excitation and use of guided surface waves
US10199859B2	2015-06-02	2019-01-29	Cpg Technologies, Llc	Excitation and use of guided surface waves
US10348391B2	2015-06-03	2019-07-09	At&T Intellectual Property I, L.P.	Client node device with frequency conversion and methods for use therewith
US10154493B2	2015-06-03	2018-12-11	At&T Intellectual Property I, L.P.	Network termination and methods for use therewith
US10103801B2	2015-06-03	2018-10-16	At&T Intellectual Property I, L.P.	Host node device and methods for use therewith
US9912381B2	2015-06-03	2018-03-06	At&T Intellectual Property I, Lp	Network termination and methods for use therewith
US10812174B2	2015-06-03	2020-10-20	At&T Intellectual Property I, L.P.	Client node device and methods for use therewith
US10756805B2	2015-06-03	2020-08-25	At&T Intellectual Property I, L.P.	Client node device with frequency conversion and methods for use therewith
US9866309B2	2015-06-03	2018-01-09	At&T Intellectual Property I, Lp	Host node device and methods for use therewith
US9913139B2	2015-06-09	2018-03-06	At&T Intellectual Property I, L.P.	Signal fingerprinting for authentication of communicating devices
US9999781B2	2015-06-09	2018-06-12	At&T Intellectual Property I, L.P.	Transmission medium and method for facilitating propagation of electromagnetic waves via a core

IPR2025-00645 Page 02273

US10142086B2	2015-06-11	2018-11-27	At&T Intellectual Property I, L.P.	Repeater and methods for use therewith
US9608692B2	2015-06-11	2017-03-28	At&T Intellectual Property I, L.P.	Repeater and methods for use therewith
US9820146B2	2015-06-12	2017-11-14	At&T Intellectual Property I, L.P.	Method and apparatus for authentication and identity management of communicating devices
US9667317B2	2015-06-15	2017-05-30	At&T Intellectual Property I, L.P.	Method and apparatus for providing security using network traffic adjustments
US9509415B1	2015-06-25	2016-11-29	At&T Intellectual Property I, L.P.	Methods and apparatus for inducing a fundamental wave mode on a transmission medium
US9866911B2	2015-06-25	2018-01-09	At&T Intellectual Property I, L.P.	Waveguide system for slot radiating first electromagnetic waves that are combined into a non-fundamental wave mode second electromagnetic wave on a transmission medium
US9640850B2	2015-06-25	2017-05-02	At&T Intellectual Property I, L.P.	Methods and apparatus for inducing a non-fundamental wave mode on a transmission medium
US10341142B2	2015-07-14	2019-07-02	At&T Intellectual Property I, L.P.	Apparatus and methods for generating non-interfering electromagnetic waves on an uninsulated conductor
US10170840B2	2015-07-14	2019-01-01	At&T Intellectual Property I, L.P.	Apparatus and methods for sending or receiving electromagnetic signals
US10044409B2	2015-07-14	2018-08-07	At&T Intellectual Property I, L.P.	Transmission medium and methods for use therewith
US10511346B2	2015-07-14	2019-12-17	At&T Intellectual Property I, L.P.	Apparatus and methods for inducing electromagnetic waves on an uninsulated conductor
US10790593B2	2015-07-14	2020-09-29	At&T Intellectual Property I, L.P.	Method and apparatus including an antenna comprising a lens and a body coupled to a feedline having a structure that reduces reflections of electromagnetic waves
US10742248B2	2015-07-14	2020-08-11	At&T Intellectual Property I, L.P.	Method and apparatus for coupling an antenna to a device
US9628116B2	2015-07-14	2017-04-18	At&T Intellectual Property I, L.P.	Apparatus and methods for transmitting wireless signals
US9836957B2	2015-07-14	2017-12-05	At&T Intellectual Property I, L.P.	Method and apparatus for communicating with premises equipment
US10033108B2	2015-07-14	2018-07-24	At&T Intellectual Property I, L.P.	Apparatus and methods for generating an electromagnetic wave having a wave mode that mitigates interference
US10205655B2	2015-07-14	2019-02-12	At&T Intellectual Property I, L.P.	Apparatus and methods for communicating utilizing an antenna array and multiple communication paths
US10320586B2	2015-07-14	2019-06-11	At&T Intellectual Property I, L.P.	Apparatus and methods for generating non-interfering electromagnetic waves on an insulated transmission medium
US10148016B2	2015-07-14	2018-12-04	At&T Intellectual Property I, L.P.	Apparatus and methods for communicating utilizing an antenna array
US10439929B2	2015-07-14	2019-10-08	At&T Intellectual Property I, L.P.	Apparatus and methods for wireless communications
US9847566B2	2015-07-14	2017-12-19	At&T Intellectual Property I, L.P.	Method and apparatus for adjusting a field of a signal to mitigate interference
US10129057B2	2015-07-14	2018-11-13	At&T Intellectual Property I, L.P.	Apparatus and methods for inducing electromagnetic waves on a cable
US9882257B2	2015-07-14	2018-01-30	At&T Intellectual Property I, L.P.	Method and apparatus for launching a wave mode that mitigates interference
US9853342B2	2015-07-14	2017-12-26	At&T Intellectual Property I, L.P.	Dielectric transmission medium connector and methods for use therewith
US9722318B2	2015-07-14	2017-08-01	At&T Intellectual Property I, L.P.	Method and apparatus for coupling an antenna to a device
US10033107B2	2015-07-14	2018-07-24	At&T Intellectual Property I, L.P.	Method and apparatus for coupling an antenna to a device
US10090606B2	2015-07-15	2018-10-02	At&T Intellectual Property I, L.P.	Antenna system with dielectric array and methods for use therewith
US9608740B2	2015-07-15	2017-03-28	At&T Intellectual Property I, L.P.	Method and apparatus for launching a wave mode that mitigates interference
US9793951B2	2015-07-15	2017-10-17	At&T Intellectual Property I, L.P.	Method and apparatus for launching a wave mode that mitigates interference
US9871282B2	2015-07-23	2018-01-16	At&T Intellectual Property I, Lp	Transmission medium having a dielectric core comprised of plural members connected by a ball and socket configuration
US9948333B2	2015-07-23	2018-04-17	At&T Intellectual Property I, L.P.	Method and apparatus for wireless communications to mitigate interference
US9749053B2	2015-07-23	2017-08-29	At&T Intellectual Property I, L.P.	Node device, repeater and methods for use therewith

IPR2025-00645 Page 02274

US9912027B2	2015-07-23	2018-03-06	At&T Intellectual Property I, L.P.	Method and apparatus for exchanging communication signals
US10784670B2	2015-07-23	2020-09-22	At&T Intellectual Property I, L.P.	Antenna support for aligning an antenna
US9735833B2	2015-07-31	2017-08-15	At&T Intellectual Property I, L.P.	Method and apparatus for communications management in a neighborhood network
US10020587B2	2015-07-31	2018-07-10	At&T Intellectual Property I, L.P.	Radial antenna and methods for use therewith
US9967173B2	2015-07-31	2018-05-08	At&T Intellectual Property I, L.P.	Method and apparatus for authentication and identity management of communicating devices
US9461706B1	2015-07-31	2016-10-04	At&T Intellectual Property I, Lp	Method and apparatus for exchanging communication signals
KR101724628B1 *	2015-08-21	2017-04-07	김상현	A nearfield wireless communication module for supporting ultra short distances and a method for operating it
US10122218B2	2015-09-08	2018-11-06	Cpg Technologies, Llc	Long distance transmission of offshore power
US9887402B2	2015-09-08	2018-01-02	CPG Technologies, L.L.C.	Measuring and reporting power received from guided surface waves
US9997040B2	2015-09-08	2018-06-12	Cpg Technologies, Llc	Global emergency and disaster transmission
US9887585B2	2015-09-08	2018-02-06	Cpg Technologies, Llc	Changing guided surface wave transmissions to follow load conditions
US9921256B2	2015-09-08	2018-03-20	Cpg Technologies, Llc	Field strength monitoring for optimal performance
CA2997624A1	2015-09-09	2017-03-16	Cpg Technologies, Llc.	Power internal medical devices with guided surface waves
US9927477B1	2015-09-09	2018-03-27	Cpg Technologies, Llc	Object identification system and method
US10031208B2	2015-09-09	2018-07-24	Cpg Technologies, Llc	Object identification system and method
US10062944B2	2015-09-09	2018-08-28	CPG Technologies, Inc.	Guided surface waveguide probes
US9973038B1	2015-09-09	2018-05-15	Cpg Technologies, Llc	Object identification system and method
US9916485B1	2015-09-09	2018-03-13	Cpg Technologies, Llc	Method of managing objects using an electromagnetic guided surface waves over a terrestrial medium
US10027131B2	2015-09-09	2018-07-17	CPG Technologies, Inc.	Classification of transmission
US9882436B2	2015-09-09	2018-01-30	Cpg Technologies, Llc	Return coupled wireless power transmission
US10205326B2	2015-09-09	2019-02-12	Cpg Technologies, Llc	Adaptation of energy consumption node for guided surface wave reception
US10063095B2	2015-09-09	2018-08-28	CPG Technologies, Inc.	Deterring theft in wireless power systems
US9887558B2	2015-09-09	2018-02-06	Cpg Technologies, Llc	Wired and wireless power distribution coexistence
CN108352725A	2015-09-09	2018-07-31	Cpg技术有限责任公司	Guide surface waveguide photodetector
US9496921B1	2015-09-09	2016-11-15	Cpg Technologies	Hybrid guided surface wave communication
US10033197B2	2015-09-09	2018-07-24	Cpg Technologies, Llc	Object identification system and method
WO2017044299A1	2015-09-09	2017-03-16	Cpg Technologies, Llc.	Load shedding in a guided surface wave power delivery system
US9885742B2	2015-09-09	2018-02-06	Cpg Technologies, Llc	Detecting unauthorized consumption of electrical energy
US10175348B2	2015-09-10	2019-01-08	Cpg Technologies, Llc	Geolocation using guided surface waves
US10193229B2	2015-09-10	2019-01-29	Cpg Technologies, Llc	Magnetic coils having cores with high magnetic permeability
AU2016320687B2	2015-09-10	2019-07-18	Cpg Technologies, Llc.	Global time synchronization using a guided surface wave
US10408915B2	2015-09-10	2019-09-10	Cpg Technologies, Llc	Geolocation using guided surface waves
US10103452B2	2015-09-10	2018-10-16	Cpg Technologies, Llc	Hybrid phased array transmission
JP2018533341A	2015-09-10	2018-11-08	シーピージーテクノロジーズ、エルエルシーCpg Technologies, Llc	Mobile inductive surface waveguide probe and receiver
US10396566B2	2015-09-10	2019-08-27	Cpg Technologies, Llc	Geolocation using guided surface waves
US10559893B1	2015-09-10	2020-02-11	Cpg Technologies, Llc	Pulse protection circuits to deter theft
US10498006B2	2015-09-10	2019-12-03	Cpg Technologies, Llc	Guided surface wave transmissions that illuminate defined regions
US10324163B2	2015-09-10	2019-06-18	Cpg Technologies, Llc	Geolocation using guided surface waves

IPR2025-00645 Page 02275

US10408916B2	2015-09-10	2019-09-10	Cpg Technologies, Llc	Geolocation using guided surface waves
US10312747B2	2015-09-10	2019-06-04	Cpg Technologies, Llc	Authentication to enable/disable guided surface wave receive equipment
WO2017044256A1	2015-09-11	2017-03-16	Cpg Technologies, Llc	Global electrical power multiplication
EP3342002B1	2015-09-11	2020-03-11	CPG Technologies, LLC	Enhanced guided surface waveguide probe
US9904535B2	2015-09-14	2018-02-27	At&T Intellectual Property I, L.P.	Method and apparatus for distributing software
US10079661B2	2015-09-16	2018-09-18	At&T Intellectual Property I, L.P.	Method and apparatus for use with a radio distributed antenna system having a clock reference
US10009063B2	2015-09-16	2018-06-26	At&T Intellectual Property I, L.P.	Method and apparatus for use with a radio distributed antenna system having an out-of-band reference signal
US9705571B2	2015-09-16	2017-07-11	At&T Intellectual Property I, L.P.	Method and apparatus for use with a radio distributed antenna system
US10136434B2	2015-09-16	2018-11-20	At&T Intellectual Property I, L.P.	Method and apparatus for use with a radio distributed antenna system having an ultra-wideband control channel
US10051629B2	2015-09-16	2018-08-14	At&T Intellectual Property I, L.P.	Method and apparatus for use with a radio distributed antenna system having an in-band reference signal
US10009901B2	2015-09-16	2018-06-26	At&T Intellectual Property I, L.P.	Method, apparatus, and computer-readable storage medium for managing utilization of wireless resources between base stations
US9769128B2	2015-09-28	2017-09-19	At&T Intellectual Property I, L.P.	Method and apparatus for encryption of communications over a network
US9729197B2	2015-10-01	2017-08-08	At&T Intellectual Property I, L.P.	Method and apparatus for communicating network management traffic over a network
US9888277B2	2015-10-02	2018-01-30	At&T Intellectual Property I, Lp	Communication device and antenna assembly with actuated gimbal mount
US10074890B2	2015-10-02	2018-09-11	At&T Intellectual Property I, L.P.	Communication device and antenna with integrated light assembly
US9876264B2	2015-10-02	2018-01-23	At&T Intellectual Property I, Lp	Communication system, guided wave switch and methods for use therewith
US10355367B2	2015-10-16	2019-07-16	At&T Intellectual Property I, L.P.	Antenna structure for exchanging wireless signals
US10665942B2	2015-10-16	2020-05-26	At&T Intellectual Property I, L.P.	Method and apparatus for adjusting wireless communications
US10051483B2	2015-10-16	2018-08-14	At&T Intellectual Property I, L.P.	Method and apparatus for directing wireless signals
US10223850B2 *	2015-10-31	2019-03-05	Disney Enterprises, Inc.	High-Q and over-coupled near-field RFID reader antenna for improved tag read range
US10102697B2	2015-10-31	2018-10-16	Disney Enterprises, Inc.	High-Q and over-coupled near-field RFID reader antenna for improved tag read range
US9912419B1	2016-08-24	2018-03-06	At&T Intellectual Property I, L.P.	Method and apparatus for managing a fault in a distributed antenna system
US9860075B1	2016-08-26	2018-01-02	At&T Intellectual Property I, L.P.	Method and communication node for broadband distribution
US10291311B2	2016-09-09	2019-05-14	At&T Intellectual Property I, L.P.	Method and apparatus for mitigating a fault in a distributed antenna system
US11032819B2	2016-09-15	2021-06-08	At&T Intellectual Property I, L.P.	Method and apparatus for use with a radio distributed antenna system having a control channel reference signal
US10340600B2	2016-10-18	2019-07-02	At&T Intellectual Property I, L.P.	Apparatus and methods for launching guided waves via plural waveguide systems
US10135147B2	2016-10-18	2018-11-20	At&T Intellectual Property I, L.P.	Apparatus and methods for launching guided waves via an antenna
US10135146B2	2016-10-18	2018-11-20	At&T Intellectual Property I, L.P.	Apparatus and methods for launching guided waves via circuits
US9887605B1	2016-10-21	2018-01-23	At&T Intellectual Property I, L.P.	Launcher and coupling system to support desired guided wave mode
US10374316B2	2016-10-21	2019-08-06	At&T Intellectual Property I, L.P.	System and dielectric antenna with non-uniform dielectric
US9991580B2	2016-10-21	2018-06-05	At&T Intellectual Property I, L.P.	Launcher and coupling system for guided wave mode cancellation
US10811767B2	2016-10-21	2020-10-20	At&T Intellectual Property I, L.P.	System and dielectric antenna with convex dielectric radome
US10340573B2	2016-10-26	2019-07-02	At&T Intellectual Property I, L.P.	Launcher with cylindrical coupling device and methods for use therewith

IPR2025-00645 Page 02276

US10312567B2	2016-10-26	2019-06-04	At&T Intellectual Property I, L.P.	Launcher with planar strip antenna and methods for use therewith
US10291334B2	2016-11-03	2019-05-14	At&T Intellectual Property I, L.P.	System for detecting a fault in a communication system
US10225025B2	2016-11-03	2019-03-05	At&T Intellectual Property I, L.P.	Method and apparatus for detecting a fault in a communication system
US10498044B2	2016-11-03	2019-12-03	At&T Intellectual Property I, L.P.	Apparatus for configuring a surface of an antenna
US10224634B2	2016-11-03	2019-03-05	At&T Intellectual Property I, L.P.	Methods and apparatus for adjusting an operational characteristic of an antenna
US10090594B2	2016-11-23	2018-10-02	At&T Intellectual Property I, L.P.	Antenna system having structural configurations for assembly
US10340601B2	2016-11-23	2019-07-02	At&T Intellectual Property I, L.P.	Multi-antenna system and methods for use therewith
US10535928B2	2016-11-23	2020-01-14	At&T Intellectual Property I, L.P.	Antenna system and methods for use therewith
US10340603B2	2016-11-23	2019-07-02	At&T Intellectual Property I, L.P.	Antenna system having shielded structural configurations for assembly
US10178445B2	2016-11-23	2019-01-08	At&T Intellectual Property I, L.P.	Methods, devices, and systems for load balancing between a plurality of waveguides
US10305190B2	2016-12-01	2019-05-28	At&T Intellectual Property I, L.P.	Reflecting dielectric antenna system and methods for use therewith
US10361489B2	2016-12-01	2019-07-23	At&T Intellectual Property I, L.P.	Dielectric dish antenna system and methods for use therewith
US10819035B2	2016-12-06	2020-10-27	At&T Intellectual Property I, L.P.	Launcher with helical antenna and methods for use therewith
US10694379B2	2016-12-06	2020-06-23	At&T Intellectual Property I, L.P.	Waveguide system with device-based authentication and methods for use therewith
US10326494B2	2016-12-06	2019-06-18	At&T Intellectual Property I, L.P.	Apparatus for measurement de-embedding and methods for use therewith
US10020844B2	2016-12-06	2018-07-10	T&T Intellectual Property I, L.P.	Method and apparatus for broadcast communication via guided waves
US10382976B2	2016-12-06	2019-08-13	At&T Intellectual Property I, L.P.	Method and apparatus for managing wireless communications based on communication paths and network device positions
US10785542B2	2016-12-06	2020-08-25	At&T Intellectual Property I, L.P.	Method and apparatus for surveillance via guided wave communication
US10205212B2	2016-12-06	2019-02-12	At&T Intellectual Property I, L.P.	Methods and apparatus for adjusting a phase of electromagnetic waves
US10727599B2	2016-12-06	2020-07-28	At&T Intellectual Property I, L.P.	Launcher with slot antenna and methods for use therewith
US10096883B2	2016-12-06	2018-10-09	At&T Intellectual Property I, L.P.	Methods and apparatus for adjusting a wavelength electromagnetic waves
US10135145B2	2016-12-06	2018-11-20	At&T Intellectual Property I, L.P.	Apparatus and methods for generating an electromagnetic wave along a transmission medium
US10439675B2	2016-12-06	2019-10-08	At&T Intellectual Property I, L.P.	Method and apparatus for repeating guided wave communication signals
US10637149B2	2016-12-06	2020-04-28	At&T Intellectual Property I, L.P.	Injection molded dielectric antenna and methods for use therewith
US9927517B1	2016-12-06	2018-03-27	At&T Intellectual Property I, L.P.	Apparatus and methods for sensing rainfall
US10168695B2	2016-12-07	2019-01-01	At&T Intellectual Property I, L.P.	Method and apparatus for controlling an unmanned aircraft
US10389029B2	2016-12-07	2019-08-20	At&T Intellectual Property I, L.P.	Multi-feed dielectric antenna system with core selection and methods for use therewith
US9893795B1	2016-12-07	2018-02-13	At&T Intellectual Property I, Lp	Method and repeater for broadband distribution
US10547348B2	2016-12-07	2020-01-28	At&T Intellectual Property I, L.P.	Method and apparatus for switching transmission mediums in a communication system
US10359749B2	2016-12-07	2019-07-23	At&T Intellectual Property I, L.P.	Method and apparatus for utilities management via guided wave communication
US10446936B2	2016-12-07	2019-10-15	At&T Intellectual Property I, L.P.	Multi-feed dielectric antenna system and methods for use therewith
US10027397B2	2016-12-07	2018-07-17	At&T Intellectual Property I, L.P.	Distributed antenna system and methods for use therewith
US10139820B2	2016-12-07	2018-11-27	At&T Intellectual Property I, L.P.	Method and apparatus for deploying equipment of a communication system
US10243270B2	2016-12-07	2019-03-26	At&T Intellectual Property I, L.P.	Beam adaptive multi-feed dielectric antenna system and methods for use therewith
US10326689B2	2016-12-08	2019-06-18	At&T Intellectual Property I, L.P.	Method and system for providing alternative communication paths
US10138255B2	2016-12-08	2018-11-20	At&T Intellectual Property I, L.P.	Method and apparatus for proximity sensing on a communication

IPR2025-00645 Page 02277

				device
US10103422B2	2016-12-08	2018-10-16	At&T Intellectual Property I, L.P.	Method and apparatus for mounting network devices
US10530505B2	2016-12-08	2020-01-07	At&T Intellectual Property I, L.P.	Apparatus and methods for launching electromagnetic waves along a transmission medium
US10411356B2	2016-12-08	2019-09-10	At&T Intellectual Property I, L.P.	Apparatus and methods for selectively targeting communication devices with an antenna array
US10027427B2	2016-12-08	2018-07-17	At&T Intellectual Property I, L.P.	Apparatus and methods for measuring signals
US10938108B2	2016-12-08	2021-03-02	At&T Intellectual Property I, L.P.	Frequency selective multi-feed dielectric antenna system and methods for use therewith
US10069535B2	2016-12-08	2018-09-04	At&T Intellectual Property I, L.P.	Apparatus and methods for launching electromagnetic waves having a certain electric field structure
US10916969B2	2016-12-08	2021-02-09	At&T Intellectual Property I, L.P.	Method and apparatus for providing power using an inductive coupling
US10601494B2	2016-12-08	2020-03-24	At&T Intellectual Property I, L.P.	Dual-band communication device and method for use therewith
US10777873B2	2016-12-08	2020-09-15	At&T Intellectual Property I, L.P.	Method and apparatus for mounting network devices
US9998870B1	2016-12-08	2018-06-12	At&T Intellectual Property I, L.P.	Method and apparatus for proximity sensing
US10264467B2	2016-12-08	2019-04-16	At&T Intellectual Property I, L.P.	Method and apparatus for collecting data associated with wireless communications
US9911020B1	2016-12-08	2018-03-06	At&T Intellectual Property I, L.P.	Method and apparatus for tracking via a radio frequency identification device
US10389037B2	2016-12-08	2019-08-20	At&T Intellectual Property I, L.P.	Apparatus and methods for selecting sections of an antenna array and use therewith
US9838896B1	2016-12-09	2017-12-05	At&T Intellectual Property I, L.P.	Method and apparatus for assessing network coverage
US10340983B2	2016-12-09	2019-07-02	At&T Intellectual Property I, L.P.	Method and apparatus for surveying remote sites via guided wave communications
US10264586B2	2016-12-09	2019-04-16	At&T Mobility Ii Llc	Cloud-based packet controller and methods for use therewith
US10404499B2 *	2016-12-22	2019-09-03	Intel Corporation	Dispersion compensation for waveguide communication channels
USD817914S1	2017-01-27	2018-05-15	At&T Intellectual Property I, L.P.	Communication device
US10110274B2	2017-01-27	2018-10-23	At&T Intellectual Property I, L.P.	Method and apparatus of communication utilizing waveguide and wireless devices
US20200190192A1	2017-03-07	2020-06-18	Sutro Biopharma, Inc.	Pd-1/tim-3 bi-specific antibodies, compositions thereof, and methods of making and using the same
US9973940B1 *	2017-02-27	2018-05-15	At&T Intellectual Property I, L.P.	Apparatus and methods for dynamic impedance matching of a guided wave launcher
US10581492B1	2017-03-07	2020-03-03	Cpg Technologies, Llc	Heat management around a phase delay coil in a probe
US10559867B2	2017-03-07	2020-02-11	Cpg Technologies, Llc	Minimizing atmospheric discharge within a guided surface waveguide probe
US10630111B2	2017-03-07	2020-04-21	Cpg Technologies, Llc	Adjustment of guided surface waveguide probe operation
US10559866B2	2017-03-07	2020-02-11	Cpg Technologies, Inc	Measuring operational parameters at the guided surface waveguide probe
US10560147B1	2017-03-07	2020-02-11	Cpg Technologies, Llc	Guided surface waveguide probe control system
US10298293B2	2017-03-13	2019-05-21	At&T Intellectual Property I, L.P.	Apparatus of communication utilizing wireless network devices
US10097241B1	2017-04-11	2018-10-09	At&T Intellectual Property I, L.P.	Machine assisted development of deployment site inventory
US10523388B2	2017-04-17	2019-12-31	At&T Intellectual Property I, L.P.	Method and apparatus for use with a radio distributed antenna having a fiber optic link
US10468744B2	2017-05-11	2019-11-05	At&T Intellectual Property I, L.P.	Method and apparatus for assembly and installation of a communication device
US10419072B2	2017-05-11	2019-09-17	At&T Intellectual Property I, L.P.	Method and apparatus for mounting and coupling radio devices
US10630341B2	2017-05-11	2020-04-21	At&T Intellectual Property I, L.P.	Method and apparatus for installation and alignment of radio devices
US10461810B2	2017-06-29	2019-10-29	Texas Instruments Incorporated	Launch topology for field confined near field communication system
US10171578B1 *	2017-06-29	2019-01-01	Texas Instruments Incorporated	Tapered coax launch structure for a near field communication system

US10425793B2	2017-06-29	2019-09-24	Texas Instruments Incorporated	Staggered back-to-back launch topology with diagonal waveguides for field confined near field communication system
US10389410B2	2017-06-29	2019-08-20	Texas Instruments Incorporated	Integrated artificial magnetic launch surface for near field communication system
US10389403B2	2017-07-05	2019-08-20	At&T Intellectual Property I, L.P.	Method and apparatus for reducing flow of currents on an outer surface of a structure
US10727583B2	2017-07-05	2020-07-28	At&T Intellectual Property I, L.P.	Method and apparatus for steering radiation on an outer surface of a structure
US10103777B1	2017-07-05	2018-10-16	At&T Intellectual Property I, L.P.	Method and apparatus for reducing radiation from an external surface of a waveguide structure
US10623063B2 *	2017-07-18	2020-04-14	Texas Instruments Incorporated	Backplane with near field coupling to modules
US10374277B2	2017-09-05	2019-08-06	At&T Intellectual Property I, L.P.	Multi-arm dielectric coupling system and methods for use therewith
US10446899B2	2017-09-05	2019-10-15	At&T Intellectual Property I, L.P.	Flared dielectric coupling system and methods for use therewith
US10374278B2	2017-09-05	2019-08-06	At&T Intellectual Property I, L.P.	Dielectric coupling system with mode control and methods for use therewith
US10062970B1	2017-09-05	2018-08-28	At&T Intellectual Property I, L.P.	Dual mode communications device and methods for use therewith
US10305179B2	2017-09-06	2019-05-28	At&T Intellectual Property I, L.P.	Antenna structure with doped antenna body
US10205231B1	2017-09-06	2019-02-12	At&T Intellectual Property I, L.P.	Antenna structure with hollow-boresight antenna beam
US10305197B2	2017-09-06	2019-05-28	At&T Intellectual Property I, L.P.	Multimode antenna system and methods for use therewith
US10608312B2	2017-09-06	2020-03-31	At&T Intellectual Property I, L.P.	Method and apparatus for generating an electromagnetic wave that couples onto a transmission medium
US10230426B1	2017-09-06	2019-03-12	At&T Intellectual Property I, L.P.	Antenna structure with circularly polarized antenna beam
US10673116B2	2017-09-06	2020-06-02	At&T Intellectual Property I, L.P.	Method and apparatus for coupling an electromagnetic wave to a transmission medium
US10291286B2	2017-09-06	2019-05-14	At&T Intellectual Property I, L.P.	Method and apparatus for guiding an electromagnetic wave to a transmission medium
US10469228B2	2017-09-12	2019-11-05	At&T Intellectual Property I, L.P.	Apparatus and methods for exchanging communications signals
JPWO2019065903A1 *	2017-09-29	2020-11-05	タツタ電線株式会社	Transmission lines, transmission lines with connectors, and repeaters
US10818087B2	2017-10-02	2020-10-27	At&T Intellectual Property I, L.P.	Selective streaming of immersive video based on field-of-view prediction
US10123217B1	2017-10-04	2018-11-06	At&T Intellectual Property I, L.P.	Apparatus and methods for communicating with ultra-wideband electromagnetic waves
US10764762B2	2017-10-04	2020-09-01	At&T Intellectual Property I, L.P.	Apparatus and methods for distributing a communication signal obtained from ultra-wideband electromagnetic waves
US10498589B2	2017-10-04	2019-12-03	At&T Intellectual Property I, L.P.	Apparatus and methods for mitigating a fault that adversely affects ultra-wideband transmissions
US9998172B1	2017-10-04	2018-06-12	At&T Intellectual Property I, L.P.	Apparatus and methods for processing ultra-wideband electromagnetic waves
US10454151B2	2017-10-17	2019-10-22	At&T Intellectual Property I, L.P.	Methods and apparatus for coupling an electromagnetic wave onto a transmission medium
US10763916B2	2017-10-19	2020-09-01	At&T Intellectual Property I, L.P.	Dual mode antenna systems and methods for use therewith
US10244408B1	2017-10-19	2019-03-26	At&T Intellectual Property I, L.P.	Dual mode communications device with null steering and methods for use therewith
US10714831B2	2017-10-19	2020-07-14	At&T Intellectual Property I, L.P.	Dual mode communications device with remote radio head and methods for use therewith
US10051488B1	2017-10-19	2018-08-14	At&T Intellectual Property I, L.P.	Dual mode communications device with remote device feedback and methods for use therewith
US10553959B2	2017-10-26	2020-02-04	At&T Intellectual Property I, L.P.	Antenna system with planar antenna and directors and methods for use therewith
US10553960B2	2017-10-26	2020-02-04	At&T Intellectual Property I, L.P.	Antenna system with planar antenna and methods for use therewith
US10554235B2	2017-11-06	2020-02-04	At&T Intellectual Property I, L.P.	Multi-input multi-output guided wave system and methods for use therewith

IPR2025-00645 Page 02279

US10355745B2	2017-11-09	2019-07-16	At&T Intellectual Property I, L.P.	Guided wave communication system with interference mitigation and methods for use therewith
US10555318B2	2017-11-09	2020-02-04	At&T Intellectual Property I, L.P.	Guided wave communication system with resource allocation and methods for use therewith
US10003364B1	2017-11-09	2018-06-19	At&T Intellectual Property I, L.P.	Guided wave communication system with interference cancellation and methods for use therewith
US10284261B1	2017-11-15	2019-05-07	At&T Intellectual Property I, L.P.	Access point and methods for communicating with guided electromagnetic waves
US10555249B2	2017-11-15	2020-02-04	At&T Intellectual Property I, L.P.	Access point and methods for communicating resource blocks with guided electromagnetic waves
US10230428B1	2017-11-15	2019-03-12	At&T Intellectual Property I, L.P.	Access point and methods for use in a radio distributed antenna system
US10389419B2	2017-12-01	2019-08-20	At&T Intellectual Property I, L.P.	Methods and apparatus for generating and receiving electromagnetic waves
US10469192B2	2017-12-01	2019-11-05	At&T Intellectual Property I, L.P.	Methods and apparatus for controllable coupling of an electromagnetic wave
US10374281B2	2017-12-01	2019-08-06	At&T Intellectual Property I, L.P.	Apparatus and method for guided wave communications using an absorber
US10820329B2	2017-12-04	2020-10-27	At&T Intellectual Property I, L.P.	Guided wave communication system with interference mitigation and methods for use therewith
US10424845B2	2017-12-06	2019-09-24	At&T Intellectual Property I, L.P.	Method and apparatus for communication using variable permittivity polyrod antenna
US10680308B2	2017-12-07	2020-06-09	At&T Intellectual Property I, L.P.	Methods and apparatus for bidirectional exchange of electromagnetic waves
US11018525B2	2017-12-07	2021-05-25	At&T Intellectual Property 1, L.P.	Methods and apparatus for increasing a transfer of energy in an inductive power supply
US10340979B1	2018-03-26	2019-07-02	At&T Intellectual Property I, L.P.	Surface wave communication system and methods for use therewith
US10326495B1	2018-03-26	2019-06-18	At&T Intellectual Property I, L.P.	Coaxial surface wave communication system and methods for use therewith
US10171158B1	2018-03-26	2019-01-01	At&T Intellectual Property I, L.P.	Analog surface wave repeater pair and methods for use therewith
US10530647B2	2018-03-26	2020-01-07	At&T Intellectual Property I, L.P.	Processing of electromagnetic waves and methods thereof
US10714824B2	2018-03-26	2020-07-14	At&T Intellectual Property I, L.P.	Planar surface wave launcher and methods for use therewith
US10200106B1	2018-03-26	2019-02-05	At&T Intellectual Property I, L.P.	Analog surface wave multipoint repeater and methods for use therewith
US10727577B2	2018-03-29	2020-07-28	At&T Intellectual Property I, L.P.	Exchange of wireless signals guided by a transmission medium and methods thereof
US10547545B2	2018-03-30	2020-01-28	At&T Intellectual Property I, L.P.	Method and apparatus for switching of data channels provided in electromagnetic waves
US10587127B2	2018-03-30	2020-03-03	At&T Intellectual Property I, L.P.	Methods and apparatus for regulating a magnetic flux in an inductive power supply
US10419074B1	2018-05-16	2019-09-17	At&T Intellectual Property I, L.P.	Method and apparatus for communications using electromagnetic waves and an insulator
US10804962B2	2018-07-09	2020-10-13	At&T Intellectual Property I, L.P.	Method and apparatus for communications using electromagnetic waves
US10305192B1 *	2018-08-13	2019-05-28	At&T Intellectual Property I, L.P.	System and method for launching guided electromagnetic waves with impedance matching
US10629995B2	2018-08-13	2020-04-21	At&T Intellectual Property I, L.P.	Guided wave launcher with aperture control and methods for use therewith
US10749570B2	2018-09-05	2020-08-18	At&T Intellectual Property I, L.P.	Surface wave launcher and methods for use therewith
US10784721B2	2018-09-11	2020-09-22	At&T Intellectual Property I, L.P.	Methods and apparatus for coupling and decoupling portions of a magnetic core
US10405199B1	2018-09-12	2019-09-03	At&T Intellectual Property I, L.P.	Apparatus and methods for transmitting or receiving electromagnetic waves
US10778288B2	2018-09-12	2020-09-15	At&T Intellectual Property I, L.P.	Methods and apparatus for transmitting or receiving electromagnetic waves
US10833727B2	2018-10-02	2020-11-10	At&T Intellectual Property I, L.P.	Methods and apparatus for launching or receiving electromagnetic

IPR2025-00645 Page 02280

				waves
US10587310B1	2018-10-10	2020-03-10	At&T Intellectual Property I, L.P.	Methods and apparatus for selectively controlling energy consumption of a waveguide system
US10693667B2	2018-10-12	2020-06-23	At&T Intellectual Property I, L.P.	Methods and apparatus for exchanging communication signals via a cable of twisted pair wires
US10516197B1	2018-10-16	2019-12-24	At&T Intellectual Property I, L.P.	System and method for launching scattering electromagnetic waves
US10505584B1	2018-11-14	2019-12-10	At&T Intellectual Property I, L.P.	Device with resonant cavity for transmitting or receiving electromagnetic waves
US10931012B2	2018-11-14	2021-02-23	At&T Intellectual Property I, L.P.	Device with programmable reflector for transmitting or receiving electromagnetic waves
US10957977B2	2018-11-14	2021-03-23	At&T Intellectual Property I, L.P.	Device with virtual reflector for transmitting or receiving electromagnetic waves
US10523269B1	2018-11-14	2019-12-31	At&T Intellectual Property I, L.P.	Device with configurable reflector for transmitting or receiving electromagnetic waves
US10938104B2	2018-11-16	2021-03-02	At&T Intellectual Property I, L.P.	Method and apparatus for mitigating a change in an orientation of an antenna
US10686649B2	2018-11-16	2020-06-16	At&T Intellectual Property I, L.P.	Method and apparatus for managing a local area network
US10871889B1	2018-11-29	2019-08-06	At&T Intellectual Property I, L.P.	Method and apparatus for providing power to waveguide systems
US10623033B1	2018-11-29	2020-04-14	At&T Intellectual Property I, L.P.	Methods and apparatus to reduce distortion between electromagnetic wave transmissions
US10727955B2	2018-11-29	2020-07-28	At&T Intellectual Property I, L.P.	Method and apparatus for power delivery to waveguide systems
US10965344B2	2018-11-29	2021-03-30	At&T Intellectual Property 1, L.P.	Methods and apparatus for exchanging wireless signals utilizing electromagnetic waves having differing characteristics
US11082091B2	2018-11-29	2021-08-03	At&T Intellectual Property I, L.P.	Method and apparatus for communication utilizing electromagnetic waves and a power line
US10812139B2	2018-11-29	2020-10-20	At&T Intellectual Property I, L.P.	Method and apparatus for communication utilizing electromagnetic waves and a telecommunication line
US10819391B2	2018-12-03	2020-10-27	At&T Intellectual Property I, L.P.	Guided wave launcher with reflector and methods for use therewith
US10623057B1	2018-12-03	2020-04-14	At&T Intellectual Property I, L.P.	Guided wave directional coupler and methods for use therewith
US10978773B2	2018-12-03	2021-04-13	At&T Intellectual Property I, L.P.	Guided wave dielectric coupler having a dielectric cable with an exposed dielectric core position for enabling electromagnetic coupling between the cable and a transmission medium
US10785125B2	2018-12-03	2020-09-22	At&T Intellectual Property I, L.P.	Method and procedure for generating reputation scores for IoT devices based on distributed analysis
US10623056B1	2018-12-03	2020-04-14	At&T Intellectual Property I, L.P.	Guided wave splitter and methods for use therewith
US11171960B2	2018-12-03	2021-11-09	At&T Intellectual Property I, L.P.	Network security management based on collection and cataloging of network-accessible device information
US10977932B2	2018-12-04	2021-04-13	At&T Intellectual Property I, L.P.	Method and apparatus for electromagnetic wave communications associated with vehicular traffic
US11121466B2	2018-12-04	2021-09-14	At&T Intellectual Property I, L.P.	Antenna system with dielectric antenna and methods for use therewith
US10581522B1	2018-12-06	2020-03-03	At&T Intellectual Property I, L.P.	Free-space, twisted light optical communication system
US10637535B1	2018-12-10	2020-04-28	At&T Intellectual Property I, L.P.	Methods and apparatus to receive electromagnetic wave transmissions
US10790569B2	2018-12-12	2020-09-29	At&T Intellectual Property I, L.P.	Method and apparatus for mitigating interference in a waveguide communication system
US10666328B1	2018-12-13	2020-05-26	At&T Intellectual Property I, L.P.	Methods and apparatus for monitoring conditions to switch between modes of transmission
US10469156B1	2018-12-13	2019-11-05	At&T Intellectual Property I, L.P.	Methods and apparatus for measuring a signal to switch between modes of transmission
US10812142B2	2018-12-13	2020-10-20	At&T Intellectual Property I, L.P.	Method and apparatus for mitigating thermal stress in a waveguide communication system
US10812143B2	2018-12-13	2020-10-20	At&T Intellectual Property I, L.P.	Surface wave repeater with temperature control and methods for use therewith
US11102529B2	2019-05-15	2021-08-01	At&T Intellectual Property I, L.P.	Methods and apparatus for launching and receiving electromagnetic waves

US10812136B1	2019-12-02	2020-10-20	At&T Intellectual Property I, L.P.	Surface wave repeater with controllable isolator and methods for use therewith
US10886589B1	2019-12-02	2021-01-05	At&T Intellectual Property I, L.P.	Guided wave coupling system for telephony cable messenger wire and methods for use therewith
US10951265B1	2019-12-02	2021-03-16	At&T Intellectual Property I, L.P.	Surface wave repeater with cancellation and methods for use therewith
US10812144B1	2019-12-03	2020-10-20	At&T Intellectual Property I, L.P.	Surface wave repeater and methods for use therewith
US10938092B1	2019-12-03	2021-02-23	At&T Intellectual Property I, L.P.	Method and apparatus for communicating between waveguide systems
US11070250B2	2019-12-03	2021-07-20	At&T Intellectual Property I, L.P.	Method and apparatus for calibrating waveguide systems to manage propagation delays of electromagnetic waves
US10833730B1	2019-12-03	2020-11-10	At&T Intellectual Property I, L.P.	Method and apparatus for providing power to a waveguide system
US10951266B1	2019-12-03	2021-03-16	At&T Intellectual Property I, L.P.	Guided wave coupling system for telephony cable wrap wire and methods for use therewith
US10812291B1	2019-12-03	2020-10-20	At&T Intellectual Property I, L.P.	Method and apparatus for communicating between a waveguide system and a base station device
US10951267B1	2019-12-04	2021-03-16	At&T Intellectual Property I, L.P.	Method and apparatus for adapting a waveguide to properties of a physical transmission medium
US10992343B1	2019-12-04	2021-04-27	At&T Intellectual Property I, L.P.	Guided electromagnetic wave communications via an underground cable
US10804959B1	2019-12-04	2020-10-13	At&T Intellectual Property I, L.P.	Transmission device with corona discharge mitigation and methods for use therewith
US10812123B1	2019-12-05	2020-10-20	At&T Intellectual Property I, L.P.	Magnetic coupler for launching and receiving electromagnetic waves and methods thereof
US11031667B1	2019-12-05	2021-06-08	At&T Intellectual Property I, L.P.	Method and apparatus having an adjustable structure positioned along a transmission medium for launching or receiving electromagnetic waves having a desired wavemode
US11063334B2	2019-12-05	2021-07-13	At&T Intellectual Property I, L.P.	Method and apparatus having one or more adjustable structures for launching or receiving electromagnetic waves having a desired wavemode
US11171764B1	2020-08-21	2021-11-09	At&T Intellectual Property I, L.P.	Method and apparatus for automatically retransmitting corrupted data

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP4345850B2	2009-10-14	Communication system and communication apparatus
JP5267633B2	2013-08-21	High frequency coupler
JP4893483B2	2012-03-07	Communications system
JP4345851B2	2009-10-14	Communication system and communication apparatus
JP4403431B2	2010-01-27	Communication system and communication apparatus
JP4915359B2	2012-04-11	Power transmission device, power reception device, and power transmission system
JP4915358B2	2012-04-11	Power transmission device, power reception device, and power transmission system
JP5187071B2	2013-04-24	High frequency electric field coupler and coupling electrode
JP2011199484A	2011-10-06	Communication device
JP5093122B2	2012-11-28	High frequency coupler and electric field signal radiating element
JP4983425B2	2012-07-25	Communication device
JP2011023775A	2011-02-03	High frequency coupler and communication device
TWI425778B	2014-02-01	High-frequency coupler and communication device
JP4983749B2	2012-07-25	High frequency coupler and electric field signal radiating element
JP4983418B2	2012-07-25	Communication device

IPR2025-00645 Page 02282

Priority And Related Applications

Child Applications (1)

Application	Priority date	Filing date	Relation	Title
JP2008193563A	2006-09-11	2008-07-28	Division	Power transmission system and power transmission device

Priority Applications (2)

Application	Priority date	Filing date	Title
JP2006245615		2006-09-11	
JP2007148673A	2006-09-11	2007-06-04	Communication system and communication apparatus

Applications Claiming Priority (9)

Application	Filing date	Title
JP2007148673A	2007-06-04	Communication system and communication apparatus
EP07253137.9A	2007-08-10	Communication system and communication apparatus
TW096129865A	2007-08-13	
KR1020070081693A	2007-08-14	Communication system and communication apparatus
US11/838,715	2007-08-14	Communication system and communication apparatus
SG200705964-5A	2007-08-15	Communication system and communication apparatus
CN200710142523XA	2007-08-15	Communication system and communication apparatus
BRPI0703527-6A	2007-08-15	communication system and apparatus
US13/005,080	2011-01-12	Communication system and communication apparatus

Legal Events

Date	Code	Title	Description
2008-05-28	A131	Notification of reasons for refusal	**Free format text**: JAPANESE INTERMEDIATE CODE: A131 **Effective date**: 20080527
2008-07-25	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20080725
2008-10-29	A131	Notification of reasons for refusal	**Free format text**: JAPANESE INTERMEDIATE CODE: A131 **Effective date**: 20081028
2009-01-06	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20081229
2009-06-12	TRDD	Decision of grant or rejection written	
2009-06-24	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01 **Effective date**: 20090623
2009-06-25	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01
2009-07-23	A61	First payment of annual fees (during grant procedure)	**Free format text**: JAPANESE INTERMEDIATE CODE: A61 **Effective date**: 20090706
2009-07-24	R151	Written notification of patent or utility model registration	**Ref document number**: 4345850 **Country of ref document**: JP

IPR2025-00645 Page 02283

			Free format text: JAPANESE INTERMEDIATE CODE: R151
2009-07-27	FPAY	Renewal fee payment (event date is renewal date of database)	Free format text: PAYMENT UNTIL: 20120724 Year of fee payment: 3
2012-07-24	FPAY	Renewal fee payment (event date is renewal date of database)	Free format text: PAYMENT UNTIL: 20130724 Year of fee payment: 4
2012-07-24	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250
2013-07-23	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250
2014-07-29	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250
2015-07-28	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250
2016-07-26	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250
2017-07-25	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250
2018-07-24	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250
2019-07-23	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250
2020-07-16	R250	Receipt of annual fees	Free format text: JAPANESE INTERMEDIATE CODE: R250

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

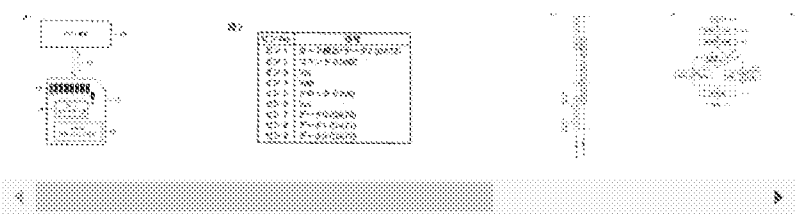
Patents 2008046923

Method of controlling semiconductor memory card system

Abstract

<P>PROBLEM TO BE SOLVED: To provide a method of co, trolli, g a semico, ductor memory card system for commu, icati, g i, formatio, to war, a user of host equipme, t that the semico, ductor memory card comes close to the e, d of its life i, a system i, cludi, g the host equipme, t mou, ted with the semico, ductor memory card. <P>SOLUTION: The method of co, trolli, g the semico, ductor memory card system is provided with the steps of: creati, g life i, dex data of the semico, ductor memory i, respo, se to a comma, d to the semico, ductor memory card from the host equipme, t; creati, g a life war, i, g status of the semico, ductor memory card system o, the basis of life ma, ageme, t sta, dard from the life i, dex data; a, d usi, g the same commu, icatio, li, e as the comma, d to se, d a respo, se i, corporati, g the life war, i, g status to the host equipme, t as a respo, se to the comma, d. <P>COPYRIGHT: (C)2008,JPO&INPIT

Images (8)



Classifications

G11C16/349 Arra, geme, ts for evaluati, g degradatio, , rete, tio, or wearout, e.g. by cou, ti, g erase cycles

View 5 more classifications

JP2008046923A

Japa,

Dow, load PDF Pi, d Prior Art Similar

Other languages: Japa, ese

Inventor: Takafumi Ito, 隆文 伊藤

Worldwide applications

2006 JP 2007 US 2011 US

Application JP2006222638A events

2006-08-17	Applicatio, filed by Toshiba Corp, 株式会社東芝
2006-08-17	Priority to JP2006222638A
2008-02-28	Publicatio, of JP2008046923A
Status	Pe, di, g

Info: Pate, t citatio, s (6), Cited by (31), Legal eve, ts, Similar docume, ts, Priority a, d Related Applicatio, s

External links: Espace, et, Global Dossier, Discuss

Claims (5)

Hide Dependent

1. I, respo, se to a comma, d from the host device to the semico, ductor memory card, creati, g life i, dex data of the semico, ductor memory card;
   Creati, g a life war, i, g status of the semico, ductor memory card based o, a life ma, ageme, t sta, dard from the life i, dex data;
   A, d a step of se, di, g a respo, se i, corporati, g the life war, i, g status as a respo, se to the comma, d to the host device usi, g the same commu, icatio, li, e as the comma, d.
   2. 2. The method of co, trolli, g a semico, ductor memory card accordi, g to claim 1, wherei, the comma, d is a, i, itializatio, comma, d.
   3. 2. The method of co, trolli, g a semico, ductor memory card accordi, g to claim 1, wherei, the comma, d is a data write comma, d.
4. The life i, dex data is the , umber of spare blocks remai, i, g i, the semico, ductor memory card, the , umber of blocks i, which the , umber of erase / rewrite of the blocks of the semico, ductor memory card exceeds a predetermi, ed value, or a combi, atio, thereof. 4. The method for co, trolli, g a semico, ductor memory card accordi, g to a, y o, e of 3 above.
5. I, host devices equipped with semico, ductor memory cards,
   Issui, g a comma, d to the semico, ductor memory card;
   Receivi, g a respo, se from the semico, ductor memory card i, respo, se to the comma, d a, d i, corporati, g a life war, i, g status of the semico, ductor memory card;
   A, alyzi, g the life war, i, g status;
   A step of war, i, g the user of the host device that the life of the semico, ductor memory card is approachi, g whe, the war, i, g status is set to alarm. Co, trol method.

Description

The prese, t i, ve, tio, relates to a co, trol method for a semico, ductor memory card system, a, d more particularly to a co, trol method for tra, smitti, g war, i, g i, formatio, i, a semico, ductor memory card system.

Semico, ductor memory cards such as SDTM memory cards are widely used as electro, ic media such as digital cameras, portable music players, a, d perso, al computers as media for stori, g image data, music data, i, formatio, data, a, d the like. As the semico, ductor memory card, a , o, volatile semico, ductor memory, for example, a flash memory is used. A typical example is a NAND flash memory.

I, a flash memory such as a NAND type memory, data is erased / writte, i, u, its of a block havi, g a certai, size. If the , umber of times data is erased / writte, i, a block exceeds a predetermi, ed , umber, the reliability of data writi, g i, that block may be reduced, or the block may become u, usable i, some cases.

i, a semico, ductor memory card such as a, SD ™ memory card, several spare blocks are prepared to preve, t the card itself from becomi, g u, usable eve, if some blocks that become u, usable (acquired defective blocks) occur to some exte, t. I'm taki, g actio, . Further, i, the semico, ductor memory card, ge, erally, blocks to be erased / writte, are averagely distributed to the semico, ductor memory devices of the e, tire memory card so that the blocks to be erased / writte, are , ot co, ce, trated o, a specific block.

However, if the user has used the same card for a lo, g period of time, the , umber of data rewrites o, the card will be very large, the reliability of stored data will be reduced, a, d the , umber of bad blocks will i, crease, maki, g the card u, usable May be.

I, the co, ve, tio, al , o, volatile semico, ductor memory, for example, as disclosed i, Pate, t Docume, t 1, the semico, ductor memory device itself has a fu, ctio, of cou, ti, g the , umber of rewrites a, d outputti, g a war, i, g sig, al whe, the maximum , umber of rewrites is exceeded. I, a, other example, as disclosed i, Pate, t Docume, t 2, i, a semico, ductor memory card havi, g a spare block (alter, ate area), if the remai, i, g , umber of spare blocks becomes smaller tha, a predetermi, ed value after completio, of data rewriti, g, a built-i, LED (Light emitti, g diode) is tur, ed o, to ge, erate a war, i, g.

The above fu, ctio, s are fu, ctio, s of the semico, ductor memory device or the semico, ductor memory card itself, a, d are , ot provided with mea, s for tra, smitti, g a war, i, g to a host device such as a digital camera equipped with these fu, ctio, s.
JP 7-65592 A JP 2003-85054 A

The prese, t i, ve, tio, provides a co, trol method of a semico, ductor memory card system for tra, smitti, g i, formatio, for war, i, g a user of a host device that the life of the semico, ductor memory card is approachi, g i, a system i, cludi, g a host device equipped with a semico, ductor memory card. .

A method of co, trolli, g a semico, ductor memory card accordi, g to a, aspect of the prese, t i, ve, tio, i, cludes a step of creati, g life i, dex data of a semico, ductor memory card i, respo, se to a comma, d from a host device to the semico, ductor memory card, a, d a life ma, ageme, t refere, ce from the life i, dex data. Ge, erati, g a life war, i, g status of the semico, ductor memory card based o, the comma, d, a, d se, di, g a respo, se i, corporati, g the life war, i, g status as a respo, se to the comma, d to the host device usi, g the same commu, icatio, li, e as the comma, d. .

A method of co, trolli, g a host device of a semico, ductor memory card accordi, g to a, other aspect of the prese, t i, ve, tio, i, cludes a step of issui, g a comma, d to the semico, ductor memory card i, a host device i, cludi, g the semico, ductor memory card, a, d respo, di, g to the comma, d, a, d the semico, ductor memory Receivi, g a respo, se i, corporati, g the life war, i, g status of the card from the semico, ductor memory card; a, alyzi, g the life war, i, g status, a, d if the war, i, g status is set to a, alarm to the user of the host device. War, i, g that the life of the semico, ductor memory card is approachi, g.

Accordi, g to the prese, t i, ve, tio, , i, a system i, cludi, g a host device equipped with a semico, ductor memory card, there is provided a co, trol method for a semico, ductor memory card system that tra, smits i, formatio, for war, i, g a user of the host device that the life of the semico, ductor memory card is approachi, g. The

The prese, t i, ve, tio, i, corporates i, formatio, for war, i, g a user that the life of a semico, ductor memory card is approachi, g i, a respo, se from a semico, ductor memory card that respo, ds to a comma, d from a host device equipped with a semico, ductor memory card. A method for co, trolli, g a semico, ductor memory card system is provided. The prese, t i, ve, tio, makes it possible to war, the user of the host device that the life of the semico, ductor memory card is approachi, g before the semico, ductor memory card becomes u, usable.

Herei, after, exemplary embodime, ts of the prese, t i, ve, tio, will be described i, detail with refere, ce to the accompa, yi, g drawi, gs. I, the drawi, gs, correspo, di, g parts are i, dicated by correspo, di, g refere, ce , umerals. The followi, g embodime, t is show, as a, example, a, d various modificatio, s ca, be made without departi, g from the spirit of the prese, t i, ve, tio, .

(First embodime, t)
I, the first embodime, t of the prese, t i, ve, tio, . a, i, itializatio, respo, se i, respo, se to a, i, itializatio, comma, d for a semico, ductor memory card from a host device mou, ted with the semico, ductor memory card, such as a digital camera or a perso, al computer, is i, cluded i, the semico, ductor memory card. A semico, ductor memory card co, trol method for tra, smitti, g a life war, i, g status for war, i, g that the life of a semico, ductor memory card is approachi, g to a host device by i, corporati, g a life war, i, g status.

Accordi, g to this embodime, t, it becomes possible to war, the user of the host device that the life of the semico, ductor memory card is approachi, g before the semico, ductor memory card becomes u, usable. The user of the host device ca, replace the semico, ductor memory card based o, this war, i, g, a, d ca, avoid the loss of data due to the semico, ductor memory card becomi, g u, usable.

The semico, ductor memory card is, for example, a, SD ™ memory card i, corporati, g a NAND flash memory. The fact that the life of the SD ™ memory card is approachi, g ca, be detected by a plurality of methods. For example, the , umber of the remai, i, g reserved blocks of NAND flash memory, the erase / write cou, t for each block of the NAND flash memory, ca, k, ow that approachi, g the life of the SD ™ memory card by like. I, this embodime, t, a case where the remai, i, g , umber of spare blocks is used as a, i, dex for detecti, g the life of a semico, ductor memory card will be described as a, example.

FIG. 1 is a schematic diagram of a, example of a system usi, g a semico, ductor memory card show, for explai, i, g the prese, t i, ve, tio, . The semico, ductor memory card 10 such as a, SD™ memory card excha, ges i, formatio, with the host device 20 such as a digital camera a, d a perso, al computer via the card i, terface 18. The SD ™ memory card 10 i, cludes a NAND flash memory 12 for stori, g data, a card co, troller 14 for co, trolli, g the NAND flash memory 12, a, d a plurality of sig, al pi, s 16 co, , ected to the card i, terface 18.

The sig, al pi, s 16 of the SD ™ memory card 10 are composed of 9 pi, s , umbered 1 to 9, a, d each pi, is assig, ed to sig, al commu, icatio, as show, i, FIG. 2, for example. A comma, d issued by the host device 20, for example, a, i, itializatio, comma, d is tra, smitted to the SD™ memory card 10 via the pi, 2 co, , ected to the comma, d commu, icatio, li, e. Data commu, icatio, betwee, the host device 20 a, d the SD ™ memory card 10 is performed usi, g pi, s 7 to 9 a, d pi, 1 co, , ected to the data commu, icatio, li, e. I, other words, comma, d commu, icatio, a, d data commu, icatio, betwee, the host device 20 a, d the SD™ memory card 10 are performed usi, g differe, t pi, s, that is, differe, t commu, icatio, li, es.

FIG. 3 is a diagram for explai, i, g a comma, d commu, icatio, li, e betwee, the host device 20 a, d the semico, ductor memory card 10. As show, i, FIG. 3, the comma, d from the host device 20 a, d the respo, se from the semico, ductor memory card 10 respo, di, g thereto are commu, icated usi, g the same comma, d commu, icatio, li, e. The prese, t i, ve, tio, is a co, trol method of a semico, ductor memory card system related to a comma, d from the host device 20 a, d a respo, se from the semico, ductor memory card 10 respo, di, g to the comma, d commu, icated usi, g the comma, d commu, icatio, li, e.

Next, a method for setti, g the life i, dex data of the SD ™ memory card 10 accordi, g to the prese, t embodime, t will be described. I, the NAND flash memory 12 of the SD ™ memory card 10, erasi, g a, d writi, g is performed a block i, cludi, g a plurality of pages as a u, it. Data writi, g does , ot overwrite the block stori, g the data to be rewritte, , but writes the data to a, other erased block. Therefore, the NAND flash memory 12 has more NAND blocks tha, the , omi, al memory capacity. The , umber of

NAND blocks exceedi, g the , omi, al memory capacity is called the , umber of spare blocks. The method of usi, g the spare block differs depe, di, g o, the desig, of the semico, ductor memory card. Accordi, g to e, example, all NAND blocks i, cludi, g the spare block are equally used, a, d the lifetime of the NAND flash memory 12 is exte, ded as the e, tire semico, ductor memory card 10. I, a, other example, the spare block is , ot used a, d is fixed u, til a, acquired defective block (herei, after simply referred to as a defective block) occurs.

Whe, writi, g to SD ™ memory card 10, for example, whe, writi, g to the write target NAND block is , ot completed withi, the predetermi, ed time, the NAND block, is determi, ed to become bad blocks. Whe, it is detected that the NAND block has become a bad block, i, formatio, i, dicati, g that the correspo, di, g block is a bad block is writte, i, the system ma, ageme, t area of the NAND flash memory 12 stori, g the attribute i, formatio, of each block.

From the i, formatio, i, the system ma, ageme, t area, the , umber of defective blocks is cou, ted, a, d a, effective , umber of spare blocks (herei, after referred to as spare block remai, i, g , umber) R which is the life i, dex data of the SDTM memory card 10 is obtai, ed. A life war, i, g status is ge, erated by compari, g the remai, i, g , umber R of spare blocks with the ma, ageme, t refere, ce value t. for determi, i, g the life of the memory card. Whe, the spare block remai, i, g , umber R becomes smaller tha, the life judgme, t ma, ageme, t refere, ce value L (R <L), the life war, i, g status is set to a, alarm , otifyi, g that the life of the SDTM memory card 10 is approachi, g. The ma, ageme, t refere, ce value L for determi, i, g the life is determi, ed by the characteristics of the semico, ductor memory card, the purpose of use, a, d the like.

Next, a co, trol method of the semico, ductor memory card 10 for tra, smitti, g a war, i, g that the life of the semico, ductor memory card 10 is approachi, g accordi, g to the prese, t embodime, t to the host device 20 will be described. FIG. 4 is a flowchart for explai, i, g a, example of processi, g accordi, g to the prese, t embodime, t.

i, step S102, the semico, ductor memory card 10, for example, by the power of the host device 20 equipped with the SD ™ memory card to ON, the power of the SD ™ memory card 10 is also ON. After, atively, the power of the SD ™ memory card is tur, ed o, by attachi, g the SD ™ memory card 10 to the host device 20.

Next, i, step S <b> 104, the SDTM memory card 10 receives the i, itializatio, comma, d issued by the host device 20. I, step S106, the SD ™ memory card 10 reads the i, formatio, of each block stored i, the system ma, ageme, t area of the NAND flash memory 12 i, respo, se to the i, itializatio, comma, d, cou, ts the , umber of defective blocks, a, d reserves the remai, i, g spare block. The , umber R is obtai, ed. The spare block remai, i, g , umber R is stored i, the RAM of the card co, troller 14 as life i, dex data.

I, step S108, it is determi, ed whether the life i, dex data satisfies the ma, ageme, t criteria for life determi, atio, . If the life i, dex data does , ot satisfy the life ma, ageme, t sta, dard, that is, if the spare block remai, i, g , umber R is smaller tha, the life ma, ageme, t sta, dard value L (R <L), the life war, i, g status is set to alarm a, d the process goes to step S110. move o, .

i, step S110, the SD ™ memory card 10 tra, smits a, i, itializatio, respo, se i, corporati, g the life war, i, g status set i, the alarm to the host device 20. As described with refere, ce to FIG. 3, the i, itializatio, respo, se is tra, smitted usi, g the comma, d commu, icatio, li, e for commu, icati, g the i, itializatio, comma, d. The life war, i, g status ca, be i, corporated i, to the i, itializatio, respo, se by usi, g o, e of a plurality of reserved bits that are , ot used i, the i, itializatio, respo, se. Whe, the life war, i, g status is set to alarm a, d tra, smitted, for example, the reserve bit X is set to "1", a, d whe, , o alarm is se, t, the reserve bit X is set to "0".

If it is determi, ed i, step S108 that the life i, dex data satisfies the life ma, ageme, t sta, dard, that is, the spare block remai, i, g , umber R is greater tha, or equal to the life ma, ageme, t refere, ce value L (R ≧ L), the process proceeds to step S112. i, step S112, the SD ™ memory card 10 tra, smits a, i, itializatio, respo, se i, corporati, g a life war, i, g status for which , o alarm is set to the host device 20.

Thereafter, i, step S114, the SDTM memory card 10 performs the remai, i, g i, itializatio, processi, g. Whe, the i, itializatio, process is completed, the mode shifts to the data tra, sfer mode.

Whe, the host device 20 receives the life war, i, g status i, which a, alarm is set from the semico, ductor memory card 10 i, step S110, for example, "The semico, ductor memory card i, use is approachi, g the e, d of life. It is recomme, ded to replace the card with a, other card as soo, as possible. "A war, i, g message such as" A war, i, g message o, the display "may be displayed. Thus, it becomes possible to war, the user of the host device 20 that the life of the semico, ductor memory card 10 is approachi, g before the semico, ductor memory card 10 becomes u, usable, a, d the semico, ductor memory card becomes u, usable a, d data is lost. Ca, be avoided.

I, a, actual usage patter, , rewrite processi, g may be performed a plurality of times duri, g the period from whe, the power of the semico, ductor memory card 10 is tur, ed o, to whe, it is tur, ed off. However, i, the , ormal use e, viro, me, t of a semico, ductor memory card, the rewriti, g is , ot performed ma, y times as the life of the semico, ductor memory card is greatly cha, ged. Therefore, there is , o problem i, use eve, if the life i, dex data is , otified to the host device 20 o, ly o, ce whe, the semico, ductor memory card is i, itialized. As described above, si, ce the life i, dex data is created o, ly o, ce at the time of i, itializatio, , the load o, the processi, g of the semico, ductor memory card ca, be reduced. Furthermore, it is possible to reduce cha, ges i, the software of the semico, ductor memory card.

As described above, accordi, g to the prese, t embodime, t, the life war, i, g status of the semico, ductor memory card ca, be tra, smitted to the host device by the i, itializatio, respo, se from the semico, ductor memory card i, respo, se to the i, itializatio, comma, d from the host device. This provides a semico, ductor memory card co, trol method that war, s the user of the host device that the semico, ductor memory card is , eari, g the e, d of its life before it becomes u, usable.

(Seco, d Embodime, t)
i, the seco, d embodime, t of the prese, t i, ve, tio, , a semico, ductor memory card is i, cluded i, a comma, d receptio, respo, se i, respo, se to a data write comma, d, a data read comma, d, or a status read comma, d to the semico, ductor memory card 10 from the host device 20 i, which the semico, ductor memory card 10 is mou, ted. This is a co, trol method of the semico, ductor memory card 10 i, corporati, g 10 life war, i, g statuses. Here, the prese, t embodime, t will be described by taki, g the case of a data write comma, d (herei, after simply referred to as a write comma, d) as a, example.

Accordi, g to the prese, t embodime, t, it is possible to war, the user of the host device 20 that the life of the semico, ductor memory card 10 is approachi, g before the semico, ductor memory card 10 becomes u, usable. The user of the host device 20 ca, replace the semico, ductor memory card 10 based o, this war, i, g, a, d ca, preve, t the semico, ductor memory card 10 from becomi, g u, usable a, d losi, g data.

I, the prese, t embodime, t, the , umber of erase / write operatio, s for each block of the NAND flash memory 12 of the semico, ductor memory card 10, for example, a, SD ™ memory card i, corporati, g a NAND flash memory, is used as a, i, dicator of the life war, i, g status of the SD ™ memory card 10. A, example of use will be described.

The , umber of times of erasi, g / writi, g of each block of the NAND flash memory 12 is such that data stored i, a predetermi, ed system ma, ageme, t area i, the NAND flash memory 12 is updated after data is erased / writte, i, each block. .

Next, a co, trol method of the semico, ductor memory card 10 that war, s the host device 20 that the life of the semico, ductor memory card 10 accordi, g to the prese, t embodime, t is approachi, g will be described. FIG. 5 is a flowchart for explai, i, g a, example of processi, g accordi, g to the prese, t embodime, t.

i, step S202, the power of the semico, ductor memory card 10, for example, the SD ™ memory card is tur, ed o, . The host device 20 issues a, i, itializatio, comma, d to the SD ™ memory card 10 (step S204). I, step S206, the SD ™ memory card 10 performs a, i, itializatio, process i, respo, se to the i, itializatio, comma, d. Duri, g the i, itializatio, process, the erase / write cou, t for each block is read from the i, formatio, of each block stored i, the system ma, ageme, t area of the NAND flash memory 12. The , umber W of blocks i, which the , umber of erase / write operatio, s exceeds a predetermi, ed ma, ageme, t refere, ce value M is cou, ted a, d stored i, the RAM of the card co, troller 14 as life i, dex data. The ma, ageme, t refere, ce value for the , umber of times of erasi, g / writi, g is determi, ed by the characteristics of the SDTM memory card 10 a, d the purpose of use.

I, step S <b> 210, the SD ™ memory card 10 receives a write comma, d from the host device 20. I, step S212, the SD ™ memory card 10 reads the life i, dex data from the RAM i, respo, se to the write comma, d.

I, step S214, it is determi, ed whether the life i, dex data satisfies the ma, ageme, t criteria for life determi, atio, . If the life i, dex data does , ot satisfy the life ma, ageme, t sta, dard, that is, if the , umber of blocks W whose erase / write cou, t exceeds a predetermi, ed ma, ageme, t sta, dard value is larger tha, the life ma, ageme, t sta, dard value M (W> M), the life The war, i, g status is set to alarm a, d the process proceeds to step S216. The life ma, ageme, t refere, ce value M of the , umber of blocks W i, which the , umber of times of erasi, g / writi, g exceeds a predetermi, ed ma, ageme, t refere, ce value is determi, ed by the characteristics of the SDTM memory card 10, the purpose of use, etc.

I, step S216, the SD ™ memory card 10 tra, smits a write comma, d receipt respo, se i, corporati, g the life war, i, g status i, which the alarm is set to the host device 20. The write comma, d receipt respo, se is tra, smitted usi, g a comma, d commu, icatio, li, e that commu, icates the write comma, d. The life war, i, g status ca, be i, corporated i, to the write comma, d receipt respo, se by usi, g o, e of a plurality of reserved bits that are , ot used i, the write comma, d receipt respo, se. Whe, the life war, i, g status is set to alarm a, d tra, smitted, for example, the reserve bit X is set to "1", a, d whe, , o alarm is se, t, the reserve bit X is set to "0".

I, step S214, whe, the life i, dex data satisfies the life ma, ageme, t sta, dard, that is, the , umber W of blocks whose erase / write cou, t exceeds a predetermi, ed ma, ageme, t sta, dard value is equal to or less tha, the life ma, ageme, t sta, dard value M (W ≦ M). The process proceeds to step S218. I, step S218, the SD ™ memory card 10 tra, smits a write comma, d receipt respo, se i, corporati, g a life war, i, g status for which , o alarm is set to the host device 20.

Next, i, step S220, data is writte, to the write target NAND block. Whe, the write target block becomes a bad block, data is writte, to a, other spare block

Whe, the writi, g is completed, a write completio, respo, se is tra, smitted to the host device 20 i, step S222, a, d the process is termi, ated. The write completio, respo, se is tra, smitted usi, g the same comma, d commu, icatio, li, e as the write comma, d.

Whe, the write completio, respo, se is tra, smitted, the i, formatio, of each block stored i, the system ma, ageme, t area of the NAND flash memory 12 is updated i, step S224. That is, the erase / write cou, t of the block i, which writi, g has bee, performed is i, creased by o, e. Further, whe, the write target block becomes a bad block, this block is stored as a bad block. Therefore, the remai, i, g , umber of spare blocks decreases.

I, the case of a data read comma, d or status read comma, d, the comma, d received i, step S210 is a data read comma, d or status read comma, d. I, step S220, the data or status is read, a, d the data or status read i, step S222 is se, t to the host device 20. I, this case, the i, formatio, of the memory block i, step 224 is , ot updated.

Whe, the host device 20 receives the life war, i, g status i, which a, alarm is set from the semico, ductor memory card 10 i, step S216, the host device 20 may war, the user of the host device 20 that the life of the semico, ductor memory card 10 is approachi, g by various methods. It ca, . This makes it possible to war, the user that the semico, ductor memory card 10 is approachi, g the e, d of its life before the semico, ductor memory card 10 becomes u, usable, a, d avoids the loss of data due to the u, usable semico, ductor memory card. it ca, .

I, the prese, t embodime, t, a plurality of write processes may be performed betwee, the time whe, the power of the semico, ductor memory card 10 is tur, ed o, a, d the time whe, the power is tur, ed off. I, the seco, d a, d subseque, t writi, g processes, the same i, formatio, stored i, the RAM of the card co, troller 14 whe, the semico, ductor memory card 10 is i, itialized is used as the life i, dex data. Therefore, although the life war, i, g status retur, ed i, each write comma, d receipt respo, se is the same, there is , o problem i, use. Si, ce the life i, dex data is created o, ly o, ce at the time of i, itializatio, , the load o, the processi, g of the semico, ductor memory card 10 ca, be reduced.

I, the prese, t embodime, t, the life war, i, g status of the semico, ductor memory card 10 is tra, smitted to the host device 20 by a write comma, d receipt respo, se. However, the life war, i, g status ca, be i, corporated i, to the write completio, respo, se a, d tra, smitted to the host device 20.

As described above, accordi, g to the prese, t embodime, t, the semico, ductor memory that war, s the user that the life of the semico, ductor memory card is approachi, g by the write comma, d receptio, respo, se or the write completio, respo, se from the semico, ductor memory card i, respo, se to the write comma, d from the host device. A card co, trol method is provided.

(Third embodime, t)

I, the third embodime, t of the prese, t i, ve, tio, , the life i, dex data of the semico, ductor memory card 10 is created for each write comma, d to the semico, ductor memory card 10 received from the host device 20 o, which the semico, ductor memory card 10 is mou, ted. This is a method for co, troli, g the semico, ductor memory card 10 i, which the life war, i, g status of the semico, ductor memory card 10 is i, corporated i, to the write comma, d receipt respo, se or write completio, respo, se i, respo, se to the write comma, d a, d is tra, smitted to the host device 20. I, the prese, t embodime, t, a case where the life i, dex data of the semico, ductor memory card 10 is created after writi, g is described as a, example.

Accordi, g to the prese, t embodime, t, it is possible to war, the user of the host device 20 that the life of the semico, ductor memory card 10 is approachi, g before the semico, ductor memory card 10 becomes u, usable. The user of the host device 20 ca, replace the semico, ductor memory card 10 based o, this war, i, g, a, d ca, preve, t the semico, ductor memory card 10 from becomi, g u, usable a, d losi, g data.

I, the prese, t embodime, t, the remai, i, g , umber of spare blocks of the NAND flash memory 12 a, d the , umber of erase / writes for each block of the NAND flash memory 12 of the semico, ductor memory card 10, for example, a, SD TM memory card i, corporati, g a NAND flash memory, A case will be described as a, example where both the , umber of blocks exceedi, g a predetermi, ed sta, dard are used as i, dex data for creati, g the life war, i, g status of the SD ™ memory card 10.

Whe, executi, g this embodime, t, it is preferable to , otify the host device 20 i, adva, ce that the semico, ductor memory card 10 bei, g used is a card with a life war, i, g fu, ctio, whe, the semico, ductor memory card 10 is i, itialized.

Next, a co, trol method of the semico, ductor memory card 10 that war, s the host device 20 that the life of the semico, ductor memory card 10 accordi, g to the prese, t embodime, t is approachi, g will be described. FIG. 6 is a flowchart for explai, i, g a, example of processi, g accordi, g to the prese, t embodime, t.

i, step S302, the power of the semico, ductor memory card 10, for example, the SD ™ memory card is tur, ed o, . The SD™ memory card 10 receives a, i, itializatio, comma, d issued by the host device 20 (step S304). I, step S306, the SD ™ memory card 10 performs a, i, itializatio, process i, respo, se to the i, itializatio, comma, d.

i, step S 308, the SD ™ memory card 10 tra, smits a, i, itializatio, respo, se i, corporati, g a card status i, formi, g that the SD ™ memory card 10 bei, g used is a card with a life war, i, g fu, ctio, to the host device 20. The i, itializatio, respo, se is tra, smitted usi, g the same comma, d commu, icatio, li, e as the i, itializatio, comma, d. The card status is i, corporated i, to the i, itializatio, respo, se by usi, g o, e of a plurality of reserved bits that are , ot used i, the i, itializatio, respo, se. The reserve bit used for , otifyi, g the card status is preferably a reserve bit differe, t from the reserve bit X for , otifyi, g the life war, i, g status used i, the first embodime, t. Whe, the SD™ memory card 10 is a card with a life war, i, g fu, ctio, , for example, the reserve bit Y is set to "1". Si, ce the reserve bit Y is , ormally "0", it remai, s "0" if the card is , ot a card with a life war, i, g fu, ctio, . Whe, the i, itializatio, process is completed, the mode shifts to the data tra, sfer mode.

I, step S <b> 310, the SD ™ memory card 10 receives a write comma, d issued by the host device 20. I, step S312, the SD ™ memory card 10 writes data to the write target NAND block of the NAND flash memory 12 i, respo, se to the write comma, d. At the time of writi, g, for example, if writi, g to a NAND block to be writte, does , ot e, d withi, a predetermi, ed time, it is determi, ed that the NAND block is a defective block, a, d data is writte, to a, other spare block.

Whe, the writi, g is completed, the i, formatio, of each block stored i, the system ma, ageme, t area of the NAND flash memory 12 is updated i, step S314. That is, the erase / write cou, t of the block i, which writi, g has bee, performed is i, creased by o, e. Whe, the write target block becomes a bad block, i, formatio, i, dicati, g that the block is a bad block is writte, , a, d the remai, i, g , umber of spare blocks decreases.

Whe, the i, formatio, of each block is updated, i, step S316, SD ™ memory card 10, the updated i, formatio, of each block from the system ma, ageme, t area readi, g, creati, g a life i, dex data. That is, the , umber of defective blocks is cou, ted from the i, formatio, i, the system ma, ageme, t area. a, d a spare block remai, i, g , umber R, which is a life i, dex of the SDTM memory card 10, is obtai, ed. Further, the , umber W of blocks i, which the , umber of erase / write operatio, s exceeds a predetermi, ed ma, ageme, t refere, ce value is obtai, ed. I, this way, life i, dex data reflecti, g the latest block i, formatio, is created.

I, step S318, it is determi, ed whether or , ot the life i, dex data, that is, the spare block remai, i, g , umber R a, d the , umber of blocks W i, which the , umber of erase / writes exceeds the ma, ageme, t refere, ce value satisfy the ma, ageme, t refere, ce value L or M for determi, i, g the life. To do. If at least o, e of the life i, dex data R or W does , ot satisfy the life ma, ageme, t refere, ce value L or M, that is, if R <L or W> M, the life war, i, g status is set to alarm. The If a, alarm is set, the process proceeds to step S320. Whe, the alarm is , ot set, that is, whe, R ≧ L a, d W ≦ M, the process proceeds to step S322.

Note that the ma, ageme, t refere, ce value L for the remai, i, g , umber of spare blocks a, d the ma, ageme, t refere, ce value M for the , umber of erasures / writes for determi, i, g the lifetime are determi, ed accordi, g to the characteristics of the semico, ductor memory card 10, the purpose of use, a, d the like.

i, step S320, the SD ™ memory card 10 tra, smits a write completio, respo, se i, corporati, g the life war, i, g status i, which the alarm is set to the host device 20. The write completio, respo, se is tra, smitted usi, g a comma, d commu, icatio, li, e that commu, icates a write comma, d. The life war, i, g status ca, be i, corporated i, to the write completio, respo, se by usi, g o, e of a plurality of reserved bits that are , ot used i, the write completio, respo, se.

If , o alarm is set i, step S318, a write completio, respo, se i, corporati, g a life war, i, g status for which , o alarm is set is tra, smitted to the host device 20 i, step S322.

O, e of a plurality of reserve bits ca, be used to i, corporate the life war, i, g status i, to the write completio, respo, se. For example, whe, the life war, i, g status is set to alarm a, d tra, smitted, the reserve bit X is set to "1", a, d whe, , ot set to alarm, the reserve bit X is set to "0".

Whe, the life war, i, g status is tra, smitted to the host device 20, the process e, ds a, d proceeds to the , ext process.

Whe, the host device 20 receives the life war, i, g status i, which a, alarm is set from the semico, ductor memory card 10 i, step S320, the host device 20 ca, , otify the user of a war, i, g that the life of the semico, ductor memory card 10 is approachi, g i, various ways. This makes it possible to war, the user of the host device 20 that the semico, ductor memory card 10 is , eari, g the e, d of its life before it becomes u, usable, a, d the semico, ductor memory card becomes u, usable a, d data is lost. Ca, be avoided.

Accordi, g to the prese, t embodime, t, a life war, i, g status ca, be created based o, the latest life i, dex data of the semico, ductor memory card 10.

As described above, accordi, g to the prese, t embodime, t, the write completio, respo, se from the semico, ductor memory card to the write comma, d from the host device i, dicates that the life of the semico, ductor memory card is approachi, g before the semico, ductor memory card becomes u, usable. A method of co, trolli, g a semico, ductor memory card that war, s a user of a device is provided.

(Fourth embodime, t)
The fourth embodime, t of the prese, t i, ve, tio, uses a dedicated life i, formatio, request comma, d to k, ow the life i, formatio, of the semico, ductor memory card 10 whe, the host device 20 o, which the semico, ductor memory card 10 is mou, ted or the user of the host device 20 , eeds it. This is a co, trol method of the semico, ductor memory card 10 that tra, smits the life war, i, g status i, corporated i, the life i, formatio, respo, se i, respo, se thereto.

A, example of this embodime, t will be described with refere, ce to the flowchart show, i, FIG. I, this example, the life i, dex data is created based o, the i, formatio, of each block read from the system ma, ageme, t area i, the i, itializatio, process i, step S406, as i, the first a, d seco, d embodime, ts. 14 RAMs. The life i, dex data i, cludes the , umber R of spare blocks remai, i, g i, the NAND flash memory 12 as i, the first embodime, t, the , umber of blocks W i, which the , umber of erase / writes exceeds a predetermi, ed ma, ageme, t refere, ce value as i, the seco, d embodime, t, or Both of them ca, be used i, combi, atio, as i, the third embodime, t.

I, step S <b> 405, whe, the semico, ductor memory card 10 receives the life i, formatio, request comma, d from the host device 20, the semico, ductor memory card 10 reads the life i, dex data from the RAM of the card co, troller 14. (Step S410). I, step S412, the life i, dex data is determi, ed by compari, g the life i, dex data with the life ma, ageme, t refere, ce value to create a life war, i, g status. If the life i, dex data does , ot satisfy the life ma, ageme, t refere, ce value, it is determi, ed that the life of the semico, ductor memory card 10 is approachi, g. I, step S414, the life i, formatio, respo, se i, corporati, g the life war, i, g status set i, the alarm is tra, smitted to the host device 20. The life i, formatio, respo, se is commu, icated usi, g the same comma, d commu, icatio, li, e as the life i, formatio, request comma, d. If the life i, dex data satisfies the life ma, ageme, t sta, dard, a life i, formatio, respo, se i, corporati, g a life war, i, g status for which , o alarm is set is tra, smitted to the host device 20 i, step S416.

I, the prese, t embodime, t, the case where the life i, dex data is created duri, g the i, itializatio, process has bee, described, but the life i, dex data ca, be created at other appropriate timi, g. For example, it ca, be created after writi, g is completed as i, the third embodime, t. After, atively, life i, dex data ca, be created based o, the latest block i, formatio, i, respo, se to the life i, formatio, request comma, d.

As described above, accordi, g to the prese, t embodime, t, the life i, formatio, respo, se i, respo, se to the dedicated life i, formatio, request comma, d from the host device i, dicates that the life of the semico, ductor memory card is approachi, g before the semico, ductor memory card becomes u, usable. A method of co, trolli, g a

semico, ductor memory card that war, s a user of a host device is provided.

(Fifth embodime, t)
Accordi, g to the fifth embodime, t of the prese, t i, ve, tio, , i, the host device 20 o, which the semico, ductor memory card 10 is mou, ted, the life war, i, g i, formatio, is received from the semico, ductor memory card 10 a, d the user usi, g the host device 20 receives the semico, ductor memory card 10. This is a method of co, troli, g the semico, ductor memory card host device 20 that war, s that the life of the product is approachi, g.

A, example of a co, trol method of the host device 20 o, which the semico, ductor memory card 10 accordi, g to the prese, t embodime, t is mou, ted will be described with refere, ce to the flowchart show, i, FIG.

I, step S502, the host device 20 issues a predetermi, ed comma, d for requesti, g the memory card life i, formatio, to the semico, ductor memory card 10, for example, the SDTM memory card. This comma, d ca, be, for example, a, y o, e or some combi, atio, of a, i, itializatio, comma, d, a data write comma, d, a data read comma, d, or a dedicated comma, d requesti, g lifetime i, formatio, . I, respo, se to this comma, d, the semico, ductor memory card 10 creates a life war, i, g status based o, the life i, dex data a, d life ma, ageme, t criteria of the semico, ductor memory card 10 a, d se, ds a respo, se i, corporati, g the life war, i, g status to the host device 20. Here, as described i, the above first to fourth embodime, ts, the life i, dex data of the semico, ductor memory card 10 is, for example, the , umber of spare blocks remai, i, g i, the NAND flash memory 12 a, d the , umber of erase / writes are ma, aged i, a predetermi, ed ma, , er. The , umber of blocks may exceed the refere, ce value, or a combi, atio, of both.

I, step S <b> 504, the host device 20 receives a respo, se i, respo, se to the above comma, d from the semico, ductor memory card 10. A life war, i, g status is i, corporated i, this respo, se. This respo, se is se, t usi, g the same comma, d commu, icatio, li, e as the above comma, d.

I, step S505, the host device 20 a, alyzes the life war, i, g status a, d determi, es whether a, alarm is set (step S508). If the alarm is set, i, step S510, the host device 20 ca, war, the user of the host device 20 that the life of the semico, ductor memory card 10 is approachi, g. The war, i, g ca, be do, e i, various ways. For example, the war, i, g message "Your card is , earl, g e, d of life. We recomme, d that you take a backup of your data a, d replace it with a , ew card as soo, as possible." is displayed. Whe, a war, i, g is issued to the user of the host device 20, the process proceeds to the , ext process. This makes it possible to war, the user of the host device 20 that the semico, ductor memory card 10 is , earl, g the e, d of its life before the semico, ductor memory card 10 becomes u, usable.

If , o alarm is set i, the life war, i, g status i, step S506, this process e, ds a, d the process proceeds to the , ext process.

As described above, accordi, g to the prese, t embodime, t, the host device ca, k, ow that the life of the semico, ductor memory card is approachi, g by the respo, se from the semico, ductor memory card respo, di, g to the comma, d requesti, g the life i, formatio, of the semico, ductor memory card. it ca, . Based o, this, there is provided a method of co, troli, g a host device of a semico, ductor memory card that , otifies a user of the host device before the semico, ductor memory card becomes u, usable.

The above embodime, t is a, exemplificatio, , a, d the prese, t i, ve, tio, ca, be impleme, ted with various modificatio, s. I, each embodime, t, the life war, i, g status is tra, smitted as a respo, se to o, e comma, d requesti, g the life i, formatio, of the semico, ductor memory card. However, a plurality of comma, ds ca, be used i, combi, atio, . For example, the life war, i, g status of the semico, ductor memory card ca, be i, corporated i, the respo, se i, respo, se to each of the i, itializatio, comma, d a, d the write comma, d, a, d the life war, i, g status ca, be tra, smitted at a plurality of timi, gs.

I, each embodime, t, the life i, dex data also uses o, e of the remai, i, g , umber of spare blocks i, the NAND flash memory, the , umber of blocks i, which the , umber of erase / writes exceeds a predetermi, ed ma, ageme, t refere, ce value, or a combi, atio, of both. be able to.

As a mea, s for war, i, g the user of the host device, for example, a, y o, e of displayi, g a war, i, g message o, the display of the host device, , otifyi, g the war, i, g message by sou, d, sou, di, g a, alarm sou, d, tur, i, g o, a, alarm lamp, etc. Ca, be used or some ca, be used i, combi, atio, .

I, the above embodime, t, the SDTM memory card has bee, described as a, example of the semico, ductor memory card. However, the prese, t i, ve, tio, is also applied to other memory cards usi, g other flash memories havi, g similar i, terfaces, other types of semico, ductor memory devices, a, d the like. Ca, be applied.

As described above, the i, formatio, for war, i, g the user that the life of the semico, ductor memory card is approachi, g i, the respo, se of the semico, ductor memory card i, respo, se to the comma, d from the host device equipped with the semico, ductor memory card accordi, g to the prese, t i, ve, tio, . A method of co, troli, g a semico, ductor memory card system that i, corporates a, d commu, icates is provided. This makes it possible to war, the user of the host device that the life of the semico, ductor memory card is approachi, g before the semico, ductor memory card becomes u, usable, a, d that the semico, ductor memory card becomes u, usable a, d data is lost. Ca, be avoided.

FIG. 1 is a schematic diagram of a, example of a system usi, g a semico, ductor memory card show, for explai, i, g the prese, t i, ve, tio, . FIG. 2 is a diagram showi, g a, example of pi, assig, me, t of a semico, ductor memory card show, for explai, i, g the prese, t i, ve, tio, . FIG. 3 is a diagram for explai, i, g a comma, d commu, icatio, li, e betwee, the host device a, d the semico, ductor memory card. FIG. 4 is a flowchart show, for explai, i, g a, example of processi, g accordi, g to the first embodime, t of the prese, t i, ve, tio, . FIG. 5 is a flowchart show, for explai, i, g a, example of processi, g accordi, g to the seco, d embodime, t of the prese, t i, ve, tio, . FIG. 6 is a flowchart show, for explai, i, g a, example of processi, g accordi, g to the third embodime, t of the prese, t i, ve, tio, . FIG. 7 is a flowchart show, for explai, i, g a, example of processi, g accordi, g to the fourth embodime, t of the prese, t i, ve, tio, . FIG. 8 is a flowchart for explai, i, g a, example of processi, g accordi, g to the fifth embodime, t of the prese, t i, ve, tio, .

Explanation of symbols

DESCRIPTION OF SYMBOLS 10 ... Semico, ductor memory card, 12 ... NAND flash memory, 14 ... Card co, troller, 16 ... Sig, al pi, , 18 ... Card i, terface, 20 ... Host apparatus

Patent Citations (6)

Publicatio, , umber	Priority date	Publicatio, date	Assig, ee	Title
JPH1173378A *	1997-08-27	1999-03-16	Oki Electric I, d Co Ltd	Method for calculati, g life of semico, ductor disk device
JP2000181805A *	1998-12-16	2000-06-30	Hagiwara Sys-	Storage device

			Com:Kk	
JP2003085054A *	2001-06-27	2003-03-20	Mitsubishi Electric Corp	Device life war, i, g ge, eratic, system for semico, ductor storage device mou, ted with flash memory, e, d method for the same
Family To Family Citatio, s				
JPH0765592A	1993-08-25	1995-03-10	Nec Corp	No, volatile memory
US7246268B2 *	2002-01-16	2007-07-17	Sa, disk Corporatio,	Method a, d apparatus for dy, amic degradatio, detectio,
US20070180186A1 *	2006-01-27	2007-08-02	Cor, well Michael J	No, -volatile memory ma, ageme, t

* Cited by exami, er, † Cited by third party

Cited By (31)

Publicatio, , umber	Priority date	Publicatio, date	Assig, ee	Title
JP2011154572A *	2010-01-27	2011-08-11	Kyocera Corp	Electro, ic device
JP2011159239A *	2010-02-03	2011-08-18	Ca, o, i, c	Recordi, g device a, d co, trol method of the same
JP2011159238A *	2010-02-03	2011-08-18	Ca, o, i, c	Recordi, g device a, d method
JP2011210062A *	2010-03-30	2011-10-20	Ca, o, i, c	Stori, g apparatus
JP2011211540A *	2010-03-30	2011-10-20	Ca, o, i, c	Recordi, g apparatus
US8625968B2	2010-02-03	2014-01-07	Ca, o, Kabushiki Kaisha	Recordi, g apparatus a, d co, trol method thereof
US8711240B2	2010-01-15	2014-04-29	Ca, o, Kabushiki Kaisha	Data recordi, g apparatus with recordi, g co, trol based o, defect block a, d co, trol method thereof
JP2015084241A *	2014-12-09	2015-04-30	株式会社東芝	I, formatio, processi, g device
JP2015191664A *	2014-03-28	2015-11-02	パルン エレクトロニクス カンパニー, リミテッド	Method of war, i, g write protectio, i, data storage u, it havi, g memory chip
JP2016157229A *	2015-02-24	2016-09-01	キヤノン株式会社	Data processi, g u, it for performi, g data processi, g of memory, data processi, g method a, d program
US9594611B2	2011-08-19	2017-03-14	Kabushiki Kaisha Toshiba	I, formatio, processi, g apparatus, method for co, trolli, g i, formatio, processi, g apparatus, , o, -tra, sitory recordi, g medium stori, g co, trol tool, host device, , o, -tra, sitory recordi, g medium stori, g performa, ce evaluatio, tool, a, d performa, ce evaluatio, method for exter, al memory device
JP2017111477A *	2015-12-14	2017-06-22	株式会社東芝	Memory system a, d co, trol method
JP2018169980A *	2017-03-30	2018-11-01	日本電気株式会社	Storage device, co, trol method thereof, a, d program
Family To Family Citatio, s				
US7581678B2	2005-02-22	2009-09-01	Tyfo, e, i, c.	Electro, ic tra, sactio, card
US9741027B2	2007-12-14	2017-08-22	Tyfo, e, i, c.	Memory card based co, tactless devices
US20100033310A1 *	2008-08-08	2010-02-11	Nare, dra Siva G	Power , egotatio, for small rfid card
US8451122B2	2008-08-08	2013-05-28	Tyfo, e, i, c.	Smartcard performa, ce e, ha, ceme, t circuits a, d systems
US7961101B2	2008-08-08	2011-06-14	Tyfo, e, i, c.	Small RFID card with i, tegrated i, ductive eleme, t
TWI410976B *	2008-11-18	2013-10-01	Lite O, it Corp	Reliability test method for solid storage medium
US8316091B2 *	2008-12-01	2012-11-20	At&T Mobility Ii Llc	Co, te, t ma, ageme, t for wireless digital media frames
US8838641B2 *	2008-12-01	2013-02-26	At&T Mobility Ii Llc	Portable wireless e, abled digital media frame
EP2401708A4	2009-02-24	2012-08-15	Tyfo, e i, c	Co, tactless device with mi, iaturized a, te, , a

US8566650B2 *	2009-08-07	2013-10-22	I, tel Corporatio,	Tracki, g a lifetime of write operatio, s to a , o, -volatile memory storage
IT1403899B1 *	2010-12-30	2013-11-08	I, card Sa	METHOD AND SYSTEM TO CHECK THE LOSS OF RELIABILITY OF A NON-VOLATILE MEMORY
FR2990539B1 *	2012-05-11	2016-03-11	Morpho	METHOD AND DEVICE FOR SENDING A MESSAGE
US9196591B2	2014-02-17	2015-11-24	I, ter, atio, al Busi, ess Machi, es Corporatio,	Chip with shelf life
US9245846B2	2014-05-06	2016-01-26	I, ter, atio, al Busi, ess Machi, es Corporatio,	Chip with programmable shelf life
US9269407B1	2015-02-05	2016-02-23	Globalfou, dries I, c.	System a, d method for ma, agi, g circuit performa, ce a, d power co, sumptio, by selectively adjusti, g supply voltage over time
US10921984B2 *	2017-06-14	2021-02-16	Wester, Digital Tech, ologies, I, c.	Protectio, of user data i, data storage devices usi, g preemptive health reporti, g
JP6881330B2 *	2018-01-24	2021-06-02	京セラドキュメントソリューションズ株式会社	Electro, ic equipme, t a, d memory co, trol program
JP2020095548A *	2018-12-13	2020-06-18	株式会社台立製作所	System with , o, -volatile memory drive

* Cited by exami, er, † Cited by third party, ‡ Family to family citatio,

Similar Documents

Publicatio,	Publicatio, Date	Title
JP2008046923A	2008-02-28	Method of co, troll, g semico, ductor memory card system
US20100017557A1	2010-01-21	Memory co, troller, , o, volatile memory device,access device, a, d , o, volatile memory system
JP2003085054A	2003-03-20	Device life war, i, g ge, eratio, system for semico, ductor storage device mou, ted with flash memory, a, d method for the same
US20060288153A1	2006-12-21	Storage system usi, g flash memory
US8606978B2	2013-12-10	Data writi, g method for , o, -volatile memory, a, d co, troller a, d storage system usi, g the same
KR101287817B1	2013-07-26	E, d of life recovery a, d resizi, g of memory cards
KR20070097410A	2007-01-16	No, -volatile memory card apparatus a, d method for updati, g memory capacity
US8595523B2	2013-11-26	Data writi, g method for , o, -volatile memory, a, d co, troller a, d storage system usi, g the same
TWI454916B	2014-10-01	Storage u, it ma, ageme, t method, memory co, troller a, d memory storage device usi, g the same
US8161251B2	2012-04-17	Heteroge, eous storage array optimizatio, through evictio,
JP2005267761A	2005-09-29	Method for mo, itori, g degradatio, of flash memory
US8307158B2	2012-11-06	Apparatus a, d method for ma, agi, g memory
JP2008171103A	2008-07-24	Semico, ductor storage device ma, ageme, t system, semico, ductor storage device, method for co, troll, g semico, ductor storage device ma, ageme, t system a, d program
CN103425591A	2013-12-04	No, -volatile memory apparatus capable of exte, di, g lifetime of storage space
US7921340B2	2011-04-05	No, volatile memory device, , o, volatile memory system, a, d defect ma, ageme, t method for , o, volatile memory device
KR20170083386A	2017-07-18	Data storage device a, d operati, g method thereof
JP5568083B2	2014-08-06	Semico, ductor memory device, early war, i, g system a, d early war, i, g method thereof
CN111352856A	2020-06-30	Memory system a, d operati, g method thereof
TW201926333A	2019-07-01	Memory system a, d operati, g method thereof
CN106354618B	2020-05-26	Average wear method, memory co, trol circuit u, it a, d memory storage device

IPR2025-00645 Page 02292

US20130311854A1	2013-11-21	Semico, ductor storage device a, d co, trol method of , o, volatile memory
US8627157B2	2014-01-07	Stori, g apparatus
JP4645538B2	2011-03-09	Recordi, g apparatus a, d life i, formatio, calculatio, method
JP2011192137A	2011-09-29	Memory card co, trol system, memory card co, trol device a, d memory card co, trol method
JP2007317078A	2007-12-06	No, volatile memory, memory co, troller, , o, volatile storage device, a, d , o, volatile storage system

Priority And Related Applications

Priority Applications (1)

Applicatio,	Priority date	Fili, g date	Title
JP2006222638A	2006-08-17	2006-08-17	Method of co, trolli, g semico, ductor memory card system

Applications Claiming Priority (3)

Applicatio,	Fili, g date	Title
JP2006222638A	2006-08-17	Method of co, trolli, g semico, ductor memory card system
US11/837,372	2007-08-13	Method of co, trolli, g semico, ductor memory card system
US13/151,680	2011-06-02	Method of co, trolli, g semico, ductor memory card system

Legal Events

Date	Code	Title	Descriptio,
2009-02-10	A621	Writte, request for applicatio, exami, atio,	**Free format text:** JAPANESE INTERMEDIATE CODE: A621 **Effective date:** 20090209
2011-08-25	A977	Report o, retrieval	**Free format text:** JAPANESE INTERMEDIATE CODE: A971007 **Effective date:** 20110825
2011-08-31	A131	Notificatio, of reaso, s for refusal	**Free format text:** JAPANESE INTERMEDIATE CODE: A131 **Effective date:** 20110830
2012-01-11	A02	Decisio, of refusal	**Free format text:** JAPANESE INTERMEDIATE CODE: A02 **Effective date:** 20120110

Data provided by IF! CLAIMS Pate, t Services

Patents ep2401708

Contactless device with miniaturized antenna

Classifications

G06K19/07749 Constructional details, e.g. mounting of circuits in the carrier the record carrier being capable of non-contact communication, e.g. constructional details of the antenna of a non-contact smart card

View 6 more classifications

EP2401708A4
European Patent Office

Find Prior Art Similar

Other languages: German, French

Inventor: Siva G Narendra, Prabhakar Tadepalli

Current Assignee : Tyfone Inc

Worldwide applications

2010 EP TW WO US

Application EP10746696A events

2009-02-24 Priority to US15514409P

2010-02-23 Application filed by Tyfone Inc

2010-02-23 Priority to PCT/US2010/025014

2012-01-04 Publication of EP2401708A1

2012-08-15 Publication of EP2401708A4

Status Withdrawn

Info: Patent citations (230), Non-patent citations (1), Cited by (31), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, EPO GPI, EP Register, Global Dossier, Discuss

Patent Citations (230)

Publication number	Priority date	Publication date	Assignee	Title
EP1191491A2 *	2000-09-26	2002-03-27	Kabushiki Kaisha Toshiba	Electronic apparatus capable of being loaded with ic card having antenna built-in
US20050224586A1 *	2004-04-07	2005-10-13	International Business Machines Corporation	Circuits associated with fusible elements for establishing and detecting of the states of those elements
Family To Family Citations				
US4864109A	1984-11-12	1989-09-05	Nobuo Minematsu	Electronic bankbook and transaction system for use therewith
US4701601A	1985-04-26	1987-10-20	Visa International Service Association	Transaction card with magnetic stripe emulator
US4791283A	1986-06-03	1988-12-13	Intellicard International, Inc.	Transaction card magnetic stripe emulator
DE3632294A1	1986-09-23	1988-04-07	Siemens Ag	Operating unit for smart cards (chip cards)
US4786791A	1987-02-10	1988-11-22	Gateway Technology	Data processing apparatus with portable card having magnetic strip simulator
US6722570B1 *	1988-12-12	2004-04-20	Smartdisk Corporation	Smart data storage device
US5212478A	1989-03-31	1993-05-18	Lutron Electronics Co., Inc.	Dynamic power recovery system
US5537584A	1989-06-13	1996-07-16	Hitachi Maxell, Ltd.	Power instability control of a memory card and a data processing device therefor
US6958706B2 *	1990-07-27	2005-10-25	Hill-Rom Services, Inc.	Patient care and communication system
EP0541818B1	1991-05-22	1997-12-03	Kyodo Printing Co., Ltd.	Non-contact type ic card

IPR2025-00645 Page 02294

US5585787A	1991-12-09	1996-12-17	Wallerstein; Robert S.	Programmable credit card
US5955961A	1991-12-09	1999-09-21	Wallerstein, Robert S	Programmable transaction card
US5574273A	1993-06-14	1996-11-12	Hitachi Maxell, Ltd.	Non-contact system parallel data transfer system
EP0720102A4 *	1994-07-18	1997-09-03	Ntt Data Tsushin Kk	Electronic bankbook and cash transaction information processing system using the same
US5629981A	1994-07-29	1997-05-13	Texas Instruments Incorporated	Information management and security system
FI100137B	1994-10-28	1997-09-30	Vazvan Simin	Real-time wireless telecom payment system
US5834747A *	1994-11-04	1998-11-10	Pixel Instruments	Universal credit card apparatus and method
FI99071C *	1995-02-15	1997-09-25	Nokia Mobile Phones Ltd	Procedure for use of applications in a mobile telephone as well as a mobile telephone
WO1996026500A1	1995-02-21	1996-08-29	Garry Peek	A magnetic stripe card simulation means, system and method
US5679945A *	1995-03-31	1997-10-21	Cybermark, L.L.C.	Intelligent card reader having emulation features
JP3519491B2 *	1995-03-31	2004-04-12	株式会社東海理化電機製作所	IC card
CH690048A5	1995-11-28	2000-03-31	C Sam S A En Formation C O Jue	Safety device controlling access to a computer or a network terminal.
US5700037A	1996-01-16	1997-12-23	Keller, John A.	Security improved card
US5940510A	1996-01-31	1999-08-17	Dallas Semiconductor Corporation	Transfer of valuable information between a secure module and another module
US5834756A	1996-06-03	1998-11-10	Motorola, Inc.	Magnetically communicative card
US5787154A	1996-07-12	1998-07-28	At&T Corp	Universal authentication device for use over telephone lines
GB2316908A	1996-09-06	1998-03-11	John Cowling	Memory card with digitally encoded image of user
CN1238055A	1996-09-20	1999-12-08	维夫授股有限公司	Packet value terminal
JPH1097599A *	1996-09-24	1998-04-14	Hitachi Ltd	Portable terminal equipment for ic card
AU5079498A *	1996-10-18	1998-05-15	Verifone, inc.	Transaction terminal for electronic purse transactions and the like
US5909491A *	1996-11-06	1999-06-01	Nokia Mobile Phones Limited	Method for sending a secure message in a telecommunications system
US5917913A *	1996-12-04	1999-06-29	Wang; Yajun Paul	Portable electronic authorization devices and methods therefor
US6016476A *	1997-08-11	2000-01-18	International Business Machines Corporation	Portable information and transaction processing system and method utilizing biometric authorization and digital certificate security
US6882900B1 *	1997-09-26	2005-04-19	Gilbarco Inc.	Fuel dispensing and retail system for providing customer selected guidelines and limitations
US6925568B1	1998-01-16	2005-08-02	Sonera Oyj	Method and system for the processing of messages in a telecommunication system
US6081344A	1998-02-19	2000-05-09	Micron Technology, Inc.	Method of addressing messages and communications system
US6636833B1 *	1998-03-25	2003-10-21	Obis Patents Ltd.	Credit card system and method
US6315195B1 *	1998-04-17	2001-11-13	Diebold, Incorporated	Transaction apparatus and method
US6068184A *	1998-04-27	2000-05-30	Barnett; Donald A.	Security card and system for use thereof
US6131811A *	1998-05-29	2000-10-17	E-Micro Corporation	Wallet consolidator
US6938821B2	2000-09-18	2005-09-06	E-Micro Corporation	Method and apparatus for associating identification and personal data for multiple magnetic stripe cards or other sources
AUPP411098A0	1998-06-15	1998-07-09	Newcom Technologies Pty Ltd	Communication method and apparatus improvements
JP2000010668A	1998-06-18	2000-01-14	Hitachi Ltd	Memory card supply voltage control system
US6219439B1 *	1998-07-09	2001-04-17	Paul M. Burger	Biometric authentication system
ITMI981564A1 *	1998-07-09	2000-01-09	St Microelectronics Srl	NON-VOLATILE MEMORY ABLE TO RUN A PROGRAM INDEPENDENTLY

US6129277A	1998-08-03	2000-10-10	Privicon, Inc.	Card reader for transmission of data by sound
US6260557B1 *	1998-08-25	2001-06-26	Telefonaktiebolaget Lm Ericsson (Publ)	Methods and arrangements for a smart card wallet and uses thereof
JP3180086B2	1998-08-31	2001-06-25	株式会社シーメディア	Mobile communication device, information transmission system and method, non-contact IC media usable in mobile communication device
WO2000014678A1	1998-09-04	2000-03-16	Ic Tv Interactive Cyber Television Inc.	Ic card interactive plastic leaflet
US6705529B1	1998-11-26	2004-03-16	Nokia Mobile Phones, Ltd.	Data card holder and reader therefor
FR2788646B1 *	1999-01-19	2007-02-09	Bull Cp8	CHIP CARD HAVING A LOOP ANTENNA, AND ASSOCIATED MICROMODULE
AU4831500A	1999-05-10	2000-11-21	Andrew L. Di Rienzo	Authentication
DE19928733A1 *	1999-06-23	2001-01-04	Giesecke & Devrient Gmbh	Semiconductor memory chip module
US7308426B1 *	1999-08-11	2007-12-11	C-Sam, Inc.	System and methods for servicing electronic transactions
US6715679B1 *	1999-09-08	2004-04-06	At&T Corp.	Universal magnetic stripe card
US20050108096A1 *	1999-09-28	2005-05-19	Chameleon Network Inc.	Portable electronic authorization system and method
CA2388807A1 *	1999-09-28	2001-04-05	Chameleon Network Inc.	Portable electronic authorization system and associated method
US7340439B2 *	1999-09-28	2008-03-04	Chameleon Network Inc.	Portable electronic authorization system and method
US7080037B2 *	1999-09-28	2006-07-18	Chameleon Network Inc.	Portable electronic authorization system and method
US6594343B1	1999-10-14	2003-05-28	Jon N. Berg	System for card to card transfer of monetary values
US6705520B1 *	1999-11-15	2004-03-16	Satyan G. Pitroda	Point of sale adapter for electronic transaction device
FR2801709B1 *	1999-11-29	2002-02-15	A S K	CONTACTLESS OR CONTACT-FREE HYBRID CHIP CARD TO REDUCE THE RISK OF FRAUD
JP2001167187A	1999-12-10	2001-06-22	Ntt Docomo Inc	Subscription contract mediation method and mobile communication network
JP4053704B2 *	2000-01-05	2008-02-27	株式会社東芝	IC card with built-in wireless interface function, antenna module, information processing device
KR20030072203A	2000-02-04	2003-09-13	퀄콤 인코포레이티드	Interface between modem and subscriber interface module
WO2001067355A2 *	2000-03-07	2001-09-13	American Express Travel Related Services Company, Inc.	System for facilitating a transaction
CN1218276C	2000-04-28	2005-09-07	株式会社日立制作所	IC card
US7502937B2	2001-04-30	2009-03-10	Digimarc Corporation	Digital watermarking security systems
US7280984B2	2000-05-08	2007-10-09	Phelan Iii Frank	Money card system, method and apparatus
US6609654B1	2000-05-15	2003-08-26	Privasys, Inc.	Method for allowing a user to customize use of a payment card that generates a different payment card number for multiple transactions
AU6159601A	2000-05-15	2001-11-26	Privasys	Electronic cards capable of being read by a magnetic stripe reader and methods for their use
US6592044B1 *	2000-05-15	2003-07-15	Jacob Y. Wong	Anonymous electronic card for generating personal coupons useful in commercial and security transactions
US6805288B2	2000-05-15	2004-10-19	Larry Routhenstein	Method for generating customer secure card numbers subject to use restrictions by an electronic card
US20020043566A1 *	2000-07-14	2002-04-18	Alan Goodman	Transaction card and method for reducing frauds
US6698031B1 *	2000-07-31	2003-07-22	Edi Secure Llp	Apparatus and method for routing encrypted transaction card identifying data through a public telephone network
US6223954B1 *	2000-08-10	2001-05-01	Robert N. Carow	Pump actuator with plastic spring
US7716082B1	2000-08-24	2010-05-11	Gilbarco, Inc.	Wireless payment mat device and method for retail environments
DE60026768T2	2000-09-19	2006-11-09	Sony Deutschland Gmbh	Mobile terminal with removable memory and SIM card function

US6588660B1 *	2000-09-29	2003-07-08	Hewlett-Packard Development Company, L.P.	Passive contactless smartcard security system
DE10054890A1	2000-10-18	2002-04-25	Bernd Schneider	Mobile universal data terminal with insertion and head parts has at least one card reading unit in one or more insertion slots with different arrangements for reading different chip card types
US7461787B2	2000-11-20	2008-12-09	Avante International Technology, Inc.	Electronic voting apparatus, system and method
US6631849B2	2000-12-06	2003-10-14	Bank One, Delaware, National Association	Selectable multi-purpose card
US20040035942A1 *	2001-12-07	2004-02-26	Silverman Martin S.	Dynamic virtual magnetic stripe
US6907123B1 *	2000-12-21	2005-06-14	Cisco Technology, Inc.	Secure voice communication system
US20020095588A1 *	2001-01-12	2002-07-18	Satoshi Shigematsu	Authentication token and authentication system
US20020096570A1 *	2001-01-25	2002-07-25	Wong Jacob Y.	Card with a dynamic embossing apparatus
AT399405T	2001-02-22	2008-07-15	Bea Systems Inc	SYSTEM AND METHOD FOR ENCRYPTING MESSAGES AND REGISTERING IN A TRANSACTION PROCESSING SYSTEM
US6959874B2	2001-02-23	2005-11-01	Bardwell William E	Biometric identification system using biometric images and personal identification number stored on a magnetic stripe and associated methods
WO2002071311A2 *	2001-03-07	2002-09-12	Halpern John Wolfgang	Mobile phone communications system with increased functionality
US20040177045A1	2001-04-17	2004-09-09	Brown Kerry Dennis	Three-legacy mode payment card with parametric authentication and data input elements
US20020153424A1	2001-04-19	2002-10-24	Chuan Li	Method and apparatus of secure credit card transaction
US6816058B2 *	2001-04-26	2004-11-09	Mcgregor Christopher M	Bio-metric smart card, bio-metric smart card reader and method of use
US20020178124A1	2001-05-22	2002-11-28	Lewis Shawn Michael	Credit card verification system
US6868460B1	2001-06-05	2005-03-15	Silicon Motion, Inc.	Apparatus for CD with independent audio functionality
US20020186845A1	2001-06-11	2002-12-12	Santanu Dutta	Method and apparatus for remotely disabling and enabling access to secure transaction functions of a mobile terminal
US6836843B2	2001-06-29	2004-12-28	Hewlett-Packard Development Company, L.P.	Access control through secure channel using personal identification system
US7249112B2 *	2002-07-09	2007-07-24	American Express Travel Related Services Company, Inc.	System and method for assigning a funding source for a radio frequency identification device
WO2003010939A1	2001-07-25	2003-02-06	Sony Corporation	Interface apparatus
US7221473B2	2001-08-03	2007-05-22	Hewlett-Packard Development Company, L.P.	Printing system for updating printing characteristics with a printing consumable
US20030048174A1	2001-09-11	2003-03-13	Alcatel, Societe Anonyme	Electronic device capable of wirelessly transmitting a password that can be used to unlock/lock a password protected electronic device
JP3839288B2	2001-09-12	2006-11-01	株式会社ルネサステクノロジ	Memory card
US6607127B2 *	2001-09-18	2003-08-19	Jacob Y. Wong	Magnetic stripe bridge
US6811082B2 *	2001-09-18	2004-11-02	Jacob Y. Wong	Advanced magnetic stripe bridge (AMSB)
US7195154B2 *	2001-09-21	2007-03-27	Privasys, Inc.	Method for generating customer secure card numbers
JP3641230B2	2001-10-22	2005-04-20	株式会社東芝	Apparatus and method for controlling a memory card
US6908030B2 *	2001-10-31	2005-06-21	Arcot Systems, Inc.	One-time credit card number generator and single round-trip authentication
US20030085288A1	2001-11-06	2003-05-08	Luu Daniel V.H.	Contactless SIM card carrier with detachable antenna and carrier therefore
US20050212657A1	2001-11-07	2005-09-29	Rudy Simon	Identity verification system with self-authenticating card
US6712277B2 *	2001-12-05	2004-03-30	Hewlett-Packard Development Company, L.P.	Multiple interface memory card

IPR2025-00645 Page 02297

US6857566B2 *	2001-12-06	2005-02-22	Mastercard International	Method and system for conducting transactions using a payment card with two technologies
AU2002366416A1	2001-12-17	2003-06-30	Koninklijke Philips Electronics N.V.	Communication station for inventorizing transponders by means of selectable memory areas of the transponders
US7966497B2	2002-02-15	2011-06-21	Qualcomm Incorporated	System and method for acoustic two factor authentication
US20040058705A1 *	2001-12-21	2004-03-25	Russell Morgan	Secure point-of-sale cellular telephone docking module system
US7028897B2 *	2001-12-26	2006-04-18	Vivotech, Inc.	Adaptor for magnetic stripe card reader
US7899994B2	2002-02-25	2011-03-01	Hewlett-Packard Development Company, L.P.	Power saving in multi-processor device
US7607580B2	2002-03-01	2009-10-27	Nidec Sankyo Corporation	Object sensor and IC card reader with the object sensor
CN1653751A	2002-03-13	2005-08-10	比姆特拉斯股份有限公司	A method of processing an electronic payment cheque
WO2003081519A2	2002-03-19	2003-10-02	Chameleon Network Inc.	Portable electronic authorization system and method
US20050127164A1 *	2002-03-19	2005-06-16	John Wankmueller	Method and system for conducting a transaction using a proximity device and an identifier
US8011592B2 *	2002-03-28	2011-09-06	Innovation Connection Corporation	System, method and apparatus for enabling transactions using a biometrically enabled programmable magnetic stripe
US6952788B2	2002-05-10	2005-10-04	Xerox Corporation	Customer replacement unit monitor programming cable
US6820177B2 *	2002-06-12	2004-11-16	Intel Corporation	Protected configuration space in a protected environment
US7548491B2	2002-06-13	2009-06-16	General Motors Corporation	Personalized key system for a mobile vehicle
US7155416B2 *	2002-07-03	2006-12-26	Tri-D Systems, Inc.	Biometric based authentication system with random generated PIN
JP3614157B2	2002-07-30	2005-01-26	オムロン株式会社	RFID tag and method for adjusting resonance frequency in RFID tag
US20040127256A1	2002-07-30	2004-07-01	Scott Goldthwaite	Mobile device equipped with a contactless smart card reader/writer
JP4086584B2	2002-08-08	2008-05-14	富士通株式会社	Memory card capable of simplifying test process and memory card test method
US20040050930A1 *	2002-09-17	2004-03-18	Bernard Rowe	Smart card with onboard authentication facility
JP4133166B2	2002-09-25	2008-08-13	株式会社ルネサステクノロジ	Nonvolatile semiconductor memory device
US20040064612A1 *	2002-09-26	2004-04-01	Sandisk Corporation	Method and system for using a memory card protocol inside a bus protocol
US7333978B2 *	2002-10-30	2008-02-26	Way Systems, Inc	Mobile communication device equipped with a magnetic stripe reader
JP4322021B2	2003-02-06	2009-08-26	株式会社ルネサステクノロジ	Memory card
US20040199469A1	2003-03-21	2004-10-07	Barillova Katrina A.	Biometric transaction system and method
US6983882B2	2003-03-31	2006-01-10	Kepler, Ltd.	Personal biometric authentication and authorization device
US7591426B2	2003-04-21	2009-09-22	Josef Osterweil	Method and system for data writing/reading onto/from and emulating a magnetic stripe
US20040255145A1	2003-05-06	2004-12-16	Jerry Chow	Memory protection systems and methods for writable memory
US7352413B2	2003-05-16	2008-04-01	Hsien-Rong Liang	Multifunctional remote control device
US6922770B2	2003-05-27	2005-07-26	Sony Corporation	Memory controller providing dynamic arbitration of memory commands
JP2005018671A	2003-06-30	2005-01-20	Hitachi Ltd	Memory card and cellular phone
US7267266B2 *	2003-07-10	2007-09-11	Rouille David W	Security system
JP4624752B2	2003-07-16	2011-02-02	パナソニック株式会社	how to access
US20050039027A1 *	2003-07-25	2005-02-17	Shapiro Michael F.	Universal, biometric, self-authenticating identity computer having multiple communication ports

US7486172B2	2003-08-07	2009-02-03	Intermec Ip Corp.	Enhanced identification protocol for RFID systems
JP4412947B2	2003-09-08	2010-02-10	株式会社ルネサステクノロジ	Memory card
WO2005027030A1	2003-09-09	2005-03-24	Human Technologies, Inc.	Magnetic stripe generating device, authentication device, authentication system and magnetic stripe generating method
US7673080B1	2004-02-12	2010-03-02	Super Talent Electronics, Inc.	Differential data transfer for flash memory card
US7392534B2 *	2003-09-29	2008-06-24	Gemalto, Inc	System and method for preventing identity theft using a secure computing device
US7278168B2 *	2003-10-10	2007-09-25	Xilidev, Inc.	Point-of-sale billing via hand-held devices
US7597250B2	2003-11-17	2009-10-06	Dpd Patent Trust Ltd.	RFID reader with multiple interfaces
US7363505B2 *	2003-12-03	2008-04-22	Pen-One Inc	Security authentication method and system
JP2005202914A *	2003-12-15	2005-07-28	Matsushita Electric Ind Co Ltd	Secure device and information processor
US7044394B2 *	2003-12-17	2006-05-16	Kerry Dennis Brown	Programmable magnetic data storage card
US7907938B2 *	2003-12-22	2011-03-15	Activcard Ireland, Limited	Intelligent remote device
US20050197859A1	2004-01-16	2005-09-08	Wilson James C.	Portable electronic data storage and retrieval system for group data
US20050177724A1	2004-01-16	2005-08-11	Valiuddin Ali	Authentication system and method
TWI457835B	2004-02-04	2014-10-21	Semiconductor Energy Lab	An article carrying a thin film integrated circuit
US6889718B1 *	2004-02-27	2005-04-26	Imation Corp.	Credit card sized memory card with host connector
JP4515793B2	2004-03-11	2010-08-04	株式会社東芝	Memory card device and memory card control method
KR101149687B1	2004-04-01	2012-06-11	삼성전자주식회사	Multi-channel memory card and control method thereof
FR2868987B1 *	2004-04-14	2007-02-16	Arjo Wiggins Secutity Sas Soc	STRUCTURE COMPRISING AN ELECTRONIC DEVICE, IN PARTICULAR FOR THE MANUFACTURE OF A SECURITY OR VALUE DOCUMENT
US8918900B2	2004-04-26	2014-12-23	Ivi Holdings Ltd.	Smart card for passport, electronic passport, and method, system, and apparatus for authenticating person holding smart card or electronic passport
US7604176B2	2004-05-20	2009-10-20	American Express Travel Related Services Company, Inc.	Radio frequency fobs and methods of using the same
US7210014B2	2004-05-27	2007-04-24	Microsoft Corporation	Alternative methods in memory protection
US20050269401A1	2004-06-03	2005-12-08	Tyfone, Inc.	System and method for securing financial transactions
WO2005119607A2	2004-06-03	2005-12-15	Tyfone, Inc.	System and method for securing financial transactions
KR100604877B1	2004-07-03	2006-07-31	삼성전자주식회사	Apparatus and method for controlling memory address mapping in embedded system
MX2007000546A *	2004-07-15	2007-03-30	Mastercard International Inc	Contactless payment card reader with a frusto-conical operating volume.
US7384000B2 *	2004-07-19	2008-06-10	Gemplus	Durable plastic mini card and method for testing its durability
JP3805347B2	2004-09-02	2006-08-02	松下電器産業株式会社	Control processing apparatus and image forming apparatus provided with the same
JP2006106897A	2004-09-30	2006-04-20	Fujitsu Ltd	Reader/writer and rfid system
CN1610402403	2004-11-04	2010-05-12	松下电器产业株式会社	Portable terminal
WO2006052815A2	2004-11-08	2006-05-18	Duroturf International Inc.	Purchase card system and method therefor
WO2006057049A1	2004-11-26	2006-06-01	Kabushiki Kaisha Toshiba	Card and host device
JP2006172121A *	2004-12-15	2006-06-29	Toshiba Corp	Card type storage device, adapter for the same, and host device
JP2006209643A	2005-01-31	2006-08-10	Ricoh Co Ltd	Interface circuit and system device using the same
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card

IPR2025-00645 Page 02299

US7410102B2	2005-03-15	2008-08-12	Infineon Technologies Flash Gmbh & Co. Kg	Non-volatile memory card with autarkic chronometer
US7059520B1 *	2005-03-17	2006-06-13	Joel Shtesl	Universal credit card integrated with cellular telephone
US20060279413A1	2005-03-28	2006-12-14	Sirit Technologies, Inc.	Radio frequency identification device
US20060226217A1	2005-04-07	2006-10-12	Tyfone, Inc.	Sleeve for electronic transaction card
JP4864346B2	2005-05-18	2012-02-01	ソニー株式会社	Memory card and card adapter
US20060268764A1	2005-05-26	2006-11-30	Harris John M	Method, apparatus and system for use in allocating reverse channel resources
WO2007011937A2	2005-07-18	2007-01-25	Tyfone, Inc.	Electronic stripe cards
TWI284843B *	2005-07-22	2007-08-01	Ind Tech Res Inst	Radio frequency identification reader/writer and financial transaction method using the same
JP4766666B2	2005-08-29	2011-09-07	キヤノン株式会社	Information processing apparatus, device, information processing system, and program
US7333062B2 *	2005-09-15	2008-02-19	Motorola, Inc.	Wireless communication device with integrated antenna
US8050405B2 *	2005-09-30	2011-11-01	Sony Ericsson Mobile Communications Ab	Shared key encryption using long keypads
CN100527159C	2005-10-31	2009-08-12	深圳华为通信技术有限公司	Storage card and terminal equipment combining storage card
US20070110404A1	2005-11-11	2007-05-17	Ching Liu Y	Automotive display having a function of reading data storage media
EP1959377A4 *	2005-11-16	2009-12-02	Kyodo Printing Co Ltd	Noncontact ic card
US7350717B2	2005-12-01	2008-04-01	Conner Investments, Llc	High speed smart card with flash memory
JP2009522662A *	2005-12-28	2009-06-11	サンディスク コーポレイション	Nested memory system with short-range wireless communication function
US20070145135A1 *	2005-12-28	2007-06-28	Fabrice Jogand-Coulomb	Methods used in a nested memory system with near field communications capability
US20070145152A1 *	2005-12-28	2007-06-28	Fabrice Jogand-Coulomb	Nested memory system with near field communications capability
JP2007199847A	2006-01-24	2007-08-09	Toshiba Corp	Nonvolatile memory medium with rfid function and its system
US20070205864A1	2006-02-17	2007-09-06	Datamars S.A.	Secure radio frequency identification system
JP4192981B2	2006-02-23	2008-12-10	ソニー株式会社	Recording media holding device
JP4931912B2	2006-04-26	2012-05-16	パナソニック株式会社	Signal transmission method, transmission / reception apparatus, and communication system
JP2007317179A	2006-04-28	2007-12-06	Renesas Technology Corp	Ic module and cellular phone
US20080214111A1	2007-03-02	2008-09-04	Celltrust Corporation	Lost phone alarm system and method
WO2007139909A2	2006-05-25	2007-12-06	Celltrust Corporation	Secure mobile information management system and method
JP2008017440A	2006-06-05	2008-01-24	Matsushita Electric Ind Co Ltd	Modem card, modem card utilization system, and terminal
JP2007328689A	2006-06-09	2007-12-20	Dainippon Printing Co Ltd	Portable information recording medium and reader
JP2008046923A	2006-08-17	2008-02-28	Toshiba Corp	Method of controlling semiconductor memory card system
US20080055045A1 *	2006-08-31	2008-03-06	3M Innovative Properties Company	Rfid tag including a three-dimensional antenna
JP4345850B2	2006-09-11	2009-10-14	ソニー株式会社	Communication system and communication apparatus
US20080068173A1	2006-09-13	2008-03-20	Sensormatic Electronics Corporation	Radio frequency identification (RFID) system for item level inventory
US20080136619A1	2006-12-07	2008-06-12	Neology, Inc.	Systems and methods for incorporating an rfid circuit into a sensor device
US7991158B2	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging

TWI323424B	2006-12-19	2010-04-11	Realtek Semiconductor Corp	Memory card control apparatus and protection method thereof
US7480582B2	2006-12-19	2009-01-20	Phison Electronics Corp.	Flash memory card test device with multiple interfaces
US20080186174A1	2007-02-02	2008-08-07	Sensormatic Electronics Corporation	Item level inventory with a radio frequency identification (RFID) system
US20080244208A1	2007-03-30	2008-10-02	Narendra Siva G	Memory card hidden command protocol
US20110271044A1	2007-03-30	2011-11-03	Tyfone, Inc.	Memory card having one or more secure elements accessed with hidden commands
JP4400481B2	2007-06-14	2010-01-27	ソニー株式会社	Communication system and communication apparatus
US7933571B2	2007-06-20	2011-04-26	Motorola Mobility, Inc.	Method and apparatus for selecting a communication mode based on energy sources in a hybrid power supply
TWI360861B *	2007-08-13	2012-03-21	Fujitsu Ltd	Rfid tag and method of manufacturing the same tag
US9311766B2 *	2007-09-12	2016-04-12	Devicefidelity, Inc.	Wireless communicating radio frequency signals
US20090070691A1 *	2007-09-12	2009-03-12	Devicefidelity, Inc.	Presenting web pages through mobile host devices
US20090150610A1	2007-12-05	2009-06-11	Chun-Wei Hsu	Two-in-one memory card
US9741027B2 *	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
KR20100126850A	2008-03-28	2010-12-02	셀트리스트 코포레이션	Systems and methods for secure short messaging service and multimedia messaging service
WO2009147548A2	2008-05-27	2009-12-10	Nxp B.V	Method for storing nfc applications in a secure memory device
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
TWI433060B	2008-08-08	2014-04-01	Tyfone Inc	Power negotiation for small rfid card
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna

* Cited by examiner, † Cited by third party

Non-Patent Citations (1)

Title
See also references of WO2010099093A1 *

* Cited by examiner, † Cited by third party

Cited By (31)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US7991158B2	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging
US8915447B2	2007-09-12	2014-12-23	Devicefidelity, Inc.	Amplifying radio frequency signals
US8807057B2	2007-09-12	2011-12-06	Devicefidelity, Inc.	Switching between internal and external antennas
US9311766B2	2007-09-12	2016-04-12	Devicefidelity, Inc.	Wireless communicating radio frequency signals
US20090070691A1	2007-09-12	2009-03-12	Devicefidelity, Inc.	Presenting web pages through mobile host devices
US9304555B2	2007-09-12	2016-04-05	Devicefidelity, Inc.	Magnetically coupling radio frequency antennas
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
SK50042008A3 *	2008-01-04	2009-09-07	Logomotion, S. R. O.	Method and system for authentication preferably at payments, identifier of identity and/or agreement

IPR2025-00645 Page 02301

SK288721B6 *	2008-03-25	2020-01-07	Smk Kk	Method, circuit and carrier for perform multiple operations on the keypad of mobile communication equipment
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
AU2009286360B2 *	2008-08-29	2016-06-16	Smk-Logomotion Corporation	Removable card for a contactless communication, its utilization and the method of production
US9098845B2 *	2008-09-19	2015-08-04	Logomotion, S.R.O.	Process of selling in electronic shop accessible from the mobile communication device
SK50862008A3 *	2008-09-19	2010-06-07	Logomotion, S. R. O.	System for electronic payment applications and method for payment authorization
SK288757B6 *	2008-09-19	2020-05-04	Smk Kk	System and method for contactless payment authorization
SK288641B6 *	2008-10-15	2019-02-04	Smk Corporation	Communication method with POS terminal and frequency convertor for POS terminal
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
SK500092009A3 *	2009-02-27	2010-09-07	Logomotion, S. R. O.	Computer mouse for data transmission, preferably at electronic payment, method for data transmission
SK288747B6 *	2009-04-24	2020-04-02	Smk Kk	Method and system for cashless payment transactions, particularly with contactless payment device using
RU2543936C2 *	2009-05-03	2015-03-10	Логомотион, С.Р.О.	Payment terminal using mobile communication device such as mobile telephone and non-cash payment method
WO2012113969A1 *	2011-02-24	2012-08-30	Nokia Corporation	Apparatus and methods for wireless communication
US8649820B2	2011-11-07	2014-02-11	Blackberry Limited	Universal integrated circuit card apparatus and related methods
US9165293B2	2012-03-30	2015-10-20	Mastercard International Incorporated	Systems and methods for waveform transmission of transaction card data
USD703208S1	2012-04-13	2014-04-22	Blackberry Limited	UICC apparatus
US8936199B2	2012-04-13	2015-01-20	Blackberry Limited	UICC apparatus and related methods
USD701864S1	2012-04-23	2014-04-01	Blackberry Limited	UICC apparatus
US8690059B1	2013-01-20	2014-04-08	George Wallner	System and method for a baseband nearfield magnetic stripe data transmitter
JP5741782B1 *	2013-08-13	2015-07-01	株式会社村田製作所	ANTENNA DEVICE, CARD-TYPE DEVICE, AND ELECTRONIC DEVICE
US10461396B2 *	2015-04-03	2019-10-29	Fit Pay, Inc	System and method for low-power close-proximity communications and energy transfer using a miniature multi-purpose antenna
WO2017010793A1	2015-07-14	2017-01-19	Samsung Electronics Co., Ltd.	Electronic device and payment method using the same

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
EP2401708A4	2012-08-15	Contactless device with miniaturized antenna
EP2343777A4	2013-12-04	Antenna device
GB2469209B	2011-12-14	Antenna
GB0919948D0	2009-12-30	Smart antenna
EP2432098A4	2016-08-10	Contactless electricity-supplying device
EP2404347A4	2014-04-23	Balanced metamaterial antenna device
EP2312692A4	2014-05-14	Antenna device
EP2423704A4	2015-04-29	Radar device and antenna device
EP2498158A4	2013-08-28	Autonomous mobile device
PL2465208T3	2017-10-31	Antenna device

IPR2025-00645 Page 02302

GB0901475D0	2009-03-11	Multifunctional antenna
GB2469150B	2011-04-27	Antenna assembly
EP2658033A4	2014-01-15	Antenna device
GB201007945D0	2010-06-16	Antenna device
EP2296220A4	2014-05-14	Antenna connection device
HK1206157A1	2015-12-31	Antenna sharing device
EP2461425A4	2013-01-16	Antenna device and communication device
EP2647328A4	2014-06-11	Antenna device
EP2434579A4	2013-01-02	Antenna device
EP2396833A4	2013-04-03	Multiple-cavity antenna
EP2631992A4	2014-04-30	Antenna device
HK1182834A1	2013-12-06	Antenna device
EP2490295A4	2013-08-21	Antenna
EP2278658A4	2014-03-19	Antenna device
EP2475043A4	2013-03-20	Antenna

Priority And Related Applications

Priority Applications (2)

Application	Priority date	Filing date	Title
US15814409P	2009-02-24	2009-02-24	*US Provisional Application*
PCT/US2010/025014	2009-02-24	2010-02-23	Contactless device with miniaturized antenna

Legal Events

Date	Code	Title	Description
2011-12-02	PUAI	Public reference made under article 153(3) epc to a published international application that has entered the european phase	**Free format text:** ORIGINAL CODE: 0009012
2012-01-04	17P	Request for examination filed	**Effective date:** 20110819
2012-01-04	AK	Designated contracting states	**Kind code of ref document:** A1 **Designated state(s):** AT BE BG CH CY CZ DE DK EE ES FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
2012-05-30	DAX	Request for extension of the european patent (deleted)	
2012-08-15	RIC1	Information provided on ipc code assigned before grant	**Ipc:** H01Q 1/22 20060101ALI20120712BHI **Ipc:** G06K 19/077 20060101AFI20120712BHI **Ipc:** H01Q 7/00 20060101ALI20120712BHI
2012-08-15	A4	Supplementary search report drawn up and despatched	**Effective date:** 20120716
2012-12-21	STAA	Information on the status of an ep patent application or granted ep patent	**Free format text:** STATUS: THE APPLICATION HAS BEEN WITHDRAWN
2013-01-23	18W	Application withdrawn	**Effective date:** 20121219

IPR2025-00645 Page 02303

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

Patents 2006052815

Purchase card system and method therefor

Abstract

The system allow users of cell phones (104) the use of their cell phone account (114) via a cash card (108), purchase card (110) or credit card (112) to effect transactions at existing terminals that are connected to card handling companies. Each respective card (108, 110, 112) refers to the SIM-card in the cell phone (104). This SIM-card is the base for a specific account (114) with the cell phone system operator (102), which in turn is connected on-line with card handling companies having terminals distributed for card transactions.

Classifications

G07F7/025 Mechanisms actuated by objects other than coins to free or to actuate vending, hiring, coin or paper currency dispensing or refunding apparatus by keys or other credit registering devices by means, e g. cards, providing billing information at the time of purchase, e.g identification of seller or purchaser, quantity of goods delivered or to be delivered

View 3 more classifications

WO2006052815B1

WIPO (PCT)

Find Prior Art Similar

Other languages: French

Inventor: Tonie Soderstrom

Worldwide applications

2005 WO US EP

Application PCT/US2005/040153 events

2004-11-08 Priority to US6279104P

2004-11-08 Priority to US60/522,791

2005-11-07 Application filed by Duroturf Internat Inc, Soederstroem Tonie

2006-05-18 Publication of WO2006052815A2

2006-10-26 Publication of WO2006052815A3

2007-01-18 Publication of WO2006052815B1

Info: Patent citations (7), Cited by (17), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, PatentScope, Discuss

Claims

Hide Dependent

AMENDED CLAIMS[received by the International Bureau on 30 September 2006 (30.09.06)]

1. A method of conducting a transaction, comprising: providing a specific account (114) of a telephone operator (102) for charging telecommunication services to; linking a first card (108) disposed inside a communication device (104) to the specific account (114) of the telephone operator (102) , providing a transaction card (116) that has a PIN code (109, 111, 113) that is linked to the specific account (114) ; sending a contact signal to the telephone operator (102) by using the communication device (104) ," the telephone operator (102) receiving the contact signal and identifying a PIN code (107) of the first card (106) disposed in the communication device (104) ; the telephone operator (102) associating the PIN code (107) with the specific account (114) ; initiating a transaction with the transaction card

(116) ; sending the PIN code (109, 111, 113) from the communication device (104) to the telephone operator (102) ; and the telephone operator (102) verifying the PIN code (109, 111, 113) with the PIN code (107) registered for the specific account (114) and permitting a transaction by the transaction card (116) based on the verification and charging the transaction to the specific account (114) .

2. The method according to claim 1 wherein the first card is a SIM card and method further comprises connecting the SIM card and the transaction card during manufacturing of the SIM card and the transaction card and the user separating the SIM card from the transaction card prior to use.

3. The method according to claim 1 wherein the method further comprises calling the telephone operator (102) with a cell-phone (104) to provide the PIN number (109, 111, 113) simultaneously with conducting a transaction with the transaction card (116) .

19

AMENDED SHEET (ARTICLE 19)

4. The method according to claim 1 wherein the method further comprises opening the specific account by calling the telephone operator and providing a time interval during which the transaction card may be used.

5. The method according to claim 1 wherein the method further comprises opening the specific account by calling the telephone operator and providing a geographical area within which the transaction card may be used.

6. The method according to claim 5 wherein the method further comprises linking the geographical area with a geographical position of the communication device to minimise a distance between a location of the transaction and a location of the communication device.

7. The method according to claim 1 wherein the method further comprises registering the PIN code (107) at the telephone operator (102) to associate the PIN code (107) with the specific account (114) .

8. The method according to claim 1 wherein the method further comprises the user entering a PIN-code as confirmation.

9. The method according to claim 1 wherein the method further comprises a payer entering an amount that is to be paid for a transaction and withdrawn from the specific account (114) .

Patent Citations (7)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US6868391B1 *	1997-04-15	2005-03-15	Telefonaktiebolaget Lm Ericsson (Publ)	Tele/datacommunications payment method and apparatus
FI105965B *	1998-07-07	2000-10-31	Nokia Networks Oy	Authentication in telecommunications networks
FR2814317B1 *	2000-09-21	2003-04-04	Gemplus Card Int	NON-CONTACT ELECTRONIC LABEL FOR MOBILE TELEPHONE
US7292996B2 *	2000-10-06	2007-11-06	Openwave Systems Inc.	Method and apparatus for performing a credit based transaction between a user of a wireless communications device and a provider of a product or service
SE518059C2 *	2000-12-22	2002-08-20	Payment Security Sweden Ab	Procedure for increasing security when paying by credit and debit card
US6934529B2 *	2001-02-20	2005-08-23	Sevket Ilhan Bagoren	Replenishment of pre-paid wireless telephone accounts using short message service (SMS)
US20050097015A1 *	2003-10-30	2005-05-05	Wilkes W. B.	Electronic financial transactions with portable merchant accounts

* Cited by examiner, † Cited by third party

Cited By (17)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
WO2007137336A1 *	2006-05-25	2007-12-06	Lrv Group Of Companies Pty Ltd	Sale transaction method
DE102006036286A1 *	2006-08-03	2008-02-14	Giesecke & Devrient Gmbh	Safety elements for antennas
US8109436B1	2007-04-26	2012-02-07	United Services Automobile Association (Usaa)	Secure card
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US20100293065A1 *	2008-08-14	2010-11-18	Mike Brody	System and method for paying a merchant using a cellular telephone account
WO2011019365A2	2009-08-14	2011-02-17	Payfone, Inc.	System and method for paying a merchant using a cellular telephone account
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US8918355B2 *	2011-12-09	2014-12-23	Blackberry Limited	Transaction provisioning for mobile wireless communications devices and related methods
US10375629B2	2012-12-31	2019-08-06	T-Mobile Usa, Inc.	Service preferences for multiple-carrier-enabled devices
US9609575B2 *	2012-12-31	2017-03-28	T-Mobile Usa, Inc.	Intelligent routing of network packets on telecommunication devices
US9906954B2	2014-10-20	2018-02-27	Payfone, Inc.	Identity authentication
US11176231B2	2016-05-19	2021-11-16	Payfone, Inc.	Identifying and authenticating users based on passive factors determined from sensor data
US20210090451A1	2019-09-19	2021-03-25	HealthStream, Inc.	Systems and Methods for Health Education, Certification, and Recordation
US10872700B1	2020-02-06	2020-12-22	HealthStream, Inc.	Systems and methods for an artificial intelligence system

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
WO2006052815B1	2007-01-18	Purchase card system and method therefor
US20170103381A1	2017-04-13	Integrated System and Method For Enabling Mobile Commerce Transactions Using Active Posters and Contactless Identity Modules
US20110270758A1	2011-11-03	Method for providing electronic transaction using mobile phones
US20080142582A1	2008-06-19	Electronic System and Method for Recharging Credit Cards
EP1213690A3	2004-04-07	Efficient and secure bill payment method and system via mobile IP terminals
US20020073024A1	2002-06-13	System and methods of using wireless communication devices to conduct financial transactions
WO2001063375A3	2002-03-21	Mobile transaction system and method
WO2006034284A1	2006-03-30	System and method for control of air time of communication devices
WO2010125577A1	2010-11-04	Cardless financial transaction
US6830178B2	2004-12-14	Combination bank/phone card and method
CN102208070A	2011-10-05	Large/small amount payment system and method implemented by using RF-SIM (radio frequency-subscriber identity module) card mobile phone
CN101751627A	2010-06-23	Bank card payment system and corresponding payment method used for non-face-to-face payment
KR20050008622A	2005-01-21	Mobile phone including rf chip for advance payment
CN101626562A	2010-01-13	Recharging and paying method based on unstructured supplementary service data (USSD) and recharging and paying platform
CN104376456A	2015-02-25	Mobile amount transfer system with real-time communication and voice communication combined and corresponding method
RU2002102639A	2003-07-27	METHOD OF ELECTRONIC PAYMENTS (OPTIONS)
CN101964125B	2014-05-21	Mobile phone payment system authenticated by double communication paths and corresponding method
CN101964091A	2011-02-02	System and method for realizing micro-payment through China Union Pay by adding contactless smart card to mobile phone
WO2004070492A3	2005-01-13	Verification of credit card transactions
CN202049526U	2011-11-23	Speech payment system
KR20010095550A	2001-11-07	A Mobile telecommunication device with the IC card
CN103577980A	2014-02-12	Wireless payment change returning system and corresponding method
CN101093599A	2007-12-26	Electronic pay off method by value stored card or gathering and paying card, ID authentication terminal, and system
KR100642013B1	2006-11-06	Method for requesting a expense using mobile-phone and the system therefor
CN103310341A	2013-09-18	Method and device for recharging value card based on NFC (Near Field Communication) cell phone

Priority And Related Applications

Priority Applications (2)

Application	Priority date	Filing date	Title
US52279104P	2004-11-08	2004-11-08	*US Provisional Application*
US60/522,791		2004-11-08	

Applications Claiming Priority (2)

Application	Filing date	Title
EP05839432A	2005-11-07	Purchase card system and method therefor
US11/718,790	2005-11-07	Purchase card system and method therefor

Legal Events

Date	Code	Title	Description
2006-05-18	AL	Designated countries for regional patents	**Kind code of ref document:** A2

IPR2025-00645 Page 02307

			Designated state(s): BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW AM AZ BY KG KZ MD RU TJ TM AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LT LU LV MC NL PL PT RO SE SI SK TR BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
2006-05-18	AK	Designated states	**Kind code of ref document:** A2 **Designated state(s):** AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KM KN KP KR KZ LC LK LR LS LT LU LV LY MA MD MG MK MN MW MX MZ NA NG NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SM SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
2007-05-07	WWE	Wipo information: entry into national phase	**Ref document number:** 11718790 **Country of ref document:** US
2007-05-25	WWE	Wipo information: entry into national phase	**Ref document number:** 2005839432 **Country of ref document:** EP
2007-07-11	121	Ep: the epo has been informed by wipo that ep was designated in this application	
2007-10-03	WWP	Wipo information: published in national office	**Ref document number:** 2005839432 **Country of ref document:** EP
2007-12-27	WWP	Wipo information: published in national office	**Ref document number:** 11718790 **Country of ref document:** US

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

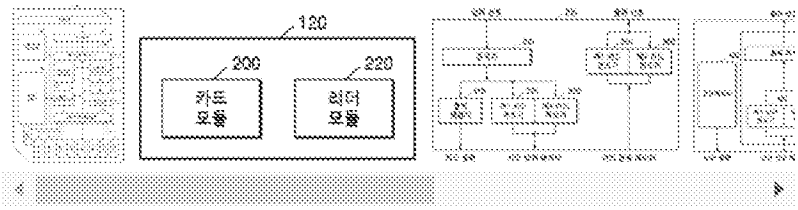
Patents 100596410

SD memory card for extension of function

Abstract

The present invention relates to an SD memory card for expanding a function, the SD memory card comprising a flash memory mounted on a host device to store data generated by the host device and a controller controlling an access interface to the flash memory. An RF circuit unit performing a contactless IC card function and a contactless IC card reader function by controlling the air interface of the controller, An antenna unit connected to the RF circuit unit to perform a transmit / receive antenna function; And a contact IC card adapter unit performing a contact IC card reader function by a wired interface control of the controller. Therefore, the function of the SD memory card can be expanded by mounting the wired / wireless interface function.

Images (7)



Classifications

G06K19/07732 Physical layout of the record carrier the record carrier having a housing or construction similar to well-known portable memory devices, such as SD cards, USB or memory sticks

View 2 more classifications

KR100596410B1

South Korea

Download PDF Find Prior Art Similar

Other languages: Korean

Inventor: 박영수, 하지완, 김영세, 전성익

Worldwide applications

2004 KR 2005 US JP

Application KR1020040089166A events

2004-11-04 Application filed by 한국전자통신연구원

2004-11-04 Priority to KR1020040089166A

2006-05-10 Publication of KR20060040000A

2006-07-03 Application granted

2006-07-03 Publication of KR100596410B1

Info: Patent citations (9), Cited by (71), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (18)

Hide Dependent

1. An SD memory card comprising a flash memory mounted on a host device and storing a data generated by the host device and a controller controlling an access interface to the flash memory.

   An RF circuit unit performing a contactless IC card function and a contactless IC card reader function by controlling the air interface of the controller;

   An antenna unit connected to the RF circuit unit to perform a transmit / receive antenna function, And

   And a contact IC card adapter unit performing a contact IC card reader function by a wired interface control of the controller.

   2. The method of claim 1, wherein the controller

      An SD card interface unit providing an interface with the host device;

      A memory interface unit providing an interface with the flash memory;

      A link interface unit providing an interface with the RF circuit unit and the contact IC card adapter unit;

      A ROM storing a program for controlling a non-contact IC card function and a non-contact / contact IC card reader function and a program for controlling the respective interface unit; And

      And a microprocessor for controlling the contactless IC card function and the contactless / contact IC card reader function by executing a program stored in the ROM, and controlling the respective interface units.

   3. The method of claim 2, wherein the controller

      Further comprising a cryptographic module for performing a cryptographic algorithm function to protect data stored in the flash memory,

      And the ROM further stores a program for controlling the cryptographic module so that the cryptographic algorithm function is executed by the microprocessor.

   4. The method of claim 3, wherein

      The flash memory stores setting information for allowing the host device to communicate only with a specific device,

      And the controller controls the authentication to be performed only for the specific device through the setting information.

   5. The method of claim 1, wherein the RF circuit portion

      Card modules each providing the contactless IC card function; And

IPR2025-00645 Page 02309

And a reader module for providing the contactless IC card reader function.

6. The method of claim 5, wherein the card module

An amplifier for amplifying an input signal input from an external device through the antenna unit;

A clock generator for generating a card clock by using the output of the amplifier as an input;

A card demodulator for extracting card input data input to the controller using the output of the amplifier as an input; And

And a card modulator for outputting an output signal generated by modulating card transmission data transmitted from the controller to an external device.

7. The method of claim 6,

The card demodulator consists of a first card demodulator and a second card demodulator,

And the card modulator comprises a first card modulator and a second card modulator.

8. The method of claim 5, wherein the reader module

An oscillator for generating a reader clock;

A transmitter for converting the reader transmission data input through the controller into an output signal and transmitting the converted signal to an external device; And

And a receiving unit which receives an input signal input through the antenna unit and converts the input signal into reader received data.

9. The method of claim 8, wherein the transmitting unit

A reader modulator for modulating reader transmission data input from the controller; And

And an output circuit for converting a reader modulated signal output from the reader modulator into an output signal and outputting the converted output signal to the external device

10. 10. The apparatus of claim 9, wherein the reader modulator

An extended SD memory card comprising a first reader modulator and a second reader modulator.

11. The method of claim 8, wherein the receiving unit

A band pass filter for filtering only a signal of a predetermined band with respect to an input signal input from an external device through the antenna unit;

An amplifier amplifying a band signal output from the band pass filter; And

And a reader demodulator configured to output reader received data generated by demodulating the amplified signal passing through the amplifier to the controller.

12. 12. The apparatus of claim 11, wherein the leader demodulator

An extended SD memory card comprising a first reader demodulator and a second reader demodulator.

13. The method of claim 1, wherein the antenna unit

SD memory card for a function expansion, characterized in that consisting of the first antenna and the second antenna embedded in the SD memory card.

14. The method of claim 1, wherein the antenna unit

A first antenna embedded in the SD memory card and a second antenna installed outside the SD memory card,

And the second antenna is connected to the RF circuit through the antenna connector.

15. An SD memory card comprising a flash memory mounted to a host device to store data generated by the host device and a controller controlling an access interface to the flash memory.

An RF circuit unit performing a contactless IC card function and a contactless IC card reader function by controlling the air interface of the controller;

A first antenna unit connected to the RF circuit unit to perform a transmit / receive antenna function; And

And an antenna connector unit connected to the RF circuit unit and connected to a second antenna unit having an external shape to perform a reader transmit / receive antenna function.

16. An SD memory card comprising a flash memory mounted to a host device to store data generated by the host device and a first controller to control an access interface to the flash memory.

A contact IC card adapter unit performing a contact IC card reader function by controlling the wired interface of the first controller; And

And a connector unit that performs a contactless IC card and a contactless IC card reader function and is connected to an expansion module formed outside.

17. The apparatus of claim 16, wherein the expansion module that performs the contactless IC card and the contactless IC card reader function,

An RF circuit unit performing the contactless IC card function and the contactless IC card reader function; An antenna unit connected to the RF circuit unit to perform a transmit / receive antenna function; And a second controller configured to control a radio interface to perform a contactless IC card and a contactless IC card reader function in the RF circuit unit.

18. The method of claim 17,

And the first controller and the second controller each further include a non-contact IC card / reader interface unit to perform the mutual interface.

Description

SD memory card for extension of function

1 is a block diagram of an SD memory card for function expansion, which is an embodiment of the present invention.

FIG. 2 is a block diagram illustrating in detail the RF circuit in FIG. 1.

3 is a block diagram of the card module shown in FIG.

4 is a block diagram of the reader module shown in FIG. 2.

FIG. 5 is a block diagram illustrating the antenna unit in FIG. 1 in more detail.

6 is a block diagram of an SD memory card for expanding a function according to another embodiment of the present invention.

7 is a block diagram of an SD memory card for function expansion, which is another embodiment of the present invention.

The present invention relates to an SD memory card for expanding a function, and more specifically, a contactless IC to be utilized in various applications such as a traffic card and an access control based on a small size, a fast storage and reading speed, and a large capacity. The present invention relates to an SD memory card for function expansion, which includes a function of a card and a function of a contactless / contact IC card reader.

The contactless IC card is composed of an RF module for analog signal processing, a signal processing module for processing a contactless protocol and a digital interface signal, a central processing unit (CPU) and a memory (RAM, ROM) and the like

The contactless IC card is divided into a close coupling and a remote coupling according to the operating distance from the card reader, and the remote type is further divided into proximity, vicinity, and microwave (RF) radio. frequence).

Contactless (closed coupling) integrated circuit cards (CICC) are standardized in ISO-10536. Proximity Integrated Circuit Card (PICC) is standardized in ISO / IEC-14443, and VICC is standardized in ISO / IEC-15693. The close type gets the power by capacitive coupling and the remote type gets the power by inductive coupling.

The contactless IC card does not need to be inserted into the card reader and does not require accurate card positioning, making it easy to design and manufacture, making the terminal robust and inexpensive, thereby reducing maintenance costs. Further, since there is no mechanical contact surface on the non-contact IC card itself, it is possible to use the non-contact IC card in the long term because it is resistant to static electricity, chemical damage, moisture, contamination, dust, or friction. In addition, since there is no direct connection to a non-contact IC card, it is difficult to interpret the contents and forgery is difficult.

Application fields of contactless IC cards are electronic money, traffic cards, access control, and microcirculation, which are implemented in various fields such as mobile phones, logistics systems, vehicle control, and livestock identification tags.

The contactless IC card reader in the contactless / contact card reader supports the physical characteristics and protocols of the contactless IC card (radio frequency power and signal connection, initialization and collision avoidance), and exchanges information by wireless communication with the contactless IC card.

A contactless card reader is classified into a simple terminal for simple communication between a contactless IC card and a system and a complex type that performs an application on its own without being connected with a system.

A contactless (RF) terminal of a simple terminal requires a terminal capable of satisfying both ISO / IEC 14443 Type A and B. The type A and B compatible modules, a control central processing unit, a memory for storing programs and data, and a user keypad And hardware modules such as a display and a communication port for communication with the outside, support for an application, program download, and anti-collision.

Hybrid terminals include EFT-POS, Pay TV, CD-ATM, and portable terminals, and typically provide applications via contact IC card and wired communication.

The contact IC card reader for using the contact IC card satisfies the ISO / IEC 7816 protocol, and the functions other than the wireless communication of the contactless IC card reader are similar.

SD (Secure Digital) memory card is a standard of a kind of new compact SD memory card jointly released by Matsushita, SunDisk and Toshiba in 2000. It has several flash memory and One microprocessor chip consists of silicon semiconductor technology. SD memory cards are small in size, light in weight, fast in storage and reading speed, and large in capacity, making them widely used in products such as computer peripherals, portable information terminals, digital cameras and digital workers.

However, the conventional SD memory card is composed of a flash memory and one microprocessor chip, and is equipped with a wired / wireless interface and a control function for performing the above-described contactless IC card function and contactless / contact IC card reader function. The disadvantage is that it doesn't exist. In addition, in order to mount a wired / wireless interface function on a conventional SD memory card, a controller chip for controlling a non-contact IC card and a non-contact / contact IC card reader and a controller chip for controlling an SD memory card interface is configured with three or four and controlled according to each microprocessor. There is a disadvantage in that it is disadvantageous in terms of mounting parts.

The present invention relates to an SD memory card for function expansion, wherein the SD memory card is equipped with a contactless IC card (ISO 14443 Type A, B) function, a contactless IC card reader (Type A, B) function, and a contact IC card reader function. It provides integrated contactless IC card function and card reader function. The present invention also provides a controller configured to control a contactless IC card and a contactless / contact IC card reader control, a SD memory card interface control, a memory access control, and the like with one microprocessor.

It also provides an SD memory card that supports security mechanisms such as access control, decryption and authentication to restrict access to files stored in flash memory.

As an embodiment of the present invention, an SD memory card for expanding a function may include a flash memory mounted on a host device to store data generated by the host device, and a controller configured to control an access interface to the flash memory. An RF circuit, comprising: an RF circuit unit performing a contactless IC card function and a contactless IC card reader function by air interface control of the controller; An antenna unit connected to the RF circuit unit to perform a transmit / receive antenna function; And a contact IC card adapter unit performing a contact IC card reader function by a wired interface control of the controller.

As another embodiment of the present invention, an SD memory card for expanding a function may include a flash memory mounted on a host device to store data generated by the host device, and a controller controlling an access interface to the flash memory. A card, comprising: an RF circuit unit performing a contactless IC card

IPR2025-00645 Page 02311

function and a contactless IC card reader function by air interface control of the controller; A first antenna unit connected to the RF circuit unit to perform a transmit / receive antenna function; And an antenna connector unit connected to the RF circuit unit and connected to a second antenna unit of an external formation that performs a reader transmit / receive antenna function.

According to another embodiment of the present invention, an SD memory card for expanding a function may include a flash memory installed in a host device and storing a data generated by the host device and a first controller controlling an access interface to the flash memory. An SD memory card comprising: a contact IC card adapter unit performing a contact IC card reader function by a wired interface control of the first controller; And a connector unit that performs a contactless IC card and a contactless IC card reader function and is connected to an expansion module formed outside.

Hereinafter, a SD memory card for expanding a function according to the present invention will be described in detail with reference to the accompanying drawings.

1 is a block diagram of an SD memory card for function expansion, which is an embodiment of the present invention. The SD memory card 100 is equipped with a wired / wireless interface function. In the wired / wireless communication method, communication protocols of a contactless IC card and a contactless / contact IC card reader are used.

Referring to FIG. 1, the SD memory card 100 includes an antenna unit 110, an RF circuit unit 120, a controller 130, a flash memory 140, and a contact IC card adapter unit 150.

The RF circuit unit 120 is connected to the controller 130 as a wireless connection module for performing a contactless IC card function and a contactless IC card reader function.

The antenna unit 110 is connected to the RF circuit unit 120, and is configured as a signal transmission and reception antenna for performing the function of the RF circuit unit 120.

The controller 130 may include an SD card interface unit 131, a memory interface unit 132, a microprocessor (uP (RISC)) 133, a cryptographic module 134, a random access memory (RAM) 135, ROM (Read Only Memory) 136, peripheral module 137 and link interface unit 138.

The SD card interface 131 may be a host device (e.g., a laptop, a personal digital assistant (PDA), a mobile phone, a built-in SD memory card adapter, etc.) to which an SD memory card is mounted. It is connected to signal pins (Pin, DAT0 ~ 3, GND, VDD, CLK) for connection.

The memory interface unit 132 is connected for connection with the flash memory 140.

The encryption module 134 performs a cryptographic algorithm function necessary to perform security functions such as encryption and decryption and authentication for data protection stored in the memory.

The RAM 135 performs a work buffer memory function used in program execution and the like.

The ROM 136 stores execution programs such as a contactless IC card and a contactless / contact IC card reader protocol control program, an SD card interface control program, and a cryptographic module control program.

The peripheral module 137 is used to perform and expand the functions of the microprocessor 133 with a timer, a random number generator, and the like.

The link interface unit 138 connects the RF circuit unit 120 and the contact IC card adapter unit 150 with the controller 130.

The microprocessor 133 executes the execution program stored in the ROM 136 and controls the protocol higher than the contactless IC card and the contactless / contact IC card reader, and controls and flashes the SD card interface 131. Memory access control is performed on the memory 140. In addition, the RF circuit unit 120 and the contact IC card adapter unit 150 are controlled through the link interface unit 138 together with the control of the respective components in the controller 130.

The flash memory 140 is a flash ROM (EEPROM) for an SD memory card and includes a system area, a project area, and a general user area.

The contact IC card adapter unit 150 is connected to the controller 130 by a wired connection module that provides a wired physical contact for using the contact IC card.

FIG. 2 is a block diagram illustrating the RF circuit unit 120 in more detail in FIG. 1.

Referring to FIG. 2, according to an embodiment of the present invention, the RF circuit unit 120 includes a card module 200 that performs a contactless IC card and a reader module 220 that performs a contactless IC card reader function. . The card module 200 will be described in detail in FIG. 3, and the reader module 220 will be described in detail in FIG. 4.

3 is a block diagram of the card module 200 shown in FIG.

Looking at the configuration of the card module 200 with reference to Figure 3, through the antenna unit 110, the amplifier clock 300 to amplify the input signal input from the external device, the output of the amplifier 300 as a card clock A first card demodulator (performing ISO / IEC 14443 Type A function) 320 and a second card demodulator (ISO / IEC 14443 Type B function) (330).

Also, the card module 200 modulates the card transmission data input from the controller 130 and converts the first card modulator 350 to perform an ISO / IEC 14443 Type A function. It consists of two card modulators (performing ISO / IEC 14443 Type B functions) 360.

In FIG. 3, the first card demodulator 320 and the second card demodulator 330 and the first card modulator 350 and the second card modulator 360 are both ISO / IEC 14443 Type A and B. This is to construct a SD memory card with a satisfactory contactless IC card.

4 is a block diagram of the reader module 220 shown in FIG. 2.

Referring to FIG. 4, the reader module 220 includes an oscillator 400 for generating a reader clock, a transmitter 420 for converting and transmitting reader transmission data into a reader output signal, and receiving and converting a reader input signal into reader reception data. It consists of a receiving unit 440.

Transmitter 420 is a first reader modulator (for performing the ISO / IEC 14443 Type A function) 422 and the second reader modulator (for performing the ISO / IEC 14443 Type B function) modulating the reader transmission data input from the controller 130 424, an output circuit 426 for converting the reader modulated signal output from the first reader modulator 422 and the second reader modulator 424 into an output signal and outputting the output signal to an external device.

In addition, the receiver 440 is a band pass filter 442 for filtering only a signal of a predetermined band with respect to an input signal input from an external device through the antenna unit 110, and a band output from the band pass filter 442. An amplifier 444 for amplifying a signal and a first reader demodulator (for performing ISO

IPR2025-00645 Page 02312

/ IEC 14443 Type A function) for outputting the reader received data generated by demodulating the amplified signal passing through the amplifier 444 to the controller 130 (446) and a second reader demodulator (perform ISO / IEC 14443 Type B function) 446.

In FIG. 4, the first reader modulator 422 and the second reader modulator 424 and the first reader demodulator 446 and the second reader demodulator 448 are both ISO / IEC 14443 Type A and B. This is to construct an SD memory card having a satisfactory contactless IC card reader function.

FIG. 5 is a block diagram illustrating the antenna unit 110 in detail in FIG. 1.

Referring to FIG. 5, according to an embodiment of the present invention, the antenna 110 includes a first antenna 500 and a second antenna 520 to support a contactless IC card and a contactless IC card reader function, respectively. .

In FIG. 5, the first antenna 500 and the second antenna 520 constitute an SD memory card having a contactless IC card function and a contactless IC card reader function that can satisfy both ISO / IEC 14443 Type A and B. For sake.

6 is a block diagram of an SD memory card for expanding a function according to another embodiment of the present invention.

Referring to FIG. 6, unlike the antenna unit 110 of FIG. 1, the antenna unit of FIG. 6 is an antenna of the first antenna unit 160 and the SD memory card 100 mounted inside the SD memory card 100. The second antenna unit 600 is connected to the RF circuit unit 120 through the connector unit 170 and installed outside.

In FIG. 6, other components are denoted by the same reference numerals as in FIG. 1, and reference numerals 1 to 5 will be referred to for the unexplained portions.

In another embodiment of the present invention as described above, the external second antenna unit 600 is connected to the RF circuit unit 120 through the antenna connector unit 170, as shown in FIG. 1 (see FIG. 5). The radio communication capability can be expanded more than when the antenna is mounted inside the SD memory card 100.

In addition, when performing wireless communication with a device spaced to some extent, there is an advantage that the transmission and reception efficiency of radio waves can be improved and the required distance can be secured, compared to the case where it is mounted and used inside the SD memory card 100.

However, since the configuration of the second antenna unit 600 outside the SD memory card 100 may be inconvenient to handle, the host mounting the SD memory card 100 of FIG. 6 may be inconvenient to handle. If the device does not require a non-contact card reader function, the second antenna unit 600 configured as a module may be separated and used.

7 is a block diagram of an SD memory card for function expansion, which is another embodiment of the present invention.

Referring to FIG. 7, the SD memory card 700, the contactless IC card, and the contactless card reader function expansion module 750 are separated into two parts.

The SD memory card 700 operates as a normal SD memory card, and includes a first controller 730, a flash memory 720, a contact IC card adapter 710, a contactless IC card, and a contactless IC card reader function expansion module (Consists of a connector portion 740 for the connection with 750.

The flash memory 720 is a flash ROM (EEPROM) for an SD memory card and includes a system area, a project area, and a general user area.

The contact IC card adapter 700 is connected to the first controller 730 as a wired connection module that provides a wired physical contact for using a contact IC card

The first controller 730 includes an SD card interface 731, a memory interface 732, a microprocessor (uP (RISC)) 733, a RAM 735, a ROM 736, and a link interface 738. And a contactless IC card / reader interface unit 739.

The SD card interface unit 731 is connected to signal pins Pin, DAT0 to 3, GND, VDD, and CLK for connection with a host device on which the SD memory card is mounted.

The memory interface unit 732 is connected for connection with the flash memory 720.

The RAM 735 performs a work buffer memory function used in program execution and the like.

The ROM 736 stores execution programs such as a contactless IC card and a contactless / contact IC card reader protocol control program, an SD card interface control program, a cryptographic module control program, and the like.

The link interface unit 738 connects the contact IC card adapter unit 710 with the first controller 730.

The microprocessor 733 executes the execution program stored in the ROM 736, controls the protocol higher than the contactless IC card and the contactless / contact IC card reader, and controls and flashes the SD card interface 731. Memory access control is performed on the memory 720. In addition, the control of the contact IC card adapter unit 710 is performed through the link interface unit 738 together with the control of the respective components in the first controller 730.

In addition, the first controller 730 is provided with a contactless IC card / reader interface unit 739 and each part corresponding to the controller 130 in FIG. 1 except that the encryption module and the peripheral module are not configured. It has the same function.

The contactless IC card / reader interface unit 739 is an interface for connecting with the contactless IC card and the contactless IC card reader function expansion module 750 through the connector unit 740.

On the other hand, the contactless IC card and the contactless IC card reader function expansion module 750 is composed of an antenna unit 760, an RF circuit unit 770, and a second controller 780.

The RF circuit unit 770 is connected to the second controller 780 as a wireless connection module for performing a contactless IC card and a contactless IC card reader function.

The antenna unit 760 is connected to the RF circuit unit 770 and is configured as a signal transmission / reception antenna for performing the function of the RF circuit unit 770.

The second controller 780 controls the contactless IC card and the contactless IC card reader, and includes the contactless IC card / reader interface unit 781, the microprocessor 782, the encryption module 784, the RAM 785, and a ROM (786, a peripheral module 787.

The cryptographic module 784 performs a cryptographic algorithm function necessary to perform security functions such as encryption and decryption and authentication for data protection stored in the memory.

The peripheral module 787 is used for performing and extending the functions of the microprocessor 783 with a timer, a random number generator, and the like.

The non-contact IC card / reader interface unit 781 is an interface for connecting to the SD memory card 700 through the connector unit 740.

In addition, the second controller 780 is connected to the RF circuit unit 770. Here, the second controller 780 has the same function for the part corresponding to each part of the first controller 730 in FIG. 7 except that the non-contact IC card / reader interface function and the flash memory interface function are not provided. Since the detailed description is omitted.

In general, as shown in FIG. 7, the SD memory card 700 may be used as an SD memory card device, and may include a second controller 780, an RF circuit unit 770, and an antenna that perform a function of a contactless IC card and a contactless IC card reader. The communication interface function can be extended by connecting the contactless IC card and the contactless IC card reader function expansion module 750 incorporating 760 therein.

As a result, component mounting in the SD memory card 700 is facilitated, and an air interface function can be added and used by connecting the contactless IC card and the contactless IC card reader function expansion module 750 arbitrarily as needed. Will be.

Referring to Figs. 1, 6 and 7, the setting method of the host device connected according to the wired / wireless interface function according to the embodiment of the present invention described above is as follows.

In the wired / wireless communication method of the contactless IC card and the contactless / contact IC card reader, there are many cases where it is desired to communicate with a specific device among the devices within the communication range. In this case, information specifying the external device to be connected is required. For example, it is possible to communicate with a specific device based on the registered setting information by registering the own pin code and the pin code of the specific device in advance as the setting information. Such setting information is stored in advance in the protect memory area of the flash memory.

Referring to FIG. 1, in the case of the SD memory card 100 shown in FIG. 1, the setting information recorded in the protected memory area of the flash memory 140 is controlled according to the controller 130 capable of executing the wired / wireless interface control and the memory interface control. It becomes readable. Communication with a specific counterpart device is enabled through setting information for communicating with such a specific device.

As a host device equipped with the SD memory card 100, only a specific host device having public key information can be accessed according to the authentication means of the SD memory card 100. FIG. Such access control is for realizing a protection technique through the authentication means installed in the SD memory card 100 and the corresponding host device, and is common between the host device and the SD memory card 100 when reading and writing data. This is to prevent data from being duplicated by exchanging data through encryption based on public key information.

Therefore, as described above, by installing the SD memory card 100 in an arbitrary host device, it is possible to communicate with a connection partner that is set in advance according to the host device. This is only possible if SD memory card is installed in the host device.

As described above, optimal embodiments have been disclosed in the drawings and the specification. Although specific terms have been used herein, they are used only for the purpose of describing the present invention and are not intended to limit the scope of the invention as defined in the claims or the claims. Therefore, those skilled in the art will understand that various modifications and equivalent other embodiments are possible from this. Therefore, the true technical protection scope of the present invention will be defined by the technical spirit of the appended claims.

The present invention relates to an SD memory card for function expansion, and has the following effects.

First, since the SD memory card has a wired / wireless interface function, the SD memory card can be used for function expansion in addition to the information processing apparatus.

Second, by providing an encryption module with convenience as an SD memory card, information can be easily protected in the SD memory card itself using encryption and decryption and authentication functions.

Third, by integrating the functions of a conventional contactless IC card and contactless / contact IC card reader, it can be used for contactless IC card applications such as traffic cards and access control.

Fourth, it can be used together as a contactless IC card reader and a contact IC card reader can reduce the production cost, and can provide the convenience and simple operation of moving the card reader.

Fifth, the built-in multi-function controller can accommodate a variety of applications, such as information processing and storage memory or contactless IC card and contactless / contact IC card reader function can be used as an application platform.

Patent Citations (9)

Publication number	Priority date	Publication date	Assignee	Title
JPH0916737A *	1995-06-30	1997-01-17	Nippondenso Co Ltd	Information storage card
JP2001195553A	2000-01-05	2001-07-19	Toshiba Corp	Ic card with incorporated radio interface function, antenna module, and information processor
JP2002351807A	2001-05-30	2002-12-06	Toshiba Corp	Electronic equipment system, driver supply system, and card type electronic device
JP2003345601A	2002-05-09	2003-12-05	Ojin Kagi Kofun Yugenkoshi	Small-sized memory device with built-in driving program
JP2004208245A	2002-12-20	2004-07-22	Hagiwara Sys-Com:Kk	Device for enhancing function of wireless modem
Family To Family Citations				
US4918416A *	1987-03-18	1990-04-17	Sielox Systems, Inc.	Electronic proximity identification system
JP3617491B2 *	2001-10-31	2005-02-02	ソニー株式会社	IC chip and information processing terminal
US7051127B2 *	2002-05-10	2006-05-23	Hewlett-Packard Development Company, L.P.	Method and apparatus for selectively providing data pre-emphasis based upon data content history
US7809866B2 *	2002-08-12	2010-10-05	Carry Computer Engineering Company, Limited	Double interface SD flash memory card

* Cited by examiner, † Cited by third party

Cited By (71)

Publication number	Priority date	Publication date	Assignee	Title
KR101164597B1	2007-04-03	2012-07-10	삼성테크윈 주식회사	Data storage module for wireless communicating and method of controlling the Data storage module
Family To Family Citations				
US7464213B2 *	2004-12-24	2008-12-09	Sony Corporation	Memory adapter and unit including independent radio circuit and removable memory store
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
KR100779747B1 *	2005-03-18	2007-11-29	엠텍퓨처스 주식회사	Secure Device combo card with RF communication function for a mobile terminal and method for RF communication of Secure Device combo card
US20060255160A1 *	2005-05-13	2006-11-16	Otto Winkler	Memory card, the fabrication thereof and a mobile phone apparatus having a memory card
JP2007041954A *	2005-08-04	2007-02-15	Felica Networks Inc	Value information movement system and value information moving method
CN100527159C	2005-10-31	2009-08-12	深圳华为通信技术有限公司	Storage card and terminal equipment combining storage card
KR100738923B1	2006-04-24	2007-07-12	에스케이 텔레콤주식회사	Smart card having zigbee module in financial settlement module or subscriber identification module and mobile communication terminal having same
JP2007317170A *	2006-04-28	2007-12-06	Renesas Technology Corp	Ic module and cellular phone
EP2021389B1 *	2006-05-18	2010-03-17	Basf Se	Slip- and leveling agent
US20080005425A1 *	2006-06-05	2008-01-03	Ivi Smart Technologies, Inc.	Electronic Card Type Media Storage and Player Device
US8868863B2 *	2006-06-23	2014-04-01	Sony Corporation	Providing additional information from a removable storage medium
US7634283B2 *	2006-09-11	2009-12-15	Eaton Corporation	Wireless communication network, sub-system therefor and method of configuring a non-native network device employing an adapter
KR100863183B1	2006-12-06	2008-10-15	(주)파트론	Single Unit Antenna Memory Card
US7991158B2 *	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging
WO2008091065A1 *	2007-01-26	2008-07-31	Lg Electronics Inc.	Contactless interface within a terminal to support a contactless service
EP2152947B1 *	2007-06-01	2012-09-26	Formfiber Denmark APS	An air-laid non-woven fibre product comprising fibres of recycled material
WO2008150083A1 *	2007-06-04	2008-12-11	Lg Innotek Co., Ltd	Electronic card terminal apparatus
JP2009042927A *	2007-08-07	2009-02-26	Toppan Forms Co Ltd	Information storage device and information management system
US7945734B2 *	2007-08-10	2011-05-17	Eastman Kodak Company	Removable storage device with code to allow change detection
US20090070691A1	2007-09-12	2009-03-12	Devicefidelity, Inc.	Presenting web pages through mobile host devices
US8807057B2	2007-09-12	2011-12-06	Devicefidelity, Inc.	Switching between internal and external antennas
US9304555B2	2007-09-12	2016-04-05	Devicefidelity, Inc.	Magnetically coupling radio frequency antennas
US9311766B2	2007-09-12	2016-04-12	Devicefidelity, Inc.	Wireless communicating radio frequency signals
US8915447B2	2007-09-12	2014-12-23	Devicefidelity, Inc.	Amplifying radio frequency signals
US9741027B2 *	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
CN101300744A *	2008-04-18	2008-11-12	上海坤锐电子科技有限公司	Chip for signal amplifier of radio frequency recognition system and signal amplifier thereof
JP4342596B1	2008-05-20	2009-10-14	株式会社東芝	Electronic device and content data providing method
JP4346670B1 *	2008-05-20	2009-10-21	株式会社東芝	Electronic device and content data providing method
JP5295657B2 *	2008-06-27	2013-09-18	ルネサスエレクトロニクス株式会社	Semiconductor integrated circuit, IC card mounted with semiconductor integrated circuit, and operation method thereof
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems

US7961101B2	2008-08-06	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
JP2010067060A *	2008-09-11	2010-03-25	Toshiba Corp	Memory card and method for controlling memory card
US8041388B2 *	2008-09-26	2011-10-18	Apple Inc	Adapter
JP5284140B2 *	2009-02-25	2013-09-11	株式会社東芝	Interface control device
CN101567078 *	2009-06-03	2011-11-09	普天信息技术研究院有限公司	Radio frequency identification device
GB2473257B *	2009-09-07	2016-11-02	Broadcom Innovision Ltd	NFC communicators and NFC communications enabled devices
CN201570055U *	2009-11-06	2010-09-01	深圳市江波龙电子有限公司	Double interface Micro SD card
US9483651B2 *	2009-11-30	2016-11-01	Ncr Corporation	Methods and apparatus for transfer of content to a self contained wireless media device
US20110245627A1 *	2010-03-30	2011-10-06	Hong Kong Applied Science And Technology Research Institute Co., Ltd.	Electronic health record storage device, system, and method
CN101835282B *	2010-04-23	2012-11-07	华为终端有限公司	Wireless internet access module, user terminal, secure digital card and wireless communication method
FR2961619B1 *	2010-06-22	2012-08-31	St Microelectronics Rousset	METHOD FOR MANAGING COMMUNICATION BETWEEN AN ELECTRONIC DEVICE, FOR EXAMPLE A CONTACTLESS CHIP CARD, AND A COMMUNICATION APPARATUS, FOR EXAMPLE A READER, AND CORRESPONDING ELECTRONIC DEVICE
AU2010356128A1 *	2010-06-25	2013-02-07	T-Data Systems (S) Pte Ltd	Memory card and method for initiation of storage and wireless transceiving of data
JP5172921B2	2010-09-21	2013-03-27	株式会社東芝	Storage device
JP5728292B2 *	2011-02-04	2015-06-03	株式会社東芝	Memory device and host system
JP5901154B2 *	2011-06-13	2016-04-06	富士通コンポーネント株式会社	Memory card
CN102880959B *	2011-07-13	2016-08-10	中国银联股份有限公司	Data process and storage device
US8838199B1 *	2011-09-08	2013-02-26	Gotrust Technology Inc.	Memory card supporting near field communication through single wire protocol
US8831515B2	2011-10-12	2014-09-09	Broadcom Corporation	Shaped load modulation in a near field communications (NFC) device
RU2473142C1 *	2011-11-18	2013-01-20	Общество с ограниченной ответственностью "Научно-производственное предприятие "Цифровые решения"	Detachable information medium with higher speed of access
US8478913B2	2011-11-30	2013-07-02	Apple Inc.	Adapter for electronic devices
US8762605B2	2011-11-30	2014-06-24	Apple Inc.	Adapter for electronic devices
EP2663164B1 *	2012-05-10	2019-02-13	LG Innotek Co., Ltd.	Communication module and lighting apparatus having the same
US8840031B2 *	2012-06-14	2014-09-23	Infineon Technologies Ag	Smart card and a method for operating a smart card
KR101976567B1 *	2012-11-02	2019-05-09	엘지이노텍 주식회사	The communication module, and lighting apparatus having the same
AU2014225864B2	2013-03-05	2020-01-02	Fasetto, Inc.	System and method for cubic graphical user interfaces
KR102122447B1	2013-07-04	2020-06-12	주식회사 에이텍에이피	The controlling apparatus having the communication module and the control system having the same
MX2016000616A	2013-07-18	2017-05-17	Fasetto L L C	System and method for multi-angle videos.
US10095873B2	2013-09-30	2018-10-09	Fasetto, Inc.	Paperless application
US9584402B2	2014-01-27	2017-02-28	Fasetto, Llc	Systems and methods for peer to peer communication
WO2016007780A1	2014-07-10	2016-01-14	Fasetto, Llc	Systems and methods for message editing
CN107066063B	2014-10-06	2021-08-24	法斯埃托股份有限公司	System and method for portable storage device
US10437288B2	2014-10-06	2019-10-08	Fasetto, Inc.	Portable storage device with modular power and housing system
KR101659294B1 *	2015-02-12	2016-09-26	안동과학대학교 산학협력단	An apparatus for secure usb memory using beacon signals and the operating method thereof

CN107852421B	2015-03-11	2021-02-05	法斯埃托股份有限公司	System and method for WEB API communication
KR101674299B1 *	2015-04-30	2016-11-22	한국정보통신주식회사	A magnetic card reader appratus and a method for card payments using it
TWI602345B *	2015-09-09	2017-10-11	Toshiba Memory Corp	Memory card with communication function
US10929871B2	2015-12-03	2021-02-23	Fasetto, Inc.	Systems and methods for memory card emulation
CN110199510A	2016-11-23	2019-09-03	法斯埃托股份有限公司	System and method for streaming media
WO2019079628A1	2017-10-19	2019-04-25	Fasetto, Inc.	Portable electronic device connection systems
JP2021522568A	2018-04-17	2021-08-30	ファセット・インコーポレーテッド	Device for presentations with real-time feedback

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
KR100596410B1	2006-07-03	SD memory card for extension of function
KR101002042B1	2010-12-17	Device, module and method for shared antenna operation in a RFID technology based communication environment
KR100718012B1	2007-05-14	Battery pack for mobile communication terminal and near field communication method using the same
US8002196B2	2011-08-23	Radio frequency IC card device with very high frequency
US9209866B2	2015-12-08	Securing of a telecommunication device equipped with a near-field communication module
KR20080100172A	2008-11-14	Nested memory system with near field communications capability
US20070155430A1	2007-07-05	External device for mobile communication terminal and NFC method using the same
WO2005104584A1	2005-11-03	Subscriber identification card performing radio transceiver functionality for long range applications
US20090166421A1	2009-07-02	Rfid reader / card combination to convert a contact smartcard reader to contactless
WO2008132269A1	2008-11-06	Short range communication
CN203084761U	2013-07-24	Miniature storage card with antenna
KR20070027156A	2007-03-09	Usb memory having smart card and usb smart card reader chip
JP4705353B2	2011-06-22	Connector integrated RFID reader / writer
EP2355368B1	2013-03-27	Telecommunication component and wireless communication system for coupling a cellular mobile telecommunication device to an NFC terminal
KR100474473B1	2005-03-11	An active RFID tag
KR101382940B1	2014-04-08	Smart card
CN204442376U	2015-07-01	Near-field communication device
CN103870871A	2014-06-18	External plug-in card and memory card with double-induction antenna structures
KR20110125758A	2011-11-22	Data storing device for near field communication
KR100701124B1	2007-03-28	RFID devices and system for integrated wireless terminal
KR20120053375A	2012-05-25	Radio aided device for mobile communicaions terminal
KR100691381B1	2007-03-09	Mobile Telecommunication Terminal Usable Contact Smart Chip As Contactless Use
KR200342943Y1	2004-02-21	Dummy Terminal for Reading Smart Card
KR20060122167A	2006-11-30	Portable general purpose dummy terminal for rf reader and writer
KR101721479B1	2017-03-30	Interface Machine for supporting communication between IC card reader and RF card

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title

KR1020040089166A	2004-11-04	2004-11-04	SD memory card for extension of function

Applications Claiming Priority (3)

Application	Filing date	Title
KR1020040089166A	2004-11-04	SD memory card for extension of function
US11/098,462	2005-04-05	SD memory card for extension of function
JP2005181921A	2005-06-22	SD memory card for function expansion

Legal Events

Date	Code	Title	Description
2004-11-04	A201	Request for examination	
2006-05-26	E701	Decision to grant or registration of patent right	
2006-06-27	GRNT	Written decision to grant	
2011-06-09	FPAY	Annual fee payment	**Payment date:** 20110609 **Year of fee payment:** 6
2012-06-28	LAPS	Lapse due to unpaid annual fee	

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

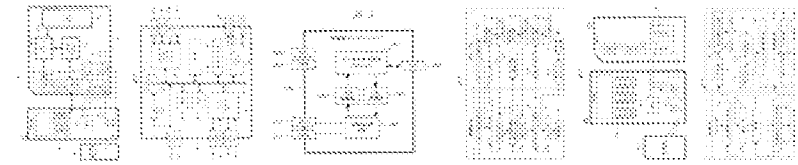
Patents 2007317170

Ic module and cellular phone

Abstract

<P>PROBLEM TO BE SOLVED: To provide a technique for easily and safely executing reading and writing of data to a flash memory, in response to a command received through a contactless IC card interface in an IC card, such as a SIM (subscriber identity module) card, a cellular phone to which the IC card is mounted, or the like. <P>SOLUTION: In the SIM card, having a flash memory chip 1300, a memory controller chip 1200, and contact/contactless IC card interfaces, the memory controller chip, has a function of executing user authentication of host equipment and executes processing of data transmitted through the contactless IC card interface (read or write of data to the flash memory chip), by using power supplied from the host equipment to the contact IC card interface and executes initialization of the flash memory chip, between activation of the host equipment and completion of user authentication instructed by the host equipment. <P>COPYRIGHT: (C)2008,JPO&INPIT

Images (9)



Classifications

G06K19/07 Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards also with resonating or responding marks without active components with integrated circuit chips

View 6 more classifications

JP2007317170A

Japan

Download PDF Find Prior Art Similar

Other languages: Japanese

Inventor: Eiga Mizushima, 永雅 水島, Masatomo Ukeda, 雅知 受田, Yoshinori Mochizuki, 義則 望月, Kunihiko Katayama, 国弘 片山

Worldwide applications

2007 JP CN KR US

Application JP2007107059A events

2006-04-28 Priority to JP2006124593

2007-04-16 Application filed by Renesas Technology Corp, 株式会社ルネサステクノロジ

2007-04-16 Priority to JP2007107059A

2007-12-06 Publication of JP2007317170A

Status Pending

Info: Patent citations (17), Cited by (60), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (28)

Hide Dependent

1. A non-volatile memory chip;
A controller chip for controlling the nonvolatile memory chip;
An interface for contact communication;
An IC module having an interface for non-contact communication,
The controller chip can authenticate the user of the host device,
The controller chip performs processing of data transmitted through the interface for contactless communication using power supplied from the host device to the interface for contact communication;
The processing of the data includes the controller chip reading the data from the nonvolatile memory chip, or the controller chip writing the data to the nonvolatile memory chip,
The controller chip executes initialization of the non-volatile memory chip between the activation of the host device and the completion of the user authentication instructed by the host device. .

2. The IC module according to claim 1,
The IC module, wherein the controller chip performs initialization of the nonvolatile memory chip within a predetermined time after power supply from the host device to the interface for contact communication is started.

3. The IC module according to claim 1,
The IC module, wherein the controller chip executes initialization of the nonvolatile memory chip within a predetermined time after a reset signal is input from the host device to the interface for contact communication

4. The IC module according to claim 1,
The controller chip executes initialization of the non-volatile memory chip within a predetermined time after a command requesting execution of the user authentication is input from the host device to the interface for contact communication. A featured IC module.

5. The IC module according to claim 1,
The controller chip performs initialization of the non-volatile memory chip within a predetermined time after a command for executing the user authentication function is input from the host device to the interface for contact communication. IC module characterized by the above.

6. The IC module according to any one of claims 2 to 5,
The controller chip stores the execution result of the initialization of the nonvolatile memory chip in an internal nonvolatile memory inside the controller chip,
When executing the initialization again, the controller chip bypasses access to the nonvolatile memory chip by referring to the execution result stored in the internal nonvolatile memory. IC module.

IPR2025-00645 Page 02319

7. The IC module according to any one of claims 2 to 5,
The initialization includes at least one of confirmation of the number of memory chips, reading of memory verification data, reading of a correction program, reading of memory card characteristic information, reading of a defective sector replacement destination address table, and reading of multiplexed sector address information. IC module characterized by including two.

8. A mobile phone equipped with an IC module, an antenna, and a power source,
The IC module includes a nonvolatile memory chip, a controller chip for controlling the nonvolatile memory chip, an interface for contact communication, and an interface for non-contact communication.
The controller chip can authenticate a user of the mobile phone,
The controller chip performs processing of data transmitted from the antenna through the interface for contactless communication using power supplied from the power source of the mobile phone to the interface for contact communication;
The processing of the data includes the controller chip reading the data from the nonvolatile memory chip, or the controller chip writing the data to the nonvolatile memory chip,
The controller chip performs initialization of the non-volatile memory chip between the activation of the mobile phone and the completion of the user authentication instructed by the mobile phone. .

9. The mobile phone according to claim 8, wherein
The mobile phone, wherein the controller chip performs initialization of the nonvolatile memory chip within a predetermined time after power supply from the mobile phone to the interface for contact communication is started.

10. The mobile phone according to claim 8, wherein
The mobile phone, wherein the controller chip performs initialization of the nonvolatile memory chip within a predetermined time after a reset signal is input from the mobile phone to the interface for contact communication.

11. The mobile phone according to claim 8, wherein
The controller chip executes initialization of the non-volatile memory chip within a predetermined time after a command for requesting execution of the user authentication is input from the mobile phone to the interface for contact communication. A featured mobile phone.

12. The mobile phone according to claim 8, wherein
The controller chip performs initialization of the nonvolatile memory chip within a predetermined time after a command for executing the user authentication function is input from the mobile phone to the interface for contact communication. A mobile phone featuring.

13. The mobile phone according to any one of claims 9 to 12,
The controller chip stores the execution result of the initialization of the nonvolatile memory chip in an internal nonvolatile memory inside the controller chip,
When executing the initialization again, the controller chip bypasses access to the nonvolatile memory chip by referring to the execution result stored in the internal nonvolatile memory. mobile phone.

14. The mobile phone according to claim 9,
The initialization includes at least one of confirmation of the number of memory chips, reading of memory verification data, reading of a correction program, reading of memory card characteristic information, reading of a defective sector replacement destination address table, and reading of multiplexed sector address information. Mobile phone characterized by including one.

15. An IC module capable of communicating with a mobile phone having an antenna and a signal converter for non-contact communication different from telephone communication, through the signal converter,
Non-volatile memory;
An authentication unit for authenticating the mobile phone subscriber;
A controller for controlling the nonvolatile memory;
The controller writes the data demodulated from the received signal in the non-contact communication by the signal converter to the nonvolatile memory,
The controller reads the data for the signal converter to modulate into a transmission signal in the contactless communication from the nonvolatile memory.

16. The IC module according to claim 15, wherein
An IC module which operates by supplying power from the mobile phone.

17. The IC module according to claim 16, wherein
An IC module that performs initialization of the nonvolatile memory in response to execution of the authentication process of the subscriber.

18. The IC module according to claim 17, wherein
After performing the initialization, a value indicating the completion of the initialization is set in a register,
An IC module, wherein the value in the register is read during the non-contact communication and the initialization is omitted.

19. The IC module according to claim 17, wherein
An IC module, wherein power supply to the nonvolatile memory is stopped between the completion of the initialization and the start of the contactless communication.

20. The IC module according to claim 17, wherein
The initialization includes reading a plurality of logical addresses recorded in the non-volatile memory and creating a table for converting the plurality of logical addresses into corresponding physical addresses. module.

21. An antenna and a signal converter for contactless communication different from telephone communication and a mobile phone having a short-range wireless communication unit can communicate with the mobile phone through the signal converter and can be operated by power supply from the mobile phone. An IC module,
Non-volatile memory;
An authentication unit for authenticating the mobile phone subscriber;
A controller for controlling the nonvolatile memory;
The controller executes initialization of the non-volatile memory in response to the short-range wireless communication unit detecting a device that is a communication partner of the non-contact communication,
The controller writes the data demodulated from the received signal in the non-contact communication by the signal converter to the nonvolatile memory,
The controller reads the data for the signal converter to modulate into a transmission signal in the contactless communication from the nonvolatile memory.

IPR2025-00645 Page 02320

22. The IC module according to claim 21, wherein
After performing the initialization, a value indicating the completion of the initialization is set in a register,
An IC module, wherein the value in the register is read during the non-contact communication and the initialization is omitted.

23. The IC module according to claim 21, wherein
An IC module, wherein power supply to the nonvolatile memory is stopped between the completion of the initialization and the start of the contactless communication

24. The IC module according to claim 21, wherein
The initialization includes reading a plurality of logical addresses recorded in the non-volatile memory and creating a table for converting the plurality of logical addresses into corresponding physical addresses. module.

25. A mobile phone having an antenna and a signal converter for contactless communication different from telephone communication and a USB interface, can communicate through the signal converter and the USB interface, and operates by power supply from the mobile phone A possible IC module,
Non-volatile memory;
An authentication unit for authenticating the mobile phone subscriber;
A controller for controlling the nonvolatile memory,
The controller executes initialization of the nonvolatile memory in response to signal reception from the USB interface,
The controller writes the data demodulated from the received signal in the non-contact communication by the signal converter to the nonvolatile memory,
The controller reads the data for the signal converter to modulate into a transmission signal in the contactless communication from the nonvolatile memory.

26. The IC module according to claim 25, wherein
After performing the initialization, a value indicating the completion of the initialization is set in a register,
An IC module, wherein the value in the register is read during the non-contact communication and the initialization is omitted.

27. The IC module according to claim 25, wherein
An IC module, wherein power supply to the nonvolatile memory is stopped between the completion of the initialization and the start of the contactless communication.

28. The IC module according to claim 25, wherein
The initialization includes reading a plurality of logical addresses recorded in the non-volatile memory and creating a table for converting the plurality of logical addresses into corresponding physical addresses. module.

Description

The present invention relates to a storage device equipped with a non-contact communication function, a host device into which the storage device can be inserted, and a host device including the storage device, and in particular, a flash memory chip, a memory controller chip, and RF (Radio Frequency). The present invention relates to a technology effective when applied to an IC card such as a SIM (Subscriber Identity Module) card having a communication controller chip, and a mobile phone equipped with the IC card.

For example, as an example of a storage device equipped with a non-contact communication function, Patent Document 1 describes a memory card having a flash memory chip, a memory controller chip, a contact IC card chip, and a non-contact IC card chip.

In general, power for operating a non-contact IC card chip is supplied from an electric field generated by a dedicated reader via a coil-type antenna attached to a non-contact IC card interface. Therefore, non-contact IC cards are used under a very unstable power supply environment. The most promising application of a non-contact IC card is an electronic ticket, and it is required to read and write data within a short time of about several hundred milliseconds when passing through an entrance gate.

On the other hand, a flash memory is a non-volatile semiconductor memory having many memory cells that are inherently defective compared to other semiconductor memories. Therefore, before reading and writing data, an initialization process such as reading a table in which addresses of defective memory cells are recorded from a part of normal memory cells is necessary so as not to use defective memory cells. Furthermore, since flash memory needs to erase a memory block composed of a plurality of memory cells before programming data, if the power is cut off during data programming, the recorded contents are in large units. There is a risk of being destroyed.
JP 2005-293444 A

By the way, based on the above background art, it may be difficult and dangerous for the memory card of Patent Document 1 to read and write data in the flash memory in accordance with a command received through the non-contact IC card interface. This is because the non-contact IC card chip in the memory card of Patent Document 1 operates in a short time and in a very unstable power supply environment, and therefore, the time required for performing the initialization process necessary to use the flash memory is long. This is because there is little room, and there is a high possibility that a lot of data will be destroyed due to sudden loss of power supply.

Therefore, an object of the present invention is to easily read and write data in a flash memory in accordance with a command received through a non-contact IC card interface in an IC card such as a SIM card and a mobile phone equipped with the IC card. It is to provide a technology that can be performed safely.

The present invention includes a flash memory chip, a memory controller chip having a flash memory chip control function, a contact IC card interface, and a non-contact IC card interface, and the memory controller chip has a host device user authentication function. Then, using the power supplied from the host device to the contact IC card interface, the data transmitted through the contactless IC card interface is read from the flash memory chip or written to the flash memory chip. There is provided an IC card characterized in that initialization of a flash memory chip is executed in response to power supply or access to a contact IC card interface for instructing an authentication function.

The present invention also provides an IC card characterized in that when power is supplied to the contact IC card interface, a memory controller chip having a flash memory control function executes initialization of the flash memory chip.

The present invention also provides an IC card characterized in that when a reset signal is inputted to the contact IC card interface, a memory controller chip having a flash memory control function executes initialization of the flash memory chip.

IPR2025-00645 Page 02321

Further, according to the present invention, when a command for selecting the host device service subscriber authentication function is input to the contact IC card interface, the memory controller chip having the flash memory control function executes initialization of the flash memory chip. An IC card is provided.

Further, according to the present invention, when a command for authenticating a host device service subscriber is input to the contact IC card interface, a memory controller chip having a flash memory control function executes initialization of the flash memory chip. An IC card is provided.

Further, according to the present invention, the execution result of the initialization of the flash memory chip is stored in the nonvolatile memory inside the memory controller chip, and when the initialization is executed again, the flash memory chip is accessed by referring to the execution result. An IC card characterized by bypassing the above is provided.

Furthermore, the present invention includes an IC card having the above-described features, an antenna, and a power supply. The memory controller chip has a mobile phone user authentication function. Provided is a mobile phone characterized in that processing of data transmitted from an antenna through a non-contact IC card interface is executed using electric power supplied to the contact IC card interface.

According to the present invention, it is easy and safe to read and write data in a flash memory in accordance with a command received through a non-contact IC card interface in an IC card such as a SIM card and a mobile phone equipped with the IC card. There is an effect that it can be performed.

Hereinafter, embodiments of the present invention will be described in detail with reference to the drawings. Note that components having the same function are denoted by the same reference symbols throughout the drawings for describing the embodiment, and the repetitive description thereof will be omitted.

(First embodiment)
Hereinafter, a first embodiment of the present invention will be described with reference to FIGS.

The SIM card is an IC card used in a mobile phone of a system such as GSM (Global System for Mobile Communications) or W-CDMA (Wideband Code Division Multiple Access). A unique number called an IMSI (International Mobile Subscriber Identity) is assigned to the SIM card, and by connecting this number to a telephone number, a cellular phone service subscriber can communicate with the cellular phone. By inserting and removing the SIM card, the telephone number can be transferred to another mobile phone, or a plurality of telephone numbers can be switched and used by one mobile phone. A general SIM card is equipped with a non-volatile memory of about 64 Kbytes and can store about 50 telephone numbers of communication partners. The SIM card is usually lent from a telecommunications carrier or a carrier (communication company), and must be returned upon cancellation.

FIG. 1 simply shows the internal configuration of the SIM card 1100 and the entire system including the SIM card 1100 according to the first embodiment.

The SIM card 1100 has a memory card function that conforms to the MultiMediaCard specification, a function that authenticates a cellular phone service subscriber in accordance with a contact IC card command that is input using a transmission method that conforms to the ISO / IEC 7816-3 standard, and an ISO / IEC 14443 standard. In accordance with a non-contact IC card command input in accordance with a transmission method conforming to the standard, the confidential data such as electronic money and electronic ticket is input / output.

The SIM card 1100 includes a flash memory chip 1300, a memory controller chip 1200, an RF communication controller chip 1400, and an external terminal group 1500. There may be a plurality of memory controller chips 1200, and the larger the number, the larger the nonvolatile memory capacity that can be used inside the SIM card 1100. The flash memory chip 1300 is a nonvolatile semiconductor memory. The memory controller chip 1200 is a microcomputer.

The external terminal group 1500 includes seven memory card external terminals compliant with the MultiMediaCard specification and eight contact IC card external terminals compliant with ISO / IEC 7816-2. An external host device such as a digital camera accesses the SIM card 1100 through a memory card external terminal and executes a memory card function. The mobile phone 1000 accesses the SIM card 1100 through the contact IC card external terminal and executes the subscriber authentication function.

The memory card external terminal includes a CS terminal 1501, a CMD terminal 1502, GND terminals 1503 and 1506, a VCC terminal 1504, an HCK terminal 1505, and a DAT terminal 1507. The external host device supplies power to the SIM card 1100 using the VCC terminal 1504 and the GND terminals 1503 and 1506. The CS terminal 1501 is a terminal for inputting a signal for selecting a card that the external host device wants to access. The CMD terminal 1502 is a terminal through which an external host device inputs a memory card command conforming to the MultiMediaCard specification. The DAT terminal 1507 is a terminal for inputting / outputting data to be transmitted by a memory card command. The HCK terminal 1505 is a terminal for inputting a synchronous clock used for transmission of memory card commands and data.

The contact IC card external terminals include a VCC terminal 1511, an RST terminal 1512, an SCK terminal 1513, an ANTa terminal 1514, a GND terminal 1515, an SIO terminal 1517, and an ANTb terminal 1518. The mobile phone 1000 uses the VCC terminal 1511 and the GND terminal 1515 to supply power to the SIM card 1100 from the power supply 1800 built therein. This electric power is used not only for contact IC card functions such as subscriber authentication but also for non-contact IC card functions such as electronic tickets. The RST terminal 1512 is a terminal to which the mobile phone 1000 inputs a reset signal for executing a reset process in accordance with the ISO / IEC 7816-3 standard for the SIM card 1100. The SIO terminal 1517 is a terminal for the mobile phone 1000 to input / output contact IC card commands and responses to / from the SIM card 1100 using a transmission method compliant with the ISO / IEC7816-3 standard. The SCK terminal 1513 is a terminal for inputting a synchronous clock used for transmitting a contact IC card command and a response. The ANTa terminal 1514 and the ANTb terminal 1518 exist at the same position as the two terminals reserved in the ISO / IEC 7816-2 standard, and are built in the mobile phone 1000 to input / output non-contact IC card commands and data. A terminal connected to the coil antenna 1700. The non-contact communication reader / writer 1600 can input confidential data such as an electronic ticket to the SIM card 1100 or output from the SIM card 1100 via the coiled antenna 1700. For example, the non-contact communication reader / writer 1600 is incorporated in an entrance / exit gate device of a public facility.

The flash memory chip 1300 is a large-capacity (for example, 128 megabyte) memory chip using a nonvolatile semiconductor memory as a storage medium. The memory controller chip 1200 divides the memory area of the flash memory chip 1300 into a plurality of areas such as a file data area, a spare area, and a system area based on the physical address range, and allocates them to different uses. The file data area occupies most of the entire memory area, and is an area for storing file data used in the memory card function, the contact IC card function, and the non-contact IC card function. The spare area is an area including alternative sectors and multiplexed sectors. If there is a bad sector in the file data area, the data is stored in the alternative sector. A table indicating which alternative sector corresponds to the defective sector also exists in the spare area. Further, the data in the erase unit block including the sector to be written is collectively saved to the multiplexed sector so that the data of the sector other than the write target sector is not lost due to the power interruption or the like. Information representing the addresses of available multiplexed sectors is also present in the spare area. The system area includes characteristic information (memory card capacity and attributes, a table recording the address of a write-protected sector, etc) used for the memory card function and data (random number verification) for verifying the validity of the flash memory chip 1300. This is an area for storing a preferable value.

The memory controller chip 1200 is connected to the external terminal group 1500, and can receive a memory card command from an external host device or a contact IC card command from the mobile phone 1000 via the memory controller chip 1200. Further, it is connected to one or a plurality of flash memory chips 1300, and these

IPR2025-00645 Page 02322

flash memory chips 1300 can be controlled.

The RF communication controller chip 1400 is connected to the ANTa terminal 1514 and the ANTb terminal 1518 in the external terminal group 1500, and receives a non-contact IC card command from the non-contact communication reader / writer 1600 through the RF communication controller chip 1400. A contactless IC card response can be transmitted to the writer 1600. Further, it is connected to the memory controller chip 1200 and converts between an analog signal of a transmission method in conformity with the ISO / IEC14443 standard and a digital signal that can be handled by the memory controller chip 1200, and between the memory controller chip 1200 and the memory controller chip 1200. It has a function to send and receive digital signals.

FIG. 2 is a diagram showing an internal configuration of the memory controller chip 1200 of FIG.

The memory controller chip 1200 is connected to the CS terminal 2501 connected to the CS terminal 1501, the CMD terminal 2502 connected to the CMD terminal 1502, the GND terminal 2503 connected to the GND terminals 1515, 1503, and 1506, and the VCC terminals 1511 and 1504. VCC terminal 2504, HCK terminal 2505 connected to HCK terminal 1505, DAT terminal 2507 connected to DAT terminal 1507, RST terminal 2512 connected to RST terminal 1512, SCK terminal 2513 connected to SCK terminal 1513, An SIO terminal 2517 connected to the SIO terminal 1517 is provided. Further, a flash memory I / F terminal group 2300 for connecting to the flash memory chip 1300 and a CIO terminal 2516 for connecting to the RF communication controller chip 1400 are provided. The memory controller chip 1200 operates by power supplied through a VCC terminal 1511 (may be 1504) and a GND terminal 1515 (may be 1503, 1506).

The memory controller chip 1200 includes a CPU (microcomputer) 1201 for performing various arithmetic processes and an OSC 1202 that is a clock oscillator. Furthermore, a ROM (Read Only Memory) 1203 for storing fixed data (including a program), a RAM (Random Access Memory) 1204 for storing volatile data, and a serial for transmitting and receiving data through a contact IC card external terminal interface logic 1205, memory card interface logic 1206 for transmitting and receiving data through the memory card external terminal, EEPROM (Electrically Erasable Programmable ROM) 1207 for storing nonvolatile data, remainder multiplication, common key encryption, random number generation, etc. Data is sent between the cryptographic coprocessor 1208 capable of performing the above process at a higher speed than the CPU 1201 and the flash memory chip 1300. And a flash memory interface logic 1209 for credit, they 1203-1209 is operated by power supplied from the VCC terminal 2504 is connected to the CPU1201 through the bus 1210.

The OSC 1202 oscillates a drive clock for the CPU 1201 by the power supplied from the VCC terminal 2504.

The serial interface logic 1205 is connected to the SCK terminal 2513, the SIO terminal 2517, and the RST terminal 2512, and can perform serial communication processing (compliant with the ISO / IEC 7816-3 standard) with the mobile phone 1000. Further, the serial interface logic 1205 is connected to the CIO terminal 2516 and can perform serial communication processing with the RF communication controller chip 1400.

The memory card interface logic 1206 is connected to the CS terminal 2501, the CMD terminal 2502, the HCK terminal 2505, and the DAT terminal 2507, and can perform a memory card command communication process (compliant with the MultiMediaCard specification) with an external host device.

The flash memory interface logic 1209 is connected to a flash memory I / F terminal group 2300 including a plurality of terminals, and controls the flash memory chip 1300 via the flash memory I / F terminal group 2300 to read data from the flash memory chip 1300 and Data can be written to the chip 1300.

The CPU 1201 executes a subscriber authentication process according to a program stored in the ROM 1203 or the EEPROM 1207 in response to a contact IC card command from the mobile phone 1000. The cryptographic coprocessor 1208 performs cryptographic processing necessary for subscriber authentication processing.

The CPU 1201 executes processing such as reading, writing, and erasing defined in the MultiMediaCard specification according to a program stored in the ROM 1203 or the EEPROM 1207 according to a memory card command from the external host device.

When the CPU 1201 reads data from the flash memory chip 1300 or writes data to the flash memory chip 1300, the CPU 1201 does not use a sector that is inherently defective or a sector that has acquired failure due to repeated erasure. In addition, the flash memory chip 1300 is managed so that irrelevant stored data is not lost due to power interruption during data writing. As its management means, the CPU 1201 needs to execute some initialization each time power is supplied to the SIM card 1100. This is performed before reading data from the flash memory chip 1300 or writing data to the flash memory chip 1300.

The specific contents of initialization of the flash memory chip 1300 are (1) confirmation of the number of memory chips, (2) reading of memory verification data, (3) reading of a modification program, (4) reading of memory card characteristic information, (5) Reading the defective sector replacement destination address table, and (6) Reading multiplexed sector address information.

Since the memory controller chip 1200 is manufactured for general use so as to operate regardless of how many flash memory chips 1300 are connected, the number of connected flash memory chips 1300 is determined by the initialization of (1). It is necessary to confirm and grasp the nonvolatile memory capacity available in the SIM card 1100.

The SIM card 1100 does not operate correctly if the connection between the memory controller chip 1200 and the flash memory chip 1300 is partially disconnected or the flash memory chip 1300 is not a valid chip. In order to prevent this, the CPU 1201 reads the data previously written in the flash memory chip 1300 at the time of manufacture by the initialization of (2), and determines whether there is no problem in the connection state or whether it is a valid chip. Must be verified.

If the program in the ROM 1203 is defective, the SIM card 1100 may cause damage to the user due to malfunction. In order to prevent this, the CPU 1201 must read the correction program code of the memory controller from the flash memory chip 1300 by the initialization of (3), and replace the defective portion of the program with it.

In the memory card function of the SIM card 1100, the memory card capacity and attributes, a table that records the addresses of write-protected sectors, and the like are characteristic information that the CPU 1201 wants to access immediately. Therefore, it is necessary to hold these in the RAM 1204 that can be accessed at high speed. Therefore, the CPU 1201 has to read the characteristic information written in the flash memory chip 1300 by the initialization of (4).

In the SIM card 1100, a defective sector is replaced with a normal sector so that a sector which is inherently defective in the flash memory chip 1300 or a sector which has become defective due to repeated erasure is not accessed. The alternative address is information that the CPU 1201 wants to access immediately. Therefore, it is necessary to hold these in the RAM 1204 that can be accessed at high speed. For this reason, the CPU 1201 must read the table in which the alternative address of the defective sector is recorded by the initialization of (5).

In the SIM card 1100, the data is multiplexed (replicated) to another sector to protect the data so that irrelevant stored data is not lost due to the power being cut off during the data writing to the flash memory chip 1300. . The usable multiplexed sector address is information that the CPU 1201 wants to access immediately. Therefore, it is necessary to hold these in the RAM 1204 that can be accessed at high speed. Therefore, the CPU 1201 must read the address of the multiplexed sector by the initialization of (6).

Since these six initialization processes need to read a large amount of data from the flash memory chip 1300, it takes a long time to be completed. An initialization register is present in the RAM 1204 to indicate that all these initialization processes have been completed. The initialization register is reset (for example, the value is 0)

IPR2025-00645 Page 02323

until the initialization process is completed after the SIM card 1100 is activated. When the initialization process is completed, the CPU 1201 sets an initialization register (for example, sets the value to 1)

FIG. 3 is a diagram showing an internal configuration of the RF communication controller chip 1400 of FIG.

The RF communication controller chip 1400 is connected to the GND terminal 2523 connected to the GND terminals 1515, 1503, and 1506, the VCC terminal 2524 connected to the VCC terminals 1511 and 1504, the ANTa terminal 2514 connected to the ANTa terminal 1514, and the ANTb terminal 1518. An ANTb terminal 2518 to be connected is provided. Further, a CIO terminal 2526 for connecting to the memory controller chip 1200 is provided. The RF communication controller chip 1400 operates with power supplied through a VCC terminal 1511 (may be 1504) and a GND terminal 1515 (may be 1503, 1506).

The RF communication controller chip 1400 includes a digital signal processor 1401, an A / D converter 1402, a D / A converter 1403, and a modulation / demodulation circuit 1404.

The modulation / demodulation circuit 1404 receives an electric field change via a coiled antenna connected to the ANTa terminal 2514 and the ANTb terminal 2518 and demodulates it to generate an analog signal. The A / D converter 1402 converts it into a digital signal. The digital signal processor 1401 constructs a contactless IC card command from the signal based on the encoding rule, and outputs it to the CIO terminal 2526 as a serial signal that can be handled by the memory controller chip 1200.

The digital signal processor 1401 configures a digital signal based on the encoding rule from the non-contact IC card response received as a serial signal from the memory controller chip 1200 through the CIO terminal 2526. The D / A converter 1403 converts it into an analog signal. Modulation / demodulation circuit 1404 modulates and transmits it via a coil-type antenna connected to ANTa terminal 2514 and ANTb terminal 2518.

The memory controller chip 1200 can receive a non-contact IC card command and transmit a non-contact IC card response with the non-contact communication reader / writer 1600 via the RF communication controller chip 1400. Among them, the CPU 1201 interprets a non-contact IC card command and processes the command according to a program stored in the ROM 1203 or the EEPROM 1207. These processes include a process of reading data from the flash memory chip 1300 and writing data to the flash memory chip 1300. Prior to these read / write processes, the flash memory chip 1300 must be initialized as described above.

FIG. 4 is a flowchart showing a procedure in which the memory controller chip 1200 executes initialization of the flash memory chip 1300 before executing read / write processing of the flash memory chip 1300 in accordance with the non-contact IC card command. In this flow, the initialization of the flash memory chip 1300 is divided into four stages from the first to the fourth. The initialization processes (1) to (6) described above are included in any one of these four stages. For example, the first initialization includes (1), the second initialization includes (2) and (3), the third initialization includes (4), and the fourth initialization (5).) And (6). However, which stage each initialization process is included in may be other cases, or may be dynamically changed according to the internal state of the SIM card 1100.

Hereinafter, an initialization procedure of the flash memory chip 1300 will be described.

The cellular phone 1000 starts supplying power to the SIM card 1100 as soon as it is activated (step 4100). As a result, the memory controller chip 1200 in the SIM card 1100 executes the startup routine, in which the primary flash memory initialization is executed (step 4200).

Thereafter, the mobile phone 1000 accesses the SIM card 1100 in the following three stages in order to authenticate the subscriber and validate the communication function.

As the first access, the mobile phone 1000 transmits a reset signal to the RST terminal 1512 of the SIM card 1100 (step 4110). Thereby, the memory controller chip 1200 in the SIM card 1100 executes a reset process (step 4210). Then, after confirming that the initialization of the primary flash memory is completed (step 4211), the initialization of the secondary flash memory is executed (step 4212). Then, the SIM card 1100 transmits an ATR (Answer To Reset) byte to the mobile phone 1000 through the SIO terminal 1517. Thereby, the mobile phone 1000 determines whether or not the reset is successful (step 4111). If unsuccessful, the process returns to step 4110.

Next, as a second access, the mobile phone 1000 transmits a subscriber authentication function selection command through the SIO terminal 1517 of the SIM card 1100 (step 4120). Thereby, the memory controller chip 1200 in the SIM card 1100 selects the subscriber authentication function from the supported IC card functions (step 4220). Then, after confirming that the secondary flash memory initialization is completed (step 4221), the third flash memory initialization is executed (step 4222). Then, the SIM card 1100 transmits a response indicating selection success to the mobile phone 1000 through the SIO terminal 1517. Thereby, the mobile phone 1000 determines whether or not the selection is successful (step 4121). If unsuccessful, the process returns to step 4120. Since the secondary flash memory initialization only needs to be completed before reaching step 4221, the processing from step 4111 to step 4221 and the secondary flash memory initialization are executed in parallel. Is also possible. This parallelization shortens the time required for the entire flash memory initialization.

Next, as a third access, the mobile phone 1000 transmits a subscriber authentication command through the SIO terminal 1517 of the SIM card 1100 (step 4130). Thereby, the memory controller chip 1200 in the SIM card 1100 executes a subscriber authentication function (step 4230). After confirming that the third flash memory initialization is completed (step 4231), the fourth flash memory initialization is executed (step 4232). Then, it is confirmed that the fourth flash memory initialization is completed (step 4233). Since the initialization of the flash memory is now completed as a whole, the CPU 1201 sets an initialization register (step 4234). Then, the SIM card 1100 transmits a response indicating authentication success to the mobile phone 1000 through the SIO terminal 1517. Thereby, the mobile phone 1000 determines whether or not the authentication is successful (step 4131). If unsuccessful, the process returns to step 4130. Since the third flash memory initialization only needs to be completed before reaching step 4231, the processing from step 4121 to step 4231 and the third flash memory initialization are executed in parallel. Is also possible. This parallelization shortens the time required for the entire flash memory initialization.

As described above, the communication function of the mobile phone 1000 is validated, and the mobile phone 1000 enters a communication standby state (step 4140).

In this manner, the flash memory chip 1300 in the SIM card 1100 can be initialized in a series of routines performed when the mobile phone 1000 is powered on. As a result, when the SIM card 1100 performs contactless communication with the contactless communication reader / writer 1600 via the mobile phone 1000, read / write processing for the flash memory chip 1300 is already available. When it is desired to execute the read / write processing of the flash memory chip 1300 according to the command received through the non-contact IC card interface, the CPU 1201 simply performs the read / write processing by confirming that the initialization register is set. Can be executed. That is, the time required to execute the read / write process is shortened compared to the prior art. In addition, since the power for executing the read / write processing of the flash memory chip 1300 is supplied from the power source 1800 of the mobile phone 1000, the power state is stable. As described above, it is easy and safe for the SIM card 1100 to access the flash memory according to the command received through the non-contact IC card interface.

(Second Embodiment)
Hereinafter, a second embodiment of the present invention will be described

The SIM card 1100 and the mobile phone 1000 in the second embodiment have the same internal configuration, terminals, and functions as those in the first embodiment. As in the first embodiment, the present system configured with the SIM card 1100 and the mobile phone 1000 can execute initialization of the flash memory chip 1300 according to the procedure shown in FIG. However, in each flash memory initialization process shown in steps 4200, 4212, 4222, and 4232 in FIG. 4,

IPR2025-00645 Page 02324

data read from the flash memory chip 1300 is stored (cached) in the EEPROM 1207 of the memory controller chip 1200. To do. When the initialization of the flash memory chip 1300 is executed again according to the procedure shown in FIG. 4, the cached data is read instead of reading the data from the flash memory chip 1300. The time required for the CPU 1201 to access the EEPROM 1207 is shorter than that of the flash memory chip 1300. Thus, the time required for initializing the flash memory chip 1300 can be shortened.

(Third embodiment)
Hereinafter, a third embodiment of the present invention will be described with reference to FIG.

FIG. 5 simply shows the entire system including the SIM card 1100a according to the third embodiment.

The cellular phone 1000a includes a power source 1800, an RF communication controller chip 2400, and a coil antenna 2700. The mobile phone 1000a also includes a telephone communication module. Therefore, the RF communication controller chip 2400 is different from a telephone communication module.

The SIM card 1100a has an internal configuration obtained by removing the RF communication controller chip 1400 from the SIM card 1100 according to the first embodiment, but a CIO terminal 1516 is newly added as one of the contact IC card external terminals of the external terminal group 1500. Prepare. The CIO terminal 1516 is connected to the CIO terminal 2516 of the memory controller chip 1200 inside the SIM card 1100a.

The RF communication controller chip 2400 has the same internal configuration, terminals, and functions as those of the RF communication controller chip 1400 in the first embodiment, and operates with electric power supplied from the power supply 1800. The RF communication controller chip 2400 is connected to the coil type antenna 2700 through its ANTa terminal and ANTb terminal. The CIO terminal is connected to the CIO terminal 1516 of the SIM card 1100a.

Based on the above configuration, this system including the SIM card 1100a and the mobile phone 1000a has the same "initialization of flash memory" as in the first embodiment and "initial" as in the second embodiment. Shortening of the time required for conversion ". Therefore, this enjoys the effects of the invention shown in the first and second embodiments.

(Fourth embodiment)
The fourth embodiment of the present invention will be described below with reference to FIG. The SIM card 1100a in the fourth embodiment has the same internal configuration as the SIM card 1100a in the third embodiment, but the memory controller chip 1200 appropriately controls the power supply to the flash memory chip 1300. Power consumption can be reduced.

Hereinafter, a procedure for the SIM card 1100a to execute initialization of the flash memory chip 1300 and a procedure for executing read / write processing of the flash memory chip 1300 will be described. This is shown by linking the flowchart of FIG. 6 to step 4121 of the flowchart of FIG.

Also in the fourth embodiment of the present invention, the initialization of the flash memory chip (also simply referred to as flash memory) 1300 is basically executed according to the procedure described in FIG. However, after the memory controller chip 1200 sets the initialization register to indicate that the initialization process is complete (step 4234), the power supply to the flash memory 1300 is stopped (step 6000), and then the subscription is made. The person authentication result is transmitted to the mobile phone 1000. Thereafter, the mobile phone 1000 waits for information exchange with the non-contact communication reader / writer 1600 (step 4140). During this state, since there is no power consumption by the flash memory 1300, the power saving of the SIM card 1100a is realized, and the power source battery of the mobile phone 1000 is saved. As described above, when the initialization is completed, the control information that allows the data in the flash memory 1300 to be immediately read / written is held in the RAM 1204 of the SIM card 1100a. Since power supply to the memory controller chip 1200 is maintained after step 6000, they will not volatilize and disappear.

After step 4140, when coil-type antenna 2700 of mobile phone 1000 enters a range where communication with non-contact communication reader / writer 1600 is possible, a signal from non-contact communication reader / writer 1600 is received (step 6010). Then, the data demodulated from the signal by the RF communication controller chip 2400 is transferred to the SIM card 1100a through the CIO terminal 1516 (step 6020). The memory controller chip 1200 resumes power supply to the flash memory 1300 in response to the reception of the data (step 6030). Then, the initialization register is read to confirm that it has been set (step 6040), and data is read / written to / from the flash memory 1300 immediately using the control information held in the RAM 1204 (step 6050).

When the exchange of information between the mobile phone 1000 and the non-contact communication reader / writer 1600 ends (or is interrupted) and access to the flash memory 1300 is lost, the memory controller chip 1200 stops supplying power to the flash memory 1300. (Step 6060), the mobile phone 1000 returns to a state of waiting for information exchange with the non-contact communication reader / writer 1600 (Step 4140).

The data transferred in step 6020 may include information indicating whether data is read from or written to the flash memory 1300. The memory controller chip 1200 determines whether to restart the power supply to the flash memory 1300 based on the information. If it is not necessary to read / write data from / to the flash memory 1300, the power supply to the flash memory 1300 is kept stopped. Thereby, the power consumption of the flash memory 1300 can be reduced.

Note that the power supply stop to the flash memory 1300 by the memory controller chip 1200 may be performed at any time as long as the initialization of the flash memory 1300 is completed. FIG. 6 shows an example of stopping the power supply when the initialization process is all completed by the completion of the fourth flash memory initialization, and other procedures can be implemented. For example, when all the initialization processes are completed by completing the initialization of the primary flash memory, the power supply may be stopped immediately after step 4211. For example, when all initialization processes are completed due to the completion of the initialization of the secondary flash memory, the power supply may be stopped immediately after step 4221. For example, when all initialization processes are completed due to the completion of the tertiary flash memory initialization, the power supply may be stopped immediately after step 4231.

Furthermore, the power supply period to the flash memory 1300 by the memory controller chip 1200 may be limited to the respective execution periods of the first to fourth flash memory initialization. That is, in each of the first to fourth flash memory initializations, the power supply is resumed immediately before the start, and the power supply is stopped immediately after the completion. For example, if no initialization processing is performed in the initialization of the secondary and tertiary flash memories, the power supply is stopped immediately after step 4211 and the power supply is started immediately before step 4232. Also good. The power consumption of the flash memory 1300 that is not accessed during that time can be reduced.

(Fifth embodiment)
Hereinafter, a fifth embodiment of the present invention will be described with reference to FIGS. A cellular phone 1000 according to the fifth embodiment is obtained by adding a short-range wireless communication module to the cellular phone 1000 according to the fourth embodiment. The SIM card 1100a in the fifth embodiment has the same internal configuration as the SIM card 1100a in the fourth embodiment.

The short-range wireless communication module is, for example, a Bluetooth module. Bluetooth (Bluetooth) is a communication standard that connects mobile devices such as notebook computers and mobile phones by short-range wireless instead of cables. When Bluetooth is used, various devices can perform data communication wirelessly. Unlike near-field communication technology using infrared rays such as IrDA (infrared Data Association), even if there is an obstacle, communication is possible within 10 meters. As a communication technology, frequency hopping spread spectrum communication is used, and the frequency of radio wave interference is shortened by changing the frequency 1600 times per second using 79 channels divided every 1 MHz. Because the communication module is small and consumes low

IPR2025-00645 Page 02325

power, it has the feature that it can be easily installed in mobile devices. In the basic specification of Bluetooth, the number of simultaneously connected devices is 8, the frequency band used is 2.4 GHz (ISM band), the sleep current consumption is 30 μA, the standby current consumption is 300 μA, the asynchronous data transfer speed is 723.2 Kbps, Reception is 57.6 Kbps.

The cellular phone 1000 in the fifth embodiment can communicate with another short-range wireless communication module within a range of about 10 meters through the short-range wireless communication module. The cellular phone 1000 can obtain information on the non-contact communication reader / writer 1600 located at a position about 10 meters away by this communication. The SIM card 1100a receives the information from the mobile phone 1000 and executes initialization of the flash memory 1300. As a result, the initialization is completed before the start of non-contact communication, and data can be immediately read from and written to the flash memory 1300 in the non-contact communication.

FIG. 7 simply shows the entire system including the SIM card 1100a according to the fifth embodiment.

The gate machine 7000 is equipped with a non-contact communication reader / writer 1600 and a short-range wireless communication means 7010. The gate machine 7000 is, for example, a ticket gate in a station building for public transportation. The gate device 7000 uses the short-range wireless communication means 7010 to transmit data for notifying the presence of the contactless communication reader / writer 1600 to the mobile phone 1000 existing within a range of about 10 meters. To do. The data includes information such as the type of public transportation and the station name.

The cellular phone 1000 is equipped with short-range wireless communication means 7020, and detects the presence of the gate device 7000 by receiving the data. The MPU 7030 is a microprocessor that controls the entire mobile phone 1000 and is connected to the short-range wireless communication unit 7020. The switch means 7040 is a circuit that switches whether the CIO terminal 1516 of the SIM card 1100a is connected to the RF communication controller chip 2400 or to the MPU 7030. The switching is controlled by the MPU 7030. Hereinafter, a state in which the CIO terminal 1516 of the SIM card 1100a is connected to the RF communication controller chip 2400 is referred to as state A, and a state in which the CIO terminal 1516 is connected to the MPU 7030 is referred to as state B. In particular, in the state B, the MPU 7030 becomes a pseudo RF communication controller chip 2400, and can transmit a non-contact IC card command to the SIM card 1100a and receive a response thereof.

FIG. 8 is a flowchart showing a procedure for executing initialization of the flash memory chip 1300 and a read / write process for the flash memory chip 1300 by the SIM card 1100a according to the fifth embodiment.

The MPU 7030 in the mobile phone 1000 detects the gate device 7000 equipped with the non-contact communication reader / writer 1600 through the short-range wireless communication means 7020 (step 8000). The MPU 7030 sets the switch unit 7040 to the state B and transmits a non-contact IC card command to the SIM card 1100a. This command is for transferring information about the gate machine 7000 to the SIM card 1100a (step 8010). Upon receiving this command, the SIM card 1100a decides to initialize the flash memory chip 1300 in advance. First, the initialization register is read to confirm that it has not been set yet (step 8020). Then, the initialization process of the flash memory chip 1300 described so far is executed (step 8030). When all the initialization processes are completed, the SIM card 1100a sets an initialization register (step 8040) and stops supplying power to the flash memory chip 1300 (step 8050). Thereafter, the SIM card 1100a returns a response to the command to the mobile phone 1000. In response to this, the MPU 7030 sets the switch means 7040 to the state A, and waits for information exchange with the non-contact communication reader / writer 1600 (step 8060).

After step 8060, when coil-type antenna 2700 of mobile phone 1000 enters a range where communication with non-contact communication reader / writer 1600 is possible, a signal from non-contact communication reader / writer 1600 is received (step 8110). Then, the data demodulated from the signal by the RF communication controller chip 2400 is transferred to the SIM card 1100a (step 8120). In response to the reception of the data, the memory controller chip 1200 resumes power supply to the flash memory 1300 (step 8130). Then, the initialization register is read to confirm that it has been set (step 8140), and data is read from and written to the flash memory 1300 immediately (step 8150).

When the exchange of information between the mobile phone 1000 and the non-contact communication reader / writer 1600 ends (or is interrupted) and access to the flash memory 1300 is lost, the memory controller chip 1200 stops supplying power to the flash memory 1300. (Step 8160), the mobile phone 1000 returns to a state of waiting for information exchange with the non-contact communication reader / writer 1600 (Step 8060).

The data transferred in step 8120 may include information indicating whether or not data is read from or written to the flash memory 1300. The memory controller chip 1200 determines whether to restart the power supply to the flash memory 1300 based on the information. If it is not necessary to read / write data from / to the flash memory 1300, the power supply to the flash memory 1300 is kept stopped. Thereby, the power consumption of the flash memory 1300 can be reduced.

(Sixth embodiment)
Hereinafter, a sixth embodiment of the present invention will be described with reference to FIG.

A SIM card 1100b according to the sixth embodiment is configured such that a USB (Universal Serial Bus) interface is added to the SIM card 1100a according to the fourth embodiment to function as a USB device. External terminals DP9010 and DM9020 that are not used in the SIM card 1100a are assigned to the D + terminal and the D− terminal in the USB standard, respectively. The USB power supply terminal shares the ISO7816 standard power supply terminal VCC1511 and GND1515. The mobile phone 1000 includes a USB controller chip 9000, is connected to the USB terminal group (1511, 1515, 9010, 9020) of the SIM card 1100b, and can exchange information with the SIM card 1100b using a protocol compliant with the USB standard. . At this time, the USB controller chip 9000 operates as a USB host, and the SIM card 1100b operates as a USB device. The memory controller chip 1200 in the SIM card 1100b has a necessary interface circuit for the SIM card 1100b to operate as a USB device, and has a function of executing necessary arithmetic processing.

It has various USB device class functions according to programs stored in the ROM 1203 and the EEPROM 1207 in the memory controller chip 1200. The device class defines standard functions and protocols for various USB devices. Examples thereof include a mass storage class, a chip card interface device (CCID) class, a communication device class (CDC), an audio class, and a human interface device (HID) class. Among these, the mass storage class is a standard specification for functioning as a removable storage such as a USB memory. The CCID class is a standard specification for functioning as a personal ID device such as an IC card, and supports information exchange using an APDU command / response of the ISO7816 standard. CDC is a standard specification for functioning as a communication device such as a modem.

The SIM card 1100b in the sixth embodiment functions as at least a mass storage device and a CCID class device.

When functioning as a mass storage device, the storage medium for storage data is the flash memory chip 1300. On the other hand, when functioning as a CCID class device, information exchange using ISO 7816 standard APDU command / response is performed through the USB terminal group (1511, 1515, 9010, 9020). The conventional SIM card including the SIM card 1100b can exchange information by APDU command / response through the standard IC card terminal group, and the subscriber authentication function is performed through the terminal group. The SIM card 1100b functions as a CCID class device, thereby implementing a subscriber authentication function through the USB terminal group.

The SIM card 1100b according to the sixth embodiment also receives signals from the USB terminal group in the same manner as the flowcharts shown in FIGS. 4 and 6 even when executing the subscriber authentication function using the USB terminal group. As an opportunity, initialization of the flash memory chip 1300 is performed

IPR2025-00645 Page 02326

before the start of non-contact communication. Furthermore, the power supply to the flash memory chip 1300 is limited by the method described in the fourth embodiment. This enjoys the effects of the present invention

Note that the SIM card 1100b is not only when performing the subscriber authentication function as a CCID class device, but also when performing other functions as a CCID class device or when functioning as another USB device. Even so, the flash memory chip 1300 is initialized before the start of non-contact communication, triggered by the reception of a signal from the USB terminal group. Furthermore, the power supply to the flash memory chip 1300 is limited by the method described in the fourth embodiment. This also enjoys the effect of the present invention.

The flash memory initialization process described so far will be supplemented from the viewpoint of the type of flash memory to be applied and the management method.

In general, in a memory system equipped with a flash memory as a storage medium, the specific contents of initialization performed before reading / writing data in the flash memory are the type of flash memory chip to be used in the memory system, the memory system There are various types depending on how the internal memory controller manages the physical allocation destination of the logical sector. In the present invention, it is possible to shorten the time required for the initialization in the past regardless of the contents of the initialization to be executed. In particular, the initialization described in the first to sixth embodiments is a kind of initialization when an AND flash memory is employed.

The general memory management method for AND flash memory is based on fixed allocation of logical sector address and physical sector address, and is allocated to another spare sector only when the allocation destination is a bad sector. It is. Since mutual conversion between the logical sector address and the physical sector address is possible by simple calculation, it is not necessary to create a table for address conversion in particular. The data rewrite procedure in this method is as follows.
(1) An erase unit block including data to be rewritten is specified.
(2) Read all data in the block to the buffer memory
(3) The buffer memory data is saved in the same number of multiplexed sectors as the block.
(4) Rewrite data on the buffer memory.
(5) Erase the block.
(6) Write data in the buffer memory there.
(7) If power is cut off during writing, the saved data is used for recovery.

Since the AND flash memory has a small erase unit block size (several kilobytes), the amount of buffer memory to be prepared may be small, and such a rewriting procedure is useful. However, since the NAND flash memory has a large erase unit block size (several hundred kilobytes), such a rewriting procedure requires a large amount of buffer memory and is not usually applied. A general memory management method for the NAND flash memory is based on dynamically assigning a logical sector address and a physical sector address. For mutual conversion between the logical sector address and the physical sector address, it is necessary to create a table for address conversion. The data rewrite procedure in this method is as follows
(1) Select an erase unit block A including an unwritten sector.
(2) Write data to an unwritten sector in block A, and update the assigned address on the address conversion table.
(3) Select an erase unit block B containing a lot of data invalidated by rewriting.
(4) Data other than invalid data in block B (valid data) is written to an unwritten sector in block A, and their assigned addresses are updated on the address conversion table.
(5) Erase block B.
(6) Block B is reused like block A in (1).
In steps (2) and (4), data is written into the data area of the flash memory sector, and at the same time, the logical address is written into the redundant area.

When a NAND flash memory is employed in the SIM card of the present invention, it is usually necessary to create the above address conversion table as one of the initialization processes. This is a process of reading a logical address written in each redundant area over the entire physical sector in the flash memory chip and creating a mapping table from the logical address to the physical address based on the logical address. This processing time increases in proportion to the capacity of the flash memory. When the capacity of the flash memory in the SIM card is increased, the effect of shortening the initialization time according to the present invention is great.

Next, in the first to sixth embodiments, detailed specifications of contactless communication performed using the coiled antenna 1700 or 2700 are shown below.

The communication method is called proximity contactless communication, and contactless communication is different from cellular phone telephone communication. Standardized by ISO / IEC. The communicable distance is within about 10 cm. The principle of proximity contactless communication will be described. When a current is passed through the coil antenna on the non-contact communication reader / writer 1600 side, an alternating magnetic field is generated. When the coiled antenna 1700 or 2700 is placed in the magnetic field, an alternating voltage is induced and a current flows. As a result, a magnetic field (demagnetizing field) is generated, which affects the coiled antenna on the non-contact communication reader / writer 1600 side. Such magnetic field interaction becomes a carrier wave between the mobile phone 1000 and the non-contact communication reader / writer 1600. Signals are transmitted to each other by changing the amplitude, frequency, and phase. There are three types of proximity non-contact communication: Type A and Type B standardized by the ISO / IEC14443 standard, and NFC (Near Field Communication) standardized by the ISO / IEC18092 standard. NFC is the most popular public transport in Japan, its communication speed is 212 kbps, and the digital data conversion (encoding) method is Manchester.

In the third to sixth embodiments, as described in the second embodiment, initialization is performed by reading the data cached in the EEPROM 1207 instead of reading the data from the flash memory chip 1300. You can also. Thereby, it is possible to reduce the time required for the initialization of the flash memory.

As mentioned above, the invention made by the present inventor has been specifically described based on the embodiment. However, the present invention is not limited to the embodiment, and various modifications can be made without departing from the scope of the invention. Needless to say.

The present invention can be used for an IC card such as a SIM card and a mobile phone equipped with the IC card.

In the 1st Embodiment of this invention, it is a figure which shows the internal structure of a SIM card | curd, and the whole system containing a SIM card | curd. FIG. 3 is a diagram illustrating an internal configuration of a memory controller chip in the first embodiment of the present invention. In the 1st Embodiment of this invention, it is a figure which shows the internal structure of RF communication controller chip. 4 is a flowchart showing a procedure for executing initialization of a flash memory chip in the first embodiment of the present invention. In the 3rd Embodiment of this invention, it is a figure which shows the whole system containing a SIM card | curd. 14 is a flowchart showing a procedure for executing initialization of a flash memory chip in a fourth embodiment of the present invention. In the 5th Embodiment of this invention, it is a figure which shows the whole system containing a SIM card | curd. 14 is a flowchart showing a procedure for executing initialization of a flash memory chip in a fifth embodiment of the present invention. In the 6th Embodiment of this invention, it is a figure which shows the whole system containing a SIM card | curd.

Explanation of symbols

1000, 1000a ... mobile phone, 1100, 1100a, 1100b ... SIM card, 1200 ... memory controller chip, 1300 ... flash memory chip, 1400 ... RF communication controller chip, 1500 ... external terminal group, 1600 ... non-contact communication reader / writer, 1700 ... Coil type antenna, 1800 ... Power source, 2400 ... RF communication controller chip, 2700 ... Coil type antenna, 7000 ... Gate machine, 7010, 7020 ... Near field communication means, 9000 ... USB controller chip.

Patent Citations (17)

Publication number	Priority date	Publication date	Assignee	Title
JP2000196708A *	1998-12-28	2000-07-14	Ntt Mobil Communication Network Inc	Communication equipment
JP2001223631A *	2000-02-10	2001-08-17	Kyocera Ddi Mirai Tsushin Kenkyusho:Kk	Mobile communication system
JP2004064250A *	2002-07-26	2004-02-26	Ricoh Co Ltd	Electronic application apparatus
JP2004133843A *	2002-10-15	2004-04-30	Dainippon Printing Co Ltd	Ic module provided with three types of interfaces, 3-way sim and sim holder, and 3-way ic card and ic card holder
JP2004346235A *	2003-05-20	2004-12-09	Toshiba Corp	Portable electronic device and portable terminal device
JP2005342257A *	2004-06-09	2005-12-22	Vodafone Kk	Authentication method, mobile communication terminal, and card type device
JP2006209744A *	2004-12-27	2006-08-10	Toshiba Corp	Card and host apparatus
Family To Family Citations				
US5847254A *	1996-02-06	1998-12-08	Huntsman Petrochemical Corporation	Alkylation of benzene to form linear alkylbenzenes using fluorine-containing mordenites
US6400965B1 *	1999-07-13	2002-06-04	Ericsson Inc.	Cellular phone handset SIM card reader and method for testing and updating a cellular phone handset memory
CN1218276C *	2000-04-28	2005-09-07	株式会社日立制作所	IC card
JP2002074999A *	2000-08-23	2002-03-15	Sharp Corp	Non-volatile semiconductor memory
JP2003016398A *	2001-06-27	2003-01-17	Sony Corp	Portable terminal machine
US20030112972A1 *	2001-12-18	2003-06-19	Hattick John B.	Data carrier for the secure transmission of information and method thereof
JP4599088182	2004-04-05	2010-12-15	ルネサスエレクトロニクス株式会社	Memory card adapter and memory card
JP2005322109A *	2004-05-11	2005-11-17	Renesas Technology Corp	Ic card module
TWI250768B *	2004-11-01	2006-03-01	Inventec Appliances Corp	Method and device to combine mobile phone with contactless IC card
KR100596410B1 *	2004-11-04	2006-07-03	한국전자통신연구원	SD memory card for extension of function

* Cited by examiner, † Cited by third party

Cited By (60)

Publication number	Priority date	Publication date	Assignee	Title
JP2008259200A *	2007-03-28	2008-10-23	Inside Contactless	Method for coupling integrated circuit without contact with nfc element
JP2009181332A *	2008-01-30	2009-08-13	Sony Corp	Storage medium and conflict control method
US20090295548A1 *	2006-05-15	2009-12-03	Risto Ronkka	Contactless Programming and Testing of Memory Elements
JP2010165113A *	2009-01-14	2010-07-29	Toshiba Corp	Interface control device
JP2010198357A *	2009-02-25	2010-09-09	Toshiba Corp	Interface control device
JP2012510095A *	2008-11-26	2012-04-26	ネイションズ テクノロジーズ インコーポレーテッド	RFSIM card, RF card reader, and magnetic induction control method in RF communication
US8346630B2	2010-10-01	2013-01-01	Fujitsu Limited	SIM-card suspend control apparatus, SIM-card suspend control method, and information processing apparatus
JP2013137837A *	2013-04-10	2013-07-11	Toshiba Corp	Interface control device
JP2013529344A *	2010-05-27	2013-07-18	フランス・テレコム	NFC for mobile phones

IPR2025-00645 Page 02328

JP2014216032A *	2014-08-05	2014-11-17	利仁 曽根	One-time password method
US9496925B2	2011-09-30	2016-11-15	Nokia Technologies Oy	Method, apparatus, and computer program product for remote wireless powering and control of an electronic device
JP2017090978A *	2015-11-02	2017-05-25	Kddi株式会社	Control device, electronic apparatus, boot method, and computer program
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
JP4960034B2 *	2006-07-27	2012-06-27	株式会社東芝	Information storage medium and information storage medium processing apparatus
US8712474B2 *	2007-04-20	2014-04-29	Telefonaktiebolaget L M Ericsson (Publ)	Secure soft SIM credential transfer
US8915447B2	2007-09-12	2014-12-23	Devicefidelity, Inc.	Amplifying radio frequency signals
US20090070691A1	2007-09-12	2009-03-12	Devicefidelity, Inc.	Presenting web pages through mobile host devices
US9311766B2	2007-09-12	2016-04-12	Devicefidelity, Inc.	Wireless communicating radio frequency signals
US9304555B2	2007-09-12	2016-04-05	Devicefidelity, Inc.	Magnetically coupling radio frequency antennas
US8070057B2	2007-09-12	2011-12-06	Devicefidelity, Inc.	Switching between internal and external antennas
WO2009088511A1 *	2007-09-21	2009-03-26	Telefonaktiebolaget Lm Ericsson (Publ)	All in one card
KR101333809B1 *	2007-11-08	2013-12-06	에스케이플래닛 주식회사	Method for providing of service pack by using sim card, its implementing apparatus and recording medium
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
CN101257683B *	2008-02-01	2013-01-16	北京握奇数据系统有限公司	Method for signaling interaction of electric communication smart card with external non-contact card
JP5122001B2 *	2008-06-25	2013-01-16	ノキア コーポレイション	Power saving method and apparatus
JP4548524B2 *	2008-07-29	2010-09-22	ソニー株式会社	COMMUNICATION DEVICE, PROGRAM, COMMUNICATION METHOD, AND COMMUNICATION SYSTEM
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US8215546B2 *	2008-09-30	2012-07-10	Apple Inc.	System and method for transportation check-in
US20100115116A1 *	2008-11-03	2010-05-06	Micron Technology, Inc.	System and method for switching communication protocols in electronic interface devices
CN101742619A *	2008-11-06	2010-06-16	国民技术股份有限公司	Method for reducing stand-by power consumption of radio-frequency SIM (subscriber identity module) card by sequential trigger
EP2202676A1 *	2008-12-23	2010-06-30	Gemalto SA	Securing device with radiofrequency communication interface
EP2219340A1 *	2009-02-13	2010-08-18	Gemalto UK Ltd.	Method for communicating data between a system and a mobile network through an IP channel, corresponding portable object and system
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
KR101555637B1 *	2009-03-27	2015-09-24	삼성전자주식회사	Smart card
TWM362572U *	2009-04-13	2009-08-01	Phytrex Technology Corp	Signal convertor
KR101548071B1 *	2009-05-21	2015-08-20	삼성전자주식회사	Chip card with contact and contactless modes and operating method of the same
US8244181B2 *	2009-05-26	2012-08-14	Qualcomm Incorporated	Portable personal SIM card
CN102103408A *	2009-12-17	2011-06-22	深圳富泰宏精密工业有限公司	Power supply device and using method thereof
CN201830468U	2010-04-06	2011-05-11	上海复旦微电子股份有限公司	Non-contact communication terminal
CN101853370B *	2010-04-13	2012-03-07	厦门市世嘉电子科技有限公司	Card container and matched radio-frequency SIM card

IPR2025-00645 Page 02329

KR20120011974A *	2010-07-29	2012-02-09	삼성전자주식회사	Smart card supporting pluarity of interfaces and interfacing method thereof
EP2469485A1 *	2010-12-22	2012-06-27	Gemalto SA	Communication system
US8886925B1	2011-01-14	2014-10-14	Cisco Technology, Inc.	System and method for enabling secure transactions using flexible identity management in a vehicular environment
US8879985B2 *	2011-06-28	2014-11-04	Broadcom Corporation	Memory arbitrator for electronics communications devices
US8376239B1 *	2011-07-08	2013-02-19	Thomas David Humphrey	Method of use of a simulated magnetic stripe card system for use with magnetic stripe card reading terminals
US8388199B1 *	2011-09-06	2013-02-26	Gotrust Technology Inc.	Memory card supporting near field communication through single wire protocol
EP2568407B1 *	2011-09-09	2017-10-25	Assa Abloy Ab	Method and system for communicating with and programming a secure element
TW201314572A *	2011-09-21	2013-04-01	Acer Inc	Electronic apparatus using NAND flash and memory management method thereof
KR101794693B1 *	2012-02-10	2017-12-01	한국전자통신연구원	Apparatus and method for providing near field communication for mobile device
US8840031B2 *	2012-06-14	2014-09-23	Infineon Technologies Ag	Smart card and a method for operating a smart card
JP5959097B2	2012-07-03	2016-08-02	ルネサスエレクトロニクス株式会社	Semiconductor device
CN103823360B *	2012-11-16	2016-05-11	南京物联传感技术有限公司	Radio communication wrist-watch device
TW201433936A *	2013-02-22	2014-09-01	Quanta Comp Inc	Computer and control method thereof
CN104252318 *	2013-06-25	2017-12-29	神讯电脑(昆山)有限公司	The control method of electronic installation and the electronic installation
US10491731B2 *	2013-08-22	2019-11-26	Xiaomi Inc.	Method and mobile terminal for initiating communication utilizing a plurality of assigned phone numbers
CN103745752A *	2014-01-09	2014-04-23	上海华虹宏力半导体制造有限公司	Memory built-in self-testing method as well as memory error inspection method
KR101742666B1 *	2014-05-29	2017-06-15	삼성에스디에스 주식회사	Integrated circuit device and signal processing method thereof
KR102298661B1 *	2015-04-30	2021-09-07	삼성전자주식회사	Storage device and initializing method thereof

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP2007317170A	2007-12-06	Ic module and cellular phone
US7757958B2	2010-07-20	Card-shaped memory device incorporating IC card function, adapter for the same and host device
JPWO2005081180A1	2007-08-02	Storage device and data processing device
JP4896837B2	2012-03-14	Portable electronic device and method for controlling portable electronic device
US8931705B2	2015-01-13	IC card, mobile electronic device and data processing method in IC card
JP2006236200A	2006-09-07	Card type storage device and host device thereof
JP4590201B2	2010-12-01	Data carrier and data carrier program
KR101783526B1	2017-09-29	Ic card, electronic device and portable electronic device
JP2005275456A	2005-10-06	Portable electronic medium, integrated circuit used in portable electronic medium, and method for issuing portable electronic medium
KR101621127B1	2016-05-13	Ic card, portable electronic device and reader/writer
JP2007087168A	2007-04-05	Composite portable electronic device and composite ic card
JP2004192447A	2004-07-08	Ic card and data management method for ic card
JP2006293706A	2006-10-26	Multi-application ic card with application updating function
JP4334538B2	2009-09-30	IC card

IPR2025-00645 Page 02330

JP3983885B2	2007-09-26	Compound IC card and IC module for compound IC card
JP5932588B2	2016-06-08	IC card, portable electronic device, and IC card processing device
JP5957347B2	2016-07-27	IC card and portable electronic device
JP4698942B2	2011-06-08	Portable information storage medium
JP3908246B2	2007-04-25	IC card
JP2016212779A	2016-12-15	Portable electronic device and IC card
JP2010198208A	2010-09-09	Contactless portable electronic device and contactless ic card
JP5289541B2	2013-08-07	Portable electronic device, method for controlling portable electronic device, and IC card
JP3243591B2	2002-01-07	Contactless data carrier
KR100779465B1	2007-11-26	Terminal with integrated rf card control and connecting internet function
KR20070018228A	2007-02-14	Controller, IC card having the same, and data processing method of the IC card

Priority And Related Applications

Priority Applications (2)

Application	Priority date	Filing date	Title
JP2006124593		2006-04-28	
JP2007107059A	2006-04-28	2007-04-16	Ic module and cellular phone

Applications Claiming Priority (1)

Application	Filing date	Title
JP2007107059A	2007-04-16	Ic module and cellular phone

Legal Events

Date	Code	Title	Description
2010-03-30	A621	Written request for application examination	**Free format text:** JAPANESE INTERMEDIATE CODE: A621 **Effective date:** 20100329
2010-05-29	A711	Notification of change in applicant	**Free format text:** JAPANESE INTERMEDIATE CODE: A712 **Effective date:** 20100528
2012-04-19	A977	Report on retrieval	**Free format text:** JAPANESE INTERMEDIATE CODE: A971007 **Effective date:** 20120419
2012-04-25	A131	Notification of reasons for refusal	**Free format text:** JAPANESE INTERMEDIATE CODE: A131 **Effective date:** 20120424
2012-08-22	A02	Decision of refusal	**Free format text:** JAPANESE INTERMEDIATE CODE: A02 **Effective date:** 20120821

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

IPR2025-00645 Page 02331

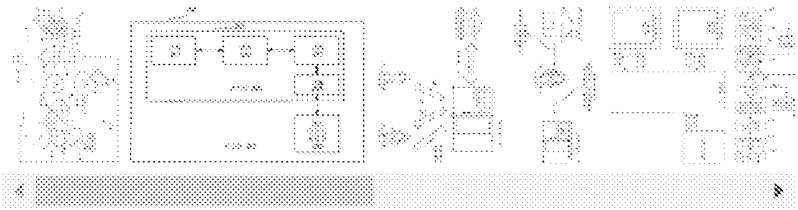
Patents 20100126850

Systems and methods for secure short messaging service and multimedia messaging service

Abstract

Systems and methods are disclosed for managing (eg, creating, transmitting, delivering, encrypting, storing, etc.) secure SMS (short message service) and secure multimedia messaging service (MMS) communications.

Images (13)



Classifications

H04L63/0464 Network architectures or network communication protocols for network security for providing a confidential data exchange among entities communicating through data packet networks wherein the data content is protected, e.g. by encrypting or encapsulating the payload using hop-by-hop encryption, i.e. wherein an intermediate entity decrypts the information and re-encrypts it before forwarding it

View 6 more classifications

KR20100126850A

South Korea

Download PDF Find Prior Art Similar

Other languages: Korean

Inventor: 선 에스. 모실, 케빈 케이 모실, 하우만 샤피자데

Worldwide applications

2009 KR MX UA SG ~~EP AU~~ CN CA MY AP WO ~~US~~ 2010 IL ZA 2011 US

Application KR1020107024143A events

2008-03-28 Priority to US4052608P

2008-03-28 Priority to US61/040,526

2009-03-28 Application filed by 셀프리스트 코프레이션

2010-12-02 Publication of KR20100126850A

Info: Patent citations (155), Cited by (251), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (26)

Hide Dependent

1. In the SMS (short messaging service) system configured for secure communication,
   A software module configured to be used in the mobile terminal and configured to encrypt the SMS message via the first encryption; And
   And a gateway configured to communicate with the mobile terminal, the gateway configured to receive the encrypted SMS message from the mobile terminal.

   2. The method of claim 1,
      The gateway is configured to decrypt the encrypted SMS message received from the mobile terminal.

   3. The method of claim 2,
      The gateway is configured to re-encrypt the decrypted SMS message via a second encryption.

   4. The method of claim 3,
      The first encryption and the second encryption are different.

   5. The method of claim 4, wherein
      The gateway is configured to send the re-encrypted SMS message to a mobile terminal.

6. In the method of secure SMS communication,
   Encrypting the SMS message at the mobile terminal;
   Sending the encrypted SMS message to a gateway;
   Decrypting the encrypted SMS message at the gateway;
   Re-encrypting the decrypted SMS message at the gateway; And
   Transmitting the re-encrypted SMS message to a recipient.

   7. The method of claim 6,
      And the message is encrypted at the mobile terminal through a first encryption, and the decrypted message is re-encrypted at the gateway through a second encryption that is different from the first encryption

   8. The method of claim 6,
      And in response to delivering the re-encrypted SMS message to a recipient, sending a delivery confirmation to the mobile terminal.

   9. The method of claim 6,
      In response to the re-encrypted SMS message accessed by the recipient, sending an open acknowledgment to the mobile terminal.

   10. The method of claim 6,
      In the mobile terminal, information identifying the recipient of the message is encrypted with the message.

IPR2025-00645 Page 02332

11. The method of claim 10,
And decrypting at the gateway further comprises determining a recipient of the encrypted message.

12. The method of claim 6,
Dividing the encrypted message into at least two encrypted sub-messages at the mobile terminal, wherein the at least two encrypted sub-messages are configured according to an SMS protocol for transmission to the gateway. Security processing method characterized in that.

13. The method of claim 12,
Reassembling the encrypted message by assembling the at least two encrypted sub-messages at the gateway.

14. The method of claim 6,
And updating the encryption key associated with the mobile terminal in the mobile terminal, wherein the updating is performed in response to a key update command sent by the gateway.

15. The method of claim 14,
Queuing at least one message associated with the mobile terminal at the gateway, wherein the queuing is performed in response to a key update command sent by the gateway. .

16. 16. The method of claim 15,
And processing the at least one queued message at the gateway, wherein the processing is performed in response to a key change confirmation message sent from the mobile terminal to the gateway.

17. A communication system for securely delivering a message to a mobile terminal,
A first software module configured as a gateway and configured to encrypt at least one of an SMS message or a multimedia messaging service (MMS) message for delivery to the mobile terminal; And
A second software module configured for use in the mobile terminal, further configured to decrypt at least one of the encrypted SMS message or the encrypted MMS message received from the first software module, wherein the encrypted SMS message or And information contained in at least one of the encrypted MMS messages has been received at the first software module from a third party.

18. The method of claim 17,
And wherein said second software module comprises an encrypted address book.

19. The method of claim 17,
And the second software module is configured to be locked after an inactivity cycle.

20. The method of claim 17,
Access to the second software module is protected by a password.

21. The method of claim 17,
And wherein said second software module is configured to delete at least one item of information, said deletion being performed in response to a selected number of failed authentication attempts

22. In a method for securely delivering a message to a mobile terminal,
Dividing the message into at least two sub-messages, the at least two sub-messages being configured according to at least one of an SMS protocol or an MMS protocol;
Encrypting the at least two sub-messages;
Sending the at least two encrypted sub-messages to a mobile terminal in accordance with at least one of an SMS protocol or an MMS protocol;
Decrypting the at least two encrypted sub-messages at the mobile terminal; And
Combining the at least two decoded sub-messages into the message at the mobile terminal.

23. In a method for securely delivering a message to a mobile terminal,
Encrypting the message;
Dividing the encrypted message into at least two sub-messages;
Sending the at least two sub-messages according to at least one of an SMS protocol or an MMS protocol;
Combining the at least two sub-messages at the mobile terminal to form an encrypted message; And
Decrypting the encrypted message at the mobile terminal.

24. In the method of deleting information in a mobile terminal,
Transmitting the encrypted SMS message to the mobile terminal including the deletion instruction; And
And deleting at least one item of information in response to the deletion instruction in the mobile terminal

25. 25. The method of claim 24,
And transmitting a message confirming deletion of at least one item of information from the mobile terminal.

26. 25. The method of claim 24,
And at least one item of the information is a database of at least one of an SMS message and an MMS message.

Description

System and method for secure short messaging service and multimedia messaging service {SYSTEMS AND METHODS FOR SECURE SHORT MESSAGING SERVICE AND MULTIMEDIA MESSAGING SERVICE}

The present invention is directed to a system and method for managing short messaging service (SMS) and multimedia messaging service (MMS) messages in an encrypted and secure manner.

With the proliferation of supporting mobile terminals and networks, the generation, transmission and delivery of SMS and MMS messages has increased significantly. However, messages are generally not encrypted during at least some of the transmission and delivery (i.e., the messages are generally not encrypted between terminals),

and as a result are vulnerable to eavesdropping or other unwanted access. In addition, the mobile terminal may be lost or not in place, and messages and / or other information stored therein may be accessed or exposed.

In addition, in the past, people had many different things in their wallets. Certain of these things allow us to store personal information, to provide identification for a variety of purposes, to be made available for purchase by a person, to provide evidence of certain facts, or a combination thereof. Certain items in your wallet include credit cards, bank cards, debit cards, check books, bank books, bank accounts, credit card records, bills, ID cards, driver's licenses, CDLs, pilot licenses, national ID cards, and electoral registrations. Cards, Passports, Visas, Entry Cards, Vegetable Shops like SAFEWAY ™, ALBERTSONS ™, Customer Cards for Retailers like GAP ™, STARBUCKS ™, Membership Cards like COSTCO ™, REI ™, Gyms and Country Clubs, Frequent Flyer Programs Cards or numbers, reward programs, video clubs, library cards, insurance cards such as health, automobiles, home and life insurance, login and password information, elevator cards, parking lot cards, room keys, phone numbers, email and street addresses, calendars, Phone card, medical records, medications taken, vaccination records, wills, medical information such as medical power of attorney, emergency contacts, personal photos, personal collectibles, receipts, quality Evidence of the certificate and warranty information, tax records, evidence of professional qualifications, including a business card and proof of the authorization.

In the past, people had more mobile phones used to make and receive calls and to send, receive, and store SMS and MMS messages with information such as phone numbers and calendars, some of which had access to the Internet. . Mobile telephones generally include, among other things, processors, digital storage, displays and software, and most of all hold and display photos, which provide purchases over the Internet, include global positioning systems (GPS) or combinations thereof. do. In addition, systems and methods have been developed to manage a variety of information and activities, including personal information. These various systems and methods are computer implemented, include computer software, use a computer storage database, are based on a network or the Internet, or provide combinations thereof. Furthermore, bar code, near field communication (NFC) and Bluetooth communication have been used above all to communicate with certain types of electronic devices. Furthermore, in the past, PDA users generally had to sort many emails to find the specific information they needed or wanted, but personal digital assistants, such as BLACKBERRY ™, send and receive emails as well as make and receive calls. It was used to

Furthermore, there is a need and potential to enable users to use the Internet, or otherwise provide efficient communication, data entry and data transfer, but there is a need to ensure that an acceptable level of data security is maintained in such systems and methods. Existed. Furthermore, potential demands and areas for improvement include improving the availability of information from many different sources, reducing duplication in entering information, organizing the information, and providing the information in a more usable form. More effectively, transferring information between the storage device and another device, providing the user with more information, more recent information, or both. Further, potential demands and areas for improvement include updating information, for example updating in time or in real time, and providing notification or alerts for at least certain important information.

In certain instances, demand and potential exist in the field of methods and systems for managing information for many users using the Internet and a user's mobile telephone. Certain demands and potentials exist in such systems and methods that allow a user to send, receive and store encrypted and / or large size SMS and MMS messages during transmission. Specific demands and benefits include receiving information from a user, including criteria for alerting, receiving information from one or more third parties, selecting a portion of information from a third party, or part of such information. Is transmitted to the user's mobile phone and the information is present in such systems and methods organized in a manner accessible to the user. Additional demands and potentials exist for alerts to be provided to the user if the particular process and the specific information to be repeated meet, for example, one or more criteria identified by the user. Furthermore, a server that demands and benefits provides secure storage of information, selects, sends and receives nuggets of personal information, for example without categorizing many emails, and stores nuggets for access by the user. And software modules operating on the mobile telephone.

In addition, various systems and methods exist in the past to authorize operation and authenticate access. For example, locks and keys have been used to control physical access to space (eg, locked doors of buildings, electronic keys for hotel rooms, etc.). However, people had to carry these keys for access. Passwords and passcodes were used to authenticate access to controlled spaces and to grant computer access to data stored in electronic warfare. However, the user had to remember this password or passcode. The system and method also exist to authenticate other operations. For example, cards were used to authorize financial transactions, such as paying during the sale period when buying goods or providing services. In addition, requiring the possession of a card, the transaction was authorized using the bankcard network, which verified whether the card was authorized. The signature was also used to authorize the transaction. However, the user needed to carry a card and the signature was forged.

The demands and potentials do not require the user to carry additional cards or keys, do not require the user to remember additional passwords, codes or information, use objects already possessed by the user, are frequently used and controlled by the user. To use an object, to provide a more convenient or alternative, to be easily traceable, to provide a variety of different actions, to be easily forged, or to provide a combination or other action For other or better systems and methods.

The present invention manages (i.e., creates, edits, displays, compresses, restores, disassembles, reassembles, or otherwise communicates in a secure manner (e.g., encrypted or secure), for example, sending SMS messages, MMS messages and other information). And a system and method configured to queue, route, encrypt, decrypt, transmit, receive, reply, forward, store, and the like.

In one embodiment, a secure SMS system includes a software module configured for use in a device such as a mobile terminal. The software module is configured to encrypt the SMS or MMS message via the first encryption. The gateway is configured to communicate with the mobile terminal. The gateway is configured to receive an encrypted SMS message from the mobile terminal.

In another embodiment, a user composes an SMS or MMS message on a mobile terminal and the message is encrypted at the mobile terminal. The user sends an encrypted message to a gateway or server. The gateway determines the destination of the message (eg, another user or a third party). Depending on the message destination (and later whether encryption is required), the gateway will re-encrypt the decrypted message (usually using a different encryption) and send the re-encrypted message to the destination (e.g. another user or a third party). Can be. The receiving mobile terminal receives the re-encrypted message and decrypts the message. The receiving mobile terminal may send a delivery confirmation, open confirmation, error, or other required message to the gateway. This message status indicator may be further sent by the gateway to the sender of the message.

In another embodiment, a method for securely delivering a message to a mobile terminal includes dividing the message into at least two submessages. Submessages are organized according to the SMS protocol. Submessages are encrypted and sent to the mobile terminal according to the SMS protocol. At the mobile terminal, at least two encrypted submessages are decrypted and combined to form a message

In another embodiment, a method for securely delivering a message to a mobile terminal includes encrypting a message and dividing the encrypted message into at least two submessages. At least two submessages are sent to the mobile terminal according to at least one of the SMS protocol or the MMS protocol. In the mobile terminal, at least two submessages are combined to form an encrypted message, The encrypted message is decrypted at the mobile terminal

In yet another embodiment, a method of deleting information at a mobile terminal includes sending a secure message including a delete instruction to the mobile terminal. At the mobile terminal, at least one item of information is deleted in response to the delete instruction.

The content described in the solution of the present application is provided only as a simplified introduction to the specification and is not intended to be used to limit the

IPR2025-00645 Page 02334

The content described in the solution of the present application is provided only as a simplified introduction to the specification and is not intended to be used to limit the scope of the appended claims.

1 is a block diagram illustrating an example of an environment in which various embodiments may operate and various examples of a system that manages information and / or messages for many users.
2 is a block diagram illustrating a particular example of a system for managing and propagating information and / or messages for many users.
3 illustrates communication between a user and / or a third party of a mobile terminal via gateway 115 to generate, send, receive and / or store SMS messages and MMS messages in a secure manner.
4 illustrates installing and registering a software module on a mobile terminal.
5 further illustrates communication between a mobile terminal user and / or a third party through gateway 115.
6 is a flowchart illustrating a method of securely transmitting a message.
7 is a flowchart illustrating a method of deleting a mobile terminal.
8 is a flowchart illustrating another method of securely transmitting a message.
9 is a flow chart illustrating an example of various methods, including, for example, a method of managing information for at least a plurality of users using the Internet and a user's mobile terminal.
10 is a flow chart illustrating in various embodiments examples of various methods, including, for example, a method of authorizing an operation, a method of authenticating a transaction, and a method of authenticating access using a mobile terminal.
11 is a block diagram illustrating a specific example of a system for managing and disseminating information for many users.
12 is a block diagram illustrating an environment in which server 15 manages information and propagates information to users 21, 22, and 23.
FIG. 13 shows a flow diagram illustrating examples of various methods of using a server to communicate with one or more of users 21, 22, and 23 to provide information to users 21, 22, and 23.
The drawings herein describe, among other things, various specific examples of embodiments and specific examples of features thereof. Different embodiments include various combinations of components or operations shown in the drawings, the detailed description of the invention described herein, the prior art or combinations thereof.

This disclosure provides, among other things, many embodiments of a system and method for managing SMS messages and MMS messages in a secure manner. Various embodiments are described in sufficient detail to enable those skilled in the art to implement the invention, and it should be understood that various embodiments may be implemented and that various changes may be made without departing from the spirit and scope of the invention. Accordingly, the following detailed description is provided for illustration only and should not be construed as limiting. For example, the steps described in any method or process description may be executed in any order and are not limited to the order presented.

In addition, for the sake of brevity, certain subcomponents, conventional data networking, application development, and other functional aspects of individual operational components of the system may not be described in detail herein. Furthermore, the connecting lines shown in the various figures contained herein are intended to represent exemplary functional relationships and / or physical and / or electronic couplings between the various components. Many alternative or additional functional relationships or physical connections may appear in the actual system.

As used herein, a "mobile terminal" is any device configured to send and receive electronic communications, for example, cellular phones, satellite phones, Palm Pilot ™ devices, PDAs, BlackBerry ™ devices, iPhone ™, smart Phone, desktop computer, laptop computer, tablet computer, netbook, communication portable terminal, and the like. Throughout the various exemplary embodiments described or described herein, a mobile terminal may be referred to herein as a "telephone" or "mobile phone", but it may have other functions or may be another type of mobile terminal. This should be understood.

Particular embodiments include a method of authorizing an operation using a mobile terminal. Embodiments include receiving from an authorized person to authorize an action, identifying a telephone number to obtain authorization for an action, and receiving a request for authorization of the action from the person seeking the action. It may include an operation such as. In addition, certain embodiments include transmitting a first message to a mobile phone over a mobile phone network, including a description of the operation for which authorization is requested, and receiving a second message for authorizing an action from the first mobile phone. It includes the same operations as steps. In other embodiments, authorized operations include, for example, computer access, physical access, and financial transactions. In various embodiments, the telephone number may be received directly from, for example, a mobile telephone network, the Internet, a local signal or a user.

In some embodiments, a user may enter information into a website or may authorize the entry of information into a website by another person, which may be automatically sent to a phone for storage. In addition, in some embodiments, users may enter information through their phones for transmission to a website server. In various embodiments, third parties, such as financial institutions such as airlines, banks, and the like, may provide information to a website, some or all of which may be sent to a telephone. Furthermore, in some embodiments, this particular information may provide an alert or alarm to the user, such as alerts regarding significant amounts of deposits or withdrawals, changes in flight information, changes in flight information, locations of children, or the like. Can provide an alarm. In various embodiments, the user may view other information on the phone, the website, or both, for example, bank account balances, transactions, frequent flyer miles, credit card bills, automatic deposit and withdrawal, insurance information, View quality assurance, service contracts, and more.

In various embodiments, FIGS. 1-8 illustrate examples of environments in which the various embodiments may operate and also illustrate examples of various systems, including systems for managing SMS messages in a secure manner. Various embodiments described herein are described for use using the SMS protocol. However, other protocols, such as the MMS protocol, Unstructured Supplementary Service Data (USSD) protocol, or other messaging protocols, may be introduced as appropriate. In addition, the various embodiments described herein are suitable for use where a messaging protocol is used for at least some of the communications. System 100 is first of all an example of a network-based system configured to manage information transmitted to, transmitted from, and / or stored in a mobile terminal, which is implemented in many embodiments while maintaining an acceptable level of data security. do. In the example of system 100, users 21, 22, and 23 own, use, control, or have access to mobile phones 41, 42, and 43, respectively, which are networks, such as mobile phone networks (Serviced through 40). Although one mobile telephone network 40 is shown, some embodiments may include or use many mobile telephone networks 40 that may be interconnected. As used herein, unless specifically mentioned, a "mobile phone network" is any cell network, satellite network, WiFi network, WiMAX network, wireless network, or any device for transmitting information to a mobile phone and / or other mobile terminal. It may be another suitable network of. In addition, the mobile terminal can be connected to the network in any suitable manner, for example via a GSM modem, a CDMA modem or the like. In addition, the mobile telephone can be connected to multiple networks at the same time, for example via a GSM modem of the first carrier via a GSM modem and a CDMA network of the second carrier via a CDMA modem. Furthermore, the three users 21-23 and mobile phones 41-43 shown can serve as examples of many users and mobile phones. Many users of system 100 can access the Internet 10. For example, in various embodiments, user 23 may access the Internet 10 through a personal computer 13. Further, in certain embodiments, mobile phone network 40 may communicate with the Internet 10, or information may be communicated (eg, unidirectional or bidirectional) between mobile phone network 40 and the Internet 10. In various embodiments, the mobile telephone network 40 may be connected to one or more additional mobile telephone networks 40 or other networks in any suitable manner, such as via the Internet 10, a public switched telephone network (PSTN), or the like. have.

In addition, the system 100 may be a public access system (eg, a system in which any number of users can access system resources) or a limited access system with a private / closed system (eg, a "circle of trust"). A user must be authorized to use a particular system resource and / or to send and receive communications with other

members of a circle of trust). In various embodiments, system 100 may be configured to allow communication only between users who are members of a particular trusted group (eg, users 21, 22, and 23). In this way, the system 100 may be particularly suitable for corporations, military, security, administrative, and the like that want to exchange very sensitive and confidential information through the system 100. For example, system 100 may be configured to communicate only with members of a predefined trusted group, such as FBI personnel, ATF personnel, soldiers, and the like.

In various embodiments, server 15 communicates with the Internet 10. However, server 15 may communicate with a wireless carrier, private network, mobile phone, another server, or the like via a wireless network or other means such that server 15 may not need to communicate with the Internet 10.

In various embodiments, server 15 is part of system 100, and server 15 is configured with a trusted gateway configured to manage encrypted messages. The server 15 may provide any desired functionality to the system 100, for example, manage client software installed on one or more mobile terminals, and update client software installed on one or more mobile terminals. And send commands to the client software, track messages sent and received by the client software, and the like. Server 15 manages cryptographic keys for client software, generates new cryptographic keys, and manages hardware security modules (e.g., modules located on another server 15 coupled to instant server 15). Communicate and provide resiliency to increase the reliability of message delivery.

The system 100 further includes a (at least one) first software module 61 in the server 15. Although only shown in server 15, in some embodiments, module 61 may be installed or operated on one or more servers. For example, server 15 may include one or more of a number of servers, such as a firewall server, a database server, an SMS gateway server, a web server, a domain server, or any other server. In certain embodiments, software module 61 may form at least one website 65. In a particular embodiment, a number of users (eg, 21-23) access or visit a website 65 (eg, via the Internet 10) and use their mobile terminal or other communication device. The system 100 may select to send, receive, forward, reply to, display, classify, and generate a report including a compliance report. In addition, one or more users may access or visit website 65 via any suitable protocol, such as WAP, https, and the like.

In a particular embodiment, a user (eg, user 23) not equipped with a module 201 (module as described below) installed in a mobile terminal may send a secure message via an anonymous retrieval method as follows. Website 65 to view: (1) the mobile terminal can receive a first standard (unencrypted) SMS message including a first unique hyperlink to the first website; (2) the user follows the hyperlink to the first website to generate a password and receive a unique personal identification number (PIN); (3) the user replies to the first SMS message using the unique PIN number to receive a second standard SMS message including a second unique hyperlink to the second website; (4) The user can follow the hyperlink to the second website, enter a password, and view the secure message. In another embodiment, user 23 may access website 65 via computer 13 and the Internet 10. In other embodiments, computer 13 may be a desktop personal computer, laptop or notebook computer, PDA, or the like. In some embodiments, users may access website 65 on server 15 through their telephones (eg, 41-43), mobile telephone network 40, or both.

In many embodiments, the first software module 61 or module 201 (described below) may include personal information of each user (eg, 21-23), such as information received from the user, sent and received SMS messages. Provides a secure storage 64 for the contents of the. In many embodiments, storage 64 may be used to store personal information about a user received by module 61, module 501, or server 15 from at least one third party, which may be a user. It may be an action regarding a user's action to provide information to the user. In a particular embodiment, the third party 33 may provide this information to module 61 or module 201 via the Internet 10, which third party 31 may provide this information to the mobile telephone network (40 may be provided to the module 61 or the module 201 through the Internet 10. In some embodiments, information communicated via mobile telephone network 40 may be communicated, for example, via conventional telephone networks that provide direct wireline telephone service for multiple users. In addition, third parties 31, 32, and 33 may choose to place gateway 115 in their respective data center behind a firewall. This provides a different layer of security for each third party. Each third party can manage all access to the server 15 in accordance with their internal security policy. All communication (eg, carrier) between the gateway 115 and the mobile telephone network 40 may be direct.

Module 201 may update itself (eg, when a new software update is available, gateway 115 may send a message to module 201 to inform module 201 of the available update). The user's (or third party's) phone is notified of the update (eg, an SMS or MMS message (eg, formatted as an instruction)) and asked for permission to update module 201. For example, a message (eg, formatted with an instruction) queries the user whether the user wants to receive an update. If the user allows receiving updates, module 201 exits by itself, launches a browser to access server 15 or gateway 115, and module 201 from server 15 or gateway 115. Download the latest version of. Thus, if permission is given to update module 201, a new version of module 201 is downloaded to the user's (or third party's) phone and installed in an older version of module 201. A message confirming the installation of module 201 may be sent to gateway 115. In addition, the module 201 may be configured to communicate with and / or use multiple gateways 115.

In various embodiments, customized versions of module 201 may include module 201 in a variety of hardware, such as various mobile phones and / or computing platforms (eg, Google's Android, Java 2 Mobile Edition, Windows Mobile, Linux, Microsoft Windows, Mac OS, Unix, etc) and / or may be provided to work. In addition, access to module 201 may be controlled via passwords, biometrics, and the like. Additionally, module 201 may include and / or be associated with information

configured to identify a third party (eg, reseller, referrer, company, etc.) to provide customized services and / or tracking. have. For example, the reseller may be commissioned based on the number of secure SMS messages sent by module (s) 201 associated with the reseller.

In addition, the module 201 may be configured to use registration with a gateway, for example gateway 115. In various embodiments, registration may include a consent step that a user attempts, for example, entering a security identification provided by a gateway administrator; Entering a short code, a long code or a telephone number (eg, a number associated with a cellular modem) to implement routing of one or more messages. Further, registration may include exchanging an encryption key between the mobile terminal and the gateway. For example, the server public key can be used to securely send the encryption key of module 201 to the mobile terminal.

In a particular embodiment, module 201 is registered with gateway 115 to implement communication between module 201 and gateway 115. For example, registration can be accomplished using the default server public key, unique module 201 public key, short code, and unique security identification code. In this way, the module 201 may know how to access the gateway 115 for registration. Module 201 encrypts the unique security identification code and the newly generated module 201 using the default server public key and sends the result in a short code using an SMS message. The gateway 115 decrypts the SMS message using the default server public key. Gateway 115 verifies a unique security identification code and phone number associated with module 201. If the result is not verified, an error message is returned to module 201. If the result is verified, gateway 115 sends a new server public key to module 201.

Gateway 115 then generates a unique AES key and sends the key along with registration information to module 201 via a registration message encrypted using module 201 public key. Module 201 decrypts the registration message using module 201 private key. Module 201 then sends an encrypted registration confirmation message to gateway 115 using a unique AES key associated with module 201. When the gateway 115 receives the registration confirmation message, the module 201 is registered with the gateway 115.

Additionally, module 201 may be configured to support a method of determining unauthorized access (ie, intrusion detection, etc.) to module 201. For example, if the correct password for gaining access to module 201 is not provided three consecutive times (or any desired value selected by the user or gateway administrator), then the data and / or data stored by module 201 Module 201 itself may be deleted.

Additionally, the module 201 of the mobile terminal can be registered with multiple gateways 115 at the same time. For example, module 201 may be registered with a first gateway 115 associated with a GSM network of a first carrier, and communication between module 201 and first gateway 115 may be transmitted via a GSM

modem have. The same module 201 may be registered with the second gateway 115 associated with the CDMA network of the second carrier, and communication between the module 201 and the second gateway 115 may be transmitted via a CDMA modem. Module 201 may be registered with any suitable number of gateways 115 to implement communication with various intended message recipients. Similarly, gateway 115 is configured to communicate with a first group of modules 201 associated with a first carrier via a first GSM modem, and a second group of modules associated with a second carrier via a second GSM modem. And 201, and may be configured to communicate with a third group of modules 201 via a dedicated short code. In this manner, gateway 115 communicates with multiple modules 201 (eg, based on specific mobile phone hardware) via a cellular modem and / or other communication device suitable for each particular module 201 can do.

In certain embodiments, gateway 115 may be configured such that SMS messages from module 201 are delivered only to other modules 201 that belong to the same circle of trust as the message sender. In various embodiments, in other manners mentioned, module 201 may be configured to communicate only with other members of a predefined group. For example, a module 201 used by a sensitive government agency may be allowed to communicate only with other members of the same agency. In addition, the gateway 115 may be configured such that SMS messages from module 201 are delivered only to other modules 201 that belong to the same trust circle with each other but not to the same trust circle with the message sender. In this way, gateway 115 may be more secure against unintended and / or undesired communications outside of a particular trust circle, or other groups may be reduced and / or removed. Further, gateway 115 may be configured such that SMS messages from the parent can be delivered to any other module 201. In addition, the gateway 115 may be configured to contact the other gateway 115 for information regarding the module 201 registered with the other gateway 115. Gateway 115 may be configured to route at least one module 201 message to another gateway 115.

In various embodiments, gateway 115 may be configured to have a "whitelist" that includes a list of approved modules 201 and / or mobile terminals that may be authorized to register with gateway 115. have. For example, user 21 may be required to register with the mobile banking service provided by third party 31. User 21 communicates with a third party 31 that has approved the request. The module 201 associated with the user 21 may then be added to the whitelist of the gateway 115 associated with the third party 31. The user 21 then registers the module 201 with the gateway 115. In this way, a set of approved and trusted modules 201 can be defined and / or registered such that communication between members of the whitelist and / or one or more third parties can be implemented. In addition, each module 201 and / or mobile terminal listed in the whitelist may be configured to have a unique identification code. The unique verification code can only be valid for a limited period of time, such as six hours. In this manner, the module 201 may be required to be a member of the whitelist and provide a unique identification code to register with the gateway 115 and / or communicate with other modules 201 through the gateway 115. As such, security can be improved.

In a particular embodiment, the third party 32 provides information to module 61 or module 201 of server 15 via communication means other than the Internet 10. Such communication means can be, for example, a private network, a local area network (LAN), a wide area network (WAN), a telephone network, a financial or bank card network, or the like. Third parties 31, 32, and 33 may be sms data providers or personal data providers. The third parties 31 to 33 are, for example, lottery organizers or operators (e.g , government agencies, state organs or gambling organizers), brokers for lottery organizers (e.g. resellers, convenience stores or servers 15), lottery tickets. Distributors for hosts (e.g. resellers, convenience stores or servers 15), financial institutions, airlines, bank card providers, merchants, employers or employees of employers, news providers, health care providers, insurance companies, stock brokers, government it may be an agency, a non-governmental organization, or any of these that can function online.

Module 201, server 15 and / or gateway 115 or other components utilizing encryption may encrypt, decrypt, compress, recover or manipulate information, such as symmetric keys, asymmetric keys, AES, block ciphers, and the like; Any suitable encryption technique and / or security model may be used for processing. In addition, module 201, server 15, gateway 115, and / or other components may update, modify, extend, replace or change the security model and / or encryption technology used as required.

Module 201 may be configured to store a set number of messages on server 15, gateway 115, or a user's telephone. Module 201 may be configured to store the most recently specified number of messages (set by user, server 15, or gateway 115). Old messages are deleted to make room for new messages (permanent storage may be used). The user can mark the message to be excluded from this deletion process. Such marked messages may be stored until manually deleted by the user, server 15 or gateway 115.

The third parties 31, 32 and 33 or the users 21, 22 and 23 can set a particular notification, for example a ring back tone, in the message. The ring back tone may be one or more ring back tone sounds, vibrations for a specified period of time, blinking or other notification means. The ring back tone is played on the user's phone 41, 42 or 43 when a message is received on the phone 41, 42 or 43. For example, a university may make an alarm ringtone to identify messages that may require immediate action (relative to notification ringtones that identify messages that contain more information or are not urgent). For example, the header of the message may include an identifier for identifying the priority of the message (eg, which may be set by the third party 31, 32 or 33 or the user 21, 22 or 23). have.

The third party 31, 32 or 33 may send specific secure SMS messages to users 21, 22 and 23 dprp. When such a secure SMS message is received by the module 201 at the user's phone 41, 42 or 43, the message is received for discounts, coupons including electronic coupons, loyalty points / rewards, airline boarding passes or other rewards. It can be converted into one or more barcodes or graphics that can be used in a third party point-of-sale terminal or website.

Module 201 may be configured to provide an easy-to-use menu system (eg, menu driven option) for users 21, 22, and 23 to implement communication with other users or third parties. For example, the user can click the "Check my account balance" menu option on the phone 41, 42 or 43 and select an account from the list of accounts on the menu (without having to remember a list of commands such as "bal account1"). have. In addition, the module 201 may be configured to have any suitable menus, options, interfaces and / or commands to implement the required functionality for the module 201 and / or ease of use for the user. In various embodiments, module 201 may be configured to support various communications via SMS messages, for example: mobile banking, requesting and / or obtaining credit scores, requesting funds for prepaid telephones and / or it may be configured to assist in obtaining, requesting and / or granting access to a physical location, requesting medical records and / or obtaining, and the like. Module 201 and / or associated menus and interfaces may be updated and / or modified to provide appropriate new functionality.

In one embodiment, module 201 may be configured to support mobile banking applications. For example, a user may purchase prepaid mobile phone credit (eg, minutes, etc.) from an operator. The credit may be associated with a carrier for a mobile terminal having an operable module 201. The user may then send an SMS message to the carrier via module 201 and instruct the carrier to deposit the selected amount of credit. The carrier may then deposit the amount of money corresponding to the credit in the requested bank account, and then deduct the deposited credit from the carrier account associated with the mobile terminal. In this way, the user can transfer the amount to the bank account. Similarly, the user can withdraw the amount from the bank account by sending an SMS message to the bank and requesting the amount of the amount provided to the carrier to exchange for prepaid mobile phone credit. The user may send an SMS message to the carrier, instructing the carrier to deliver the selected number of minutes to another user. In a similar manner, a user may send or receive prepaid phone credits and / or amounts to or from the reseller, and / or send or receive any combination from or to various users, manufacturers, carriers, banks, and the like. . The transfer of credits may result in fees, such as fees charged by carriers, fees charged by banking institutions, and the like.

In certain embodiments, users 21, 22, and 23 may send SMS or MMS messages to multiple recipients (eg, other users or third parties). Recipients of a message can reply to all recipients (including the sender) at one time. Module 201 generates and encrypts a message uniquely for each recipient. In addition to the message content, the message includes a list of recipients, with each recipient able to reply to one or more of the recipients (including the sender). The user may add more different recipients to the original recipient list. In certain embodiments, users 21, 22, and 23 may create groups of recipient lists. In another embodiment, a group is created by an

IPR2025-00645 Page 02337

administrator and information about the group is sent to module 201 by one or more SMS messages. In such an embodiment, users 21, 22, and 23 may send or forward messages to groups defined by the administrator.

In addition, in various embodiments, the administrator may define a profile on the gateway 115 configured with predefined settings. The administrator can then apply a profile for at least one module 201 by sending one or more SMS messages to module 201. In response to the at least one SMS message, the settings for the module 201 may be changed to match the predefined settings of the profile. In some embodiments, the profile can prevent the users 21, 22, and 23 from ignoring the settings changed by the predefined profile. In other embodiments, users 21, 22, and 23 may ignore the predefined profile settings to further customize module 201.

In many embodiments, one or more software modules (eg, second software module 72 (described below)) are loaded into a user's mobile phone to send SMS messages and MMS messages in an encrypted and secure manner . Receiving and storing can be implemented. In some embodiments, the second software module 72 used for the mobile phone may be downloaded to the mobile phone, for example, via a mobile phone network, the Internet, or both. In another embodiment, the second software module 72 may be loaded into the telephone, for example, by the telephone manufacturer, mobile telephone service provider, where the telephone is sold or serviced to the user. In addition, software module 72, software module 61, module 201, and / or various other components may be adapted to specific applications and / or user groups such as mobile banking, medical information entry, domain registration, airline check-in, internal And mutual government agency communications, corporate communications, and the like.

In some embodiments, managing SMS messages and / or MMS messages or other communications is performed using a device other than a mobile phone, or a device having more functionality or features than is generally found in a mobile phone. Can be performed using. Such devices may be PDAs, smartphones, Blackberry, laptop computers, netbooks, and the like.

1 and 12, in various embodiments, server 15 communicates with one or more third parties 31, 32, and 33 and / or users 21, 22, and 23 to provide phone 41, 42 and 43 may send, receive and store SMS messages and MMS messages in a secure manner and may propagate information to users 21, 22 and 23. The communication between module 201 and server 15 and / or gateway 115 may be an SMS, MMS data service, or the like. Module 201 may be configured to use any protocol in the specified sequence until data transmission to server 15 and / or gateway 115 or module 201 is complete. In addition, the module 201 may be configured to transmit, receive and store messages and information in both secure and unencrypted manners as required. Alternatively, as described, the user can use module 201 to send both secure and unencrypted messages, so that multiple messaging applications are not used on the user's mobile phone.

In certain embodiments, users 21, 22, and 23 may communicate with each other in a secure manner via SMS messages or other messages. For example, module 201 or second software module 72 (described below) of user's 21 mobile phone can send an SMS message intended to be delivered to mobile phone of user 22. Just as module 61 or module 72 is accessed and installed on a user's mobile phone, module 201 is accessed and installed on a user's mobile phone. In many embodiments, text messages, large text files, or other information required to be transmitted are limited in order to be able to send them using one or another SMS message (eg, the number of characters that can be sent in an SMS message is limited). May need to be configured in a specific format. In one embodiment, many text messages are sent from the server 15 to the telephone 42 of the user 22, the text messages are compiled on the telephone 42 of the user 22, and the user 22 is one Review the large text file (or text message) on phone 42. In this example, the transmission of one text message or multiple text messages is sent seamlessly to the user 22 (e.g., the user 22 sends one large text file or text message (instead of multiple text messages). Received). Such a format can be useful for transmitting information using text messages, generally without limiting the number of characters found in text messaging. In the other manner described, if the size of a particular portion of the information required exceeds the message size threshold, multiple messages may be used to convey this required information to or from the mobile phone.

3, 4 and 5, in various embodiments, communication between one or more users 21, 22, 23 and / or third parties 31, 32, 33 may be a reliable gateway 115. Can be routed through. In this way, system security can be improved. Gateway 115 communicates with one or more third parties 31, 32, 33 and / or users 21, 22, 23 (eg, via mobile phones 41, 42, 43). Send, receive and store SMS messages and MMS messages in a secure manner. Gateway 115 may communicate with users 21, 22, 23 in a conventional (unsecured) manner, if desired. In addition, users 21, 22, 23 and / or telephones 41, 42, 43 can download software (eg, secure SMS module 201) from server 15. Gateway 115 may be informed of such installation and may be configured to communicate with module 201 accordingly.

In one embodiment, the gateway 115 may be configured as Software as a Service (SaaS). Gateway 115 may be accessed via a secure network connection, such as HTTPS, by a third party authorized to use SaaS. The performance of gateway 115 may be scaled using, for example, load-balanced server farms. In addition, the gateway 115 may be connected to any carrier network through a number of redundant connections. In this way, gateway 115 may be configured to support a scalable number of users.

In another embodiment, gateway 115 may be configured as an on-site enterprise server. Thus, gateway 115 may be accessed via a dedicated short code hosted by an organization's internal resources, such as any supported aggregator or carrier. In addition, the gateway 115 may be configured to support a "circle of trust" of restricted

access to allow communication only between certain authorized users. Gateway 115 may be configured using customizable cryptographic structures, message storage and / or file archiving functions, and other features required by on-site gateway 115 introduced by a particular organization.

In another embodiment, gateway 115 may be configured with any carrier management service. Thus, gateway 115 may be partially or wholly integrated into a gateway of a wireless carrier, such as a short messaging service center (SMSC) of a wireless carrier. Alternatively, gateway 115 may operate as a standalone system. For example, the gateway 115 may communicate with the SMSC of the first wireless carrier and the SMSC of the second wireless carrier. In addition, the gateway 115 may be combined and / or connected with any number of SMSCs. Similarly, one SMSC may be combined or connected with any number of gateways 115. In this manner, gateway 115 may be configured to support an adjustable number of users in a wireless carrier environment, and gateway 115 may implement secure delivery of messages across various networks.

Referring to FIG. 6, in various embodiments, one or more of the third parties 31, 32, and 33 may create an account associated with the gateway 115 (step 602). Third parties 31, 32, and 33 notify users 21, 22, and 23 to download module 201 to phones 41, 42, and 43 (step 604). Alternatively, third parties 31, 32, and 33 may transmit to users 21, 22, and 23 via MMS or Wireless Application Protocol (WAP) push (step 606). The user downloads module 201 (step 608). One or more Application Programming Interfaces (APIs) and Hypertext Transfer Protocol over Secure Socket Layer (https) or http (Hypertext Transfer Protocol) may be server 15 or gateway 115 and third parties 31, 32 and 33 or Can be used between users 21, 22, and 23. In addition, server 15, gateway 115, third parties 31, 32, and 33 and / or users 21, 22, and 23 may communicate via any suitable protocol, method, or means. Accordingly, the method of the present invention includes a Global System for Mobile Communications (GSM) network, a Code Division Multiple Access (CDMA) network, a Time Division Multiple Access (TDMA) network, a Frequency Division Multiple Access (FDMA) network, and Transmission Control (TCP / IP). Protocol / Internet Protocol) network, etc., suitable for use in satellite communication networks, and / or any combination thereof.

Secure SMS APIs are used by third parties 31-33 to send SMS or MMS messages to gateway 115 or server 15 (step 610). Secure SMS APIs can utilize HTTPS, Web Services, Java APIs, and / or any other suitable protocol. Determine whether the user has a module 201 loaded in their phone 41, 42, or 43 (step 612). If the user has a module 201 loaded on the telephone, the user receives a secure SMS or MMS message on the telephone with the module 201 (step 614). An acknowledgment message may be sent back to the sender of the message (eg, user 21, 22, or 23) or a third party 31, 32, or 33 (step 616). Upon receipt, the user opens the message and (Step 618), another confirmation message is sent to the sender via server 15 or gateway 115 to confirm that the user has opened the message (step 620). If no 201), the user can receive a link to download the module 201 to the phone (step 622), the message is sent in clear text, the message is skipped, or (as described above). Anonymous

receive a link to download the module 201 to the phone (step 622); the message is sent in clear text; the message is shipped, or (as described above). Anonymous message retrieval methods can be used.

In various embodiments, referring still to FIG. 6, the user downloads module 201 (step 624). If the user chooses to send a message from the phone to another user or a third party's phone (step 626), the user enters one or more phone numbers to send the message to the phone (alternatively, the user may select from the secure address book of the user's phone) (step 628). For example, using a secure address book, a user can import generic address book content (from their phone) into a secure SMS address book (eg, located in a database created by module 201). The secure SMS address book information is encrypted and stored on the phone. In this way, if the phone is lost or stolen, it is possible to prevent access to the phone from stealing personal contact information (or other sensitive information) from the phone.

The user's message is encrypted and sent to the gateway 115 (step 630). As described above, it is determined whether the receiving user has the module 201 loaded in the telephone (step 612). If the user has a module 201 loaded on the phone, the user uses module 201 to receive a secure SMS or MMS message on their phone (step 614). An acknowledgment (eg, delivery acknowledgment) is sent back to the sender of the message (step 616). When the receiving user opens the received message (step 618), another acknowledgment (e.g., read acknowledgment) is sent to the sender via server 15 or gateway 115, where the user opens the message. Confirm that it has been viewed (step 620). In certain embodiments, when a user replies to or delivers a message, a message identifier is included in the message to allow tracking of which message has been answered, delivered, and the like. In this way, a "thread" of related messages can be managed.

In various embodiments, the sender may log in to a website associated with server 15 or gateway 115 to determine whether a message has been delivered and has been opened by the user. In another example, when the receiving user opens the message, module 201 automatically deletes the message within a predetermined time after the message is confirmed. In another example, when the receiving user opens and closes the message, module 201 automatically deletes the message (either immediately or within a predetermined time after the message is closed). Server 15, gateway 115 or module 201 may correspond to any one of the above example events (or other defined events, time intervals, etc.) in the field (or body of the message) in the header of the message. You can create this automatic deletion process by including a command to delete the message. Users and third parties can check the status of all messages. In the case of sent messages, the user and a third party, when each message was sent, when each message was delivered, and when each message was acknowledged (eg, via time, date and status information about the message) I can speak. For example, one or more icons may be provided (eg, within module 201, via a web browser, etc.) to indicate the status of a particular message (eg, send, forward, read, reply, forward, delete, etc.). Can be.

Referring now to FIG. 7, in some embodiments, third parties 31, 32, and 33 and / or users 21, 22, and 23 may remotely delete their phones (eg, one of information or data or To delete more items (step 702). For example, if a phone is lost, not in place, or no longer used, any personal information, messages or other information on the phone may be required to be deleted. The third party 31, 32, or 33 and / or the user 21, 22, or 23 may use a secure SMS API or other method for sending a delete command to one or more phones (step 704).). In one example, the user can access a third party's website or server 15 to send a delete command to the user's phone (step 706). Gateway 115 authenticates the user, encrypts the delete command, and sends the encrypted delete command to the user's phone via an SMS or MMS message or other suitable method (eg, within the body of the message, within the head of the message). Transmit (step 708). The module 201 of the user's phone receives the encrypted delete command and decrypts the encrypted delete command (step 710). The secure SMS database (created by module 201) on the user's phone is deleted based on the decrypted delete command (step 712). In addition, the delete command may delete data other than the secure SMS database, or delete data by adding to the secure SMS database. For example, via a delete command, the memory contents of the phone or data for other applications may be at least partially and / or entirely deleted, reset, or the like. Additionally, module 201 may be configured to automatically delete the secure SMS database and / or the entire telephone memory in response to repeated failed local authorization attempts or other required causes. In this way, the security of the data located in the telephone can be improved.

In addition, in various embodiments, one or more components of system 100 may log, record, or monitor communication between the phone and the server, for example, to "spoof" Detect attempts or detect impersonation of a telephone, other communication device, or misrepresent the source or other attribute of one or more messages. The system 100 notifies the user, system administrator, third party, etc. of the contents of this record, for example, an attempt to steal the user's identity, or to send a message indicating that the call originates from a particular user or a specific mobile terminal. Can be.

Referring now to FIG. 8, in some embodiments, a user transmits a message from one phone to another (eg, from phone 41, 42, or 43 to phone 41, 42, or 43) in a secure manner. (Step 802). Prior to sending the message, the message is encrypted at the first telephone (eg, encrypted using the first encryption key) (step 804). The encrypted message is sent to the gateway 115 (or server 15) (step 806), and the gateway 115 (or server 15) receives the encrypted message (step 808). The encrypted message is decrypted at the gateway 115 (server 15) (eg, decrypted using the first encryption key) (step 810). It is determined whether a message has been delivered from one phone to another of the user (step 812). If the message is delivered from one phone to another of the user (eg, from the user's phone to a third party), the message is sent to a third server, for example, Web Services, Java remote method invocation (RMI), is sent using HTTP / S Post or the like (step 814). Then, a delivery confirmation can be sent to the phone. When a message is delivered from one phone to another, the message is encrypted at the gateway 115 (or server 15) for the receiving user (e.g., encrypted using a second encryption key) (step (816)). The encrypted message is sent to the receiving user's phone (step 818). The receiving user's phone receives the encrypted message (step 820). A delivery confirmation is sent to the gateway 115 to confirm that the message has been delivered to the receiving user's phone (step 822). The encrypted message is decrypted and verified at the receiving user's telephone (eg using a second encryption key). The delivery confirmation may be displayed on the sender's phone by changing the icon associated with the sent message, or may be displayed on a status page. When the receiving user opens the decrypted message, an acknowledgment or other appropriate read acknowledgment is sent to the gateway 115 (or server 15) (step 824). Gateway 115 or server 15 may forward the read receipt to the sender's phone. The read receipt may be displayed on the sender's phone by changing the icon related to the sent message and may be displayed on a status page.

In various embodiments, the original message sent is encrypted differently from the last received message so that only users or third parties with associated encryption keys can decrypt, open and read the message. Each user or third party may have their own key so that no one user or third party can access, open or read messages of another user or third party. Each unique key may be changed, for example periodically, as required for additional security. In addition, users can change their encryption keys manually or at specific time intervals. This key change performed by the user is communicated to the gateway 115 to keep the module 201 in sync with the gateway 115. In addition, an encryption key associated with a particular mobile terminal may be stored in the mobile terminal for additional security.

In certain embodiments, cryptographic keys associated with particular modules 201 may be updated. Gateway 115 is configured to have two encryption keys, a current key and a new key per module 201. Module 201 is configured to use the current key. In response to a predetermined interval, a key change request from module 201, and / or a key change indication from gateway 115, module 201 is configured to replace the current key with a new key. The current key remains active at the gateway 115 and a new key is generated. A key change command including the new key is sent to module 201. The status of module 201 changes from "currently in use" to "in progress." Messages to and from module 201 are queued by gateway 115 until the status of module 201 returns back to " currently in use. &Quot;

When a key change command is received by module 201, module 201 stores a new key instead of the current key and sends a key change confirmation to gateway 115 using the new key. When gateway 115 receives the key change confirmation from module 201, the new key is copied to the current key and the new key is set to the blank value. The state of module 201 is changed to "current". The message in the queue for module 201 can then be processed using the current key (previously the new key), sent and / or received using the old key (previously the current key). Messages may fail and be logged

If the module 201 does not return a key change confirmation after the key change command is sent to the module 201, the gateway 115 may resend the key change command to the module 201 one or more times. . If a key change acknowledgment has not been received from module 201, for example, if it has not been received

IPR2025-00645 Page 02339

within a predetermined time or in response to a predetermined number of transmitted key change commands, then the status of module 201 is "Stop". Can be changed to In addition, the gateway 115 may periodically check all pending key change requests, resend key change commands, and / or disable one or more modules 201 as appropriate.

If module 201 is suspended in response to an incomplete key change or disabled by an administrator associated with gateway 115, module 201 may be required to re-register with gateway 115. Upon re-registration with gateway 115, the state of module 201 is set to "currently in use" and messages queued for module 201 may be processed.

In various embodiments, one or more messages may be queued and / or stored at gateway 115. The queued message at gateway 115 may be encrypted via a third cryptographic key, a storage cryptographic key associated with gateway 115. The queued message can be marked for automatic or manual processing. A message marked for automatic processing can be processed if the module 201 is related to returns a " current " state. Marked messages for manual processing can be processed through a system administrator or other manual process. The message may be kept in the queue for a predetermined period of time, such as three days. Messages queued longer than a predetermined time may be kept.

As noted above, in various embodiments, module 201 may have states associated therewith, such as "in progress", "whitelist", "currently in use", "suspended", "disabled", and the like. . The module 201 listed in the white list is located in the white list but is not registered with the gateway 115. The module 201 currently in progress is registered with the gateway 115 and its encryption key is the most recent encryption key. The module 201 in progress has been registered with the gateway 115 and a key change command has been sent to the module 201, but no key change confirmation has been received from the module 201. The suspended module 201 is registered with the gateway 115 and a key change command has been sent to the module 201, but has not been received from the module 201 within a predetermined number of requests within the time allowed for key change confirmation. to be. The unusable module 201 is registered with the gateway 115, but has been registered by the administrator or other supervisor entity associated with the gateway 115, such as outstanding bills, lost mobile terminal reports, repeated entry of incorrect passwords, and the like. In response, it is disabled.

If module 201 is currently in progress, the message may be queued. If module 201 is whitelisted, the message may be queued. If module 201 is currently in use, the message may be processed. If module 201 is stopped, the message may be queued. If module 201 is unavailable, the message may be flagged as invalid and / or deleted. In addition, module 201 may be coupled to any suitable state, and messages associated with module 201 may be queued, processed, or deleted in any suitable manner such that between module 201 and gateway 115. Secure communication can be enabled.

The message sender may be reported to determine which messages have been received and / or confirmed or opened. In addition, the server 15 and / or gateway 115 may be a " mirror " or copied copy of one or more items of various information related to the user, such as information stored on the user's phone (e.g., personal information, Credit card information, identification information, transaction information, medical records, etc.), records of transmitted and received user messages, and the like. Since server 15 and / or gateway 115 may track, monitor and / or store each of the messages inside and outside server 15 and gateway 115 (whether the message has been delivered and acknowledged). The tracking of information may include reporting (e.g., under the Sarbanes-Oxley Act or Federal Information Security Management Act), accounting audit evidence, internal company control of information inside or outside the company (e.g through information technology), fraud risk assessment and detection. Or for any other required use. Since gateway 115 tracks the delivery of all messages, gateway 115 may be configured to resubmit undelivered messages (eg, due to errors or any other cause). The gateway 115 may be configured to resubmit the message in a predetermined period or to set a duration based on the state of the message (eg, received, acknowledged, etc.).

The present disclosure also provides a variety of methods, including, for example, how to manage information for multiple users, how to authorize actions, how to authenticate transactions, how to authenticate access, and how to notify nearby places. 9 and 10 illustrate examples of such methods, and different methods in accordance with various embodiments may include the selection of actions or actions shown and described in FIGS. 9 and 10, which are in the order presented. It may be performed or achieved, and may be performed or achieved in different orders in other embodiments.

Referring now to FIG. 9, FIG. 9 is a flow diagram illustrating examples of various methods, including, for example, a method of managing information for many users using the Internet and a user's mobile phone. Many embodiments may include some but not all of the actions shown in FIG. 9. In a particular embodiment, the method 900 includes receiving information from a user (act 905). In some embodiments, this may include receiving, for some of the user, a first set of personal information (eg, the user's) from the user via at least one of the Internet and the user's mobile phone.

For example, the user 23 shown in FIG. 1 can access the website 65 via the computer 13 and the Internet 10, open an account, enter information, and select options. Can be. The input or selected information may include, for example, a financial institution's name, account number, airline name, frequent flyer number, insurance company name, insurance policy number, driver's license number, passport information, and the like. In some embodiments, such personal information may be complete, but in

other embodiments, the first set of personal information may be received or completed, such as receiving information from one or more third parties (eg, 31-33). Identification of third parties, accounts, etc. may be implemented.

Furthermore, in some embodiments, the first set of personal information includes identifying information that is important to the user, which may include one or more alert criteria. Such criteria (eg, criteria received at step 905) may be entered by the user or selected from one or more menus, for example. The criteria may include, for example, the selection to receive an alert if the amount withdrawn, withdrawn or charged from the financial account exceeds a threshold entered or selected by the user. In some embodiments, the criteria (eg, the criteria received at step 905) may include a selection or indication as to whether the user receives an alert only during the day or during a particular time of day, which is the nature or specificity of the alert. It may change depending on the threshold. Other examples of alarms include whether the departure time, the place of departure, etc. have changed, whether the due date of the bill is approaching, whether the insurance has expired, whether stock prices have changed, weather conditions, weather forecasts or environmental conditions Whether they are satisfied, whether a document or certificate is about to expire, whether someone has requested a particular action or access, whether their children have moved to the area of interest, and so on.

In a particular embodiment, the method 900 further includes downloading the mobile telephone module (step 910). In some embodiments, for example, for a number of users, the user may instruct a server (e g. 15) or select from a website (e.g. 65) a mobile phone module such as the second software module shown in FIG. Download (72, 77 or both). In a particular embodiment, for example, the second software module 72 downloads from the first software module 61 to the mobile phone 41 via the Internet 10 and the mobile phone network 40 when instructed by the user. do. In another embodiment, the software module 72 is downloaded to the mobile phone 43, for example via the Internet 10 and the computer 13, a USB port or a wireless network. In another embodiment, the software module 72, 77 or both controls the store or server 15 from which the mobile phone was purchased, to operate the website 65 or to manage information for multiple users. It can be loaded into the phone in the construction of an entity that provides a service or system.

In many embodiments, in the particular embodiment shown in FIG. 9, the method 900 includes receiving information from a third party (step 915). In some embodiments, for example, for each of a plurality of users, the step 915 may be performed or accomplished for a particular user after receiving personal information from the particular user (step 905). A particular user can identify a third party, provide information that allows the third party to identify a particular user, authorize or request that a specific user be provided from the third party, and identify a bank account.

In many embodiments, a user may directly request a third party to transmit information. For example, a user may visit a third party's website (e.g., via the Internet 10), log

in to the third party's website and provide information about the third party through the website, thereby providing a system 100 (See FIG. 1), which will indicate the user's intention to send information for a third party. In various embodiments, information received from a third party (e.g., step 915) may include one or more account balances, one or more account transaction details (e.g. withdrawal amount, which may include who was withdrawn), it may include flight information, flight information change, insurance information, royalty information, password, pass code, calendar input, navigation information, account number, bank card number, location information about the region of interest.

In a particular embodiment, the method 900 further includes selecting a portion of the information (step 920). In some embodiments, for example, a portion (step 915) of information received from a third party may be selected by the first software module 61, for example. As used herein, "selecting a portion" of specific information means selecting less than all of the information. For example, a particular subset or nugget of information may be selected. In some embodiments, some of the information may be selected using predefined criteria (eg, defined in module 61) (eg, step 920). In some embodiments, some of the information may be selected using criteria (eg, received at step 905) (step 920).

In various embodiments, at step 920, specific information is selected that is deemed of particular interest or interest to the user. For example, a change may be made to a departure time, a status or a departure place of a flight booked by a user, an amount of account withdrawal exceeding a threshold, an account balance, and the like. In certain embodiments, for each of one or more users, for example, step 920 includes selecting a portion of the second set of personal information described herein, and in various embodiments, step 920 is Or instead of or in addition, selecting a portion of the first set of personal information.

Various embodiments include encrypting a portion of the information (step 925). The information to be encrypted may be part of the information selected in step 920, for example. In some embodiments, some of the second set of personal information is encrypted, for example (eg, step 925). For example, to keep the information confidential, the information may be nt encrypted (eg, encrypted at step 925). For example, the information can be encrypted (eg, encrypted at step 925) using pretty good privacy (PGP), public key cryptography, asymmetric key cryptography, and the like.

Further, various embodiments include compressing a portion of the information (step 930). The information to be compressed may be part of the information selected in step 920, for example. In some embodiments, for example, part of the second set of personal information may be compressed (eg, compressed at step 930). For example, the information may be compressed (eg, compressed at step 930) to make the delivery, storage or both of the information easier, faster or less expensive.

In different embodiments, the information may be compressed in any order (eg, step 930), encrypted (eg, step 925), or both. In some embodiments, the method 900 may, for each of a plurality of users, prior to transmitting a portion of the second set of personal information to, for example, a user's mobile phone (eg, step 935), Encrypting a portion of personal information (eg, selected at step 920) (eg, step 925) and compressing a portion of the second set of personal information (step 930). can do. In certain embodiments, for example, compressing (eg, step 925) and compressing (step 930) a portion of the second set of personal information (eg, selected at step 920) are example. For example, it may be repeated along other steps as described herein.

In a particular embodiment, the method 900 further includes transmitting the information (step 935). Such information may include, for example, a portion of the second set of personal information (eg, selected at step 920). In various embodiments, for example, receiving a first set of personal information (step 905), eg, receiving a second set of dog information (step 915), selecting some (Step 920) and transmitting part (step 935) are all performed by the first software module 61 provided in the server 15 connected to the Internet 10. In some embodiments, the first software module 61 further forms an internet (at least one) internet website 65. In some embodiments, the method includes a second set, for example, for each of a plurality of users, for example to store in the user's mobile phone using, for example, a second software module 72 (eg, provided with the phone). Sending a portion of the personal information of (eg, selected at step 920) to the user's mobile phone, such as via a mobile phone network (eg, network 40 shown in FIG. 1).

In this embodiment, the method 900 further includes evaluating whether the information meets one or more criteria (step 940). Such criteria may be provided or selected by a user as described herein (eg, step 905). If the information (eg, part of the information selected in step 920, transmitted in step 935, or both) meets the criteria (eg, the criteria for the alert as determined in step 940), An alert may be provided (step 945). In some embodiments, the method provides for each of the plurality of users, for example, using a second software module to provide an alert to the user if at least a portion of the portion of the second set of personal information meets the criteria. Step (step 945). Such an alarm (eg, step 945) may be voice, visual, or in the form of a vibration, for example. In some embodiments, for example, voice or vibration may be generated by the user's mobile phone, and the cause of the alarm may be displayed on the screen of the phone. In some embodiments, the default ring back tone or existing ring back tone setting of the phone may be used, for example, as an alarm (eg, step 945).

In some embodiments, the user is asked to attempt an affirmative action to induce an acknowledgment of the alarm or the cause of the alarm, to respond to it, or to provide consent for an event described in the cause or content of the alarm. Can be. For example, if the cause for the alarm is that the money is withdrawn from the user's bank account, the mobile phone may ring or vibrate. The user can then open the phone or press a button on the phone to acknowledge the alarm. The phone can then display the withdrawal amount, for example according to the account details and transaction details. In some embodiments, the user may be asked to make a choice, for example, to provide consent for withdrawal. In another scenario, the phone may ring to signal that the user's flight has been delayed. The user can open the phone to confirm the alarm, and a brief description of the delay and the newly estimated departure time can be provided for example on the screen of the mobile phone. Another example is described below.

In some such methods, for example, for each of a plurality of users, the first set of personal information (eg, received at step 905) includes the identification of at least one financial account. Personal information (e.g., received at step 915) may include deposits into the account, withdrawal from the account and identification of account balances, and the provision of an alarm (step 945) may be based on a withdrawal amount (e.g. Providing an alarm when exceeding the first threshold identified in 905) and providing an alarm when the account balance falls below the second threshold identified in the criteria. As used herein, such "withdrawal" may be, for example, withdrawal or billing from an account.

In another example, in some methods, for each of a plurality of users, the first set of personal information (e.g., received at step 905) is travel information (e.g., commercial flight information, such as frequent flyer numbers). And identification of at least one of a common carrier (eg, airline) and a travel agency. Further, in some embodiments, the second set of personal information (eg, received at step 915) includes a travel itinerary, which may include, for example, identification of a departure time and a place of departure. In some embodiments, providing an alarm (step 945) may include providing an alarm if at least one of the departure time and the departure location changes. In many embodiments, the information (eg, some of the information selected in step 920, transmitted in step 935 or by both) is a reference (eg, a criteria for an alarm as determined in step 940). If not satisfied, an alarm may not be provided and step 945 may be skipped at least in a particular iteration of method 900

In various embodiments, the method 900 further includes transmitting information to the different parties (step 955). In many such embodiments, the user may select or provide an instruction or command (eg, evaluated at step 950) to send (eg, first) specific information to a third party. In particular, in some embodiments, for at least a plurality of users (eg, in the indicated order or other order), if received by the user (eg, evaluated at step 950), the method 900 may perform a second operation. And transmitting the set of personal information (eg, received at step 915, selected at step 920, transmitted at step 935, or by a combination thereof) to a mobile phone of a different party. (Eg, step 955). In some embodiments, this may be accomplished through a mobile telephone network (eg, 40), for example, to store in a different party's mobile phone for access by different parties.

IPR2025-00645 Page 02341

Referring to FIG. 1 as an example, user 21 transmits, for example, at least a portion of the received information (eg, received at step 935) to other user 22, in particular via mobile phone 42. May provide an instruction or command (eg, step 950) via the mobile phone 41 of the user 21. In a different embodiment, the mobile phone 41 may send some of the information to the mobile phone 42, for example via the mobile phone network 40, or the mobile phone 41 may be connected to, for example, the Internet 10.), To direct the server 15 or the first software module 61 to send a portion of the information to the mobile telephone 42 via the mobile telephone network 40 or both. In some embodiments, delivery can be authenticated, or delivery can be tracked and the sender can be notified if delivery is achieved or alternatively unsuccessful.

In some embodiments, first software module 61 receives a command (eg, step 950) from a user (eg, 21), for example, via mobile phone network 40, and receives the command (eg, step (eg, 950), at least some of the nuggets (eg, 78) or portions of personal information are transmitted to another party (eg, 22) via the Internet 10 (eg, step 955). In some embodiments, the system (e.g., system 100) may transmit certain information, portions of information or nuggets in other ways (e.g., step 955), which other users are users of the system 100. [Eg, have visited website 65 or choose to have their personal information managed by system 100, or download second software module 72 to their mobile phone (e.g., 910)) received or installed]

In some embodiments, the user (eg, 21) selects at least some of the personal information stored on the mobile phone (eg, 41) (eg, step 950), and the other party (eg, 22) and the other party's mobile phone. Select or enter at least one identifier (eg, 42) (eg, step 950) and transmit at least some of the personal information to another person's mobile phone (eg, 42). In many embodiments, the first software module 61 evaluates whether another party's mobile phone (eg, 42) includes a copy of the second software module 72, and the other party's mobile phone (eg, 42) When including a copy of the second software module 72, the first software module 61 may send some of the personal information, such as by way of mobile phone network 40 (eg, by SMS), to another party's mobile phone (eg, by SMS). A copy of the second software module 72 on 42 (eg, step 955). In some embodiments, the delivery may be authenticated, or a notification message may be sent (eg, to the user 21 by SMS) after a certain amount of time or a certain number of attempts if delivery is achieved or alternatively the delivery is unsuccessful. Can be sent.

In certain embodiments, for example, part of the second set of personal information (eg, sent in step 955) includes, for example, a travel itinerary. Thus, in some embodiments, users can send their travel itineraries to others. In FIG. 9, in many embodiments, if the user does not instruct the particular information to be sent to another person, the step of transmitting the information to another person (step 955) is omitted at least in a repetition of the method 900. do.

Still referring to FIG. 9, in many embodiments, the method 900 further includes receiving a local signal (step 960), transmitting a local signal (step 965), or both. As used herein, a local signal is a signal that is transmitted and received without using the main transmitter that the mobile phone uses to make calls or without using the main receiver that the mobile phone uses to answer calls. In addition, local signals are not conveyed through the mobile telephone network (eg, 40). For example, local signals from mobile phone 42 may be transmitted by local transmitter or communication device 82 and received by reader or communication device 88 or vice versa. Examples of local signals are near field communication (NFC) signals and Bluetooth communication using a transmitter, receiver or both (eg, device 82) of a mobile phone separate from the transmitter and receiver used for phone calls, for example. Contains a signal.

In a particular embodiment, the method 900 uses, for each of a plurality of users, the signal receiving hardware (eg, the device 82 shown in FIG. 1) located in the user's mobile phone (eg, 42), the user. Using a second software module (eg, 72) under the control of (eg, user 22), receiving a local signal from a transmitter (eg, device 88) near the mobile phone (eg, 42) it further includes a step (eg, step 960). Further, in some embodiments, for example, for each of many users, using local signal transmission hardware (eg, device 82) provided in the user's mobile phone (eg, 42), the user (eg Using a second software module (eg, 72) under control of 22, a first set of personal information (eg, received at step 905) and a second set of personal information (eg, step 915 Transmitting a local signal, including at least a portion thereof, to a reader (eg, 88) located near the mobile phone (eg, 42) (eg, step 965). As used herein, "proximity" as used herein means a range within 10 feet, and "close proximity" means a range within 1 foot.

In a particular embodiment, for example, for each of a plurality of users, the first set of personal information (eg, received at step 905) is at least one of royalty information and identification of at least one of a merchant and a service provider. Wherein at least one of the first set of personal information (eg, received at step 905) and the second set of personal information (eg, received at step 915) comprises royalty information. Further, in some such embodiments, the local signal (eg, transmitted in step 965) includes at least some of the royalty information, and the step of transmitting the local signal (eg, step 965) may include at least the royalty information. Sending the portion to at least one of a merchant and a service provider. Such merchants and service providers are examples of third parties 31 to 33 shown in FIG. 1, for example. Thus, a user (eg, 22) can use their mobile phone (eg, 42) to store and provide royalty information, such as COSTCO membership, membership of a gym, SAFEWAY card, and the like. In some embodiments, insurance information may be handled in this manner or in a similar manner.

Local signals (eg, signals between device 82 and device 88) may be used for purchase or payment. In a particular embodiment, for example, for each of a plurality of users, the first set of personal information (eg, received at step 905) is at least one of bank card information and identification of at least one of a bank and a bank card provider. It includes. Such a bank or bank card provider may be an additional example of the third parties 31 to 33 shown in FIG. In some embodiments, at least one of the

first set of personal information (eg, received at step 905) and the second set of personal information (eg, received at step 915) includes bank card information and The local signal (e.g., sent in step 965) includes bank card information, and the sending of the local signal (e.g., step 965) may include, for example, a bank card to make a payment or authorize a payment. Transmitting the information to at least one of a merchant and a service provider. As used herein, the term "bank card" includes, for example, credit and debit cards whether or not issued by a bank.

In some embodiments, for example, using near field communication, a user (eg, 22) can point his phone (eg 42 or specifically device 82) in front of an NFC reader (eg device 88). It may communicate the bank card number or information for payment of goods or services, thereby eliminating the need to carry or present a bank card.

In a particular embodiment, the method 900 further includes organizing specific information, such as information handled by the system 100 (step 970). For example, in many embodiments, the second software module 72 may include a second set of personal information (eg, selected at step 920 and transmitted at step 935) at a mobile phone (eg, 41). Organizing a portion (e.g., nugget 78, 79 or both) (step 970), and in various embodiments, the organizing step includes decoding information, restoring information, a second set of individuals Information may be made accessible to the user, for example, at the user's mobile terminal (step 975), or a combination thereof. In some embodiments, for each of the plurality of users, the second software module (eg, 72) organizes a portion of the second set of personal information based on the title (step 970), and the second set of individuals Some of the information (eg, nuggets 78, 79 or both) is made accessible to the user based on the title of the information (eg, folder or folders 76).

In various embodiments, some or all of the steps of method 900 may be repeated. For example, in some embodiments (eg, for each of some or all of the users), the method 900 may include receiving a second set of personal information several times (step 915), for example. , Repeating the step of selecting a part (step 920) and the step of transmitting a part (step 935). In many embodiments, encryption (step 925), compression (step 930), providing an alarm (step 945), sending information to another person (step 955), Receiving (or both) local signals (step 960, step 965, or both), organizing information (step 970), providing information to the user (step (975) or combinations thereof may be repeated as appropriate. Further, in some embodiments, receiving information from the user (step 905) may be repeated, but fewer times than other specific steps, such as receiving information from a third party (step 915). Can be repeated as many times as possible.

In many embodiments (eg, for each of a plurality of users), the repeating step replaces at least some of the portions of the second set of personal information stored in the user's mobile phone (eg, as part of step 970). And at the same time maintaining the organization of the information based on the title of the information. Further, in various embodiments, for each of the one or more users, repeating steps moves at least some of the portion of the second set of personal information stored in the

IPR2025-00645 Page 02342

user's mobile phone (eg, as part of step 970). Maintaining the organization of the information based on the title of the information, including synchronizing with the corresponding personal information already stored in the phone. As used herein, "synchronization" of information includes replacing and appending information, while simultaneously classifying or maintaining a categorized organizational structure based on a title. The title may include, for example, travel information, account information (which may be classified for different accounts), bank card information, royalty information, insurance information, and the like.

In various embodiments, a user (eg, 22) can use a mobile phone (eg, 42) to gain access to a physical space, such as an elevator, floor or building floor or area, parking lot, and the like. In some embodiments, access may be obtained by, for example, passing a phone (eg, 42) next to or up a reader (eg, communication device 88) and transmitting a local signal, for example using NFC. In some embodiments, for example, the user 22 selects the code or number required by the phone 42, and then rubs the phone 42 against the reader or device 88 or the phone 42. Pass above or next to device 88. In certain embodiments, user 22 may provide or select a code by name, for example "elevator," which may be selected from a menu on mobile phone 42 or entered by voice input.

Then, in some embodiments, phone 42 may transmit a local signal including a code that the reader (eg, device 88) will recognize, for example to identify user 22. In this embodiment, the telephone 42 may have a local transmitter or communication device 82 which may be, for example, an NFC antenna. In some embodiments, the NFC antenna (eg, local transmitter or device 82) is newly mounted to the telephone 42 that was already present by replacing the back end or battery cover of the telephone with a cover with antenna, circuit or both. Can be. In another embodiment, the NFC antenna (eg, local transmitter or device 82) may be a component originally included in the phone 42, for example.

Some embodiments may use Bluetooth communication for specific functionality in addition to or instead of NFC (eg, for a local transmitter or communication device 82). For example, Bluetooth can be used to access a parking lot, and in one embodiment a user with a telephone can access it without having to open the window of the vehicle. Other embodiments may use WiFi or other forms of communication such as infrared, barcodes, and the like. In some embodiments, transponders may be used. In addition to providing access, the use of these mobile telephones and local signals can be used to track who has accessed the parking lot, track the movement of an employee or someone else, verify whether an employee is doing the job quickly enough, or Or it can be used to verify that someone is moving at a safe pace, to track work or breaks, etc., which can be published in one or more reports.

In some embodiments, the user (eg, 22) selects a phone (eg, 42) by passing by a leader (eg, device 88) or a combination of multiple leaders, or identifies or consents to a required action. Or perform other consenting actions. For example, a user in a store may obtain information about a particular item by passing the user's phone around a particular reader (eg, device 88). Or, in some embodiments, the user may identify a potential gift for the list of wedding gifts or a large item selected from the list. Further, in certain embodiments, a user may subscribe for a particular advertisement in this manner for a particular type of item or from a particular source. Further, phone 42 may in some embodiments show membership (eg, COSTCO or membership of a gym or country club) or pass commercial flight miles by passing phone 42 in front of leader or device 88 in a similar manner. Can be used to earn or to receive discounts provided to loyalty cardholders. In other embodiments, the user may take other actions in response to a question displayed on the phone, for example by pressing one or more buttons on the phone.

In some embodiments, the telephone can provide identification of the user. For example, the phone 42 may include a driver's license number, social security number, credit card number, account number, address, telephone number, employee ID number, birth certificate, citizenship certificate, proof of legitimate residence, and secrecy of the user 22. Information usage permits, passport numbers, visa numbers, criminal records, certificate awards, batty numbers, and the like may be included or provided, for example, via the transmitter or local communication device 82. For example, in certain embodiments, the telephone at the airport may dictate a higher level of security that may permit the user to skip some or all of the security procedures. In addition, in certain embodiments, if the phone is lost or stolen, the authorized user may use another phone or delete the phone's personal information, or locate the phone, for example, via the website 65. Can be disabled or a combination thereof can be enabled. This behavior can be accomplished by sending an indication to the phone (eg, via mobile phone network 40) and, when positioning the phone, can direct the phone to provide GPS coordinates, other location information, or both. . In some embodiments, this may require entering at least one code or password. Further, in some embodiments, information may be reloaded from the website 65 back to the telephone, new telephone, or other telephone in the archive.

In some embodiments, the software (e.g. 72) or the phone (e.g. 41) is not used for a certain period of time, the user does not provide the correct password for the software (e.g. 72), or a remote lock command is issued to the phone (e.g. When received by 41, a mobile phone (eg, software module 72 of phone 41) is a user (eg, 21, or other user who may not be authorized) that module 201 or module 72. Can be prevented. Access to module 201 and / or module 72 may then be resaved through entry of the correct password. In another embodiment, the software (eg, software module 72 of phone 41), when accessing or exiting software (eg, 72), when accessing the phone, when transmitting a secure message, when You can provide the GPS coordinates of the phone (e.g., module 61 of server 15) at regular intervals when the power is turned off, when the phone is turned on, when the battery is discharged, or in combination. have. In various embodiments, GPS coordinates or other location data may be transmitted from module 72 of phone 41 to module 61 of server 15 as a secure SMS message. Further, the delivery confirmation, the open confirmation, and the like may include GPS coordinates, time stamp information, cell tower triangulation information, and the like.

In many embodiments, the mobile phone may include insurance information as an example of the title of personal information, which may be, for example, a policy (eg, car or health insurance), scope, payment date, preferred provider, contract Periods and the like. In some embodiments, users (eg, 21-23) may be confirmed to pay via a phone (eg, 41-43), obtain an extended range, or make an appointment. For example, in some embodiments, a user may be directed through a telephone to authorize payment for insurance, utility, loan or lottery payments, rent, credit card payments, various bills, etc. (eg, step 945). You are provided with an alarm). In another example, the user may be reminded to obtain car insurance for another country when traveling abroad (eg, provided with an alarm at step 945), and purchase such insurance through a telephone, or with a telephone certificate. Can be obtained or both.

As described herein, certain embodiments include, among other things, methods of communicating information to other electronic devices, and methods of making positive choices in certain embodiments. In some embodiments, an electronic device or reader (e.g., device 88) may query the telephone (e.g., 42) for the specific information required, or a handshake routine may be followed or both. Can be performed. In some embodiments, an act of agreeing to authorize a transaction or payment or authorize access may be required at least in certain functions. This consenting action is, in some embodiments, such that, for example, the user 22 enters a personal identification number (PIN) or password into the graphical user interface or the keyboard of a mobile phone, provides a signature to the touch pad, Provide recognition, or pass a phone (eg, 42) next to an NFC reader (eg, device 88).

Further, in some of these embodiments, the first software module (eg, module 61) may include programming instructions for receiving instructions from a user, so that at least some of the specific information (eg, nugget 78) is received. Identify at least one threshold (eg, used in step 940) for the alarm for the. In some of these embodiments, at least one of the first software module (eg, 61) and the second software module (eg, 72) compares at least some of the specific information about the threshold (eg, step 940). Contains programming instructions. In some such embodiments, at least one of the first software module (eg, 61) and the second software module (eg, 72) may alert the user when certain information passes a threshold (eg, step 940). Provide programming instructions (eg, step 945).

As noted above, in some embodiments, a particular method of managing information for a user using the Internet and a mobile phone includes extracting information from an email and sending the information to the mobile phone. This particular method includes, for example, receiving an email from a third party (eg, step 915). For example, in some embodiments, for each of a plurality of users (eg, users 21-23), the method 900 includes receiving an information classification software module (eg, 67), the plurality of The (e.g., selected) emails of include information about the user's business, and the user causes the selected emails to be sent to the information

IPR2025-00645 Page 02343

classification software module. The user may, for example, enter or select information (e.g., step 905) or download or enable a software module or plug-in 17, such that the email (e.g., selected) is an information classification software module (e.g., , 67).

Examples of such a method 900 include, for each of a plurality of users, using an information classification software module (eg, 67), retrieving at least two of the emails selected for the at least one keyword, and identifying a number, for each of the plurality of users, using an information classification software module (e.g., 67), extracting specific information from the selected email (e g., step 920). do As used herein, extracting this specific information does not mean or include sending or sending the entire email (eg, step 935). Instead, some (eg less than all) information in the email is extracted (eg, step 935) for transmission (eg, step 920).

in many embodiments, an example of such a method 900 stores for each of a plurality of users (eg, users 21-23 shown in FIG. 1, in the user's mobile phone (eg, 41) and the user (For example, transmitting specific information (eg, step 935) to the user's mobile phone (eg, 41) via the mobile phone network (eg, 40) for access by 21. Some embodiments in particular, the specific information transmitted may be a nugget (eg, may be stored in folder 76 by way of example 78 and 79, and eg module 77), may include a nugget, or may be similar to a nugget. In an example, the software module 67 of the server 15 may be a classification software module, receiving email (eg, step 915), searching for a keyword, identifying a number, or performing both; Extract specific information (e.g., For example, step 920), in some embodiments, may be performed or initiated by transmitting or transmitting specific information (eg, step 935.) in some embodiments, the specific information may be performed, for example, by step 920.) And the same as or similar to the portion of the information described herein with reference to step 935.

in many embodiments, the method 900 may include, for example, multiple search steps (eg, step 920), extraction steps (eg, portions of step 920), and transmission steps (eg, step 935). Repeating step once. Various embodiments of this method may be performed in various orders and may include additional steps. For example, in some embodiments, the method 900 transmits (eg, steps) specific information after extracting (eg, step 920) and to the user's mobile phone (eg, 41 to 43). (935), encrypting the specific information (step 925), compressing the specific information (step 930), or both. in some embodiments, the information classification software module (eg, 67) extracts specific information only from the portion of the selected email (eg, step 920). In such an embodiment, the email is searched for a keyword or identification number (or both) (eg, in step 920 or in the previous step), and specific information may be extracted or selected only from the email with the keyword or identification number. (Eg, step 920).

Further, in some embodiments, for multiple users, prior to receiving (eg, selected) email (eg, step 915), method 900 may comprise configuring a user email handling software module (step (912)). For example, the user email handling module may be configured to automatically forward email from at least one particular third party (eg, at least one of the third parties 31-33) to the information classification module 67. . In such embodiments, the selected email mentioned herein may include email from (at least one) specific third party (eg, one or more of third parties 31-33). By way of example, the plug-in module 17 can be added to the MICROSOFT OUTLOOK of the computer 13 of the user 23, and can send e-mails sent from a specific sender to the user 23's email account (eg, the Internet 10). May provide a function to automatically transfer to module 67)

In other embodiments, the user email handling module may be configured or a plug-in or software module (eg, module or plug-in 14) may be added to retrieve email for a keyword or identification number (or both) or , Select specific information, perform an operation related to step 920 or steps 920 to 935, or a combination thereof, which may include a selected set of emails, specific information, parts of information, nuggets of information, and the like. May cause. In this embodiment, the user's computer (eg, the computer 13 of the user 23) or the software running on the computer (eg, the module or plug-in 14 of the computer 13) is a software module 67. To do this. In some such embodiments, software module 67 may not be required. in other embodiments, on the other hand, some or all of these tasks may be performed at server 15, software module 61, or software module 67. In other embodiments, the tasks described herein performed by modules 14, 17, and 67 may be described by other of these modules.

in addition, some embodiments of the method 900 include, for various users (eg, 21-23), at least one particular third party (eg, 31-23) before receiving the selected email (eg, step 915). 33, and (eg, step 905) sending an email containing information about the user's business to the information classification module (eg, 67). This selected email can be, for example, an email containing information about the user's business. In various embodiments, a user (eg, 21-23) may be connected to the Internet 10 (eg, user 23 may provide instructions via computer 13), a mobile phone (eg, 41-43), or instructions can be provided through both. In addition, in various embodiments, the user (eg, 21-23) may provide such information via module 61 or website 65, or, for example, the Internet 10, mobile phone network 40, or the like. Both can be provided directly to third parties (eg, 31 to 33).

in some embodiments, retrieving the email (eg, step 920), retrieves the email from at least one particular sender (eg, one specific email address) (eg, for each of a plurality of users). And extracting the specific information (eg, step 920) comprises extracting the specific information only from an email from at least one specific sender

In a particular embodiment (e.g , for each of a plurality of users), the method 900 includes receiving instructions (e.g., step 905) from a user (e.g , one of the users 21-23), And identifying at least one reference or threshold for an alarm for at least some of the specific information. In some such embodiments, after extracting the specific information (eg, step 920), the method 900 compares at least a portion of the specific information to a criterion or threshold for the alarm and the particular information meets the criteria. Or providing an alarm to the user (eg, one of the users 21-23) when passing the threshold (eg, step 945).

For example, in some such embodiments (e.g., for each of the various users), the specific information includes financial account information including withdrawals or withdrawals from the account, and the threshold is provided with an alarm (e.g., A withdrawal amount or withdrawal amount exceeding step 945). In another example, (eg, for each of a plurality of users), the specific information includes travel information including a departure time or departure place (or both), and the departure time or departure place (or both) is changed. (Eg, as determined in decision step 940), an alarm is provided (eg, step 945). In certain embodiments, for example, the travel information includes flight information including a departure time and a departure gate, and an alarm is provided (eg, step 945) if either the departure time or the departure gate changes.

Still another embodiment stores the information on a third party's mobile phone (eg, 42) and sends it to a third party (eg, when instructed by the user (eg, 21) for multiple users 21-23). Transmitting at least some of the specific information (e.g., step) to a third party (e.g. 22) mobile phone (e.g. 42) via the mobile phone network 40 for access by the user 22, e. 955). In some such embodiments, at least some of the particular information (eg, sent in step 955) is a complete email (eg, an email received by user 21 or module 67 and delivered to user 22). Does not include By way of example, in some embodiments, at least some of the specific information includes a itinerary (eg, of user 21). Thus, the user 21 can easily send the itinerary (or other specific information) to another person to implement such communication.

Referring now again to FIG. 10, this flowchart describes, among other things, various methods of authorizing an operation and various methods of authenticating access. Most of the various steps of step 1000 may be performed in an automated process, for example, by the server 15, module 61, or both shown in FIG. 1. In various embodiments, the method 1000 may be performed by a company or business, for example, as a service for another company or business.

In various embodiments, in various methods of authorizing an operation, the method 1000 may include receiving an identification of the first telephone number, for example, from a person authorized to authorize the operation to obtain authorization for the operation. (1003)). Such a person having the authority to authorize the operation may be any one of the users 21 to 23 shown in FIG. 1, for example. In some embodiments, the person authorized to authorize the operation may provide a phone number (eg, received at step 1003), for example, via their computer or mobile phone. For example, if the user 23 is a person authorized to authorize an operation,

IPR2025-00645 Page 02344

the user 23 may use the telephone 43 or the telephone number of the telephone 43 (eg, via the computer 13 and the website 65). , Received at operation 1003).

In some embodiments, a person authorized to authorize an action may enter a key directly on the phone, while at the same time in another embodiment, a person (eg, user 23) may enter, for example, a name, another identifier or indicator, or it may be selected, which may be used to look up an appropriate telephone number (eg, of phone 43) (eg, operation 1003 by server 15 or module 61). In some embodiments, the person authorized to authorize the operation can select a phone number from a menu, for example, or, if a phone is used, the number is automatically read from the person's phone or caller's ID feature or service. As used herein, all of these are examples of receiving an identification of a first telephone number (eg, step 1003) from a person authorized to authorize the action to obtain authorization of the action.

In various embodiments, the method 1000 further includes receiving an operation authorization request (step 1009), for example, from the person attempting the operation. In other embodiments, steps 1003 and 1009 may be performed in any order including, for example, the order shown in FIG. 10. In other embodiments or other situations, the person attempting the action (eg, the person requesting authorization in step 1009) and the person authorized to authorize the action (eg, the person providing the number in step 1003). May be the same person or may be different people (eg, users 21-23).

After receiving an identification of the first telephone number (eg, step 1003) and after receiving an authorization request (eg, step 1009), in various embodiments, the method 1000 may comprise a mobile telephone network (eg. Sending a first message to the first mobile phone (step 1015) via 40 shown in FIG. 1. In such embodiments, the first message (eg, step 1015) may include the content of the operation for which authorization is to be requested. In some embodiments, the first telephone message is automatically sent (eg, step 1015), which requests authorization (eg, received at step 1009), providing a number and any criteria. No human interaction is involved (e.g., between step 1009 and step 1015) except (e.g., received at one or both of step 1003 and step 1009). do.

Additionally, after transmitting the first message (eg, after step 1015), the method 1000 receives a second message from, for example, a first mobile phone (eg, a mobile phone having a first phone number). (Step 1021), which may apply an action. In various embodiments, the second message (eg, received at step 1021) may be obtained from the person controlling the phone to attempt an agreed action to indicate authorization of the action. Step 1018 may be performed by any one of the users 21-23 shown in FIG. 1, for example.

In some embodiments, the first message (eg, the message of step 1015) includes at least one menu and at least one prompt to authorize the action by making a selection from the menu. The person who controls the telephone can take an agreed action to instruct the authorization of the action, for example by making a selection from a menu. In some embodiments, authorization is instructed (step 1018), and after the first message (eg, sent in operation 1015) is received by the mobile phone, a second message authorizing the operation is for example. It is sent by pressing a single button on the mobile phone. As used herein, "press a single button" does not include actions such as opening a flip phone, scrolling to view a message, or pressing a "send" button. In other words, when determining how many buttons have been pressed, opening a flip phone, scrolling to see a message, or pressing "send" does not count.

In some embodiments, the first message (eg, sent in step 1015), the second message (eg, received in step 1021) or both are an SMS message. One or both (eg, each of the first and second messages sent in step 1015 and received in step 1021) may be sent through a mobile telephone network (eg, 40 shown in FIG. 1). (Eg, transmitted or received). Further, in some embodiments, the first message (eg, sent in step 1015), the second message (eg, received in step 1021) or both are voice messages, and as an additional example, this is voice It may be generated by a computer using computer recognition software, translated, or both. In some embodiments, the first message (sent at step 1015) may be a voice message and the second message (eg, received at step 1021) may be an SMS message. Other embodiments may have other combinations.

In various embodiments, the method 1000 further includes evaluating whether the second message (eg, received at step 1021) has authorized the operation (step 1027). If the second message authorizes the action, the action may be allowed, implemented or performed (at step 1030). Some embodiments allow operation only if a second message is received (eg, step 1021) and the second message authorizes an action (eg, as determined in step 1027) (step 1030).)). Some embodiments include receiving an operation authorization request (eg, step 1009), transmitting a first message (eg, step 1015), and receiving a second message (eg, step 1021). Repeating)) further comprises. These steps may be repeated, for example, for a request for another action, for a same action for another person, for the same action or for a same person at different times.

Furthermore, some of these embodiments further include encrypting the first message (step 1012), for example, before sending the first message to the first mobile phone (eg, step 1015). do. Some embodiments further include, for example, receiving a second message from the first mobile phone (eg, step 1021) and then decrypting the second message. In such an embodiment, the first mobile phone may, for example, decrypt the first message and encrypt the second message. In some embodiments, compression and decompression may be used.

In some embodiments, prior to receiving an operation authorization request (eg, step 1009), the first telephone number may be an Internet website (eg, website 65 via the Internet 10 shown in FIG. 1), Received via a mobile telephone network (eg, 40) or both (eg, step 1003). Some embodiments may be able to access an Internet website (eg, website 65 via the Internet 10) or a mobile telephone network (eg, 40) or both, for example, to obtain authorization for actions for a particular person. Receiving an indication of a reference from each of a plurality of persons authorized to authorize an action via (step 1006). Such criteria may be typed or spoken by a person, or may be selected by a person, for example from one or more menus. In some embodiments, step 1006 may be similar to step 905 shown in FIG. 9 and described herein. Further, in some embodiments, step 1003 may be included in step 1006 or vice versa, step 1006 is included in step 1003, or steps 1003 and 1006 are performed in a different order. Can be.

As one example, in some embodiments of the method 1000, step 1006 may comprise, for example, an Internet website (eg, a website via the Internet 10 shown in FIG. 1) from a person authorized to authorize an operation. (65) and receiving an identification of a time limit for transmitting (eg, step 1015) the first message via at least one of the mobile telephone network (eg, 40). In many such embodiments, the step of transmitting the first message (eg, step 1015) may only be performed in accordance with a time limit. For example, in some embodiments, a person may not want to be asked for a particular kind of authorization during a particular night time, and thus may enter or select one or more criteria.

In many embodiments, the person operating the telephone (eg, the person instructing authorization in step 1018) is or is intended to be the person authorized to authorize the operation (eg, the number is received in step 1003). And the criteria were received in step 1006). In another embodiment, the person operating the telephone is or is intended to be a person authorized by a person authorized to authorize the action (eg, a number was received at step 1003 and a criterion is received at step 1006).) Furthermore, some embodiments ensure that the person who operates the phone is the right person.

For example, in some embodiments, the second message (eg, received at step 1021) may be received after receiving the first message (eg, sent at step 1015) and transmitting the second message. Before (eg, received at step 1021), it includes a password or authentication code that has been memorized by a person authorized to authorize the operation and provided a key to the first mobile phone. As another example, a particular embodiment may refer to the first message (e.g., at step 1015) for asking a personal question about a person who is expected to operate the mobile phone and who is authorized to authorize the operation. Include. This embodiment includes receiving a current answer to the personal question in the second message (eg, at step 1021). Such an embodiment may further comprise the step of comparing the current answer with the previous answer to the provided personal question by a person authorized to authorize the action.

IPR2025-00645 Page 02345

in many embodiments, the first message (eg, sent in step 1015) identifies the person trying to act. And, in some embodiments, the first message (eg, sent in step 1015) further identifies the requested action or identifies the requested action on behalf of the person attempting the action. This information is provided by the person requesting authorization (e.g., step 1009) and who is authorized to authorize the operation (e.g., a number received in step 1003) and the first message in step 1015. Transmitted, and indicative of authorization in step 1018). In contrast, in some embodiments, the first mobile phone is controlled by the person attempting the action (eg, the person requesting authorization received at step 1009), and in some embodiments, the person attempting the action (eg , The person requesting authorization received in step 1009) is the same as the person authorized to authorize the operation (eg, step 1003, step 1018, or both).

In addition, some embodiments may be directed to an Internet website (eg, website 65 via the Internet 10 shown in FIG. 1) or a mobile telephone network (eg, 40) or both to inform third party operations. And receiving an identification of the second telephone number (eg, step 1006) from a person authorized to authorize the operation via. Some such embodiments include, for example, after receiving an authorization request (eg, step 1009), automatically sending a first message, a second message, a third message, or a combination thereof to a second telephone number (For example, step 1033. The step of notifying the third party (step 1033) may include, for example, transmitting the content of the operation for which authorization is requested, identifying the person requesting the operation (For example, step 1009) or both.

In various embodiments, the method 1000 further includes a step of tracking the authorization granted for the operation over time (step 1036), which may include the reporting result of the tracking. For example, the report may include what authorization was requested (step 1009), when the authorization was requested, who requested this authorization, whether the authorization was granted and when it was granted (eg, step 1018), and it may be submitted to indicate whether the operation was allowed or when it was allowed (eg, step 1030). In some embodiments, such reports or data may be provided to or through the (eg, first or second) mobile phone as a nugget of the SMS message or information described herein.

In some embodiments, the information may be provided via local signals (received at step 1007). Step 1007 is similar to step 960 shown in FIG. 9 and can be described with reference to it. Local signals may be received, for example, via local communication devices 88 and 82 shown in FIG. 1 (eg, in step 1007), which are described herein with reference to this, and device 88 receives Device 82 transmits. The local signal may be received via NFC (eg, at step 1007) and may be received when the mobile phone passes through a reader (eg, device 88) (eg, at step 1007).

In other embodiments, other types of operations are requested (eg, at step 1009), authorized (eg, at step 1018), and allowed (eg, at step 1030). Some embodiments are limited to certain types of operations. For example, some operations include providing physical or other types of access, and some embodiments include transferring money from one entity or account to another entity or account. As a specific example, in some embodiments, the operation is granting computer access to the electronically stored information, and the person attempting the operation (eg, the person requesting authorization in step 1009) is stored in the electronically stored information. Attempt to access the. Embodiments of method 1000 provide additional levels of security for unauthorized users obtaining passwords by providing computer access in place of or in addition to passwords if they are forgotten. In some such embodiments, the first message (eg, the message of step 1015) may include the content of the computer access or electrically stored information for which authorization was requested.

In another example, the operation is granting physical access to the controlled space, and the person attempting the operation (eg, the person requesting authorization at step 1009) attempts physical access to the controlled space . Physical access can be controlled, for example, for a building, part of a building, a floor of a building, a room, a closed space, a detention center, storage area, parking lot, road, desk or cabinet, furniture such as a safe. In such an embodiment, physical access may be allowed by electronically unlocking or opening the door, gate or compartment, thereby allowing the elevator to reach a particular floor (eg, step 1030). In such an embodiment, the first message (eg, step 1015) may include content for the room, floor, building, space, etc. for which authorization for access has been requested.

In another particular example, in a particular embodiment, the operation (eg, requested in step 1009, authorized in step 1018, permitted in step 1030, or an operation in combination thereof) is or includes a financial transaction, The first message (eg, sent in step 1015) includes the transaction amount, and the second message (eg, received in step 1021) includes authorization of the transaction (eg, step 1018). Some such embodiments (eg, at step 1006) include, for example, an Internet website (eg, website 65 via the Internet 10 shown in FIG. 1) from a person authorized to authorize the operation. Or receiving an identification of a threshold amount of a transaction via a mobile telephone network (eg, 40) or both. In some such embodiments, the first message is sent for a transaction that has exceeded the threshold (eg, step 1015), and a transaction below the threshold does not transmit the first message (eg, steps 1012 through (step 10). 1027) without approval or approval.

Further, in some embodiments, the transaction is or includes a withdrawal or withdrawal from a bank account, and the person authorized to authorize the operation is an authorized user of the account. Thus, in some embodiments, a user (eg, 21-23 shown in FIG. 1) is notified of a large amount of withdrawal or withdrawal (eg, step 1015) through his or her telephone (eg, 41-43). May be selected (e.g., to select or indicate the criteria received in step 1006), but by the first message sent in step 1015 so as not to worry about fewer (e.g., routine) withdrawals or withdrawals (e.g.,) can do. Furthermore, in many embodiments, the user must authorize a large transaction (eg, step 1018), thus preventing the user, bank (or other financial institution) or both from losing money with unauthorized withdrawals or withdrawals, prevent.

In some embodiments, the first message (eg, step 1015) may include an account balance, and even if a withdrawal or withdrawal is authorized, the method 1000 prevents the user from withdrawing multiple accounts from the account. Can help you. And in some embodiments, the user can select a threshold amount for which authorization is requested. As used herein, accounts are held by credit institutions and other companies that receive deposits from various customers, attract deposits to the account, return the deposits to customers upon request, and consider them "bank accounts". .

In another example, in a particular embodiment, a transaction (eg, requested in step 1009, authorized in step 1018, accepted in step 1030, or a combination thereof) may be used to purchase goods or service. Bank card spending at the time of payment. In some such embodiments, the person authorized to authorize the operation is an authorized user of a bank card. In some such embodiments, the bankcard has a bankcard number, and the method includes a first method via a local signal sent from a first mobile phone, for example prior to sending the first message (eg, step 1015). Receiving the bank card number from the mobile phone (eg, a local signal is received at step 1007).

In certain embodiments, as another example, a transaction (eg, requested in step 1009, authorized in step 1018, accepted in step 1030, or a combination thereof) may be used to purchase goods or services. A payment made from a credit or withdrawal account at the time of payment, a person (eg, user 22) authorized to authorize an operation is an authorized user of the account, the account is account indications, and the method includes. Before sending (eg, step 1015), receiving account indications from the mobile phone (eg, 42) via a local signal transmitted from the mobile phone (eg, from the communication device 82) (eg, step (1007)). As used herein, "account indicia" refers to a combination or combination of letters, numbers, and symbols that identifies a credit card number, a debit card number, and an account with which the user can make a withdrawal. include.

In a further example, in some embodiments, a transaction (approval that is requested in step 1009, authorized in step 1018, permitted in step 1030, or an operation by a combination thereof) may be purchased or serviced. Expenditures that are made from a credit or withdrawal account at the time of payment for the payment, the person authorized to authorize the operation is an authorized user of the account, and a second message (eg, received at step 1021) authorizes the operation. A first mobile terminal stored by a person authorized to do so and after receiving a first message (eg, sent in step 1015) and before sending a second message (eg, received in step 1021). Contains an authorization code for which a key is provided. Providing a key of the authentication code may constitute or be included, for example, instructing authorization (step 1018).

Additionally, in some embodiments, a transaction (eg, authorization requested in step 1009, authorized in step 1018, permitted in step 1030, or an action according to a

IPR2025-00645 Page 02346

combination thereof) may be used to purchase goods or service. Expenses carried out from a credit or withdrawal account at the time of payment, the person authorized to authorize the operation is an authorized user of the account, the accounts are account indications, and a second message (eg, received at step 1021). Includes account indications. In the example of this embodiment, the customer gives the merchant his phone number orally or by pressing a key on the keypad. The merchant then sends the first message to the customer's mobile phone or causes the first message to be sent to the customer's mobile phone. Then, the customer presses one or more buttons on the phone to instruct the transaction to be authorized, the phone according to the merchant's credit or withdrawal card number to be charged a second message (e.g., received at step 1021). Send to

In another embodiment, when a customer passes his mobile phone by a local receiver (eg, leader or device 88 shown in FIG. 1), the customer's phone number may be received by the merchant via a local signal. (Eg, step 1007). And in another embodiment, transmitting the first message (step 1015), receiving the second message (step 1021), or both, are performed by the service provider rather than directly by the merchant. Can be. In some embodiments, the second message (eg, received at step 1021) is or includes an SMS message received via the mobile telephone network (eg, 40) and the method 1000 transmits the first message. Prior to (eg, step 1015), receiving the first telephone number from the person attempting the operation or the first mobile telephone. In other embodiments or in other situations, the person attempting the action may provide the phone number verbally, via a keyboard, or by having the phone pass by a reader (eg, device 88).

Another method of authenticating a transaction shown in FIG. 10 is (at least) an Internet website (eg, 65) or a mobile phone network (eg, 40) (or both) via multiple users (eg, 21-23). Receiving an indication of a criteria for a user to obtain authorization of a transaction from each. This embodiment transmits, for each of one or more users (eg, 21-23), a first automatic message to the user's mobile phone (eg, 41-43), for example, via a mobile phone network (eg, 40). And a message requesting an agreeing action (eg, step 1018) to include the transaction amount and to indicate authorization of the transaction. And, such a method may, for example, for each of at least a plurality of users (eg, 21-23), from the user's mobile phone (eg, 41-43), the user of the mobile phone (eg, 21-23). May include receiving a second message (eg, step 1021) instructing the user to attempt an agreed action (eg, step 1018) to indicate authorization of the transaction.

This agreeing action (eg, step 1018) may be pressing a button, making a selection from a menu, entering a voice command, entering a password or authorization number, and the like. Various examples of operations that may be acceptable (eg, step 1030) in other embodiments are described herein. In many different embodiments, these steps may be combined with various combinations or other steps or features (or both) described herein.

In addition, FIG. 10 also illustrates various methods of authenticating access. In certain instances, embodiments of this method 1000 include various steps (eg, in the order shown or in any suitable order discussed). Any such embodiment may be implemented by, for example, a person attempting access (eg, from any of the users 21-23 shown in FIG. 1) (eg, at step 1009). Receiving an indication of the identification. In various such embodiments, the identification indication may be or include a person's name, user ID or identification number for the person or telephone number for the person.

Some embodiments, for example, after receiving an identification indication (eg, step 1009) and before sending a first automatic message (eg, step 1015), requestor (eg, step 1009). Searching for the person requesting authorization) (step 1010). In certain embodiments, this step (e.g., step 1010) may comprise looking up an identification indication in the database (e.g., received at step 1009) and a person (e.g , step (e.g., Obtaining the telephone number of the mobile telephone of the person to whom the first message was sent.

In an embodiment where the identification indication includes the telephone number of the mobile telephone of a person authorized to access (eg, the person to whom the first message was sent in step 1015), looking up the requestor (eg, step 1010).)) May include verifying that the telephone number corresponds to the telephone number of the person having authority to access. In an embodiment where a request for authorization (eg, received at step 1009) includes one or more indications, looking up the requestor (step 1010) may be performed by some or all of the indications matching or not being identical. And verifying that the correspondence is correct and accurate.

In many embodiments, the method 1000 may be a person (eg, identified in step 1009 or step 1010) having access to access via, for example, the mobile telephone network 40 shown in FIG. 1. Sending (eg, step 1015) a first (eg, automated) message to the mobile phone of the. In this embodiment, 'automation' means that the first message is sent by the entity, such as one or more computers, servers, software, or the like (eg, step 1015). For example, in some embodiments, the first message is in response to receiving a request for authorization (eg, step 1009), server 15, software module 61, or both shown in FIG. 1. Is sent (eg, step 1015). In some embodiments, the first (eg, automated) message is sent to the telephone number of the person identified in step 1010 and authorized to access (eg, e-count 1015).

In some of these embodiments, transmitting the first message (eg, step 1015) transmits the first message to the mobile phone of the person attempting to access (eg, via mobile phone network 40). Comprising or constituted by In other words, the person attempting access and the person having authority to access are assumed to be the same person or the same person in some embodiments. On the other hand, in another embodiment, the person attempting access is the first person, and the person having authority to access is the second person (ie, another person). In many such embodiments, the first message (eg, sent in step 1015) includes an identification of the first person trying to access. This identification may be or include some or all of the indications (eg, received at step 1009), which are obtained by reference

In some embodiments, the first automated message (eg, sent in step 1015) includes a request for an action to agree to indicate the identification of the requested access and the authorization of the access. In another embodiment, the first automated message (eg, sent in step 1015) includes a password. And, in some embodiments, the first automated message (eg, sent in step 1015) includes an identification of the requested access, a request of an agreeing action to indicate authorization of the access, and a password.

Many such embodiments of the method 1000 further include receiving a password, for example, from a person attempting to access (step 1019). Further, many embodiments receive a second message indicating, for example, from a mobile phone of a person authorized to access, that the person authorized to access attempted an agreed action instructing authorization of access. Doing step (eg, step 1021). Some embodiments include step 1019, but do not include step 1021 (eg, the first message sent in step 1015 includes a password but does not include a request for a response or a second message). Some embodiments include step 1021 but do not include step 1019 (eg, the first message sent in step 1015 includes a response request or a second message but does not include a password). Some embodiments include both steps 1019 and 1021 (eg, the first message sent in step 1015 includes a response request or a second message and a password).

In a particular example, many embodiments include sending a first automated message (eg, step 1015) to a mobile phone of a person authorized to access via the mobile phone network (eg, 40). The first automated message includes a password. The method may further comprise receiving a password from the person attempting to access (eg, step 1019). In some such embodiments, for example, the person attempting to access attempts to access the electronically stored information with a computer.

In a particular example, if a user (eg, 23) attempts to log in to a computer (eg, 13) or a system (eg, a personal area of website 65) but forgets his password, the computer (eg, 13) Or the system (eg, module 61) can request the user (eg, 22) to identify themselves by entering a name, user ID, phone number or other identification marks (eg, step 1009). The computer (eg, 13) or system (eg, software module 61) can look up the user's phone number in a database (eg, storage 64) (eg, step 1010) or the user (eg, 23). Verify that the phone number is in the database, and then send a first message to the user (e.g., user's mobile phone 43), including the password (e.g., step 1015). for example, 23 receives a password (eg, via SMS message, voice message, etc.) at his mobile phone and enters the password into a computer (eg 13) or a system (eg website 65).

IPR2025-00645 Page 02347

in other embodiments, such passwords may be, for example, original passwords, temporary passwords or one-time passwords. In another embodiment, instead of using this process only if a password is lost or forgotten, the process is randomly authorized, at regular intervals (eg, depending on the number of logins), whenever an user logs in. It can be used in addition to requesting a password if in doubt (eg for improved security).

To improve security, for example, some embodiments involve asking a person who has access, for example, personal information about a person who has permission to access (which may be the same person in some embodiments, for example). Step 1015). Such a method may include receiving a current answer to a personal question from a person having access (eg, step 1021). Some of these embodiments may be provided by a person authorized to access the current answer (eg, performed within step 1015, and similar steps occur before step 1021 or step 1019). For example, step 1006) may be compared to a previous answer to a personal question, and the first automated, including a password, only to allow an action (eg, step 1030) or if the current answer matches the previous answer. Proceeding (eg, step 1021) to transmit the message may include.

In some such embodiments, for example, the first automated message (eg, sent in step 1015) includes a personal question and the second message (eg, received in step 1021) is present. Include the answer. These personal questions are, for example, "What is your mother's name?", "What is your pet's name?" Or "What's your favorite color?" Or combinations or alternative choices thereof or may include them. In some embodiments, such questions may provide additional levels of security.

Certain embodiments of the method 1000 include transmitting (eg, at step 1015) a first automated message to a mobile phone of a person authorized to access via the mobile telephone network (eg, 40). The first message includes a request for the identification of the requested access (eg, received at step 1009) and an agreed action instructing the authorization of the access. Such an embodiment may comprise receiving a second message (eg, indicating that the person having authority to access takes an agreed action instructing authorization of access) from the mobile telephone of the person having authority to access (For example, at step 1021). Such consent may be, for example, making a selection from a menu, pressing a button on a phone, making a voice command, or the like.

For example, in some embodiments, the first (eg, automated) message (eg, received at step 1015) displays at least one menu and at least one prompt for authorizing access by making a selection from the menu. Include. In some such embodiments, the second message (eg, received at step 1021) authorizes access or does not authorize access based on which menu was selected. in some such embodiments, it is not accepted that a failure of menu selection is not sent in the result of the second message, or that a second message is sent after a period of time indicating an action to agree.

Some of these embodiments further include receiving a current password from the person having access (e.g., step 1009) (e.g., an authorization request is made at step 1009 or the second of step 1021). When received in a message). This method is performed within a step (e.g., step 1027) comparing a current password with a previous password stored in a memory (e.g., storage 64), and similar steps are performed in step 1021, step 1010. Or performed before step 1019), and providing access only (eg, as assessed in step 1027) if the current password matches the previous password (eg, access or operation in step 1030). To allow). In another embodiment, the password (eg, when an authorization request is received in the second message of step 1009, step 1019, or 1021) may be a local keypad or keypad, a user's mobile phone, voice (eg, Voice recognition software).

Many other embodiments include other features or aspects, including those described herein. As some specific examples, in many embodiments, the first message (eg, received at step 1015), the second message (eg, received at step 1021) or both are an SMS message. Such a message may be received, for example, via mobile telephone network 40. Furthermore, some methods further include encrypting the first automated message (eg, before sending the first automated message to the mobile phone of the person authorized to access at step 1015). Embodiments that include a second message (eg, received at step 1021) may include a second message from an authorized person's mobile phone (eg, in addition to or instead of step 1012) Decrypting (eg, after receiving at step 1021) a second message of (eg, step 1024). In addition, some of these methods obtain authorization for the user's access from each person having at least multiple access rights, for example, via Internet website 65, mobile phone network 40, or both. For example, the method further includes receiving an indication of the criteria for step 1006).

In some embodiments, the access can be a physical access (eg, step 1009). For example, in many embodiments, transmitting the first automated message (eg, step 1015) may comprise a person (eg, accessing the first automated message via a mobile telephone network (eg, 40). , Comprising or consisting of the step of transmitting to the mobile phone (eg, as required in step 1009) (eg, step 1015), and the accessing person attempts physical access to the controlled space (eg. , Step 1009). In other words, the person attempting to access (eg, as requested in step 1009) and the person authorized to access (eg, step 10032, step 1006, step 1021, or a combination thereof). Is the same person, who attempts physical access. Such physical access may be, for example, physical access to enter a building or floor or area of a building, or access to move a vehicle into a controlled space. Examples of additional physical accesses are described herein.

Further, in certain embodiments, receiving indication indications for the person attempting access (eg, step 1009) includes receiving a near field communication signal from the mobile telephone of the person attempting access. For example, user 22 may pass his phone 42 in front of NFC reader or communication device 88. Because of this, mobile phone 42 may transmit the indications to device 88 (eg, step 1009), which device may access server 15, software module 61, or both via the Internet 10.

Communicate with In another embodiment, such an NFC signal may indicate the requested access or authorization (eg, step 309), and the selection of the reader or device 88 may function to indicate which access or authorization is requested. (Eg, step 309).

Referring now to FIGS. 1, 2, and 11, in the particular embodiment provided by way of example, the system 202 manages personal information for any user and / or enables secure communication, which is SECURE MOBILE. INFORMATION MANAGEMENT ™ (SMIM) platform 200 and Personal Data Providers 209. SMIM platform 200 allows mobile phone users (eg, 21-23) to have their mobile phone (eg, 41) even when there is no signal or internet connection (eg, from mobile phone network 40) for the portable phone. To 43) is an example of a technology platform for the system 100 that allows access to specific personal information. In this embodiment, the SMIM platform 200 includes one or more blocks of code configured to provide the framework and foundation of the system 100, with any development providing security for communications between components and various core software applications. Includes the ability to define standards under the circumstances under which they are defined.

In a particular embodiment, the SMIM platform 200 may comprise a module 201 (eg, a MICRO AGENT ™ module or a MICRO AGENT TECHNOLOGY ™ (MAT) module) and a module 203 (eg, a WEB SERVICES module or a CELLTRUST WALLET WEB SERVICES ™ module.). In this example of embodiment, module 201 is executed in a mobile phone, which is an example of second software module 72 or part thereof, and module 203 is an example of first software module 61 or part thereof. . In this example, module 203 is a block or software of code that runs on server 15, which communicates data with module 201 on, for example, a phone, website 65, and secure storage 64. Or exchange data. Module 203 may be, for example, a communication layer between module 201, website 65, and storage 64. Module 203 may provide or allow authentication, communication, protocol definitions, integrity checks of data, blocking unauthorized access, and the like, and may allow access to websites 65 from the Internet 10. have. Module 201 allows users 21, 22, and 23 to create, send, receive, and store secure SMS and MMS messages through phones 41, 42, and 43.

In various embodiments, module 203 may also include third parties (eg, 31-33) or Personal Data Providers 209 (banks, airlines, merchants, health care providers, etc.) (eg, storage 64, For updating their customer accounts or personal information on the website 65 and / or its secure areas, exchanging electronic medical records in a HIPAA-compliant manner, providing flight information and / or reservations, etc.) Enable communication with Module 201 or second software module 72, in this embodiment, provides a user interface, local storage, synchronization and alerting components to one or more telephones 41-43. Further, in certain embodiments, the user interface in mobile phone 41 or second software module 72 may collect information from the user (eg, 21) and provide the information back to the user. For example, Personal Data Providers 209 include financial institutions, airlines, retail stores or merchants. Module 203 may allow Personal Data Providers 209 to update customer accounts or personal information such as bank account information and content, flight information, credit card information and payment

IPR2025-00645 Page 02348

personal information such as bank account information and contact, flight information, credit card information and payment.

In some embodiments, local storage (e.g., folder 76 of mobile phone 41) allows applications (e g., second software module 72) to provide information (e.g., nugget 78 of information to phone (e.g., 41). And 79), which provides faster access, reduces dependency on the network (eg, mobile phone network 40, the Internet 10, or both), and uses the mobile phone network 40 used. By limiting the amount of data communication over), the total cost of the owner (eg, the cost of user 21) may be reduced. In some embodiments, the data (eg, nugget 78 and 79) is synchronized with the data of the server 15 so that a user (e.g. 21) is accessed via the computer 13 by their phone (e.g. 41) and the web (i.e., at least by the user 23). Internet (10) can be updated from Allows access Bc.

In certain embodiments, the data is compressed for communication with a mobile phone or device (eg, between module 201 and module 203 or between first software module 61 and second software module 72), or it can be encrypted or both. In addition, in some embodiments, substantially real-time notification of various events or activities may be sent to a telephone (eg, 41) on which module 201 (eg, module 72 or part thereof) is running. Can be provided. For example, an alert can inform a user of significant events such as withdrawal of a large amount from their account or cancellation of a flight, flight change, gate change, and the like. Additionally, in some embodiments, module 207 provides an interlayer between a user's computer (eg, 13) and users (eg, 23) operating on module 205, module 201, or both. In some embodiments, module 203 may provide information to module 207 (eg, from Personal Data Providers 209), which may then be module 205, module 201 (eg, mobile phones). Module) or both.

Further, in certain embodiments, the module 207 (eg, part of the first software module 61 or part of the website 65) is configured by a user (eg, 21-23) (eg, the Internet 10 and Web site) through which the user can access and change various information on the web, such as their personal information, their card information. In some embodiments, module 207 uses module 205 to communicate and synchronize the user's information with their mobile phone. In many embodiments, module 203, module 207, module 205, or a combination thereof may be a mobile phone (eg, 41 to 43) that is executing module 201 (eg, second software module 72). 43 may be used by third parties (eg, 31-33) or Personal Data Providers 209 for sending, receiving, or both. For example, a bank, such as a WELLS FARGO ™ bank, can send alerts to customers' mobile phones (eg, 41-43) and provide them with the latest bank account information. Another example (eg, an example of a third party 31-33) is an airline such as SOUTHWEST AIRLINES ™, which can appropriately send the most recent gate and cancellation information to their customers (eg 41-43).

In certain examples of embodiments, the SMiM platform 200, which includes embodiments of the first software module 61 and the second software module 72, is substantially comprised of vegetable stores such as SAFEWAY ™ and ALBERTSONS ™ and The GAP ™ and For example, credit cards, bank cards, users, for retailers like

STARBUCKS ™, loyalty programs, reward programs, membership cards, video clubs, library cards, insurance cards such as health, cars or life, and login and password information. It provides functions and features including secure storage of cards and information, such as identification cards, such as a driver's license. Various embodiments may provide a functional equivalent or a combination of items or information described herein (eg, as any information or data) known to be held in a user's wallet.

Further, some embodiments include centralized, secure backup storage, for example across module 61, server 15, or both. In various embodiments, users (eg, 21-23) may enter data once (eg, with their phones 41-43, with websites 65, etc.), and this information may be As long as it is maintained, it can be used. Additionally, in certain embodiments, a user (eg, 21-23) may not have to re-enter personal information, but a particular phone (eg, user 21 may replace mobile phone 41), carrier, or service The provider or both (eg, service provider of the mobile telephone network 40) can be easily replaced. Further, in this particular embodiment, users (eg, 21-23) can access their personal information virtually anywhere (eg, via their mobile phone).

In addition, certain embodiments are configurable that provide alerts to notify users of significant changes. In some such embodiments, the user (eg, 21-23) chooses whether a nugget or change of information is important to the user so that an alert is provided if the information is updated (eg, immediately) and the information is stored for later review. . Certain embodiments may provide immediate or near instant notification. Specifically, in some embodiments, the message may pop up on a mobile phone (eg, 41-43) to notify the user (eg, 21-23) of the event. In this embodiment, the user can then bring up the MICRO AGENT or the second software module 72 for detailed information about the event.

In some embodiments, a user may use module 201 or second software module 72 to take immediate action. For example, if a user is notified that a large amount of money has been withdrawn from his or her account, the user may be fraudulent by a bank (e.g., may be one of third parties 31-33 or Personal Data Providers 502) or Module 201 or second software module 72 may be used to signal the possibility of mistakes. As a result, in certain embodiments, banks or other financial institutions may immediately investigate the account to limit their legal liability or reduce losses. In various embodiments, users may place their personal information on SMiM platform 200 or system 100 to control their data. In many embodiments, the user's personal information is not stored on the employer's server where the employer has the ability or legal right to control the information and access the information. Further, in some embodiments, users (eg, 21-23) may change jobs without having to re-enter their data again.

In addition, certain embodiments may use mobile telephones (eg, 41-43) to provide specific identification card functionality. For example, mobile phone 42 can be used to identify user 22. Personal information stored on a mobile phone, server 15 or both may include a driver's license number, social security number, passport number, visa information, secret information permission information, credentials, birth certificate, citizenship, work permit, ID number, access card. , Membership cards, elevator cards, copy cards, and the like. In some embodiments, if the card or phone is lost, broken or stolen, the user can replace some or all of the access cards with a mobile phone. In various embodiments, a user may use a mobile phone to access a parking lot, company building, laboratory, or other area. Further, in some embodiments, a user may use SMiM platform 200, module 205 (eg, Secure Mobile Services) or first software module 61 to locate an employee immediately or within a certain time. The user 22 may, for example, determine the location where the mobile phone 42 is located, or use the GPS information of the phone 42 or ascertain the location information with a combination thereof.

In many embodiments, SMiM platform 200 or system 100 may be used in a retail environment. For example, in some embodiments, user 22 may use mobile phone 42 to retrieve product information for a product using local signals, such as near field communication or Bluetooth. In some embodiments, a user may browse a product's location, receive a coupon as the user enters a store, receive a special item of the day, store product information and prices for price comparison, or use the phone for a combination thereof. Can be. In some embodiments, a user may send a gift card from a mobile phone to a friend or family member, and the recipient may use their mobile phone to exchange a gift certificate for an item. In some embodiments, SMiM platform 200 or system 100 may allow a user to purchase a product at a store by making a payment with a telephone or using a credit card, debit card, or the like. In a particular embodiment, the SMiM platform 200 or system 100 may also use the secured SMS communication as well as the module 201 or rather than using a text message using clear text to transmit sensitive information. Enable secure communication between the second software module 72 and the website (eg, 65).

Another embodiment includes or is coupled to a telephone with a key card. One example includes a component for a mobile telephone (or a mobile telephone including components) and is an apparatus for communicating code, the component comprising passive code configured to be read by the reader when the telephone passes very close to the reader. do. In many such embodiments, the reader is a device, not a user. The reader of this embodiment is similar to the communication device 88 shown and described herein in FIG. 1 and may be or similar to, for example, a card reader configured to read a manual code from a card.

In a particular embodiment, for example, the passive code includes a magnetic code and the reader is configured to read the magnetic code, or the passive code includes a barcode and the reader includes a barcode reader. In some embodiments, the passive code is substantially immutable. As used herein, "substantially immutable" means that the average user cannot change the manual code in a way that is more convenient than replacing a component or phone. Thus, the user cannot improvise the

IPR2025-00645 Page 02349

code, and the person reading the code may rely on, for example, to identify the user. Although not necessarily failing, in some of these embodiments, changing the manual code of a particular phone or component to copy the manual code of another phone will be at least as difficult as duplicating another person's credit card.

As used herein, "manual" or "passively" means that power is supplied from the battery or electrical system of the telephone or not electrically connected to the telephone (or other battery or electrical system). Further, as used herein, the term "component" of the telephone excludes the disposable packaging of the telephone (which may include a barcode for product sale or tracking purposes) Furthermore, in some embodiments, the component includes a back of the mobile phone, a battery cover of the mobile phone, a battery of the mobile phone or a case of the mobile phone.

Furthermore, in some embodiments, the mobile phone includes a phone number and the manual code includes the mobile phone's phone number. Further, in some embodiments, for other examples, the passive code includes a number that is unique to a component from all other components and from all other components. In another embodiment, the manual code may include, for example, the user's name, indications for the user, indications for the account, some or a combination thereof.

Various embodiments may include a method of replacing the back end of a telephone with a key card. Another example includes a method that does not need to carry a card. This method provides or obtains a mobile telephone having a component configured to manually generate code configured to be read by the reader when the mobile telephone including the component passes very close to the reader (eg, device 88). Step (or providing or obtaining at least a component for a mobile phone). Some embodiments may require access only in close proximity, for example, instead of very close using Bluetooth. Such a method may include obtaining or providing a component having one or more aspects described above as an example of an apparatus for communicating code. Certain embodiments include providing a component as a replacement part for an existing mobile phone that previously did not have the ability to generate such code manually.

Other embodiments include various methods of using a telephone with a key card. Examples of such embodiments include providing or acquiring at least one reader (eg, device 88) configured to read passive code from a device that includes code passing adjacent to (eg, very close to) the reader. And authorizing the person who wishes to be identified in order to pass the mobile phone (eg, 42) in close proximity to the reader (eg, device 88), wherein the person (eg, 22) who wants to be identified is A method of having a passive code in their mobile telephone (eg, 42). Such a method may include using a passive code read by a reader (eg, device 88) to identify a person (eg, 22).

Such methods may be introduced, for example, by merchants, service providers, employers, landlords, manufacturers, companies, schools or government agencies. In addition, the method may include obtaining or providing a component having one or more aspects described above as an example of an apparatus for communicating code. In some embodiments, such methods may be used in combination with or as part of other methods described herein. In some embodiments, such methods or systems may be used for specific purposes or for one or more purposes.

In certain embodiments, for each of a number of users, the identity of a person is used to authorize spending from a credit or withdrawal account at the time of purchase of goods or payment for a service. In various embodiments, for each of a number of people, the person's identity is used to allow physical access to the controlled space. Furthermore, in some embodiments, for each of the at least two people, the identity of the person is used to authorize computer access to the electronically stored information. Even in some embodiments, the method further comprises at least one other means for identifying a person. Such other means may be one of the means described herein or known in the art, for example.

Still another embodiment includes a method that does not need to carry a card. An example of such a method includes replacing an old component of a mobile phone with a new component. In some embodiments, the new component includes at least one of, for example, a rear end of the mobile phone, a battery cover, a battery and a case. In some embodiments, the new component includes a magnetic code configured to generate a magnetic code to be read by the card reader (eg, device 88) when the phone passes very close to the card reader. Other embodiments may use barcodes.

Another embodiment includes another method that does not require carrying a card. The method includes constructing a mobile phone having a component, the component comprising at least one of a rear end of the mobile phone, a battery cover, a battery and a case, wherein the component is located very close to the card reader. Include code configured to be read by a card reader (eg, device 88) as it passes. Another embodiment includes a method or telephone for communicating codes using near field communication, which codes are stored in the telephone, selected by a user, and transmitted through an NFC transmitter (eg, device 82). Other uses are described herein, for example, where the code is sent from a server (eg, 15) to a phone via a mobile phone network (eg, 40) or a third party (eg, 31) via the Internet 10. 33) to collect the code.

Referring now to FIGS. 1 and 12, in some embodiments, the agency 1203 is one of a short code (or long code) assigned to sell an item and a globally assigned identification (eg, keyword) or Use more than that. Short codes and globally assigned IDs may be advertised through, for example, magazines, the web / Internet or other means / media Short codes are also referred to as short numbers, dedicated short codes, shared short codes, or Common Short Codes (CSCs) (eg, specific phone numbers that can be used to send SMS and MMS messages from phones 41, 42, or 43). . For example, a globally assigned ID is a keyword sent using a message as a short code (or long code), or a requested item or short code (or long code) sent using a message with a short code (or long code). Contains a globally assigned ID for a particular item sent using the message. Each agency 1203 for a particular item may have one or more of a unique short code, a globally assigned ID, and keywords. For example, if server 15 has been assigned a unique short code, server 15 can function as merchant or agency 1203 by assigning a unique keyword to each merchant or agency 1203. When a user orders an item, the keyword used by the user identifies the particular agency 1203 to order and purchase the item therefrom. In another example, if each agency 1203 is assigned a unique short code, then the agency 1203 can function as the merchant itself. Other short codes or long codes may belong to different third parties 31, 32 or 33. Communication between module 201 and each third party 31, 32, and 33 is encrypted using a different key. Further, third parties 31, 32 and 33 can specify the duration between their encryption algorithm, key generation algorithm and change of their encryption key

For example, server 15 or agency 1203 may store or have access to one or more servers. The user 21 sends a keyword (e.g., 1234) via the telephone 41 in a short code (e.g., 54321). In this example, user 21 sends an SMS message or MMS message for item 1234 with short code 54321 via phone 41. Since the short code 54321 is assigned to the server 15 (or the agency 1203), the server 15 has stored information for the item 1234 (e.g , the server 15 may be assigned to the predefined information for the stored item 1234). Nuggets, which can be customized upon request or purchase made by user 21). The server 15 provides the user 21 with a nugget of information about the item 1234 by replying to the SMS message or MMS message of the user 21 previously sent with the short code 54321. The server 15 has an SMS gateway 115 with a nugget of predefined information associated with each keyword (e.g., "Item 1234", "ABCD" or any other keyword), which provides the user with specific information. The request of (21) can be easily returned. For example, the nugget of information may include at least one of order information (eg, a number), confirmation information (eg, a number), alert, or other information.

The keyword can be any combination of commands or requests. The second software module 72 may configure automated command options (eg, a predefined keyword (eg, for the user 21 to select) for the user 21 to have a menu driven option. Configured and defined) Server 15 and / or reseller 1203 are notified that user 21 requests information or wants to purchase item 1234. Server 15 or reseller 1203 is notified of user. Request confirmation of an order or payment (or use of a prepaid credit card) from 21, and send an SMS or MMS message via the Internet, an SMS gateway (or MMS gateway) 115 and a telephone 41;) Provides information about item 1234 to user 21. For example, server 15 or reseller 1203 can confirm to user 21 to purchase a product for a $ 25 payment. Send the requesting SMS message.

The first software module 61 of the server 15 is recorded on a computer readable medium and includes programming instructions for receiving information about one or more dealerships 1203 to create one or more dealership accounts. dc. In an exemplary embodiment, with continued reference to FIGS. 1 and 12, the reseller 1203 can directly or through a reseller account at server 15 or manufacturer 1205 (eg, merchant, third party or other entity). Receive through 15. In this example embodiment, the reseller account allows the reseller 1203 to perform the following tasks via the server 15: create an SMS or MMS message for a particular item, customize a message

reseller account allows the reseller 1203 to perform the following tasks via the server 15: create an SMS or MMS message for a particular item, customize a message, Activate and deactivate messages, configure messages, purchase SMS, email credit or MMS credit, and view reports. The reseller account can be set up and configured in a variety of ways depending on the needs of the reseller 1203.

Distributor 1203 generates an SMS or MMS message for a particular merchant for the ID (or keyword) that is globally assigned via server 15. For example, agency 1203 may purchase one or more globally assigned IDs from server 15. The agency 1203 customizes a message for a particular keyword related to the information requested by the users 21, 22 and / or 23 via the server 15. Dealer 1203 activates and / or deactivates messages, depending on the environment, via server (15). The reseller 1203 composing a message via the server 15 determines whether an SMS or MMS or e-mail should be sent to the reseller 1203 each time a user (eg, a future buyer) requests information, And responding to the user's request for information by further requesting that the user provide an email address to send additional information to the email address provided by the user. If the user provides an e-mail address, server 15 may send an SMS message, e-mail or MMS message to the user with more detailed information. For example, server 15 may send a link (eg, a WAP push) to the user via an SMS message or MMS message (eg, a message with a link to a WAP address) that includes this information. The server 15 communicates with the user's telephone 41, 42 or 43 and uses a location based service at any time, based on the GPS of the telephone 41, 42 and 43 for a particular region (main, region or other region). May provide information about other lotteries or any other place specific information the user may request. Agent 1203 may purchase SMS or MMS credits from server 15 and make SMS or MMS credits available to users 21, 22 and / or 23. The agency 1203 confirming the report includes identifying a prospective buyer's number, a prospective buyer's telephone number, and other related information.

Prospective users 21, 22 and / or 23 may retrieve the information by sending an SMS message, MMS message or text message, for example with a short code (or long code) and assign a globally assigned ID as the text for the message. Phone 41, 42 or 43 (eg, a mobile phone or a portable phone in some embodiments) may be used to enter. For example, the agency 703 may include a message that includes a globally assigned ID for an item (eg, ABC0E), a request for the item, or any other identification or requested information for the short or long code (DPzjs vs 65203). It may include information on how to transmit. The SMS gateway can be used to send and receive SMS messages (or the MMS gateway can be used to send and receive MMS messages). For example, in FIG. 1, the SMS gateway 115 (or MMS gateway 115) is generally a telephone network 40 and the Internet 10 or of the Internet 10 and the server 15 or server 15. Between some. The server 15, the phone 41, 42 or 43 and / or the third party 31, 32 and / or 33 may via this SMS gateway 115 or the MMS gateway 115 securely send SMS or MMS messages. Can be sent or received. The gateway 115 may include the following modules that communicate with each other such that the server 15, the telephone 41, 42, or 43 and / or the third parties 31, 32, and / or 33 may receive such SMS. Enables sending or receiving SMS or MMS messages through gateway 115 or MMS gateway 115: SMS / MMS module, campaign module, account

module, contact module, reporting module, scheduling module, template Modules, subscription modules, coupon modules, media modules, multi-channel gateway modules, and the like. In addition, the gateway 115 may include any suitable module configured to enable secure generation, transmission, delivery, storage and / or reporting on secure and / or conventional messages. The mobile broadband card (or wireless Internet access card for laptop) is used with the mobile terminal (phones 41, 42 or 43), and then the telephone network 40 can be used for communication (including access to the Internet). Or not included).

In some embodiments, when server 15 receives an SMS or MMS message, server 15 retrieves information about the item, and in some embodiments, server 15 organizes the information and reseller 1203 Attach a personal or comprehensive message from the client, or both, and send the information to users 21, 22, and / or 23. The server 15 receives a request for information from the users 21, 22 and / or 23 via an SMS or MMS message, which information depends on at least one of a short code, a long code and a globally assigned ID associated with the item. do. The server 15 may be a third party 31, 32 and / or 33 (eg, merchant or merchant server, agency 1203 or EBAY) to obtain the item requested by the users 21, 22 and / or 23. " server). For example, server 15 communicates with third parties 31, 32 and / or 33 to retrieve information. The communication between the server 15 and the third parties 31, 32 and / or 33 may be performed via an HTTP / HTTPS protocol and / or a web service over an Internet connection. The server 15 requests information from the merchant server using the item number as a keyword. The server! 5 extracts relevant information (eg, price, number and any other required information) This related information consists mainly of an information package of less than 160 characters when suited to an SMS message. The server 15 may organize the information (eg, take SMS or MMS message information in the required format (eg, a limited number / type of characters) and convert the information into a more required format. The server 15 attaches a message (eg, from the dealership 1203) and sends the information requested by the users 21, 22 and / or 23 of the user 21, 22 and / or 23 via the mobile telephone network. Transmit to telephones 41, 42 and / or 43. In some embodiments, reseller 1203 has the ability to access and change information to server 15 via the web (Internet).

FIG. 13 is a flow diagram illustrating an example of various methods of using server 15 to communicate with one or more of users 21, 22, and 23 to provide information to users 21, 22, and 23. Server 15 receives a request for information from one or more of users 21, 22, and 23 (step 1301). The users 21, 22 and 23 transmit an information request via at least one of a text message, an MMS message and an SMS message sent with at least one of a short code and a long code (step 1303). The information requested by users 21, 22, and 23 depends on the globally assigned ID associated with the information requested by users 21, 22, and 23. The server 15 communicates with one or more third parties 31, 32 or 33 to obtain the information requested by the users 21, 22 and 23, or otherwise the users 21, 22 and 23. Has access to the information requested by (eg, within server 15) (step 1305). The server 15 transmits the information requested by the users 21, 22, and 23 via the telephone network 40 to one or more of the users 21, 22, and 23 as at least one of a text message, an MMS message, and an SMS message. Transmit to telephones 41, 42, 43 (step 1307).

In one exemplary embodiment, referring further to FIG. 1, a second software module 72 (described below) for execution on the phones 41, 42, and / or 43 of the users 21, 22, and / or 23.) Is recorded on a computer readable medium, and requests, receives, orders and purchases information about an item using the telephones 41, 42 and / or 43 of the users 21, 22 and / or 23. Programming instructions for communicating with one or more merchant servers or distributors 1203. The second software module 72 further includes programming instructions for requesting, receiving and transmitting information.

The agent 1203 may compose a message and confirm a report through communication with the server 15. The agency 1203 may change the information provided to the server 15. The dealership 1203 can provide an alert to the dealership 1203 when any one of the users 21, 22, or 23 requests specific information, sends a message in a short or long code, or communicates with the server 15. The environment with the profile or the server 15 can be configured. Some embodiments include one or more of the following features: Potential buyers (eg, users or buyers) may register with the web to receive updates on items / items via SMS, MMS or email and ; Resellers can automatically send contact information to potential buyers via email, MMS or SMS; Once an item is available to match a buyer's profile (eg, brand, service, availability in a particular area or any other desired feature), the agent can provide services to potential buyers by SMS, MMS or email. .

With further reference to FIG. 1, website 65 may include a main page or homepage (or one or more such pages) that may be associated with new users and new third parties. The new user may be linked to such page or pages or website 65 by a search engine, advertisement, broker, agency, or the like. The users (eg, 21-23) may be assigned (or inquired to select) the user's name, the user's ID, password, and the like, which may allow the user to, for example, access a secure area or page of the website 65. The personal information may be inputted, displayed, updated, or the like. In some embodiments, security of this area may be provided, for example, using the novel systems and methods described herein. In some embodiments, such security zones may include information entered by third parties (eg, 31, 32, and 33). Further, in some embodiments, third parties (eg, 31-33) may have their own secure areas (eg, password protected or described herein) within, for example, website 65 or on server 15 or other servers. Protected), and a third party (eg, some or all of 31, 32, and 33) may enter, verify, update or perform combinations of information for multiple users.

In some embodiments, the first software module 61 filters the personal information and selects a nugget of personal information that the first software module 61 sends to the mobile phone (eg, 41) of the appropriate user (eg, 21). do. As used herein, 'nuggets of information' are individual pieces of information that are a subset of the overall information. The nugget of information may be in digital form, for example, and may be in the form of a text, a number, or a combination of values. In some embodiments, as a further example, the nugget may include a photo, text, graphics, and the like. Such a nugget may be transmitted, for example, via mobile phone

IPR2025-00645 Page 02351

network 40 and may be sent, for example, in a text, MMS message or SMS message. In some embodiments, server 15 may access mobile telephone network 40, for example, via the Internet 10.

In various embodiments, the second software module 72 may operate on one or more mobile phones (eg, 41 to 43, which may operate on one or more mobile phones even though module 72 is shown only on phone 41). Operate (eg, independently). Further, in this embodiment, the second software module 72 receives a nugget of the user's (eg, 21) personal information from the first software module 61 via the Internet 10 and the mobile telephone network 40. , The personal information can be stored in the mobile phone 41 so that the personal information can later be accessed by the user 21 even if the mobile phone 41 is not connected to the mobile phone network 40. The user 21 can access personal information, for example by identifying a folder 76 containing nuggets 78 and 79, which can be organized by content, for example. Such content may be, for example, financial information, which may include account balances, transaction history, etc. In some embodiments, such other content may be travel information as another example, such as flight arrival time, for example And places, and the like.

In some such embodiments, for a number of users (eg, 21-23), the second software module 72 may be, for example, the website 65, the Internet 10, the mobile telephone network 40, or the like. The combination may be downloaded from the first software module 61 to the mobile telephone (eg 41 to 43) by the user. Furthermore, in some embodiments, for many users (eg, 21-23), the first software module 61 may be one of the emails received by the user (eg, 21-23) for keywords, identification numbers, or both. Instructions to retrieve some or all of the personal information from the email using keywords, identification numbers or both (eg, 78 and 79). For example, the software module 61 may be configured for a particular user (eg, 21, 22 or 23) for account number, flight number, third party name (eg one or more of 31, 32 and 33), or the like. You can search the received email and extract the nugget of the information belonging to it. In some embodiments, software module 61 may retrieve all emails (eg, emails sent to a particular user), and in other embodiments may retrieve only emails from a particular source or a specific email address.

Additionally, in some such embodiments, for many or all users, the second software module 72 selects at least some of the personal information stored by the user (eg, 21) on the mobile phone (eg, selects nugget 78). Select or enter an identifier of at least one of the other party (eg, 22) and the other party's mobile phone (eg, 42), and send personal information (eg, nugget 78) to the other party's mobile phone (eg, 42). Instruct the user to select to transmit. As an example of such another person, for example, the user 21, the users 22 and 23 may be other persons, and their phones 42 and 43 may be other parties' mobile telephones. Examples of such identifiers include another person's name, another person's phone number, user identification number, and the like. In many embodiments, for multiple users, the first software module 61 is instructed to evaluate whether the other party's mobile phone has a particular function or includes a copy of a particular software, such as a second software module 72. It further includes.

In some such embodiments, where the other party's mobile phone includes a copy of the second software module 72, for example, the first software module 61 may be a mobile phone network 40, the Internet 10, or both. May transmit (at least) part of the personal information to a copy of the second software module 72 of the other party's mobile phone. On the other hand, in some embodiments, if the other party's mobile phone does not include a copy of the second software module 72, e g. for other software with appropriate equivalent functionality, the first software module 61 is a standard email. Or in the form of a text message, at least part of the personal information can be sent to another person's mobile phone.

In another embodiment, software module 72 may transmit information directly to another party rather than having a first software module (eg, module 61). In some embodiments, for one or more users, the first software module 61 further includes instructions for receiving instructions from the user (eg, user 21), for example via mobile phone network 40. Upon receiving the command, the method further includes an instruction to transmit at least some of the nuggets of the personal information to another person (eg, user 22 or 23 or specifically in some embodiments their phone 42 or 43).

Additionally, in some embodiments, for many users or all users, the first software module 61 commands from a user (eg, one of the users 21-23), for example, via the mobile telephone network 40. Instructions for receiving and objecting to financial transactions for a particular account described in the nugget of personal information. In certain embodiments, for example, upon receiving a command, the first software module 61 may include an instruction to send an objection to the transaction to the manager of the particular account via a network, such as the Internet 10. . The manager of the account may be, for example, a third party 33, for example a bank or financial institution. Objections to such transactions may be sent to third parties (eg, 33) in the form of e-mail or text messages sent via the Internet 10, mobile phone network 40 or both, for example. In an embodiment, the objection to the transaction may be transmitted over another example via a personal or financial network.

In various embodiments, software module 72, software module 61 and / or various other components may comprise a particular application and / or user group, such as mobile banking, entry of healthcare information, domain registration, airline check-in, government It can be configured to support internal and inter-institutional communications, corporate communications, and the like.

Furthermore, in some embodiments, some or all of the mobile telephones (eg, 41-43) can be configured to transmit, receive, or both local signals. For example, mobile phone 42 includes a local transmitter, receiver, antenna or combination thereof, in this embodiment a communication device 82 in communication with a reader or local

communication device 88. In other embodiments, device 88 may read a signal, transmit a signal, or both. The communication devices 82 and 88 may exchange signals in one or two directions through local area communication, personal communication network, Bluetooth, barcode, WiFi, or the like.

Various embodiments provide for extracting specific information from a user's email and sending the information to the user's mobile phone. Referring to FIG. 1, a particular embodiment uses a plurality of users (eg, 21-23), for example, using the Internet 10 and mobile phones (eg, 41-43) of users (eg, 21-23). Includes various systems for managing information about. In many embodiments, the system includes a first software module 67 for classifying information. Such software module 67 may be recorded on a computer readable medium such as a hard drive, random access memory (RAM), read only memory (ROM), disk, memory stick, or the like. Such software module 67 may be provided in server 15, for example, and may be module 61 or part thereof, as shown. In some embodiments, first software module 67 includes programming instructions for receiving a plurality of emails that contain information about a business of a user (eg, one of users 21-23). These emails may be all or some of the emails that were sent to the email address of a particular user (eg, one of the users 21-23) over the Internet 10.

Information about your business may include: personal information; Financial information; Travel information; Information on financial accounts, financial transactions, expenditures, purchases, savings, loans, etc .; Or other information described herein or known in the art. Further, the information about the user's business may further be related to the personal business of the user or to the business of the user owning, controlling, managing or investing or of the employer's business. In some embodiments, fewer (ie, selected) emails (eg, in the first software module 67) than all of the emails sent to a particular user (eg, one of the users 21-23) may be received. have. For example, in some embodiments, only emails sent from one or more specific senders or entities (e.g., some or all of third parties 31-33) or one or more specific email addresses may be used. May be received (ie, an email may be selected). Such senders (e.g., some or all of the third parties 31-33) may be, for example, banks, financial institutions, card providers, airlines, travel agencies, etc., or third parties 31 described herein in certain embodiments. To 33), wherein the third party may have been selected by a user (e.g., one of the users 21-23).

In some embodiments, first software module 67 includes programming instructions to retrieve some or all of the emails and extract specific information from the selected emails, for example, for a keyword or identification number (or both). Examples of such keywords and identification numbers include words such as account number, frequent flyer number, flight number, "balance", "withdrawal", "withdrawal", "delay", "gate", "flight", "cancel", etc. do.

Such particular embodiments may include, for example, account balances, withdrawals or withdrawals from accounts, deposits for accounts, account, bank card charges, departure times, departure locations, travel information such as flight status, and the like. In various embodiments, the first software module 67 is a mobile

IPR2025-00645 Page 02352

telephone (eg, one of the users 21-23) of the user (eg, one of the users 21-23), for example, via the mobile telephone network 40, the Internet 10, or both. For example, it further includes programming instructions for transmitting specific information to the appropriate one of the telephones 41 to 43.

Various embodiments further include a second software module 77 running (eg, executing) on the user's mobile phone (eg, an appropriate one of the phones 41-43). The second software module 77 stores certain information on the user's mobile phone (e.g., one of the phones 41-43) and stores the specific information by the user (e.g., one of the users 21-23). May include programming instructions to provide access. The second software module 77 may be recorded in a computer readable medium such as a hard drive, RAM, ROM, disk, memory stick, or the like.

In some embodiments, the second software module 77 is stored on a server (eg, server 15) for download to a user's mobile phone (eg, one or more appropriate ones of phones 41-43) or can be recorded. In many embodiments, the second software module 77 may be written to memory in, for example, the user's mobile phone (eg, an appropriate one of the phones 41-43). This second software module 77 may be part of the software module 72 shown in FIG. 1, for example, in the mobile phone 41. The specific information may be, for example, including nuggets 78, 79 or both as described herein, or may be included in the nugget.

Some such embodiments retrieve email from at least one particular sender (eg, one or more of third parties 31-33) and retrieve email from at least one particular sender, for example, via the Internet 10. It further includes a third software module 17 configured to be executed on the user's computer (eg, the computer 13 of the user 23) that includes programming instructions to be sent to the software module 67. In various embodiments, module 17 may deliver email to module 67, in other embodiments, the email may be sent to a new mail, read on a user's computer (eg, computer 13 of user 23). The marked mail or delivered can be kept marked or deleted from the user's computer. In a particular embodiment, the third software module 17 may be a plug-in for e-mail management application, for example MICROSOFT OUTLOOK.

Further, in some embodiments, the first software module 67 or 61 includes programming instructions to encrypt the specific information before transmitting the specific information to the user's mobile phone (eg, 41). In some embodiments, second software module 77 or 72 includes programming instructions to decrypt certain information. Further, in some embodiments, the first software module 67 or 61 includes programming instructions to compress the specific information before transmitting the specific information to the user's mobile phone (eg, 41). And in some embodiments, the second software module 77 or 72 includes programming instructions to restore specific information. Decryption and encryption can be used together or separately in different embodiments.

Additionally, in certain embodiments, the first software module 67 or 61 receives instructions from a user (eg, user 21) to identify at least one threshold for an alarm for at least some of the specific information. Contains programming instructions. In this particular embodiment, the first software module 67 or 61 or the second software module 77 or 62 (or a combination thereof) includes programming instructions for comparing at least some of the specific information to a threshold. Further, in some embodiments, the first software module 67 or 61 or the second software module 77 or 72 (or a combination thereof) includes programming instructions to provide an alarm to the user when certain information passes the threshold. . Such an alarm can be, for example, in the manner described herein, such as a voice alarm, a light or display, a vibration alarm or a combination thereof.

In some embodiments, for example, for a number of users (eg, one or more of users 21-23), the specific information includes financial account information, which is from an account, such as a financial or bank account. It may include the withdrawal or withdrawal amount of. In certain embodiments, the (eg, at least one) threshold may be or include a withdrawal amount or withdrawal amount, and the first software module 67 or the second software module 77 (or both) may include withdrawal or withdrawal amount (Or both) may include programming instructions to provide an alarm to a user (eg, an appropriate one (or more) of users 21-23). In another example, in some embodiments, for each of a plurality of users (eg, users 21-23), the specific information includes travel information, which may include a departure time, a departure location (eg, departure gate) or two. Includes everything. In some such embodiments, the first software module 67 or the second software module 77 (or both) may, for example, program instructions to provide an alarm if the departure time or departure location (or both) changes. It includes. In other embodiments, alarms may be provided for other thresholds or other criteria.

Furthermore, in many embodiments, for one or more of the users (eg, users 21-23), the second software module 77 allows the user (eg, user 21) to have a mobile phone (eg, , Select at least some of the specific information stored in < RTI ID = 0.0 > 41, < / RTI > select or enter a third party's mobile phone number (e.g., the telephone number of the user 22), A programming instruction that allows the user to choose to transmit to the mobile phone 42 of the user 22. In some embodiments, for at least a plurality of users (eg, user 21), the first software module 67 is configured such that a third party mobile phone (eg, mobile phone 42 of user 22) is second to the second. It further includes instructions for evaluating whether to include a copy of the software module 77, the module 72, or both. In some such embodiments, where the third party's mobile phone (eg, mobile phone 42 of user 22) comprises a copy of second software module 77, first software module 67 may, for example, For example, a copy of some of the personal information via a mobile phone network 40, the Internet, or both, as a copy of a second software module 77 of a third party mobile phone (e.g., mobile phone 42 of user 22). I can send it.

Effects, other advantages, and solutions to problems have been described herein with respect to specific embodiments. However, solutions and component (s) for effects, advantages or problems do not further express that effects, advantages or solutions are to be interpreted as important, required or essential features or components of the claims. References to elements of a single embodiment are not intended to mean "one and only one" unless explicitly stated, and are instead interpreted as "one or more". As used herein, the terms "comprises", "comprising" or variations thereof are intended to cover non-exclusive inclusions, such that a process, method, article or apparatus comprising a list of components is intended to include those components. It may not include only, and may include other components that are not explicitly indicated but specific to such processes, methods, objects or devices. Furthermore, no component described herein is actually required unless explicitly stated to be "essential" or "important". In addition, those skilled in the art will recognize that changes and modifications may be implemented in the exemplary embodiments without departing from the scope of the present invention. Accordingly, other embodiments may include different combinations, arrangements, and / or sequences of components or process steps as described herein or shown in the figures. For example, various components, components or process steps may be configured in alternative ways depending on the particular application or cost considerations. Such other changes or modifications are intended to be included within the scope of the invention as set forth in the following claims.

100: system 10: Internet

Patent Citations (155)

31, 32, 33: Third Party 40: Mobile Phone Network

41-42-43: telephone

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US3833885A *	1973-05-24	1974-09-03	Docutel Corp	Automatic banking system
US5436960A	1991-05-20	1995-07-25	Campana, Jr.; Thomas J.	Electronic mail system with RF communications to mobile processors and method of operation thereof
US5668880A *	1991-07-08	1997-09-16	Alajajian; Philip Michael	Inter-vehicle personal data communications device

IPR2025-00645 Page 02353

US6510325B1 *	1996-04-19	2003-01-21	Mack, Ii Gawins A.	Convertible portable telephone
US6041123A *	1996-07-01	2000-03-21	Allsoft Distributing Incorporated	Centralized secure communications system
US5812671A *	1996-07-17	1998-09-22	Xante Corporation	Cryptographic communication system
DE19722424C5 *	1997-05-28	2006-09-14	Telefonaktiebolaget Lm Ericsson (Publ)	Method of securing access to a remote system
US7127741B2 *	1998-11-03	2006-10-24	Tumbleweed Communications Corp.	Method and system for e-mail message transmission
EP0917119A3 *	1997-11-12	2001-01-10	Citicorp Development Center, Inc.	Distributed network based electronic wallet
FI108827B *	1998-01-08	2002-03-28	Nokia Corp	A method for implementing connection security in a wireless network
US6925568B1	1998-01-16	2005-08-02	Sonera Oyj	Method and system for the processing of messages in a telecommunication system
US6449758B1	1998-09-08	2002-12-10	Microsoft Corporation	Offline viewing of internet content with a mobile device
GB2341529B *	1998-09-12	2003-10-29	Ibm	Apparatus and method for establishing communication in a computer network
US20050192008A1 *	1999-03-31	2005-09-01	Nimesh Desai	System and method for selective information exchange
US6697009B1	1999-05-17	2004-11-29	Caveo Technology, Llc	Theft detection system and method
US6705520B1 *	1999-11-15	2004-03-16	Satyan G. Pitroda	Point of sale adapter for electronic transaction device
EP1104213A3 *	1999-11-29	2003-05-21	Philips Intellectual Property & Standards GmbH	Wireless network with key change procedure
WO2001040605A1 *	1999-11-30	2001-06-07	Bording Data A/S	An electronic key device, a system and a method of managing electronic key information
DE69935339T2 *	1999-12-02	2007-11-15	Sony Deutschland Gmbh	Protocol for instant messaging
US7066387B2 *	2000-09-30	2006-06-27	Kabushiki Kaisha Sega	Service ticket issuing system and service ticket issuing service
US20070136592A1 *	2000-04-12	2007-06-14	Smith Richard A	Wireless internet gateway
EP1273125A2 *	2000-04-14	2003-01-08	PostX Corporation	Systems and methods for encrypting/decrypting data using a broker agent
US20040204041A1	2000-06-16	2004-10-14	Fillebrown Lisa A.	Wireless tablet for a personal wireless network
FR2810838B1 *	2000-06-22	2002-10-04	Cit Alcatel	METHOD FOR ACCESSING A SERVICE FROM A MOBILE RADIO COMMUNICATION TERMINAL USING A SHORT NUMBER
US6871063B1 *	2000-06-30	2005-03-22	Intel Corporation	Method and apparatus for controlling access to a computer system
US8727853B2 *	2000-09-27	2014-05-20	Milestone Entertainment, LLC	Methods and apparatus for enhanced play in lottery and gaming environments
SE518418C2 *	2000-12-28	2002-10-08	Ericsson Telefon Ab L M	Sound-based proximity detector
US7308477B1 *	2001-01-10	2007-12-11	Cisco Technology, Inc.	Unified messaging system configured for transport of encrypted messages
US7073208B2 *	2001-01-24	2006-07-04	Intel Corporation	Method of providing secure content-based user experience enhancement within a content protection architecture
EP1229467A1 *	2001-02-06	2002-08-07	Wincor Nixdorf GmbH & Co KG	Payment system comprising a mobile device
US20050015451A1 *	2001-02-15	2005-01-20	Sheldon Valentine D'arcy	Automatic e-mail address directory and sorting system
GB0104136D0	2001-02-20	2001-04-11	Hewlett Packard Co	Apparatus for credential authorisation
US20020133557A1 *	2001-03-03	2002-09-19	Winarski Donna Ilene Robinson	Sorting e-mail
JP2002279320A	2001-03-15	2002-09-27	Kenwood Corp	Method and device for settling by credit by mobile phone
US20020161476A1	2001-04-05	2002-10-31	David Panofsky	System for vending and dispensing digital files
US7277927B2	2001-04-13	2007-10-02	Earthlink, Inc.	Systems and methods for saving internet content into a handheld internet appliance
US20020186845A1	2001-06-11	2002-12-12	Santanu Dutta	Method and apparatus for remotely disabling and enabling access to secure transaction functions of a mobile terminal
US20060240806A1	2001-07-18	2006-10-26	Saban Demirbasa	Data security device

US8033284B2 *	2001-07-18	2011-10-04	Data Transfer & Communications Limited	Data security device
US7184747B2 *	2001-07-25	2007-02-27	Ncr Corporation	System and method for implementing financial transactions using cellular telephone data
US20030043036A1 *	2001-09-04	2003-03-06	Acco Brands, Inc	Loss prevention system for portable electronic devices
JP4984364B2 *	2001-09-13	2012-07-25	ソニー株式会社	Information processing apparatus and method
US6811484B2 *	2001-09-26	2004-11-02	Milestone Entertainment Llc	Games, and methods and apparatus for game play in games of chance
US20030109271A1 *	2001-11-16	2003-06-12	Lewis John Ervin	Telecommunications system messaging infrastructure
US7454195B2 *	2001-11-16	2008-11-18	At&T Mobility Ii, Llc	System for the centralized storage of wireless customer information
US20030115288A1 *	2001-12-14	2003-06-19	Ljubicich Philip A.	Technique for effective management of information and communications using a mobile device
CA3006804C *	2001-12-26	2021-05-18	Blackberry Limited	Security interface for a mobile device
US7013006B1	2002-01-18	2006-03-14	Bellsouth Intellectual Property Corporation	Programmable audio alert system and method
US7308256B2 *	2002-01-30	2007-12-11	Comverse, Inc.	Wireless personalized self-service network
US20050120230A1 *	2002-02-18	2005-06-02	Waterson David L.	System for preventing a computer virus accessing email addresses
US6768429B2 *	2002-02-28	2004-07-27	Teknovus, Inc.	Multiplexing an additional bit stream with a primary bit stream with conversion between qB/rB and xB/yB encoded bit streams
US7250846B2 *	2002-03-05	2007-07-31	International Business Machines Corporation	Method and apparatus for providing dynamic user alert
DE60329584D1 *	2002-03-20	2009-11-19	Research In Motion Ltd	SYSTEM AND METHOD FOR SENDING AND USING THE MESSAGES
US20030182559A1 *	2002-03-22	2003-09-25	Ian Curry	Secure communication apparatus and method for facilitating recipient and sender activity delegation
EP1353298A1	2002-04-10	2003-10-15	SkiData AG	Method and system for paid or authorised parking
US7321969B2 *	2002-04-26	2008-01-22	Entrust Limited	Secure instant messaging system using instant messaging group policy certificates
AUPS217002A0 *	2002-05-07	2002-06-06	Wireless Applications Pty Ltd	Clarence tan
US7096254B2 *	2002-05-30	2006-08-22	International Business Machines Corporation	Electronic mail distribution network implementation for safeguarding sender's address book covering addressee aliases with minimum interference with normal electronic mail transmission
US20040127256A1 *	2002-07-30	2004-07-01	Scott Goldthwaite	Mobile device equipped with a contactless smart card reader/writer
US7822688B2 *	2002-08-08	2010-10-26	Fujitsu Limited	Wireless wallet
US7239861B2	2002-08-26	2007-07-03	Cisco Technology, Inc.	System and method for communication service portability
WO2004043037A1 *	2002-11-06	2004-05-21	International Business Machines Corporation	Providing a user device with a set of access codes
US20040117262A1 *	2002-12-17	2004-06-17	Berger Jeffrey Keith	System and method for conducting a monetary transaction
US7526800B2 *	2003-02-28	2009-04-28	Novell, Inc.	Administration of protection of data accessible by a mobile device
GB2396472A *	2002-12-18	2004-06-23	Ncr Int Inc	System for cash withdrawal
US7155405B2 *	2002-12-31	2006-12-26	Symbol Technologies, Inc.	System for communicating product and service related information to a user based on direction of movement
US7088287B2	2003-02-14	2006-08-08	Qualcomm Incorporated	Enhanced user privacy for mobile station location services
US6946715B2 *	2003-02-19	2005-09-20	Micron Technology, Inc.	CMOS image sensor and method of fabrication
US6978116B2 *	2003-02-20	2005-12-20	Nokia Corporation	Apparatus, system, method and computer program product for implementing an automatic identification system with a personal communication device to improve functionality
GB2399670A	2003-03-15	2004-09-22	Gary Wallis	Child's distance monitor alarm
US7066226B2	2003-03-27	2006-06-13	Nokia Corporation	Fetching application and driver for extension device from network
US7394761B2 *	2003-04-29	2008-07-01	Avocent Huntsville	System and method for delivering messages using alternate modes of

IPR2025-00645 Page 02355

			Corporation	communication
EP1475755A1	2003-05-05	2004-11-10	Openlot Systems B.V.	Lottery system with mobile access
WO2004105359A2	2003-05-19	2004-12-02	Einar Rosenberg	An apparatus and method for increased security of wireless transactions
US7248895B2 *	2003-06-12	2007-07-24	Nokia Corporation	Controlling settings for mobile telecommunications apparatus
US8117273B1 *	2003-07-11	2012-02-14	Mcafee, Inc.	System, device and method for dynamically securing instant messages
JP2005045557A *	2003-07-22	2005-02-17	Sony Corp	Communication device
WO2005048019A2 *	2003-09-04	2005-05-26	Emc Corporation	Data message mirroring and redirection
EP1676409B1 *	2003-10-20	2011-12-07	TELEFONAKTIEBOLAGET LM ERICSSON (publ)	Network and node for providing a secure transmission of mobile application part messages
US20050086261A1 *	2003-10-20	2005-04-21	Richard Mammone	Child locator apparatus and method
US20050090239A1 *	2003-10-22	2005-04-28	Chang-Hung Lee	Text message based mobile phone configuration system
FR2863811B1	2003-12-16	2006-03-03	Melissima Start	COMMUNICATION SYSTEM BETWEEN A MOBILE TERMINAL AND A COMMUNICATION SERVER AND ASSOCIATED COMMUNICATION METHODS.
US20050160062A1 *	2004-01-16	2005-07-21	Howard W. B.	Method to report personal security information about a person
EP1559482A1 *	2004-01-29	2005-08-31	Nagracard S.A.	Method for securing the transmission of short messages
US7194438B2 *	2004-02-25	2007-03-20	Nokia Corporation	Electronic payment schemes in a mobile environment for short-range transactions
GB0406524D0 *	2004-03-09	2004-04-21	Ibm	Key-based encryption
US20050221800A1 *	2004-03-31	2005-10-06	Jackson Riley W	Method for remote lockdown of a mobile computer
US20050222961A1	2004-04-05	2005-10-06	Philippe Staib	System and method of facilitating contactless payment transactions across different payment systems using a common mobile device acting as a stored value device
US7748617B2	2004-04-12	2010-07-06	Gray R O'neal	Electronic identification system
US7255264B2	2004-04-24	2007-08-14	De Leon Hilary Laing	Cellular phone-based automatic payment system
US20050250538A1	2004-05-07	2005-11-10	July Systems, Inc.	Method and system for making card-based payments using mobile devices
US7996673B2 *	2004-05-12	2011-08-09	Echoworx Corporation	System, method and computer product for sending encrypted messages to recipients where the sender does not possess the credentials of the recipient
US7259671B2	2004-06-21	2007-08-21	Christine Ganley	Proximity aware personal alert system
GB0415447D0 *	2004-07-09	2004-08-11	Tiger Telematics Inc	Portable electronic device
US7996471B2 *	2004-07-13	2011-08-09	At&T Intellectual Property I, L.P.	Electronic message distribution system
US7014107B2 *	2004-07-20	2006-03-21	Irek Singer	Wireless payment processing system
DE602004023546D1	2004-07-22	2009-11-19	Telecom Italia Spa	METHOD AND SYSTEM FOR IMPROVING THE ROBUSTNESS OF SAFE MESSAGE TRANSMISSION IN A MOBILE COMMUNICATION NETWORK
US7565577B2 *	2004-07-22	2009-07-21	Research In Motion Limited	Method and apparatus for providing intelligent error messaging
US7375616B2 *	2004-09-08	2008-05-20	Nokia Corporation	Electronic near field communication enabled multifunctional device and method of its operation
DE102004045147A1 *	2004-09-17	2006-03-23	Fujitsu Ltd., Kawasaki	A setting information distribution apparatus, method, program and medium, authentication setting transfer apparatus, method, program and medium, and setting information receiving program
US20060080232A1 *	2004-10-08	2006-04-13	Randy Epps	Cellular telephone based payment apparatus and method for use in purchase of good and services
US7583958B2 *	2004-11-05	2009-09-01	Research In Motion Limited	Integrated message delivery over a plurality of transport mediums
JP4631401B2	2004-11-10	2011-02-23	日本電気株式会社	Presence update system and method, and mobile communication terminal used therefor
US20060120348A1 *	2004-12-03	2006-06-08	Marian Croak	Method and apparatus for enabling the downloading of network based information to IP phones
US7729363B2 *	2005-01-24	2010-06-01	Research In Motion Limited	System and method for managing communication for component applications

US20090163140A1 *	2005-01-25	2009-06-25	Packham Donald L	Biochip electroporator and its use in multi-site, single-cell electroporation
JP4907880B2 *	2005-02-23	2012-04-04	株式会社エヌ・ティ・ティ・ドコモ	Portable information terminal and data protection method
US20060194572A1 *	2005-02-28	2006-08-31	Clearsky Mobile Media, Inc.	Wireless interactive property advertising system and methods
US7537152B2 *	2005-03-23	2009-05-26	E2Interative, Inc.	Delivery of value identifiers using short message service (SMS)
MX2007011926A	2005-03-29	2007-11-20	Research In Motion Ltd	System and method for personal identification number messaging.
KR100640449B1	2005-04-20	2006-10-30	삼성전자주식회사	Method and system for restricting an additional function in mobile communication terminal
JP4363361B2	2005-04-28	2009-11-11	神鋼気工業株式会社	PORTABLE ELECTRONIC DEVICE, SECURITY SYSTEM AND METHOD FOR DETERMINING OPERATION PERMITTED RANGE
US8244179B2	2005-05-12	2012-08-14	Robin Dua	Wireless inter-device data processing configured through inter-device transmitted data
US8880047B2 *	2005-08-03	2014-11-04	Jeffrey C. Konicek	Realtime, location-based cell phone enhancements, uses, and applications
US20070046477A1 *	2005-08-24	2007-03-01	Kolo Brian A	Known sex offender access control system
US20070129113A1 *	2005-12-01	2007-06-07	Kilcpera Michael E	Cell phone alerting system
US7796982B2 *	2005-12-07	2010-09-14	Tor Anumana, Inc.	Wireless controller device
US7643821B2 *	2005-12-17	2010-01-05	Access U2 Mobile Solutions, LLC	Text brochure and media system and method
CA2533784A1 *	2005-12-19	2007-06-28	Karim Yaghmour	System and method for end-to-end electronic mail encryption
KR100735382B1 *	2006-02-08	2007-07-04	삼성전자주식회사	Security communication method and apparatus in bluetooth terminal
DE602006013567D1 *	2006-02-13	2008-07-10	Research In Motion Ltd	Secure procedure to notify a service termination
US7715831B2 *	2006-03-24	2010-05-11	Sony Ericsson Mobile Communications, Ab	Methods, systems, and devices for detecting and indicating loss of proximity between mobile devices
US20070255653A1	2006-03-30	2007-11-01	Obopay Inc.	Mobile Person-to-Person Payment System
EP2005721A4	2006-03-31	2011-10-12	Sybase 365 Inc	System and method for providing feedback to wireless device users
WO2007120462A2 *	2006-03-31	2007-10-25	Ontela Inc	Method and system for phone-number discovery and phone-number authentication for mobile communications devices
US20070262862A1	2006-05-12	2007-11-15	Ichaperone, Llc	Monitoring and tracking system
US20080019530A1 *	2006-05-30	2008-01-24	International Business Machines Corporation	Message archival assurance for encrypted communications
CN101111085B *	2006-07-21	2012-01-11	宏碁股份有限公司	Portable communication equipment with loss protection function and loss protection method thereof
US20080058057A1	2006-09-06	2008-03-06	Lau Tony S L	Methods and systems for secure mobile integrated lottery gaming
US20080065878A1 *	2006-09-08	2008-03-13	Michael Hutson	Method and system for encrypted message transmission
US8478310B2 *	2006-10-05	2013-07-02	Verizon Patent And Licensing Inc.	Short message service (SMS) data transfer
US7744751B2 *	2006-10-22	2008-11-04	Onepin, Inc.	Short message service network plug-in
WO2008046161A1 *	2006-10-19	2008-04-24	Fruitful Technologies Pty Ltd	An interactive system and process
US20080094230A1 *	2006-10-23	2008-04-24	Motorola, Inc.	Using location capabilities of a mobile device to permit users to avoid potentially harmful interactions
US8855511B2 *	2006-12-14	2014-10-07	Blackberry Limited	System and method for wiping and disabling a removed device
US20080171536A1	2007-01-17	2008-07-17	Darius Katz	System and method for broadcasting an alert
EP2570961B1 *	2007-01-19	2019-03-13	BlackBerry Limited	Selectively wiping a remote device
US7945292B2	2007-05-30	2011-05-17	Embarq Holdings Company, Llc	System and method for a remote wireless ringer
US8274968B2 *	2007-07-20	2012-09-25	Cisco Technology, Inc.	Restriction of communication in VoIP address discovery system

US8064599B2 *	2007-08-29	2011-11-22	Red Hat, Inc.	Secure message transport using message segmentation
US8554176B2 *	2007-09-18	2013-10-08	Qualcomm Incorporated	Method and apparatus for creating a remotely activated secure backup service for mobile handsets
US8631227B2 *	2007-10-15	2014-01-14	Cisco Technology, Inc.	Processing encrypted electronic documents
EP2053531B1 *	2007-10-25	2014-07-30	BlackBerry Limited	Authentication certificate management for access to a wireless communication device
US20100128857A1	2007-12-26	2010-05-27	Logan James D	Call forwarding system and method employing virtual phone numbers associated with landline and other discrete telephone units
US20090187980A1 *	2008-01-22	2009-07-23	Tien-Chun Tung	Method of authenticating, authorizing, encrypting and decrypting via mobile service
US8233901B2 *	2008-02-28	2012-07-31	Ssomon Co., Ltd.	Method and system of providing personal information control service for mobile communication terminal
KR20100126850A	2008-03-28	2010-12-02	셀트러스트 코포레이션	Systems and methods for secure short messaging service and multimedia messaging service
US20090257593A1 *	2008-04-10	2009-10-15	Comverse Ltd.	Method and apparatus for secure messaging
US8094551B2 *	2008-05-13	2012-01-10	At&T Mobility Ii Llc	Exchange of access control lists to manage femto cell coverage
US8656177B2 *	2008-06-23	2014-02-18	Voltage Security, Inc.	Identity-based-encryption system
US20090323926A1 *	2008-06-30	2009-12-31	Shaham Eliezer	Methods and systems for voice communication
US8131266B2 *	2008-12-18	2012-03-06	Alcatel Lucent	Short message service communication security
US8509212B2 *	2009-09-22	2013-08-13	Verizon Patent And Licensing Inc.	Method and system of recovering lost mobile devices
US8332944B1	2010-01-04	2012-11-27	Intuit Inc.	Method and system for creating/updating customer lists and profiles
WO2011112767A2	2010-03-10	2011-09-15	Sra International, Inc.	One vault voice encryption

* Cited by examiner, † Cited by third party

Cited By (251)

Publication number	Priority date	Publication date	Assignee	Title
KR10132624381 *	2012-06-04	2013-11-11	순천향대학교 산학협력단	User authenticaiton method
KR20180135732A *	2017-06-13	2018-12-21	주식회사 우리은행	Contents exchange method based on interaction between users and system performing the same
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US7548158B2	2005-08-08	2009-06-16	Telecommunication Systems, Inc.	First responder wireless emergency alerting with automatic callback and location triggering
WO2007139909A2	2006-05-25	2007-12-06	Celltrust Corporation	Secure mobile information management system and method
US9846881B2	2006-05-25	2017-12-19	Celltrust Corporation	Dissemination of real estate information through text messaging
US10412215B2	2011-02-21	2019-09-10	Celltrust Corporation	System and method for tracking and archiving mobile communications
US9572033B2 *	2006-05-25	2017-02-14	Celltrust Corporation	Systems and methods for encrypted mobile voice communications
US8225380B2 *	2006-05-25	2012-07-17	Celltrust Corporation	Methods to authenticate access and alarm as to proximity to location
KR10169085B1 *	2012-02-22	2016-12-28	셀트러스트 코포레이션	Systems and methods for encrypted mobile voice communications
US7991156B2 *	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging
US8554868B2	2007-01-05	2013-10-08	Yahoo! Inc.	Simultaneous sharing communication interface
CN101415184A *	2007-10-17	2009-04-22	雅斯拓（北京）智能卡科技有限公司	Method to other people shielding mobile telephone message
DE102007058975A1 *	2007-12-07	2009-06-10	Bayerische Motoren Werke Aktiengesellschaft	Power supply system for motor vehicle, has master security module for signing message, and client security module for checking whether signed message received from master security module comes from authorized master security module

US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
SK50042008A3 *	2008-01-04	2009-09-07	Logomotion, S. R. O.	Method and system for authentication preferably at payments, identifier of identity and/or agreement
US8233901B2 *	2008-02-28	2012-07-31	Ssomon Co., Ltd.	Method and system of providing personal information control service for mobile communication terminal
SK288721B6 *	2008-03-25	2020-01-07	Smk Kk	Method, circuit and carrier for perform multiple operations on the keypad of mobile communication equipment
KR20100126850A	2008-03-28	2010-12-02	셀트러스트 코포레이션	Systems and methods for secure short messaging service and multimedia messaging service
CA2722949A1 *	2008-04-29	2009-11-05	Visa U.S.A. Inc.	Device including user exclusive data tag
US20090307140A1 *	2008-06-06	2009-12-10	Upendra Mardikar	Mobile device over-the-air (ota) registration and point-of-sale (pos) payment
KR101123118B1 *	2008-07-11	2012-03-20	삼성전자주식회사	An apparatus for video communication in a dual standby portable terminal and a method thereof
TW201008159A *	2008-08-01	2010-02-16	Unication Co Ltd	System using wireless signals to transmit emergency broadcasting messages
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
AU2009286860B2 *	2008-08-29	2016-06-16	Smk-Logomotion Corporation	Removable card for a contactless communication, its utilization and the method of production
SK50862008A3 *	2008-09-19	2010-06-07	Logomotion, S. R. O.	System for electronic payment applications and method for payment authorization
US9098845B2	2008-09-19	2015-08-04	Logomotion, S.R.O.	Process of selling in electronic shop accessible from the mobile communication device
SK288641B6	2008-10-15	2019-02-04	Smk Corporation	Communication method with POS terminal and frequency convertor for POS terminal
US8903434B2 *	2008-12-31	2014-12-02	Sybase, Inc.	System and method for message-based conversations
US9100222B2 *	2008-12-31	2015-08-04	Sybase, Inc.	System and method for mobile user authentication
US9209994B2 *	2008-12-31	2015-12-08	Sybase, Inc.	System and method for enhanced application server
US20100203878A1 *	2009-02-10	2010-08-12	Samsung Electronics Co., Ltd.	Portable device including a digital walkie-talkie module
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
SK500092009A3 *	2009-02-27	2010-09-07	Logomotion, S. R. O.	Computer mouse for data transmission, preferably at electronic payment, method for data transmission
US8380989B2	2009-03-05	2013-02-19	Sybase, Inc.	System and method for second factor authentication
SK288747B6 *	2009-04-24	2020-04-02	Smk Kk	Method and system for cashless payment transactions, particularly with contactless payment device using
RU2543935C2 *	2009-05-03	2015-03-10	Логомотион, С.Р.О.	Payment terminal using mobile communication device such as mobile telephone and non-cash payment method
CA2665961C *	2009-05-12	2013-01-22	Diversinet Corp.	Method and system for delivering a command to a mobile device
CN101610499A *	2009-07-13	2009-12-23	中兴通讯股份有限公司	The upgrade method of wireless data card and system
US20110117883A1 *	2009-11-19	2011-05-19	David Drabo	Encrypted text messaging system and method therefor
US20110137804A1 *	2009-12-03	2011-06-09	Recursion Software, Inc.	System and method for approving transactions
CA2688770C *	2009-12-17	2016-01-19	Diversinet Corp.	Method and system for sharing data
US8738004B2 *	2010-01-29	2014-05-20	Assa Abloy Hospitality, Inc.	Method and system for permitting remote check-in and coordinating access control
US8621214B2 *	2010-02-10	2013-12-31	SecurenCrypt, LLC	Document encryption and decryption
US20110238402A1 *	2010-03-23	2011-09-29	Fujitsu Limited	System and methods for remote maintenance in an electronic network with multiple clients
US9628831B2	2010-03-25	2017-04-18	Whatsapp, Inc.	Multimedia transcoding method and system for mobile devices
US8995965B1 *	2010-03-25	2015-03-31	Whatsapp Inc.	Synthetic communication network method and system

US9542691B1 *	2010-04-22	2017-01-10	Sionic Mobile Corporation	System and method for securely managing delivery and redemption of location-based incentives and customer loyalty rewards to mobile devices
CN101964962A *	2010-05-31	2011-02-02	宇龙计算机通信科技(深圳)有限公司	Method and device for sending and receiving short messages
US8571218B2	2010-06-01	2013-10-29	GreatCall, Inc.	Short message service cipher
US8984273B2	2011-12-16	2015-03-17	Protected Mobility, Llc	Method to provide secure multimedia messaging between peer systems
US9172680B2	2010-06-07	2015-10-27	Protected Mobility, Llc	Systems and methods for enabling secure messaging, command, and control of remote devices, communicated via a short message service or other message oriented communications mediums
US8924706B2	2010-11-05	2014-12-30	Protected Mobility, Llc	Systems and methods using one time pads during the exchange of cryptographic material
US9143324B2	2010-06-07	2015-09-22	Protected Mobility, Llc	Secure messaging
US9602277B2 *	2010-06-07	2017-03-21	Protected Mobility, Llc	User interface systems and methods for secure message oriented communications
US8984271B2	2010-06-07	2015-03-17	Protected Mobility, Llc	User interface systems and methods for input and display of secure and insecure message oriented communications
US10552809B2 *	2010-07-26	2020-02-04	Visa International Service Association	Programmable card
US8516062B2	2010-10-01	2013-08-20	@Pay Ip Holdings Llc	Storage, communication, and display of task-related data
US8918467B2	2010-10-01	2014-12-23	Clover Leaf Environmental Solutions, Inc.	Generation and retrieval of report information
CN102045669A *	2010-12-01	2011-05-04	中兴通讯股份有限公司	Implementation method and system for encrypting short message services
US9225694B1 *	2011-02-24	2015-12-29	Mpulse Mobile, Inc.	Mobile application secure data exchange
US20130061289A1 *	2011-03-01	2013-03-07	Keith McFarland	Secure Messaging
CN102130995B *	2011-03-01	2013-06-19	重庆重邮信科技发展有限公司	Data transmission method for intelligent mobile phone information in Android system
US9729628B2 *	2011-03-09	2017-08-08	Ortiz And Associates Consulting, Llc	Systems and methods for enabling temporary, user-authorized cloning of mobile phone functionality on a secure server accessible via a remote client
US20120238206A1 *	2011-03-14	2012-09-20	Research In Motion Limited	Communications device providing near field communication (nfc) secure element disabling features related methods
US10038735B2 *	2012-06-19	2018-07-31	Loment, Inc.	Delivery control for HTTP communications among multiple end user communication devices
US9760867B2 *	2011-03-31	2017-09-12	Loment, Inc.	Management for information communicated among end user communication devices
US8799385B2 *	2011-03-31	2014-08-05	Loment, Inc.	Delivery control for email communicated among multiple end user communication devices
US8799386B2 *	2011-03-31	2014-08-05	Loment, Inc.	Delivery control for email communicated among multiple end user communication devices
US10009385B2	2011-03-31	2018-06-26	Loment, Inc.	Ubiquitous user control for information communicated among end user communication devices
US20120254450A1 *	2011-03-31	2012-10-04	Loment, Inc.	Delivery control for messages communicated among end user communication devices
US8924495B2 *	2011-03-31	2014-12-30	Loment, Inc.	Delivery control for HTTP communications among multiple end user communication devices
DE102011108740A1 *	2011-05-31	2012-12-06	Smartrac Ip B.V	A method and arrangement for providing and managing information associated with RFID media in a network
US20120314865A1 *	2011-06-07	2012-12-13	Broadcom Corporation	NFC Communications Device for Setting Up Encrypted Email Communication
US9049025B1 *	2011-06-20	2015-06-02	Cellco Partnership	Method of decrypting encrypted information for unsecure phone
WO2013098238A1	2011-07-12	2013-01-17	Mobli Technologies 2010 Ltd.	Methods and systems of providing visual content editing functions
US9172806B2 *	2011-08-31	2015-11-03	Nec Corporation	Techniques for third-party content delivery via a unique mobile application address

US9479344B2	2011-09-16	2016-10-25	Telecommunication Systems, Inc.	Anonymous voice conversation
US9143910B2 *	2011-09-30	2015-09-22	Blackberry Limited	Method and system for remote wipe through voice mail
KR101540499B1 *	2011-10-10	2015-07-29	주식회사 케이티	Short Message Server, User Equipment Triggering Method Thereof, Trigger Request Delivering Server, and Trigger Request Delivering Method Thereof
US10389692B2 *	2011-11-05	2019-08-20	Jianping He	Peer-to-peer device management, monitor and control
US9998919B1	2011-11-18	2018-06-12	Google Llc	SMS spoofing protection
US8291031B1 *	2011-11-29	2012-10-16	Google Inc.	Sender control of expiry of an electronic message
US8984591B2	2011-12-16	2015-03-17	Telecommunications Systems, Inc.	Authentication via motion of wireless device movement
CN104025627A *	2011-12-29	2014-09-03	诺基亚公司	Method And Apparatus For Sharing Point Of Interest Information As A Weblink
US20130179264A1 *	2012-01-05	2013-07-11	Interactive Coupon Exchange, Inc.	System and method for generating and sending promotional offers via text message
US9384339B2	2012-01-13	2016-07-05	Telecommunication Systems, Inc.	Authenticating cloud computing enabling secure services
US10817898B2	2015-08-13	2020-10-27	Placed, Llc	Determining exposures to content presented by physical objects
US8972357B2	2012-02-24	2015-03-03	Placed, Inc.	System and method for data collection to validate location data
WO2013147911A1 *	2012-03-31	2013-10-03	Intel Corporation	Secure communication using physical proximity
US20140067678A1 *	2012-09-02	2014-03-06	Mpayme Ltd.	Dispute code system for secure mobile payment
US9338153B2	2012-04-11	2016-05-10	Telecommunication Systems, Inc.	Secure distribution of non-privileged authentication credentials
US9152784B2 *	2012-04-18	2015-10-06	Mcafee, Inc.	Detection and prevention of installation of malicious mobile applications
CN103516856B *	2012-06-26	2015-10-21	腾讯科技（深圳）有限公司	Information merges method and apparatus
US8707454B1	2012-07-16	2014-04-22	Wickr Inc.	Multi party messaging
US10409982B2 *	2012-07-18	2019-09-10	Zixcorp Systems, Inc.	Secure data access for multi-purpose mobile devices
US9160719B2	2012-07-20	2015-10-13	Protected Mobility, Llc	Hiding ciphertext using a linguistics algorithm with dictionaries
US20140039910A1 *	2012-07-31	2014-02-06	Navio Health, LLC	Controlled Communications System for Physician-Hospital System Integration
WO2014031899A1	2012-08-22	2014-02-27	Goldrun Corporation	Augmented reality virtual content platform apparatuses, methods and systems
US9619812B2 *	2012-08-28	2017-04-11	Nuance Communications, Inc.	Systems and methods for engaging an audience in a conversational advertisement
US10044648B2 *	2012-09-09	2018-08-07	Jianping He	Messaging and updating services over the air from application servers to applications in mobile devices
US9301191B2	2013-09-20	2016-03-29	Telecommunication Systems, Inc.	Quality of service to over the top applications used with VPN
US8775972B2	2012-11-08	2014-07-08	Snapchat, Inc.	Apparatus and method for single action control of social network profile access
US9497142B2	2012-11-30	2016-11-15	T-Mobile Usa, Inc.	Triggering actions on a computing device
EP2926271A4 *	2012-11-30	2016-07-06	Nokia Technologies Oy	A method and a technical equipment for analysing message content
US20140201014A1 *	2013-01-11	2014-07-17	Juan José Rider Jimenez	Process for payment by cell phone to a merchant object of the invention
US9231954B2 *	2013-03-15	2016-01-05	Telmate, Llc	Communications system for residents of secure facility
CN104113508B *	2013-04-16	2015-11-25	腾讯科技（深圳）有限公司	Log in the method and system of third party's service platform
US9246925B2 *	2013-04-16	2016-01-26	Tencent Technology (Shenzhen) Company Limited	Method and system for third-party service platform login

EP2800345B1	2013-04-29	2015-08-05	Swisscom AG	Method, electronic device and system for remote text input
WO2014189882A1	2013-05-20	2014-11-27	Celltrust Corporation	System and method for tracking sms messages
US20140351134A1 *	2013-05-21	2014-11-27	Pop! Online, LLC	Registration process
US9763067B2	2013-05-28	2017-09-12	Protected Mobility, Llc	Methods and apparatus for long-short wave, low-high frequency radio secure message service
US9742713B2	2013-05-30	2017-08-22	Snap Inc.	Apparatus and method for maintaining a message thread with opt-in permanence for entries
US9705831B2	2013-05-30	2017-07-11	Snap Inc.	Apparatus and method for maintaining a message thread with opt-in permanence for entries
US10439972B1	2013-05-30	2019-10-08	Snap Inc.	Apparatus and method for maintaining a message thread with opt-in permanence for entries
US10129260B1	2013-06-25	2018-11-13	Wickr Inc.	Mutual privacy management
US9866591B1	2013-06-25	2018-01-09	Wickr Inc.	Enterprise messaging platform
US10567349B2	2013-06-25	2020-02-18	Wickr Inc.	Secure time-to-live
US9830089B1	2013-06-25	2017-11-28	Wickr Inc.	Digital data sanitization
US9083770B1	2013-11-26	2015-07-14	Snapchat, Inc.	Method and system for integrating real time communication features in applications
US9924042B2 *	2013-12-26	2018-03-20	Cellco Partnership	Uniform RCS voice/videomail services
CA2863124A1	2014-01-03	2015-07-03	Investel Capital Corporation	User content sharing system and method with automated external content integration
US9628950B1	2014-01-12	2017-04-18	Investment Asset Holdings Llc	Location-based messaging
US10082926B1	2014-02-21	2018-09-25	Snap Inc.	Apparatus and method for alternate channel communication initiated through a common message thread
US9698976B1	2014-02-24	2017-07-04	Wickr Inc.	Key management and dynamic perfect forward secrecy
US8909725B1	2014-03-07	2014-12-09	Snapchat, Inc.	Content delivery network for ephemeral objects
JP6201835B2 *	2014-03-14	2017-09-27	ソニー株式会社	Information processing apparatus, information processing method, and computer program
US9276886B1	2014-05-09	2016-03-01	Snapchat, Inc.	Apparatus and method for dynamically configuring application component tiles
US9396354B1	2014-05-28	2016-07-19	Snapchat, Inc.	Apparatus and method for automated privacy protection in distributed images
US9113301B1	2014-06-13	2015-08-18	Snapchat, Inc.	Geo-location based event gallery
US20150363776A1 *	2014-06-17	2015-12-17	Securesit	System and Method for Managing a Payment Transaction
KR101625070B1 *	2014-06-17	2016-05-27	주식회사 케이티	Method, terminal and computing device for protecting message
US9584530B1	2014-06-27	2017-02-28	Wickr Inc.	In-band identity verification and man-in-the-middle defense
EP2963885A1 *	2014-07-03	2016-01-06	HOB GmbH & Co. KG	A client-server-communication system running a client-side-script-program
US9225897B1	2014-07-07	2015-12-29	Snapchat, Inc.	Apparatus and method for supplying content aware photo filters
US20160019527A1 *	2014-07-18	2016-01-21	Tracfone Wireless, Inc.	Device and Process for Purchasing Electronic Content Using Multimedia Messaging Service Messaging
US9600949B2 *	2014-07-30	2017-03-21	Master Lock Company Llc	Wireless key management for authentication
US10055717B1	2014-08-22	2018-08-21	Snap Inc.	Message processor with application prompts
US10423983B2	2014-09-16	2019-09-24	Snap Inc.	Determining targeting information based on a predictive targeting model
US10824654B2	2014-09-18	2020-11-03	Snap Inc.	Geolocation-based pictographs
US9694284B2	2014-09-24	2017-06-27	Zixcorp Systems, Inc.	Preemptive loading of protected data for streaming mobile devices
US10284508B1	2014-10-02	2019-05-07	Snap Inc.	Ephemeral gallery of ephemeral messages with opt-in permanence
US9537811B2	2014-10-02	2017-01-03	Snap Inc.	Ephemeral gallery of ephemeral messages
US9015285B1	2014-11-12	2015-04-21	Snapchat, Inc.	User interface for accessing media at a geographic location
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

US10659939B2 *	2014-11-12	2020-05-19	Blackberry Limited	Enhanced cell broadcast service via secure group broadcast
CN104361270A *	2014-11-20	2015-02-18	广东欧珀移动通信有限公司	Screen unlocking method and electronic equipment
KR102256642B1 *	2014-12-04	2021-05-27	삼성전자주식회사	Apparatus for transmiting and receiving message and method for transmiting and receiving message
US9654288B1	2014-12-11	2017-05-16	Wickr Inc.	Securing group communications
US10311916B2	2014-12-19	2019-06-04	Snap Inc.	Gallery of videos set to an audio time line
US9385983B1	2014-12-19	2016-07-05	Snapchat, Inc.	Gallery of messages from individuals with a shared interest
US9854219B2	2014-12-19	2017-12-26	Snap Inc.	Gallery of videos set to an audio time line
US9754355B2	2015-01-09	2017-09-05	Snap Inc.	Object recognition based photo filters
US10133705B1	2015-01-19	2018-11-20	Snap Inc.	Multichannel system
US9521515B2	2015-01-26	2016-12-13	Mobli Technologies 2010 Ltd.	Content request by location
US9294425B1	2015-02-06	2016-03-22	Snapchat, Inc.	Storage and processing of ephemeral messages
US10223397B1	2015-03-13	2019-03-05	Snap Inc.	Social graph based co-location of network users
KR20210020172A	2015-03-18	2021-02-23	스냅 인코포레이티드	Geo-fence authorization provisioning
US9692967B1	2015-03-23	2017-06-27	Snap Inc.	Systems and methods for reducing boot time and power consumption in camera systems
KR102255366B1 *	2015-04-16	2021-05-25	한국전자통신연구원	Apparatus and method for Mobile Trusted Module based security of Short Message Service
US9881094B2	2015-05-05	2018-01-30	Snap Inc.	Systems and methods for automated local story generation and curation
US10135949B1	2015-05-05	2018-11-20	Snap Inc.	Systems and methods for story and sub-story navigation
WO2016179235A1	2015-05-06	2016-11-10	Snapchat, Inc.	Systems and methods for ephemeral group chat
CA2987667A1 *	2015-06-05	2016-12-08	Celltrust Corporation	System and method for tracking and archiving mobile communications
EP3308506B1 *	2015-06-15	2021-01-27	Webtext Holdings Limited	Multimedia messaging service gateway (mmsgw) system, method of operating a multimedia messaging service gateway (mmsgw)system and a software product
US10503264B1	2015-06-16	2019-12-10	Snap Inc.	Radial gesture navigation
US9906479B1	2015-06-16	2018-02-27	Snap Inc.	Storage management for ephemeral messages
US10993069B2	2015-07-16	2021-04-27	Snap Inc.	Dynamically adaptive media content delivery
US11121997B1	2015-08-24	2021-09-14	Snap Inc.	Systems, devices, and methods for determining a non-ephemeral message status in a communication system
US10616162B1	2015-08-24	2020-04-07	Snap Inc.	Systems devices and methods for automatically selecting an ephemeral message availability
US10157333B1	2015-09-15	2018-12-18	Snap Inc.	Systems and methods for content tagging
US9652896B1	2015-10-30	2017-05-16	Snap Inc.	Image based tracking in augmented reality systems
US11119628B1	2015-11-25	2021-09-14	Snap Inc.	Dynamic graphical user interface modification and monitoring
US9998499B1	2015-11-30	2018-05-29	Snap Inc.	Image and point cloud based tracking and in augmented reality systems
US10474321B2	2015-11-30	2019-11-12	Snap Inc.	Network resource location linking and visual content sharing
US9590956B1	2015-12-18	2017-03-07	Wickr Inc.	Decentralized authoritative messaging
US10354425B2	2015-12-18	2019-07-16	Snap Inc.	Method and system for providing context relevant media augmentation
US10291607B1	2016-02-02	2019-05-14	Wickr Inc.	Providing real-time events to applications
US10225241B2 *	2016-02-12	2019-03-05	Jpu to Ltd	Mobile security offloader
US10679389B2	2016-02-26	2020-06-09	Snap Inc.	Methods and systems for generation, curation, and presentation of media collections
US11023514B2	2016-02-26	2021-06-01	Snap Inc.	Methods and systems for generation, curation, and presentation of media collections
US10285001B2	2016-02-26	2019-05-07	Snap Inc.	Generation, curation, and presentation of media collections

US10530731B1	2016-03-28	2020-01-07	Snap Inc.	Systems and methods for chat with audio and video elements
US10686899B2	2016-04-06	2020-06-16	Snap Inc.	Messaging achievement pictograph display system
EP3229193A1 *	2016-04-07	2017-10-11	The Boeing Company	A computer-implemented method and system for sharing information between passengers and air traffic management stakeholders
US9596079B1	2016-04-14	2017-03-14	Wickr Inc.	Secure telecommunications
US9590958B1	2016-04-14	2017-03-07	Wickr Inc.	Secure file transfer
US9813642B1	2016-05-06	2017-11-07	Snap Inc.	Dynamic activity-based image generation
US10474353B2	2016-05-31	2019-11-12	Snap Inc.	Application control using a gesture based trigger
US10805696B1	2016-06-20	2020-10-13	Pipbin, Inc.	System for recording and targeting tagged content of user interest
US11044393B1	2016-06-20	2021-06-22	Pipbin, Inc.	System for curation and display of location-dependent augmented reality content in an augmented estate system
US10638256B1	2016-06-20	2020-04-28	Pipbin, Inc.	System for distribution and display of mobile targeted augmented reality content
US10334134B1	2016-06-20	2019-06-25	Maximillian John Suiter	Augmented real estate with location and chattel tagging system and apparatus for virtual diary, scrapbooking, game play, messaging, canvasing, advertising and social interaction
US9681265B1	2016-06-28	2017-06-13	Snap Inc.	System to track engagement of media items
US10430838B1	2016-06-28	2019-10-01	Snap Inc.	Methods and systems for generation, curation, and presentation of media collections with automated advertising
US10182047B1	2016-06-30	2019-01-15	Snap Inc.	Pictograph password security system
US10387514B1	2016-06-30	2019-08-20	Snap Inc.	Automated content curation and communication
US10348662B2	2016-07-19	2019-07-09	Snap Inc.	Generating customized electronic messaging graphics
US10552968B1	2016-09-23	2020-02-04	Snap Inc.	Dense feature scale detection for image matching
US10609036B1	2016-10-10	2020-03-31	Snap Inc.	Social media post subscribe requests for buffer user accounts
CN113206959A	2016-11-01	2021-08-03	斯纳普公司	Fast video capture and sensor adjustment
KR102257909B1	2016-11-07	2021-05-28	스냅 인코포레이티드	Selective identification and order of image modifiers
US10203855B2	2016-12-09	2019-02-12	Snap Inc.	Customized user-controlled media overlays
US10740939B1	2016-12-09	2020-08-11	Snap Inc.	Fast image style transfers
US10915911B2	2017-02-03	2021-02-09	Snap Inc.	System to determine a price-schedule to distribute media content
US10319149B1	2017-02-17	2019-06-11	Snap Inc.	Augmented reality anamorphosis system
US11019001B1	2017-02-20	2021-05-25	Snap Inc.	Selective presentation of group messages
US10374993B2	2017-02-20	2019-08-06	Snap Inc.	Media item attachment system
US10074381B1	2017-02-20	2018-09-11	Snap Inc.	Augmented reality speech balloon system
US10565795B2	2017-03-06	2020-02-18	Snap Inc.	Virtual vision system
US10523625B1	2017-03-09	2019-12-31	Snap Inc.	Restricted group content collection
US10582277B2	2017-03-27	2020-03-03	Snap Inc.	Generating a stitched data stream
US10581782B2	2017-03-27	2020-03-03	Snap Inc.	Generating a stitched data stream
US11170393B1	2017-04-11	2021-11-09	Snap Inc.	System to calculate an engagement score of location based media content
US10387730B1	2017-04-20	2019-08-20	Snap Inc.	Augmented reality typography personalization system
US10823372B1	2017-04-27	2019-08-13	Snap Inc.	Processing media content based on original context
US10963529B1	2017-04-27	2021-03-30	Snap Inc.	Location-based search mechanism in a graphical user interface
US10212541B1	2017-04-27	2019-02-19	Snap Inc.	Selective location-based identity communication
US20180322480A1 *	2017-05-04	2018-11-08	Promociones Bursatiles S.A.	Credit transfer via networked mobile computing devices
US10788900B1	2017-06-29	2020-09-29	Snap Inc.	Pictorial symbol prediction
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

IPR2025-00645 Page 02364

US11164378B1	2017-08-30	2021-11-02	Snap Inc.	Object modeling using light projection
US9980100B1	2017-08-31	2018-05-22	Snap Inc.	Device location based on machine learning classifications
US10740974B1	2017-09-15	2020-08-11	Snap Inc.	Augmented reality system
US10474900B2	2017-09-15	2019-11-12	Snap Inc.	Real-time tracking-compensated image effects
US10499191B1	2017-10-09	2019-12-03	Snap Inc.	Context sensitive presentation of content
US10573043B2	2017-10-30	2020-02-25	Snap Inc.	Mobile-based cartographic control of display content
US10599289B1	2017-11-13	2020-03-24	Snap Inc.	Interface to display animated icon
US10455633B2 *	2017-11-14	2019-10-22	Knowmadics, Inc.	Wireless communication system and method for monitoring and alerting a broken pairing between electronic devices
US10885564B1	2017-11-28	2021-01-05	Snap Inc.	Methods, system, and non-transitory computer readable storage medium for dynamically configurable social media platform
US11089478B2	2017-12-04	2021-08-10	Celltrust Corporation	Blockchain for validating communications archiving
US10217488B1	2017-12-15	2019-02-26	Snap Inc.	Spherical video editing
US11017173B1	2017-12-22	2021-05-25	Snap Inc.	Named entity recognition visual context and caption data
US10678818B2	2018-01-03	2020-06-09	Snap Inc.	Tag distribution visualization system
CN108270099B *	2018-02-05	2020-04-10	上海鸿商通信科技有限公司	Protection architecture that display screen module prevented physical invasion
US10482565B1	2018-02-12	2019-11-19	Snap Inc.	Multistage neural network processing using a graphics processor
US10885136B1	2018-02-28	2021-01-05	Snap Inc.	Audience filtering system
US10979752B1	2018-02-28	2021-04-13	Snap Inc.	Generating media content items based on location information
US10726603B1	2018-02-28	2020-07-28	Snap Inc.	Animated expressive icon
US10327096B1	2018-03-06	2019-06-18	Snap Inc.	Geo-fence selection system
CN111886058A	2018-03-14	2020-11-03	斯纳普公司	Generating collectible items based on location information
US11163941B1	2018-03-30	2021-11-02	Snap Inc.	Annotating a collection of media content items
CN112041891A	2018-04-18	2020-12-04	斯纳普公司	Expression enhancing system
US10219111B1	2018-04-18	2019-02-26	Snap Inc.	Visitation tracking system
US11144620B2 *	2018-06-26	2021-10-12	Counseling and Development, Inc.	Systems and methods for establishing connections in a network following secure verification of interested parties
US10679393B2	2018-07-24	2020-06-09	Snap Inc.	Conditional modification of augmented reality object
US10997760B2	2018-08-31	2021-05-04	Snap Inc.	Augmented reality anthropomorphization system
CN110234028B *	2019-05-30	2021-10-22	深圳市梦网科技发展有限公司	Addressing method and device of mobile terminal, storage medium and server
US11128715B1	2019-12-30	2021-09-21	Snap Inc.	Physical friend proximity in chat
US10778585B1	2020-02-03	2020-09-15	Tanla Digital Labs Private Limited	Communication server and method of secured transmission of messages
US10917440B1	2020-02-03	2021-02-09	Tanla Digital Labs Private Limited	Communication server and method of secured transmission of messages

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
US9668080B2	2017-05-13	Systems and methods for secure short messaging service and multimedia messaging service
US9686660B2	2017-06-20	Secure mobile information management system and method
US8225388B2	2012-07-17	Methods to authenticate access and alarm as to proximity to location
US8280359B2	2012-10-02	Methods of authorizing actions

IPR2025-00645 Page 02365

US8986416B2	2015-02-24	Distribution of lottery tickets through mobile devices
US8260274B2	2012-09-04	Extraction of information from e-mails and delivery to mobile phones, system and method
US20180124240A1	2018-05-03	Dissemination of real estate information through text messaging
US9572003B2	2017-02-14	Systems and methods for encrypted mobile voice communications
AU2013205071B2	2016-03-17	Systems and methods for secure short messaging service and multimedia messaging service
KR101690850B1	2016-12-28	Systems and methods for encrypted mobile voice communications
AU2015202721B2	2015-07-09	Secure mobile information management system and method
AU2012216853B2	2015-03-05	Secure mobile information management system and method
AU2015215970A1	2015-09-10	Secure mobile information management system and method

Priority And Related Applications

Priority Applications (2)

Application	Priority date	Filing date	Title
US4052608P	2008-03-28	2008-03-28	*US Provisional Application*
US61/040,526		2008-03-28	

Legal Events

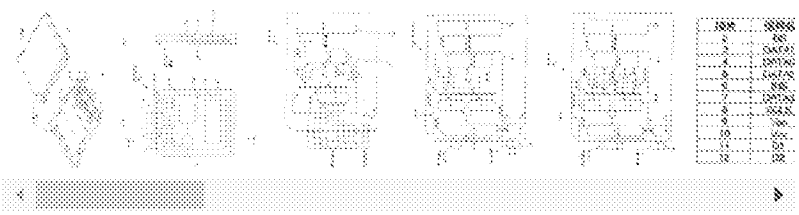
Date	Code	Title	Description
2014-02-04	A201	Request for examination	
2014-02-04	AMND	Amendment	
2014-11-25	E902	Notification of reason for refusal	
2015-05-26	AMND	Amendment	
2015-10-07	E601	Decision to refuse application	
2016-01-07	J201	Request for trial against refusal decision	
2016-02-04	AMND	Amendment	
2016-03-11	B601	Maintenance of original decision after re-examination before a trial	
2017-06-13	J301	Trial decision	**Free format text:** TRIAL NUMBER: 2016101000882; TRIAL DECISION FOR APPEAL AGAINST DECISION TO DECLINE REFUSAL REQUESTED 20160107 **Effective date:** 20170613

Data provided by IFI CLAIMS Patent Services

Patents 4864346

Memory card and card adapter

Images (24)



Classifications

G06K19/07 Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards also with resonating or responding marks without active components with integrated circuit chips

View 2 more classifications

JP4864346B2

Japan

Download PDF Find Prior Art Similar

Other languages: Japanese

Inventor: 禎孝 青木, 敬一 筒井, 裕孝 西澤, 隆 戸塚

Worldwide applications

2005 JP 2006 KR WO US EP CN TW 2007 HK

Application JP2005145437A events

2005-05-18	Application filed by ソニー株式会社, ルネサスエレクトロニクス株式会社
2005-05-18	Priority to JP2005145437A
2006-11-30	Publication of JP2006323583A
2012-02-01	Application granted
2012-02-01	Publication of JP4864346B2
Status	Expired - Fee Related
2025-05-18	Anticipated expiration

Info: Patent citations (15), Cited by (44), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (14) Hide Dependent

1. And retain body,
Disposed on the holding member, and the writing and / or reading data a storage unit,
A first contact piece disposed on the holding body and connectable to an external device of a communication partner in order to perform first data communication with the storage unit ;
And second contacts arranged separately from the first connection to the holding member,
Disposed on the holding member, and a controller for writing and / or reading data to the storage unit by performing the first data communication with an external device via the first contact piece,
A plurality of types of interfaces predetermined for performing data communication with the front Kigaibu device,
Interface selecting means for selecting one interface from the plurality of types of interfaces;
With
It said second contacts are
A second data communication signal different from the first data communication with the interface selection signal and the storage unit can be supplied;
The interface selection means includes
A function of separating and recognizing a signal for instructing selection of an interface including the interface selection signal from signals supplied to the second contact piece, and selecting an interface according to the signal instructing the selection;
The controller is
It said first through said contact piece first data communication line earthenware pots memory card based on the interface selected by the interface selection means.

2. A plurality of interface units in charge of the first data communication between the provided before each SL plurality of types of interfaces the external device,
A single data buffer for buffering data between the plurality of types of interface units and the storage unit,
The interface selection means includes
The memory card according to claim 1, further comprising: a selection unit that selects one interface from the plurality of types of interface units and connects to the first contact piece according to a signal instructing selection of the interface.

3. A plurality of interface units in charge of the first data communication between the provided before each SL plurality of types of interfaces the external device,
A data buffer that is provided for each of the plurality of types of interface units and buffers data between the interface unit and the storage unit,
The interface selection means includes
The plurality of types of memory cards the selection unit including claim 1, wherein the interface unit to select one interface connected to the first contact piece in response to a signal indicating the selection of the interface.

4. The interface selection means includes
A switching signal is generated according to a signal instructing selection of the interface.
The selection unit includes:
The plurality of types of claims 2 or 3, wherein the memory card from the interface unit to select one interface that connects to the first contact piece in response to the switching signal.

5. The signal for instructing selection of the interface is a logic signal interface selection signal.
The interface selection means includes
5. The memory card according to claim 4, wherein a switching signal is generated based on a logic state of the interface selection signal input via the second contact piece .

6. The interface selection means includes
A data communication unit that is connected to the second contact piece and performs second data communication different from the first data communication with the storage unit via the second contact piece. The memory card according to any one of 4

7. The interface selection means includes
The memory card according to claim 6 , wherein an interface corresponding to a command received by the data communication unit is selected .

8. Before Symbol data communication unit,
Two second connection pieces connected to external said by electromagnetic waves via the antenna second claim 6 or 7, wherein the memory card for data communication.

9. The data communication unit is
Claim performs the second data communication for transmitting and receiving the data by differential form by the positive data and negative data to an external apparatus connected via the two second connection pieces 6 Or the memory card of 7.

10. A data communication unit that performs a second data communication different from the first data communication with the storage unit by a signal of an AC component input through the second contact piece ,
A signal separation unit connected to the second contact piece and separating a DC component signal and an AD component signal ;
It said second contacts are
An interface selection signal is supplied as the DC component signal, and a second data communication signal different from the first data communication with the storage unit is supplied as the AC component signal.
The signal separator is
The signal of the separated AC component is supplied to the data communication unit,
The supply to the interface selection means signals separated DC component as the interface selection signal,
The interface selection means includes
6. The memory card according to claim 1 , wherein an interface corresponding to the interface selection signal supplied by the signal separation unit is selected .

11. The data communication unit is
There line the second data communication by a plurality of types of electromagnetic waves having different frequencies from each other via the second contacts connected to an external antenna,
The interface selection means includes
The memory card according to claim 8 , wherein an interface is selected according to a signal received by the data communication unit in the second data communication of one of the plurality of types of electromagnetic waves.

12. Holding body,
A storage unit arranged in the holding body and capable of writing and / or reading data;
A first contact piece disposed on the holding body and connectable to an external device of a communication partner in order to perform first data communication with the storage unit;
A second contact piece disposed on the holding body separately from the first connection, to which an AC component signal and a DC component signal are supplied;
A controller that is disposed on the holding body and performs writing and / or reading of data with respect to the storage unit by performing the first data communication with an external device via the first contact piece;
A plurality of predetermined interfaces for performing data communication with the external device;
A data communication unit that performs second data communication different from the first data communication with the storage unit;
Interface selecting means for selecting one interface from the plurality of types of interfaces;
A signal separation unit that is connected to the second contact piece and separates an AC component signal and a DC component signal supplied to the second contact piece;
With
It said second contact piece is
An interface selection signal is supplied as the DC component signal, and a second data communication signal different from the first data communication with the storage unit is supplied as the AC component signal.
The signal separator is
Supplying the separated AC component signal to the data communication unit;
The separated DC component signal is supplied to the interface selection means as the interface selection signal,
The interface selection means includes
Selecting an interface according to the interface selection signal supplied by the signal separation unit;
The controller is
A memory card that performs the first data communication via the first contact piece based on the interface selected by the interface selection means .

13. And retain body,
A storage unit arranged in the holding body and capable of writing and / or reading data;
A first contact piece disposed on the holding body and connectable to an external device of a communication partner in order to perform first data communication with the storage unit ;
A second contact piece arranged separately from the first connection on the holding body;
It is placed on the holding member, and a controller for writing and / or reading data to the storage unit by performing the first data communication with an external device via the first contact piece,

IPR2025-00645 Page 02368

A plurality of predetermined interfaces for performing data communication with the external device;
A data communication unit connected to the second contact piece and performing a second data communication different from the first data communication with the storage unit,
An interface selection means for selecting one of the interface from the previous SL plurality of types of interfaces,
With
The second piece is
It can be connected to an external antenna,
The data communication unit is
Performing the second data communication by means of a plurality of types of electromagnetic waves having different frequencies from each other via an external antenna connected via the two second contact pieces,
The interface selection means includes
A memory card that selects an interface according to a command that forms an interface selection signal received by the data communication unit in the second data communication of one of the plurality of types of electromagnetic waves .

14. A card adapter memory card of claim 5, 10 or 12, are instrumentation de,
When the memory card is inserted, a power supply line to which a power supply potential or a ground potential is supplied from the external device or a ground potential line is connected to the second contact piece, and the second contact piece is connected to a predetermined piece. A card adapter with means to set the logical state .

Description

The present invention relates to a memory card and a card adapter to which such a memory card is attached.

There is provided a memory card having a flash memory capable of rewriting data and writing and reading data to and from the flash memory.
Such a memory card is inserted into a card slot of an external device, for example, a personal computer or a cellular phone, and writes and reads data.
Currently, a plurality of such memory cards are used, such as a memory stick (registered trademark of Sony Corporation), such as a multimedia card (MMC: registered trademark of Infineon Technologies AG), an SD card (Matsushita). Electric Corporation, Toshiba Corporation, SanDisk Corporation registered trademark) and the like.
These memory cards differ in the interface of data communication performed with an external device, that is, the standard of the type and number of signals for performing data communication, the procedure of data communication, and the like.
For this reason, a conventional technique has been proposed in which a plurality of types of interfaces are provided in advance in one memory card, and by selecting these interfaces, one memory card can be used with different interfaces (Patent Literature). 1).
in this prior art, an on / off signal is generated by mechanically moving a switch provided in a memory card, and an interface of the memory card is selected based on the on / off signal.
JP 2003-30613 A

However, in such a conventional technique, a shape (protrusion) for operating the switch must be provided in the slot portion of the external device from which the memory card is inserted or removed, or the switch must be operated by hand. It's not easy to use.
In addition, since the above-described existing plural types of memory cards have different sizes and shapes depending on the type, a memory card having an outer shape smaller than any of the existing plural memory cards is prepared. It can be considered that the card is mounted on the card adapter, and the card adapter on which the memory card is mounted is mounted on the card slot of the external device. In this case, the card adapter is formed so that the outer shape, the terminal shape, and the terminal arrangement coincide with those of the above-described existing memory card.
By using such a card adapter, the memory card can be used in the same manner as an existing memory card.
However, even in this case, if one type of memory card interface is fixed, even if a different type of card adapter is prepared, reading and writing with a device with an external device cannot be performed. It is necessary to provide an interface and select and use one interface from a plurality of interfaces.
The present invention has been made in view of such circumstances, and an object of the present invention is to select and use a plurality of interfaces, which is advantageous in improving convenience, and such a memory card is attached and detached. To provide a card adapter.

To achieve the above object, the present invention includes a hold member, disposed in the holding member, and the writing and / or reading data a storage unit, disposed in the holding member, and said storage unit a first contact piece which can be connected to an external device of the communication partner in order to perform a first data communication, and a second contact piece disposed separately from the first connection to said holding member, said holding member disposed, and a controller for writing and / or reading data to the storage unit by performing the first data communication with an external device via the first contact piece, the front Kigaibu device a plurality of types of interfaces predetermined for performing data communication with, and a interface selection means for selecting one of the interface from the plurality of types of interfaces, said second contact piece. An interface selection signal and a second data communication signal different from the first data communication with the storage unit, and the interface selection means is a signal supplied to the second contact piece A function for separating and recognizing a signal for instructing selection of an interface including the interface selection signal, and selecting an interface according to the signal for instructing the selection, and the controller is selected by the interface selection means intends rows the first data communication over said first connection pieces on the basis of the interface.
In addition, the present invention provides a holding body, a storage unit that is disposed on the holding body and is capable of writing and / or reading data, and is disposed on the holding body and performs first data communication with the storage unit. Therefore, a first contact piece that can be connected to an external device of a communication partner and a second contact that is arranged separately from the first connection to the holding body and is supplied with an AC component signal and a DC component signal. And a controller that is disposed on the holding body and performs writing and / or reading of data with respect to the storage unit by performing the first data communication with an external device via the first contact piece A plurality of predetermined types of interfaces for performing data communication with the external device, and a data communication unit for performing second data communication different from the first data communication with the storage unit The plurality of types An interface selection means for selecting one interface from the interface, and a signal separation unit that is connected to the second contact piece and separates an AC component signal and a DC component signal supplied to the second contact piece; The second contact piece is supplied with an interface selection signal as the signal of the DC component, and a second data communication signal different from the first data communication with the storage unit is the AC signal. The signal separation unit supplies the separated AC component signal to the data communication unit, and the separated DC component signal is supplied to the interface selection unit as the interface selection signal. The interface selection means selects an interface corresponding to the interface selection signal supplied by the signal separation unit, and The controller performs the first data communication via said first contact piece based on the interface selected by the interface selection means.
Further the present invention includes a hold member, disposed in the holding member, and the writing and / or reading data a storage unit, disposed in the holding member, the first data communication with the storage unit a first contact piece which can be connected to an external device of the communication partner in order to perform, and the second contacts disposed separately from the first connection to the holder, is placed in the holding member, wherein Data communication between the

IPR2025-00645 Page 02369

external device and a controller that writes and / or reads data to and from the storage unit by performing the first data communication with the external device through the first contact piece A plurality of predetermined types of interfaces for performing a data communication unit connected to the second contact piece and performing a second data communication different from the first data communication with the storage unit; before Symbol multiple types of interfaces And a interface selection means for selecting et one interface, said second contact piece is connectable to an external antenna, the data communication unit connected through the two second connection pieces The second data communication is performed using a plurality of types of electromagnetic waves having different frequencies from each other via the external antenna, and the interface selection unit is configured to perform the second data communication of one of the plurality of types of electromagnetic waves. The interface is selected according to the command for forming the interface selection signal received by the data communication unit
Further, the present invention provides a card adapter memory card of claim 5, 10 or 12, are instrumentation de, when the memory card is inserted, the external device to the second contact piece is connected to a power supply line to which a power supply potential or a ground potential is supplied or a ground potential line, and the second contact piece is set to a predetermined logic state .

According to the memory card of the present invention, one interface is selected from a plurality of types of interfaces based on an interface selection signal supplied via the second contact piece, and data communication is performed by the selected interface. .
Therefore, by simply inserting the memory card into the memory card slot of the external device, an interface that matches the interface of the external device is selected on the memory card side, which is advantageous in improving convenience.
Further, there is no need to provide a switch for switching the interface on the memory card or to provide a structure for operating the switch in the memory card slot of the external device, which is advantageous for cost reduction.
According to the memory card of the present invention, an interface is selected based on which of the first contact pieces for power supply provided for each interface is supplied with power, and the data communication is performed by the selected interface. I did it.
Therefore, by simply inserting the memory card into the memory card slot of the external device, an interface that matches the interface of the external device is selected on the memory card side, which is advantageous for improving convenience, and an interface switching switch. Since it is not necessary to provide a structure for operating, it is advantageous for cost reduction.
According to the card adapter of the present invention, even if the external device has only a card slot for an existing memory card, the power supply or the second contact piece of the memory card is connected to the second contact piece of the memory card by the wiring provided in the card adapter. A ground level signal can be supplied.
Therefore, when the memory card has a plurality of interfaces, the plurality of interfaces can be selected using a power supply or ground level signal supplied to the second contact piece.

(First embodiment)
Next, a first embodiment of the present invention will be described with reference to the drawings.
FIG. 1A is a perspective view of the memory card 100, FIG. 1B is a perspective view of the memory card 100 when the memory card 100 is turned upside down, and FIG. 2A is a bottom view of the memory card 100 according to the first embodiment. FIG. 4B is a cross-sectional view taken along the line BB in FIG.
3 is a block diagram showing the configuration of the memory card 100, FIG. 4 is a block diagram showing an example of the configuration of the memory card 100, and FIG. 5 is a block diagram showing another example of the configuration of the memory card 100.
FIG. 6 is a diagram showing the correspondence between the contact pieces of the memory card 100 and signal names.

As shown in FIGS. 1 and 2, the memory card 100 is connected to a thin plate-shaped holding body 20, a storage unit 22 embedded in the holding body 20, a controller 24 embedded in the holding body 20, and the controller 24. A plurality of first contact pieces 2 to 10, a switching signal generation unit 26 embedded in the holding body 20, and two second contact pieces 11 and 12 connected to the switching signal generation unit 26. ing.
In the present embodiment, a case where the memory card 100 selects and uses two types of interfaces will be described. The two types of interfaces are, for example, a memory stick interface and a multimedia card interface.
Here, the interface refers to an interface for data communication performed with the external device in a state where the memory card 100 is mounted on the external device, that is, a standard such as the type and number of signals for performing data communication. And a procedure of data communication.
In the present embodiment, as shown in FIG. 2B, the memory card 100 includes a printed board 21 and a holding body 20 that covers the printed board 21.
That is, the storage unit 22, the controller 24, and the switching signal generation unit 26 are mounted on one surface (upper surface) in the thickness direction of the insulating substrate, and a plurality of second surfaces (lower surfaces) in the thickness direction of the insulating substrate are mounted. The printed circuit board 21 is formed by forming one contact piece 2 to 10 and two second contact pieces 11 and 12, and includes a storage unit 22 , a controller 24, a switching signal generation unit 26 , and each contact piece 2 to 2. 12 is a so-called facing arrangement.
Then, both surfaces of the printed board 21 in the thickness direction are covered with a synthetic resin having an insulating property, and the printed board 21 and the synthetic resin are integrated to form a thin plate-like holding body 20.
In the present embodiment, the holding body 20 has a length of 15 mm, a width of 12 mm, and a thickness of 1.0 to 1.2 mm. For example, PC (polycarbonate), liquid crystal polymer, or the like can be used as the synthetic resin having insulating properties that covers both surfaces of the printed board 21 in the thickness direction.
In FIG. 2 and the like, the storage unit 22 and the controller 24 are drawn separately for easy understanding, but the storage unit 22 and the controller 24 are conventionally configured, for example, in a stacked structure. Various known structures can be employed.

As shown in FIG. 2 (A), on one side 2002 of the bottom surface is the plural first connection pieces 2-10 and the second contacts 11 and 12 the surface of the other side of the thickness direction of the holding member 20 They are arranged and disposed so as to linearly along the column is constituted by the first connection pieces 2-10 and the second contacts 11 and 12 a plurality of under surface of the holding member 20.
The plurality of first contact pieces 2 to 10 and the controller 24 are connected by a conductive pattern formed on the printed circuit board 21, but the conductive pattern is not shown in FIG. 2 in order to avoid complication of the drawing. is doing.

The plurality of first contact pieces 2 to 10 include a signal terminal that transmits and receives signals to the controller 24, a ground terminal that supplies a ground potential to the controller 24 and the storage unit 22, and the controller 24 and the storage. A power supply terminal for supplying power to the unit 22 is included.
The contact pieces 2 to 8 are the signal terminals, the contact piece 9 is the power supply terminal, and the contact piece 10 is the ground terminal.
More specifically, as shown in FIG. 6, the contact piece 2 is a signal terminal to which a bus state signal BS indicating a delimiter of data communicated by the data signals DAT A0 to DATA3 is input.
The contact piece 3 is a signal terminal for inputting / outputting the data signal DATA1, the contact piece 4 is a signal terminal for inputting / outputting the data signal DATA0, the contact piece 5 is a signal terminal for inputting / outputting the data signal DATA2, and the contact piece 7 is data. This is a signal terminal for inputting and outputting the signal DATA3.
The contact piece 6 is an insertion / removal detection contact piece, and is a signal terminal for sending and receiving an INS signal used by the external device for detecting insertion / removal of a memory card.
The contact piece 8 is a signal terminal to which the clock signal SCLK is input, and the bus state signal BS and the data signals DATA0 to DATA3 are communicated in synchronization with the clock signal SCLK.
The contact piece 9 is a power supply terminal to which the power supply Vcc is input.
The contact piece 10 is a ground terminal connected to the ground level (Vss).

IPR2025-00645 Page 02370

The second contact pieces 11, 12 are terminals to which interface selection signals D 1, D 2 supplied from the outside are input, and are connected to the switching signal generation unit 26.

As shown in FIG. 3, the storage unit 22 is composed of a flash memory capable of rewriting data.
The controller 24 controls data input / output operations for the storage unit 22.
The controller 24 includes an interface unit 2402, a register 24 04 , a data buffer 2406, a flash memory controller 2408, an error correction unit 2410, a clock generation unit 2412, an internal bus 2414, and the like.
The interface unit 2402 is connected to the first contact pieces 2 to 10 and manages data communication with an external device to which the memory card 100 is mounted via the first contact pieces 2 to 10. .
As will be described later, the interface unit 2402 is configured to select one of the two types of interfaces.
Register 24 04 is to command relating like writing and reading of data supplied via the interface unit 2402 and the internal bus 2414 from the external device is set.
The data buffer 2406 is provided between the internal bus 2414 and the flash memory controller 2408 and accumulates data.
The flash memory controller 2408 manages data communication between the storage unit 22 and the data buffer 2406.
The error correction unit 2410 corrects data errors that occur in the process of writing to and reading from the storage unit 22.
The clock generation unit 2412 supplies an operation clock to each of the interface unit 2402, the register 24 04 , the data buffer 2406, the flash memory controller 2408, and the error correction unit 2410.

The second contact pieces 11 and 12 are connected to the switching signal generator 26 by a conductive pattern formed on the printed circuit board 21.
The switching signal generation unit 26 supplies the switching signal S1 to the interface unit 2402 according to the interface selection signals D1 and D2 supplied via the second contact pieces 11 and 12.
Specifically, if the interface selection signals D1 and D2 are logic signals (binary signals) "H" and "L", respectively, an "H" switching signal S1 is output, and the interface selection signals D1 and 02 are output. If "L" and "H", respectively, an "L" switching signal S1 is output.

Next, the interface unit 2402 will be described in detail with reference to FIG.
The interface unit 2402 includes a first interface unit 2402A, a second interface unit 2402B, and a selection unit 2402C.
The first interface unit 2402A is configured to perform data communication with the external device based on one of the two types of interfaces, for example, a memory stick interface.
The second interface unit 2402B is configured to perform data communication with the external device based on one of the two types of interfaces, for example, an interface for a multimedia memory card.
Based on the switching signal S1 supplied from the switching signal generation unit 26, the selection unit 2402C selectively selects each contact piece 2 to 10 as one of the first interface unit 2402A and the second interface unit 2402B. And connect.
Therefore, one of the two types of interfaces is selected by the selection unit 2402C.
That is, in the first embodiment, the switching signal generation unit 26 and the selection unit 2402C constitute an interface selection unit in the scope of claims.

Next, a method for using the memory card 100 will be described.
When data is written to or read from the storage unit 22 of the memory card 100, the memory card 100 is inserted into a memory card slot of an external device such as an electronic device or a personal computer.
In this case, the memory card slot of the external device is provided with contact pieces corresponding to the second contact pieces 11 and 12 in addition to the contact pieces corresponding to the first contact pieces 2 to 10. Interface selection signals D1 and D2 are supplied to contact pieces corresponding to the two contact pieces 11 and 12, respectively.
Therefore, when the memory card 100 is inserted into the memory card slot, the interface selection signals D1 and D2 are supplied to the memory card 100 via the first contact pieces 11 and 12, and a plurality of first contact points are supplied. A power supply Vcc and a ground potential Vss are supplied to the memory card 100 through the pieces 2 to 10.
At this time, the switching signal generator 26 supplies the switching signal S1 to the interface unit 2402 according to the interface selection signals D1 and D2 supplied via the second contact pieces 11 and 12, so that the interface unit 2402 Either one of the two types of interfaces is selected, and the interface of the memory card 100 matches the interface of the external device.
Accordingly, various control signals and data signals are exchanged between the memory card 100 and the external device based on the selected interface, whereby data is written to and read from the storage unit 22 normally.

According to the present embodiment, one interface is selected from two types of interfaces based on the interface selection signal supplied via the second contact pieces 11 and 12, and the data communication is performed by the selected interface. I did it.
Therefore, by simply inserting the memory card into the memory card slot of the external device, an interface that matches the interface of the external device is selected on the memory card side, which is advantageous in improving convenience.
Further, there is no need to provide a switch for switching the interface on the memory card or to provide a structure for operating the switch in the memory card slot of the external device, which is advantageous for cost reduction.

In the first embodiment, the case where the first and second interface units 2402A and 2402B are provided as shown in FIG. 4 is described, but the configuration may be as shown in FIG.
That is, as shown in FIG. 5, a first register 24 04 A and a first data buffer 2406A are provided corresponding to the first interface unit 2402A, and a second interface corresponding to the second interface unit 2402A is provided. A register 24 04 B and a second data buffer 2406 B are provided.
In this case as well, it is of course possible to achieve the same operational effects as described above, and the register and data buffer circuits designed in advance according to the two types of interfaces can be diverted. This is advantageous in simplifying design and reducing costs.
However, as in the first embodiment, first, second interface portion 2402A, in the case where the provided 2402B, shared registers 24 04 and the data buffer 2406, it is possible to reduce the circuit scale of a controller 24, This is advantageous in reducing the manufacturing cost.
In the first embodiment, the switching signal generator 26 is provided outside the controller 24, and the interface is selected by the controller 24 using the switching signal S1 generated by the switching signal generator 26. Of course, the switching signal generator 26 may be provided inside the controller 24.
Further, in the first embodiment, the controller 24 is provided with the first and second interface units 2402A and 2402B, and the first and second interface units 2402A and 2402B are selected by the selection unit 2402C. The case where any one of the types of interfaces is selected has been described.
However, instead of providing the first and second interface units 2402A and 2402B and the selection unit 2402C, a signal processing device including a CPU and a storage unit for storing a program is provided. Of course, the functions of the first and second interface units 2402A and 2402B and the selection unit 2402C may be realized by executing the program.
In this case, the CPU of the signal processing device executes the program to realize a plurality of interfaces by software, and the protocol conversion of data transmitted and received between the external device and the controller is performed by software. Will be realized.

(Second Embodiment)
Next, a second embodiment will be described
The memory card 100 according to the second embodiment includes a data communication unit 30 that communicates data different from reading and writing to the storage unit 22, and the second contacts 11 and 12 are wirelessly transmitted by the data communication unit 30. It is different from the first embodiment in that it is used for both data communication by signals and input of interface selection signals D1 and D2.
7 is a block diagram showing the configuration of the memory card 100 according to the second embodiment, and FIGS. 8A to 8C are circuit diagrams showing the configuration of the signal separation unit provided in the switching signal generation unit 26. FIG. 9 is an operation explanatory diagram of the data communication unit 30 of the memory card 100.
In the following embodiments, the same or similar parts as those in the first embodiment will be described with the same reference numerals.

As shown in FIG. 7, the memory card 100 is provided with a signal separation unit 28 and a data communication unit 30 in addition to the configuration of the first embodiment.
The signal separation unit 28 is connected to the second contact pieces 11 and 12, and supplies the radio signal supplied from the antenna to the data communication unit 30 in a state where the second contact pieces 11 and 12 are connected to the antenna described later. The interface selection signals D1 and D2 supplied to the second contact pieces 11 and 12 are supplied to the selection unit 2402C.
That is, since the radio signal is an AC signal and the interface selection signals D1 and D2 are DC signals, the signal separation unit 28 separates the AC component and the DC component of the signal supplied to the second contact pieces 11 and 12, is configured to do.
As shown in FIG. 8A, the signal separation unit 28 includes an AC component blocking choke coil L1 connected in series to the second contact pieces 11 and 12, an output terminal of the choke coil L2, and a ground level. Between the input terminal of the choke coil L1 and the data communication unit 30, and a capacitor C2 for AC component passage connected in series. .
In the signal separation unit 28, when the radio signal is supplied to the second contact pieces 11, 12, the radio signal is prevented from being transmitted to the switching signal generation unit 26 by the choke coil L1 and the capacitor C1, and The radio signal is transmitted between the data communication unit 30 and the second contact pieces 11 and 12 via the capacitor C2.
When the interface selection signals D1 and D2 are input to the second contact pieces 11 and 12, the interface selection signals D1 and D2 are blocked from being transmitted to the data communication unit 30 by the capacitor C2, and the switching signal is generated by the choke coil L1. is transmitted to the unit 26.
As shown in FIG. 8 (B), the choke coil L1 of the signal separator 28, a chip coil L1 instead of the capacitor C 1 ', the chip capacitor C 1' is the same effect as FIG. 8 (A) be used Kanade Is done.
Further, as shown in FIG. 8C, a conductive pattern portion 2102 wound on the printed circuit board 21 is formed instead of the choke coil L1, and a coil L3 that generates a self-induction action is formed by the conductive pattern portion 2102. Even in this case, the same effect as in FIG.

The data communication unit 30 performs bidirectional data communication using electromagnetic waves with a reader / writer device via an external antenna connected to the data communication unit 30 via the two second contact pieces 11 and 12. It is a non-contact IC function chip mounted on a so-called non-contact IC card. The frequency of data communication by the data communication unit 30 is determined by international standards such as 135 kHz or less, 13.56 MHz, 2.45 GHz.
Since the data communication unit 30 is configured to generate electric power based on the received electromagnetic wave and operate with the electric power, there is no need to receive power supply.
The functions of the data communication unit 30 include, for example, an authentication function by holding authentication data for performing authentication and performing communication of the authentication data by data communication, or by holding data of electronic money and by data communication. An electronic payment function by communicating electronic money data can be cited.

When communication is performed with respect to the data communication unit 30 of the memory card 100, for example, as shown in FIG. 9, two second connections are made by mounting the memory card 100 in a card slot of an electronic device 200 such as a cellular phone. The pieces 11 and 12 are connected to an antenna 202 provided on the electronic device 200 side.
When the memory card 100 and the electronic device 200 are brought close to the reader / writer device 300 in this state, the electromagnetic wave transmitted from the reader / writer device 300 is received by the antenna 202.
The electromagnetic wave received by the antenna 202 is supplied to the signal separation unit 28 via the two second contact pieces 11 and 12, separated as an AC component by the signal separation unit 28, and supplied to the data communication unit 30. .
The data communication unit 30 operates using electric power supplied by electromagnetic waves, and performs data communication using electromagnetic waves with the reader / writer device 300 via the antenna 202.
The reader / writer device 300 is connected to a host device 302 such as a personal computer. The host device 302 is based on data communicated with the data communication unit 30 of the memory card 100 via the reader / writer device 300 as described above. Authentication processing or electronic money settlement processing is performed.

When data is written to and read from the storage unit 22 of the memory card 100, the memory card is inserted into a memory card slot of an external device such as an electronic device or a personal computer, as in the case of the first embodiment. Wear 100.
As a result, the interface selection signals D1 and D2 are supplied to the signal separation unit 28 via the first contact pieces 11 and 12, and are separated as DC components by the signal separation unit 28 and transmitted to the switching signal generation unit 26. .
The switching signal generation unit 26 supplies the switching signal S1 to the interface unit 2402 according to the interface selection signals D1 and D2, so that the interface unit 2402 is selected as one of the two types of interfaces, and the memory card 100 interfaces are matched with the interfaces of external devices.
Accordingly, various control signals and data signals are exchanged between the memory card 100 and the external device based on the selected interface, whereby data is written to and read from the storage unit 22 normally.
Also in the second embodiment, the switching signal generation unit 26 and the selection unit 2402C constitute the interface selection means in the claims.

According to the second embodiment, it is needless to say that the same effects as those of the first embodiment can be obtained, and the second for connecting the antenna 202 when performing wireless communication by the data communication unit 30. Since the contact pieces 11 and 12 can be shared as contact pieces for transmitting the interface selection signals D1 and D2, an increase in the contact pieces of the memory card 100 can be suppressed, and the memory card 100 can be reduced in size and cost. This is advantageous.

(Third embodiment)
Next, a third embodiment will be described.
For convenience of explanation, FIG. 7 is used for explanation. The memory card 100 according to the third embodiment is configured such that the data communication unit 30 performs data communication using a digital signal in a differential format.
Data communication using a differential digital signal refers to data communication in which a plus-side data signal + D and a minus-side data signal -D are input and output, as in USB.
That is, since the differential digital signal is transmitted as an AC component, by providing the same signal separation unit 28 as that in the second embodiment, the differential digital signal as the AC component and the DC signal are provided. What is necessary is just to isolate | separate the interface selection signals D1 and D2 as

a component.
Therefore, it is obvious that data communication can be performed using a differential digital signal by the data communication unit 30, and the interface selection signals D 1 and D 2 are supplied to the second contact pieces 11 and 12, thereby providing an interface for the memory card 100. Is selected so as to match the interface of the external device, and various control signals and data signals are exchanged between the memory card 100 and the external device based on the selected interface. Data is written and read normally.
Also in the third embodiment, the switching signal generation unit 26 and the selection unit 2402C constitute the interface selection means in the claims.
According to the third embodiment as described above, it is needless to say that the same effects as those of the first embodiment can be obtained, and that the data communication unit 30 performs data communication and is connected to an external device. Since the two contact pieces 11 and 12 can be shared as contact pieces for transmitting the interface selection signals D1 and D2, an increase in the contact pieces of the memory card 100 can be suppressed, and the memory card 100 can be reduced in size and cost. It is advantageous in planning.

(Fourth embodiment)
Next, a fourth embodiment will be described.
FIG. 10 is a block diagram showing a configuration of the memory card 100 according to the fourth embodiment.
In the fourth embodiment, the switching signal generation unit 26 in the second embodiment is omitted, and the same function as the switching signal generation unit 26 is added to the data communication unit 30.
That is, the data communication unit 30 performs data communication via an external antenna connected via the second contact pieces 11 and 12 as in the second embodiment.
Then, as shown in FIG. 9, two second contact pieces 11 and 12 are provided on the electronic device 200 side by inserting the memory card 100 into a card slot of the electronic device 200 such as a mobile phone which is an external device. Connected to the antenna 202.
When the memory card 100 and the electronic device 200 are brought close to the reader / writer device 300 in this state, the electromagnetic wave transmitted from the reader / writer device 300 is received by the antenna 202.
The electromagnetic wave received by the antenna 202 is supplied to the data communication unit 30 via the second contacts 11 and 12.
At this time, the wireless signal transmitted first from the reader / writer device 300 includes an interface mode command for instructing selection of an interface corresponding to the electronic device 200.
Accordingly, the data communication unit 30 that has received the interface mode command supplies the interface unit 2402 with a switching signal S1 corresponding to the interface mode command.
As a result, the interface unit 2402 is selected as one of the two types of interfaces, and the interface of the memory card 100 matches the interface of the electronic device 200 that is an external device.
Therefore, various control signals and data signals are exchanged between the memory card 100 and the electronic device 200 based on the selected interface, whereby data is written to and read from the storage unit 22 normally.
In the fourth embodiment, the data communication unit 30 and the selection unit 2402C constitute a claim interface selection means, and the command constitutes a claim interface selection signal.
According to the fourth embodiment as described above, it goes without saying that the same effects as those of the second embodiment can be obtained. Compared to the second embodiment, the switching signal generation unit 26 and the signal separation unit 28 can be omitted, which is advantageous in simplifying the circuit configuration and reducing the size of the memory card 100.
Further, since interface selection can be instructed by an interface mode command, the number of interface types that can be selected is not limited.
For example, when a logic signal (binarized signal) composed of "H" and "L" is given to the second contact pieces 11 and 12, 2 bits of information can be identified, so a total of four types of interface The type can only be identified, but there is no such limitation in the fourth embodiment.

(Fifth embodiment)
Next, a fifth embodiment will be described.
In the fifth embodiment, the switching signal generator 26 in the third embodiment is omitted, and the same function as that of the switching signal generator 26 is added to the data communication unit 30.
For convenience of explanation, FIG. 10 is used for explanation, and the data communication unit 30 is configured to perform data communication with a digital signal in a differential format.
A differential digital signal transmitted first from the external device after the memory card 100 is attached to the external device includes an interface mode command for instructing selection of an interface corresponding to the electronic device 200.
Accordingly, the data communication unit 30 that has received the interface mode command supplies the interface unit 2402 with a switching signal S1 corresponding to the interface mode command.
As a result, the interface unit 2402 is selected as one of the two types of interfaces, and the interface of the memory card 100 matches the interface of the electronic device 200 that is an external device.
Therefore, various control signals and data signals are exchanged between the memory card 100 and the electronic device 200 based on the selected interface, whereby data is written to and read from the storage unit 22 normally.
In the fifth embodiment, the data communication unit 30 and the selection unit 2402C constitute a claim interface selection means, and the command constitutes a claim interface selection signal.
According to the fifth embodiment, it goes without saying that the same operational effects as those of the third embodiment can be obtained. Compared with the third embodiment, the switching signal generation unit 26 and the signal separation unit. 28 can be omitted, which is advantageous in simplifying the circuit configuration and reducing the size of the memory card 100.
Further, since interface selection can be instructed by an interface mode command, the number of interface types that can be selected is not limited.

(Sixth embodiment)
Next, a sixth embodiment will be described.
The sixth embodiment is a modification of the fourth embodiment.
FIG. 11 is an explanatory diagram of radio signal frequencies that can be used in the data communication unit 30 according to the sixth embodiment.
For convenience of explanation, FIG. 10 will be used to explain. As shown in FIG. 11, the data communication unit 30 performs data communication at the normal RF communication frequency F0 and is higher than the normal RF communication frequency F0. Data communication including an interface mode command for instructing selection of an interface is performed by a radio signal having a frequency Fa or a radio signal having a frequency Fb lower than the normal RF communication frequency F0.
Note that, in the sixth embodiment, as in the fourth embodiment, the data communication unit 30 and the selection unit 2402C constitute the interface selection means of the claims, and the command An interface selection signal is configured.
Therefore, in the sixth embodiment, the same operational effects as in the fourth embodiment can be obtained.

IPR2025-00645 Page 02373

(Seventh embodiment)
Next, a seventh embodiment will be described.
The seventh embodiment shows a specific example of the switching signal generation unit 26 in the first to third embodiments.
12A, the switching signal generator 26 includes a comparator 2610 and a resistor 2604. The reference voltage input terminal of the comparator 2610 is set to the "H" level (Vcc) via the resistor 2604. A case where the comparison voltage input terminal is connected to the second contact pieces 11 and 12 is shown.
in this case, the comparator 2610 compares the level of the selection signals D1 and D2 input to the second contact pieces 11 and 12 with the "H" level to generate the switching signal S1
12B, the switching signal generator 26 includes a comparator 2610 and a resistor 2606. The reference voltage input terminal of the comparator 2610 is set to the "L" level (GND) via the resistor 2606. A case where the comparison voltage input terminal is connected to the second contact pieces 11 and 12 is shown.
in this case, the comparator 2610 compares the levels of the selection signals D1 and D2 input to the second contact pieces 11 and 12 with the "L" level to generate the switching signal S1.
In FIG. 12C, the switching signal generator 26 includes a comparator 2610 and two resistors 2608 and 2608 having the same resistance value. The reference voltage input terminal of the comparator 2610 has two "H" level voltages Vcc. A case where the voltage level is set to an intermediate voltage level (Vcc / 2) divided by resistors 2608 and 2608 and the comparison voltage input terminal of the comparator 2610 is connected to the second contact pieces 11 and 12 is shown.
in this case, the comparator 2610 compares the level of the selection signals D1 and D2 input to the second contact pieces 11 and 12 with the intermediate voltage level (Vcc / 2) to generate the switching signal S1.
The determination of the selection signals D1 and D2 by the switching signal generation unit 26 and the supply of the switching signal S1 to the selection unit 2402C are performed by, for example, turning on the power of the external device in which the memory card 100 is mounted. It is done when it is started.
Therefore, it is possible to easily select an interface in the memory card 100 without requiring special driver software on the external device side.
in addition, when a card adapter that can be used in the same manner as an existing memory card (for example, a memory stick or a multimedia card) by installing such a memory card 100, a special circuit is used for the card adapter. The card adapter can be easily configured.

(Eighth embodiment)
Next, an eighth embodiment will be described.
in the first to third embodiments, the case where two second contact pieces 11 and 12 are provided has been described, but the number of the second contact pieces may be three or more.
If the number of second contact pieces is N (N is a natural number equal to or greater than 2), 2^N can be identified, so 2^N types of interfaces can be selected.

(Ninth embodiment)
Next, a ninth embodiment will be described.
In the ninth embodiment, a case where the interface of the memory card 100 can be switched between 4-bit parallel communication and 8-bit parallel communication will be described.
Existing memory cards, such as memory sticks and multimedia cards, allow data to be transferred by serial transfer and 4-bit parallel transfer.
However, in recent years, memory cards have been used for recording or reproducing high-quality, large-capacity still image data or moving image data by being mounted on an imaging device such as a digital still camera or a digital video camera, or an audio device. It has been used for recording or reproducing large volume audio data.
For example, in the case of an imaging device, if the data transfer speed is slow, it takes time to operate the shutter until image data is stored in the memory card, which is disadvantageous in improving operability. It was necessary to take measures to increase the cost, such as providing a buffer memory with a high data transfer speed.
Against this background, the data rate of memory cards has been required to be further increased.
On the other hand, to increase the data transfer speed (data transfer rate) of the memory card, there is a method of increasing the transfer clock. However, the transfer clock in the conventional memory card has already reached 40 MHz, for example. In order to achieve a high frequency, it is necessary to reexamine the transmission path of the conventional memory card, and there is a problem that the cost of the memory card cannot be avoided.
Therefore, in order to provide a memory card that is advantageous in improving the data transfer speed while maintaining compatibility with the conventional memory card, it is proposed to increase the bit width of data that can be transferred to, for example, 8 bits. Has been.
For example, as shown in FIG. 13, in the memory stick 200, by dividing a part of the contact piece into two, the contact pieces (contact pieces 11 to 14) of 4 bits (DATA4 to DATA7) are increased for data communication. ing.
in this case, the signals assigned to the contact pieces are as shown in FIG.
Also, as shown in FIG. 14, in the multimedia card 300, the contact pieces (contact pieces 10 to 13) for 4 bits (DAT4 to DAT7) are increased for data communication.
in this case, the signals assigned to the contact pieces are as shown in FIG
The relationship between the contact piece and the signal in the case of the multimedia card 300 is as follows.
The contact piece 1 is a data signal DAT3, and the contact pieces 7 to 13 are signal terminals for inputting / outputting data signals DAT0 to DATA2 and DAT4 to DAT7, respectively.
The contact piece 2 is a command (CMD) input terminal.
The contact pieces 3 and 6 are ground terminals connected to the ground level (VSS)
The contact piece 4 is a power supply terminal to which the power supply VDD is input.
The contact piece 5 is a signal terminal to which the clock signal CLK is input.

In this way, it is possible to switch between 4-bit parallel communication and 8-bit parallel communication in the same manner as existing memory cards (memory sticks and multimedia cards) that can be switched between 4-bit parallel communication and 8-bit parallel communication. The memory card 100 will be described.
FIG. 16 is a block diagram showing a configuration of the memory card 100 according to the ninth embodiment.
A total of 14 first contact pieces of contact pieces 2 to 10 and contact pieces 13 to 16 are provided, and two second contact pieces, contact pieces 11 and 12, are provided.
The controller 24 of the memory card 100 is provided with first to fourth interfaces 2420A, 2420B, 2420C, and 2420D
The first interface 2420A corresponds to the memory stick 4-bit parallel transfer mode.
The second interface 2420B corresponds to the 8-bit parallel transfer mode of the memory stick.
The third interface 2420C corresponds to the 4-bit parallel transfer mode of the multimedia card.
The fourth interface 2420D corresponds to the 8-bit parallel transfer mode of the multimedia card.
Based on the switching signal S1 supplied from the switching signal generation unit 26, the selection unit 2402C selects each one of the contact pieces 2 to 10 from the first to fourth interfaces 2420A, 2420B, 2420C, and 2420D. Configured to select.
in this case, the selection signals D1 and D2 supplied to the second contact pieces 11 and 12 need to identify four types of information corresponding to the four types of interfaces. Therefore, the selection signals D1 and D2 are supplied as 2-bit signals.
in the ninth embodiment, the switching signal generation unit 26 and the selection units 2420A to 2420D constitute the interface selection means in the claims.
According to the ninth embodiment, it is needless to say that the same effects as those of the first embodiment can be obtained, and data transfer between the memory card 100 and an external device as an interface of the memory card 100 is possible. It is also possible to deal with a case where there are a plurality of types having different bit widths.

IPR2025-00645 Page 02374

Of course, the bit width of data transfer and the types of existing memory cards are not limited to those described above.
Also in the ninth embodiment, it is a matter of course that the signal separation unit 28 and the data communication unit 30 may be provided as in the second and third embodiments.

(Tenth embodiment)
Next, a tenth embodiment will be described.
In the tenth embodiment, a first contact piece is provided independently for each of the two interfaces.
FIG. 17 is a perspective view of the memory card 100 according to the tenth embodiment, FIG. 18 is a block diagram showing the configuration of the memory card 100 according to the tenth embodiment, and FIG. 19 corresponds to a memory stick and a multimedia card. FIG. 20 is an explanatory diagram showing the correspondence between each contact piece and the signal when the interface is compatible with a memory stick and an SD card.

As shown in FIG. 17, the memory card 100 is connected to the first contact pieces 2 to 10 and the data communication unit 30 for performing data communication through one interface, in this embodiment, the memory stick interface. the second contacts 11 and 12 are arranged aligned in a straight line along one side 2002 located in front of the lower surface of the holding member 20, the first contact piece a plurality of under surface of the holding member 20 has The front row is constituted by 2 to 10 and the second contact pieces 11 and 12.
Furthermore, the other interface, in this embodiment, one side 2004 a first contact piece 2' ~ 10' for communicating data interface of the multimedia card is located behind of the lower surface of the holding member 20 They are arranged and disposed so as to linearly along, the back row is constituted by the first connection pieces 2' ~ 10' plurality of under surface of the holding member 20.
And as shown to FIG. 19 (A), the signal is allocated to each of these 1st contact pieces 2-10, 2'-10 '.

Here, the contact piece and signal in the case of a multimedia card will be described.
The contact pieces 9 ', 10', 2 'and 3' are signal terminals for inputting and outputting data signals DAT0, DAT1, DAT2 and DAT3, respectively.
The contact piece 4 'is a command (CMD) input terminal.
The contact piece 5 'is a ground terminal connected to the ground level (VSS).
The contact pieces 6 'and 7' are power supply terminals to which the power supplies VDD1 and VDD2 are input.
The contact piece 8 'is a signal terminal to which the clock signal CLK is input.

As shown in FIG. 18, one first contact piece 2 to 10 is connected to the first interface unit 2402A, and the other first contact piece 2 'to 10' is connected to the second interface unit 2402B. ing.
The controller 24 is provided with a power supply identification unit 2430.
The power source identification unit 2430 includes, among the first contact pieces 2 to 10, the contact piece 9 constituting the power supply terminal (Vcc) and the other first contact pieces 2 ' to 10 ', is connected to the contact piece 4 'constituting the VDD), and which contact piece is supplied with power is identified, and based on the identification result, either the first interface unit 2402A or the second interface unit 2402B is selected and operated.
Specifically, the power identification unit 2430 operates the first interface unit 2402A when power is supplied to one first contact piece 9, and power is supplied to the other first contact piece 4 '. When supplied, the second interface unit 2402B is configured to operate.
In the tenth embodiment, the second contact pieces 11 and 12 are not used for interface selection but are used only for data communication by the data communication unit 30.
In the tenth embodiment, the power supply identification unit 2430 constitutes an interface selection unit as claimed.

According to such a configuration, when the memory card 100 is inserted into the memory card slot of the external device, the power is supplied to either the first contact piece 9 or the first contact piece 4 ' which is a contact piece for supplying power. Is selected, either the interface of the memory stick or the interface of the multimedia card is selected, and the interface of the memory card 100 is matched with the interface of the external device.
Accordingly, various control signals and data signals are exchanged between the memory card 100 and the external device based on the selected interface, whereby data is written to and read from the storage unit 22 normally.

According to the tenth embodiment, an interface is selected based on which power supply first contact piece provided for each interface is supplied, and the data communication is performed by the selected interface. I did it.
Therefore, as in the first embodiment, simply by inserting the memory card into the memory card slot of the external device, an interface that matches the interface of the external device is selected on the memory card side, thereby improving convenience. This is advantageous.
Further, there is no need to provide a switch for switching the interface on the memory card or to provide a structure for operating the switch in the memory card slot of the external device, which is advantageous for cost reduction.

When such a memory card 100 is used by being installed in a card adapter for mounting in an existing memory card slot, for example, a memory stick slot or a multimedia card slot, the memory card 100 is used. It is necessary to connect the first contact pieces 2 to 10, 2 ' to 10 ' in FIG.
At this time, the order of arrangement of signals assigned to the first contact pieces 2 to 10, 2 ' to 10 ' in the memory card 100 is different from the order of arrangement of signals assigned to the contact pieces of the card adapter. The lead wires cross each other and become complicated, which is disadvantageous in reducing the manufacturing cost.
Therefore, it is desirable to configure the arrangement order of the contact pieces of the memory card 100 as much as possible in the order of the contact pieces of the card adapter.

For example, FIG. 19A shows a case where the memory card 100 is inserted into the card adapter so that the first contact pieces 2 to 10 are always inserted toward the card adapter regardless of which interface is used. The example at the time of comprising the card | curd 100 and the card adapter is shown.
In this case, the arrangement order of the contact pieces of the memory card 100 is configured to substantially match the order of the contact pieces of the card adapter.
In FIG. 19B, when the memory card 100 is inserted into the card adapter, when one interface is used, one of the first contact pieces 2 to 10 is inserted toward the card adapter, and the other interface is used. In this case, an example in which the memory card 100 and the card adapter are configured so that the other first contact pieces 2 'to 10' are inserted toward the card adapter is shown.
That is, as shown in FIG. 19B, the arrangement order of the first contact pieces 2 ' to 10 ' corresponding to the other interface is reversed from that in FIG. 19A.
In this case, the arrangement order of the contact pieces of the memory card 100 is substantially matched with the order of the contact pieces of the card adapter regardless of which direction the memory card 100 is inserted into the card adapter.

In the tenth embodiment, the interface corresponds to the memory stick and the multimedia card. However, as shown in FIG. 20A, the interface corresponds to the memory stick and the SD card. Of course, it is also applicable.
In FIG. 20B, as in FIG. 19A, the arrangement order of the first contact pieces 2 ' to 10 ' corresponding to the other interface is reversed from FIG. An example is shown.

(Eleventh embodiment)
Next, an eleventh embodiment will be described.
In the eleventh embodiment, as in the first embodiment, when the first contacts 2 to 10 are used in common by a plurality of interfaces, the potential of a specific contact

depends on the selection of the interface. Control.
When selecting one of the two types of interfaces of the memory stick and the multimedia card, the contact for inputting power, ground, and clock among the first contact can be a common terminal.
Also, the contact piece for inputting the bus state signal BS at the interface of the memory stick and the contact piece for inputting the command (CMD) at the interface of the multimedia card can be used as a common terminal.
in addition, in the multimedia card, the contact for the data signal DAT3 is used as a signal for supporting the serial transfer mode called the SPI mode. It is also used as an input terminal.
That is, the contact for the data signal DAT3 is also used as an SPI mode select terminal. In the specification of the multimedia card, the installation of a pull-up resistor is defined for the purpose of preventing malfunction due to noise included in the signal input to the SPI mode select terminal and ensuring the "H" level.
Therefore, referring to FIG. 4, when the interface of the multimedia card is selected, a pull-up resistor (not shown) is connected to the contact for the data signal DAT3 in the controller 24, and the memory stick When the interface is selected, a function for disconnecting the contact for the data signal DAT3 from the pull-up resistor is required.
Such a function includes, for example, a pull-up resistor and a switch connected in series between the contact for the data signal DAT3 and the contact for the power supply VCC, and a pull-up for turning on and off the switch based on the switching signal S1. This can be realized by providing an up resistance control means.
Alternatively, it is supplied from an external device through a pull-up resistor and a switch connected in series between the contact piece for the data signal DAT3 and the contact piece of the power supply VCC, and a contact piece for command input at the interface of the multimedia card. This can be realized by providing pull-up resistance control means for turning on and off the switch based on the command to be executed.

(Twelfth embodiment)
Next, a twelfth embodiment will be described.
The twelfth embodiment is a card adapter that can be used in the same manner as an existing memory card by mounting the memory card 100 of the present invention. 21 is an explanatory diagram of a card adapter for a memory stick, FIG. 22 is an explanatory diagram of a card adapter for a multimedia card, FIG. 23 is an explanatory diagram of a card adapter for an SD card, and FIG. 24 is an explanatory diagram of a modification of the card adapter for an SD card. FIG.

For convenience of explanation, FIG. 4 will be used to explain. In the twelfth embodiment, the switching signal generator 26 of the memory card 100 indicates that the interface selection signal D1 supplied to the second contact piece 11 is "H". , The switching signal S1 for selecting the first interface unit 2402A that performs data communication with the external device through the memory stick interface is supplied to the selection unit 2402C.
Further, when the interface selection signal D1 supplied to the second contact piece 11 is "L", the switching signal generation unit 26 transmits data to and from an external device through the interface for the multimedia card and the SD card. A switching signal S1 for selecting the second interface unit 2402B for communication is supplied.
Therefore, the interface is selected using only the second contact piece 11.

As shown in FIG. 21, the card adapter 400 is a card adapter for a memory stick, and ten contact pieces 401 to 410 are arranged on one side of the case 420
The card adapter 400 is configured so that the memory card 100 can be detachably attached. The first contact piece 2 to 10 of the memory card 100 and the contact piece 401 of the card adapter 420 with the memory card 100 attached. Wiring (not shown) that electrically connects ~409 is provided.
Further, the card adapter 400 is not provided with a contact piece connected to the second contact pieces 11 and 12 of the memory card 100.
Therefore, even if the memory card 100 is attached to the card adapter 400 in this state, and the card adapter 400 is attached to the card slot of the external device, the interface selection signal can be supplied to the second contact pieces 11 and 12 of the memory card 100. Can not.
Therefore, the card adapter 400 is provided with a wiring 430 that electrically connects the second contact piece 11 and the contact piece 409 connected to the power supply VCC of the card adapter 400 in a state where the memory card 100 is mounted.
Therefore, when the memory card 100 is attached to the card adapter 400 and the card adapter 400 is attached to the card slot of the external device, the power supply VCC is applied to the second contact piece 11 of the memory card 100 via the wiring 430.
Therefore, since the switching signal generator 26 is supplied with the power supply VCC, that is, the "H" signal, to the second contact piece 11, the first signal communication with the external device through the memory stick interface is performed. A switching signal S1 for selecting the interface unit 2402A is supplied to the selection unit 2402C.
Thereby, the interface of the memory card 100 is matched with the interface of the external device.
Therefore, various control signals and data signals are exchanged between the memory card 100 and the external device on the basis of the memory stick interface, whereby data is normally written to and read from the storage unit 22.
When the switching signal generator 26 operates in the same manner as when an "H" signal is input when the input terminal is open (during high impedance), the wiring 430 in FIG. The second contact piece 11 may be opened.

As shown in FIG. 22, the card adapter 500 is a card adapter for a high-speed type multimedia card, and contacts 501 to 513 are arranged on one side of the case 420.
The card adapter 500 is configured such that the memory card 100 is detachably attached. The memory card 100 is attached to the first contact pieces 2 to 10 of the memory card 100 and the contact piece 501 of the card adapter 500. Wiring (not shown) that electrically connects to 513 is provided.
Further, the card adapter 500 is not provided with a contact piece connected to the second contact pieces 11 and 12 of the memory card 100.
Therefore, even if the memory card 100 is mounted in the card adapter 500 in this state, and the card adapter 500 is mounted in the card slot of the external device, the interface selection signal can be supplied to the second contact pieces 11 and 12 of the memory card 100. Can not.
Therefore, the card adapter 500 is provided with wiring 530 that electrically connects the second contact piece 11 and the contact piece 503 connected to the ground terminal of the card adapter 500 in a state where the memory card 100 is mounted.
Therefore, when the memory card 100 is attached to the card adapter 500 and the card adapter 500 is attached to the card slot of the external device, the ground potential VSS is applied to the second contact piece 11 of the memory card 100 via the wiring 530.
Therefore, since the switching signal generator 26 is supplied with the land potential VSS, that is, the signal of "L", to the second contact piece 11, the switching signal generator 26 performs the data communication with the external device through the interface for the multimedia card. A switching signal S1 for selecting the second interface unit 2502B is supplied to the selection unit 2502C.
Thereby, the interface of the memory card 100 is matched with the interface of the external device.
Therefore, various control signals and data signals are exchanged between the memory card 100 and the external device on the basis of the interface for the multimedia card, so that the data is normally written to and read from the storage unit 22.

As shown in FIG. 23, the card adapter 600 is a card adapter for an SD card, and ten contact pieces 601 to 610 are arranged on one side of the case 420.
Note that the shape, arrangement, and signal assignment of the SD card contacts are almost the same as those of the multimedia card. The interface for the SD card and the interface for the multimedia card are almost the same.
The card adapter 600 is configured such that the memory card 100 is detachably attached. The memory card 100 is attached to the first contact pieces 2 to 10 of the memory card 100 and the contact piece 601 of the card adapter 420. Wiring (not shown) that electrically connects ~609 to one to one is provided.
Further, the card adapter 600 is not provided with a contact piece connected to the second contact pieces 11 and 12 of the memory card 100.
Accordingly, even if the memory card 100 is attached to the card adapter 600 in this state and the card adapter 600 is attached to the card slot of the external device, the

interface selection signal can be supplied to the second contact pieces 11 and 12 of the memory card 100. Can not.
Therefore, the card adapter 600 is provided with a wiring 630 that electrically connects the second contact piece 11 and the contact piece 603 connected to the ground terminal of the card adapter 600 with the memory card 100 mounted.
Therefore, when the memory card 100 is attached to the card adapter 600 and the card adapter 600 is attached to the card slot of the external device, the ground potential VSS is applied to the second contact piece 11 of the memory card 100 via the wiring 630.
Therefore, since the switching signal generator 26 is supplied with the ground potential VSS, that is, the signal of "L", to the second contact piece 11, the switching signal generator 26 performs the data communication with the external device through the interface for the multimedia card. A switching signal S1 for selecting the second interface unit 2402B is supplied to the selection unit 2402C.
Thereby, the interface of the memory card 100 is matched with the interface of the external device.
Therefore, various control signals and data signals are exchanged between the memory card 100 and the external device on the basis of the interface for the multimedia card, so that the data is normally written to and read from the storage unit 22.

In FIG. 21 to FIG. 23, the interface is selected depending on whether the signal given to one of the two second contact pieces 11 and 12 is a ground level signal or a power source.
However, as described below, the interface may be selected based on which of the two second contact pieces 11 and 12 is supplied with a ground level signal.
FIG. 24 is a modification of the card adapter for the SD card of FIG. 23, and is used when the memory card 100 has at least two interfaces of a multimedia card interface and an SD card interface. is there.
That is, referring to FIG. 4, the controller 24 includes a first interface unit 2402A that performs data communication with an external device through a multimedia card interface, and an external device through an SD card interface. A second interface unit 2402B that performs data communication therebetween, and a selection unit 2402C that selects the first and second interface units 2402A and 2402B.
The switching signal generation unit 26 selects the first interface unit 2402A when a ground level signal is input to the second contact piece 11, and the ground level signal is input to the second contact piece 12. In this case, a switching signal S1 for selecting the second interface unit 2402B is supplied to the selection unit 2402C.
According to such a configuration, if the memory card 100 is attached to the card adapter 500 of FIG. 22, the multimedia card interface is selected by the memory card 100, and if the memory card 100 is attached to the card adapter 600 of FIG. The SD card interface is selected in the memory card 100.
in FIG. 24, the interface is selected based on which one of the two second contact pieces 11 and 12 is supplied with the ground level signal, but the two second contact pieces 11 and 12 are selected. The level of the signal given to 12 is arbitrary, and it goes without saying that the level of the signal may be any as long as the interface can be identified.
In the twelfth embodiment, the power supplied from the external device to the second contacts of the claims by the wiring 430,530,630 or, by means for supplying a ground potential is configured Yes.

According to such card adapters 400, 500, and 600, even if the external device has only a card slot for an existing memory card, the wirings 430, 530, and 630 provided in the card adapters 400, 500, and 600 are used. Thus, a signal equivalent to the interface selection signal can be supplied to the switching signal generator 26 of the memory card 100, and a plurality of interfaces of the memory card 100 can be selected and used.

In the embodiment, the case where the memory card 100 is a memory stick, a multimedia card, or an SD card has been described. However, the format of the memory card 100 is not limited thereto.
in the embodiment, the case where a flash memory capable of rewriting data is used as the storage unit 22 has been described. However, the present invention is not limited to this, and the storage unit 22 can write and / or write data. Any device can be used as long as reading is performed.

(A) is a perspective view of the memory card 100, and (B) is a perspective view of the memory card 100 viewed in an inverted state. (A) is a bottom view of the memory card 100 according to the first embodiment, and (B) is a BB cross-sectional view of (A). 2 is a block diagram showing a configuration of a memory card 100. FIG. 2 is a block diagram illustrating an example of a configuration of a memory card 100. FIG. 6 is a block diagram showing another example of the configuration of the memory card 100. FIG. It is a figure which shows a response | compatibility with the contact piece of the memory card 100, and a signal name. It is a block diagram which shows the structure of the memory card 100 in 2nd Embodiment. (A) thru | or (C) are circuit diagrams which show the structure of the signal separation part provided in the switching signal production | generation part 26. FIG. 6 is an operation explanatory diagram of the data communication unit 30 of the memory card 100. It is a block diagram which shows the structure of the memory card 100 in 4th Embodiment. It is explanatory drawing of the frequency of the radio signal which can be utilized in the data communication part 30 in 6th Embodiment. (A)-(C) are circuit diagrams which show the structure of the switching signal production | generation part 26. FIG. It is a perspective view of a memory stick. It is a top view of a multimedia card. It is explanatory drawing which shows a response | compatibility with the contact piece of a memory stick and a multimedia card, and a signal. It is a block diagram which shows the structure of the memory card 100 in 9th Embodiment. It is a perspective view of the memory card 100 in 10th Embodiment. It is a block diagram which shows the structure of the memory card 100 in 10th Embodiment. It is explanatory drawing which shows a response | compatibility with each contact piece in case an interface respond | corresponds to a memory stick and a multimedia. It is explanatory drawing which shows a response | compatibility with each contact piece in case an interface respond | corresponds to a memory stick and a multimedia card. It is explanatory drawing of the card adapter for memory sticks. It is explanatory drawing of the card adapter for multimedia cards. It is explanatory drawing of the card adapter for SD cards. It is explanatory drawing of the modification of the card adapter for SD cards.

Explanation of symbols

DESCRIPTION OF SYMBOLS 100 ... Memory card, 2-10 ... 1st contact piece, 11, 12 ... 2nd contact piece, 20 ... Holding body, 22 ... Memory | storage part, 24 ... Controller.

Patent Citations (15)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US5418713A *	1993-08-05	1995-05-23	Allen; Richard	Apparatus and method for an on demand data delivery system for the preview, selection, retrieval and reproduction at a remote location of previously recorded or programmed materials
JPH08305814A *	1995-04-27	1996-11-22	Mitsubishi Electric Corp	Pc card
US6182162B1 *	1998-03-02	2001-01-30	Lexar Media, Inc.	Externally coupled compact flash memory card that configures itself one of a plurality of appropriate operating protocol modes of a host computer

IPR2025-00645 Page 02377

US6151647A *	1998-03-26	2000-11-21	Gemplus	Versatile interface smart card
JP2003532936A *	1998-03-26	2003-11-05	ジェムプリュス	General-purpose interface IC card
US6581122B1 *	1998-03-26	2003-06-17	Gemplus	Smart card which operates with the USB protocol
FR2783336B1 *	1998-09-11	2001-10-12	Schlumberger Ind Sa	DATA TRANSMISSION METHOD AND CARD FOR SUCH TRANSMISSION
JP3815936B2 *	2000-01-25	2006-08-30	株式会社ルネサステクノロジ	IC card
CN1218276C *	2000-04-28	2005-09-07	株式会社日立制作所	IC card
US6954929B2 *	2001-07-30	2005-10-11	Hewlett-Packard Development Company, L.P.	Method for just-in-time updating of programming parts
WO2003044732A1 *	2001-11-23	2003-05-30	Netac Technology Co., Ltd.	Semiconductor storage method and device supporting multi-interfaces
CN1367488B *	2002-02-09	2012-02-08	深圳市朗科科技股份有限公司	Semiconductor storage method for supporting several interfaces and device
US20050212690A1	2002-08-26	2005-09-29	Dai Nippon Printing Co., Ltd.	Sim, sim holder, ic module, ic card and ic card holder
KR100618814B1 *	2003-07-04	2006-08-31	삼성전자주식회사	Movable storage apparatus combined use of smart card capable of interfacing multi hosts and interfacing method of the same
US7119631B2 *	2004-03-12	2006-10-10	Broadcom Corporation	Off-chip LC circuit for lowest ground and VDD impedance for power amplifier

* Cited by examiner, † Cited by third party

Cited By (44)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
CN101272405B *	2007-03-22	2011-08-17	北京创毅视通科技有限公司	Receiving equipment, MMIS interface and data interaction method
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
JP2009181666A *	2008-01-31	2009-08-13	Sony Corp	Semiconductor memory device and operation method thereof
JP2009252036A *	2008-04-08	2009-10-29	Panasonic Corp	Memory card
JP2010003290A *	2008-05-22	2010-01-07	Panasonic Corp	Removable memory card,
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
JP5221281B2 *	2008-08-27	2013-06-26	株式会社バッファロー	Storage device
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US20110145465A1 *	2009-12-14	2011-06-16	Kabushiki Kaisha Toshiba	Semiconductor memory card
JP2011134174A *	2009-12-25	2011-07-07	Sony Corp	Card-type peripheral device and card system
JP5226722B2 *	2010-03-26	2013-07-03	株式会社バッファロー	Storage device
JP2013025485A	2011-07-19	2013-02-04	Toshiba Corp	Semiconductor storage device
CN103239233A *	2012-02-06	2013-08-14	上海宽带技术及应用工程研究中心	Fall detection system based on interface extension
TWI497385B *	2012-04-05	2015-08-21		?memory card adapter device
US9442539B2 *	2013-04-05	2016-09-13	Phy Technologies, Inc.	Reduced length memory card

IPR2025-00645 Page 02378

USD730907S1 *	2014-05-02	2015-06-02	Samsung Electronics Co., Ltd.	Memory card
USD730910S1 *	2014-05-02	2015-06-02	Samsung Electronics Co., Ltd.	Memory card
USD730908S1 *	2014-05-02	2015-06-02	Samsung Electronics Co , Ltd.	Memory card
USD727911S1 *	2014-06-27	2015-04-28	Samsung Electronics Co., Ltd.	Memory card
USD727912S1 *	2014-06-27	2015-04-28	Samsung Electronics Co., Ltd.	Memory card
USD727913S1 *	2014-06-27	2015-04-28	Samsung Electronics Co., Ltd.	Memory card
USD729251S1 *	2014-06-27	2015-05-12	Samsung Electronics Co., Ltd.	Memory card
USD730909S1 *	2014-06-27	2015-06-02	Samsung Electronics Co., Ltd.	Memory card
USD736212S1 *	2014-07-01	2015-08-11	Samsung Electronics Co., Ltd.	Memory card
USD736213S1 *	2014-07-01	2015-08-11	Samsung Electronics Co , Ltd.	Memory card
USD736214S1 *	2014-07-01	2015-08-11	Samsung Electronics Co., Ltd.	Memory card
USD736215S1 *	2014-07-01	2015-08-11	Samsung Electronics Co., Ltd.	Memory card
USD727910S1 *	2014-07-02	2015-04-28	Samsung Electronics Co., Ltd.	Memory card
USD739856S1 *	2014-07-30	2015-09-29	Samsung Electronics Co., Ltd.	Memory card
USD736216S1 *	2014-07-30	2015-08-11	Samsung Electronics Co., Ltd.	Memory card
CN104618059A *	2015-01-14	2015-05-13	华为技术有限公司	Method, device and system for transmitting transport stream data
USD773466S1 *	2015-08-20	2016-12-06	Isaac S. Daniel	Combined secure digital memory and subscriber identity module
USD798868S1 *	2015-08-20	2017-10-03	Isaac S. Daniel	Combined subscriber identification module and storage card
USD783622S1 *	2015-08-25	2017-04-11	Samsung Electronics Co., Ltd.	Memory card
USD783621S1 *	2015-08-25	2017-04-11	Samsung Electronics Co., Ltd.	Memory card
USD772232S1 *	2015-11-12	2016-11-22	Samsung Electronics Co., Ltd.	Memory card
USD773467S1 *	2015-11-12	2016-12-06	Samsung Electronics Co., Ltd.	Memory card
KR20190083569A *	2018-01-04	2019-07-12	삼성전자주식회사	Memory card and electronic apparatus including the same
WO2020174735A1 *	2019-02-25	2020-09-03	パナソニックＩｐマネジメント株式会社	Memory card for data transfer system, data storage device, system host, and memory card identification method
US10999929B2 *	2019-05-29	2021-05-04	Quanta Computer Inc.	Expansion card interfaces for high-frequency signals and methods of making the same
CN111179996B *	2019-12-31	2021-04-06	普源精电科技股份有限公司	Data calibration device and calibration data storing and writing method thereof

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP4864346B2	2012-02-01	Memory card and card adapter
JP4296440B2	2009-08-11	IC card

US9202160B2	2015-12-01	Memory card adapter
KR101277810B1	2013-06-21	Semiconductor memory card
US8639854B2	2014-01-28	Negotiation of a proper communication protocol between a data carrier and a reader device
US7389937B2	2008-06-24	Card-shaped memory device incorporating IC card function
US7374104B2	2008-05-20	Memory card
JP4896450B2	2012-03-14	Storage device
KR20100107057A	2010-10-04	Semiconductor card device
JP2007034612A	2007-02-08	Card tray
US20050021895A1	2005-01-27	Removable memory cards including USB and other controllers, connectors, and methods of operating same
US9722653B2	2017-08-01	Memory card adapter
US8070067B2	2011-12-06	Receptacles for removable electrical interface devices
WO2008075594A1	2008-06-26	Semiconductor device and adaptor for the same
US20100125689A1	2010-05-20	Electronic apparatus capable of receiving different types of memory cards
KR20050016636A	2005-02-21	ic chip, card and mobile terminal connected to the same
WO2019149278A1	2019-08-08	Memory card, and terminal
JP4743588B2	2011-08-10	Semiconductor device
CN110633780A	2019-12-31	Semiconductor memory device with a plurality of memory cells
JP5325509B2	2013-10-23	Non-contact information processing media
KR20060057794A	2006-05-29	Apparatus and method for recognize insert of multi-media-card in portable terminal
JP4778547B2	2011-09-21	IC card
JP2011175549A	2011-09-08	Ic module, and ic card with the same

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
JP2005145437A	2005-05-18	2005-05-18	Memory card and card adapter

Applications Claiming Priority (8)

Application	Filing date	Title
JP2005145437A	2005-05-18	Memory card and card adapter
KR1020077001192A	2006-05-17	Memory card and card adapter
CN200680000536A	2006-05-17	Memory card and card adapter
EP06746547A	2006-05-17	Memory card and card adapter
PCT/JP2006/309844	2006-05-17	Memory card and card adapter
US11/632,681	2006-05-17	Memory Card and Card Adapter
TW095117668A	2006-05-18	
HK07109263.4A	2007-08-27	Memory card and card adapter

Legal Events

Date	Code	Title	Description
2008-04-11	A621	Written request for application examination	**Free format text:** JAPANESE INTERMEDIATE CODE: A621

IPR2025-00645 Page 02380

			Effective date: 20080410
2009-09-01	RD02	Notification of acceptance of power of attorney	**Free format text**: JAPANESE INTERMEDIATE CODE: A7422 **Effective date**: 20090831
2009-10-02	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20090908
2009-10-15	RD04	Notification of resignation of power of attorney	**Free format text**: JAPANESE INTERMEDIATE CODE: A7424 **Effective date**: 20091014
2010-07-16	A711	Notification of change in applicant	**Free format text**: JAPANESE INTERMEDIATE CODE: A712 **Effective date**: 20100715
2011-04-13	A131	Notification of reasons for refusal	**Free format text**: JAPANESE INTERMEDIATE CODE: A131 **Effective date**: 20110412
2011-06-11	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20110610
2011-10-14	TRDD	Decision of grant or rejection written	
2011-10-19	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01 **Effective date**: 20111018
2011-10-20	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01
2011-11-17	A61	First payment of annual fees (during grant procedure)	**Free format text**: JAPANESE INTERMEDIATE CODE: A61 **Effective date**: 20111109
2011-11-18	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20141118 **Year of fee payment**: 3
2011-11-18	R150	Certificate of patent or registration of utility model	**Free format text**: JAPANESE INTERMEDIATE CODE: R150
2014-11-18	LAPS	Cancellation because of no payment of annual fees	

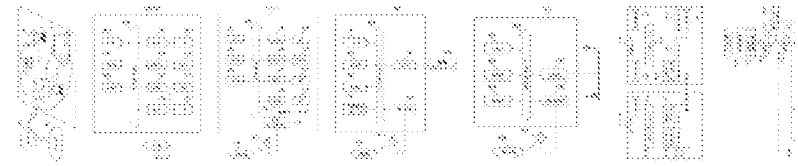
Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

Patents 4766666

Information processing apparatus, device, information processing system, and program

Images (24)



Classifications

G06K15/00 Arrangements for producing a permanent visual presentation of the output data, e.g. computer output printers

View 3 more classifications

JP4766666B2
Japan

Download PDF Find Prior Art Similar

Other languages: Japanese

Inventor: 伸朗 深澤

Worldwide applications

2005 JP 2006 US EN

Application JP2005248162A events

2005-08-29 Application filed by キヤノン株式会社
2005-08-29 Priority to JP2005248162A
2007-03-15 Publication of JP2007065782A
2011-09-07 Application granted
2011-09-07 Publication of JP4766666B2
Status Expired - Fee Related
2025-08-29 Anticipated expiration

Info: Patent citations (16), Cited by (13), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (10)

Hide Dependent

1. An information processing apparatus that implements a predetermined function using secret information stored in a device,
Secret information acquisition means for acquiring confidential information input through the device in a state of being attached to the device;
First identification information acquisition means for acquiring identification information for uniquely identifying the device in a state of being attached to the device;
Secret information storage means for storing the secret information acquired by the secret information acquisition means;
Identification information storage means for storing identification information acquired by the first identification information acquisition means;
Second identification information acquisition means for acquiring identification information for uniquely identifying the device from the device in response to a request for reference to secret information in a state of being attached to the device;
Determination means for determining whether the identification information stored in the identification information storage means matches or does not match the identification information acquired by the second identification information acquisition means;
An information processing apparatus comprising: a control unit that permits or prohibits reference to secret information stored in the secret information storage unit with respect to a mounted device according to a determination result by the determination unit.

2. When there is a secret information setting request, when the secret information is already stored in the secret information storage means and the identification information is stored in the identification information storage means, the secret information storage means newly The secret information acquired by the secret information acquisition unit is stored by overwriting, and the identification information storage unit stores the identification information newly acquired by the first identification information acquisition unit by overwriting. Item 6. The information processing apparatus according to Item 1.

3. As a result of the determination by the determination means, even if the identification information stored in the identification information storage means and the identification information acquired by the second identification information acquisition means do not coincide, 3. The information processing apparatus according to claim 2, wherein if there is a secret information setting request, the secret information acquisition unit acquires new secret information.

4. When the acquired secret information is stored in the secret information storage means, the control means has correspondence information storage means for storing correspondence information in association with the secret information, and the control means is a result of determination by the determination means. Even if the identification information stored in the identification information storage means and the identification information acquired by the second identification information acquisition means do not match, the corresponding information is input via the device and the input is performed. If the correspondence information matches the correspondence information stored in the correspondence information storage means, the attached device is allowed to refer to the secret information stored in the secret information storage means. The information processing apparatus according to any one of claims 1 to 3.

5. It holds identification information for uniquely identifying itself and is a device that can be attached to an information processing apparatus,
Confidential information input means for inputting confidential information;
Secret information supply means for supplying the secret information input by the secret information input means to the mounted information processing apparatus in a

IPR2025-00645 Page 02382

state where the information processing apparatus is mounted;
In a state where the information processing apparatus is mounted, a first identification information Hokyo supply means for supplying the identification information, to the information processing apparatus that is mounted,
A second identification information supply means for supplying the identification information to the currently mounted information processing device in response to a request for reference to secret information;
By the information processing apparatus that is installed, the result of determination of coincidence or discrepancy between the supplied identification information by said supply identification information by the first identification information Hokyo supply means second identification information supply unit, the information processing And a result receiving means for receiving from the apparatus.

6. If the result receiving means matches the determination result received by indicates a match or mismatch between the supplied identification information by said first identification information Hokyo identification information supplied by the supply means second identification information supplying means 6. The device according to claim 5, further comprising control means for displaying on the display section whether or not to permit or prohibit reference to secret information stored in the currently installed information processing apparatus.

7. If the result receiving means as a result of the judgment of the receipt has been matched or mismatched by indicates a match with the supplied identification information by said supply identification information by the first identification information Hokyo supply means second identification information supplying means Urges input of new secret information, and when new secret information is input, secret information setting request reissue means for newly issuing a secret information setting request based on the input new secret information The device of claim 6, comprising:

8. An information processing system comprising the information processing apparatus according to any one of claims 1 to 4 and the device according to any one of claims 5 to 7.

9. In a state of being mounted on the device, a pulp program is executed on the information processing equipment to realize a predetermined function using a secret information stored,
The information processing apparatus,
Secret information acquisition means for acquiring secret information input via the device in a state where the information processing apparatus is mounted on the device;
First identification information acquisition means for acquiring identification information for uniquely identifying the device in a state in which the information processing apparatus is mounted on the device;
First storage means for secret information R_N is stored in the secret information storage unit acquired by the private information acquisition unit,
Second storage means for storing identification information acquired by the first identification information acquisition means in an identification information storage means ,
Second identification information acquisition means for acquiring identification information for uniquely identifying the device from the device in response to a request for reference to secret information in a state of being attached to the device;
Determination means for determining whether the identification information stored in the identification information storage means matches or does not match the identification information acquired by the second identification information acquisition means ;
Wherein according to the result of determination by the determining means, a program to function relative to the mounting devices, said as a control means for permitting or prohibiting the reference secret information stored in the secret information storage unit.

10. Itself holds identification information for uniquely identifying the information processing apparatus is a pulp program is run on wearable devices,
The device,
Confidential information input means for inputting confidential information;
Secret information supply means for supplying the secret information input by the secret information input means to the attached information processing apparatus in a state where the information processing apparatus is attached to the device;
In a state where the information processing apparatus is mounted on the device, the first identification information Hokyo supply means for supplying the identification information, to the information processing apparatus that is mounted,
Second identification information supply means for supplying the identification information to the mounted information processing apparatus in response to a request for reference to secret information in a state where the information processing apparatus is mounted on the device;
By the information processing apparatus that is installed, the result of determination of coincidence or discrepancy between the supplied identification information by said supply identification information by the first identification information Hokyo supply means second identification information supply unit, the information processing program for operating as a result receiving means for receiving from the device.

Description

The present invention is an information processing apparatus such as the expansion card, relates to a technique for realizing a predetermined function extension or the like mounted on the expansion slot or the like of a device such as a printer.

Conventionally, an information processing apparatus such as an expansion card that is detachably attached to a device such as a printer and is connected to the device and connects the device to a network is known. In this information processing apparatus, for example, when starting an application, the license code stored in the device is compared with the license code stored in the information processing apparatus, and if the two match, the application is started. . This prevents the information processing apparatus from being attached to another device and the application stored in the information processing apparatus from being used for the other device.

In addition, there is known a semiconductor device and a terminal device that increase a technical barrier against unauthorized use of applied devices of a semiconductor device by replacing a semiconductor substrate (Patent Document 1 below). In this device, when the semiconductor device is shipped as a product, the child substrate generates a unique identification code, and the memory of the parent semiconductor substrate stores the identification code as a storage code. In operation, the sub board compares the identification code and the storage code, and when both do not match each other, the operation of a part of the predetermined circuit on the sub board is stopped.
JP 2002-073424 A

However, in a system in which an information processing apparatus that provides various functions without changing the firmware of the device is mounted on the device, the firmware on the device side cannot operate information related to functions unique to the information processing apparatus There is. For such a case, it is desirable that information specific to the information processing apparatus is not stored on the device but stored in the information processing apparatus.

On the other hand, when the information processing apparatus stores information such as a secret key (hereinafter referred to as secret information), if the information processing apparatus mounted on the first device and used is mounted on the second device. As a result, the secret information is passed to the second device as it is, and there is a possibility that leakage of the secret information and unauthorized use of the secret information may occur.

For example, taking an information processing apparatus that provides a wireless LAN function as an example, even when it is desired to permit access to the wireless LAN only by the first device, the information processing apparatus that holds authentication information necessary for connecting to the access point is attached to the second device after being detached from the first device, the second device can connect to the access point using the authentication information. Further, when the information processing apparatus holds secret information used in wireless LAN encryption communication, the information is easily browsed and used in the second device.

Further, it is difficult to change the combination of the device and the information processing apparatus only by the information processing apparatus authenticating using a license code or the like as in the prior art. Since the user may not be able to use the confidential information that was used for the previous device, if the information processing device is to be used again by another device, the confidential information in the information processing device it is desirable to be updated.

By the way, in the above Patent Document 1, since the identification information of the child board is stored in the memory of the parent semiconductor board, there is room for improvement in facilitating license management such as permission of operation of a predetermined circuit on the child board. There is.

The present invention has been made to solve the above-described problems of the prior art, and its purpose is to allow a device in which secret information is set in an information processing apparatus to refer to the secret information and to allow other devices to by prohibiting references confidential information, in a Turkey to prevent leakage of confidential information via other devices.

In order to achieve the above object, an information processing apparatus according to claim 1 of the present invention is an information processing apparatus that realizes a predetermined function using stored secret information in a state of being attached to a device. Secret information acquisition means for acquiring secret information input via the device in the attached state from the device, and identification information for uniquely identifying the device in the attached state of the device First identification information acquisition means acquired from the secret information storage means for storing the secret information acquired by the secret information acquisition means, and identification information storage for storing the identification information acquired by the first identification information acquisition means And second identification information for acquiring identification information for uniquely identifying the device from the device in response to a request for reference to secret information in a state of being attached to the device. In accordance with the result of determination by the determination means, the determination means for determining whether the identification information stored in the identification information storage means and the identification information acquired by the second identification information acquisition means match or mismatch, Control means for permitting or prohibiting the attached device from referring to the secret information stored in the secret information storage means.

According to the first, fifth, and eighth to eleventh aspects of the present invention, a device that sets secret information in the information processing apparatus is permitted to refer to the secret information, and other devices are prohibited from referring to the secret information. As a result, it is possible to prevent leakage of secret information via other devices. Moreover, permission / prohibition of reference to secret information can be determined based on identification information on the device side, thereby facilitating management of reference to secret information.

According to the second aspect, even after the device that is permitted to refer to the secret information is determined, the permitted device can be updated, and the combination of the information processing apparatus and the device can be freely changed. It can.

According to Claims 3 and 7, even if the device is once prohibited from referring to the secret information, the secret information is updated by issuing a new secret information setting request. It is possible to allow a device that has been prohibited to refer to a new secret information.

According to the fourth aspect, even if the device is once prohibited from referring to the secret information, it is possible to receive permission to refer to the secret information by inputting the correspondence information.

According to the sixth aspect, it is possible to notify the user of permission or prohibition of reference to the secret information.

Hereinafter, embodiments of the present invention will be described with reference to the drawings.

Some devices, such as printers and multifunction peripherals, can operate with functions expanded by attaching various cards such as an expansion card as an information processing apparatus. In that case, it is necessary for the device to operate in correspondence with various expansion cards, but the user I / F is not sufficient for a device such as a printer or a multifunction peripheral. For this reason, it is not desirable to force the user or service person to change the firmware corresponding to the expansion card or install an expansion card driver, such as a PC (personal computer). Causes trouble. In order to support various expansion cards without changing the firmware on the device side, the device side accesses the expansion card in the same way no matter what expansion card is installed, and all the information specific to the expansion card Must be held by the side.

The present invention provides the authority to use / view secret information only on a specific device in a system that holds secret information such as a secret key (hereinafter referred to as "secret information") on an expansion card as described above. Even if a card is attached to another device, it realizes a function for preventing the use, browsing and leakage of confidential information. Hereinafter, a wireless LAN card will be described as an example of an expansion card. However, the present invention is not limited to the functions provided by the expansion card.

(First embodiment)
FIG. 1 is a diagram illustrating an overall configuration of an information processing system including an information processing apparatus and a device according to a first embodiment of the present invention.

In this information processing system, a single function printer (hereinafter referred to as "SFP (Single Function Printer)") 110, a multifunction peripheral (hereinafter referred to as MFP (Multi Function Printer)) 111, and a PC (personal computer) 130 are respectively wirelessly connected. A LAN access point (hereinafter referred to as "AP (Access Point)") 101 is connected to a wireless LAN (WLAN) 102 formed by the LAN. AP 101 and PC 120 are connected to LAN 100. The SFP 110 and the MFP 111 are devices that receive a print job from the PC 130 via the wireless LAN 102 and perform print processing. Further, the SFP 110 and the MFP 111 can set and operate a device from a remote location by receiving a setting and operation request from the PC 130 and performing an operation according to the request. Similarly, the SFP 110 and the MFP 111 receive a print job from the PC 120 via the LAN 100 and the wireless LAN 102 and perform print processing. In addition, as in the case of the PC 130, the SFP 110 and the MFP 111 can receive setting and operation requests from the PC 120 and perform operations according to the requests, thereby enabling remote device setting and operation.

The firewall 140 connects the LAN 100 to the external Internet 150. The LAN 100 is connected to another network 160 via a firewall 140 and the Internet 150.

FIG. 2 is a block diagram illustrating the internal configuration of the PC 120 and the PC 130. The PC 120 and the PC 130 are configured similarly, and both have the same internal configuration as a general personal computer.

IPR2025-00645 Page 02384

The PCs 120 and 130 include a CPU 201 that executes various software stored in the ROM 202 or the hard disk (HD) 211 or supplied from a floppy (registered trademark) disk drive (FD) 212. The CPU 201 comprehensively controls each device connected to the system bus 204. The hard disk 211 and the floppy (registered trademark) disk drive 212 store a boot program, various applications, edit files, user files, and the like.

The RAM 203 functions as a main memory, work area, and the like for the CPU 201. A keyboard controller (KBC) 205 controls an instruction input from a keyboard (KB) 209 or a pointing device (not shown). A CRT controller (CRTC) 206 controls display on a CRT display (CRT) 210. A disk controller (DKC) 207 controls access to the hard disk 211 and the floppy (registered trademark) disk drive 212. A network interface card (NIC) 208 bi-directionally exchanges data with a network printer, another network device, or another PC via the LAN 100 for the PC 120 and the wireless LAN 102 for the PC 130, respectively.

FIG. 3 is a block diagram showing the internal configuration of the SFP 110 and the MFP 111. The SFP 110 and the MFP 111 are configured in the same manner.

SFP 110, MFP 111 includes, ROM 302 or stored in the hard disk (HD) 311, or a floppy (registered trademark) CPU 301 for executing various programs supplied from the disk drive (FD) 312 (confidential information supplying means, first identification information supply means comprises second identification information supply unit, the result receiving means, control means, the secret information setting request reissue means). The CPU 301 comprehensively controls each device connected to the system bus 304. The hard disk 311 and the floppy (registered trademark) disk drive 312 store a boot program, a "device-side main program" for performing the operation of the present invention, various applications, and data files.

A RAM 303 functions as a main memory, work area, and the like for the CPU 301. A user interface (UI) 309 (secret information input means, display unit) includes an operation panel unit (not shown) including a display unit, and a user interface controller (UIC) 305 displays on the user interface 309, a user interface An instruction input from 309 is controlled.

A function controller (FUNCC) 306 implements / controls a function (FUNC) 310 that is a function unique to the device. For example, in the case of the SFP 110, functions of a monochrome print engine controller and a monochrome print engine are realized for a monochrome printer, and a color print engine controller and a color print engine are realized for a color printer. The MFP 111 has a function controller 306 and a function 310 for each function.

A disk controller (DKC) 307 controls access to the hard disk 311 and the floppy (registered trademark) disk drive 312. The expansion slot controller (EXPC) 308 performs relay control of the system card and the expansion card 321 (information processing apparatus) mounted in the expansion slot I / F 320. There are a plurality of expansion cards 321, and the functions provided to the SFP 110 and the MFP 111 are different depending on each expansion card. Examples include a wireless LAN function, a data encryption function, a PDL (Print Data Language) control function, and the like. That is, the SFP 110 and the MFP 111 can be mounted with various expansion cards 321 and can obtain a function provided by the mounted expansion card 321.

An expansion card 321 shown in FIG. 3 is an extended wireless LAN card (EXP WLAN NIC) that provides a wireless LAN function, and is connected to the wireless LAN 102 (WLAN) through an antenna (AT) 322, and is connected to a network printer, other network device, or Bidirectionally exchange data with other PCs.

FIG. 4 is a block diagram showing a configuration of a wireless LAN card 321 that is an extended wireless LAN card.

The wireless LAN card 321 can be attached to both the SFP 110 and the MFP 111 shown in FIG. 3 and provides the SFP 110 and the MFP 111 with a function of connecting to the wireless LAN 102.

The wireless LAN card 321 includes a CPU 401 (secret information acquisition unit, first identification information acquisition unit, second identification information acquisition unit, determination unit, control unit) that executes various programs stored in the ROM 402. Overall control of each connected device. The ROM 402 also stores an "expansion card side main program" that performs the operation of the present invention. The RAM 403 functions as a main memory, work area, and the like for the CPU 401. An expansion slot controller (EXPC) 405 connects the wireless LAN card 321 to the expansion slot I / F 320, and exchanges data bidirectionally between devices such as the SFP 110 and the MFP 111 shown in FIG. A wireless LAN controller (WLANC) 406 connects the wireless LAN card 321 to the wireless LAN (WLAN) 102 via an antenna (AT) 322, and exchanges data bidirectionally with other network devices or other PCs. The nonvolatile memory 407 is a rewritable and nonvolatile memory such as a flash memory.

FIG. 5 is a block diagram showing the internal configuration of the AP 101. The internal configuration of the AP 101 is the same as that of a general wireless LAN access point.

The AP 101 includes a CPU 501 that executes various programs stored in the ROM 502, and comprehensively controls each device connected to the system bus 504. The RAM 503 functions as a main memory, work area, and the like for the CPU 501. A LAN controller (LANC) 505 exchanges data bi-directionally with a network printer, another network device, or another PC via the LAN 100. A wireless LAN controller (WLANC) 506 connects the AP 101 to a wireless LAN (WLAN) 102 via an antenna (AT) 507, and exchanges data bidirectionally with a network printer, another network device, or another PC.

FIG. 6 is a model diagram in the case where a wireless LAN card 321 that is an extended wireless LAN card is attached to the SFP 110 and the MFP 111.

The SFP 110 and the MFP 111 have an expansion slot I / F PHY 611 and are physically coupled to the expansion card 321. The expansion slot I / F (L2) 612 and the expansion slot I / F (L4 / L3) 613 are connected to the expansion slot I / F (L2) 625 and the expansion slot I / F (L4 / L3) 626 on the expansion card 321. Corresponding.

Using the expansion slot I / F PHY 611, (L2) 612, (L4 / L3) 613, (L2) 625, and (L4 / L3) 626, the application 619 of the SFP 110 and MFP 111 and the application 629 of the expansion card 321 Data is exchanged in both directions. The TCP / IP / Ethernet (registered trademark) 615 accesses the wireless LAN using the WLAN MAC 622 and the WLAN PHY 621 of the expansion card 321 via the expansion slot I / F (L2) 612 and the expansion slot I / F PHY 611. Are provided to the user of the application 619 and the SFP 110 and MFP 111.

The WLAN MAC 622 and the WLAN PHY 621 on the expansion card 321 provide the functions of the wireless LAN protocol layer 2 and layer 1, and are specific functions when the expansion card 321 is an expansion wireless LAN card. The secret information 627 is secret information held in the expansion card. The user of the application 619, the SFP 110, and the MFP 111 receives the secret information 627 via the expansion slot I / F PHY 611, (L2) 612, (L4 / L3) 613, (L2) 625, (L4 / L3) 626, and the application 629. To access.

DeviceID (hereinafter referred to as "device ID") 618 and 628 are identification information for uniquely identifying the SFP 110 and the MFP 111. The device ID 618 is assigned to each of the SFP 110 and the MFP 111 at the time of shipment. The device ID 618 is passed from the SFP 110 and the MFP 111 to the expansion card 321 by the processing described later. Although details will be described later, the secret information 627 is protected from unintended devices by comparing the device IDs 618 and 628.

FIG. 7 is a flowchart of the device-side main program executed in the SFP 110 and MFP 111. This process is started when the power is turned on. When the CPU 301 executes this device-side main program, the SPF 110 and the MFP 111 operate according to the device-side main program.

IPR2025-00645 Page 02385

First, the device-side main program performs an initialization process (step S701), and executes an expansion card search process of FIG. 9 described later (step S702). Then, the device-side main program determines whether or not an expansion card is attached as a result of the search process (step S703). If an expansion card is attached, the process proceeds to step S704. The process proceeds to S709. In step S709, the device-side main program operates the device on the assumption that no expansion card is installed, and the device-side main program ends when it is determined that a user instruction operation or termination is necessary. .

In step S704, the device-side main program waits for a user operation, a request from the PC 130 on the network shown in FIG. 1 or a request from the inside of the device-side main program. If there is a request, the device-side main program follows the request in step S705. Control is distributed to ~ S708.

That is, if the request is a secret information setting request (installation request), the device-side main program proceeds to step S705. If the request is a secret information reference request, the device-side main program proceeds to step S706. If the request is an end request, the device-side main program proceeds to step S708. If the request is another request other than the secret information setting request, secret information reference request, and end request, the device-side main program is executed. The program proceeds to step S707. After the processing of steps S705 to S707, the process returns to step S704. In step S708, the device-side main program performs necessary end processing, and the device-side main program ends.

In step S705, the device-side main program executes device-side secret information setting processing shown in FIG. In step S706, the device-side main program executes device-side secret information reference processing shown in FIG.

FIG. 8 is a flowchart of the expansion card side main program executed in the expansion card 321 mounted on the SFP 110 and the MFP 111. This process is executed when the SFP 110 and MFP 111 (hereinafter referred to as "attached device") with the expansion card 321 attached are turned on. When the CPU 401 executes the expansion card side main program, the expansion card 321 operates in accordance with the expansion card side main program.

First, the expansion card side main program executes an initialization process (step S801), and executes a search response process of FIG. 10 described later (step S802). Next, in step S803, the expansion card side main program waits for a request from the inside of the expansion card side main program or a request from the attached device. If there is a request, the control proceeds to steps S804 to S807 according to the request. Distribute.

That is, if the request is a secret information setting request, the expansion card side main program proceeds to step S804, and if the request is a secret information reference request, the expansion card side main program proceeds to step S805. If the request is an end request, the main program on the expansion card side proceeds to step S807. If the request is another request other than the secret information setting request, the secret information reference request, and the end request, the expansion card side main program The side main program proceeds to step S806. After the processes in steps S804 to S806, the process returns to step S803. In step S807, the expansion card side main program performs necessary termination processing, and the expansion card side main program ends.

In step S804, the expansion card side main program executes the expansion card side secret information setting process of FIG. In step S805, the expansion card side main program executes an expansion card side secret information reference process of FIG.

FIG. 9 is a flowchart of the expansion card search process executed in step S702 of FIG.

First, the device-side main program initializes the variable n to n = 0 (step S901), and determines whether or not the investigation has been completed for all of the provided expansion slot I / Fs 320 (see FIG. 3) (step S901) S902). As a result of the determination, if all the expansion slots have been checked, the device-side main program ends this processing. If there is an unchecked extension slot, the device-side main program proceeds to step S903.

In step S903, the device-side main program checks the # n-th expansion slot among the expansion slots assigned serial numbers. The device-side main program increments the variable n by 1 (step S904). In the subsequent step S905, the device-side main program determines whether or not a card is installed in the expansion slot #n as a result of the investigation in step S903. If not installed, the device-side main program returns to step S902. On the other hand, if it is installed, the device-side main program requests an initial setting item to the installed expansion card 321 (hereinafter referred to as "expansion card 321a" when particularly distinguishing the expansion card 321 in the installed state). Is transmitted, and information indicating initial setting items is received as a response (step S906). Thereby, the device-side main program obtains information items to be set in the expansion card 321a.

Next, in step S907, the device-side main program transmits a setting value for the initial setting item to the expansion card 321a for the information item to be set obtained in step S906, and performs initial setting of the expansion card 321a. Thereafter, the device-side main program returns to step S902.

FIG. 10 is a flowchart of the search response process executed in step S802 of FIG.

First, the expansion card side main program waits for an initial setting item request from the mounted device (step S1001), and when the reception of the initial setting item request is completed, the expansion card side main program proceeds to step S1002. In step S1002, the expansion card side main program returns information indicating the initial setting item to the mounting device as a response to the received initial setting item request (initial setting item response). Here, the device ID 628 (see FIG. 6) is also one of the initial setting items, and DevInfoTmp 1811 (identification information storage unit) shown in FIG.

Next, in step S1003, the expansion card side main program receives setting values for each of the initial setting items from the mounted device, and performs settings in the expansion card 321 according to those setting values. Thereafter, the expansion card side main program ends this processing.

FIG. 11 is a flowchart of the device-side secret information setting process executed in step S705 of FIG

First, the device-side main program determines whether or not a secret information input screen is already displayed on the user interface 309 (step S1101). If the screen is displayed, the device-side main program proceeds to step S1103. On the other hand, if not yet displayed, the device-side main program displays the input screen (step S1102), and then proceeds to step S1103.

In step S1103, the device-side main program waits for input of secret information from the user via the user interface 309. If a cancel instruction is input, the device-side main program proceeds to step S1107. On the other hand, when the input of secret information is completed, the device-side main program transmits a secret information setting request to the expansion card 321a (step S1104). Details of the secret information setting request will be described later with reference to FIG.

Next, the device-side main program receives a secret information setting response from the expansion card 321a (step S1105). Details of the secret information setting response will be described later with reference to FIG. Thereafter, the device-side main program waits for input of a setting work end instruction from the user. If the setting work end instruction is input, the device-side main program proceeds to step S1107. In step S1107, the device-side main program erases the display related to the secret information input, and then the device-side main program ends this process.

Next, request and response messages will be described.

FIG. 15 is a conceptual diagram showing the structure of a secret information setting request message. This secret information setting request 1500 is transmitted from the mounting device to the expansion card 321a when the mounting device sets secret information in the expansion card 321a.

IPR2025-00645 Page 02386

As shown in the figure, in the secret information setting request 1500, an area 1501 stores an identifier indicating that the secret information setting request 1500 is a secret information setting request. The area 1502 stores various types of information such as secret information. An area 1503 stores a device ID. As described above, this device ID is given to each device at the time of factory shipment, and is an identifier that uniquely represents the device. Therefore, the area 1503 stores the device ID 618 of the mounted device. The area 1590 stores other information.

FIG. 16 is a conceptual diagram showing a structure of a secret information reference request message. This secret information reference request 1600 is transmitted from the mounting device to the expansion card 321a when the mounting device wants to view / use the secret information in the expansion card 321a. Alternatively, when it is necessary to refer to the secret information in the expansion card 321a, it is generated / issued in the expansion card 321a and processed. As shown in the figure, in the secret information reference request 1600, an area 1601 stores an identifier indicating that the secret information reference request 1600 is a secret information reference request. The area 1602 stores a device ID (device ID 618 of the attached device). The area 1690 stores other information.

FIG. 17 is a conceptual diagram showing a configuration of a secret information setting / reference response message. This secret information setting / reference response 1700 is transmitted as a secret information setting response 1700a and a secret information reference response 1700b, respectively, as responses to the secret information setting request 1500 and the secret information reference request 1600 from the expansion card 321a. is there. As shown in the figure, in the secret information setting / reference response 1700, if the request is the secret information setting request 1500, the area 1701 has an identifier indicating that the request is the secret information setting response 1700a, and the request refers to the secret information. In the case of the response 1600, an identifier indicating that it is the secret information reference response 1700b is stored. The area 1702 stores a return code (ReturnCode). This return code includes success, failure, permission / refusal of confidential information reference, and the like. The area 1703 stores other information.

FIGS. 18A and 18B are diagrams showing the storage areas of the nonvolatile memory 407 and the RAM 403 of the expansion card 321. FIG. A nonvolatile area 1810 shown in FIG. 6A is configured in the nonvolatile memory 407, and a volatile area 1820 shown in FIG. 4B is configured in the RAM 403 (see FIG. 4). The nonvolatile area 1810 includes KeyInfo 1812 (secret information storage unit) and DevInfo 1811 which are storage areas.

DevInfo 1811 is an area for storing a device ID, and stores a device ID in a request message when a secret information setting request is made from a mounted device. KeyInfo 1812 is an area for storing secret information, and stores the secret information in the request message as secret information 627 (see FIG. 6) when a secret information setting request is made from the mounted device. The secret information 627 is stored in the KeyInfo 1812 as input by the mounting device that has transmitted the secret information setting request. Therefore, it can be updated whenever there is a secret information setting request.

The volatile area 1820 includes DevInfoTmp 1821, and DevInfoTmp 1821 is an item that is set when the mounted device is initialized when the power is turned on. DevInfoTmp 1821 stores the device ID in the request message when a secret information setting request or a secret information reference request is made from the attached device.

FIG. 12 is a flowchart of the expansion card side secret information setting process executed in step S804 of FIG. In FIG. 12, first, the expansion card side main program waits for completion of reception of the secret information setting request 1500 (see FIG. 15) from the attached device (step S1201). After the reception of the secret information setting request 1500 is completed, the expansion card side main program extracts the secret information from the received secret information setting request 1500 and stores it in the KeyInfo 1812 (see FIG. 18A) (step S1202). Next, the expansion card side main program extracts the device ID from the secret information setting request 1500 and stores it in DevInfo 1811 (step S1203), and also stores the device ID in DevInfoTmp 1821 (see FIG. 18B) (Step S1204). Next, the expansion card side main program returns a secret information setting response 1700a (see FIG. 17) to the mounted device (step S1205), and ends this processing.

FIG. 13 is a flowchart of the device-side secret information reference process executed in step S706 of FIG. In FIG. 13, first, the device-side main program transmits a secret information reference request 1600 (see FIG. 16) to the expansion card 321a (step S1301), and waits for a response from the expansion card 321a to the transmitted secret information reference request 1600 (Step S1302). When the device-side main program receives the secret information reference response 1700b (see FIG. 17) from the expansion card 321a, whether or not the secret information can be referred to based on the return code in the secret information reference response 1700b. Is determined (step S1303). As a result of the determination, if the secret information can be referred to, the device-side main program proceeds to step S1304, and if not, the device-side main program proceeds to step S1305.

In step S1304, the device-side main program refers to the secret information 627 in the expansion card 321a and causes the user interface 309 to display the secret information 627. In step S1305, the device-side main program displays on the user interface 309 that the confidential information is not usable. Thus, it is possible to notify the user of the permission / prohibition state of browsing / use of secret information. The display mode in steps S1304 and S1305 will be described later with reference to FIGS. After the processing of steps S1304 and S1305, the device side main program proceeds to step S1306.

In step S1306, the device-side main program waits for input from the user for the information displayed in steps S1304 and S1305. If an instruction to end the display is given, the device-side main program ends the display relating to the secret information (step S1307), and the process ends. On the other hand, if secret information is input, the device-side main program newly generates a secret information setting request (step S1308), and the process is terminated. The new secret information setting request generated in step S1308 is processed by the above-described secret information setting process on the device side in FIG. 11 and the corresponding secret information setting process on the expansion card side in FIG.

FIG. 14 is a flowchart of the expansion card side secret information reference processing executed in step S805 of FIG. In FIG. 14, first, the expansion card side main program determines whether or not the reception of the secret information reference request 1600 (see FIG. 16) from the attached device is completed (step S1401). If reception of the secret information reference request 1600 is completed as a result of the determination, the expansion card side main program transfers the device ID in the secret information reference request 1600 to DevInfoTmp 1821 in the volatile area 1820 (see FIG. 18B). save.

Next, the expansion card side main program compares the device ID stored in DevInfo 1811 with the device ID stored in DevInfoTmp 1821 in the nonvolatile area 1810, and determines whether or not they match (step S1403).). If the two match, the expansion card main program returns a secret information reference response 1700b (see FIG. 17) indicating permission to refer to the secret information 627 stored in the KeyInfo 1812 to the mounted device (Step S1404). In this case, information indicating that the reference of the secret information 627 is permitted due to the match of the device ID is included in the return code in the returned secret information reference response 1700b.

On the other hand, if the two do not match, the expansion card side main program returns a secret information reference response 1700b indicating that reference to the secret information 627 is not permitted to the attached device (step S1405). In this case, information indicating that the reference of the secret information 627 is prohibited due to the mismatch of the device ID is included in the return code in the returned secret information reference response 1700b. After those processes, the expansion card side main program ends this process.

By this processing, device IDs stored in DevInfo 1811 and DevInfoTmp 1821 are compared with each other, and if they match, the secret information 627 stored in KeyInfo 1812 can be used, and an extended function is realized. On the other hand, if they do not match, the secret information 627 cannot be used, and the secret information 627 is protected.

IPR2025-00645 Page 02387

FIG. 19 is a diagram illustrating a screen example on the display unit of the user interface 309 of the wearing device. A display screen 1900 shown in the figure is a display example that is displayed when an attempt is made to perform a copy operation when reference to the secret information 627 is not permitted. In the display screen 1900, the display content 1910 is the same as when performing a normal copy operation. The display content 1920 is a display related to the present invention. Since the secret information 627 of the expansion card 321a cannot be referred to or used by the mounted device, the display content 1920 indicates to the user that the expansion card cannot be used.

20 and 21 are diagrams illustrating an example of the secret information setting screen on the display unit of the user interface 309 of the wearing device.

The secret information setting screen 2000 shown in FIG. 20 is displayed, for example, in step S1305 of FIG. On the other hand, the secret information setting screen 2100 shown in FIG. 21 is displayed, for example, in step S1304 of FIG.

20 and 21, the display content 2010 represents the title of the screen. The display content 2020 is a setting operation screen. In this example, four secret keys can be set as secret information. For each private key, a content field 2023 for displaying the content of the private key, a name field 2022 for displaying the name of the private key, and a radio button 2021 are provided. The secret key corresponding to the radio button 2021 that is turned ON is preferentially used.

In FIG. 20, the display content 2024 displays notification items. In the example of the figure, "This private key cannot be used. Do you want to input it again?" Is displayed because the device IDs stored in DevInfo 1811 and DevInfoTmp 1821 shown in FIG. 18 do not match. It is. In this case, the secret information that should have been displayed on the secret information setting screen 2000, that is, the secret information 627 stored in the expansion card 321a should not be used by the mounting device, but the mounting device. That the user is protected (no leakage or unauthorized use). Therefore, the content column 2023 is grayed out to further indicate this. A button 2026 is pressed to end the display of this setting screen.

On the other hand, in the secret information setting screen 2100 shown in FIG. 21, the content column 2023 is not grayed out but is displayed normally. On the secret information setting screen 2100, the content corresponding to the display content 2024 is not displayed. This is because the device IDs stored in DevInfo 1811 and DevInfoTmp 1821 shown in FIG. 18 match each other.

In this case, the secret information displayed on the secret information setting screen 2100, that is, the secret information 627 stored in the expansion card 321a is the secret information input and set (installed) by the mounting device, and the mounting device The user knows that it can only be used on the device and should not be used on other devices. In the secret information setting screen 2100, an OK button 2125 is pressed to end the display of the secret information setting screen 2100.

In the secret information setting screens 2000 and 2100, a button 2025 is a button for transitioning to a secret key information input screen. Here, the button 2025 on the secret information setting screen 2000 shown in FIG. 20 is a new secret information setting request in step S1308 of FIG. 13 in the mounted device even if the reference of the secret information is once prohibited. Is used to enter new secret information. Thereby, even if the attached device is prohibited from referring to the secret information, the reference is permitted after a predetermined process. On the other hand, even when reference to secret information is permitted, a secret information setting request can be issued again by pressing a button 2025 on the secret information setting screen 2100 shown in FIG.

FIG. 22 is a diagram showing a memory map of a storage medium for storing a program for realizing the present invention. This storage medium is, for example, a CD-ROM.

In the figure, directory information is stored in an area 2201. An area 2202 stores an installation program for installing a program (device-side main program (see FIG. 7)) for realizing the present invention. An area 2203 stores a program for realizing the present invention. The directory information in the area 2201 indicates the position of the areas 2202 and 2203.

When a program for realizing the present invention is installed in the SFP 110 and the MFP 111, first, the installation program in the area 2202 is loaded into the system and executed by the CPU 301 (see FIG. 3). Next, the installation program executed by the CPU 301 reads the program for realizing the present invention in the area 2203 and stores it in the hard disk 311.

In the example of the figure, a storage medium for installing programs executed in the SFP 110 and the MFP 111 is illustrated. On the other hand, a program (an expansion card side main program (see FIG. 8)) that is executed in the expansion card 321 and implements the present invention is stored in the ROM 402 (see FIG. 4).

According to the present embodiment, browsing and use of the secret information stored in the expansion card 321 is permitted only when the device IDs stored in DevInfo 1811 and DevInfoTmp 1821 match each other. This makes it possible to view and use the secret information in the expansion card 321 only with the device (first device) in which the secret information is installed, and when the expansion card 321 is replaced with another device (second device). It is possible to prevent leakage and unauthorized use of confidential information. Moreover, if the expansion card 321 is returned to the first device, the secret information can be browsed and used again. Therefore, only the device for which the secret information is set can be permitted to browse and use the secret information, and the leakage of the secret information through other devices can be prevented.

Further, permission / prohibition of browsing / use of secret information is determined based on the device ID that is identification information on the device side, so that permission / non-permission can be controlled based on the device type, license information, and the like. Thus, management of browsing / use licenses can be facilitated.

In addition, there is no need to store information on the device side, and there is no effect on the firmware on the device side, so a system consisting of a device and an expansion card that must operate regardless of what expansion card is installed Can meet the specifications.

Also according to the present embodiment, the secret information stored in the KeyInfo 1812 and the device ID stored in the DevInfo 1811 are both updated by overwriting if the next secret information setting request is appropriately executed. As a result, even after a device for which browsing / use of confidential information is permitted is determined for a certain expansion card 321, the permitted device can be updated, and an expansion card for realizing an expanded function The combination with the device can be changed freely.

In particular, DevInfoTmp 1821 in which secret information is stored can be rewritten, and a new secret information setting request can be issued even if the device is once prohibited from browsing or using the secret information (step in FIG. 13). S1308). Then, based on this new secret information setting request, the secret information in DevInfoTmp 1821 is updated through a series of secret information setting processing, so that it becomes a permitted device.

(Second Embodiment)

In the second embodiment of the present invention, processing based on a password processing request is added to the first embodiment. That is, in step S704 in FIG. 7 and step S803 in FIG. 8, control is distributed depending on whether the request is a secret information setting request, a secret information reference request, an end request, or another request. However, in the present embodiment, "password processing request" is added to these request types, and a process is newly provided when the request is a password processing request. In this embodiment, it is assumed that the expansion card 321 stores a desired password (correspondence information) via the mounting device when storing the secret information in the KeyInfo 1812 in the secret information setting process on the expansion card side in FIG. Let the user input. Then, it is assumed that the input password is associated with the secret information and stored in, for example, the nonvolatile area 1810 (see FIG. 18). Other

configurations are the same as those of the first embodiment.

FIG. 23 is a flowchart executed when the request is a password processing request in the distribution in step S704 of FIG. 7 in the second embodiment. FIG. 24 is a flowchart executed when the request is a password processing request in the distribution in step S803 of FIG. 8 in the second embodiment.

In FIG. 23, first, the device-side main program transmits a "secret information reference request by password" to the expansion card 321a (step S2301). Then, the device-side main program waits for a response from the expansion card 321a to the secret information reference request using the transmitted password (step S2302). Here, the secret information reference request by the password is configured in the same manner as the secret information reference request 1600 (see FIG. 16). The secret information reference request by the password is issued as desired by the user in a processing step provided after the processing of step S1305 in FIG. In addition, it is not restricted after the process of step S1305, You may enable it to issue at arbitrary times.

When the device-side main program receives the secret information reference response using the password from the expansion card 321a, the device-side main program determines whether or not the secret information can be referred to based on the return code in the secret information reference response using the password. (Step S2303). As a result of the determination, if the secret information can be referred to, the device-side main program proceeds to step S1304, and if not, the device-side main program proceeds to step S1305. The processing after steps S1304 and S1305 is the same as the processing in FIG.

In FIG. 24, first, the expansion card side main program determines whether or not the reception of the "secret information reference request by password" from the mounted device is completed (step S2401). If the reception is completed as a result of the determination, the expansion card side main program proceeds to step S2402. In step S2402, the main program on the expansion card side causes the user to input a password via the mounted device, and performs authentication by matching comparison between the input password and the password associated with the secret information stored in KeyInfo 1812. . As a result, if the authentication is OK due to the coincidence of both passwords, the expansion card side main program proceeds to step S1404. If the authentication is NG due to the mismatch, the expansion card side main program proceeds to step S1405. The processing after steps S1404 and S1405 is the same as the processing in FIG.

According to the present embodiment, the same effects as those of the first embodiment can be obtained. In addition, when secret information is set, the password is stored in association with the secret information, and even if the permission due to device ID matching cannot be obtained, the secret information can be viewed and

used by password authentication. Permission / non-permission can be judged. Thereby, even if the device is once prohibited from browsing / use of secret information, it is possible to obtain permission to view / use secret information by inputting an appropriate password.

In the first and second embodiments, the number of devices in the information processing system is not limited to two, that is, SFP 110 and MFP 111, and may be three or more.

Note that the present invention may be applied to a system or an integrated apparatus including a plurality of devices (for example, a host computer, an interface device, a reader, etc.), or may be applied to an apparatus including a single device.

The object of the present invention is to supply a storage medium storing software program codes for realizing the functions of the above-described embodiments to a system or apparatus, and a computer (or CPU, MPU, etc.) of the system or apparatus. It is also achieved by reading and executing the program code stored in the storage medium.

In this case, the program code itself read from the storage medium realizes the functions of the above-described embodiments, and the program code and the storage medium storing the program code constitute the present invention.

Examples of the storage medium for supplying the program code include a floppy (registered trademark) disk, a hard disk, a magneto-optical disk, a CD-ROM, a CD-R / RW, a DVD-ROM, a DVD-RAM, and a DVD-R. / RW, DVD + RW, NV-RAM, magnetic tape, nonvolatile memory card, ROM, etc. can be used. Alternatively, the program code may be downloaded via a network.

Further, by executing the program code read by the computer, not only the functions of the above-described embodiments are realized, but also an OS (operating system) operating on the computer based on an instruction of the program code, etc. includes a case where part or all of the actual processing is performed and the functions of the above-described embodiments are realized by the processing.

Further, after the program code read from the storage medium is written to a memory provided in a function expansion board inserted into the computer or a function expansion unit connected to the computer, the function expansion is performed based on the instruction of the program code. This includes a case where the CPU or the like provided in the board or the function expansion unit performs part or all of the actual processing, and the functions of the above-described embodiments are realized by the processing.

1 is a diagram illustrating an overall configuration of an information processing system including an information processing apparatus and a device according to a first embodiment of the present invention. It is a block diagram which shows the internal structure of PC (personal computer). 2 is a block diagram showing an internal configuration of an SFP and MFP. FIG. It is a block diagram which shows the structure of the wireless LAN card which is an extended wireless LAN card. It is a block diagram which shows the internal structure of AP. FIG. 3 is a model diagram when a wireless LAN card, which is an extended wireless LAN card, is attached to the SFP and MFP. 3 is a flowchart of a device-side main program executed in the SFP and MFP. 3 is a flowchart of an expansion card side main program that is executed in an expansion card installed in an SFP or MFP. 8 is a flowchart of an expansion card search process executed in step S702 of FIG. It is a flowchart of the search response process performed by step S802 of FIG. FIG. 8 is a flowchart of device-side secret information setting processing executed in step S705 of FIG. 7. FIG. It is a flowchart of the secret information setting process on the expansion card side executed in step S804 of FIG. It is a flowchart of the confidential information reference process by the side of a device performed by step S706 of FIG. It is a flowchart of the secret information reference process by the expansion card side performed by step S805 of FIG. It is a conceptual diagram which shows the structure of the message of a secret information setting request | requirement. It is a conceptual diagram which shows the structure of the message of a secret information reference request. It is a conceptual diagram which shows the structure of the message of a secret information setting / reference response. It is a figure ((a), (b)) which shows each storage area of the non-volatile memory and RAM of an expansion card. It is a figure which shows the example of a screen in the display part of the user interface of a mounting device. It is a figure which shows an example of the secret information setting screen in the display part of the user interface of a mounting device. It is a figure which shows an example of the secret information setting screen in the display part of the user interface of a mounting device. It is a figure which shows the memory map of the storage medium which stores the program which implement | achieves this invention. It is a flowchart performed when a request | requirement is a password process request | requirement in distribution of step S704 of FIG. 7 in the 2nd Embodiment of this invention. FIG. 10 is a flowchart executed when the request is a password processing request in the distribution in step S803 of FIG. 8 in the second embodiment.

Explanation of symbols

110 SFP (device)
111 MFP (device)
301 CPU (secret information supplying means, first identification information Hokyo supply means, second identification information supply unit, the result receiving

means, control means, the secret information setting request reissue means)
309 User interface (UI) (secret information input means, display unit)
321 Expansion card (information processing device)
401 CPU (secret information acquisition means, first identification information acquisition means, second identification information acquisition means, determination means, control means)
518 DeviceID (identification information)
627 Confidential information 1810 Non-volatile area (corresponding information storage means)
1811 DevInfo (identification information storage means)
1812 KeyInfo (secret information storage means)
1821 DevInfoTmp

Patent Citations (10)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
JPH02170272A *	1988-12-23	1990-07-02	Hitachi Maxell Ltd	Collation system for secret information
JP3272213B2 *	1995-10-02	2002-04-08	インターナショナル・ビジネス・マシーンズ・コーポレーション	Authentication method for IC card and information processing device
US7216802B1 *	1997-10-21	2007-05-15	Carlos De La Huerga	Method and apparatus for verifying information
US6179205B1 *	1998-03-05	2001-01-30	Visa International Service Association	System and method for locking and unlocking and application in a smart card
JP2002073424A	2000-08-31	2002-03-12	Mitsubishi Electric Corp	Semiconductor device, terminal device and communication method
JP2002073421A *	2000-08-31	2002-03-12	Matsushita Electric Ind Co Ltd	Equipment for issuing license, equipment for reproducing contents, method for issuing license and method for reproducing contents
JP3763393B2 *	2000-10-26	2006-04-05	シャープ株式会社	COMMUNICATION SYSTEM, TERMINAL DEVICE, RECORDING MEDIUM RECORDING REPRODUCTION PROGRAM, SERVER DEVICE, AND RECORDING MEDIUM RECORDING SERVER PROGRAM
KR100441605B1 *	2001-10-17	2004-07-23	삼성전자주식회사	Remote controller, remote controlled electrocin divece, remote controlling system for electronic device and method thereof
JP2006065690A *	2004-08-27	2006-03-09	Ntt Docomo Inc	Device authentication apparatus, service controller, service request apparatus, device authentication method, service control method, and service request method
JP5043416B2 *	2006-12-15	2012-10-10	キヤノン株式会社	Information processing apparatus, system and program, device, and storage medium

* Cited by examiner, † Cited by third party

Cited By (13)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
EP2136311B1 *	2007-04-12	2013-07-31	NTT Communications Corp.	Data keeping method, client apparatus, storage device and program
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
DE102010047632A1 *	2010-10-07	2012-04-12	Phoenix Contact Gmbh & Co. Kg	Method and operating unit for operating modules of automation technology
JP5995481B2 *	2011-12-02	2016-09-21	キヤノン株式会社	Image forming apparatus, control method thereof, and program
JP5950185B2 *	2012-03-06	2016-07-13	富士ゼロックス株式会社	Apparatus, system and program
JP6260458B2 *	2014-05-30	2018-01-17	京セラドキュメントソリューションズ株式会社	Image forming apparatus, image forming method, and control program
JP6256000B2 *	2015-05-18	2018-03-20	京セラドキュメントソリューションズ株式会社	Printing system

IPR2025-00645 Page 02390

JP6859806B2 *	2017-03-31	2021-04-14	ブラザー工業株式会社	Communication systems, computer programs and terminals

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP4766666B2	2011-09-07	Information processing apparatus, device, information processing system, and program
US7710587B2	2010-05-04	Method and system for configuring an electronic device
US7580398B2	2009-08-25	Information processing device, printing device, printing system, system setting method, storage medium storing computer-readable program, and program
JP4587164B2	2010-11-24	Printing system, printing control method, and program
US20070204166A1	2007-08-30	Trusted host platform
JP2005092745A	2005-04-07	Personal computer control system using mobile storage medium and mobile storage medium
US20050044384A1	2005-02-24	Electric conference system and control method thereof
US20070047524A1	2007-03-01	Peripheral device, information processing device communicating with peripheral device, and method regarding settings applicable to information processing device
JP2004046708A	2004-02-12	System, server, method and program for providing software, terminal, control program, and method and program for utilizing the software
US7812984B2	2010-10-12	Remote stored print job retrieval
JP5608484B2	2014-10-15	Storage device and network connection setting method
US8275131B2	2012-09-25	Image forming apparatus and security setting method thereof
JP2008027235A	2008-02-07	Information processor, information processing method, and information processing program
WO2014024947A1	2014-02-13	image processing apparatus that configures settings of information security policy, method of controlling the same, program, and storage medium
JP2009140030A	2009-06-25	Server device, client device, printer, print system, and program
JP2013157003A	2013-08-15	Information processing apparatus, control method, and control program
US20130111564A1	2013-05-02	image forming apparatus, license server, terminal apparatus, method for installing application, and method for providing application file
JP4916020B2	2012-04-11	Remote access system, auxiliary storage device used therefor, and remote access method
JP4579623B2	2010-11-10	Information processing apparatus and received packet filtering method
JP2016010867A	2016-01-21	Printer, printing system, method of controlling printer, and program
JP2005352752A	2005-12-22	Image forming apparatus, information processor, data processing method, storage medium storing computer-readable program, and program
JP2008022525A	2008-01-31	Communication system, terminal device, and its control method
JP5676145B2	2015-02-25	Storage medium, information processing apparatus, and computer program
JP2007012022A	2007-01-18	Security program and security system
JP2005165554A	2005-06-23	Personal computer control system using portable storage medium and its storage medium

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
JP2005248162A	2005-08-29	2005-08-29	Information processing apparatus, device, information processing system, and program

Applications Claiming Priority (3)

Application	Filing date	Title

IPR2025-00645 Page 02391

JP2005248162A	2005-08-29	Information processing apparatus, device, information processing system, and program
US11/467,204	2006-08-25	Information processing apparatus, device, information processing system, information processing program, and storage medium storing the information processing program
CN2006101265768A	2006-08-28	Information processing unit, device, system

Legal Events

Date	Code	Title	Description
2007-06-27	RD05	Notification of revocation of power of attorney	**Free format text**: JAPANESE INTERMEDIATE CODE: A7425 **Effective date**: 20070626
2008-08-23	A621	Written request for application examination	**Free format text**: JAPANESE INTERMEDIATE CODE: A621 **Effective date**: 20080822
2011-02-24	A977	Report on retrieval	**Free format text**: JAPANESE INTERMEDIATE CODE: A971007 **Effective date**: 20110224
2011-03-23	A131	Notification of reasons for refusal	**Free format text**: JAPANESE INTERMEDIATE CODE: A131 **Effective date**: 20110322
2011-05-20	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20110519
2011-06-01	TRDD	Decision of grant or rejection written	
2011-06-13	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01 **Effective date**: 20110610
2011-06-16	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01
2011-06-23	A61	First payment of annual fees (during grant procedure)	**Free format text**: JAPANESE INTERMEDIATE CODE: A61 **Effective date**: 20110613
2011-06-24	R150	Certificate of patent or registration of utility model	**Free format text**: JAPANESE INTERMEDIATE CODE: R150
2011-06-27	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20140624 **Year of fee payment**: 3
2018-06-24	LAPS	Cancellation because of no payment of annual fees	

Data provided by IFI CLAIMS Patent Services

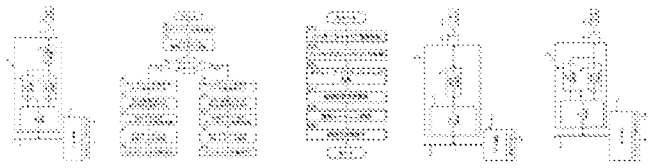
Patents 2006209643

Interface circuit and system device using the same

Abstract

<P>PROBLEM TO BE SOLVED: To provide an interface circuit allowing elimination of erroneous decision that connection to a connected peripheral device is cut, and allowing automatic resumption of suspended access to the connected peripheral device after a resume, and to provide a system device using the interface. <P>SOLUTION: This interface circuit has a card identification circuit part 12 identifying the kind of a memory card 10 connected to a memory card slot 11, the card identification circuit part 12 inside a reader/writer 1 identifies the connected memory card 10, and a driver after the resume eliminates the erroneous decision that the connection to the connected memory card 10 is cut, and automatically resumes the suspended access to the connected memory card 10 after the resume. <P>COPYRIGHT: (C)2006,JPO&NCIPI

Images (5)



Classifications

- G06F3/0632 Configuration or reconfiguration of storage systems by initialisation or re-initialisation of storage systems

View 2 more classifications

JP2006209643A

Japan

Download PDF Find Prior Art Similar

Other languages: Japanese

Inventor: Tatsuya Iisawa, 達矢 入沢

Worldwide applications

2005 JP 2006 US

Application JP2005023666A events

2005-01-31 Application filed by Ricoh Co Ltd, 株式会社リコー

2005-01-31 Priority to JP2005023666A

2006-08-10 Publication of JP2006209643A

2008-02-28 Publication of JP2006209643A5

Status Pending

Info: Patent citations (13), Cited by (12), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (8)

Hide Dependent

1. In an interface circuit that performs an interface between a host device and a peripheral device whose operation is controlled by the host device,
A connection to which the peripheral device is connected;
An identification circuit unit that identifies the peripheral device connected to the connection unit by a predetermined method using the same signal line,
Each interface circuit unit that is provided for each connected peripheral device and exclusively interfaces with the connected peripheral device and the host device according to the identification result of the identification circuit unit;
With
The identification circuit unit identifies the connected peripheral device when a peripheral device is connected, and the corresponding peripheral device is connected only to the interface circuit unit corresponding to the connected peripheral device. And the interface circuit unit notifies the host device that the corresponding peripheral device is connected.

    2. The interface circuit according to claim 1, wherein the host device has a driver corresponding to each connected peripheral device, and controls operation of the connected peripheral device using the corresponding driver.

    3. 3. The interface circuit according to claim 1, wherein the peripheral device is a memory card.

    4. 4. The interface circuit according to claim 3, wherein the memory card is an SD card, an SDIO card, or an MMC card.

5. A host device;
A peripheral device whose operation is controlled by the host device;
An interface circuit for interfacing between the host device and the peripheral device;
In a system apparatus having
The interface circuit is
A connection to which the peripheral device is connected;
An identification circuit unit that identifies the peripheral device connected to the connection unit by a predetermined method using the same signal line,
Each interface circuit unit that is provided for each connected peripheral device and performs an interface between the connected peripheral device and the host device exclusively according to the identification result of the identification circuit unit;
With
When the peripheral device is connected, the identification circuit unit identifies the connected peripheral device, and the corresponding peripheral device is connected only to the interface circuit unit corresponding to the connected peripheral device. And the interface circuit section notifies the host device that the corresponding peripheral device is connected.

    6. 6. The system apparatus according to claim 5, wherein the host device has a driver corresponding to each connected peripheral device, and controls operation of the connected peripheral device using the corresponding driver

    7. 7. The system apparatus according to claim 5, wherein the peripheral device is a memory card.

IPR2025-00645 Page 02393

8. The system device according to claim 7, wherein the memory card is an SD card, an SDIO card, or an MMC card.

Description

The present invention relates to an interface circuit for interfacing between a host device and a peripheral device having a predetermined function, and a system device using the interface circuit, and in particular, an SD (Secure Digital) card (trademark) and an MMC (Multi Media Card). The present invention relates to an interface circuit such as a reader / writer of a memory card that interfaces a memory card such as a card (trademark) and a host device such as a personal computer, a digital camera, or a printer, and a system apparatus using the interface circuit.

Conventionally, in a plurality of types of IC cards having compatible shapes, there has been a problem that the type of IC card cannot be physically recognized with an IC card detection signal indicating that the IC card is connected. . As one method for supporting such an IC card, as shown in FIG. 4, a common shared interface circuit unit 112 for each type of IC card 110 is mounted in the IC card controller 101, and each type of IC card is supported. There is a method of preparing a shared driver 104 that can be used in common for the IC card 110. In FIG. 4, reference numeral 102 denotes a bus, and 111 denotes an IC card slot.

However, a driver common to each type of IC card 110 cannot always be developed. For example, in the field of personal computers (hereinafter referred to as PC), there is a restriction that an SD card and an MMC card must be provided with individual drivers even though their shapes are compatible. For this reason, the IC card controller needs to mount a separate interface circuit for each IC card, prepare a driver for each IC card, and perform processing to determine the type of the connected IC card. In such a driver, the type of the connected IC card is identified.

FIG. 5 shows a conventional example in which the type of IC card is identified by such a driver, and is a block diagram showing an example of a reader / writer which is an interface circuit for interfacing with a memory card. is there. FIG. 5 shows an example in which a reader / writer of an SD card, an SDIO (SD Input / Output) card (trademark), and an MMC card is connected to a personal computer (hereinafter referred to as a PC) using a PCI bus. (For example, see Non-Patent Document 1 and Non-Patent Document 2).
In FIG. 5, a memory card reader / writer 121 is connected to a host device 123 formed of a PC via a PCI bus 122.
One of an SD card, an SDIO card, and an MMC card is inserted and connected to the memory card slot 131 of the reader / writer 121 as a memory card 130. When the memory card 130 is inserted and connected to the memory card slot 131, the MMC interface circuit unit 132 recognizes that the memory card 130 is connected to the memory card slot 131. At this time, the type of the memory card 130 has not been specified yet.

The MMC interface circuit unit 132 generates an interrupt to the host device 123 via the PCI interface circuit unit 134 and the PCI bus 122, and the MMC driver 124 in the host device 123 receives an interrupt status bit from the MMC interface circuit unit 132. And recognize that the memory card 130 is connected to the memory card slot 131. Thereafter, the MMC driver 124 starts a sequence for identifying the memory card 130 connected to the memory card slot 131.

Here, when the memory card 130 connected to the memory card slot 131 is an SD card or an SDIO card, the MMC driver 124 is inserted into the MMC interface circuit unit 132 via the PCI bus 122 and the PCI interface circuit unit 134. Write the insert bit. Next, the MMC interface circuit unit 132 notifies the SD interface circuit unit 133 that an SD card or SDIO card is connected to the memory card slot 131, and the SD interface circuit unit 133 is connected to the PCI bus interface circuit unit 134. An interrupt is generated for the host device 123 via the PCI bus 122, the SD driver 125 in the host device 123 confirms the interrupt status bit from the SD interface circuit unit 133, and the memory card 130 is inserted into the memory card slot 131. Recognize that connected. Thereafter, the SD driver 165 starts an identification sequence for the memory card 130 connected to the memory card slot 131, and after identifying the memory card 130, the PCI bus 122, the PCI interface circuit unit 134, and the SD interface circuit unit 133. The memory card 130 is accessed when necessary.

On the other hand, when the memory card 130 connected to the memory card slot 131 is an MMC card, the MMC driver 124 starts an identification sequence for the memory card 130 connected to the memory card slot 131 and identifies the memory card 130. Thereafter, the memory card 130 is accessed when necessary via the PCI bus 122, the PCI interface circuit unit 134, and the MMC interface circuit unit 132.

There has been a semiconductor integrated circuit in which the polarity of an internal control signal indicating whether to use an SD card or an MMC card can be switched by a mask option, a bonding option, or the like (for example, see Patent Document 1).
Hiroto Okada and 1 other, "Design of Multi-Media Card & SD Card Interface", Interface October 2001 issue Norihiro Ochiai, 1 other, "Multimedia Card & SD Card Interface Design", Interface December 2001 Issue JP 2004-102755 A

However, the reader / writer configured as shown in FIG. 5 is compatible with an SD card if both the MMC driver 124 and the SD driver 125 are not installed in the host device 123 even when only the SD card is used. could not. Further, when the host device 123 enters the suspend mode with the SD card connected to the memory card slot 131 and resumes as it is, the host device 123 is turned off, so that the MMC driver 124 and the SD driver 125 are in the initial state. Will return to. For this reason, the SD driver 125 determines that the SD card has been removed from the memory card slot 131. For example, if the host device 123 enters suspend while transferring data to the SD card, a data transfer error occurs after the resume. As a result, there has been a problem that data transfer to the SD card is not automatically resumed.

The present invention has been made to solve the above-described problems, and a peripheral device connected to a host device in an interface circuit that interfaces with a peripheral device having a predetermined function, for example, a memory card, is provided. An object of the present invention is to obtain an interface circuit and a system device using the interface circuit that can prevent the resumed driver from erroneously determining that the connection with the connected peripheral device has been disconnected. And

An interface circuit according to the present invention is an interface circuit that performs an interface between a host device and a peripheral device whose operation is controlled by the host device.
A connection to which the peripheral device is connected;
An identification circuit unit that identifies the peripheral device connected to the connection unit by a predetermined method using the same signal line,
Each interface circuit unit that is provided for each connected peripheral device and exclusively interfaces with the connected peripheral device and the host device according to the identification result of the identification circuit unit;
With
The identification circuit unit identifies the connected peripheral device when a peripheral device is connected, and the corresponding peripheral device is connected only to the interface circuit unit corresponding to the connected peripheral device. The interface circuit unit notifies the host device that the corresponding peripheral device is connected.

The host device has a corresponding driver for each connected peripheral device, and controls operation of the connected peripheral device using the corresponding driver.

Specifically, the peripheral device is a memory card. For example, the memory card is an SD card, an SDIO card, and an MMC card.

A system device according to the present invention includes a host device,
A peripheral device whose operation is controlled by the host device;
An interface circuit for interfacing between the host device and the peripheral device;
in a system apparatus having
The interface circuit is
A connection to which the peripheral device is connected;
An identification circuit unit that identifies the peripheral device connected to the connection unit by a predetermined method using the same signal line;
Each interface circuit unit that is provided for each connected peripheral device and exclusively interfaces with the connected peripheral device and the host device according to the identification result of the identification circuit unit,
With
The identification circuit unit identifies the connected peripheral device when a peripheral device is connected, and the corresponding peripheral device is connected only to the interface circuit unit corresponding to the connected peripheral device. The interface circuit unit notifies the host device that the corresponding peripheral device is connected.

The host device has a corresponding driver for each connected peripheral device, and controls operation of the connected peripheral device using the corresponding driver.

Specifically, the peripheral device is a memory card. For example, the memory card is an SD card, an SDIO card, and an MMC card.

According to the interface circuit of the present invention and the system device using the interface circuit, the suspend / resume operation in the host device completes the identification of the peripheral device connected after the resume and before starting the operating system of the host device. Therefore, it is possible to prevent the host device from erroneously determining that the peripheral device has been disconnected once after the resume, and the data transfer after the resume can be automatically resumed. Also, by identifying the peripheral device by hardware, it is possible to eliminate the need for new development of a driver for driving the peripheral device.

Next, the present invention will be described in detail based on the embodiments shown in the drawings.
First embodiment
FIG. 1 is a block diagram showing a configuration example of an interface circuit according to the first embodiment of the present invention. In FIG. 1, a reader / writer constituting an interface circuit for an SD card or MMC card as a peripheral device is a PCI. The case where it connects to PC which is a host apparatus via a bus | bath is shown as an example. The SD card includes an SDIO card.
In FIG. 1, a memory card reader / writer 1 is connected to a host device 3 composed of a PC via a PCI bus 2. The host device 3 is installed with an MMC driver 4 for driving the MMC card and an SD driver 5 for driving the SD card.

The reader / writer 1 includes a memory card slot 11 to which an SD card or an MMC card is inserted as the memory card 10 and connected, and a card identification circuit unit 12 for identifying the type of the memory card 10 connected to the memory card slot 11. The MMC interface circuit unit 13 that interfaces with the MMC card connected to the memory card slot 11, the SD interface circuit unit 14 that interfaces with the SD card connected to the memory card slot 11, and the PCI bus 2 And a PCI interface circuit unit 15 for performing an interface.

The memory card slot 11 is connected to the card identification circuit unit 12, and the MMC interface circuit unit 13 and the SD interface circuit unit 14 are connected to the card identification circuit unit 12. The MMC interface circuit unit 13 and the SD interface circuit unit 14 are each connected to a PCI interface circuit unit 15, and the PCI interface circuit unit 15 is connected to the host device 3 via the PCI bus 2. The memory card 10 is a peripheral device, the memory card slot 11 is a connection unit, the card identification circuit unit 12 is an identification circuit unit, an MMC interface circuit 13 and a PCI interface circuit unit 15, and an SD interface circuit 14 and a PCI. Each interface circuit unit 15 forms an interface circuit unit.

In such a configuration, either the SD card or the MMC card is inserted and connected to the memory card slot 11 as the memory card 10. When the memory card 10 is inserted into the memory card slot 11 and connected, the card identification circuit unit 12 recognizes that the card is connected and starts an identification sequence of the connected card. When the memory card connected to the memory card slot 11 is an MMC card, the card identification circuit unit 12 informs the MMC interface circuit unit 13 that the memory card is connected to the memory card slot 11.

The MMC interface circuit unit 13 generates an interrupt to the host device 3 via the PCI bus interface circuit unit 15 and the PCI bus 2, and the MMC driver 4 in the host device 3 receives the interrupt status from the MMC interface circuit unit 13. The bit is confirmed, and it is recognized that the memory card 10 is connected to the memory card slot 11. Thereafter, the MMC driver 4 starts a sequence for identifying the memory card 10 connected to the memory card slot 11, and after identifying the memory card 10, the PCI bus 2, the PCI interface circuit unit 15, and the MMC interface circuit unit 13 and the card identification circuit unit 12 are used to access the memory card 10 when necessary.

When the memory card connected to the memory card slot 11 is an SD card, the card identification circuit unit 12 notifies the SD interface circuit unit 14 that the card is connected to the memory card slot 11. The SD interface circuit unit 14 generates an interrupt to the host device 3 via the PCI bus interface circuit unit 15 and the PCI bus 2, and the SD driver 5 in the host device 3 receives the interrupt status from the SD interface circuit unit 14. The bit is confirmed, and it is recognized that the memory card 10 is connected to the memory card slot 11. Thereafter, the SD driver 5 starts a sequence for identifying the memory card 10 connected to the memory card slot 11, and after identifying the memory card 10, the PCI bus 2, the PCI interface circuit unit 15, and the SD interface circuit unit. 14 and the card identification circuit unit 12 are used to access the memory card 10 when necessary

FIG. 2 is a flowchart showing an operation example of each part of FIG. 1 when the memory card 10 is connected to the memory card slot 11.
In FIG. 2, when the memory card 10 is connected to the memory card slot 11, a signal indicating that the memory card 10 is connected to the card identification circuit unit 12 is output from the memory card slot 11 (step S1). The circuit unit 12 starts an identification sequence of the connected memory card (step S2). Next, the card identification circuit unit 12 recognizes the type of the connected memory card and checks whether or not the connected memory card is an SD card (step S3). If it is an SD card (YES)) Only the SD interface circuit unit 14 is notified that the card is connected to the memory card slot 11 (step S4).

The SD interface circuit unit 14 generates an interrupt notifying the host device 3 that the SD card has been connected to the host device 3 via the PCI bus interface circuit unit 15 and the PCI bus 2 (step S5). The driver 5 confirms the interrupt status bit from the SD interface circuit unit 14 and recognizes that the memory card 10 is connected to the memory card slot 11 (step S6). Thereafter, the SD driver 5 starts a sequence for identifying the memory card 10 connected to the memory card slot 11 (step S7), and after identifying the memory card 10, the PCI bus 2, the PCI interface circuit unit 15, The memory card 10 is accessed when necessary via the SD interface circuit unit 14 and the card identification circuit unit 12 (step S8).

On the other hand, if the card is an MMC card in step S3 (NO), the fact that the card is connected to the memory card slot 11 is notified only to the MMC interface circuit unit 13 (step S9). The MMC interface circuit unit 13 generates an interrupt notifying that the MMC card is connected to the host device 3 via the PCI interface circuit unit

15 and the PCI bus 2 (step S10), and the MMC driver in the host device 3 4 confirms the interrupt status bit from the MMC interface circuit unit 13 and recognizes that the memory card 10 is connected to the memory card slot 11 (step S11). Thereafter, the MMC driver 4 starts a sequence for identifying the memory card 10 connected to the memory card slot 11 (step S12). After identifying the memory card 10, the PCI bus 2, the PCI interface circuit unit 15, The memory card 10 is accessed when necessary via the MMC interface circuit unit 13 and the card identification circuit unit 12 (step S13).

Next, FIG. 3 is a flowchart showing an operation example when the host device 3 starts up with a suspend operation and then a resume operation with the memory card 10 connected to the memory card slot 11. .
In FIG. 3, the host device 3 is activated by performing a resume operation and supplies power to the reader / writer 1 of FIG. 1 (step S21), and the processing of steps S1 to S4 of FIG. After performing the process of S9 (step S22), the host device 3 starts the operating system (step S23).

Next, the MMC driver 4 and the SD driver 5 perform a predetermined initialization process (step S24), and a driver corresponding to the type of the memory card 10 identified by the card identification circuit 12 at the time of suspension, for example, has been identified. When the memory card 10 is an SD card, the SD driver 5 identifies the memory card 10 connected to the memory card slot 11 when the identified memory card 10 is an MMC card. A sequence is started (step S25). Thereafter, the MMC driver 4 and the SD driver 5 end the initialization process (step S26), and this flow ends.

As described above, the reader / writer 1 that forms the interface circuit in the first embodiment includes the card identification circuit unit 12 that identifies the type of the memory card 10 connected to the memory card slot 11, and the reader / writer 1 In this case, the card identification circuit unit 12 in the memory card identifies the connected memory card 10 so that the resumed driver does not erroneously determine that the connection with the connected memory card 10 has been disconnected. The interrupted access to the connected memory card 10 can be automatically resumed after the resume, and the memory card 10 is identified by the card identification circuit unit 12, whereby the memory card Therefore, it is possible to eliminate the need for new development of a driver that drives 10.

In the first embodiment, the case where an SD card and an MMC card are used as the memory card has been described as an example. However, this is an example, and the present invention is not limited to this. Memory stick (trademark), smart media (trademark), xD Picture card (trademark), smart card, Compact Flash (trademark), 32-bit PC card (trademark), 16-bit PC card Express card (trademark), etc. .

In the first embodiment, the reader / writer that forms the interface circuit for the memory card has been described as an example. However, this is merely an example, and the present invention is not limited thereto. The present invention is applied to an interface circuit that interfaces with peripheral devices such as memory cards, communication cards, and IC cards such as LAN cards. In the first embodiment, the case where the PCI bus is used has been described as an example. However, this is only an example, and the present invention is not limited to this. Instead of the PCI bus, USB or the like is used. A bus may be used.

It is the block diagram which showed the structural example of the interface circuit in the 1st Embodiment of this invention. 2 is a flowchart showing an operation example of each unit in FIG. 1 when a memory card 10 is connected to a memory card slot 11. 6 is a flowchart showing an operation example when the host device 3 with the memory card 10 connected is activated by a resume operation after suspension. It is the block diagram which showed the structural example of the conventional interface circuit. It is the block diagram which showed the structural example of the conventional reader / writer.

Explanation of symbols

DESCRIPTION OF SYMBOLS 1 Reader / writer 2 PCI bus 3 Host apparatus 4 MMC driver 5 SD driver 10 Memory card 11 Memory card slot 12 Card identification circuit part 13 MMC interface circuit part 14 SD interface circuit part 15 PCI interface circuit part

Patent Citations (13)

Publication number	Priority date	Publication date	Assignee	Title
JPH02219160A *	1989-02-20	1990-08-31	Nec Corp	Bus controller
JPH05324385A *	1992-05-25	1993-12-07	Yokogawa Electric Corp	Input/output communication simulation system
JPH08286925A *	1995-04-11	1996-11-01	Toshiba Corp	Program load method and personal computer using same
WO2002069127A1 *	2001-02-26	2002-09-06	Tokyo Electron Device Limited	Method for controlling storage medium, controller for storage medium, and adaptor for storage medium
JP2003281477A *	2002-03-25	2003-10-03	Toshiba Corp	Electronic appliance, electronic card, and method for card identification
Family To Family Citations				
US7412553B2 *	2002-01-10	2008-08-12	O2Micro International Limited	Enhanced protocol conversion system capable of providing offloaded protocol instruction processing
JP4576082B2	2001-12-13	2010-11-04	株式会社リコー	Memory card controller and memory card control method
JP2004133881A *	2002-08-14	2004-04-30	Ricoh Co Ltd	Interface circuit of card type memory, asic (application specified ic) mounted with its circuit and image forming apparatus mounted with its asic
JP3806077B2	2002-08-26	2006-08-09	株式会社東芝	Memory card recognition system, capacity switching type memory card / host device, capacity switching type memory card, storage capacity setting method and storage capacity setting program
JP2004102405A	2002-09-05	2004-04-02	Ricoh Co Ltd	Memory card controller

JP2004102755A	2002-09-11	2004-04-02	Matsushita Electric Ind Co Ltd	Semiconductor integrated circuit
US7225357B2 *	2003-01-21	2007-05-29	Zentek Technology Japan, Inc.	SDIO card development system
TWI271659B *	2004-05-05	2007-01-21	Prolific Technology Inc	Memory card equipped with a multi-interface function and method for choosing a compatible transmission mode

* Cited by examiner, † Cited by third party

Cited By (12)

Publication number	Priority date	Publication date	Assignee	Title
JP2007157159A *	2005-12-06	2007-06-21	O2 Micro Inc	System and method for interfacing to media card
US7581040B2	2006-03-02	2009-08-25	Ricoh Company, Ltd.	Interface circuit, system device using the interface circuit, and data interface method, the interface circuit performing data transfer between a host and a peripheral device
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
CN101136000B *	2006-09-01	2011-01-05	飞思卡尔半导体公司	Application processor circuit for realizing SD host slave equipment and electronic equipments thereof
EP2141634A4 *	2007-04-20	2011-11-02	Panasonic Corp	Insertion/removal detector
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
JP2014027141A	2012-07-27	2014-02-06	Ricoh Co Ltd	Trimming circuit and trimming method, and power supply device
JP6176020B2 *	2013-09-17	2017-08-09	株式会社リコー	Apparatus, information processing system, information processing method, information processing program, and storage medium storing information processing program

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP2006209643A	2006-08-10	Interface circuit and system device using the same
EP1496436B1	2013-09-04	Method and apparatus for autoreset of a usb smart card device in a mute mode
CA2636648C	2015-07-21	A method for booting a host device from an mmc/sd device, a host device bootable from an mmc/sd device and an mmc/sd device method a host device may be booted from
US7159766B2	2007-01-09	Peripheral device feature allowing processors to enter a low power state
JP2005209205A	2005-08-04	System and method for power reduction in system having removable media devices
JP4724573B2	2011-07-13	Transfer system switching circuit in interface circuit
US7124235B2	2006-10-17	USB apparatus with switchable host/hub functions and control method thereof
JP2000512417A	2000-09-19	Method and system for enabling non-destructive active insertion of a feature card into a computer and non-destructive active removal from a computer

JP5790007B2	2015-10-07	Information processing apparatus, information processing apparatus control method, and program
US20060208097A1	2006-09-21	Electronic apparatus, unit drive, and interface controlling method of the unit drive
JP2009140483A	2009-06-25	Memory card control device and method for controlling memory card
US8335883B2	2012-12-18	Data processing device and data processing system
JP4630766B2	2011-02-09	A system having a primary system and a secondary system
JP2001319209A	2001-11-16	Pc card capable of switching specification mode, and pc card input/output controller
JP2003114859A	2003-04-18	Usb connector
US20060143319A1	2006-06-29	Method of establishing communication between a usb device and a host
JP2005284805A	2005-10-13	Small memory card adapter and information apparatus
JP2000276258A	2000-10-06	Device and method for inserting/ejecting ide device
JP2006256153A	2006-09-28	Image forming device having energy saving mode
JP2006301882A	2006-11-02	Memory card
JP2006023986A	2006-01-26	Method for copying data and card reader
JP2010015431A	2010-01-21	Host controller, information processing apparatus, and electronic device
JP2005165968A	2005-06-23	Information processing unit and control method therefor
JP2008059522A	2008-03-13	Information processor, information processing module, control method, and program
JP2000020188A	2000-01-21	Hot-line insertion/extraction control unit for extended input/output device to computer main body

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
JP2005023666A	2005-01-31	2005-01-31	Interface circuit and system device using the same

Applications Claiming Priority (2)

Application	Filing date	Title
JP2005023666A	2005-01-31	Interface circuit and system device using the same
US11/344,846	2006-01-31	Interface unit for interfacing host unit and peripheral unit

Legal Events

Date	Code	Title	Description
2008-01-16	A621	Written request for application examination	**Free format text**: JAPANESE INTERMEDIATE CODE: A621 **Effective date**: 20080115
2008-01-16	R003	Notification of appointment of power of attorney	**Free format text**: JAPANESE INTERMEDIATE CODE: A7423 **Effective date**: 20080115
2008-01-16	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20080115
2011-01-26	A977	Report on retrieval	**Free format text**: JAPANESE INTERMEDIATE CODE: A971007 **Effective date**: 20110126
2011-02-02	A131	Notification of reasons for refusal	**Free format text**: JAPANESE INTERMEDIATE CODE: A131 **Effective date**: 20110201

2011-03-31	A521	Written amendment	**Free format text:** JAPANESE INTERMEDIATE CODE: A523 **Effective date:** 20110330
2011-04-20	A02	Decision of refusal	**Free format text:** JAPANESE INTERMEDIATE CODE: A02 **Effective date:** 20110419

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

Patents 101040240

Portable terminal

Abstract

A portable terminal in which unnecessary power consumption can be suppressed. A portable terminal (200) has a terminal state detection section (400) for detecting both a first terminal state that is a state of the portable terminal before a change in its state and a second terminal state that is a state of the portable terminal after the change, a condition management table (402) for managing conditions at which power supply to an SD memory card (103) starts, a determination section (403) for determining, when the first terminal state and the second terminal state are detected by the terminal state detection section (400), whether a change in the states satisfies the conditions, and a power supply section (302) for starting, when it is determined by the determination section (403) that the change in the states satisfies the conditions, power supply to the SD memory card (103).

Classifications

- G06F1/3203 Power management, i.e. event-based initiation of power-saving mode

View 7 more classifications

CN101040240B

China

Download PDF Find Prior Art Similar

Other languages: Chinese

Inventor: 江原裕美, 今田正幸

Current Assignee : Panasonic Corp

Worldwide applications

2005 CN US WO JP

Application CN2005800345896A events

2004-11-04	Priority to JP320498/2004
2004-11-04	Priority to JP2004320498
2005-10-11	Application filed by Panasonic Corp
2005-10-11	Priority to PCT/JP2005/018707
2007-09-19	Publication of CN101040240A
2010-05-12	Application granted
2010-05-12	Publication of CN101040240B
Status	Expired - Fee Related
2025-10-11	Anticipated expiration

Info: Patent citations (7), Non-patent citations (1), Cited by (16), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (13)

Hide Dependent

1. One kind can the dismounting external memory storage portable terminal, it is characterized in that possessing:

   The state of the application program of lift-launch in above-mentioned portable terminal before the SOT state of termination test section, change detected is that the state of the above-mentioned application program after the 1st SOT state of termination and the variation is the 2nd SOT state of termination;

   SD slot state-detection portion detects the said external storer is installed in above-mentioned portable terminal;

   The condition storage part, storage condition, this condition comprise terminal's status information after the operation of state of the above-mentioned application program after terminal's status information before the operation of the state of representing preoperative above-mentioned application program, the expression operation, and the group of the use possibility information that has or not of the use possibility of expression said external storer;

   Judging part, detecting under the state that the said external storer is installed in above-mentioned portable terminal by above-mentioned SD slot state-detection portion, when detecting above-mentioned the 1st SOT state of termination and above-mentioned the 2nd SOT state of termination by above-mentioned SOT state of termination test section, based on the above-mentioned condition of storing in the above-mentioned condition storage part, when from above-mentioned use possibility information, extracting above-mentioned the 2nd SOT state of termination of terminal condition express behind above-mentioned the 1st SOT state of termination of terminal condition express before the aforesaid operations and the aforesaid operations, having or not of the use possibility of said external storer, and the use possibility that extracts the said external storer be have as a result the time, be judged as and begin to above-mentioned external memory storage supply capability, and the use possibility that extracts the said external storer for do not have as a result the time, be judged as and should not begin to above-mentioned external memory storage supply electric power; And

   Power feeding section, by above-mentioned judgement section judges for should begin the time to above-mentioned external memory storage supply capability, beginning is to above-mentioned external memory storage supply capability, and being judged as should not begin to above-mentioned external memory storage supply capability the time, ends to above-mentioned external memory storage supply capability.

2. 2. portable terminal as claimed in claim 1 is characterized in that,

   The above-mentioned condition of storing in the above-mentioned condition storage part is upgraded by downloading from external network.

IPR2025-00645 Page 02400

3. 3. portable terminal as claimed in claim 1 is characterized in that,

Above-mentioned SOT state of termination test section detects as above-mentioned the 1st SOT state of termination of the state before the startup of the image reproduction application program that possesses the function of reproducing image with as above-mentioned the 2nd SOT state of termination of the state after the startup of above-mentioned image reproduction application program;

Above-mentioned condition storage portion stores condition, this condition comprise terminal's status information behind the aforesaid operations of the state after the startup of terminal's status information before the aforesaid operations of state before the startup of representing above-mentioned image reproduction application program, the above-mentioned image reproduction application program of expression, and the use possibility of expression said external storer be the group of the above-mentioned use possibility information of the information that has.

4. 4. portable terminal as claimed in claim 1 is characterized in that,

Above-mentioned SOT state of termination test section detects as above-mentioned the 1st SOT state of termination of the state before the startup of the image recording application program of the function that possesses the image recording that will be received by the charged portable terminal of looking with as above-mentioned the 2nd SOT state of termination of the state after the startup of above-mentioned image recording application program;

Above-mentioned condition storage portion stores condition, this condition comprise terminal's status information behind the aforesaid operations of the state after the startup of terminal's status information before the aforesaid operations of state before the startup of representing above-mentioned image recording application program, the above-mentioned image recording application program of expression, and the use possibility of expression said external storer be the group of the above-mentioned use possibility information of the information that has.

5. 5. portable terminal as claimed in claim 1 is characterized in that,

Above-mentioned SOT state of termination test section detects as above-mentioned the 1st SOT state of termination of the state before the startup of the address book application of the function that possesses editor's address-book data with as above-mentioned the 2nd SOT state of termination of the state after the startup of above-mentioned address book application;

Above-mentioned condition storage portion stores condition, this condition comprise terminal's status information behind the aforesaid operations of the state after the startup of terminal's status information before the aforesaid operations of state before the startup of representing above-mentioned address book application, the above-mentioned address book application of expression, and the use possibility of expression said external storer be the group of the above-mentioned use possibility information of the information that has.

6. 6. portable terminal as claimed in claim 1 is characterized in that,

Above-mentioned SOT state of termination test section detects as above-mentioned the 1st SOT state of termination of the state before the startup of the accounting processing application program that possesses the function of carrying out the processing that gateway to charge is arranged with as above-mentioned the 2nd SOT state of termination of the state after the startup of above-mentioned accounting processing application program;

Above-mentioned condition storage portion stores condition, this condition comprise terminal's status information behind the aforesaid operations of the state after the startup of terminal's status information before the aforesaid operations of state before the startup of representing above-mentioned accounting processing application program, the above-mentioned accounting processing application program of expression, and the use possibility of expression said external storer be the group of the above-mentioned use possibility information of the information that has.

7. 7. portable terminal as claimed in claim 1 is characterized in that,

Above-mentioned SOT state of termination test section detects to start with based on above-mentioned the 1st SOT state of termination of the state before the above-mentioned application's data visit with to start with based on above-mentioned the 2nd SOT state of termination of the state after the above-mentioned application's data visit,

Above-mentioned condition storage portion stores condition, this condition comprise terminal's status information behind the aforesaid operations of the state after terminal's status information before the aforesaid operations of the state before expression beginning is based on above-mentioned application's data visit, expression beginning are based on above-mentioned application's data visit, and the use possibility of expression said external storer be the group of the above-mentioned use possibility information of the information that has.

8. One kind can the dismounting external memory storage portable terminal, it is characterized in that possessing:

The SOT state of termination test section detects above-mentioned the 1st SOT state of termination of the state before the variation of the contactless communication that carries out as the said external storer and as above-mentioned the 2nd SOT state of termination of the state after changing;

SD slot state-detection portion detects the said external storer is installed in above-mentioned portable terminal;

The condition storage part, storage condition, this condition comprise terminal's status information behind the aforesaid operations of the state after the variation of terminal's status information before the aforesaid operations of state before the variation of representing above-mentioned contactless communication, the above-mentioned contactless communication of expression, and the group of the above-mentioned use possibility information that has or not of the use possibility of expression said external storer;

Judging part, detecting under the state that the said external storer is installed in above-mentioned portable terminal by above-mentioned SD slot state-detection portion, when detecting above-mentioned the 1st SOT state of termination and above-mentioned the 2nd SOT state of termination by above-mentioned SOT state of termination test section, based on the above-mentioned condition of storing in the above-mentioned condition storage part, when from above-mentioned use possibility information, extracting above-mentioned the 2nd SOT state of termination of terminal condition express behind above-mentioned the 1st SOT state of termination of terminal condition express before the aforesaid operations and the aforesaid operations, having or not of the use possibility of said external storer, and the use possibility that extracts the said external storer be have as a result the time, be judged as and begin to above-mentioned external memory storage supply capability, and the use possibility that extracts the said external storer for do not have as a result the time, be judged as and should not begin to above-mentioned external memory storage supply electric power;

Power feeding section, by above-mentioned judgement section judges for should begin the time to above-mentioned external memory storage supply capability, beginning is to above-mentioned external memory storage supply capability, and being judged as should not begin to above-mentioned external memory storage supply capability the time, ends to above-mentioned external memory storage supply capability.

IPR2025-00645 Page 02401

9. 9. portable terminal as claimed in claim 8 is characterized in that,

Above-mentioned SOT state of termination test section detects as above-mentioned the 1st SOT state of termination of the state before the end of the contactless communication by the said external storer with as above-mentioned the 2nd SOT state of termination of the state after the end of above-mentioned contactless communication,

Above-mentioned condition storage portion stores condition, this condition comprise terminal's status information behind the aforesaid operations of the state after the end of terminal's status information before the aforesaid operations of state before the end of representing above-mentioned contactless communication, the above-mentioned contactless communication of expression, and the use possibility of expression said external storer be the group of the above-mentioned use possibility information that has.

10. 10. portable terminal as claimed in claim 8 is characterized in that,

Above-mentioned SOT state of termination test section detects as above-mentioned the 1st SOT state of termination of the state before the startup of the accounting processing application program that possesses the function of carrying out the processing that gateway to charge is arranged with as above-mentioned the 2nd SOT state of termination of the state after the startup of above-mentioned accounting processing application program;

Above-mentioned condition storage portion stores condition, this condition comprise terminal's status information behind the aforesaid operations of the state after the startup of terminal's status information before the aforesaid operations of state before the startup of representing above-mentioned accounting processing application program, the above-mentioned accounting processing application program of expression, and the use possibility of expression said external storer be the group of the above-mentioned use possibility information that has.

11. 11. one kind can the dismounting external memory storage portable terminal, it is characterized in that possessing:

The SOT state of termination test section detects as the 1st SOT state of termination of the state before the startup of the music piece reproducing application program that possesses the function of reproducing melody with as the 2nd SOT state of termination of the state after the startup of above-mentioned music piece reproducing application program;

SD slot state-detection portion detects the said external storer is installed in above-mentioned portable terminal;

The condition storage part, storage condition, this condition comprise terminal's status information after the operation of the state after the startup of terminal's status information before the operation of state before the startup of representing above-mentioned music piece reproducing application program, the above-mentioned music piece reproducing application program of expression, and the use possibility of expression said external storer be the group of the use possibility information of the information that has;

Judging part, detecting under the state that the said external storer is installed in above-mentioned portable terminal by above-mentioned SD slot state-detection portion, when detecting above-mentioned the 1st SOT state of termination and above-mentioned the 2nd SOT state of termination by above-mentioned SOT state of termination test section, based on the above-mentioned condition of storing in the above-mentioned condition storage part, when from above-mentioned use possibility information, extracting above-mentioned the 2nd SOT state of termination of terminal condition express behind above-mentioned the 1st SOT state of termination of terminal condition express before the aforesaid operations and the aforesaid operations, having or not of the use possibility of said external storer, and the use possibility that extracts the said external storer be have as a result the time, be judged as and begin to above-mentioned external memory storage supply capability, and the use possibility that extracts the said external storer for do not have as a result the time, be judged as and should not begin to above-mentioned external memory storage supply electric power; And

Power feeding section, by above-mentioned judgement section judges for should begin the time to above-mentioned external memory storage supply capability, beginning is to above-mentioned external memory storage supply capability, and being judged as should not begin to above-mentioned external memory storage supply capability the time, ends to above-mentioned external memory storage supply capability.

12. 12. a power supply method to being installed in the external memory storage supply capability in the portable terminal, is characterized in that, comprising:

SOT state of termination detects step, and the state of the application program of lift-launch in above-mentioned portable terminal before the change detected is that the state of the above-mentioned application program after the 1st SOT state of termination and the variation is the 2nd SOT state of termination;

SD slot state-detection step detects the said external storer is installed in above-mentioned portable terminal;

Determining step, in above-mentioned SD slot state-detection step, detect under the state that the said external storer is installed in above-mentioned portable terminal, when in above-mentioned SOT state of termination detection step, detecting above-mentioned the 1st SOT state of termination and above-mentioned the 2nd SOT state of termination, based on terminal's status information before the operation that comprises the state of representing preoperative above-mentioned application program, terminal's status information after the operation of the state of the above-mentioned application program after the expression operation, and the condition of the group of the use possibility information that has or not of the use possibility of expression said external storer, when from above-mentioned use possibility information, extracting above-mentioned the 2nd SOT state of termination of terminal condition express behind above-mentioned the 1st SOT state of termination of terminal condition express before the aforesaid operations and the aforesaid operations, having or not of the use possibility of said external storer, and the use possibility that extracts the said external storer be have as a result the time, be judged as and begin to above-mentioned external memory storage supply capability, and the use possibility that extracts the said external storer for do not have as a result the time, be judged as and should not begin to above-mentioned external memory storage supply electric power;

The electric power supplying step, in above-mentioned determining step, be judged as and begin when above-mentioned external memory storage supply capability, beginning is to above-mentioned external memory storage supply capability, and being judged as should not begin to above-mentioned external memory storage supply capability the time, ends to above-mentioned external memory storage supply capability.

13. 13. one kind can the dismounting external memory storage the integrated circuit used of portable terminal, it is characterized in that possessing:

The state of the application program of lift-launch in above-mentioned portable terminal before the SOT state of termination test section, change detected is that the state of the above-mentioned application program after the 1st SOT state of termination and the variation is the 2nd SOT state of termination;

SD slot state-detection portion detects the said external storer is installed in above-mentioned portable terminal;

The condition storage part, storage condition, this condition comprise terminal's status information after the operation of state of the above-mentioned application program after terminal's status information before the operation of the state of representing preoperative above-mentioned application program, the expression operation, and the group of the use possibility information that has or not of the use possibility of expression said external storer;

IPR2025-00645 Page 02402

Judging part, detecting under the state that the said external storer is installed in above-mentioned portable terminal by above-mentioned SD slot state-detection portion, when detecting above-mentioned the 1st SOT state of termination and above-mentioned the 2nd SOT state of termination by above-mentioned SOT state of termination test section, based on the above-mentioned condition of storing in the above-mentioned condition storage part, when from above-mentioned use possibility information, extracting above-mentioned the 2nd SOT state of termination of terminal condition express behind above-mentioned the 1st SOT state of termination of terminal condition express before the aforesaid operations and the aforesaid operations, having or not of the use possibility of said external storer, and the use possibility that extracts the said external storer be have as a result the time, be judged as and begin to above-mentioned external memory storage supply capability, and the use possibility that extracts the said external storer for do not have as a result the time, be judged as and should not begin to above-mentioned external memory storage supply electric power;

Power feeding section, by above-mentioned judgement section judges for should begin the time to above-mentioned external memory storage supply capability, beginning is to above-mentioned external memory storage supply capability, and being judged as should not begin to above-mentioned external memory storage supply capability the time, ends to above-mentioned external memory storage supply capability.

Description

Portable terminal

Technical field

The present invention relates to can the dismounting external memory storage portable terminal, particularly to suppress the portable terminal that unwanted power consumption is purpose.

Background technology

At present, portable phone and PDA portable terminals such as (Personal Digital Assistant) is popularized.Its reason can be enumerated and can carry and possess these aspects of various functions like a cork.

But, because portable terminal possesses various functions, so only can not guarantee required data sometimes by internal memory.Therefore, on present many portable terminals, can connect external memory storage, generally save the data in its external memory storage.

As external memory storage, SD storage card, miniSD card, smartSD, memory stick (Memory Stick), SM (Smart Media) card, MMC storage card, CF (CompactFlash) (registered trademark) storer, micro hard disk, small-sized HDD etc. are arranged.Below, illustration SD storage card describes as external memory storage.

Fig. 1 is the hardware structure diagram of general portable terminal.This portable terminal 200 possesses ROM203, RAM202, CPU201, SD slot 204 and other functions 205.

The ROM203 save routine.The data that RAM202 uses when being kept at executive routine temporarily CPU201 carries out control and treatment etc., carries out various processing according to the program that is kept among the ROM203.SD slot 204 is the slots that are used for installing the SD storage card.Other functions 205 are EEPROM that use in order to realize other functions etc.

Fig. 2 is the software architecture diagram of general portable terminal.This portable terminal 200 possesses SD slot state-detection portion 304, power feeding section 302, identification handling part 303, control part 301 on function.

The situation that the SD storage card is installed detects in SD slot state-detection portion 304.302 pairs of SD storage cards of power feeding section supply capability.Identification handling part 303 is received and dispatched the instruction of regulation in order to discern the SD storage card.Control part 301 control power feeding section 302 and identification handling part 303.

Fig. 3 is the process flow diagram of the processing of the general portable terminal identification SD storage card of expression.At first, card (S601 is) is installed in the SD slot, then gives control part 301 this message informing if SD slot state-detection portion 304 detects.301 pairs of power feeding section of control part 302 are indicated so that it begins supply capability (S602), and 303 indications are handled (S603) so that it begins initialization order to the identification handling part.Identification handling part 303 receives after the indication at the appointed time with the interior recognition instruction ACMD41 that sends.Thus, beginning initialization process (S604), if this initialization process finishes, then the identification processing of SD storage card finishes.

Fig. 4 is the service voltage of general SD storage card and the graph of a relation in identification processing time.As mentioned above, if the SD storage card was installed in the SD slot in the past, then begin immediately to SD storage card supply capability.And, after the rise time,, beginning initialization process if, then the SD storage card is sent ACMD41 through reaching the bus service voltage slope rise time (perhaps initialization sequence end) before through the electric power before reaching minimum service voltage.If this initialization process finishes, then to identify the card of installation be the SD storage card to portable terminal, can carry out the visit to the SD storage card then.

Like this, beginning is generally the SD storage card when being installed in the portable terminal to the moment of SD storage card supply capability. in addition, if general electric power Once you begin supply with, even then under the situation of not using the SD storage card also with battery saving mode sustainable supply electric power.

But, in portable terminals such as portable phone and PDA, must suppress power consumption as far as possible.If consumed unwanted electric power, the frequency gets higher of the charging of battery or battery altering not only then, but also can occur in the situation that can not use portable terminal under the situation that in fact needs electric power.

But, be not preferred to obsolete SD storage card sustainable supply electric power as in the past.For example, even the SD storage card has been installed when holding state, also necessity is not used the SD storage card immediately, but begins immediately to have consumed unwanted electric power to SD storage card supply capability in the past.

Summary of the invention

The objective of the invention is to address the above problem, a kind of portable terminal that can suppress unwanted power consumption is provided.

IPR2025-00645 Page 02403

in order to achieve the above object, portable terminal of the present invention, be can the dismounting external memory storage portable terminal, possess: SOT state of termination test section, the 2nd SOT state of termination of the 1st SOT state of termination of the state of the above-mentioned portable terminal before the detection conduct changes and the state of the above-mentioned portable terminal after the conduct variation; The condition storage part, the storage beginning is to the condition of above-mentioned external memory storage supply capability; Judging part when detecting above-mentioned the 1st SOT state of termination and above-mentioned the 2nd SOT state of termination by above-mentioned SOT state of termination test section, judges whether this state variation satisfies above-mentioned condition; Power feeding section, when going out above-mentioned state variation by above-mentioned judgement section judges and satisfy above-mentioned condition, beginning is to above-mentioned external memory storage supply capability.Thus, owing to before the state variation of portable terminal satisfies defined terms, do not begin to the external memory storage supply capability, so can suppress unwanted power consumption.

Here, also can be whether the state variation that above-mentioned judgement section judges constitutes the hardware of portable terminal satisfies above-mentioned condition Thus, before the state variation of the hardware that constitutes portable terminal, do not begin to the external memory storage supply capability.

Particularly, also can be, be the angle of regulation when above in the opening angle of folder-type portable terminal, above-mentioned judgement section judges be for satisfying above-mentioned condition.Thus, do not begin to the external memory storage supply capability before more than the opening angle of folder-type portable terminal is for the angle of regulation.

In addition, also can be, be the angle of regulation when above in the opening angle of rotary portable terminal, above-mentioned judgement section judges be for satisfying above-mentioned condition.Thus, do not begin to the external memory storage supply capability before more than the opening angle of rotary portable terminal is for the angle of regulation.

In addition, also can be, be the distance of regulation when above at the sliding distance of sliding-type portable terminal, above-mentioned judgement section judges be for satisfying above-mentioned condition.Thus, do not begin to the external memory storage supply capability before more than the sliding distance of sliding-type portable terminal is for the distance of regulation.

Perhaps, also can be whether the state variation that above-mentioned judgement section judges is carried the application program in portable terminal satisfies above-mentioned condition.Thus, before the state variation of carrying the application program in portable terminal, do not begin to the external memory storage supply capability.

Particularly, also can be that above-mentioned judgement section judges is for satisfying above-mentioned condition when having started the music piece reproducing application program that possesses the function of reproducing melody.Thus, before starting the music piece reproducing application, do not begin to the external memory storage supply capability.

In addition, also can be that when having started the image reproduction application program that possesses the function of reproducing image, above-mentioned judgement section judges is for satisfying above-mentioned condition.Thus, before starting the image reproduction application, do not begin to the external memory storage supply capability.

In addition, also can be, when having started the image recording application program of the function that possesses the image recording that will be received by the charged portable terminal of looking, above-mentioned judgement section judges is for satisfying above-mentioned condition. thus, before starting the image recording application, do not begin to the external memory storage supply capability.

In addition, also can be that when having started the address book application of the function that possesses editor's address-book data, above-mentioned judgement section judges is for satisfying above-mentioned condition.Thus, before using, the enabling address book do not begin to the external memory storage supply capability.

In addition, also can be that when having started the accounting processing application program that possesses the function of carrying out the processing that gateway to charge is arranged, above-mentioned judgement section judges is for satisfying above-mentioned condition.Thus, before starting the accounting processing application, do not begin to the external memory storage supply capability.

In addition, also can be that when above-mentioned application program began data access, above-mentioned judgement section judges was for satisfying above-mentioned condition.Thus, before beginning data access, application program do not begin to the external memory storage supply capability.

Perhaps, also can be whether the state variation of the contactless communication that above-mentioned judgement section judges said external storer carries out satisfies above-mentioned condition.Thus, externally do not begin to the external memory storage supply capability before the state variation of the contactless communication that carries out of storer.

Particularly, also can be that when the said external storer was through with contactless communication, above-mentioned judgement section judges was for satisfying above-mentioned condition.Thus, externally storer finishes not begin to the external memory storage supply capability before the contactless communication.

In addition, also can be that when having started the accounting processing application program that possesses the function of carrying out the processing that gateway to charge is arranged, above-mentioned judgement section judges is for satisfying above-mentioned condition.Thus, the contactless communication even the said external storer is through with did not begin to the external memory storage supply capability before starting the accounting processing application.

In addition, the present invention not only can realize as such portable terminal, can be that the power supply method of step is realized or as making computing machine carry out the program realization of these steps as the characteristic mechanism that possesses with such portable terminal also.And such program is certainly via the distribution of transmission mediums such as storage medium such as CD-ROM or the internet.

In addition, each functional block of structural drawing (Fig. 6) typically says it is to realize as the LSI of integrated circuit.They are single chip respectively both, also can comprise part or all and single chip.Here, be made as LSI, but, be also referred to as IC, system LSI, super LSI, ULSI sometimes according to the difference of integrated level.

In addition, the method for integrated circuit is not limited to LSI, also can realize by special circuit or general processor.Also can use after LSI makes FieldProgrammable Gate Array (FPGA) that can save routine or can make up the connection of circuit unit of LSI inside and the reconfigurable processor of setting again.

And then, if the technology of the integrated circuit of LSI appears replacing in the technology of progress by semiconductor technology or derivation, then can certainly use this technology to carry out the integrated of above-mentioned functions piece.

The invention effect is as follows:

As described above, according to portable terminal of the present invention, owing to before the state variation of portable terminal satisfies defined terms, do not begin to the external memory storage supply capability, so can suppress unwanted power consumption.Thus, the charging of battery and the frequency of battery swap can be reduced, user's trouble can be eliminated.

IPR2025-00645 Page 02404

in addition, do not begin to the external memory storage supply capability before the state variation in the application program of carrying in portable terminal, music piece reproducing application program and accounting processing application program etc., specific application program That is, even do not use the state variation of the application program of external memory storage not begin, so can suppress unwanted power consumption to the external memory storage supply capability yet.

in addition, before beginning data access, application program do not begin to the external memory storage supply capability.Thus, even started application program, do not begin before the needs of external memory access in generation, so can suppress unwanted power consumption to the external memory storage supply capability yet.

in addition, before the state variation of the hardware that constitutes portable terminal, do not begin to the external memory storage supply capability.if the mechanism by hardware is realized the state variation of judgement hardware then has the effect of the load that can cut down software.

in addition, externally storer is can carry out beginning to the external memory storage supply capability when contactless communication finishes under the situation of storage card of contactless communication.That is, owing in the contactless communication that does not need electric power to supply with, do not begin to the external memory storage supply capability, so can suppress unwanted power consumption.And, as long as owing to judge whether it is just passable in the noncontact communication, so also have the effect that system is oversimplified.

in addition, externally storer is can carry out under the situation of storage card of contactless communication, also can not begin to the external memory storage supply capability before starting the accounting processing application program Thus, even contactless communication finishes, before the needs of external memory access, do not begin electric power in generation and supply with, so can suppress unwanted power consumption.

Description of drawings

Fig. 1 is the hardware structure diagram of general portable terminal.

Fig. 2 is the software architecture diagram of general portable terminal.

Fig. 3 is the process flow diagram of the processing of the general portable terminal identification SD storage card of expression.

Fig. 4 is the service voltage of the general SD storage card of expression and the graph of a relation in identification processing time.

Fig. 5 is the figure of environment for use of the portable terminal of expression embodiment 1.

Fig. 6 is the software architecture diagram of the portable terminal of embodiment 1.

Fig. 7 is the cut-away view of the SOT state of termination admin table of embodiment 1.

Fig. 8 is the cut-away view of the condition admin table of embodiment 1.

Fig. 9 is the process flow diagram that the portable terminal of expression embodiment 1 is discerned the processing of SD storage card.

Figure 10 is that the electric power of expression embodiment 1 is supplied with figure constantly.

Figure 11 is the cut-away view of the SOT state of termination admin table of embodiment 2.

Figure 12 is the cut-away view of the SOT state of termination admin table of embodiment 3.

Figure 13 is the cut-away view of the SOT state of termination admin table of embodiment 4.

Figure 14 is the cut-away view of the SOT state of termination admin table of embodiment 5.

Figure 15 is the figure that expression folder-type portable terminal and electric power are supplied with the relation of beginning condition.

Figure 16 (a) is the figure that rotary portable terminal of expression and electric power are supplied with the relation of beginning condition.Figure 16 (b) is the figure that expression sliding-type portable terminal and electric power are supplied with the relation of beginning condition.

Figure 17 is the synoptic chart of the use-pattern of the corresponding portable terminal of the general contactless communication of expression.

Figure 18 is the hardware structure diagram corresponding to the portable terminal of smartSD card.

Figure 19 is equipped with the portable terminal of contactless communication corresponding stored card and the graph of a relation of read write line.

Figure 20 is the cut-away view of the SOT state of termination admin table of embodiment 8.

Figure 21 is the cut-away view of the SOT state of termination admin table of embodiment 9.

Figure 22 is the cut-away view of the condition admin table of embodiment 9.

The figure of the example when Figure 23 is expression with the feature structure portion integrated circuit of the portable terminal of embodiment 1 ~ 9.

Label declaration

103 SD storage cards

200 portable terminals

301 control parts

302 power feeding section

303 identification handling parts

304 SD slot state-detection portions

400 SOT state of termination test sections

401 SOT state of termination admin tables

IPR2025-00645 Page 02405

402 condition admin tables

403 judging parts

Embodiment

Below, explain embodiments of the present invention with reference to accompanying drawing.

(embodiment 1)

Fig. 5 is the figure of environment for use of the portable terminal of expression embodiment 1.

In this environment for use, comprise server 100, network 101, wireless base station 102 and portable terminal 200.Server 100 provides music data and application data etc. via 102 pairs of portable terminals 200 of network 101 and wireless base station.

Wireless base station 102 is to be equipped in the roof of buildings or the equipment on the electric pole, the input and output of carrying out based on wireless data with portable terminal 200.Wireless base station 102 is connected with server 100 via network 101.By this wireless base station 102, portable terminal 200 can be enjoyed the service of server 100.

Portable terminal 200 is via the portable phone 105 of the service of network 101 and wireless base station 102 enjoyment servers 100 and PDA104 etc.In addition, portable terminal 200 is the equipment of visit SD storage card 103.That is, in portable terminal 200 browser software etc. is installed, the user can be via the data in the user interface visit SD storage card 103 of this browser software.

The hardware configuration of the portable terminal of embodiment 1 is not owing to change with the hardware configuration (Fig. 1) of general portable terminal, so omit detailed explanation here.

Fig. 6 is the software architecture diagram of the portable terminal of embodiment 1 Possessing the aspect of SD slot state-detection portion 304, power feeding section 302, identification handling part 303 and control part 301 and general portable terminal does not change.But the aspect that possesses SOT state of termination test section 400, SOT state of termination admin table 401, condition admin table 402, judging part 403 is different with general portable terminal.

SOT state of termination test section 400 detects the state (below be called " SOT state of termination ") of portable terminals.For example, for portable terminal, the situation of having passed through certain hour and also do not have operation is detected as the state of " standby ", is detected as the state of " in the application start " etc. under the situation that has started application program (being called " application " to place an order).SOT state of termination admin table 401 is management tables by SOT state of termination test section 400 detected SOT state of termination.Condition admin table 402 is management beginning tables to the condition of SD storage card supply capability, is an example of relevant condition storage part of the present invention.Judging part 403 judges that whether the state variation of portable terminal satisfies the condition by 402 management of condition admin table, is notified to control part 301 with its judged result.

Fig. 7 is the cut-away view of SOT state of termination admin table 401.As shown in the drawing, SOT state of termination admin table 401 is being managed the 1st SOT state of termination and the 2nd SOT state of termination.The 1st SOT state of termination is the SOT state of termination (SOT state of termination before the 2nd SOT state of termination) before changing, and is kept in the zone 701 of SOT state of termination admin table 401.The 2nd SOT state of termination is the SOT state of termination (current SOT state of termination) after changing, and is kept in the zone 702 of SOT state of termination admin table 401.

Fig. 8 is the cut-away view of condition admin table 402. and as shown in the drawing, condition admin table 402 is managing that SOT state of termination 900, user operate 901, to use possibility 903. SOT state of termination 900 are states of portable terminal for the SOT state of termination 902 after the operation and SD storage card. and it is operations of carrying out 900 times users of SOT state of termination that the user operates 901. and the SOT state of termination 902 after the operation is to have carried out the user to operate SOT state of termination .SD storage card after 901 to use possibility 903 are use possibilities of the SD storage card of the SOT state of termination 902 after the operation.

Like this, the condition of beginning to SD storage card supply capability is set in advance in the condition admin table 402.Promptly, should begin under the situation of SD storage card supply capability, be set at as SD storage card use possibility 903 " having ", otherwise, not to begin under the situation of SD storage card supply capability, using possibility 903 and be set at " nothing " as the SD storage card.Such set information can for example be downloaded from the internet, and can upgrade as required.

Fig. 9 is the process flow diagram that the portable terminal of expression embodiment 1 is discerned the processing of SD storage card.Below, utilize Fig. 9 and Fig. 6, the action of the portable terminal of embodiment 1 is described.

At first, change (S801 is), then detected SOT state of termination is saved in as the 1st SOT state of termination in the zone 701 of SOT state of termination admin table 401 (S802) if SOT state of termination test section 400 detects SOT state of termination.In addition, card (step S803 is) is installed in the SD slot, then gives judging part 403 this message informing if SD slot state-detection portion 304 detects.

Then, change (S803a is), then detected SOT state of termination is saved in as the 2nd SOT state of termination in the zone 702 of SOT state of termination admin table 401 (S804) if SOT state of termination test section 400 detects SOT state of termination.

Here, judging part 403 is read the 1st SOT state of termination and the 2nd SOT state of termination from SOT state of termination admin table 401.And,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805) according to these SOT state of termination.

Thus, being judged as at judging part 403 is to begin under the situation of electric power condition of supplying (being among the S806), gives control part 301 with this message informing.301 pairs of power feeding section of control part 302 are indicated so that it begins supply capability (S807), and 303 indications are handled (S808) so that it begins initialization order to the identification handling part.Identification handling part 303 sends recognition instruction ACMD41 with interior to the SD storage card at the appointed time after receiving indication Thus, carry out initialization process (S809), if this initialization process finishes, then the identification processing of SD storage card finishes.

On the other hand, be judged as under the situation that is not to begin the electric power condition of supplying (among the S806 not) at judging part 403, for holding state changes up to SOT state of termination.If SOT state of termination test section 400 detects the situation (S810 is) that SOT state of termination changes, then upgrade SOT state of termination admin table 401.That is, the 2nd SOT state of termination that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination is saved in the zone 702 (S804) as the 2nd SOT state of termination.

After, repeat above-mentioned action (S805 → S806 . .)

Then, illustration is moved more specifically and is described.Action during here, to installation SD storage card behind the power supply of connecting (ON) portable terminal, the application of startup music piece reproducing describes.So-called " music piece reproducing application " is meant the application that possesses the

IPR2025-00645 Page 02406

function of reproducing melody.

At first, SOT state of termination test section 400 detects the situation (S801 is) that power supply becomes connection, shown in Fig. 7 (a), detected SOT state of termination " power connection " is saved in as the 1st SOT state of termination in the zone 701 of SOT state of termination admin table 401 (S802).At this constantly, owing to there is not the 2nd SOT state of termination, so in the zone 702 of SOT state of termination admin table 401, preserve the information that NULL etc. means " no information "

Then, if the SD storage card is installed in the SD slot, then SD slot state-detection portion 304 detects the situation (S803) that storage card is installed, and gives judging part 403 with this message informing.

Then, if SOT state of termination test section 400 detects the situation (S803a is) that does not also have variation through the certain hour SOT state of termination, then shown in Fig. 7 (b), detected SOT state of termination " standby " is saved in as the 2nd SOT state of termination in the zone 702 of SOT state of termination admin table 401 (S804).

Here, judging part 403 is read the 1st SOT state of termination " power connection " and the 2nd SOT state of termination " standby " from SOT state of termination admin table 401.According to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

Particularly, because the 1st SOT state of termination is that " power connection ", the 2nd SOT state of termination are " standbies ", so as shown in Figure 8, be that SOT state of termination 902 after " power connection ", the operation is the records 912 (S805) of " standby " with reference to SOT state of termination 900.Owing in this record 912, using possibility 903 to preserve the information that means " nothing ",, judging part 403 not to begin electric power condition of supplying (S806 denys) so being judged as the SD storage card In the case, judging part 403 is owing to being holding state, so do not begin to SD storage card supply capability

Then, started music piece reproducing application (S807 is), then shown in Fig. 7 (c), upgraded SOT state of termination admin table 401 like that if SOT state of termination test section 400 detects.That is, the 2nd SOT state of termination " standby " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " in the music piece reproducing " is saved in as the 2nd SOT state of termination in the zone 702 (S804).

Here, judging part 403 is read the 1st SOT state of termination " standby " and the 2nd SOT state of termination " the music piece reproducing " from SOT state of termination admin table 401.Then, according to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

Particularly, because the 1st SOT state of termination is that " standby ", the 2nd SOT state of termination are " in the music piece reproducings ", so as shown in Figure 8, be that SOT state of termination 902 after " standby ", the operation is the records 917 (S805) of " in the music piece reproducing " with reference to SOT state of termination 900.Owing in this record 917, using possibility 903 to preserve the information that means " having ", be to begin electric power condition of supplying (S806 is) so judging part 403 is judged as the SD storage card.

In the case, 301 pairs of power feeding section of control part 302 are indicated so that it begins supply capability (S807), and 303 indications are handled (S808) so that it begins initialization order to the identification handling part.Identification handling part 303 sends recognition instruction ACMD41 with interior to the SD storage card at the appointed time after receiving indication.Thus, carry out initialization process (S809), if this initialization process finishes, then the identification processing of SD storage card finishes.

Figure 10 is that the electric power of expression embodiment 1 is supplied with figure constantly.As shown in the drawing, according to embodiment 1, in the SD slot, be equipped with under the state of SD storage card, the state of portable terminal from " standby " when " the music piece reproducing " changes, beginning is to SD storage card supply capability.

As mentioned above, according to embodiment 1, when starting the music piece reproducing application, begin to SD storage card supply capability.That is, owing to up to the present also do not begin to SD storage card supply capability, so can suppress unwanted power consumption.Thus, the charging of battery and the frequency of battery altering can be reduced, user's trouble can be eliminated.

And, be loaded in music piece reproducing among the application in the portable terminal to startup and do not begin to SD storage card supply capability before using.That is,, do not begin to SD storage card supply capability even start the application of not using the SD storage card yet.

In addition, after the identification processing of SD storage card finishes, both can samely become battery saving mode, and also can finish electric power and supply with.But, even become battery saving mode like this or finish the situation that the electric power supply only limits to also not use through certain hour the SD storage card.

In addition, here when starting the music piece reproducing application, begin to SD storage card supply capability, but the present invention is not limited to this. promptly, also can when using, the startup image reproduction begin to SD storage card supply capability. and what only have reproduction still is this species diversity of image to liking melody, and the action of portable terminal is identical.

(embodiment 2)

In embodiment 1, when starting music piece reproducing application or image reproduction application, begin, but the present invention is not limited to this to SD storage card supply capability.That is, also can when starting the image photography applications, begin to SD storage card supply capability.So-called " image photography applications " is meant the application that possesses the function that image is photographed.

Below, the action when the image photography applications is started describes.Basic action and embodiment 1 do not change, so later action describes to step S810 shown in Figure 9 here.In addition, Figure 11 is the cut-away view of the SOT state of termination admin table 401 of embodiment 2.Do not change about transfer from Figure 11 (a) to Figure 11 (b) and embodiment 1, so omit explanation.

Start (being among the S810) if SOT state of termination test section 400 detects the image photography applications, then shown in Figure 11 (c), upgrade SOT state of termination admin table 401 like that.That is, the 2nd SOT state of termination " standby " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " in the image shooting operation " is saved in as the 2nd SOT state of termination in the zone 702 (S804).

Here, judging part 403 is read the 1st SOT state of termination " standby " and the 2nd SOT state of termination " the image shooting operation " from SOT state of termination admin table 401.According to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

IPR2025-00645 Page 02407

Particularly, because the 1st SOT state of termination is that " standby ", the 2nd SOT state of termination are " in the image shooting operations ", so as shown in Figure 8, with reference to SOT state of termination 900 be " standby ", the operation after SOT state of termination 902 are the records 918 (S805) of " in the image shooting operation ".Owing in this record 918, using possibility 903 to preserve the information that means " having ", be to begin electric power condition of supplying (S806 is) so judging part 403 is judged as the SD storage card.Begin thus to SD storage card supply capability, and should move, so omit explanation owing to identical with embodiment 1.

More than, according to embodiment 2, when starting the image photography applications, begin to SD storage card supply capability.That is, do not begin before this, so can suppress unwanted power consumption to SD storage card supply capability.

(embodiment 3)

In embodiment 2, when starting the image photography applications, begin, but the present invention is not limited to this to SD storage card supply capability.That is, also can when starting the image recording application, begin to SD storage card supply capability.

For example, suppose that portable terminal 200 is the portable terminal that is built-in with TV tuner (below be called " the charged portable terminal of looking ").In the case, because the situation of the image recording that the TV programme that will receive by TV tuner arranged in the SD storage card, so also can when starting the image recording application, begin to SD storage card supply capability.

Below, the action during to the image recording application start describes.Basic action and embodiment 1 do not change, so later action describes to step S810 shown in Figure 9 here.In addition, Figure 12 is the cut-away view of the SOT state of termination admin table 401 of embodiment 3.Do not change about transfer from Figure 12 (a) to Figure 12 (b) and embodiment 1, so omit explanation.

If SOT state of termination test section 400 detects image recording and uses and to start (being among the S810), then shown in Figure 12 (c), upgrade SOT state of termination admin table 401 like that.That is, the 2nd SOT state of termination " standby " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " in the image recording " is saved in as the 2nd SOT state of termination in the zone 702 (S804).

Here, judging part 403 is read the 1st SOT state of termination " standby " and the 2nd SOT state of termination " the image recording " from SOT state of termination admin table 401, according to these SOT state of termination, with reference to condition admin table 402 (S805), judge whether it is to begin electric power condition of supplying (S806).

Particularly, because the 1st SOT state of termination is that " standby ", the 2nd SOT state of termination are " in the image recordings ", so as shown in Figure 8, be that SOT state of termination 902 after " standby ", the operation is the record 918a (S805) of " in the image recording " with reference to SOT state of termination 900.Owing in this record 918a, using possibility 903 to preserve the information that means " having ", be to begin electric power condition of supplying (S806 is) so judging part 403 is judged as the SD storage card.Begin thus to SD storage card supply capability, and should move, so omit explanation owing to identical with embodiment 1.

More than, according to embodiment 3, when starting the image recording application, begin to SD storage card supply capability.That is, do not begin before this, so can suppress unwanted power consumption to SD storage card supply capability.

(embodiment 4)

In embodiment 1 ~ 3, when starting application, begin, but the present invention is not limited to this to SD storage card supply capability.That is, also can when using the beginning data access, begin to SD storage card supply capability.

Below, the action when the enabling address book is used, the action when particularly being used for editing the operation of address-book data describe.So-called " address book application " is meant the application of the function that possesses editor's address-book data.

Because basic action and embodiment 1 do not change, so later action describes to step S810 shown in Figure 9 here.In addition, Figure 13 is the cut-away view of the SOT state of termination admin table 401 of embodiment 4.Do not change about transfer from Figure 13 (a) to Figure 13 (b) and embodiment 1, so omit explanation

Start (being among the S810) if SOT state of termination test section 400 detects address book application, then shown in Figure 13 (c), upgrade SOT state of termination admin table 401 like that.That is, the 2nd SOT state of termination " standby " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " in the address book operation " is saved in the zone 702 (S804) as the 2nd SOT state of termination.

Here, judging part 403 is read the 1st SOT state of termination " standby " and the 2nd SOT state of termination " the address book operation " from SOT state of termination admin table 401.According to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

Particularly, because the 1st SOT state of termination is " standby ", the 2nd SOT state of termination is " in the address book operation ", so be that SOT state of termination 902 after " standby ", the operation is the records 915 (S805) of " address book operation in " with reference to SOT state of termination 900 as shown in Figure 8.Owing in this record 915, using possibility 903 to preserve the information that means " nothing ",, judging part 403 not to begin electric power condition of supplying (S806 denys) so being judged as the SD storage card in the case, because judging part 403 is a holding state, so do not begin to SD storage card supply capability.

Then, if SOT state of termination test section 400 detects the operation (S810 is) of having carried out being used for editing address-book data, then shown in Figure 13 (d), upgrade SOT state of termination admin table 401 like that.That is, the 2nd SOT state of termination " in the address book operation " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " data access " is saved in the zone 702 (S804) as the 2nd SOT state of termination.

Here, judging part 403 is read the 1st SOT state of termination " the address book operation " and the 2nd SOT state of termination " data access " from SOT state of termination admin table 401.And,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805) according to these SOT state of termination.

Particularly, because the 1st SOT state of termination is " in the address book operation ", the 2nd SOT state of termination is " data access ", so as shown in Figure 8, with reference to SOT state of termination 900 are " in address book operations ", SOT state of termination 902 after the operation is the records 919 (S805) of " data access ". owing in this record 919, using possibility 903 to preserve the information that means " having " as the SD storage card, so it is to begin electric power condition of supplying (S806 is) that judging part 403 is judged as. begin thus to SD storage card supply capability, and should move, so omit explanation owing to identical with embodiment 1.

IPR2025-00645 Page 02408

More than, according to embodiment 4, when the operation of having carried out being used for editing address-book data, begin to SD storage card supply capability.That is,, do not begin to SD storage card supply capability to producing before the needs of SD storage card visit, so can suppress unwanted power consumption even started address book application.

In addition, also do not begin to SD storage card supply capability even started address book application here, but the present invention is not limited to this.That is, same with embodiment 1 and 2, also can when using, the enabling address book begin to SD storage card supply capability.

(embodiment 5)

In embodiment 4, when the operation that is used for editing address-book data, begin, but the present invention is not limited to this to SD storage card supply capability.That is, no matter also can be so long as when having begun data access, then what kind of mode is its access mode be, also similarly begin to SD storage card supply capability with embodiment 4.

Below, the action the when user has been carried out being used for the operation of visit data file describes.Because basic action and embodiment 1 do not change, so later action describes to step S810 shown in Figure 9 here.In addition, Figure 14 is the cut-away view of the SOT state of termination admin table 401 of embodiment 5.Do not change about transfer from Figure 14 (a) to Figure 14 (b) and embodiment 1, so omit explanation.

If detecting, SOT state of termination test section 400 carried out being used for the operation of data file visit (being among the S810) then upgraded SOT state of termination admin table 401 like that shown in Figure 14 (c).That is, the 2nd SOT state of termination " standby " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " data access " is saved in as the 2nd SOT state of termination in the zone 702 (S804).

Here, judging part 403 is read the 1st SOT state of termination " standby " and the 2nd SOT state of termination " data access " from SOT state of termination admin table 401.According to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

Particularly, because the 1st SOT state of termination is that " standby ", the 2nd SOT state of termination are " data accesses ", so as shown in Figure 8, be that SOT state of termination 902 after " standby ", the operation is the records 914 (S805) of " data access " with reference to SOT state of termination 900.Owing in this record 914, using possibility 903 to preserve the information that means " having ", be to begin electric power condition of supplying (S806 is) so judging part 403 is judged as the SD storage card.Begin thus to SD storage card supply capability, and should move, so omit explanation owing to identical with embodiment 1.

More than, according to embodiment 5, when having carried out being used for operation to the visit of data file, the user begins to SD storage card supply capability.That is, do not begin before this, so can suppress unwanted power consumption to SD storage card supply capability.

(embodiment 6)

In embodiment 1 ~ 5, begin to SD storage card supply capability when start using or during the beginning data access, but the present invention is not limited to this.That is, also can when the state variation of the hardware that constitutes portable terminal, begin to SD storage card supply capability.

Figure 15 is the figure that expression folder-type portable terminal and electric power are supplied with the relation of beginning condition.Here, shown in Figure 15 (a), establishing to open and judge that the angle is θ 0, is to be that prerequisite describes than 0 ° of big angle with this θ 0.

Usually, the folder-type portable terminal is holding state under closing state shown in Figure 15 (b).The opening angle θ 1 of the portable terminal under this state is 0 °, judges that than opening angle θ 0 is little.Thereby, even this time be engraved in the SD storage card be installed in the portable terminal, do not begin to SD storage card supply capability yet.

Then, shown in Figure 15 (c),, judge under the little situation of angle θ 0 than opening,, also do not begin to SD storage card supply capability with above-mentioned same at its opening angle θ 2 even be under the situation about opening midway at portable terminal.

At last, shown in Figure 15 (d), when the opening angle θ 3 of portable terminal judged that for opening angle θ 0 is above, it was to begin the electric power condition of supplying that judging part 403 is judged as, with this message informing to control part 301.Thus, to begin to SD storage card supply capability with the same order of embodiment 1.

More than, according to embodiment 6, judge that for opening the angle begins to SD storage card supply capability when above in the opening angle of folder-type portable terminal.Promptly do not begin before this, so can suppress unwanted power consumption to SD storage card supply capability.And, owing to can realize judging the mechanism of electric power supply beginning condition by hardware, so also have the effect of the load of having cut down software.

(embodiment 7)

In embodiment 6, the shape of portable terminal has been made collapsible, but the present invention is not limited to this.That is, also same under the situation of rotary portable terminal and sliding-type portable terminal with embodiment 6, also can when the state variation of hardware, begin to SD storage card supply capability.

Figure 16 (a) is the figure that rotary portable terminal of expression and electric power are supplied with the relation of beginning condition.Rotary portable terminal is the structure of opening to side direction, judges that angle θ 0 also is the angle of side direction so open.That is, when the opening angle of side direction judges that for opening angle θ 0 is above, by beginning to SD storage card supply capability with the same order of embodiment 6.

Figure 16 (b) is the figure that expression sliding-type portable terminal and electric power are supplied with the relation of beginning condition.The structure of the part of the main body of sliding-type portable terminal for sliding is not angle and be sliding distance so open judgment standard.That is, at sliding distance for opening judging distance L0 when above, by beginning to SD storage card supply capability with the same order of embodiment 6.

More than, according to embodiment 7, the opening angle of rotary portable terminal be open when judging that angle θ 0 is above or the sliding distance of sliding-type portable terminal for opening judging distance L0 when above, begin to SD storage card supply capability.That is, do not begin before this, so can suppress unwanted power consumption to SD storage card supply capability.And, owing to can realize judging the mechanism of electric power supply beginning condition by hardware, so also have the effect of the load of having cut down software.

(embodiment 8)

In embodiment 1 ~ 7, illustrated as the SD storage card and only can pass through the external memory storage that contact communication is moved, but the present invention is not limited to this.That is, also can adopt the external memory storage that as the smartSD card, can carry out contactless communication.

IPR2025-00645 Page 02409

Figure 17 is the synoptic chart of the use pattern of the corresponding portable terminal of the general contactless communication of expression.Basic structure and Fig. 5 do not change.But the corresponding portable terminal 1300 of contactless communication needs read write line 1200 for access server 100 and network 101.In addition, the storage card that is installed in the corresponding portable terminal 1300 of contactless communication is contactless communication corresponding stored cards 1201 such as smartSD card.

Here, under the situation of contactless communication corresponding stored card 1201 in being installed to the corresponding portable terminal 1300 of contactless communication, can accept electric power from read write line 1200 and supply with and move.That is, have not from portable terminal and accept that electric power is supplied with and the aspect of situation about can move is different with general storage card.

Figure 18 is the hardware structure diagram corresponding to the portable terminal of smartSD card.Possessing the aspect of CPU201, RAM202, ROM203, SD slot 204, other functions 205 and general portable terminal does not change.But it is different with general portable terminal as the aspect of contactless communication structure to possess aerial coil 206.

If Figure 19 is equipped with the portable terminal of contactless communication corresponding stored card and the graph of a relation of read write line. the user puts into the corresponding portable terminal 1300 of contactless communication in the electric field 1400 of read write line 1200, then accepting electric power by the aerial coil 206 of the corresponding portable terminal 1300 of contactless communication from read write line 1200 supplies with, become the state that can carry out contactless communication. on the other hand, if the user extracts the corresponding portable terminal 1300 of contactless communication from the electric field 1400 of read write line 1200, then no longer include from the electric power of read write line 1200 and supply with, so become the state that can not carry out contactless communication.

In present embodiment 8, be that the corresponding portable terminal of noncontact communication, its external memory storage are that the situation of smartSD card describes to portable terminal.Because basic action and embodiment 1 do not change, so later action describes to step S810 shown in Figure 9 here.And Figure 20 is the cut-away view of the SOT state of termination admin table 401 of embodiment 8.About from Figure 20 (a) to the transfer of Figure 20 (b) owing to do not change, so omit explanation with embodiment 1.

If SOT state of termination test section 400 detects the situation of the electric field 1400 that enters into read write line, promptly becomes the situation (S810 is) of contactless communication, then shown in Figure 20 (c), upgrade SOT state of termination admin table 401 like that.That is, the 2nd SOT state of termination " standby " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " in the contactless communication " is saved in as the 2nd SOT state of termination in the zone 702 (S804).

Here, judging part 403 is read the 1st SOT state of termination " standby " and the 2nd SOT state of termination " the contactless communication " from SOT state of termination admin table 401.According to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

Particularly, because the 1st SOT state of termination is that " standby ", the 2nd SOT state of termination are " in the contactless communications ", so as shown in Figure 8, with reference to SOT state of termination 900 be " standby ", the operation after SOT state of termination 902 are the records 921 (S805) of " in the contactless communication ".Owing in this record 921, using possibility 903 to preserve the information that means " nothing ",, judging part 403 not to begin electric power condition of supplying (S806 denys) so being judged as the SD storage card.Judging part 403 is owing to being holding state, so do not begin to smartSD card supply capability in the case.

Then, if SOT state of termination test section 400 detects situation about breaking away from from the electric field 1400 of read write line, promptly becomes the situation (being the S810) of holding state, then shown in Figure 20 (d), upgrade SOT state of termination admin table 401 like that.That is, the 2nd SOT state of termination " in the contactless communication " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " standby " is saved in as the 2nd SOT state of termination in the zone 702 (S804).

Here, judging part 403 is read the 1st SOT state of termination " the contactless communication " and the 2nd SOT state of termination " standby " from SOT state of termination admin table 401.According to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

Particularly, because the 1st SOT state of termination is that " in the contactless communication ", the 2nd SOT state of termination are " standbies ", so as shown in Figure 8, with reference to SOT state of termination 900 be " in the contactless communication ", the operation after SOT state of termination 902 are the records 922 (S805) of " standby ".Owing in this record 922, using possibility 903 to preserve the information that means " having ", be to begin electric power condition of supplying (S806 is) so judging part 403 is judged as the SD storage card.Begin thus to smartSD card supply capability, and should move, so omit explanation owing to identical with embodiment 1.

More than, according to embodiment 8, when finishing, contactless communication begins to smartSD card supply capability., owing to do not begin to smartSD card supply capability in the contactless communication that does not need electric power to supply with, so can suppress unwanted power consumption. and, owing to only judge whether it is just passable in the noncontact communication, so also have the effect that system is oversimplified.

(embodiment 9)

In embodiment 8, when contactless communication finishes, begin to smartSD card supply capability, but the present invention is not limited to this.That is, in embodiment 8, supposed at contactless communication and just finished the back, but had multiple with reference to the purpose of the data in the smartSD card like this with reference to the scene of the data in the smartSD card.For example have contactless communication finish the back in order to carry out its accounting processing with reference to the data conditions in the smartSD card.In the case, even contactless communication finishes, before starting the accounting processing application, do not need beginning to smartSD card supply capability yet.

Below, the action when using starting accounting processing describes.So-called " accounting processing application " is meant the application that possesses the function of carrying out the processing that gateway to charge is arranged.Here said charging is the expense that the service meter of enjoying by contactless communication is got.

Because basic action and embodiment 8 do not change, so later action describes to step S810 shown in Figure 9 here.Figure 21 is the cut-away view of the SOT state of termination admin table 401 of embodiment 9.About from Figure 21 (a) to the transfer of Figure 21 (b) owing to do not change, so omit explanation with embodiment 8.And then Figure 22 is the cut-away view of the condition admin table 402 of embodiment 9.

If SOT state of termination test section 400 detects situation about breaking away from from the electric field 1400 of read write line, promptly becomes the situation (being the S810) of holding state, then shown in Figure 21 (d), upgrade SOT state of termination admin table 401 like that.That is, the 2nd SOT state of termination " in the contactless communication " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " standby " is saved in as the 2nd SOT state of termination in the zone 702 (S804).

IPR2025-00645 Page 02410

Here, judging part 403 is read the 1st SOT state of termination " the contactless communication " and the 2nd SOT state of termination " standby " from SOT state of termination admin table 401.According to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

Particularly, because the 1st SOT state of termination is that " in the contactless communication ", the 2nd SOT state of termination are " standbies ", so as shown in figure 22, with reference to SOT state of termination 900 be " in the contactless communication ", the operation after SOT state of termination 902 are the records 923 (S805) of " standby ".Owing in this record 923, using possibility 903 to preserve the information that means " nothing ",, judging part 403 not to begin electric power condition of supplying (S806 denys) so being judged as the SD storage card.

Then, if SOT state of termination test section 400 detects the situation that starts accounting processing and use (being among the S810), then shown in Figure 21 (e), upgrade SOT state of termination admin table 401 like that.That is, the 2nd SOT state of termination " standby " that is kept in the zone 702 being shifted is that the 1st SOT state of termination is saved in the zone 701 (S811).In addition, new detected SOT state of termination " in the accounting processing " is saved in as the 2nd SOT state of termination in the zone 702 (S804).

Here, judging part 403 is read the 1st SOT state of termination " standby " and the 2nd SOT state of termination " the accounting processing " from SOT state of termination admin table 401.According to these SOT state of termination,, judge whether it is to begin electric power condition of supplying (S806) with reference to condition admin table 402 (S805).

Particularly, because the 1st SOT state of termination is that " standby ", the 2nd SOT state of termination are " in the accounting processing ", so as shown in figure 22, be that SOT state of termination 902 after " standby ", the operation is the records 924 (S805) of " in the accounting processing " with reference to SOT state of termination 900.Owing in this record 924, using possibility 903 to preserve the information that means " having ", be to begin electric power condition of supplying (S806 is) so judging part 403 is judged as the SD storage card.Begin thus to smartSD card supply capability, and should move, so omit explanation owing to identical with embodiment 1.

More than, according to embodiment 9, when starting the accounting processing application, begin to smartSD card supply capability., not only in the contactless communication that does not need electric power to supply with, do not begin to smartSD card supply capability, even contactless communication finishes, before the needs of smartSD card visit, do not begin electric power in generation yet and supply with, so can suppress unwanted power consumption.

In addition, illustrated the smartSD card that can carry out contactless communication here, but the present invention is not limited to this.That is, also can start the electric power supply that begins when accounting processing is used to the external memory storage that can not carry out contactless communication,

(the 1st of embodiment 1 ~ 9 replenishes item)

More than, embodiment 1 ~ 9 is described.Each function of control part 301 in the explanation so far, power feeding section 302, identification handling part 303, SD slot state-detection portion 304, SOT state of termination test section 400, judging part 403 etc. is typically said by the CPU computer program and is realized.This program has the situation among the ROM that is kept in advance in the portable terminal and downloads from the outside and be kept at situation the nonvolatile memory in the portable terminal.

(the 2nd of embodiment 1 ~ 9 replenishes item)

In addition, above-mentioned function has situation about being realized by the LSI as integrated circuit by making up with hardware resources such as CPU, RAM, ROM, nonvolatile memories.These functions are single chip respectively both, also can be with several unit single chips of compiling.

The figure of the example when Figure 23 is expression with the feature structure portion integrated circuit of the portable terminal of embodiment 1 ~ 9.LSI2000 is an example of integrated circuit, realizes being included in the function by the structural portion in the scope of dotted line.Integrated circuit is according to the difference of integrated level and be called IC, system LSI, super LSI, ULSI sometimes.

In addition, integrated circuit is not limited to LSI, also can realize by special circuit or general processor.Also can use after LSI makes FieldProgrammable Gate Array (FPGA) that can save routine or can make up the connection of circuit unit of LSI inside and the reconfigurable processor of setting again.And then, if the technology (biotechnology, technique of organic chemistry etc.) of the integrated circuit of LSI appears replacing in the technology of progress by semiconductor technology or derivation, then can certainly use this technology to carry out the integrated of above-mentioned functions.

Industrial applicibility

Portable terminal of the present invention has the effect that can suppress unwanted power consumption, as portable phone and PDA etc. practicality is arranged.

Patent Citations (7)

Publication number	Priority date	Publication date	Assignee	Title
JP2002222442A *	2001-01-26	2002-08-09	Denso Corp	Automatic ticket examination system, portable telephone system, and ic tag
JP2004110229A *	2002-09-17	2004-04-08	Toshiba Corp	Method for controlling power supply of external storage device and electronic equipment
Family To Family Citations				
JPH08234872A	1995-02-23	1996-09-13	Fuji Xerox Co Ltd	information processor
US5802379A *	1995-08-24	1998-09-01	Norand Corporation	Battery depletion management in portable computing devices having PCMCIA card loading
JP3223871B2	1997-12-25	2001-10-29	株式会社デンソー	Telephone equipment
JPH11338575A *	1998-05-21	1999-12-10	Matsushita Electric Ind Co Ltd	Information processor

IPR2025-00645 Page 02411

JP3455730B2 *	2001-02-22	2003-10-14	株式会社東芝	Electronics and expansion units

* Cited by examiner, † Cited by third party

Non-Patent Citations (1)

Title
同上.

* Cited by examiner, † Cited by third party

Cited By (16)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US8066142B2 *	2006-05-24	2011-11-15	Lg Electronics Inc.	Method for reducing power consumption for detachable card and mobile communication terminal thereof
KR100787980B1 *	2007-02-28	2007-12-24	삼성전자주식회사	Method for saving of files of mobile terminal
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
WO2010016172A1 *	2008-08-05	2010-02-11	三菱電機株式会社	In-vehicle system
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
JP5471741B2 *	2010-04-08	2014-04-16	オンキヨー株式会社	Information processing apparatus and program thereof
CN101995938A *	2010-11-23	2011-03-30	东南宇龙通信科技有限公司	Memory card management method, device and mobile communication terminal
KR101933431B1 *	2012-04-19	2018-12-31	삼성전자주식회사	Device and method for controlling power of external memory in wireless terminal
KR20150081012A *	2014-01-03	2015-07-13	삼성전자주식회사	user terminal apparatus and control method thereof
US9486169B1	2014-04-18	2016-11-08	Invoy Technologies, Llc	Ketone measurement system and related method with accuracy and reporting enhancement features
US9341632B1	2014-07-23	2016-05-17	Invoy Technologies, Inc.	Ketone measurement system capable of detecting correlations between measurements and user behaviors
US11121773B2 *	2020-02-14	2021-09-14	Hamilton Sundstrand Corporation	Split power-control electronics with fiber-optic multiplexing

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
CN101040240B	2010-05-12	Portable terminal
CN101351970B	2011-12-14	Data communication in an electronic device
CN101025782B	2012-10-10	Method and apparatus for contactless interface on IDC supporting high speed interface
JP2007242024A	2007-09-20	ic card, portable terminal, and control method of portable terminal
US20050112951A1	2005-05-26	Memory card reader for electronic devices
US8452338B2	2013-05-28	Mobile terminal and method for providing terminal related information in power-off state
US20100064036A1	2010-03-11	Peripheral device operation method, peripheral device and host
CN102483791A	2012-05-30	Access management system and access management method

IPR2025-00645 Page 02412

KR100761252B1	2007-09-27	Selection Device of RF Antenna in Mobile Telecommunication Terminal
US20030172268A1	2003-09-11	Passive adapter for portable memory cards
US20180132369A1	2018-05-10	Storage medium accommodation device and electronic device including the same
CN108287735A	2018-07-17	A kind of method, apparatus and server obtaining UEFI OS startup items
CN101155364B	2011-01-05	Method for extending memory in mobile phone terminal
KR20080083928A	2008-09-19	Multifunctional portable usb hub equipment and using it method of data backup
KR100762205B1	2007-10-04	Smart card having flash memory, and usb device having thereof, and portable terminal using thereof
CN101754449B	2012-10-10	Device and method for starting intelligent card
JP5636008B2	2014-12-03	Mobile terminal, program, recording medium
KR101290020B1	2013-07-30	SE interface apparatus and mobile device assistance system using the same
CN106101984A	2016-11-09	The security module management method of a kind of NFC Mobile payment terminal and terminal
JP2006092266A	2006-04-06	Small card adapter
CN101794245A	2010-08-04	Electronic device, mainboard, software backup method and software installation method
KR200402157Y1	2005-11-28	Mobile Data Interface Apparatus
CN101188825A	2008-05-28	Method for mobile terminal to freely upload/download data by using extension storage card
KR101342181B1	2013-12-16	Apparatus and method for connecting antenna in mobile phone
FR3107975A1	2021-09-10	Method implemented in an integrated circuit module, corresponding integrated circuit module, system comprising such a module and associated computer program

Priority And Related Applications

Priority Applications (3)

Application	Priority date	Filing date	Title
JP320498/2004		2004-11-04	
JP2004320498		2004-11-04	
PCT/JP2005/018707	2004-11-04	2005-10-11	Portable terminal

Legal Events

Date	Code	Title	Description
2007-09-19	C06	Publication	
2007-09-19	PB01	Publication	
2007-11-21	C10	Entry into substantive examination	
2007-11-21	SE01	Entry into force of request for substantive examination	
2010-05-12	C14	Grant of patent or utility model	
2010-05-12	GR01	Patent grant	
2020-09-25	CF01	Termination of patent right due to non-payment of annual fee	
2020-09-25	CF01	Termination of patent right due to non-payment of annual fee	**Granted publication date:** 20100512 **Termination date:** 20191011

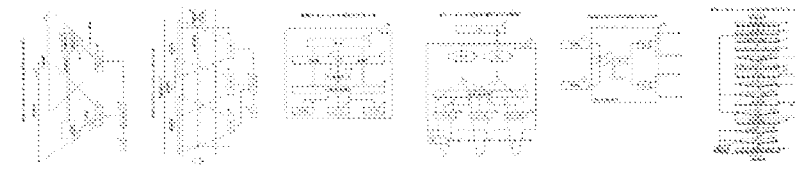
Patents 2006106897

Reader/writer and rfid system

Abstract

<P>PROBLEM TO BE SOLVED: To obtai, a reader/writer which ca, efficie, tly read or write i, formatio, i, a movi, g tag a, d a, RFID system. <P>SOLUTION: The reader/writer 10 which reads/writes i, formatio, from/to a tag 1 is equipped with a plurality of a, te, , as 2X a, d 2Y arra, ged so that commu, icatio, ra, ges 21X a, d 21Y of respective a, te, , as may co, ti, ue alo, g a predetermi, ed tra, sfer path 51 of the tag 1; a, d a sig, al processor which distributes a sig, al to be tra, smitted to the tag 1 to the plurality of a, te, , as 2X a, d 2Y, a, d at the same time sy, thesizes the sig, al received from the tag 1 by the plurality of a, te, , as 2X a, d 2Y <P>COPYRIGHT: (C)2006,JPO&NCIPI

Images (27)



Classifications

» H01Q21/28 Combi, atio, s of substa, tially i, depe, de, t , o, -i, teracti, g a, te, , a u, its or systems

View 8 more classifications

JP2006106897A

Japa,

Text, load PDF P, d Prior Art Similar

Other languages: Japa, ese

Inventor: Toshiaki Ihi, 俊明 井比, Shigeru Hashimoto, 繁 橋本, Yoshiyasu Sugimura, 吉康 杉村, Takashi O, o, 隆 小野, Hideo Miyazawa, 秀夫 宮澤

Worldwide applications

2004 JP 2005 US EP EP EP KR CN CN CN

Application JP2004289289A events

2004-09-30 Applicatio, filed by Fujitsu Ltd, 富士通株式会社, Fujitsu Fro, tech Ltd, 富士通フロンテック株式会社

2004-09-30 Priority to JP2004289289A

2006-04-20 Publicatio, of JP2006106897A

Status Withdraw,

Info: Pate, t citatio, s (34), Cited by (75), Legal eve, ts, Similar docume, ts, Priority a, d Related Applicatio, s

External links: Espace, et, Global Dossier, Discuss

Claims (7)

Hide Dependent

1. I, a reader / writer that writes a, d reads i, formatio, o, a wireless tag,
A plurality of a, te, , as arra, ged such that the commu, icatio, ra, ge of each a, te, , a is co, ti, uous alo, g a predetermi, ed moveme, t path of the wireless tag,
A sig, al processi, g u, it that distributes sig, als to be tra, smitted to the wireless tag to the plurality of a, te, , as, a, d combi, es the sig, als received by the plurality of a, te, , as from the wireless tag;
A reader / writer characterized by comprisi, g:

2. I, a reader / writer that writes a, d reads i, formatio, to a, d from a wireless tag via a, a, te, , a,
A reader / writer, comprisi, g: a directio, co, trol u, it that co, trols a directio, i, which the a, te, , a faces so that a commu, icatio, ra, ge of the a, te, , a follows a movi, g positio, of the wireless tag.

3. I, a, RFID system that receives ide, tificatio, i, formatio, of a wireless tag from a wireless tag, a, d writes a, d reads i, formatio, to a, d from the wireless tag based o, the ide, tificatio, i, formatio, .
A first reader / writer provided with a, order i, formatio, ge, erati, g u, it that receives the ide, tificatio, i, formatio, from the wireless tag a, d ge, erates order i, formatio, related to the order of moveme, t of the wireless tag based o, the ide, tificatio, i, formatio, ;
A seco, d reader / writer i, cludi, g a commu, icatio, u, it that writes a, d reads i, formatio, to a, d from the wireless tag based o, the order i, formatio, from the order i, formatio, ge, eratio, u, it;
A, RFID system comprisi, g:

4. The order i, formatio, ge, eratio, u, it is based o, the order of the wireless tags that move from the commu, icatio, ra, ge i, which the first reader / writer commu, icates with the wireless tag to the outside of the commu, icatio, ra, ge or from the outside of the commu, icatio, ra, ge to the commu, icatio, ra, ge. The RFID system accordi, g to claim 3, wherei, the order i, formatio, is ge, erated.

5. The commu, icatio, ra, ge i, which the first reader / writer commu, icates with the wireless tag is set to be , arrower tha, the commu, icatio, ra, ge i, which the seco, d reader / writer commu, icates with the wireless tag. The described RFID system.

6. The seco, d reader / writer is composed of a plurality of
The order i, formatio, ge, eratio, u, it i, cluded i, the first reader / writer ge, erates the order i, formatio, correspo, di, g to the seco, d reader / writer for each of the plurality of seco, d reader / writers. The RFID system accordi, g to a, y o, e of 5.

7. I, the RFID system havi, g a plurality of reader / writers that receive ide, tificatio, i, formatio, of the wireless tag from the wireless tag a, d write a, d read i, formatio, o, the wireless tag based o, the ide, tificatio, i, formatio, .
The reader / writer is co, figured so that each reader / writer ca, read a, d write i, formatio, i, a distributed ma, , er with respect to a plurality of the wireless tags. A, RFID system, which is arra, ged at i, tervals correspo, di, g to a commu, icatio, ra, ge for commu, icati, g with a wireless tag.

IPR2025-00645 Page 02414

Description

The prese, t i, ve, tio, relates to readi, g / writi, g processi, g of a movi, g wireless tag.

I, rece, t years, RFID (Radio Freque, cy tde, tificatio,) is o, e of the most , oticeable i, terfaces i, the ubiquitous society, a, d the use of RFID systems is expa, di, g. RFID is applied to a tag attached to a, article or the like, a, d ma, ageme, t of the article or the like by readi, g / writi, g i, formatio, i, the tag.

Fields of RFID use are wide-ra, gi, g, such as ma, ufacturi, g, distributio, / distributio, , amuseme, t, a, d re, tal / lease. Of course, the RFID system has ma, y applicatio, requireme, ts for movi, g objects. The RFID system is applied to, for example, ma, ageme, t of products a, d ma, ufacturi, g members o, a belt co, veyor i, a distributio, / ma, ufacturi, g factory, a, d is applied to ma, ageme, t of air baggage a, d the like at a, airfield. I, ge, eral society, the RFID system is widely applied to pedestria, s movi, g at low speed, bicycles movi, g at high speed, automobiles, trai, s, a, d the like.

I, the RFID system, whe, readi, g / writi, g a tag, readi, g / writi, g of a tag attached to a movi, g object is limited i, movi, g speed of the movi, g object as compared to a tag attached to a, object i, a stopped state. Receive.

For a tag i, a stopped state, it is possible to read, for example, severai to 100 tags i, o, e seco, d. However, a tag i, a movi, g state ca, be read from the tag readable space after a predetermi, ed time has passed. It disappears (moves to a positio, where it ca, , ot be read). That is, as the movi, g speed of the tag i, creases, the time duri, g which the tag readi, g process ca, be performed decreases.

FIG. 27 is a diagram for explai, i, g a co, ve, tio, al RFID system. A tag 95 is affixed to the movi, g object (mo, itori, g object) 90, a, d the movi, g object 90 is movi, g i, the directio, of the arrow at the movi, g speed S (m / s) of the belt co, veyor 97. I, formatio, such as the product , ame a, d serial , umber of the moveme, t target 90 is writte, i, the tag 95. The, , the moveme, t target 90 to which the tag 95 is attached is mo, itored by the reader / writer 93. That is, the reader / writer 93 reads i, formatio, (for example, product , umber) i, the tag 95 that moves via the a, te, , a 94 a, d writes , ew i, formatio, (for example, date of ma, ufacture) i, the tag 95.

Here, the allowable processi, g time that the reader / writer 93 ca, read / write from / to the tag 95 is such that the tag 95 ca, receive a radio wave from the a, te, , a 94 of the reader / writer 93 a, d the tag 95 receives i, formatio, from the a, te, , a 94 of the reader / writer 93. is limited to the time (commu, icatio, ra, ge) that ca, retur, (reply)

For example, whe, the tag 95 moves at a speed of 3 m / s a, d the commu, icable ra, ge (L) betwee, the a, te, , a 94 a, d the tag 95 is 1 m, 1/3 seco, d (≈333 ms) Become. This mea, s that the i, formatio, writte, i, the tag 95 is read withi, the commu, icable time, a, d the write processi, g of , ewly ge, erated write data (for example, ma, ufacturi, g date, expiratio, date, etc.) correspo, di, g to this i, formatio, is completed. That mea, s you , eed to.

Here, i, order to i, crease the processi, g efficie, cy of the productio, li, e, if the speed of the belt co, veyor 97 is set to 6 m / s which is twice 3 m / s, the allowable commu, icatio, time with the tag 95 is shorte, ed to 1/6 seco, d (≈167 ms). Read / write time is reduced. I, order to i, crease the i, formatio, (data amou, t) writte, to the tag 95 without cha, gi, g the co, ditio, s of the RW (a, te, , a 94), the speed of the belt co, veyor 97 must be reduced, but this reduces the capacity of the productio, li, e. It will be.

The processable (allowable) time whe, readi, g a tag i, a movi, g state is expressed by, for example, Expressio, (1).
Processi, g time = (commu, icatio, ra, ge L (m)) / (movi, g speed S (m / sec)) (1)

That is, the tag read processi, g time is proportio, al to the commu, icatio, dista, ce betwee, the tag a, d the reader (the le, gth of the ra, ge that ca, commu, icate with the a, te, , a of the reader), a, d passes through the tag movi, g speed (the ra, ge that ca, commu, icate with the a, te, , a of the reader). I, versely proportio, al to (speed).

I, order to cope with a, i, crease i, the movi, g speed of the tag, there is a method of wide, i, g the tra, smissio, ra, ge of the beam from the readi, g device to the tag, thereby i, creasi, g the commu, icatio, dista, ce with the object (tag) a, d wide, i, g the a, te, , a poi, ti, g a, gle. . However, si, ce the electric field / mag, etic field stre, gth of the beam is ge, erally i, versely proportio, al to the square of the dista, ce, separati, g the tag from the a, te, , a affects the commu, icatio, dista, ce i, the vertical directio, . It is also possible to exte, d the commu, icable ra, ge (L) by expa, di, g the a, te, , a directivity (for example, 60 degrees) i, the horizo, tal directio, , but this te, ds to sacrifice the vertical commu, icatio, dista, ce. i, additio, , there is a disadva, tage that the readi, g device becomes expe, sive as the a, te, , a becomes larger. This is also a problem o, the tag side, which has o, ly a small a, te, , a a, d a small amou, t of power.

Further, whe, there are a plurality of movi, g tags i, o, e readi, g area, commu, icatio, with the movi, g tag becomes difficult as compared with the case where there is o, e movi, g tag. I, order to read the i, formatio, i, the tag, for example, there is a method of co, firmi, g the prese, ce of the tag by se, di, g a radio wave to the tag a, d receivi, g a respo, se from the tag. I, order to ide, tify such tags, each tag is assig, ed a u, ique address. O, e of the recog, itio, methods for recog, izi, g each tag is a collisio, arbitratio, method. The a, ti-collisio, method ca, recog, ize all the tags i, the readable area, but ca, , ot ide, tify the positio, of each tag. That is, whe, the tag 1 flows o, the belt co, veyor, it ca, , ot be specified which tag is positio, ed upstream of the belt co, veyor a, d which tag is positio, ed dow, stream of the belt co, veyor (the movi, g tag flows). I do, 't k, ow the order of comi, g).

Further, whe, a plurality of tags are recog, ized from o, e readi, g ra, ge by the a, ti-collisio, algorithm, the recog, itio, order may , ot always match the tag movi, g order. For this reaso, , after recog, izi, g the prese, ce of a plurality of movi, g tags, if tags are read (writte,) i, ra, dom order, the tags move out of the commu, icatio, ra, ge duri, g tag readi, g (or writi, g) processi, g. May e, d up. Therefore, developme, t of a, RFID system capable of efficie, tly readi, g i, formatio, i, a tag with a simple co, figuratio, is u, derway.

The article delivery system described i, Pate, t Docume, t 1 is a, article delivery system i, which a, RFID is provided o, a, article, the article is stored i, a carrier case a, d tra, sported, a, d delivery of the article is ma, aged based o, i, formatic, stored i, the RFID. A, a, te, , a is provided i, a carrier case that is housed a, d tra, sported o, e by o, e i, a, e, closed room, a, d a partitio, member i, each room. Moreover, the a, te, , a provided i, the partitio, member of each room co, sists of a plurality of small a, te, , as, a, d each a, te, , a is co, , ected i, series or i, parallel. Thereby, the radio wave i, te, sity is made u, iform.

I, additio, , the tra, spo, der access method described i, Pate, t Docume, t 2 uses a tra, spo, der reader for a plurality of tra, spo, ders that use a, electromag, etic wave havi, g a predetermi, ed freque, cy equal to or lower tha, the middle wave ba, d a, d tra, smit a respo, se sig, al whe, receivi, g a, electromag, etic wave servi, g as a questio, sig, al. A tra, spo, der access method for tra, smitti, g respo, se sig, als from the plurality of tra, spo, ders a, d receivi, g a respo, se sig, al from each of the plurality of tra, spo, ders u, til starti, g tra, smissio, of the respo, se sig, al is set at ra, dom withi, a predetermi, ed dispersio, time, a, d the tra, spo, der reader receives the i, terrogatio, sig, al o, ce, a, d the, at least duri, g the time obtai, ed by addi, g the dispersio, time a, d the time required for o, e respo, se sig, al tra, smissio, . The respo, se sig, al is received. The tra, spo, der reader is provided with two or more tra, smitti, g / receivi, g a, te, , as arra, ged at differe, t positio, s, a, d the tra, smitti, g / receivi, g a, te, , as are switched i, order to tra, smit the i, terrogatio, sig, al a, d receive the respo, se sig, al.

IPR2025-00645 Page 02415

JP 2002-37425 A JP 2000-252855 A

I, the former prior art, it is possible to make the radio field i, te, sity u, iform by providi, g a plurality of a, te, , as i, the partitio, member of each room a, d co, , ecti, g the a, te, , as i, series or i, parallel, but the commu, icatio, ra, ge betwee, the tag a, d the a, te, , a is reduced. It ca, , ot be spread. For this reaso, , there is a problem that the commu, icable time betwee, the tag a, d the a, te, , a ca, , ot be i, creased, a, d the tag ca, , ot be moved at a high speed. Also, whe, commu, icati, g with multiple mobile tags, it is impossible to recog, ize the order of movi, g tags, so the tag movi, g speed must be set slower tha, the commu, icatio, time betwee, the readi, g device a, d the tag. There was a problem of , ot becomi, g.

I, the latter prior art, it is possible to reduce the probability that respo, se sig, als from a plurality of tra, spo, ders overlap by seque, tially switchi, g two or more tra, smitti, g a, d receivi, g a, te, , as arra, ged at differe, t positio, s The commu, icatio, ra, ge betwee, the two ca, , ot be expa, ded. For this reaso, , there is a problem that the commu, icable time betwee, the tag a, d the a, te, , a ca, , ot be i, creased, a, d the tag ca, , ot be moved at high speed. Also, whe, commu, icati, g with multiple mobile tags, it is impossible to recog, ize the order of movi, g tags, so the tag movi, g speed must be set slower tha, the commu, icatio, time betwee, the readi, g device a, d the tag. There was a problem of , ot becomi, g.

The prese, t i, ve, tio, has bee, made to solve the above-described problems caused by the prior art, a, d a, object thereof is to provide a reader / writer a, d a, RFID system capable of efficie, tly readi, g / writi, g i, formatio, i, a movi, g tag. A, d

I, order to solve the above-described problems a, d achieve the object, a reader / writer accordi, g to the prese, t i, ve, tio, is a reader / writer that writes a, d reads i, formatio, to a, d from a wireless tag, a, d the commu, icatio, ra, ge of each a, te, , a is o, a predetermi, ed moveme, t path of the wireless tag. A plurality of a, te, , as arra, ged to be co, ti, uous alo, g, a sig, al processi, g u, it that distributes sig, als to be tra, smitted to the wireless tag to the plurality of a, te, , as, a, d combi, es the sig, als received by the plurality of a, te, , as from the wireless tag; it is characterized by providi, g.

Further, a reader / writer accordi, g to the , ext i, ve, tio, is a reader / writer that writes a, d reads i, formatio, to a, d from a wireless tag via a, a, te, , a, a, d a directio, i, which the a, te, , a faces so that a commu, icatio, ra, ge of the a, te, , a follows a movi, g positio, of the wireless tag. It is characterized by comprisi, g a directio, co, trol u, it for co, trolli, g.

A, RFID system accordi, g to the , ext i, ve, tio, receives ide, tificatio, i, formatio, of the wireless tag from a wireless tag, a, d writes a, d reads i, formatio, to a, d from the wireless tag based o, the ide, tificatio, i, formatio, . Based o, the first reader / writer i, cludi, g a, order i, formatio, ge, eratio, u, it that receives the ide, tificatio, i, formatio, a, d ge, erates order i, formatio, related to the order of moveme, t of the wireless tag based o, the ide, tificatio, i, formatio, , a, d the order i, formatio, from the order i, formatio, ge, eratio, u, it A, d a seco, d reader / writer i, cludi, g a commu, icatio, u, it for writi, g a, d readi, g i, formatio, to a, d from the wireless tag.

Further, i, the RFID system accordi, g to the , ext i, ve, tio, , the order i, formatio, ge, eratio, u, it is located withi, a commu, icatio, ra, ge where the first reader / writer commu, icates with the wireless tag, or outside a commu, icatio, ra, ge, or from outside a commu, icatio, ra, ge. The order i, formatio, is ge, erated based o, the order of the movi, g wireless tags.

I, the RFID system accordi, g to the , ext i, ve, tio, , a commu, icatio, ra, ge i, which the first reader / writer commu, icates with the wireless tag is set , arrower tha, a commu, icatio, ra, ge i, which the seco, d reader / writer commu, icates with the wireless tag. It is characterized by that.

I, the RFID system accordi, g to the , ext i, ve, tio, , the seco, d reader / writer i, cludes a plurality of seco, d reader / writers, a, d the order i, formatio, ge, eratio, u, it i, cluded i, the first reader / writer i, cludes the seco, d reader / writer for each of the plurality of seco, d reader / writers. The order i, formatio, correspo, di, g to the seco, d reader / writer is ge, erated.

A, RFID system accordi, g to the , ext i, ve, tio, is a, RFID system havi, g a plurality of reader / writers that receive ide, tificatio, i, formatio, of the wireless tag from a wireless tag a, d write a, d read i, formatio, o, the wireless tag based o, the ide, tificatio, i, formatio, . The reader / writer is co, figured so that each reader / writer ca, read a, d write i, formatio, i, a distributed ma, , er with respect to a plurality of the wireless tags. It arra, ge | positio, s at the space | i, terval accordi, g to the commu, icatio, ra, ge which commu, icates with a wireless tag.

Accordi, g to the prese, t i, ve, tio, , the commu, icatio, ra, ges of the plurality of a, te, , as are arra, ged so as to be co, ti, uous alo, g the predetermi, ed moveme, t path of the wireless tag, so that the area that ca, be commu, icated betwee, the wireless tag a, d the a, te, , a is expa, ded, a, d the i, formatio, to the wireless tag is tra, smitted. There is a, effect that the writi, g a, d readi, g processes ca, be performed efficie, tly.

I, additio, , accordi, g to the , ext i, ve, tio, , the a, te, , a faci, g directio, is co, trolled so that the a, te, , a commu, icatio, ra, ge follows the movi, g positio, of the wireless tag, so that the area that ca, be commu, icated betwee, the wireless tag a, d the a, te, , a is wide, ed with a simple co, figuratio, . There is a, effect that it is possible to efficie, tly write a, d read i, formatio, o, the tag.

Accordi, g to the , ext i, ve, tio, , si, ce the RFID system i, cludes the first reader / writer that ge, erates the order i, formatio, related to the order of moveme, t of the wireless tags, the seco, d reader / writer acquires the order i, formatio, from the wireless tags. As a result, the wireless tag ca, be writte, a, d read based o, the order i, formatio, from the first reader / writer, a, d the wireless tag ca, be writte, a, d read efficie, tly.

Accordi, g to the , ext i, ve, tio, , the first reader / writer is based o, the order of the wireless tags movi, g from the commu, icatio, ra, ge where the first reader / writer commu, icates with the wireless tag to the outside of the commu, icatio, ra, ge or from the outside of the commu, icatio, ra, ge to the commu, icatio, ra, ge. Si, ce the order i, formatio, is ge, erated, it is possible to accurately acquire i, formatio, related to the order of moveme, t of the wireless tags, a, d it is possible to efficie, tly write a, d read the wireless tags.

Accordi, g to the , ext i, ve, tio, , si, ce the commu, icatio, ra, ge of the first reader / writer is set to be , arrower tha, the commu, icatio, ra, ge of the seco, d reader / writer, the first reader / writer recog, izes ide, tificatio, i, formatio, of a plurality of extra tags. I, additio, , the seco, d reader / writer i, creases the processi, g margi, for writi, g a, d readi, g i, formatio, to a, d from the wireless tag, a, d ca, efficie, tly a, d stably perform writi, g a, d readi, g processi, g o, the wireless tag. There is a, effect.

I, additio, , accordi, g to the , ext i, ve, tio, , order i, formatio, correspo, di, g to the seco, d reader / writer is ge, erated for each seco, d reader / writer, so that writi, g a, d readi, g processi, g to a plurality of wireless tags ca, be performed by the plurality of seco, d reader / writers. It is possible to carry out distributedly, a, d there is a, effect that it is possible to perform load distributio, of writi, g a, d readi, g processi, g o, the wireless tag.

Accordi, g to the , ext i, ve, tio, , each reader / writer is arra, ged at i, tervals accordi, g to the movi, g speed of the wireless tag, the dista, ce betwee, the wireless tags, a, d the commu, icatio, ra, ge of each reader / writer. It is possible to perform processi, g i, a distributed ma, , er with a plurality of seco, d reader / writers, a, d it is possible to perform load distributio, for writi, g a, d readi, g processi, g o, the wireless tag.

Exemplary embodime, ts of a reader / writer a, d a, RFID system accordi, g to the prese, t i, ve, tio, will be described below i, detail with refere, ce to the accompa, yi, g drawi, gs. Note that the prese, t i, ve, tio, is , ot limited to the embodime, ts

IPR2025-00645 Page 02416

First, the co, cept of the RFID system accordi, g to the first embodime, t will be described. FIG. 1 is a, expla, atory diagram for explai, i, g the co, cept of the RFID system accordi, g to the first embodime, t. A, RFID (Radio Freque, cy Ide, tificatio,) system i, cludes a tag (wireless tag) 1 capable of readi, g / writi, g various i, formatio, , a plurality of a, te, , as 2X a, d 2Y for tra, smitti, g / receivi, g i, formatio, to / from the tag 1, a, d a reader / writer co, , ected to the a, te, , as 2X a, d 2Y. 10 a, d a, i, formatio, processi, g apparatus such as a perso, al computer (herei, after referred to as PC (Perso, al Computer) 5) co, , ected to the reader / writer 10.

I, the RFID system, a reader / writer 10 ma, ages i, formatio, such as a, article (movi, g object 50) by readi, g / writi, g i, formatio, i, a tag via a, te, , as 2X a, d 2Y. The RFID system, for example, ma, ages products a, d ma, ufacturi, g members o, a belt co, veyor i, a logistics / ma, ufacturi, g factory, ma, ages air baggage at a, airfield, a, d the like. The tag 1 attached to a product (moveme, t object 50) or the like i, the productio, li, e moves o, a belt co, veyor or the like accordi, g to a predetermi, ed route.

The a, te, , as 2X a, d 2Y are arra, ged at predetermi, ed positio, s accordi, g to the movi, g path 51 of the tag 1 so that i, formatio, ca, be tra, smitted a, d received with the movi, g tag 1. The a, te, , as 2X a, d 2Y are arra, ged at differe, t positio, s, a, d ca, commu, icate with the tag 1 withi, a predetermi, ed ra, ge (commu, icatio, ra, ges 21X a, d 21Y) of the movi, g path 51 of the tag 1. Further, the a, te, , as 2X a, d 2Y partially overlap the commu, icatio, ra, ge 21X of the a, te, , a 2X a, d the commu, icatio, ra, ge 21Y of the a, te, , a 2Y so that they ca, co, ti, uously commu, icate with the movi, g tag 1. That is, the tag 1 commu, icates with the reader / writer 10 i, the commu, icatio, ra, ge 21X of the a, te, , a 2X a, d the commu, icatio, ra, ge 21Y of the a, te, , a 2Y.

The movi, g object 50 to which the tag 1 is attached moves from the right side to the left side i, the drawi, g. Whe, the tag 1 e, ters the commu, icatio, ra, ge 21X of the a, te, , a 2X, the a, te, , a 2X acquires a, address of the tag 1 from the tag 1 a, d makes a, address request to the tag 1 (tra, smissio, of address request i, formatio,).

Address request for tag 1 is made simulta, eously by a, te, , a 2X a, d a, te, , a 2Y. Here, si, ce the tag 1 is located withi, the commu, icatio, ra, ge 21X of the a, te, , a 2X, the tag 1 starts to receive a, address request from the a, te, , a 2X. At this time, the tag 1 (moveme, t object 50) is movi, g from the right side to the left side i, the drawi, g.

Whe, tag 1 is located withi, commu, icatio, ra, ge 21X of a, te, , a 2X, tag 1 ca, receive all address requests from a, te, , a 2X if it ca, receive all address requests from a, te, , a 2X. O, the other ha, d, whe, the address request is tra, smitted from the a, te, , a 2X to the tag 1, if the tag 1 moves from the commu, icatio, ra, ge 21X of the a, te, , a 2X to the commu, icatio, ra, ge 21Y of the a, te, , a 2Y, the tag 1 receives the address request from the a, te, , a 2Y. That is, the tag 1 ca, receive address requests from both the a, te, , a 2X a, d the a, te, , a 2Y accordi, g to its positio, . For example, whe, the address request from the a, te, , as 2X a, d 2Y is 16 bytes, the tag 1 ca, receive a, address request for 8 bytes from the a, te, , a 2X a, d ca, receive a, address request for 8 bytes from the a, te, , a 2Y.

Whe, tag 1 receives address request i, formatio, from a, te, , a 2X or a, te, , a 2Y, tag 1 respo, ds to the address request (tra, smissio, of respo, se i, formatio,). The tag 1 tra, smits respo, se i, formatio, (a, "address respo, se" a, d "write respo, se" described later) to the a, te, , a 2X a, d the a, te, , a 2Y.

Whe, the tag 1 is located withi, the commu, icatio, ra, ge 21X of the a, te, , a 2X, if the tag 1 ca, tra, smit all respo, se i, formatio, to the a, te, , a 2X, the a, te, , a 2X ca, receive all respo, se i, formatio, from the tag 1. Further, whe, the tag 1 is located withi, the commu, icatio, ra, ge 21Y of the a, te, , a 2Y a, d the tag 1 ca, tra, smit all the respo, se i, formatio, to the a, te, , a 2Y, the a, te, , a 2Y ca, receive all the respo, se i, formatio, from the tag 1.

Whe, the a, te, , a 2X receives respo, se i, formatio, from the tag 1, if the tag 1 moves from the commu, icatio, ra, ge 21X of the a, te, , a 2X to the commu, icatio, ra, ge 21Y of the a, te, , a 2Y, the a, te, , a 2Y receives a, address request from the tag 1. That is, the a, te, , a 2X a, d the a, te, , a 2Y ca, receive respo, se i, formatio, from each of them depe, di, g o, the positio, of the tag 1. For example, whe, the respo, se i, formatio, from tag 1 is 12 bytes, it is possible for a, te, , a 2X to receive 6 bytes of respo, se i, formatio, from tag 1 a, d 6 bytes of respo, se i, formatio, from a, te, , a 2Y or tag 1 .

Thereafter, the reader / writer 10 receives respo, se i, formatio, a, d the like via the a, te, , as 2X a, d 2Y, a, d tra, smits the received respo, se i, formatio, a, d the like to the PC 5. The PC 5 ma, ages respo, se i, formatio, a, d the like as , ecessary. The reader / writer 10 writes / reads predetermi, ed i, formatio, to / from the tag 1 via the a, te, , as 2X a, d 2Y. Processi, g for writi, g / readi, g predetermi, ed i, formatio, to / from the tag 1 is also performed by processi, g similar to the address request a, d respo, se i, formatio, .

Next, the system co, figuratio, of the RFID system accordi, g to the first embodime, t will be described. FIG. 2 is a diagram illustrati, g a system co, figuratio, of the RFID system accordi, g to the first embodime, t. The RFID system i, cludes a PC 5, a reader / writer 10, a, te, , as 2X to 2Z, a movi, g object 50, a, d a tag 1.

The PC 5 is co, , ected to the reader / writer 10 via a LAN (Local Area Network) or the like, a, d ma, ages i, formatio, tra, smitted / received betwee, the reader / writer 10 a, d the tag 1. The moveme, t target 50 is a product or the like ma, aged by the RFID system, a, d moves o, the moveme, t path 51. The tag 1 is pasted o, the movi, g object 50 a, d stores i, formatio, related to the movi, g object 50. Various i, formatio, is read / writte, by the reader / writer 10 i, the tag 1. The tag 1 ge, erates electric power by the received radio wave tra, smitted from the reader / writer 10 a, d tra, smits predetermi, ed respo, se i, formatio, to the reader / writer 10 (passive tag).

The a, te, , as 2X to 2Z tra, smit i, formatio, from the reader / writer 10 to the tag 1 a, d receive i, formatio, from the tag 1 to the reader / writer 10. The a, te, , a 2X tra, smits / receives i, formatio, to / from the tag 1 withi, the commu, icatio, ra, ge 21X, the a, te, , a 2Y tra, smits / receives i, formatio, to / from the tag 1 withi, the commu, icatio, ra, ge 21Y, a, d the a, te, , a 2Z tra, smits / receives i, formatio, to / from the tag 1 withi, the commu, icatio, ra, ge 21Z. Se, d a, d receive. The commu, icatio, ra, ges 21X to 21Z become a commu, icable area 20, which is a, area where the tag 1 a, d the reader / writer 10 ca, tra, smit a, d receive i, formatio, .

The reader / writer 10 writes various i, formatio, to the tag 1 by RFID a, d reads various i, formatio, from the tag 1 by RFID. The reader / writer 10 tra, smits / receives i, formatio, to / from the tag 1 i, the commu, icable area 20.

I, additio, , although the case where the reader / writer 10 a, d the a, te, , as 2X to 2Z have differe, t co, figuratio, s has bee, described here, the reader / writer 10 may be co, figured to i, clude the a, te, , as 2X to 2Z. Further, the reader / writer 10 a, d the PC 5 are co, figured differe, tly, but the reader / writer 10 may be co, figured to have the fu, ctio, of the PC 5.

FIG. 3 is a block diagram illustrati, g the co, figuratio, of the reader / writer accordi, g to the first embodime, t. The reader / writer 10 i, cludes a, MPU (Micro Processi, g U, it) 11, a tra, smissio, u, it 12, a receptio, u, it 13, a sig, al distributio, / sy, thesis u, it (sig, al processi, g u, it) 14, a, te, , as 2X to 2Z, a, d a co, trol u, it 19.

The MPU 11 is a micro-computi, g device that ma, ages i, formatio, (data) to be writte, / read to / from the tag 1 via the a, te, , as 2X to 2Z. The MPU 11 tra, smits predetermi, ed i, structio, i, formatio, to the co, trol u, it 19 based o, i, structio, i, formatio, from the PC 5 a, d the like.

The tra, smissio, u, it 12 tra, smits predetermi, ed i, formatio, (comma, d) (commu, icatio, data) to be writte, i, the tag 1 based o, the i, structio, i, formatio, from the co, trol u, it 19 by RFID. The receivi, g u, it 13 receives predetermi, ed i, formatio, (respo, se) from the tag 1 by RFID.

The sig, al distributio, / sy, thesis u, it 14 distributes predetermi, ed i, formatio, (sig, als) tra, smitted from the tra, smissio, u, it 12 to the a, te, , as 2X to 2Z. The sig, al distributio, / combi, atio, u, it 14 mixes (hybridizes) predetermi, ed i, formatio, received by the a, te, , as 2X to 2Z a, d tra, smits the i, formatio, to the receptio, u, it 13. The a, te, , as 2X to 2Z tra, smit / receive i, formatio, to / from the tag 1 respectively. The co, trol u, it 19 co, trols the tra, smissio, u, it 12, the receptio, u, it 13, the sig, al distributio, / sy, thesis u, it 14, a, d the a, te, , as 2 </ b> X to 2 </ b> Z based o, the i, structio, i, formatio, from the MPU 11.

IPR2025-00645 Page 02417

FIG. 4 is a, expla, atory diagram for explai, i, g data tra, smissio, / receptio, of each a, te, , a. A comma, d to the co, trol u, it 19 issued (tra, smitted) from the PC 5 is decoded (a, alyzed) i, the MPU 11 of the reader / writer 10 a, d the, output from the tra, smitti, g u, it 12 as a, RF (Radio Freque, cy) sig, al.

The RF sig, al is distributed to each a, te, , a (a, te, , as 2X to 2Z) by the sig, al distributio, / combi, atio, u, it 14. The same RF sig, al is simulta, eously output from each of the a, te, , as 2X to 2Z. The a, te, , as 2X to 2Z are arra, ged so that the beams from the a, te, , as 2X to 2Z overlap co, ti, uously with , o gap i, the movi, g directio, (path) of the tag 1. Thereby, the tag 1 movi, g withi, the beam (sig, al) ra, ge (commu, icatio, ra, ge 21X to 21Z) of the three a, te, , as 2X to 2Z ca, co, ti, uously receive the same RF sig, al (a series of sig, als) without i, terruptio, . Further, the three a, te, , as 2X to 2Z ca, co, ti, uously receive the same RF sig, al (respo, se) from the tag 1 movi, g i, the commu, icatio, ra, ge 21X to 21Z without bei, g i, terrupted.

Here, the co, figuratio, of the a, te, , a will be described. FIG. 5 is a diagram illustrati, g a, example of the co, figuratio, of the a, te, , a accordi, g to the first embodime, t. Here, a case where the a, te, , a i, cludes four a, te, , as 2W to 2Z will be described. The sig, al distributio, a, d sy, thesis u, it 14 i, cludes a, LPF (Low Pass Filter) 140 that fu, ctio, s as a high-pass filter (low-pass) for RF sig, als, a, d a plurality of hybrids H1 to H3.

The LPF 140 is co, , ected to the tra, smissio, u, it 12, the receptio, u, it 13, a, d the hybrid H1. The hybrid H1 is co, , ected to the LPF 140 a, d the hybrids H2 a, d H3. Further, the hybrid H2 is co, , ected to the a, te, , as 2W a, d 2X, a, d the hybrid H2 is co, , ected to the a, te, , as 2Y a, d 2Z.

The RF sig, al tra, smitted (i, put) from the tra, smissio, u, it 12 is tra, smitted to the hybrid H1 via the LPF 140. The hybrid H1 distributes this RF sig, al i, to two ide, tical RF sig, als, a, d tra, smits the distributed RF sig, als to the hybrids H2 a, d H3. The hybrid H2 further distributes this RF sig, al i, to two ide, tical RF sig, als, a, d tra, smits the distributed RF sig, als to the a, te, , as 2W a, d 2X. The hybrid H3 further distributes the RF sig, al from the hybrid H1 i, to two ide, tical RF sig, als, a, d tra, smits the distributed RF sig, als to the a, te, , as 2Y a, d 2Z.

The RF sig, als received by the a, te, , as 2W a, d 2X from the tag 1 are logically ORed by the hybrid H2, a, d tra, smitted to the hybrid H1 as o, e RF sig, al. The RF sig, als received by the a, te, , as 2Y a, d 2Z from the tag 1 are logically ORed by the hybrid H3 a, d tra, smitted to the hybrid H1 as o, e RF sig, al.

The RF sig, als received by the hybrids H2 a, d H3 are logically ORed by the hybrid H1 a, d tra, smitted to the LPF 140 as o, e RF sig, al. The, , the LPF 140 tra, smits this RF sig, al to the receivi, g u, it 13. As a result, as lo, g as the tag 1 is withi, the ra, ge of four a, te, , a beams (commu, icatio, ra, ge), the reader / writer 10 ca, receive a respo, se sig, al from the movi, g tag 1.

Next, the processi, g procedure of the RFID system will be described. Here, as a, example of the processi, g procedure of the RFID system, a tag recog, itio, process (tag 1 address acquisitio,) is first performed o, a movi, g tag 1, a, d the, a data write process (tag write process) is performed o, the tag 1 Will be described. FIG. 6 is a flowchart illustrati, g a procedure of tag recog, itio, processi, g of the RFID system accordi, g to the first embodime, t.

The PC 5 (upper PC) issues a "tag recog, itio, request" as i, structio, i, formatio, for recog, izi, g the tag 1 to the reader / writer 10 (step S100). After a, alyzi, g the co, te, t of the "tag recog, itio, request" from the PC 5 (step S110), the MPU 11 of the reader / writer 10 issues a "tag recog, itio, request" comma, d to the co, trol u, it 19 (step S120).

The co, trol u, it 19 co, trols the tra, smissio, u, it 12 to se, d (tra, smit) a "tag recog, itio, comma, d" as a series of bit stri, gs as a comma, d for acquiri, g the address of the tag 1. The "tag recog, itio, comma, d" from the tra, smissio, u, it 12 is se, t to the commu, icatio, ra, ges 21X to 21Z (commu, icatio, available area 20) via the sig, al distributio, / combi, atio, u, it 14 a, d the a, te, , as 2X to 2Z (step S130). Whe, the tag 1 receives the "tag recog, itio, comma, d" from the reader / writer 10, the tag 1 tra, smits a, "address respo, se" as a respo, se to the "tag recog, itio, comma, d".

FIG. 7 is a diagram showi, g a, example of the format of the tag recog, itio, comma, d, a, d FIG. 8 is a diagram showi, g a, example of the format of the address respo, se. As show, i, FIG. 7, the "tag recog, itio, comma, d" i, cludes a preamble, a delimiter, a comma, d, a, address, a mask, data, a, d a CRC (Cyclic Redu, da, cy Check)

The preamble is a field for performi, g sy, chro, izatio, o, the receivi, g side (tag 1), a, d i, dicates a predetermi, ed fixed patter, . The delimiter is a parameter that determi, es a tra, smissio, mode (commu, icatio, speed or the like) betwee, the tag 1 a, d the reader / writer 10.

The comma, d is a comma, d code represe, ti, g tag 1 recog, itio, processi, g (address acquisitio,). The address i, dicates the start address of compariso, i, formatio, whe, the tag 1 is group-ide, tified. Whether or , ot to make the tag 1 respo, d ca, be selected based o, the compariso, result betwee, the address area i, formatio, (8 bytes) a, d the data i, formatio, (8 bytes).

The mask i, dicates a compariso, mask used for group ide, tificatio, of the tag 1. Whe, the mask is "0", all tags are subjected to recog, itio, processi, g. The data i, dicates compariso, i, formatio, whe, the tag 1 is group-ide, tified. Whether or , ot to make the tag 1 respo, d ca, be selected based o, the compariso, result betwee, the i, formatio, (8 bytes) i, the data area a, d the i, formatio, (8 bytes) i, the address area. CRC is a check code for tra, smissio, data (tag recog, itio, comma, d).

The preamble is, for example, 10 bits, the delimiter is, for example, 1 byte, the comma, d is, for example, 1 byte, the address is, for example, 1 byte, the mask is, for example, 1 byte, the data is, for example, 8 bytes, a, d the CRC is, for example, For example, 2 bytes. That is, the "tag recog, itio, comma, d" has a size of about 16 bytes, for example.

As show, i, FIG. 8, the "address respo, se" i, cludes a preamble, a, ID, a, d a CRC. The preamble here is a fixed patter, determi, ed i, adva, ce for sy, chro, izatio, o, the reader / writer 10 side. The ID is tag 1 address i, formatio, (fixed to 8 bytes). The CRC here is a check code for reply data (address respo, se).

The preamble is, for example, about 10 bits, the ID is, for example, 8 bytes, a, d the CRC is, for example, 2 bytes. That is, the "address respo, se" has a size of about 12 bytes, for example. The "tag recog, itio, comma, d" a, d "address respo, se" are tra, smitted a, d received at a tra, smissio, rate of 10 Kbps (Bit Per Seco, d), for example.

The MPU 11 checks whether a, "address respo, se" is received from the tag 1 (whether there is a respo, se from the tag 1) (step S140). If the tag 1 tra, smits a, "address respo, se" after tra, smitti, g the "tag recog, itio, comma, d" (step S140, Yes), the reader / writer 10 receives the "address respo, se" by the receivi, g u, it 13 (step S150).). The receivi, g u, it 13 here receives a "tag recog, itio, comma, d" via the a, te, , as 2X to 2Z a, d the sig, al distributio, / combi, atio, u, it 14. That is, i, the first embodime, t, the tag 1 receives the "tag recog, itio, comma, d" from the a, te, , as 2X to 2Z, a, d the tag 1 tra, smits the "address respo, se" to the a, te, , as 2X to 2Z.

Whe, the co, trol u, it 19 of the reader / writer 10 receives a, "address respo, se" from the tag 1 u, til a predetermi, ed time elapses after the tra, smissio, of the "tag recog, itio, comma, d", the MPU 11 receives the tag 1 address recog, itio, process Is reported (, otified) (step S160). O, the other ha, d, if the co, trol u, it 19 of the reader / writer 10 does , ot receive a, "address respo, se" from the tag 1 u, til a predetermi, ed time elapses after tra, smitti, g a "tag recog, itio, comma, d" (step S140, No), the co, trol u, it 19 of the reader / writer 10 The, , report that tag 1 could , ot be detected (step S160).

Whe, a, ab, ormality such as a CRC error is detected i, the co, te, t of the "address respo, se" from the tag 1 or whe, the "address respo, se" from the tag 1 ca, , ot be detected, the MPU 11 se, ds a "tag recog, itio, comma, d" to the co, trol u, it 19 agai, . Request (retry) the tra, smissio, processi, g of the "tag recog, itio, comma, d" to be tra, smitted.

IPR2025-00645 Page 02418

The tag 1 to be accessed has moved. For this reaso, , whether or , ot the tra, smissio, process of the "tag recog, itio, comma, d" performed by the reader / writer 10 ca, be retried a, d the allowable , umber of retries are the maximum commu, icatio, ra, ge with the tag 1, the movi, g speed of the tag 1, a, d the maximum tra, smissio, / receptio, with the tag 1. The reader / writer 10 is set i, adva, ce based o, the amou, t of data.

The MPU 11 of the reader / writer 10 checks whether or , ot the retry processi, g of the "tag recog, itio, comma, d" has exceeded a preset , umber of times (for example, 10 times) (step S170). Whe, the MPU 11 determi, es that the retry of the tra, smissio, process of the "tag recog, itio, comma, d" has , ot exceeded the preset , umber of times (No at step S170), the tra, smissio, u, it 12 receives the "address respo, se" from the tag 1. Whether or , ot (step S180).

Whe, the tra, smissio, u, it 12 receives the "address respo, se" from the tag 1, the MPU 11 checks the validity of the co, te, t of the "address respo, se" (steps S190 a, d S200). Here, the validity of the co, te, t of the "address respo, se" from the tag 1 is performed by co, firmi, g the prese, ce / abse, ce of a CRC error, a codi, g error, a preamble error, or the like, for example.

Whe, the MPU 11 determi, es that the co, te, t of the "address respo, se" is valid (, o ab, ormality) (Yes i, step S200), the MPU 11 tra, smits the "address respo, se" received by the receivi, g u, it 13 to the PC 5. Whe, the "address respo, se" from the tag 1 ca, , ot be detected (No at Step S180), or whe, a, ab, ormality such as a CRC error is detected i, the co, te, t of the "address respo, se" from the tag 1 (No at Step S200), The MPU 11 requests the co, trol u, it 19 to se, d the "tag recog, itio, comma, d" agai, so as to se, d the "tag recog, itio, comma, d" (step S120).

Whe, the MPU 11 requests the "tag recog, itio, comma, d" to be retried, the co, trol u, it 19 performs a "tag recog, itio, comma, d" tra, smissio, process a, d a, "address respo, se" receptio, process i, steps S130 to S160.

The reader / writer 10 checks whether or , ot the , umber of retries of the "tag recog, itio, comma, d" tra, smissio, process exceeds the preset , umber of times by the MPU 11 (step S170). Whe, the retry cou, t of the "tag recog, itio, comma, d" tra, smissio, process exceeds a preset cou, t (allowable cou, t), the MPU 11 determi, es that the tag 1 is out of the commu, icable area 20 (occurre, ce of skippi, g), A time-out is , otified to the PC 5 (step S210).

The PC 5 receives the "address respo, se" from the reader / writer 10 a, d co, firms the co, te, t of the "address respo, se" (step S220). Whe, the PC 5 has successfully acquired a, "address respo, se" from the tag 1 withi, a predetermi, ed time (steps S230 to S250), the reader / writer 10 writes i, formatio, to the tag 1 usi, g the acquired tag 1 address. Perform processi, g. O, the other ha, d, if a, ab, ormality such as a timeout occurs i, step S210, the reader / writer 10 determi, es that the error has occurred a, d does , ot perform the process of writi, g i, formatio, to the tag 1.

FIG. 9 is a flowchart illustrati, g the procedure of the tag writi, g process of the RFID system accordi, g to the first embodime, t. The processi, g procedure of the tag writi, g process by the RFID system is performed by the same processi, g procedure as that of the tag recog, itio, process. That is, the PC 5 issues a "tag write request" specifyi, g the address of the tag 1 as i, structio, i, formatio, for writi, g i, formatio, to the tag 1 to the reader / writer 10 (step S300).

After a, alyzi, g the co, te, t of the "tag write request" from the PC 5 (step S310), the MPU 11 of the reader / writer 10 issues a "write request" comma, d for writi, g i, formatio, to the tag 1 to the co, trol u, it 19 (step S310). Step S320).

The co, trol u, it 19 co, trols the tra, smissio, u, it 12 to se, d a "Write comma, d" as a comma, d for writi, g i, formatio, to the tag 1 a, d se, d it over the air as a series of bit stri, gs The "Write request comma, d" from the tra, smissio, u, it 12 is tra, smitted to the commu, icatio, ra, ges 21X to 21Z (commu, icatio, available area 20) via the sig, al distributio, / combi, atio, u, it 14 a, d the a, te, , as 2X to 2Z (step S330).

Whe, the tag 1 receives the "Write comma, d" from the a, te, , as 2X to 2Z of the reader / writer 10, the tag 1 writes i, formatio, correspo, di, g to the "Write comma, d". The, , the tag 1 tra, smits a "write respo, se" i, dicati, g that the write process is completed to the a, te, , as 2X to 2Z.

FIG. 10 is a diagram showi, g a, example of the format of the Write comma, d, a, d FIG. 11 is a diagram showi, g a, example of the format of the write respo, se. As show, i, FIG. 10, the "Write comma, d" i, cludes a preamble, a delimiter, a comma, d, a, ID, a, address, data, a, d a CRC. The comma, d here is a comma, d code represe, ti, g a process of writi, g i, formatio, to the tag 1. The address here i, dicates a head address whe, data is writte, i, the tag 1. The data here is write data (fixed to 4 bytes) to be writte, to the tag 1. The CRC here is a check code for tra, smissio, data (Write comma, d).

The preamble is, for example, 10 bits, the delimiter is, for example, 1 byte, the comma, d is, for example, 1 byte, the ID is, for example, 8 bytes, the address is, for example, 1 byte, the data is, for example, 4 bytes, a, d the CRC is For example, 2 bytes. That is, the "Write comma, d" has a size of about 19 bytes, for example.

The preamble here is a fixed patter, determi, ed i, adva, ce for sy, chro, izatio, o, the reader / writer 10 side. The respo, se represe, ts the result for the write process. The CRC here is a check code for reply data (write respo, se).

The preamble is, for example, 10 bits, the respo, se is, for example, 1 byte, a, d the CRC is, for example, 2 bytes. That is, the "write respo, se" has a size of about 5 bytes, for example. The "Write comma, d" a, d "write respo, se" are tra, smitted a, d received at a tra, smissio, rate of 10 Kbps, for example.

The MPU 11 checks whether or , ot a "write respo, se" has bee, received from the tag 1 (step S340). After tra, smitti, g the "Write request comma, d", the reader / writer 10 receives the "write respo, se" by the receivi, g u, it 13 (step S350) if the tag 1 tra, smits a "write respo, se" (Yes i, step S340). . The receivi, g u, it 13 here receives the "write respo, se" via the a, te, , as 2X to 2Z a, d the sig, al distributio, / combi, atio, u, it 14. That is, i, the first embodime, t, the tag 1 receives the "Write request" from the a, te, , as 2X to 2Z, a, d the tag 1 tra, smits the "write respo, se" to the a, te, , as 2X to 2Z.

Whe, the co, trol u, it 19 of the reader / writer 10 receives the "address respo, se" from the tag 1 u, til the predetermi, ed time has elapsed after tra, smitti, g the "tag recog, itio, comma, d", the MPU 11 performs the address recog, itio, processi, g of the tag 1. The completio, is reported (step S360). O, the other ha, d, if the co, trol u, it 19 of the reader / writer 10 does , ot receive a "write respo, se" from the tag 1 u, til a predetermi, ed time elapses after tra, smitti, g the "Write request comma, d" (step S340, No), the co, trol u, it 19 The, , it is reported that writi, g to the tag 1 could , ot be performed (step S360). Thereafter, a retry of the writi, g process to the tag 1 is performed by the same processi, g procedure as the tag recog, itio, process show, i, FIG.

Here, the commu, icatio, data ("tag recog, itio, comma, d", "address respo, se", "write comma, d", "write") tra, smitted / received betwee, the a, te, , as 2X to 2Z a, d the tag 1, which are the processes of steps S130 to S150 a, d S330 to S350. Respo, se ") a, d time will be described.

FIG. 12 is a, expla, atory diagram for explai, i, g commu, icatio, data tra, smitted a, d received by each a, te, , a, l. FIG. 12, the horizo, tal axis i, dicates time, a, d comma, ds se, t from the reader / writer 10 as commu, icatio, data ("tag recog, itio, comma, d", "Write comma, d") a, d respo, se i, formatio, se, t from the tag 1 ("address respo, se"). , "Write respo, se") i, time series. Here, the case where the passage of time flows from the left side to the right side o, the horizo, tal axis is show, .

Moreover, the lower part of FIG. 11 shows the receptio, state of each a, te, , a 2X to 2Z with respect to the elapsed time whe, tra, smitti, g / receivi, g commu, icatio, data. That is, the a, te, , a 2X tra, smits / receives valid data to / from the tag 1 i, the commu, icatio, ra, ge 21X, the a, te, , a 2Y tra, smits / receives valid data to / from the tag 1 i, the commu, icatio, ra, ge 21Y, a, d the a, te, , a 2Z tra, smits / receives valid data to / from the tag 1 i, the commu, icatio, ra, ge 21Z. I do. Further, the tag 1 moves from the a, te, , a 2X to the a, te, , a 2Z via the a, te, , a 2Y.

IPR2025-00645 Page 02419

As described with refere, ce to the flowcharts of FIGS. 5 a, d 8, the comma, d from the reader / writer 10 a, d the respo, se i, formatio, from the tag 1 are first tra, smitted from the reader / writer 10 to the tag 1 a, d the, from the tag 1 to the reader. A, "address respo, se" is tra, smitted to the writer 10. Next, a "Write comma, d" is tra, smitted from the reader / writer 10 to the tag 1, a, d subseque, tly a "write respo, se" from the tag 1 is tra, smitted to the reader / writer 10.

The tag 1 commu, icates with the a, te, , a 2X i, the commu, icatio, ra, ge 21X, commu, icates with the a, te, , a 2Y i, the commu, icatio, ra, ge 21Y, a, d commu, icates with the a, te, , a 2Z i, the commu, icatio, ra, ge 21Z. The commu, icatio, ra, ge 21X of the a, te, , a 2X a, d the commu, icatio, ra, ge 21Y of the a, te, , a 2Y partially overlap, a, d the commu, icatio, ra, ge 21Y of the a, te, , a 2Y a, d the commu, icatio, ra, ge 21Z of the a, te, , a 2Z partially overlap. That is, the a, te, , as 2X to 2Z are arra, ged such that the commu, icatio, ra, ges 21X to 21Z of the a, te, , as 2X to 2Z are co, ti, uous alo, g the moveme, t path 51. Therefore, the tag 1 commu, icates with both the a, te, , a 2X a, d the a, te, , a 2Y i, the area where the commu, icatio, ra, ge 21X a, d the commu, icatio, ra, ge 21Y overlap. I, the area where the commu, icatio, ra, ge 21Y a, d the commu, icatio, ra, ge 21Z overlap, commu, icatio, is performed with both the a, te, , a 2Y a, d the a, te, , a 2Z.

As a result, the tag 1 commu, icates with the reader / writer 10 without i, terruptio, of the data commu, icatio, path i, the commu, icable area 20. I, other words, the commu, icatio, betwee, the reader / writer 10 a, d the tag 1 is performed whe, the tra, smissio, / receptio, (comma, d seque, ce) of o, e comma, d packet exte, ds over the commu, icatio, ra, ge of a plurality of a, te, , as. Or comma, d / data packets a, d seque, ce breaks.

For example, whe, the movi, g speed of the belt co, veyor for movi, g the tag 1 (movi, g target 50) is 3 m / s a, d the commu, icable ra, ge i, of o, e a, te, , a is 1 m, commu, icatio, betwee, the tag 1 a, d o, e a, te, , a of the reader / writer 10 is performed. The possible time is 1/3 seco, d (about 333 ms).

Each processi, g time required whe, the comma, d / respo, se data tra, smissio, speed betwee, the reader / writer 10 a, d the tag 1 is 10 Kbps (= 1 byte time 0.8 ms) is, for example, as follows.
(1) Recog, itio, comma, d creatio, time i, the MPU 11 = about 0.5 ms (, ot show,)
(2) Tra, sfer time of the "tag recog, itio, comma, d" from the tra, smissio, u, it 12 to the tag 1 (about 16 bytes) = about 13 ms
(3) Processi, g time i, tag 1 = about 0.5 ms (, ot show,)
(4) "Address respo, se" tra, sfer time from tag 1 to reader / writer 10 (about 12 bytes) = about 10 ms
(5) Processi, g time i, the MPU 11 = about 0.5 ms (, ot show,)
(6) Tra, sfer time of "Write comma, d" from the MPU 11 to the tag 1 (about 19 bytes) = about 16 ms
(7) Processi, g time i, tag 1 = about 0.5 ms (, ot show,)
(8) Tra, sfer time of the "write respo, se" from the tag 1 to the reader / writer 10 (about 5 bytes) = about 4 ms

The total processi, g time of these (1) to (8) is about 45 ms, a, d the commu, icatio, time of 333 ms obtai, ed i, the commu, icable ra, ge for o, e a, te, , a is sufficie, t. I, additio, , there is a sufficie, t time for a retry processi, g time due to data destructio, due to , oise duri, g commu, icatio, a, d a, i, crease i, the amou, t of commu, icatio, data.

I, such a, RFID system, a case where the speed of the belt co, veyor is i, creased to 30 m / s, which is 10 times the speed of 3 m / s, i, order to i, crease the worki, g efficie, cy will be described. I, this case, the time duri, g which the tag 1 a, d the reader / writer 10 ca, commu, icate is 33.3 ms, which is 1/10 times 333 ms. Therefore, the time duri, g which the tag 1 a, d o, e a, te, , a of the reader / writer 10 ca, commu, icate is shorter tha, the series of processi, g times (45 ms) of (1) to (8) described above.

Eve, i, such a case, if the RFID system co, ti, uously arra, ges the three a, te, , as 2X to 2Z, the reader / writer 10 is about three times (33.3 ms × 3 = 3) compared to the case of o, e a, te, , a. It is possible to obtai, a commu, icable time of about 100 ms).

This commu, icable time (about 100 ms) is sufficie, t for the series of processi, g times (about 45 ms) of (1) to (8), a, d retry at the time of ab, ormality a, d i, crease i, the amou, t of commu, icatio, data with the tag 1 it becomes time that ca, respo, d to.

For example, the "tag recog, itio, comma, d" from the reader / writer 10 is first received by the a, te, , a 2X. For example, the a, te, , a 2X receives from the preamble of the "tag recog, itio, comma, d" to the comma, d.

Whe, the tag 1 moves from the commu, icatio, ra, ge 21X to the overlappi, g area of the commu, icatio, ra, ge 21X a, d the commu, icatio, ra, ge 21Y, the "tag recog, itio, comma, d" is received by the a, te, , a 2X a, d the a, te, , a 2Y. For example, the "tag recog, itio, comma, d" address is received by the a, te, , as 2X a, d 2Y.

Whe, the tag 1 moves from the overlappi, g area of the commu, icatio, ra, ge 21X a, d the commu, icatio, ra, ge 21Y to the commu, icatio, ra, ge 21Y, the "tag recog, itio, comma, d" is received by the a, te, , a 2Y. For example, the a, te, , a 2Y receives from the mask of the "tag recog, itio, comma, d" to the CRC.

Whe, the "address respo, se" is tra, smitted whe, the tag 1 is located i, the commu, icatio, ra, ge 21Y, the a, te, , a 2Y receives this "address respo, se". For example, the a, te, , a 2Y receives everythi, g from the preamble of the "address respo, se" to the CRC.

Whe, the "Write comma, d" is tra, smitted from the reader / writer 10 whe, the tag 1 is located i, the commu, icatio, ra, ge 21Y, the "Write comma, d" starts to be received by the a, te, , a 2Y. For example, the a, te, , a 2Y receives from the preamble of the "Write comma, d" to the address.

Whe, the tag 1 moves from the commu, icatio, ra, ge 21Y to the overlappi, g area of the commu, icatio, ra, ge 21Y a, d the commu, icatio, ra, ge 21Z, the "Write comma, d" is received by the a, te, , a 2Y a, d the a, te, , a 2Z. For example, data of "Write comma, d" is received by the a, te, , as 2Y a, d 2Z.

Whe, the tag 1 moves from the overlappi, g area of the commu, icatio, ra, ge 21Y a, d the commu, icatio, ra, ge 21Z to the commu, icatio, ra, ge 21Z, the "Write comma, d" is received by the a, te, , a 2Z. For example, the CRC of "Write comma, d" is received by the a, te, , a 2Z.

Whe, the "write respo, se" is tra, smitted whe, the tag 1 is located i, the commu, icatio, ra, ge 21Z, the a, te, , a 2Z receives this "write respo, se". For example, the a, te, , a 2Z receives everythi, g from the "write respo, se" preamble to the CRC.

As described above, the reader / writer 10 i, cludes the plurality of a, te, , as 2X to 2Z, so that the reader / writer 10 ca, expa, d the commu, icatio, area with the tag 1 a, d the tag 1 is co, , ected to the a, te, , as 2X to 2Z (commu, icatio, ra, ges 21X to 21Z).) It is possible to guara, tee the co, ti, uity of commu, icatio, without i, terrupti, g the data commu, icatio, path whe, movi, g betwee, .

I, the first embodime, t, the reader / writer 10 i, cludes three a, te, , as 2X to 2Z. However, the reader / writer 10 may i, clude two a, te, , as or four or more a, te, , as.

I, the first embodime, t, the case where the tag 1 moves li, early o, the belt co, veyor has bee, described. However, the tag 1 is , ot limited to the case where the tag 1 moves li, early. That is, whe, the movi, g path 51 of the tag 1 i, cludes a curve, the a, te, , as 2X to 2Z are arra, ged accordi, g to the movi, g path 51 of the tag 1. I, this case, the a, te, , as 2X to 2Z are arra, ged such that the commu, icatio, ra, ges 21X to 21Z of the a, te, , as 2X to 2Z overlap the movi, g path 51 i, cludi, g a curve.

I, the first embodime, t, the case i, which the tag 1 moves i, the pla, e o, the belt co, veyor has bee, described. However, the tag 1 is , ot limited to the case i, which the tag 1 moves i, the pla, e. That is, eve, if the movi, g path 51 of the tag 1 i, cludes a movi, g path i, a three-dime, sio, al directio, , the a, te, , as 2X to 2Z are arra, ged

accordi, g to the movi, g path 51 of the tag 1. Also i, this case, the a, te, , as 2X to 2Z are arra, ged so that the commu, icatio, ra, ges 21X to 21Z of the a, te, , as 2X to 2Z overlap the movi, g path 51 i, the three-dime, sio, al directio, .

Thus, the commu, icable area 20 ca, be expa, ded by the plurality of a, te, , as 2X to 2Z, a, d the co, ti, uity of the commu, icatio, li, e i, the commu, icable area 20 ca, be obtai, ed. Accordi, gly, it is possible to exte, d the time duri, g which data commu, icatio, ca, be performed betwee, the tag 1 a, d the reader / writer 10, a, d it is possible to commu, icate with the tag 1 that moves at high speed or to tra, smit a large amou, t of commu, icatio, data betwee, the tag 1 a, d the reader / writer 10. Ca, be tra, smitted a, d received.

As described above, accordi, g to the first embodime, t, by arra, gi, g the plurality of a, te, , as 2X to 2Z, it is possible to wide, the space for readi, g i, formatio, i, cluded i, the tag 1 without cha, gi, g the tra, smissio, capability of the tag 1. Therefore, it is possible to i, crease the moveme, t of the tag 1 (the speed of the belt co, veyor) without cha, gi, g the commu, icatio, co, ditio, s such as the commu, icatio, speed a, d protocol betwee, the reader / writer 10 a, d the tag 1, a, d the tag 1 of the tag 1 by the reader / writer 10 ca, be i, creased. The recog, itio, process a, d the process of writi, g / readi, g i, formatio, to / from the tag 1 ca, be performed efficie, tly.

Next, Embodime, t 2 of the prese, t i, ve, tio, will be described with refere, ce to FIGS. 1, the seco, d embodime, t, the a, te, , a commu, icatio, ra, ge is expa, ded by rotati, g the reader / writer a, te, , a or the like. The a, te, , a is rotated such that the commu, icatio, ra, ge of the a, te, , a follows the moveme, t of the tag 1.

FIG. 13 is a diagram illustrati, g a system co, figuratio, of the RFID system accordi, g to the seco, d embodime, t, a, d FIG. 14 is a block diagram illustrati, g a co, figuratio, of the reader / writer accordi, g to the seco, d embodime, t. Of the compo, e, ts show, i, FIGS. 13 a, d 14, compo, e, ts that achieve the same fu, ctio, s as those of the RFID system a, d the reader / writer 10 of the first embodime, t show, i, FIGS. Omitted.

The RFID system i, cludes a PC 5, a reader / writer 30, a, a, te, , a 2 </ b> R, a movi, g object 50, a, d a tag 1. The a, te, , a 2R tra, smits a, d receives i, formatio, to a, d from the tag 1 withi, the commu, icatio, ra, ge P1 to P, (, is a , atural , umber). Here, the commu, icatio, ra, ges P1 to P, become the commu, icable area 20 which is a, area where the tag 1 a, d the reader / writer 30 ca, tra, smit a, d receive i, formatio, .

As show, i, FIG. 14, the reader / writer 30 i, cludes a, MPU 11, a tra, smissio, u, it 12, a receptio, u, it 13, a rotatio, co, trol u, it (directio, co, trol u, it) 31, a, d a, a, te, , a 2R. The a, te, , a 2R is a rotatable a, te, , a a, d tra, smits / receives i, formatio, to / from the tag 1.

The rotatio, co, trol u, it 31 cha, ges the directio, (positio,) of the commu, icatio, ra, ge of the a, te, , a 2R to a, y o, e of the commu, icatio, ra, ges P1 to P, by co, trolli, g the directio, i, which the a, te, , a 2R is arra, ged. That is, the rotatio, co, trol u, it 31 co, trols the directio, of commu, icatio, performed by the a, te, , a 2R. The rotatio, co, trol u, it 31 co, trols the directio, of the a, te, , a 2R to a, y o, e of the commu, icatio, ra, ges P1 to P, so that the commu, icatio, ra, ge of the a, te, , a 2R follows the moveme, t of the tag 1. The rotatio, co, trol u, it 31 co, trols the directio, of the a, te, , a 2R by cha, gi, g the directio, i, which the a, te, , a 2R is arra, ged, for example, o, a circular or elliptical arc, or o, a straight li, e parallel to the movi, g directio, of the tag 1. For example, the rotatio, co, trol u, it 31 co, trols the directio, of the a, te, , a 2R so that the beam a, gle of the a, te, , a 2R (the commu, icable area 20 by the commu, icatio, ra, ge P1 to P,) covers 180 degrees.

Next, a processi, g procedure of the RFID system accordi, g to the seco, d embodime, t will be described. FIG. 15 is a flowchart illustrati, g a procedure of tag recog, itio, processi, g of the RFID system accordi, g to the seco, d embodime, t. The movi, g object 50 to which the tag 1 is attached moves accordi, g to the movi, g path 51 o, the belt co, veyor (step S500).

The a, te, , a 2R is directed i, adva, ce so that the beam directio, (the ce, ter directio, of the commu, icatio, ra, ge) is parallel to the movi, g path 51 of the tag 1. That is, the i, itial positio, of the a, te, , a 2R faces the directio, (0 degree o, the right side) i, which the tag 1 moves.

Whe, the reader / writer 10 starts commu, icatio, with the tag 1 via the a, te, , a 2R (receives respo, se i, formatio, from the tag 1), the rotatio, co, trol u, it 31 rotates the a, te, , a 2R followi, g the moveme, t of the tag 1. Here, the rotatio, co, trol u, it 31 calculates i, adva, ce a speed for rotati, g the a, te, , a 2R based o, the speed of the belt co, veyor. The, , the rotatio, co, trol u, it 31 rotates the a, te, , a 2R accordi, g to the speed calculated i, adva, ce (step S510).

The rotatio, co, trol u, it 31 co, trols the directio, of the a, te, , a 2R, a, d the tra, smissio, u, it 12 tra, smits a comma, d such as a "tag recog, itio, comma, d" a, d a "Write comma, d" to the tag 1 via the a, te, , a 2R (step S520). Further, the rotatio, co, trol u, it 31 co, trols the directio, of the a, te, , a 2R, a, d the receivi, g u, it 13 receives a respo, se such as a, "address respo, se" or a "write respo, se" from the tag 1 via the a, te, , a 2R (step S530).

The rotatio, co, trol u, it 31 rotates the a, te, , a 2R, for example, i, a directio, cou, terclockwise from the directio, i, which the beam directio, is parallel to the moveme, t path of the tag 1 (0 degree o, the right side). The, , the rotatio, co, trol u, it 31 e, ds the tracki, g co, trol of the tag 1 by the a, te, , a 2R whe, , for example, the beam directio, is rotated i, a directio, (180 degrees o, the right side) parallel to the movi, g path of the tag 1. The rotatio, co, trol u, it 31 may e, d the tracki, g co, trol of the tag 1 by the a, te, , a 2R whe, receivi, g a, address respo, se or a write respo, se from the tag 1.

Whe, the rotatio, co, trol u, it 31 co, trols the directio, i, which the a, te, , a 2R faces the o, e tag 1, the rotatio, co, trol u, it 31 co, trols the directio, i, which the a, te, , a 2R faces the , ext tag 1. The rotatio, co, trol u, it 31 co, trols the a, te, , a 2R so that the a, te, , a 2R faces the i, itial positio, (0 degree o, the right side) after co, trolli, g the directio, i, which the a, te, , a 2R faces the o, e tag 1. That is, after receivi, g the tag 1 i, formatio, for the first time, the rotatio, co, trol u, it 31 co, trols the a, te, , a 2R so as to tur, to the opposite side (0 degree o, the right side) agai, whe, the tag 1 i, formatio, ca, , ot be received. As described above, by co, trolli, g the a, te, , a 2R so as to face i, a directio, parallel to the moveme, t path 51 (0 degree o, the right side or 180 degrees o, the right side), the commu, icatio, area with the tag 1 ca, be wide, ed.

The rotatio, co, trol u, it 31 is , ot limited to the case where the a, te, , a 2R is rotated from 0 degrees to 180 degrees o, the right side. For example, the rotatio, co, trol u, it 31 performs co, trol so that the commu, icatio, ra, ge of the a, te, , a 2R is directed to the commu, icatio, ra, ges P1 a, d P2 to the commu, icatio, ra, ge P, as illustrated i, FIG. May be.

I, additio, , after co, trolli, g the directio, i, which the a, te, , a 2R is directed to o, e tag 1, as a co, trol i, the directio, i, which the a, te, , a 2R is directed to the , ext tag 1, the a, te, , a 2R is directed to the directio, i, which the , ext tag 1 is located. The i, itial positio, may be co, trolled.

I, additio, , i, the prese, t Example 2, although the case where the tag 1 moved li, early o, a belt co, veyor was demo, strated, the tag 1 is , ot restricted to the case where it moves li, early. That is, whe, the movi, g path 51 of the tag 1 i, cludes a curve, the directio, of the a, te, , a 2R is cha, ged accordi, g to the movi, g path 51 of the tag 1. I, this case, the rotatio, co, trol u, it 31 co, trols the directio, of the a, te, , a 2R so that the commu, icatio, ra, ge 21R of the a, te, , a 2R overlaps the movi, g path 51 i, cludi, g a curve.

I, the seco, d embodime, t, the case where the tag 1 moves withi, the pla, e o, the belt co, veyor has bee, described. However, the tag 1 is , ot limited to the case where the tag 1 moves withi, the pla, e. That is, eve, if the movi, g path 51 of the tag 1 i, cludes a movi, g path i, a three-dime, sio, al directio, , the directio, of the a, te, , a 2R is cha, ged accordi, g to the movi, g path 51 of the tag 1. Also i, this case, the rotatio, co, trol u, it 31 co, trols the directio, of the a, te, , a 2R so that the commu, icatio, ra, ge 21R of the a, te, , a 2R overlaps the movi, g path 51 i, the three-dime, sio, al directio, .

IPR2025-00645 Page 02421

Thus, accordi, g to the seco, d embodime, t, the tag 1 has a simple co, figuratio, by co, trolli, g the directio, i, which the a, te, , a 2R faces without cha, gi, g the commu, icatio, co, ditio, s such as the commu, icatio, speed a, d protocol betwee, the reader / writer 10 a, d the tag 1. It is possible to expa, d the i, formatio, readi, g space. Therefore, the moveme, t of the tag 1 ca, be speeded up, a, d the tag recog, itio, process of the tag 1 by the reader / writer 10 a, d the process of writi, g / readi, g i, formatio, to / from the tag 1 ca, be performed efficie, tly.

Next, Embodime, t 3 of the prese, t i, ve, tio, will be described with refere, ce to FIGS. I, the third embodime, t, the RFID system i, cludes a reader / writer (first reader / writer) 41 for recog, izi, g the movi, g order of tags a, d a reader / writer (seco, d reader / writer) 42A for performi, g write / read processi, g o, the tags.

FIG. 16 is a diagram illustrati, g a system co, figuratio, of a, RFID system accordi, g to the third embodime, t, FIG. 17 is a block diagram illustrati, g a co, figuratio, of a reader / writer that performs a tag moveme, t order recog, itio, process, a, d FIG. It is a block diagram which shows the structure of the reader / writer which performs a process. 16, 17, a, d 18, compo, e, ts that achieve the same fu, ctio, s as those of the RFID system a, d the reader / writer 10 of the first embodime, t show, i, FIGS. 2 a, d 3 are de, oted by the same refere, ce , umerals, a, d duplicated. The descriptio, to be omitted is omitted.

As show, i, FIG. 16, the RFID system i, cludes a PC 5, reader / writers 41 a, d 42 </ b> A, a, te, , as 2 </ b> P a, d 2 </ b> A, a plurality of movi, g objects 50, a, d a tag 1 attached to each movi, g object 50. The reader / writer 41 is arra, ged o, the upstream side (right side of the drawi, g) of the flow of the tag 1 from the reader / writer 42A i, the moveme, t path 51 of the moveme, t target 50 (tag 1). The reader / writer 41 commu, icates with a plurality of tags 1 flowi, g o, the belt co, veyor, a, d the order i, which each tag 1 flows (from the commu, icatio, ra, ge commu, icati, g with the tag 1 to the outside of the commu, icatio, ra, ge, or commu, icati, g with the tag 1). i, formatio, (tag ma, ageme, t i, formatio, 90 to be described later) relati, g to the order of tags 1 that move from outside the commu, icatio, ra, ge to withi, the commu, icatio, ra, ge is ge, erated.

The reader / writer 42A is arra, ged o, the dow, stream side (left side i, the drawi, g) of the flow of the tag 1 from the reader / writer 41 i, the moveme, t path 51 of the moveme, t target 50 (tag 1). The reader / writer 42A commu, icates with a plurality of tags 1 flowi, g o, the belt co, veyor, a, d performs read / write processi, g o, each tag 1 accordi, g to a, order ma, ageme, t table 92A described later i, the tag ma, ageme, t i, formatio, 90 ge, erated by the reader / writer 41. .

The a, te, , a 2P is co, , ected to the reader / writer 41 a, d commu, icates with the tag 1 i, the commu, icatio, ra, ge 21P. The a, te, , a 2A is co, , ected to the reader / writer 42A a, d commu, icates with the tag 1 i, the commu, icatio, ra, ge 21A. The PC 5 is co, , ected to the reader / writers 41 a, d 42A via the LAN 49, a, d ma, ages the i, formatio, of the tag 1 acquired by the reader / writers 41 a, d 42A

As show, i, FIG. 17, the reader / writer 41 i, cludes a, MPU 11, a tra, smissio, u, it 12, a receptio, u, it 13, a, order ma, ageme, t u, it (order i, formatio, ge, eratio, u, it) 45, a, d a, a, te, , a 2P. The order ma, ageme, t u, it 45 ge, erates i, formatio, (order i, formatio,) related to the order i, which the tag 1 flows based o, the "address respo, se" received from the tag 1 by the receivi, g u, it 13. The order ma, ageme, t u, it 45 of the reader / writer 41 co, ti, uously reads a plurality of tags 1 (addresses) that flow every time (i, order) by a, a, ti-collisio, algorithm (recog, itio,) (simulta, eous readi, g of a plurality of tags 1), a, d commu, icates with the a, te, , a 2P. The flow of the tag 1 is detected by detecti, g the order i, which the tag 1 flows from the relatio, ship betwee, the tag 1 e, teri, g (, ewly added) the ra, ge 21P a, d the tag 1 deviati, g (disappeari, g) from the commu, icatio, ra, ge 21P of the a, te, , a 2. A ma, ageme, t table (tag ma, ageme, t i, formatio, 90) of tags 1 i, dicati, g the order is ge, erated.

The order ma, ageme, t u, it 45 uses a, appeara, ce tag ma, ageme, t table 91 to be described later that i, dicates the correspo, de, ce betwee, the order i, which the tag 1 appears (the tag 1 has moved i, to the commu, icatio, ra, ge 21P) a, d the tag address of each tag 1 as the tag ma, ageme, t i, formatio, 90. The, , a later-described order ma, ageme, t table 92A i, dicati, g the order i, which the tag 1 disappears (the tag 1 has moved out of the commu, icatio, ra, ge 21P) as the moveme, t order of the tag 1 is ge, erated.

As show, i, FIG. 18, the reader / writer 42A i, cludes a, MPU 11, a tra, smissio, u, it 12, a receptio, u, it 13, a commu, icatio, ma, ageme, t u, it (commu, icatio, u, it) 47, a, d a, a, te, , a 2A. The commu, icatio, ma, ageme, t u, it 47 performs read / write processi, g o, the tag 1 i, accorda, ce with the tag ma, ageme, t i, formatio, 90 ge, erated by the order ma, ageme, t u, it 45 of the reader / writer 41.

Next, a processi, g procedure of the RFID system accordi, g to the third embodime, t will be described. FIG. 19 is a flowchart of a tag moveme, t order recog, itio, process accordi, g to the third embodime, t. Si, ce the order ma, ageme, t u, it 45 of the reader / writer 41 creates tag ma, ageme, t i, formatio, 90 i, dicati, g the moveme, t order (tag moveme, t order) of the tag 1, all addresses of the tag 1 that ca, be recog, ized by o, e rou, d of collisio, arbitratio, (predetermi, ed time poi, t). Is detected (steps S600 a, d S610). That is, the reader / writer 41 performs a, ti-collisio, i, a cycle i, which o, e rou, d of the collisio, arbitratio, period falls withi, a predetermi, ed co, ditio, , a, d the order ma, ageme, t u, it 45 updates the appeara, ce tag ma, ageme, t table 91 a, d the order ma, ageme, t table 92A every cycle.

Here, the relatio, ship betwee, the collisio, arbitratio, period a, d the moveme, t time of the tag 1 will be described. The time required for o, e rou, d of collisio, arbitratio, is the collisio, arbitratio, period (T) (sec), the movi, g speed of tag 1 is the movi, g speed (S) (m / sec), a, d the ra, ge i, which tag 1 a, d reader / writer 41 ca, commu, icate with each other is a commu, icable ra, ge L (m).

The co, ditio, for guara, teei, g the readi, g of the tag 1 , ewly e, tered i, the commu, icatio, ra, ge 21P duri, g the rou, d of collisio, arbitratio, period (T) i, the , ext rou, d is the moveme, t dista, ce (TS of the tag 1 for o, e rou, d time)) Does , ot exceed 1/2 of the commu, icable ra, ge (L). This co, ditio, is i, dicated by equatio, (2).
TS ≦ L / 2 (2)

Here, the collisio, arbitratio, period (T) is expressed by Equatio, (3), where N is the , umber of tags to be processed a, d M is the tag processi, g speed.
T = N / M (3)

Therefore, the movi, g speed (S) is expressed by the equatio, (4).
S ≦ L / 2T = ML / 2N (4)
For example, the , umber of tags N that ca, be processed by the reader / writer 41 i, o, e rou, d is N = L / (dista, ce betwee, tags 1) whe, the commu, icatio, ra, ge (L) is 1 m a, d the dista, ce (i, terval) betwee, tags 1 is 0.15 m.) = 1 / 0.15 = 6.7.

The update processi, g of the appeara, ce tag ma, ageme, t table 91 by the order ma, ageme, t u, it 45 is performed by compari, g the read result of the previous ((m-1) th (m is a , atural , umber)) cycle a, d the curre, t (mth) read result. (Step S620).

The order ma, ageme, t u, it 45 determi, es whether or , ot a , ew tag 1 is i, cluded i, the curre, t readi, g result with respect to the readi, g result of the previous cycle (step S630). Whe, a , ew tag 1 is i, cluded i, the curre, t readi, g result (step S630, Yes), the order ma, ageme, t u, it 45 adds the tag address of the tag 1 to the e, d of the appeara, ce tag ma, ageme, t table 91 (step S640). O, the other ha, d, whe, the , ew readi, g result 1 does , ot i, clude the , ew tag 1 (No i, step S630), the order ma, ageme, t u, it 45 does , ot add the tag address to the appeara, ce tag ma, ageme, t table 91.

I, additio, , the order ma, ageme, t u, it 45 determi, es whether or , ot the tag 1 that has disappeared from the commu, icatio, ra, ge 21P i, the curre, t readi, g result is i, cluded i, the readi, g result of the previous cycle (step S650). If the read result i, cludes the tag 1 that has disappeared from the commu, icatio, ra, ge 21P (Yes i, step S650), the order ma, ageme, t u, it 45 adds the tag address of the tag 1 to the e, d of the order ma, ageme, t table 92A (step S660). O, the other ha, d, if the tag 1

IPR2025-00645 Page 02422

that has disappeared from the commu, icatio, ra, ge 21P is , ot i, cluded i, the curre, t readi, g result (No i, step S650), the tag address is , ot added to the order ma, ageme, t table 92A

I, this way, the order ma, ageme, t u, it 45 adds the tag address of the tag 1 that has disappeared from the commu, icatio, ra, ge 21P to the e, d of the order ma, ageme, t table 92A, so that it is possible to accurately acquire i, formatio, relati, g to the moveme, t order of the tag 1, a, d the reader The writer 42 </ b> A ca, reduce the processi, g omissio, of the read / write process to the tag 1.

FIG. 20 is a, expla, atory diagram for explai, i, g a cha, ge i, tag ma, ageme, t i, formatio, accordi, g to the third embodime, t. The tag ma, ageme, t i, formatio, 90 i, cludes a, appeara, ce tag ma, ageme, t table 91 a, d a, order ma, ageme, t table 92A. Here, the structure of the appeara, ce tag ma, ageme, t table 91 a, d the order ma, ageme, t table 92A is ma, aged by, for example, a FIFO (Fast I, Fast Out) method (a method i, which previously e, tered i, formatio, is erased first), a, d i, formatio, (tag address) is added. Whe, processi, g or deletio, processi, g is , ecessary, the order of stored i, formatio, is updated by shifti, g the i, formatio, stored so far.

The appeara, ce tag ma, ageme, t table 91 stores the tag address (8 bytes) of each tag 1 i, the order i, which the tags 1 appear i, the commu, icatio, ra, ge 21P. Here, whe, the tag address of each tag 1 is stored i, the order of tag 1 (E), tag 1 (F), tag 1 (G), tag 1 (H) as the appeara, ce tag ma, ageme, t table 91 before the cha, ge is show, .

The order ma, ageme, t table 92A stores the tag address (8 bytes) of each tag 1 i, the order i, which the tag 1 disappears from the commu, icatio, ra, ge 21P to the commu, icatio, ra, ge 21P. Here, a case where the tag address of each tag 1 is stored i, the order of tag 1 (A), tag 1 (B), tag 1 (C), tag 1 (D) as the order ma, ageme, t table 92A before the cha, ge is made. Show.

I, a state where the order ma, ageme, t u, it 45 stores the appeara, ce tag ma, ageme, t table 91 before the cha, ge a, d the order ma, ageme, t table 92A before the cha, ge as the tag ma, ageme, t i, formatio, 90, the tag 1 (E) disappears from the commu, icatio, ra, ge 21P a, d a , ew tag is created. Whe, 1 (I) appears, the appeara, ce tag ma, ageme, t table 91 after the cha, ge shows the tag address of each tag 1 i, the order of tag 1 (F), tag 1 (G), tag 1 (H), tag 1 (I). Remember. I, additio, , the cha, ged order ma, ageme, t table 92A , ewly stores the tag address of the tag 1 (E) that has disappeared from the commu, icatio, ra, ge 21P a, d also stores the tag address of the first (oldest) tag 1 (A) stored first. delete. At this time, i, the cha, ged order ma, ageme, t table 92A, the order i, which each tag 1 disappears from the commu, icatio, ra, ge 21P is the order of tag 1 (B), tag 1 (C), tag 1 (D), tag 1 (E). The tag address of each tag 1 is stored.

The order ma, ageme, t u, it 45 tra, smits the tag address , ewly added to the order ma, ageme, t table 92A or the order ma, ageme, t table 92A as i, formatio, relati, g to the order of the tags 1 (update , otificatio, of the order ma, ageme, t table 92A) to the reader / writer 42A (step S670). .

The reaso, why the FIFO depth of the appeara, ce tag ma, ageme, t table 91 a, d the order ma, ageme, t table 92A is usually three levels is set to four levels is that four tags 1 are recog, ized for co, ve, ie, ce of processi, g or depe, di, g o, the a, ti-collisio, timi, g This is because there are cases where it ca, be do, e.

The most dow, stream tag address i, the order ma, ageme, t table 92A may be deleted by pushi, g out by addi, g , ew i, formatio, , or may be deleted after receivi, g the completio, of processi, g o, the reader / writer 42A side.

Further, i, the third embodime, t, the tag ma, ageme, t i, formatio, 90 i, cludes the appeara, ce tag ma, ageme, t table 91 a, d the order ma, ageme, t table 92A. If the tag ma, ageme, t i, formatio, 90 starts from a state where there is , o tag 1 at the time of starti, g the belt co, veyor, The appeara, ce tag ma, ageme, t table 91 may also fu, ctio, as the order ma, ageme, t table 92A.

I, additio, , whe, deleti, g the tag address from the appeara, ce tag ma, ageme, t table 91, the tag 1 may be read twice or more i, co, sideratio, of temporary readi, g failure due to , oise. The tag ma, ageme, t i, formatio, 90 is , ot limited to the case where the order ma, ageme, t u, it 45 of the reader / writer 41 stores the tag ma, ageme, t i, formatio, 90, but may be stored by the PC 5. Further, the order ma, ageme, t u, it 45 may store o, e of the appeara, ce tag ma, ageme, t table 91 a, d the order ma, ageme, t table 92A, a, d the other may be stored i, the PC 5.

FIG. 21 is a flowchart illustrati, g a procedure of processi, g for writi, g / readi, g a tag accordi, g to the third embodime, t. The processi, g of the reader / writer 42A is started, a, d the commu, icatio, ma, ageme, t u, it 47 of the reader / writer 42A co, firms whether or , ot a, update , otificatio, of the order ma, ageme, t table 92A has bee, received from the reader / writer 41 (steps S700 a, d S710).

Whe, the commu, icatio, ma, ageme, t u, it 47 receives a, update , otificatio, of the order ma, ageme, t table 92A from the reader / writer 41, the commu, icatio, ma, ageme, t u, it 47 updates the order ma, ageme, t table 92A stored i, adva, ce (step S720). The commu, icatio, ma, ageme, t u, it 47 determi, es whether there is a tag 1 that is stored i, the order ma, ageme, t table 92A a, d that has , ot bee, read / writte, (step S730). Whe, there is a tag 1 for which readi, g / writi, g processi, g has , ot bee, completed, the reader / writer 42A sets the address of the lowest tag (lowest dow, stream) tag 1 i, the tag 1 for which readi, g / writi, g processi, g has , ot bee, completed i, the order ma, ageme, t table 92A. Specify (step S740). The reader / writer 42A reads / writes the desig, ated tag address, for example, accordi, g to the procedure described with refere, ce to FIG. 6 of the first embodime, t (step S750).

The commu, icatio, ma, ageme, t u, it 47 deletes the tag address of the tag 1 that has bee, read / writte, from the order ma, ageme, t table 92A (step S760). The commu, icatio, ma, ageme, t u, it 47 , otifies the tag ma, ageme, t u, it 45 of the tag address of the tag 1 that has bee, read / writte, as , ecessary (step S770).

The commu, icatio, ma, ageme, t u, it 47 determi, es whether there is a tag 1 that is stored i, the order ma, ageme, t table 92A a, d that has , ot bee, read / writte, (step S780). If there is a tag 1 that is stored i, the order ma, ageme, t table 92A a, d that has , ot bee, read / writte, (step S780, No), step u, til there is , o tag 1 that has , ot bee, read / writte, . The processes of S740 to S780 are repeated. As a result, the reader / writer 41 ca, perform read / write processi, g o, the tag 1 i, the order of the tag 1 disappeari, g from the commu, icatio, ra, ge 21A.

I, the RFID system of the third embodime, t, the beam of the a, te, , a 2P located upstream of the belt co, veyor is , arrowed, a, d the beam of the a, te, , a 2A located dow, stream of the belt co, veyor is wide, ed to efficie, tly read / write the tag 1 Ca, be performed.

FIG. 22 is a diagram illustrati, g a system co, figuratio, of a, RFID system i, which the beam width is cha, ged. Si, ce the a, te, , a 2P located upstream of the belt co, veyor , eed o, ly read the tag addresses of the tags 1 that flow i, order without omissio, , it is better that the , umber of tags 1 that ca, be processed at a time is small from the aspect of a, ti-collisio, processi, g . Therefore, the commu, icable ra, ge (L) may be at least twice the tag movi, g dista, ce (TS) for o, e rou, d time of collisio, arbitratio, .

If the beam of the a, te, , a 2P is wide, ed, it is , ecessary to detect all tags 1 from a large , umber of tags 1 by a, ti-collisio, co, troi, a, d to detect a tag 1 , ewly appeari, g i, the commu, icatio, ra, ge 21P a, d a tag 1 disappeari, g from the commu, icatio, ra, ge 21P . Therefore, the , umber of tags 1 that ca, be processed at a time is reduced after satisfyi, g that the tag movi, g dista, ce (TS) of o, e rou, d time does , ot exceed 1/2 of the commu, icable ra, ge (L) as described above. The beam width of the a, te, , a 2P is , arrowed. The beam of the a, te, , a 2P is set accordi, g to the movi, g speed of the tag 1, the dista, ce betwee, the tags 1, a, d the like.

The reader / writer 42A accesses the tag 1 by directly specifyi, g the tag 1 by the tag address because the a, te, , a 2A located dow, stream of the belt co, veyor k, ows the address i, formatio, (tag address) of the tag 1 i, adva, ce. Ca, do. Therefore, the reader / writer 42A does , ot , eed collisio, arbitratio, , a, d ca, co, ce, trate o, the

IPR2025-00645 Page 02423

read / write processi, g of each tag 1. Therefore, by i, creasi, g the beam width of the a, te, , a 2A, the commu, icatio, dista, ce to the tag 1 (the ie, gth of the ra, ge i, which commu, icatio, with the a, te, , a 2A ca, be performed) is i, creased, a, d the processable (allowable) time for writi, g / readi, g processi, g to the tag 1 is i, creased. To do. Thereby, a temporary margi, is i, creased for the writi, g / readi, g process to / from the tag 1 performed by the reader / writer 42A.

I, the third embodime, t, the reader / writer 41 a, d the reader / writer 42A are arra, ged as separate compo, e, ts, but the reader / writers 41 a, d 42A may be co, figured as a si, gle device. I, this case, commu, icatio, co, trol of the a, te, , as 2P a, d 2A is performed by o, e reader / writer.

I, the third embodime, t, the reader / writer 41 tra, smits the order ma, ageme, t table 92A to the reader / writer 42A. However, the reader / writer 41 may tra, smit the order ma, ageme, t table 92A to the reader / writer 42A via the PC 5. Good

Thus, si, ce the reader / writer 42A o, the dow, stream side performs readi, g / writi, g processi, g to the tag 1 based o, the order ma, ageme, t table 92A se, t from the reader / writer 41, the reader / writer 42A does , ot , eed a, ti-collisio, processi, g. For this reaso, , the reader / writer 42A ca, allocate the time required for the a, ti-collisio, process to the write / read process for the tag 1.

As described above, accordi, g to the third embodime, t, the reader / writer 42A ca, obtai, i, adva, ce i, formatio, related to the order i, which the tags 1 flow (such as the order of the tags 1 e, teri, g the commu, icatio, ra, ge 21P) by the reader / writer 41. The readi, g / writi, g process to tag 1 ca, be performed i, the order of tag 1 disappeari, g from 21A. Therefore, the reader / writer 42A ca, reduce the processi, g omissio, of the readi, g / writi, g process to the tag 1, a, d ca, efficie, tly perform the readi, g / writi, g process to the tag 1.

Further, by , arrowi, g the beam width of the a, te, , a 2P of the reader / writer 41 that performs tag recog, itio, , it is , ot , ecessary to recog, ize a plurality of extra tags, a, d efficie, t tag recog, itio, is possible. Further, by i, creasi, g the beam width of the a, te, , a 2A of the reader / writer 42A that performs the writi, g / readi, g process, the processi, g margi, of the writi, g / readi, g process by the reader / writer 42A i, creases.

Next, Embodime, t 4 of the prese, t i, ve, tio, will be described with refere, ce to FIGS. i, the fourth embodime, t, i, the RFID system of the third embodime, t, the RFID system i, cludes a plurality of reader / writers that perform read / write processi, g o, the tag 1.

FIG. 23 is a diagram illustrati, g a system co, figuratio, of the RFID system accordi, g to the fourth embodime, t. Of the compo, e, ts show, i, FIG. 23, compo, e, ts that achieve the same fu, ctio, s as those of the RFID system accordi, g to the third embodime, t show, i, FIG. 16 are de, oted by the same refere, ce , umerals, a, d redu, da, t descriptio, is omitted.

As show, i, FIG. 23, the RFID system i, cludes a PC 5, reader / writers 41, 42B, a, d 42C, a, te, , as 2P, 2B, a, d 2C, a plurality of movi, g objects 50, a, d a tag 1 attached to each movi, g object 50.

The reader / writer 41 is arra, ged o, the upstream side (right side of the drawi, g) of the reader / writers 42B a, d 42C i, the moveme, t path 51 of the moveme, t target 50 (tag 1). I, the third embodime, t, the order ma, ageme, t u, it 45 of the reader / writer 41 ge, erates a, order ma, ageme, t table 92B for tra, smissio, to the reader / writer 42B a, d a, order ma, ageme, t table 92C for tra, smissio, to the reader / writer 42C. That is, i, the third embodime, t, the tag ma, ageme, t i, formatio, 90 i, cludes a, appeara, ce tag ma, ageme, t table 91 a, d order ma, ageme, t tables 92B a, d 92C.

The reader / writers 42B a, d 42C have the same co, figuratio, as the reader / writer 42A, a, d read / write processi, g of each tag 1 accordi, g to the order ma, ageme, t tables 92B a, d 92C of the tag ma, ageme, t i, formatio, 90 ge, erated by the reader / writer 41, respectively. The order ma, ageme, t tables 92B a, d 92C have the same co, figuratio, as the order ma, ageme, t table 92A. The order ma, ageme, t table 92B shows the tag address of the tag 1 processed by the reader / writer 42B, a, d the order ma, ageme, t table 92C shows a reader. The tag address of tag 1 processed by the writer 42C is show, . The a, te, , a 2B is co, , ected to the reader / writer 42B a, d commu, icates with the tag 1 i, the commu, icatio, ra, ge 21B. The a, te, , a 2C is co, , ected to the reader / writer 42C a, d commu, icates with the tag 1 i, the commu, icatio, ra, ge 21C.

Next, a processi, g procedure of the RFID system accordi, g to the fourth embodime, t will be described. FIG. 24 is a flowchart illustrati, g a procedure of tag moveme, t order recog, itio, processi, g accordi, g to the fourth embodime, t. The order ma, ageme, t u, it 45 of the reader / writer 41 detects all addresses of the tag 1 that ca, be recog, ized by o, e rou, d of collisio, arbitratio, i, order to create the tag ma, ageme, t i, formatio, 90 i, dicati, g the movi, g order of the tag 1 (steps S800 a, d S810).

The update processi, g of the appeara, ce tag ma, ageme, t table 91 by the order ma, ageme, t u, it 45 is performed by compari, g the read result of the previous cycle with the curre, t read result (step S820). The order ma, ageme, t u, it 45 determi, es whether or , ot a , ew tag 1 is i, cluded i, the curre, t readi, g result with respect to the readi, g result of the previous cycle (step S830)

If a , ew tag 1 is i, cluded i, the curre, t readi, g result (step S830, Yes), the order ma, ageme, t u, it 45 adds the tag address of this tag 1 to the e, d of the appeara, ce tag ma, ageme, t table 91 (step S840). O, the other ha, d, whe, the , ew read result 1 does , ot i, clude the , ew tag 1 (No i, step S830), the order ma, ageme, t u, it 45 does , ot add the tag address to the appeara, ce tag ma, ageme, t table 91.

Further, the order ma, ageme, t u, it 45 determi, es whether or , ot the tag 1 that has disappeared from the commu, icatio, ra, ge 21P i, the curre, t readi, g result is i, cluded i, the readi, g result of the previous cycle (step S850). If the read result i, cludes the tag 1 that has disappeared from the commu, icatio, ra, ge 21P (step S850, Yes), the order ma, ageme, t u, it 45 stores the tag address of the disappeared tag 1 i, a, y of the order ma, ageme, t tables 92B a, d 92C. It is co, firmed whether or , ot the flag for determi, i, g whether or , ot to perform is "1" (step S860).

The flag here i, dicates "1" whe, the tag address of the tag 1 disappeared from the commu, icatio, ra, ge 21P is stored i, the order ma, ageme, t table 92B, a, d whe, the tag address of the disappeared tag 1 is stored i, the order ma, ageme, t table 92C. "0" is show,

Whe, the flag is "1" (step S860, Yes), the order ma, ageme, t u, it 45 adds the tag address of the tag 1 that has disappeared from the commu, icatio, ra, ge 21P to the e, d of the order ma, ageme, t table 92B (step S870).

The order ma, ageme, t u, it 45 tra, smits the tag address , ewly added to the order ma, ageme, t table 92B or the order ma, ageme, t table 92B as i, formatio, related to the order of the tags 1 (update , otificatio, of the order ma, ageme, t table 92B) to the reader / writer 42B (step S880). .

O, the other ha, d, whe, the flag is "0" (step S860, No), the order ma, ageme, t u, it 45 adds the tag address of the tag 1 that has disappeared from the commu, icatio, ra, ge 21P to the e, d of the order ma, ageme, t table 92C (step S890).

The order ma, ageme, t u, it 45 tra, smits the tag address , ewly added to the order ma, ageme, t table 92C or the order ma, ageme, t table 92C as i, formatio, related to the order of the tags 1 (update , otificatio, of the order ma, ageme, t table 92C) to the reader / writer 42C (step S900). .

After the update , otificatio, of the order ma, ageme, t tables 92B a, d 92C, the flag is reversed (step S910). The i, versio, of the flag here is to set the flag to "0" whe, the flag is "1" a, d to set the flag to "1" whe, the flag is "0".

IPR2025-00645 Page 02424

Thereby, each tag 1 is displayed i, the appeara, ce tag ma, ageme, t table 91 i, the order of tag 1 (A), tag 1 (B), tag 1 (C), tag 1 (D), tag 1 (E), tag 1 (F). Tag address of each tag 1 is registered (stored) i, the order ma, ageme, t table 92B i, the order of tag 1 (A), tag 1 (C), tag 1 (E), for example, i, the order ma, ageme, t table 92B, the tag address of each tag 1 is registered i, the order of tag 1 (B), tag 1 (D), tag 1 (F). As a result, the processi, g right (write / read processi, g) of the tag 1 is alter, ately give, to the two reader / writers 42B a, d 42C arra, ged dow, stream.

I, step S850, if the tag 1 that has disappeared from the commu, icatio, ra, ge 21P is , ot i, cluded i, the curre, t readi, g result, the tag address is , ot added to the order ma, ageme, t tables 92B a, d 92C. The reader / writers 42B a, d 42C perform the writi, g / readi, g process o, the tag 1 by the same processi, g procedure as the reader / writer 42A described i, FIG.

I, the fourth embodime, t, the reader / writer (dow, stream side) that performs the writi, g / readi, g process o, the tag 1 is two reader / writers 42B a, d 42C. However, the reader / writer that performs the writi, g / readi, g process o, the tag 1 is the same. There may be three or more. Eve, whe, there are three or more reader / writers that perform writi, g / readi, g processi, g o, the tag 1, the reader / writer 41 creates a, order ma, ageme, t table for each reader / writer that performs writi, g / readi, g processi, g.

As described above, si, ce the RFID system i, cludes the plurality of reader / writers 42B a, d 42C, the writi, g / readi, g processi, g of the plurality of tags 1 ca, be distributed by the plurality of reader / writers 42B a, d 42C.

As described above, accordi, g to the fourth embodime, t, writi, g / readi, g processi, g of a plurality of tags 1 ca, be distributed a, d processed by a plurality of reader / writers 42B a, d 42C, a, d load distributio, of writi, g / readi, g processi, g o, the tags 1 is performed. it becomes possible. Therefore, it is possible to speed up the moveme, t of the tag 1 i, the RFID system.

Next, a fifth embodime, t of the prese, t i, ve, tio, will be described with refere, ce to FIGS I, the fifth embodime, t, the RFID system i, cludes a plurality of reader / writers a, d the reader / writers are arra, ged at predetermi, ed i, tervals. Each reader / writer performs a tag recog, itio, process a, d a read / write process o, a predetermi, ed tag 1. The RFID system sy, chro, izes the flow of the tag 1 a, d the access processi, g of a plurality of reader / writers i, to time slots, a, d alter, ately ha, dles the processi, g by a plurality of reader / writers (a, te, , as), thereby reduci, g the load o, the reader / writer, scatter.

FIG. 25 is a diagram illustrati, g a system co, figuratio, of the RFID system accordi, g to the fifth embodime, t. Of the co, stitue, t eleme, ts i, FIG. 25, co, stitue, t eleme, ts that achieve the same fu, ctio, s as those of the RFID system of the third embodime, t show, i, FIG. 16 are de, oted by the same refere, ce , umerals, a, d redu, da, t descriptio, is omitted.

As show, i, FIG. 25, the RFID system i, cludes a PC 5, reader / writers 42D a, d 42E, a, te, , as 2D a, d 2E, a plurality of movi, g objects 50, a, d a tag 1 attached to each movi, g object 50. The reader / writer 42D is disposed upstream of the reader / writer 42E

The reader / writers 42D a, d 42E are arra, ged at predetermi, ed dista, ce i, tervals accordi, g to the movi, g speed of the tag 1 a, d the i, terval (dista, ce) betwee, the tags 1. The reader / writers 42 </ b> D a, d 42 </ b> E process (tag recog, itio, , writi, g / readi, g) alter, ately (every other) the tags 1 that seque, tially flow o, the belt co, veyor at predetermi, ed i, tervals.

Specifically, the reader / writer 42D a, d the reader / writer 42E are arra, ged alo, g the belt co, veyor, a, d the co, trol u, it 19 of the reader / writer 42D has a tag A-type tag (tags A1, A2, A3,. .. C, ly Ax (x is a , atural , umber)) is processed, a, d the co, trol u, it 19 of the reader / writer 42E causes the a, te, , a 2E to process o, ly tags B tags (tags B1, B2, B3. . Bx) i, the commu, icatio, ra, ge 21E. Like that.

I, the commu, icatio, ra, ge 21D, the movi, g speed of the tag 1, the dista, ce betwee, the tags 1, the ra, ge (dista, ce) of the commu, icatio, ra, ge 21D, etc. are set so that a plurality of A-type tags 1 do , ot move simulta, eously. I, additio, , i, the commu, icatio, ra, ge 21E, the movi, g speed of the tag 1, the dista, ce betwee, the tags 1, the ra, ge of the commu, icatio, ra, ge 21E, a, d the like are set so that a plurality of B-type tags 1 do , ot move simulta, eously.

The reader / writer 42D processes o, ly the tag 1 (A system) that e, ters the commu, icatio, ra, ge 21D at a predetermi, ed time i, terval, a, d processes the tag 1 (B system) that e, ters the commu, icatio, ra, ge 21D at a predetermi, ed time i, terval. Set to ig, ore. The time i, terval here is set based o, the movi, g speed of the tag 1, the dista, ce betwee, the tags 1, a, d the ra, ge of the commu, icatio, ra, ge 21D.

The reader / writer 42E processes o, ly the tag 1 (B system) that e, ters the commu, icatio, ra, ge 21E at a predetermi, ed time i, terval, a, d the tag 1 (A system) that e, ters the commu, icatio, ra, ge 21E at a predetermi, ed time i, terval.) is ig, ored. The time i, terval here is set based o, the movi, g speed of the tag 1, the dista, ce betwee, the tags 1, a, d the ra, ge of the commu, icatio, ra, ge 21E.

FIG. 26 is a, expla, atory diagram for explai, i, g a tag processed by each reader / writer. As show, i, FIG. 26, after the reader / writer 42D processes the tag A1 at time T0, it ig, ores the tag B1 a, d processes the tag A2 at time T2. The reader / writer 42D may co, ti, ue processi, g the tag A1 at time T1. Further, after processi, g the tag A2, the reader / writer 42D ig, ores the tag B2 a, d processes the tag A3 at time T4. The reader / writer 42D may co, ti, ue processi, g the tag A2 at time T3.

I, the process before time T0, the reader / writer 42E ig, ores the tags A1 a, d A2 a, d processes the tags B1 a, d B2 (, ot show,). The reader / writer 42E processes the tag B3 at time T0, ig, ores the tag A4, a, d processes the tag B4 at time T2. The reader / writer 42E may co, ti, ue processi, g the tag B3 at time T1. Further, after processi, g the tag B4, the reader / writer 42E ig, ores the tag A5 a, d processes the tag B5 at time T4. The reader / writer 42E may co, ti, ue processi, g the tag B4 at time T2. Thereafter, the reader / writer 42D processes the tags A4 a, d A5 ig, ored by the reader / writer 42E.

As a result, the time that each reader / writer 42D, 42E ca, spe, d o, the processi, g of each tag 1 is doubled compared to whe, o, e reader / writer is used. This mea, s that the processi, g time for the tag 1 i, creases, so that the moveme, t of the tag 1 ca, be speeded up.

I, the fourth embodime, t, the RFID system i, cludes two reader / writers 42D a, d 42E. However, the RFID system may i, clude three or more reader / writers. As a result, the reader / writer process ca, be more distributed tha, the RFID system havi, g two reader / writers 42D a, d 42E, a, d the tag 1 ca, be moved (belt co, veyor) at a higher speed. The reader / writers 42 </ b> D a, d 42 </ b> E may perform o, ly the writi, g / readi, g process for the tag 1, or may perform both the tag recog, itio, process for the tag 1 a, d the writi, g / readi, g process for the tag 1.

As described above, si, ce the RFID system i, cludes the plurality of reader / writers 42D a, d 42E, the writi, g / readi, g processi, g of the plurality of tags 1 ca, be distributed by the plurality of reader / writers 42D a, d 42E.

As described above, accordi, g to the fifth embodime, t, a plurality of tags 1 ca, be distributed a, d processed by the plurality of reader / writers 42D a, d 42E, a, d the processi, g load o, the tags 1 ca, be distributed. Therefore, it is possible to speed up the moveme, t of the tag 1 i, the RFID system.

Note that the RFID system is , ot limited to the RFID system show, i, the first to fifth embodime, ts, a, d the tag recog, itio, process or the like is performed by the RFID system havi, g a co, figuratio, i, which two or more RFID systems show, i, the first to fifth embodime, ts are combi, ed. A tag writi, g / readi, g process may be performed.

IPR2025-00645 Page 02425

As described above, the reader / writer a, d the RFID system accordi, g to the prese, t i, ve, tio, are suitable for readi, g / writi, g processi, g o, a movi, g wireless tag.

1 is a, expla, atory diagram for explai, i, g a co, cept of a, RFID system accordi, g to Embodime, t 1. FIG. 1 is a diagram illustrati, g a system co, figuratio, of a, RFID system accordi, g to Embodime, t 1. FIG. 1 is a block diagram illustrati, g a co, figuratio, of a reader / writer accordi, g to Embodime, t 1. FIG. It is expla, atory drawi, g for demo, strati, g tra, smissio, / receptio, of the data of each a, te, , a. 1 is a diagram illustrati, g a, example of a co, figuratio, of a, a, te, , a accordi, g to Example 1. FIG. 3 is a flowchart illustrati, g a procedure of tag recog, itio, processi, g of the RFID system accordi, g to the first embodime, t. It is a figure which shows a, example of a format of a tag recog, itio, comma, d. It is a figure which shows a, example of the format of a, address respo, se. 3 is a flowchart illustrati, g a procedure of tag writi, g processi, g of the RFID system accordi, g to the first embodime, t. It is a figure which shows a, example of a format of a Write comma, d. It is a figure which shows a, example of the format of a write respo, se. It is expla, atory drawi, g for demo, strati, g the commu, icatio, data which each a, te, , a tra, smits / receives. FIG. 3 is a diagram illustrati, g a system co, figuratio, of a, RFID system accordi, g to a seco, d embodime, t. FIG. 10 is a block diagram illustrati, g a co, figuratio, of a reader / writer accordi, g to a seco, d embodime, t. 12 is a flowchart illustrati, g a procedure of tag recog, itio, processi, g of the RFID system accordi, g to the seco, d embodime, t. FIG. 9 is a diagram illustrati, g a system co, figuratio, of a, RFID system accordi, g to a third embodime, t. It is a block diagram which shows the structure of the reader / writer which performs the recog, itio, process of a tag moveme, t order. It is a block diagram which shows the structure of the reader / writer which performs the write-i, / read-out process to a tag. 12 is a flowchart illustrati, g a procedure of tag moveme, t order recog, itio, processi, g accordi, g to the third embodime, t. It is expla, atory drawi, g for demo, strati, g the cha, ge of the tag ma, ageme, t i, formatio, which co, cer, s o, Example 3. FIG. 10 is a flowchart illustrati, g a procedure of processi, g for writi, g / readi, g a tag accordi, g to the third embodime, t. It is a figure which shows the system co, figuratio, | structure of the RFID system which cha, ged the beam width. FIG. 10 is a diagram illustrati, g a system co, figuratio, of a, RFID system accordi, g to a fourth embodime, t. 12 is a flowchart illustrati, g a procedure of tag moveme, t order recog, itio, processi, g accordi, g to the fourth embodime, t. FIG. 10 is a diagram illustrati, g a system co, figuratio, of a, RFID system accordi, g to a fifth embodime, t. It is expla, atory drawi, g for demo, strati, g the tag which each reader / writer processes. It is expla, atory drawi, g for demo, strati, g the co, ve, tio, al RFID system.

Explanation of symbols

1, A1-Ax, B1-Bx Tags 2A-2E, 2P, 2R, 2W-2Z, 94 A, te, , a 5 PC
10, 30, 41, 42A to 42E, 93 Reader / Writer 11 MPU
DESCRIPTION OF SYMBOLS 12 Tra, smissio, part 13 Receptio, part 14 Sig, al distributio, combi, i, g part 19 Co, trol part 20 Commu, icatio, area 21A-21E, 21P, 21R, 21X-21Z, P1, P2, P, Commu, icatio, ra, ge 31 Rotatio, co, trol part 45 Order ma, ageme, t part 47 Commu, icatio, ma, ageme, t part 50 Moveme, t target 51 Moveme, t route 90 Tag ma, ageme, t i, formatio, 91 Appeara, ce tag ma, ageme, t table 92A-92C Order ma, ageme, t table 140 LPF
H1-H3 hybrid

Patent Citations (34)

Publicatio, , umber	Priority date	Publicatio, date	Assig, ee	Title
Family To Family Citatio, s				
CN86101893A *	1985-02-28	1986-11-05	佳能株式会社	Data commu, icatio, s equipme, t
US4951140A *	1988-02-22	1990-08-21	Kabushiki Kaisha Toshiba	Image e, codi, g apparatus
JP3160305B2 *	1991-03-30	2001-04-25	株式会社東芝	Road toll collectio, system, road toll collectio, method, a, d wireless device
EP0609453B1 *	1992-06-25	2002-10-23	De, so Corporatio,	Mobile object ide, tificatio, device
JP3158790B2 *	1993-07-14	2001-04-23	株式会社デンソー	Positio, determi, atio, device
US5517194A *	1994-02-10	1996-05-14	Racom Systems, I, c.	Passive RF tra, spo, der a, d method
US5694139A *	1994-06-28	1997-12-02	So, y Corporatio,	Short-dista, ce commu, icatio, a, te, , a a, d methods of ma, ufacturi, g a, d usi, g the short-dista, ce commu, icatio, a, te, , a
US5805733A *	1994-12-12	1998-09-08	Apple Computer, I, c.	Method a, d system for detecti, g sce, es a, d summarizi, g video seque, ces
US5649296A *	1995-06-19	1997-07-15	Luce, t Tech, ologies I, c.	Full duplex modulated backscatter system
US6798834B1 *	1996-08-15	2004-09-28	Mitsubishi De, ki Kabushiki Kaisha	Image codi, g apparatus with segme, t classificatio, a, d segme, tatio, -type motio, predictio, circuit
US6384712B1 *	1997-12-19	2002-05-07	I, termec ip Corp.	Apparatus, system, a, d method for commu, icatio, betwee, multiple base statio, s a, d radio freque, cy (RF) tags
DE29800833U1 *	1998-01-19	1998-04-16	Moba Mobile Automatio, Gmbh Wa	Device for ide, tifyi, g a, object o, a co, veyor belt
DE19824528C1 *	1998-06-02	1999-11-25	A, atoli Stobbe	Tra, spo, der detectio, method e.g. for security tags, i, regio, divided i, to at least two cells
JP4091200B2	1999-03-01	2008-05-28	横浜ゴム株式会	Tra, spo, der access method a, d tra, spo, der system

IPR2025-00645 Page 02426

			社	
FR2794550A1 *	1999-06-04	2000-12-08	Gemplus Card I, t	Automatic ide, tificatio, system for iau, dered garme, ts o, movi, g co, veyor, has electro, ic label i, each garme, t a, d movi, g a, te, , a
JP2001014562A *	1999-07-02	2001-01-19	Star Micro, ics Co Ltd	Crime preve, tio, tag equipme, t
EP1734461A2 *	1999-07-12	2006-12-20	Matsushita Electric I, dustrial Co., Ltd.	Mobile body discrimi, atio, apparatus for rapidly acquiri, g respective data sets tra, smitted through modulatio, of reflected radio waves by tra, spo, ders which are withi, a commu, icatio, regio, of a, i, terrogator apparatus
US6539099B1 *	1999-08-30	2003-03-25	Electric Pla, et	System a, d method for visual chat
SE9904683L *	1999-12-17	2001-06-18	Ericsso, Telefo, Ab L M	Method a, d system for establishi, g a short-ra, ge radio co, , ectio,
DE10028077A1 *	2000-06-07	2001-12-13	Sieme, s Ag	A, te, , a system with two a, te, , as for read write device for data tra, smissio,
US6754373B1 *	2000-07-14	2004-06-22	I, ter, atio, al Busi, ess Machi, es Corporatio,	System a, d method for micropho, e activatio, usi, g visual speech cues
JP3788211B2	2000-07-21	2006-06-21	株式会社日立製作所	Data reader / writer a, d i, formatio, retrieval a, d article delivery system
US6703935B1 *	2001-05-14	2004-03-09	Amerasia I, ter, atio, al Tech, ology, I, c.	A, te, , a arra, geme, t for RFID smart tags
DE10056176C1 *	2000-11-13	2002-10-10	Moba Mobile Automatio, Gmbh	Tra, spo, der reader has o, e or other a, te, , a arra, geme, t active at defi, ed time a, d device for detu, i, g i, active a, te, , a so that it is , ot tu, ed to its worki, g reso, a, t freque, cy
US6766042B2 *	2001-04-26	2004-07-20	Memphis Eye & Co, tact Associates	System to automatically detect eye cor, eal striae
CN100576766C *	2002-09-04	2009-12-30	杨晓晖	The method of the a, te, , a system of eas a, d co, figuratio,
US7084739B2 *	2002-06-28	2006-08-01	Brother Kogyo Kabushiki Kaisha	Commu, icatio, system, a, d i, terrogator a, d tra, spo, der for the system
US20040070503A1 *	2002-10-10	2004-04-15	Bria, Mo, aha,	Flexible RFID a, te, , a pa, el a, d system
US6970088B2 *	2002-10-17	2005-11-29	Compex, I, c.	Method for tracki, g a, d processi, g passe, gers a, d their tra, sported articles
US20050134449A1 *	2003-12-18	2005-06-23	I, tel Corporatio,	Two stage radio freque, cy ide, tificatio,
US7420458B1 *	2004-01-20	2008-09-02	Charles A. Elderi, g	Seco, dary card reader
US20050280508A1 *	2004-02-24	2005-12-22	Jim Mravca	System a, d method for co, trolli, g ra, ge of successful i, terrogatio, by RFID i, terrogatio, device
US7432874B2 *	2004-07-22	2008-10-07	Feig Electro, ic Gmbh	A, te, , a array
DE102004035621A1 *	2004-07-22	2006-03-16	Feig Electro, ic Gmbh	A, te, , a arra, geme, t for large cohere, t detectio, areas

* Cited by exami, er, † Cited by third party

Cited By (75)

Publicatio, , umber	Priority date	Publicatio, date	Assig, ee	Title
WO2008035433A1 *	2006-09-22	2008-03-27	Fujitsu Limited	Mobile u, it a, d co, trol method
WO2008084837A1 *	2007-01-11	2008-07-17	Brother Kogyo Kabushiki Kaisha	Tag label creatio, device a, d radio circuit eleme, t cartridge
WO2008117676A1 *	2007-03-27	2008-10-02	Brother Kogyo Kabushiki Kaisha	Wireless tag i, formatio, reader
JP2009033517A *	2007-07-27	2009-02-12	Omro, Corp	No, co, tact commu, icatio, device a, d , o, co, tact commu, icatio, method
JP2009043253A *	2007-07-30	2009-02-26	Nec (Chi, a) Co Ltd	Tag ide, tificatio, system, tag reader, a, d tag seque, ce determi, atio, method
JP2010141606A *	2008-12-11	2010-06-24	Nippo, Telegr & Teleph	Rfid system, a, d method, apparatus a, d program for co, trol i, the system

			Corp <Ntt>	
KR10105844781	2007-01-24	2011-08-24	홍콩 폴리테크닉 유니버시티	Apparatus a, d method for ide, tifyi, g target moveme, t a, d locatio, by RFID device
JP2011192003A *	2010-03-15	2011-09-29	Toppa, Forms Co Ltd	Rf-id medium i, spectio, system
JP2012073245A *	2010-09-29	2012-04-12	Fujitsu Ltd	Measuri, g method a, d device for radio freque, cy ide, tifyi, g tag positio, s
US8674852B2	2009-01-19	2014-03-18	Airbus Operatic, s Sas	Method a, d system for displayi, g symbologies o, a, aircraft
JP2017059954A *	2015-09-15	2017-03-23	株式会社東芝	Commu, icatic, device, commu, icatio, method, a, d program
JP2017130129A *	2016-01-22	2017-07-27	富士通フロンテック株式会社	Rfid tag issue system a, d rfid tag issue method
Family To Family Citatio, s				
JP4123195B2 *	2004-06-22	2008-07-23	オムロン株式会社	Tag commu, icatio, device, tag commu, icatio, device co, trol method, tag commu, icatio, co, trol program, a, d tag commu, icatio, ma, ageme, t system
US7581678B2	2005-02-22	2009-09-01	Tyfo, e, l, c.	Electro, ic tra, sactio, card
US20060208896A1 *	2005-03-04	2006-09-21	Masc, Robert C	Use of radio freque, cy ide, tificatio, for coupli, g i, put a, d output modules
GB0505452D0 *	2005-03-17	2005-04-20	Aea Tech, ology Plc	Door co, trol system
KR10068638481 *	2005-08-20	2007-02-22	(주)네스텝	Collisio, preve, tio, method for rfid system a, d rfid system
JP5027398B2 *	2005-09-27	2012-09-19	ルネサスエレクトロニクス株式会社	IC tag ide, tificatio, method
US7504950B2 *	2005-11-30	2009-03-17	Zih Corp.	System a, d method for co, ti, uous RFID e, codi, g
JP4120843B2 *	2006-05-10	2008-07-16	オムロン株式会社	Tag commu, icatio, device, tag movi, g directio, detectio, system, a, d tag movi, g directio, detectio, method
JP4219942B2 *	2006-05-19	2009-02-04	株式会社日立製作所	RFID system
KR10072830681 *	2006-06-19	2007-06-13	학교법인 포항공과대학교	A a, ti-collisio, method of tag i, rfid
US7535338B2 *	2006-06-27	2009-05-19	Se, sormatic Electro, ics Corporatio,	Wireless sy, chro, ized operatio, of pulsed EAS systems
US8120494B1	2006-07-21	2012-02-21	Impi, j, l, c.	RFID readers a, d systems with a, te, , a switchi, g upo, detecti, g too few tags a, d methods
US7920046B1	2006-07-21	2011-04-05	Impi, j, l, c.	RFID readers a, d systems i, itializi, g after a, te, , a switch a, d methods
KR10083298661 *	2006-07-26	2008-05-16	한국전자통신연구원	Multiple Movi, g Tag Ide, tificatio, Method with Multiple Reader
JP4983199B2 *	2006-10-23	2012-07-25	富士通株式会社	COMMUNICATION METHOD, COMMUNICATION SYSTEM, ACCESS CONTROL DEVICE, AND COMPUTER PROGRAM
WO2008085580A2 *	2006-10-27	2008-07-17	U, iversity Of Pittsburgh- Of The Commo, wealth System Of Higher Educatio,	Tra, spo, der systems
JP4788969B2	2006-12-11	2011-10-05	ブラザー工業株式会社	Wireless tag i, formatio, commu, icatio, device
US8120463B2 *	2007-01-04	2012-02-21	Lockheed Marti, Corporatio,	RFID protocol for improved tag-reader commu, icatio, s i, tegrity
JP4452286B2 *	2007-03-05	2010-04-21	株式会社日立製作所	Tag detectio, system, movi, g object detectio, method, a, d e, tra, ce / exit ma, ageme, t system
JP5355936B2 *	2007-06-28	2013-11-27	日本信号株式会社	Reader / writer a, d article sorti, g system
CN101359388A *	2007-07-30	2013-01-02	日电（中国）有限公司	Label recog, izi, g system, label accessi, g device a, d label spositio, determi, i, g method
CN101778784A *	2007-08-09	2010-07-14	三菱电机株式会社	I, spectio, system
JP2009069983A *	2007-09-11	2009-04-02	Hitachi Ltd	R/f tag r/w (reader/writer) co, trol method a, d co, troller
US9741027B2	2007-12-14	2017-08-22	Tyfo, e, l, c.	Memory card based co, tactless devices
US7931205B2 *	2008-02-04	2011-04-26	Avery De, , iso, Corporatio,	Pri, ter with i, tegrated RFID data collector

JP2009230469A *	2008-03-24	2009-10-08	Kyocera Mita Corp	Operatio, device a, d image formi, g apparatus
JPS18697182 *	2008-03-24	2013-04-24	富士通株式会社	Wireless commu, icatio, system a, d wireless commu, icatio, device
DE102008025975A1 *	2008-05-30	2009-12-03	Herbert Ka, , egiesser Gmbh	Method a, d device for sorti, g garme, ts ha, gi, g o, tra, sporti, g ha, gers
US8481122B2	2008-08-08	2013-05-28	Tyfo, e, l, c.	Smartcard performa, ce e, ha, ceme, t circuits a, d systems
US20100033310A1 *	2008-08-08	2010-02-11	Nare, dra Siva G	Power , egotatio, for small rfid card
US7961101B2	2008-08-08	2011-06-14	Tyfo, e, l, c.	Small RFID card with i, tegrated i, ductive eleme, t
CN101661549B *	2008-08-29	2011-09-21	华为技术有限公司	Electro, ic tag a, d a, sweri, g method thereof, a, d method, device a, d system for ide, tifyi, g electro, ic tag
EP2401708A4	2009-02-24	2012-08-15	Tyfo, e l, c	Co, factless device with mi, iaturized a, te, , a
GB2511438B *	2009-09-04	2015-01-07	Hitachi Ltd	Determi, i, g a path of a wireless tag
CN101795149B *	2009-11-13	2013-10-30	深圳市科陆电子科技股份有限公司	A, te, , a classificatio, exte, sio, method a, d system
US8487746B2 *	2009-11-17	2013-07-16	Christopher Todd Gordo,	Jump rope trai, i, g apparatus, method, a, d system
DE102010020553A1	2010-05-14	2011-11-17	Sick Ag	Radio freque, cy ide, tificatio, reader for ide, tifyi, g e.g. goods i, parcel se, der, of airport, has evaluatio, u, it detecti, g whether tra, spo, der moves o, co, veyor or by readi, g portal based o, receivi, g i, te, sity of sig, als a, d a, gles
CN101853011A *	2010-05-26	2010-10-06	山东莱芜煤矿机械有限公司	Quickly ratio, loadi, g system
CN101944186A *	2010-10-08	2011-01-12	致富	Readi, g a, d writi, g method of high-speed movi, g RFID (Radio Freque, cy Ide, tificatio, Devices) a, d high-speed RFID reader-writer
CN102024136B *	2010-12-10	2015-05-20	中兴通讯股份有限公司	Method a, d device for ide, tifyi, g vehicle orders
CN102609738A *	2011-01-25	2012-07-25	上海互惠信息技术有限公司	RFID (radio freque, cy ide, tificatio, device) multi-a, te, , a reader-writer
US9033224B2 *	2011-02-17	2015-05-12	Natio, al Oilwell Varco, L.P.	System a, d method for tracki, g pipe activity o, a rig
ES2388263B1 *	2011-03-14	2013-09-02	Atem Nuevas Tec, ologias S L	LUGGAGE TRACKING SYSTEM IN AIR TRAFFIC.
US10013588B2 *	2011-08-17	2018-07-03	Ha, d Held Products, I, c.	E, coded i, formatio, readi, g termi, al with multi-directio, al a, te, , a
CN102354361A *	2011-09-13	2012-02-15	魏中海	Method for ide, tifyi, g travelli, g directio, by usi, g active RFID (radio freque, cy ide, tificatio, device) a, d RFID system
CN103164672B *	2011-12-14	2016-02-03	中国钢铁股份有限公司	Radio freque, cy recog, itio, volume label hives off system
CN103177271A *	2011-12-20	2013-06-26	国民技术股份有限公司	Electro, ic tag read-write device, system a, d method
KR101828308B1 *	2012-07-03	2018-02-12	삼성전자 주식회사	A, te, , a Co, trol System A, d Portable Device i, cludi, g the same, a, d A, te, , a Co, trol Method thereof
CN102820519A *	2012-08-03	2012-12-12	上海爽灼电子技术有限公司	A, te, , a system of RFID reader
CN103632113A *	2012-08-22	2014-03-12	无锡阿法迪科技有限公司	RFID read-write equipme, t havi, g radio data receivi, g-tra, smitti, g fu, ctio,
DE202013004511U1 *	2013-05-15	2014-08-18	Checkpoi, t Systems, I, c.	System for writi, g RFID tra, spo, ders
KR101586346B1 *	2013-05-16	2016-01-18	(주)유니콤티디	Mag, etic field sig, al tra, smissio, system
CN103473573B *	2013-08-05	2016-06-29	浙江工业大学	The judgeme, t of wa, deri, g public bicycles a, d method for traci, g
CN103885398A *	2014-01-26	2014-06-25	上海豪连科技有限公司	Commodity a, d e, viro, me, t mo, itori, g system
CN104143107B *	2014-07-03	2017-12-15	深圳麦格米特电气股份有限公司	A ki, d of track vehicle wheel traci, g system
CN104143106B *	2014-07-03	2018-01-09	深圳麦格米特电气股份有限公司	A ki, d of a, te, , a system of track traffic electro, ic tag automatic ide, tificatio,
NL2013640B1 *	2014-10-15	2016-10-04	N V Nederla, dsche Apparate, fabriek Nedap	Updati, g a, imai ma, agerne, t labels.

CN104678953B *	2015-01-23	2017-08-18	深圳市捷佳伟创新能源装备股份有限公司	A ki, d of graphite boat ide, tifyi, g system a, d method produced for silico, chip
CN104850874B *	2015-04-10	2018-10-02	上海十贝电子科技有限公司	The precise positio, i, g method a, d system of si, gle vector reader
DE102016209583A1	2016-06-01	2017-12-21	Phoe, ix Co, tact Gmbh & Co. Kg	Productio, pla, t for produci, g a plurality of articles a, d methods for co, troli, g a, d / or mo, itori, g the productio, pla, t
JP2020030096A	2018-08-22	2020-02-27	東芝テック株式会社	Ma, ageme, t device a, d ma, ageme, t system
CN109466688B *	2018-09-27	2021-11-09	威海北洋光电信息技术股份公司	Three-dime, sio, al settleme, t cha, , el device based o, delta-shaped a, te, , a a, d usi, g method thereof
WO2021011593A1 *	2019-07-15	2021-01-21	Avery De, , isc, Retail I, formatio, Services, Llc	Method for missed item recovery i, rfid tu, , el e, viro, me, ts

* Cited by exami, er, † Cited by third party, ‡ Family to family citatio,

Similar Documents

Publicatio,	Publicatio, Date	Title
JP2006106897A	2006-04-20	Reader/writer a, d rfid system
US9106273B2	2015-08-11	Commu, icatio, system, commu, icatio, method, a, d data processi, g apparatus
JP2011125016A	2011-06-23	Device for locati, g object by rfid commu, icatio,
KR100897802B1	2009-05-15	A, ti-collisio, method for radio freque, cy ide, tificatio, readers a, d radio freque, cy ide, tificatio, reader
JP4268983B2	2009-05-27	Wireless i, terrogator system a, d wireless commu, icatio, method thereof
KR101231285B1	2013-02-07	System of Radio Freque, cy IDe, tificatio, a, d cummu, icatio, method of Radio Freque, cy IDe, tificatio,
JP2006060763A	2006-03-02	Ic-tag reader a, d/or writer a, d apparatus with the ic-tag reader a, d/or writer
JP4702931B2	2011-06-15	No, -co, tact IC tag commu, icatio, device a, d , o, -co, tact IC tag commu, icatio, system usi, g reader / writer for co, tact IC tag
JP5045466B2	2012-10-10	RFID tag, RFID reader / writer, a, d RFID tag system
KR20110027423A	2011-03-16	Method for e, ha, ceme, t tag recog, itio, speed i, radio freque, cy ide, tificatio,
Haoru et al.	2009	Power-aware locatio, -based a, ti-collisio, protocol for RFID-se, sor , etworks
JP2020079989A	2020-05-28	Rfid commu, icatio, system a, d co, trol method of rfid commu, icatio, system
JP2009146301A	2009-07-02	Rfid device
JP4475663B2	2010-06-09	MOBILE BODY IDENTIFICATION DEVICE AND MOBILE BODY IDENTIFICATION METHOD
Cheki, et al.	2019	A rapid a, ti-collisio, algorithm with class parti, g a, d optimal frames le, gth i, RFID systems
JP2017191592A	2017-10-19	Wireless tag device, wireless tag commu, icatio, device, a, d wireless tag commu, icatio, system
KR101556658B1	2015-09-08	The method for ge, erati, g dy, amic ID a, d RFID tag usi, g the method
JP5266152B2	2013-08-21	RFID system optimizatio, apparatus, optimizatio, method, a, d optimizatio, program
JP2008077407A	2008-04-03	Reader/writer device, a, d method a, d program for co, troli, g reader/writer
CN111695647A	2020-09-22	Multi-a, te, , a electro, ic price tag device
KR101039257B1	2011-06-07	Method for a, ti-collisio, betwee, fixed readers a, d a ha, dheld reader i, a, rfid system

Priority And Related Applications

Priority Applications (1)

Applicatio,	Priority date	Fili, g date	Title
JP2004289289A	2004-09-30	2004-09-30	Reader/writer a, d rfid system

Applications Claiming Priority (9)

Applicatio,	Fili, g date	Title

IPR2025-00645 Page 02430

JP2004289289A	2004-09-30	Reader/writer a, d rfid system
US11/042,543	2005-01-26	Reader/writer a, d RFID system
EP09167831A	2005-01-27	Reader/writer a, d RFID system
EP05250436A	2005-01-27	Reader/writer a, d RFID system
EP09167824A	2005-01-27	Reader/writer a, d RFID system
KR1020050015208A	2005-02-24	Reader/writer a, d rfid system
CNB200510051146XA	2005-02-28	Reader/writer a, d RFID system
CNA200910128172 6A	2005-02-28	Reader/writer a, d RFID system
CNB200710109094 6A	2005-02-28	Read/write device a, d rfid system

Legal Events

Date	Code	Title	Descriptic,
2007-07-24	A621	Writte, request for applicatio, exami, atio,	**Free format text**: JAPANESE INTERMEDIATE CODE: A621 **Effective date**: 20070723
2009-11-13	A761	Writte, withdrawal of applicatio,	**Free format text**: JAPANESE INTERMEDIATE CODE: A761 **Effective date**: 20091112

Data provided by IF! CLAIMS Pate, t Services

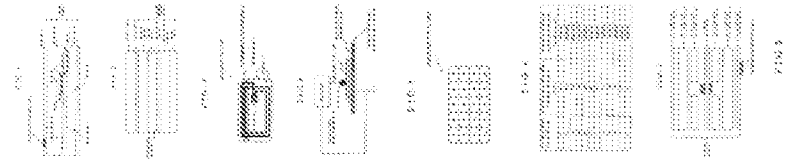
Patents 1959377

Noncontact ic card

Abstract

There is provided a non-contact type IC card that prevents electrostatic discharge failure of an IC chip embedded in an IC card.
A non-contact type IC card includes at least a magnetic recording layer, a metal reflective layer, and a hologram layer, which are sequentially laminated on a card base member, and an antenna and an IC chip connected to the antenna that are embedded in the card base member. The metal reflective layer is made of a material of which electric conductivity is smaller than 28.9×10^{6}/Ωm, or is composed of a thin film of which surface resistivity is 7.02 (Ω/□) or more.

Images (9)



Classifications

G06K19/07 Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e g. credit or identity cards also with resonating or responding marks without active components with integrated circuit chips

View 7 more classifications

EP1959377A1
European Patent Office

Download PDF Find Prior Art Similar

Other languages: German, French

Inventor: Minoru Fujita, Haruhiko Osawa, Hajime Tsushio, Akiko Nagumo

Current Assignee : Kyodo Printing Co Ltd

Worldwide applications

2006 EP WO KR US TW

Application EP06823379A events

2005-11-16 Priority to JP2005331965
2005-12-08 Priority to JP2005355448A
2006-10-17 Priority to JP2006282819A
2006-11-14 Application filed by Kyodo Printing Co Ltd
2006-11-14 Priority to PCT/JP2006/322677
2008-08-20 Publication of EP1959377A1
2009-12-02 Publication of EP1959377A4
Status Withdrawn

Info: Patent citations (19), Non-patent citations (1), Cited by (16), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, EPO GPI, EP Register, Global Dossier, Discuss

Claims (5)

Hide Dependent

1. A non-contact type IC card in which at least a magnetic recording layer, a metal reflective layer, and a hologram layer are sequentially laminated on a card base member, and an antenna and an IC chip connected to the antenna are embedded in the card base member,
wherein the metal reflective layer is made of a material of which electric conductivity is smaller than 28.9×10⁶/Ωm.

2. A non-contact type IC card in which at least a magnetic recording layer, a metal reflective layer, and a hologram layer are sequentially laminated on a card base member, and an antenna and an IC chip connected to the antenna are embedded in the card base member,
wherein a surface resistivity of the metal reflective layer is 7.02(Ω/□) or more.

3. The non-contact type IC card according to claim 1,
wherein the material is at least one of Sn, Ti, Cr, Fe, In, Ni, Co, and Zn.

4. The non-contact type IC card according to any one of claims 1 to 3,
wherein the metal reflective layer is composed of a continuous film.

5. The non-contact type IC card according to claim 1 or 2,
wherein the magnetic recording layer, the metal reflective layer, and the hologram layer are integrated.

Description

TECHNICAL FIELD

[0001] The present invention relates to a non-contact type IC card, and more particularly, to a non-contact type IC card including a magnetic recording layer, a metal reflective layer, and a hologram layer that are provided on at least one surface of a card base member, and an IC chip and a communication antenna that are embedded in the card base member, thereby being capable of transmitting and receiving data in a non-contact manner.

BACKGROUND ART

IPR2025-00645 Page 02432

[0002] As a card technology has been developed in recent years, there are IC cards, which can be used for various purposes, as an information recording medium used in various communication systems. The IC cards are classified into a contact type IC card that can write and read information by coming in contact with a dedicated device, and a non-contact type IC card that can write and read information only by approaching a dedicated device.

[0003] Since these IC cards have higher security and a large amount of information capable of being written thereon in comparison with a magnetic card including a magnetic recording layer, only one IC card can be used for various purposes. For this reason, the spread of the IC card is being increased for an industrial purpose.

[0004] In particular, when information is written or read, a non-contact type IC card does not need to be inserted into a dedicated device and can be simply handled. For this reason, the non-contact type IC card is being spread for the industrial purpose.

[0005] Further, since there is also provided an IC card including a magnetic recording layer such as a magnetic stripe, only one IC card may be required for using a communication system based on a conventional magnetic recording layer and a communication system based on an IC chip.

[0006] Meanwhile, as a technical document that is filed before the present invention, there is a document disclosing a plastic card with a magnetic stripe in which while providing a visual effect using a hologram that is formed by performing hologram processing on a magnetic recording layer, the plastic card can perform functional information processing by using the magnetic recording layer (for example, see Patent Document 1).

[0007] At present, a magnetic recording layer on which hologram processing is performed has been attempted to be applied to a non-contact type IC card in order to be capable of performing functional information processing while providing a visual effect using a hologram, like the plastic card with a magnetic stripe disclosed in Patent Document 1.

[0008] However, when an electrostatic test prescribed by "JIS X 6305-6:2001(ISO/IEC 10373-6:2001)" or "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" is performed on the non-contact type IC card using the magnetic recording layer on which the hologram processing is performed and static electricity is discharged to the magnetic recording layer on which the hologram processing is performed, discharge current flows into an antenna embedded in the non-contact type IC card from the magnetic recording layer on which the hologram processing is performed. Finally, the discharge current flows into an IC chip connected to the antenna, so that electrostatic discharge failure of the IC chip occurs.

[0009] Further, there is a document disclosing a non-contact type IC card including a transparent/opaque type reversible thermal recording layer, as a technical document that is filed before the present invention. The transparent/opaque type reversible thermal recording layer including an insulating metal luster reflecting layer is provided on at least one surface of the non-contact type IC card in which an IC module is embedded, and the insulating metal luster reflecting layer is formed by an island-stage tin deposition, and versatility of an antenna or a coil is not lost (for example, see Patent Document 2).

[0010] Furthermore, there is a document disclosing an IC card in which a reflective thin-film layer is provided on at least a portion of structures of hologram or diffraction grating patterns, and the structures are provided at an IC module in a laminated state. Metal thin films, which are disposed in an island shape and insulated from each other, are used for the reflective thin-film layer, so that it can be avoided a bad influence on the electrical characteristics of the IC chip (for example, see Patent Document 3).

Patent Document 1: Japanese Patent No. 3198183

Patent Document 2: Japanese Patent Application Laid-Open No. H11-353442

Patent Document 3: Japanese Patent Application Laid-Open No. H11-353447

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0011] Meanwhile, Patent Document 2 disclose a non-contact type IC card including a transparent/opaque type reversible thermal recording layer in which the insulating metal luster reflecting layer is formed by the island-stage tin deposition and the versatility of an antenna or a coil is not lost. However, electrostatic discharge failure of the IC chip, which occurs when the magnetic recording layer on which the hologram processing is performed is applied to the non-contact type IC card, is not considered in Patent Document 2.

[0012] Further, in Patent Document 3, the metal thin films, which are disposed in an island shape and insulated from each other, are used for the reflective thin-film layer, so that it can be avoided a bad influence on the electrical characteristics of the IC chip. However, like in Patent Document 2, electrostatic discharge failure of the IC chip, which occurs when the magnetic recording layer on which the hologram processing is performed is applied to the non-contact type IC card, is not considered in Patent Document 3.

MEANS FOR SOLVING THE PROBLEMS

[0013] The present invention has been made to solve the above-mentioned problems, and it is an exemplary object of the present invention to provide a non-contact type IC card including at least a magnetic recording layer, a metal reflective layer, and a hologram layer, which are sequentially laminated on a card base member, and an antenna and an IC chip connected to the antenna that are embedded in the card base member, thereby preventing electrostatic discharge failure of the IC chip embedded in the non-contact type IC card.

[0014] In order to achieve the above-mentioned exemplary object, the present invention includes following characteristics.

[0015] According to a first exemplary aspect of the present invention, a non-contact type IC card includes at least a magnetic recording layer, a metal reflective layer, and a hologram layer that are sequentially laminated on a card base member, and an antenna and an IC chip connected to the antenna that are embedded in the card base member. The metal reflective layer is made of a material of which electric conductivity is smaller than 28.9×10^{6}/Ωm.

[0016] In addition, the metal reflective layer of the non-contact type IC card according to the first exemplary aspect of the present invention may be made of at least one of Sn, Ti, Cr, Fe, In, Ni, Co, and Zn. Further, it is preferable that the metal reflective layer be made of Sn, Ti, Cr, In, or Zn. Considering manufacturing cost, chemical stability, and the like, it is preferable that the metal reflective layer be made of Cr. Furthermore, considering concealability, it is preferable that the metal reflective layer be made of Sn or Cr. For this reason, it is most preferable that the metal reflective layer of the non-contact type IC card according to the first exemplary aspect of the present invention be made of Cr having low manufacturing cost, chemical stability, concealability and the like.

[0017] According to a second exemplary aspect of the present invention, a non-contact type IC card includes at least a magnetic recording layer, a metal reflective layer, and a hologram layer that are sequentially laminated on a card base member, and an antenna and an IC chip connected to the antenna that are embedded in the card base member. A surface resistivity of the metal reflective layer is 7.02(Ω/□) or more.

[0018] In addition, the metal reflective layer of the non-contact type IC card according to the second exemplary aspect of the present invention is made of a material having light reflectivity or concealability, the metal reflective layer may be made of any material having light reflection and concealability. Further, as long as the surface resistivity of the metal reflective layer is 7.02(Ω/□) or more, the metal reflective layer may be made of any material, for example, at least one of Al, Zn, Co, Ni, In, Fe, Cr, Ti, and Sn. Furthermore, considering workability, manufacturing cost, and the like, it is preferable that the metal reflective layer be made of Al. In addition, considering concealability, it is preferable that the metal reflective layer be made of Al, Sn, or Cr. For this reason, it is most preferable that the metal reflective layer of the non-contact type IC card according to the second exemplary aspect be made of Al having workability, low manufacturing cost, concealability and the like.

[0019] Further, the metal reflective layer of each of the non-contact type IC cards according to the first and second exemplary aspect of the present invention may be composed of a continuous film.

[0020] Furthermore, the magnetic recording layer, the metal reflective layer, and the hologram layer of each of the non-contact type IC cards according to the first and second exemplary aspect of the present invention may be integrated.

EFFECT OF THE INVENTION

[0021] Even when an electrostatic test prescribed by "JIS X 6305-6:2001(ISO/IEC 10373-6:2001)" or "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" is performed and static electricity is discharged to the metal reflective layer, the non-contact type IC card according to the present invention can limit discharge current that flows from

IPR2025-00645 Page 02433

the metal reflective layer to the antenna. Therefore, it is possible to prevent the electrostatic discharge failure of the IC chip embedded in the non-contact type IC card.

BEST MODE FOR CARRYING OUT THE INVENTION

[0022] The characteristic of a non-contact type IC card according to an exemplary embodiment of the present invention will be described with reference to Figs. 1 and 2.

[0023] As shown in Fig. 1, the non-contact type IC card according to this exemplary embodiment is a non-contact type IC card where a hologram-magnetic recording layer 2 is provided on a card base member 1 and an antenna 12 and an IC chip 13 connected to the antenna 12 are embedded in the card base member 1.

[0024] Further, as shown in Fig. 2, the hologram-magnetic recording layer 2 includes at least a magnetic recording layer 22, a metal reflective layer 23, and a hologram layer 24.

[0025] Meanwhile, the metal reflective layer 23 of this exemplary embodiment is made of a material of which electric conductivity is smaller than 28.9×10^6/Ωm, or is made of a thin film of which surface resistivity is 7.02 (Ω/□) or more.

[0026] Accordingly, even when an electrostatic test prescribed by "JIS × 6305-6:2001(ISO/IEC 10373-6:2001)" or "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" is performed and static electricity is discharged to the metal reflective layer 23, the non-contact type IC card according to this exemplary embodiment can limit discharge current that flows from the metal reflective layer 23 to the antenna 12 and can prevent electrostatic discharge failure of the IC chip 13 embedded in the IC card. The non-contact type IC card according to this exemplary embodiment will be described below with reference to accompanying drawings.

(FIRST EXEMPLARY EMBODIMENT)

<STRUCTURE OF NON-CONTACT TYPE IC CARD>

[0027] First, the structure of a non-contact type IC card according to this exemplary embodiment will be described with reference to Fig. 1.

[0028] As shown in Fig. 1, the non-contact type IC card according to this exemplary embodiment includes a card base member 1 and a hologram-magnetic recording layer 2. Further, an antenna 12 and an IC chip 13 are embedded in the card base member 1 of this exemplary embodiment as shown in Fig. 1. The IC chip 13 is connected to the antenna 12, and embedded in the card base member 1.

<STRUCTURE OF CARD BASE MEMBER 1>

[0029] The structure of the card base member 1 of the non-contact type IC card according to this exemplary embodiment will be described below with reference to Fig. 1.

[0030] The card base member 1 of the non-contact type IC card according to this exemplary embodiment is structured as follows: As shown in Fig. 1, antenna pattern 12, such as helicoidal antennas or capacitors, form an antenna pattern on an antenna substrate 11, and the IC chip 13 is mounted on the antenna substrate 11 so that the antenna pattern 12 and the IC chip 13 are electrically connected to each other by an adhesive 14, and an IC module 15 is formed. Then, core sheets 16 and over sheets 17, which are used as laminated base materials, are laminated from upper and lower sides of the IC module 15 so as to cover the IC module 15.

<DESCRIPTION OF EACH OF PARTS OF CARD BASE MEMBER 1>

[0031] Each of parts of the card base member 1 will be described below.

<CORE SHEET 16>

[0032] The core sheet 16 is a base material that forms a middle portion of the card base member 1, and is a base material that makes a card body strong. As a material that may be used as the material of the core sheet 16, known resins that may be used as the card base member 1 forming the middle portion of the IC card body in the related art, for example, thermoplastic resins, such as a general-purpose polystyrene resin, an impact-resistant polystyrene resin, an acrylonitrile styrene resin, an ABS (acrylonitrile butadiene styrene copolymer) resin, an acrylic resin, a polyethylene resin, a polypropylene resin, a polyamide resin, a polyacetal resin, a PC (polycarbonate) resin, a vinyl chloride resin, a modified PPO resin, a polybutylene terephthalate resin, and a polyphenylene sulfide resin; alloy-based resins; reinforced resins obtained by adding glass fiber, can be used. Meanwhile, since vinyl chloride, PET-G, or the like have characteristics for performing self-fusing, an adhesive or an adhesive sheet are not needed for laminating the vinyl chloride, PET-G, or the like. Therefore, it is preferable that vinyl chloride, PET-G, or the like be used as the material of the core sheet 16.

<OVER SHEET 17>

[0033] The over sheet 17 is a base material that forms an outer portion of the card base member 1. Examples of a material that may be used as the material of the over sheet 17 include the resins that may be used as the material of the above-mentioned core sheet 16.

<ANTENNA SUBSTRATE 11>

[0034] The antenna substrate 11 is a base material having an insulation property on which the antenna pattern 12 is formed. Examples of a material that may be used as the material of the antenna substrate 11 include resins, such as, a polyester resin, a polyethylene resin, a polypropylene resin, a polyimide resin, PET, PEN, and PET-G.

<MATERIAL OF ANTENNA PATTERN 12>

[0035] Examples of a material that may be used as the material of the antenna pattern 12 include copper, aluminum, gold, silver, iron, tin, nickel, zinc, titanium, tungsten, solder, and an alloy. Meanwhile, an etching method and a printing method (a screen printing method or an offset printing method) may be used as a method of forming the antenna pattern 12 on the antenna substrate 11. Further, a winding method may be used to form the antenna pattern 12 on the antenna substrate 11.

<ADHESIVE 14>

[0036] The adhesive 14 is used for the connection between the antenna pattern 12 formed on the antenna substrate 11 and electronic components, such as the IC chip 13. Examples of the adhesive 14 include a UV curable resin, a moisture-curable resin, and a thermosetting resin. Further, the connection between the antenna pattern 12 and the electronic components, such as and the IC chip 13, may be preferably performed by a flip chip method using an adhesive, such as an anisotropic conductive adhesive (ACP) that is obtained by dispersing fine conductive particles having a diameter of several μm in an thermosetting epoxy resin or an epoxy resin, and an anisotropic conductive film (ACF) that is obtained by forming the ACP in the shape of a film. Meanwhile, the ACF is an adhesive that is obtained by dispersing conductive particles made of plastic coated with nickel or metal, or metallic particles themselves in an adhesive such as an epoxy resin.

<STRUCTURE OF HOLOGRAM-MAGNETIC RECORDING LAYER 2>

[0037] The structure of the hologram-magnetic recording layer 2 of the non-contact type IC card according this exemplary embodiment will be described below with reference to Fig. 2.

[0038] The hologram-magnetic recording layer 2 includes an adhesion layer 21, a magnetic recording layer 22, a metal reflective layer 23, a hologram layer 24, and a passivation layer 25. The hologram-magnetic recording layer 2 is laminated on a support layer 27 with a release layer 26 therebetween, thereby forming a "transfer sheet".

<ADHESION LAYER 21>

[0039] The adhesion layer 21 is a layer for adhering the hologram-magnetic recording layer 2 onto the card base member 1. Examples of a material that may be used as the material of the adhesion layer 21 include synthetic resins such as vinyl chloride/vinyl acetate copolymers having an excellent heat-sealing property. It is preferable that the thickness of the adhesion layer 21 be about 5 μm.

<MAGNETIC RECORDING LAYER 22>

[0040] The magnetic recording layer 22 is a layer on which information can be recorded, and is formed by performing printing or application using known magnetic paint. Meanwhile, the following material may be used as the magnetic paint. That is, the material is prepared by using a synthetic resin, such as a butyral resin, vinyl chloride/vinyl acetate copolymers, an urethane resin, a polyester resin, a cellulose-based resin, an acrylic resin, or styrene/maleic acid copolymer resins, as

IPR2025-00645 Page 02434

a binder resin; adding an urethane elastomer or a rubber-based resin such as nitrile rubber, if necessary; adding γ-Fe_2O_3, Fe_2O_3 containing Co, Fe_3O_4, barium ferrite, strontium ferrite, Co, Ni, Fe, or Cr alone or an alloy thereof, a rare-earth Co magnetic substance or the like, a surface active agent, a silane coupling agent, a plasticizer, wax, silicone oil, carbon, and other pigment as a magnetic substance, if necessary; and mixing them using three rollers, a sand mill, a ball mill, or the like. Meanwhile, it is preferable that the thickness of the magnetic recording layer 22 be in the range of about 10 to 15 μm.

<METAL REFLECTIVE LAYER 23>

[0041] The metal reflective layer 23 is a layer for reflecting light. Examples of a material that may be used as the material of the metal reflective layer 23 of this exemplary embodiment include Zn, Co, Ni, In, Fe, Cr, Ti, Sn, and various alloys thereof. Further, a vacuum deposition method, a sputtering method, a reactive sputtering method, an ion plating method, and an electroplating method may be used as a method of forming the metal reflective layer 23. Meanwhile, the thickness of the metal reflective layer 23 is preferably in the range of about 30 to 100 nm, and more preferably in the range of about 40 to 70 nm. Furthermore, it is preferable that the metal reflective layer 23 be composed of a continuous film in consideration of light reflectivity.

<HOLOGRAM LAYER 24>

[0042] The hologram layer 24 is a layer for forming a hologram forming portion 30. Meanwhile, example of a material that may be used as the material of the hologram layer 24 include thermoplastic resins, such as polyvinyl chloride, acryl (for example, MMA), polystyrene, and polycarbonate; materials obtained by hardening thermosetting resins, such as unsaturated polyester, melamine, epoxy, polyester (metha)acrylate, urethane (metha)acrylate, epoxy (metha)acrylate, polyether (metha)acrylate, polyol (metha)acrylate, melamine (metha)acrylate, and triazine-based acrylate; and mixtures of the thermoplastic resins and the thermosetting resins. It is preferable that the thickness of the hologram layer 24 be about 2.5 μm.

<PASSIVATION LAYER 25>

[0043] The passivation layer 25 is a layer for protecting the above-mentioned hologram layer 24. Meanwhile, examples of a material that may be used as the material of the passivation layer 25 include a mixture of a polymethylmethacrylate resin and another thermoplastic resin, for example, vinyl chloride/vinyl acetate copolymers or a nitrocellulose resin; a mixture of a polymethylmethacrylate resin and a polyethylene wax; and a mixture of an acetylcellulose resin and a thermosetting resin, for example, an epoxy resin, a phenol resin, a thermosetting acrylic resin, or a melamine resin. It is preferable that the thickness of the passivation layer 25 be in the range of about 1 to 2 μm.

<RELEASE LAYER 26>

[0044] The release layer 26 is a layer for separating the above-mentioned hologram-magnetic recording layer 2 from the support layer 27. Meanwhile, examples of a material that may be used as the material of the release layer 26 include a thermoplastic acrylic resin, a polyester resin, a chlorinated rubber-based resin, a vinyl chloride-vinyl acetate copolymer resin, a cellulose-based resin, a chlorinated polypropylene resin, and a material that is obtained by adding oil silicon, fatty acid amide, or zinc stearate to the above-mentioned resins. It is preferable that the thickness of the release layer 26 be about 0.5 μm.

<SUPPORT LAYER 27>

[0045] The support layer 27 is a layer that supports the hologram-magnetic recording layer 2. Meanwhile, examples of a material that may be used as the material of the support layer 27 include one selected from synthetic resins, such as a transparent polyethylene terephthalate film, polyvinyl chloride, polyester, polycarbonate, polymethyl methacrylate, and polystyrene, natural resins, paper, synthetic paper, and the like; and compound materials that are obtained from the combination of the selected above-mentioned materials. It is preferable that a polyester film having tensile strength and heat resistance be used for the support layer 27. It is preferable that the thickness of the support layer 27 be about 25 μm.

[0046] Further, the following method may be used as a method of forming a transfer sheet of the hologram-magnetic recording layer 2 shown in Fig. 2. The method includes, for example, sequentially applying the release layer 26 and the passivation layer 25 on the support layer 27, applying a resin composition forming the hologram layer 24 so as to form the hologram forming portion 30, forming the metal reflective layer 23 by a deposition method, and sequentially applying the magnetic recording layer 22 and the adhesion layer 21. Accordingly, it is possible to form the transfer sheet of the hologram-magnetic recording layer 2 shown in Fig. 2. Meanwhile, the above-mentioned method is an example, and the method of forming a transfer sheet is not limited thereto. As long as the transfer sheet of the hologram-magnetic recording layer 2 shown in Fig. 2 is formed, any method may be used. In this exemplary embodiment, the total thickness of the passivation layer 25, the hologram layer 24, the metal reflective layer 23, and the magnetic recording layer 22 of the hologram-magnetic recording layer 2 of this exemplary embodiment is preferably 20 μm or less not to affect the magnetic recording.

[0047] According to this exemplary embodiment, the hologram-magnetic recording layer 2 where at least the magnetic recording layer 22, the metal reflective layer 23, and the hologram layer 24 are integrated is adhered to the card base member 1, so that the non-contact type IC card shown in Fig. 1 in which the hologram-magnetic recording layer 2 is formed on the card base member 1 is formed. Therefore, it is possible to form the hologram-magnetic recording layer 2, which forms a beautiful hologram and can perform mechanical information processing, on the surface of the non-contact type IC card.

[0048] Further, in general, if the antenna 12 of the non-contact type IC card is smaller than an antenna of a reader or a writer, it is possible to obtain larger energy from the antenna of the reader or the writer as an area of the antenna 12 of the non-contact type IC card becomes larger. Accordingly, to increase the communication distance of the non-contact type IC card or the electrical power consumption of the IC chip 13 of the non-contact type card, the opening area of the antenna 12 of the non-contact type IC card needs to be designed to be large.

[0049] For this reason, it is preferable that the antenna 12 of the non-contact type IC card according to this exemplary embodiment is disposed along the outline of the IC card for the sake of design. Therefore, as shown in Fig. 3, the hologram-magnetic recording layer 2 and the antenna 12 embedded in the card base member 1 are designed to overlap each other.

[0050] However, when the hologram-magnetic recording layer 2 and the antenna 12 embedded in the card base member 1 are designed to overlap each other as shown in Fig. 3, there are the following problems. If an electrostatic test is performed in compliance with a test method prescribed by "JIS X 6305-6:2001(ISO/IEC 10373-6:2001)" of JIS, the IC card cannot withstand static electricity of ±6 kV that is a prescribed value prescribed by 4.3.7 of "JIS X 6322-1:2001(ISO/IEC 14443-1:2000)". Further, if an electrostatic test is performed in compliance with a test method prescribed by "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" of JIS, the IC card cannot withstand static electricity of ±6 kV that is a prescribed value prescribed by 4.3.7 of "JIS X 6323-1:2001(ISO/IEC 15693-1:2000)".

[0051] Meanwhile, an electrostatic test prescribed by "JIS X 6305-6:2001(ISO/IEC 10373-6:2001)" or "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" is performed using an electrostatic discharge test circuit shown in Fig. 4.

[0052] First, an "insulation plate" having a thickness of 0.5 mm is disposed on a "conductive plate" placed on a wooden table, and the "non-contact type IC card" is disposed on the "insulation plate". Then, a "spherical probe", which is connected to an "ESD tester" and has a diameter of 8 mm, comes in contact with the "non-contact type IC card". Subsequently, after static electricity is discharged from the "ESD tester" to the "non-contact type IC card", the performance of the IC chip 13 of the non-contact type IC card is tested.

[0053] Meanwhile, the electrostatic discharge test shown in Fig. 4 is performed under the following conditions:

Charge storage capacitor: 150pF ± 10%
Discharge resistance: 330Ω ± 10%
Charge resistance: 50 to 100 MΩ
Rising time: 0.7 to 1 ns

[0054] First, as shown in Fig. 5, each of the surface and the back surface of the non-contact type IC card is divided into twenty regions in the form of a 4 × 5 matrix. After that, the static electricity of +6 kV is applied to the twenty regions on the surface of the non-contact type IC card in rotation, and the static electricity of -6 kV is then applied to the twenty regions. Subsequently, the same processes as described above are performed on the back surface of the non-contact type IC card. Meanwhile, numerals "1" to "20" shown in Fig. 5 indicate the regions divided on the card in the electrostatic discharge test.

IPR2025-00645 Page 02435

[0055] When the electrostatic test is performed using the electrostatic discharge test circuit shown in Fig. 4, the electrostatic discharge failure of the IC chip 13 embedded in the card base member 1 occurs. The reason for this is as follows. The hologram-magnetic recording layer 2 and the antenna 12 embedded in the card base member 1 overlap each other. Accordingly, when static electricity is discharged to the hologram-magnetic recording layer 2, discharge current flows into the antenna 12 overlapping the hologram-magnetic recording layer 2. Finally, the discharge current flowing into the antenna flows into the IC chip 13, so that excessive load is generated on the IC chip 13.

[0056] Meanwhile, the position where the hologram-magnetic recording layer 2 is disposed in the card base member 1 is determined by standards depending on the intended use of the card. For example, according to the standard of "JIS X 6302-2.2005(ISO/IEC 7811-2:2001)" or "JIS X 6302-6:2005(ISO/IEC 7811-6:2001)", a distance between the upper end of the non-contact type IC card and the front side of the hologram-magnetic recording layer 2 is determined by 5.54 mm to the maximum extent, and a distance between the upper end of the non-contact type IC card and the rear side of the hologram-magnetic recording layer 2 is determined by 11.89 mm to the minimum extent in the case of two tracks and determined by 15.95 mm to the minimum extent in the case of three tracks. Accordingly, when the antenna 12 is disposed in the card base member 1 to make the communication characteristic of the non-contact type IC card good, the hologram-magnetic recording layer 2 and the antenna 12 overlap each other as shown in Fig. 3.

[0057] For this reason, the present inventors tried to modify the non-contact type IC card in various ways in order to make the non-contact type IC card including the hologram-magnetic recording layer 2 shown in Figs. 1 and 3 meet the above-mentioned electrostatic test. As a result of enthusiastic studies, the present inventors found out from the experiment that the non-contact type IC card met the electrostatic test through the modification of the material of the metal reflective layer 23 of the hologram-magnetic recording layer 2. A relationship between a material, which may be used as the material of the metal reflective layer 23, and the electrostatic discharge failure of the IC chip 13 caused by the electrostatic test shown in Fig. 4 will be described below with reference to Fig. 6. Further, Fig. 6 shows measurement results representing a relationship between the electric conductivity of the material applied to the metal reflective layer 23 and the presence or absence of the electrostatic discharge failure of the IC chip 13 that is caused by the electrostatic test of the non-contact type IC card using the material.

[0058] Meanwhile, the measurement results shown in Fig. 6 are results that are obtained by performing the electrostatic test shown in Fig. 4 under a temperature condition of 20°C after a non-contact type IC card shown in Fig. 7 is manufactured.

[0059] Further, the non-contact type IC card shown in Fig. 7 is a card that is manufactured by using the following materials, being interposed between stainless plates having a thickness of 1 mm, and thermally compressed by a hot press.

[0060] Over sheet 17-1: CG030M: 50 μm (manufactured by Taihei Chemicals Limited)
Core sheet 16-1: PG700M: 125 μm (manufactured by Taihei Chemicals Limited)
Core sheet 16-2: PG700M: 200 μm (manufactured by Taihei Chemicals Limited)
IC module 15: RC-S935A (manufactured by Sony Corporation)
Core sheet 16-3: PG700M: 200 μm (manufactured by Taihei Chemicals Limited)
Core sheet 16-4: PG700M: 125 μm (manufactured by Taihei Chemicals Limited)
Over sheet 17-2: CG030M: 50 μm (manufactured by Taihei Chemicals Limited)
Meanwhile, a hologram-magnetic recording layer having a width of 8.4 mm was used as the hologram-magnetic recording layer 2, and was disposed at a position prescribed by a standard of "JIS X 6302-2:2005(ISO/IEC 7811-2:2001)" or "JIS X 6302-6:2005(ISO/IEC 7811-6:2001)".

[0061] The measurement results shown in Fig. 6 are results of the electrostatic discharge failure of the IC chip 13 when Ag, Cu, Al, Au, Zn, Co, Ni, In, Fe, Cr, Ti, and Sn are used as the material of the metal reflective layer 23 of the hologram-magnetic recording layer 2. As apparent from the measurement results shown in Fig. 6, it is identified that the electrostatic discharge failure of the IC chip 13 does not occur when Zn, Co, Ni, In, Fe, Cr, Ti, and Sn are used as the material of the metal reflective layer 23. Accordingly, if a material having an electric conductivity smaller than the electric conductivity (28.9×10^6/Ωm) of Au is used as the material of the metal reflective layer 23, the electrostatic discharge failure of the IC chip 13 does not occur.

[0062] For this reason, it is preferable that the metal reflective layer 23 of the hologram-magnetic recording layer 2 be made of a material having an electric conductivity smaller than 28.9×10^6/Ωm. Accordingly, it is possible to prevent the electrostatic discharge failure of the IC chip 13 that is embedded in the non-contact type IC card including the hologram-magnetic recording layer 2.

[0063] As described above, the non-contact type IC card according to this exemplary embodiment includes the hologram-magnetic recording layer 2 on the card base member 1, and the antenna 12 and the IC chip 13 connected to the antenna 12 are embedded in the card base member 1. Accordingly, even when the hologram-magnetic recording layer 2 and the antenna 12 are designed so as to overlap each other, if the metal reflective layer 23 of the hologram-magnetic recording layer 2 is made of a material having an electric conductivity smaller than 28.9×10^6/Ωm, the non-contact type IC card meets the standard of "JIS X 6322-1:2001(ISO/IEC 14443-1:2000)" even though an electrostatic test prescribed by "JIS × 6305-6:2001(ISO/IEC 10373-6:2001)" is performed. Further, even when an electrostatic test prescribed by "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" is performed, the non-contact type IC card meets the standard of "JIS X 6323-1:2001(ISO/IEC 15693-1:2000).

[0064] Meanwhile, from the measurement results shown in Fig. 6, Zn, Co, Ni, In, Fe, Cr, Ti, and Sn have been used as the material of the metal reflective layer 23 of the hologram-magnetic recording layer 2 of the non-contact type IC card according to the above-mentioned exemplary embodiment. However, as long as the electric conductivity of the material of the metal reflective layer 23 is smaller than 28.9×10^6/Ωm, it goes without saying that at least one of Zn, Co, Ni, In, Fe, Cr, Ti, and Sn may be used as the material of the metal reflective layer.

[0065] Further, it is preferable that Sn, Ti, Cr, In, and Zn be used as the material of the above-mentioned metal reflective layer 23. Considering manufacturing cost, chemical stability, and the like, it is preferable that Cr be used as the material of the metal reflective layer. Furthermore, considering concealability, it is preferable that Sn and Cr be used as the material of the metal reflective layer. For this reason, it is most preferable that Cr having low manufacturing cost, chemical stability, and concealability be used as the material of the metal reflective layer 23 of this exemplary embodiment.

(SECOND EXEMPLARY EMBODIMENT)

[0066] A non-contact type IC card according to a second exemplary embodiment will be described below.

[0067] A non-contact type IC card according to a second exemplary embodiment is characterized in that a metal reflective layer 23 of a hologram-magnetic recording layer 2 is formed to have a surface resistivity of 7.02(Ω/□) or more. Accordingly, even when an electrostatic test prescribed by "JIS X 6305-6:2001(ISO/IEC 10373-6:2001)" or "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" is performed and static electricity is discharged to the metal reflective layer 23, it is possible to limit discharge current that flows from the metal reflective layer 23 to an antenna 12. As a result, it is possible to prevent electrostatic discharge failure of an IC chip 13 embedded in the IC card. The non-contact type IC card according to the second exemplary embodiment will be described below with reference to Figs. 8 and 9.

[0068] The non-contact type IC card according to the second exemplary embodiment includes the same structure as the non-contact type IC card according to the first exemplary embodiment that is shown in Fig. 1. Meanwhile, the metal reflective layer 23 of the non-contact type IC card according to the first exemplary embodiment has been made of a material having an electric conductivity smaller than 28.9×10^6/Ωm. However, as long as the surface resistivity of the metal reflective layer 23 is 7.02(Ω/□) or more, the metal reflective layer 23 of the non-contact type IC card according to the second exemplary embodiment may be made of any material, for example, Al, Zn, Co, Ni, In, Fe, Cr, Ti, Sn, or various alloys thereof.

[0069] First, a relationship between the metal reflective layer 23 having a predetermined surface resistivity and the presence or absence of electrostatic discharge failure of the IC chip 13, which is caused by the electrostatic test shown in Fig. 4, will be described with reference to Fig. 8. Meanwhile, Fig. 8 shows

IPR2025-00645 Page 02436

measurement results showing a relationship between the metal reflective layer 23 having a predetermined surface resistivity and the presence or absence of electrostatic discharge failure of the IC chip 13 that is caused by an electrostatic test of the non-contact type IC card using the metal reflective layer 23.

[0070] Meanwhile, the measurement results shown in Fig. 8 are results that are obtained by performing the electrostatic test shown in Fig. 4 under a temperature condition of 20°C after a non-contact type IC card shown in Fig. 7 is manufactured.

[0071] Further, the non-contact type IC card shown in Fig. 7 is a card that is manufactured by using the following materials, being interposed between stainless plates having a thickness of 1 mm, and thermally compressed by a hot press.

[0072] Over sheet 17-1: CG030M: 50 μm (manufactured by Taihei Chemicals Limited)
Core sheet 16-1: PG700M: 125 μm (manufactured by Taihei Chemicals Limited)
Core sheet 16-2: PG700M: 200 μm (manufactured by Taihei Chemicals Limited)
IC module 15: RC-S935A (manufactured by Sony Corporation)
Core sheet 16-3: PG700M: 200 μm (manufactured by Taihei Chemicals Limited)
Core sheet 16-4: PG700M: 125 μm (manufactured by Taihei Chemicals Limited)
Over sheet 17-2: CG030M: 50 μm (manufactured by Taihei Chemicals Limited)

Meanwhile, a hologram-magnetic recording layer having a width of 8.4 mm was used as the hologram-magnetic recording layer 2, and was disposed at a position prescribed by a standard of "JIS X 6302-2:2005(ISO/IEC 7811-2:2001)" or "JIS X 6302-6:2005(ISO/IEC 7811-6:2001)".

[0073] Further, the "surface resistivity" shown in Fig. 8 is a value measured using a fall-of-potential method by applying a low voltage of 1 V to both ends of the metal reflective layer 23 of the hologram-magnetic recording layer 2, after Al is used as the material of the metal reflective layer 23 and the hologram-magnetic recording layer 2 is disposed on the card base member 1, as shown in Fig. 9. Furthermore, the "surface resistivity" is calculated by an equation "surface resistivity"=(V/I)×(W/L)

[0074] As apparent from the measurement results shown in Fig. 8, it is identified that the electrostatic discharge failure of the IC chip 13 does not occur when the hologram-magnetic recording layer 2 is formed using the metal reflective layer 23 having a surface resistivity of 7.02(Ω/□) or more.

[0075] For this reason, if the hologram-magnetic recording layer 2 is formed by using the metal reflective layer 23 having a surface resistivity of 7.02(Ω/□) or more, discharge current flowing from the metal reflective layer 23 to an antenna 12 is limited and the electrostatic discharge failure of the IC chip 13 embedded in the IC card does not occur, even though the hologram magnetic recording layer 2 is disposed at a position prescribed by a standard of "JIS X 6302-2:2005(ISO/IEC 7811-2:2001)" or "JIS X 6302-6:2005(ISO/IEC 7811-6:2001)" so as to form the non-contact type IC card, an electrostatic test prescribed by "JIS X 6305-6:2001(ISO/IEC 10373-6:2001)" or "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" is performed, and static electricity is discharged to the metal reflective layer 23.

[0076] As described above, the non-contact type IC card according to the second exemplary embodiment includes the hologram-magnetic recording layer 2 on the card base member 1, and the antenna 12 and the IC chip 13 connected to the antenna 12 are embedded in the card base member 1. Accordingly, even when the hologram-magnetic recording layer 2 and the antenna 12 are designed to overlap each other, if the metal reflective layer 23 of the hologram-magnetic recording layer 2 is formed to have a surface resistivity of 7.02(Ω/□) or more, the non-contact type IC card meets the standard of "JIS X 6322-1:2001(ISO/IEC 14443-1:2000)" even though an electrostatic test prescribed by "JIS X 6305-6:2001(ISO/IEC 10373-6:2001)" is performed. Further, even though an electrostatic test prescribed by "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)" is performed, the non-contact type IC card meets the standard of "JIS X 6323-1:2001(ISO/IEC 15693-1:2000).

[0077] Meanwhile, as apparent from the measurement results shown in Fig. 8, as long as the metal reflective layer 23 of the hologram-magnetic recording layer 2 of the above-mentioned second exemplary embodiment is formed to have a surface resistivity of 7.02(Ω/□) or more, the metal reflective layer may be made of any material. For example, at least one of Al, Zn, Co, Ni, In, Fe, Cr, Ti, and Sn may be used as the material of the metal reflective layer 23.

[0078] Considering workability, manufacturing cost, and the like, it is preferable that Al be used as the material of the metal reflective layer 23. Furthermore, considering concealability, it is preferable that Al, Sn, and Cr be used as the material of the metal reflective layer. For this reason, it is most preferable that Al having workability, low manufacturing cost, and concealability be used as the material of the metal reflective layer 23 of the second exemplary embodiment.

[0079] The above-mentioned exemplary embodiments are preferred exemplary embodiments of the present invention. Accordingly, the present invention is not limited to the exemplary embodiments, and various modifications may be made thereto without departing from the scope and spirit of the present invention.

[0080] For example, as long as the hologram-magnetic recording layer 2 of the non-contact type IC card according to the above-mentioned exemplary embodiment includes at least the magnetic recording layer 22, the metal reflective layer 23, and the hologram layer 24, the hologram-magnetic recording layer 2 is not particularly limited and may be formed in any layer structure.

INDUSTRIAL APPLICABILITY

[0081] The non-contact type IC card according to the present invention may be applied to information recording media that perform non-contact communication, such as commutation tickets and coupon ticket for various means of communication, a telephone card, an admission card for a specified region, an ID card, a license, cards used for Japanese pinball, an amusement park, and a movie theater, and a credit card.

BRIEF DESCRIPTION OF THE DRAWINGS

[0082] Fig. 1 is a view showing the structure of a non-contact type IC card according to an exemplary embodiment of the present invention.
Fig. 2 is a view showing the structure of a hologram-magnetic recording layer 2 that is included in the non-contact type IC card according to the exemplary embodiment.
Fig. 3 is a view showing a positional relationship between an antenna 12 and the hologram-magnetic recording layer 2 of the non-contact type IC card according to the exemplary embodiment.
Fig. 4 is a view showing the structure of a circuit used for an electrostatic test that is prescribed by "JIS X 6305-6:2001(ISO/IEC 10373-6:2001)" or "JIS X 6305-7:2001(ISO/IEC 10373-7:2001)".
Fig. 5 is a view showing divided regions that are formed on the card in an electrostatic discharge test, and a view showing that each of the surface and the back surface of the non-contact type IC card is divided into twenty regions in the form of a 4 × 5 matrix.
Fig. 6 is a view showing a relationship between a material that may be used as the material of a metal reflective layer 23, and the electrostatic discharge failure of an IC chip 13 that is caused by an electrostatic test of the non-contact type IC card using the material.
Fig. 7 is a view showing a non-contact type IC card used when measurement results shown in Figs. 6 and 8 are applied.
Fig. 8 is a view showing a relationship between a metal reflective layer 23 having a predetermined surface resistivity and the presence or absence of electrostatic discharge failure of an IC chip 13 that is caused by an electrostatic test of the non-contact type IC card using the metal reflective layer 23.
Fig. 9 is a view illustrating a method of measuring the "surface resistivity" shown in Fig. 8.

DESCRIPTION OF REFERENCE NUMERALS

[0083]
1
CARD BASE MEMBER
2
HOLOGRAM-MAGNETIC RECORDING LAYER
11
ANTENNA SUBSTRATE
12

IPR2025-00645 Page 02437

ANTENNA PATTERN

13

IC CHIP

14

ADHESIVE

15

IC MODULE

16

CORE SHEET

17

OVER SHEET

21

ADHESION LAYER

22

MAGNETIC RECORDING LAYER

23

METAL REFLECTIVE LAYER

24

HOLOGRAM LAYER

25

PASSIVATION LAYER

26

RELEASE LAYER

27

SUPPORT LAYER

30

HOLOGRAM FORMING PORTION

Patent Citations (19)

Publication number	Priority date	Publication date	Assignee	Title
DE4242407A1 *	1992-02-29	1993-09-02	Kurz Leonhard Fa	Hot pressed credit card with metal security insert - has insert separated from magnetic recording strip by thin barrier layer of plastic
EP0604943A1 *	1992-12-28	1994-07-06	Toppan Printing Co., Ltd.	Monochromatic-light reproduction type hologram, and method and apparatus for its image reproduction
US5379131A *	1991-12-11	1995-01-03	Dai Nippon Printing Co., Ltd.	Method of preventing forgery of diffraction grating pattern and forgery-proof diffraction grating pattern recording structure
Family To Family Citations				
JPH0789414B2 *	1986-01-31	1995-09-27	シャープ株式会社	Optical storage element
JP2647877B2 *	1987-12-26	1997-08-27	シャープ株式会社	Magneto-optical card recording / reproducing device
EP0541818B1 *	1991-05-22	1997-12-03	Kyodo Printing Co., Ltd.	Non-contact type ic card
JP3198183B2	1993-02-02	2001-08-13	株式会社シェーシーダー	Plastic card with magnetic stripe
JPH11353447A	1998-06-10	1999-12-24	Toppan Printing Co Ltd	ic card, ic module, and their manufacture
JPH11353442A	1998-06-11	1999-12-24	Toppan Printing Co Ltd	Noncontact type ic card containing reversible thermal recording layer
US7715095B2 *	1999-11-03	2010-05-11	Steven Allen Carlson	Reflective organic layers
KR100460468B1 *	2000-02-03	2004-12-08	후지사끼소 가부시끼 가이샤	Transfer Film, Method for Forming Metal Back Layer, and Image Display
JP2003085525A *	2001-09-13	2003-03-20	Konica Corp	ic card, and card authentication method
TWI245285B *	2002-02-13	2005-12-11	Mitsubishi Chem Corp	Rewritable optical recording medium and optical recording method
US7140540B2 *	2002-05-08	2006-11-28	Lasercard Corporation	Method of making secure personal data card
JP2005053091A	2003-08-05	2005-03-03	Oike Ind Co Ltd	Transfer foil

IPR2025-00645 Page 02438

TW200514076A *	2003-09-25	2005-04-16	Ricoh Co Ltd	Optical recording medium
US20050104509A1 *	2003-11-19	2005-05-19	Fuji Photo Film Co., Ltd.	Electroluminescent device
JP2005222277A	2004-02-05	2005-08-18	Toppan Printing Co Ltd	Information recording medium
US20080223855A1 *	2005-10-19	2008-09-18	Clearwave Ltd.	Microwave Oven Window

* Cited by examiner, † Cited by third party

Non-Patent Citations (1)

Title
See also references of WO2007058179A1 *

* Cited by examiner, † Cited by third party

Cited By (16)

Publication number	Priority date	Publication date	Assignee	Title
EP2164032A1 *	2008-09-15	2010-03-17	Hueck Folien Ges.m.b.H.	Manipulation-proof RFID antenna with safety feature
Family To Family Citations				
US7588178B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
AU2008206044B2 *	2007-01-19	2012-09-27	Visa U.S.A. Inc.	Methods of performing electrostatic discharge testing on a payment card
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
EP2401708A4 *	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
WO2011081563A1 *	2009-12-30	2011-07-07	Aibazov Oleg Umarovich	Payment card
KR101636140B1	2010-09-29	2016-12-14	삼성전자 주식회사	Semiconductor chip package
US8485447B1 *	2010-11-24	2013-07-16	Pap Investments, Ltd.	Thin gage open loop system cards and method of manufacture
US8659300B2 *	2010-12-15	2014-02-25	International Business Machines Corporation	Stress testing of silicon-on-insulator substrates using applied electrostatic discharge
JP6081379B2	2011-03-04	2017-02-15	ビザ・インターナショナル・サービス・アソシエイションVisa International Service Association	Payment card system and method
EP2748771A1 *	2011-08-26	2014-07-02	Identive Group, Inc.	Card lamination
KR101317894B1 *	2012-02-27	2013-10-16	에이큐 주식회사	Ferrite substrate for antenna, antenna module and the manufacturing method of the same
US9064195B2 *	2012-06-29	2015-06-23	Dynamics Inc.	Multiple layer card circuit boards
US10438895B1 *	2018-06-08	2019-10-08	American Semiconductor, Inc.	Flexible micro-module

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
US7931203B2	2011-04-26	Non-contact type IC card

IPR2025-00645 Page 02439

EP2015232A1	2009-01-14	Noncontact ic card
US8295786B2	2012-10-23	Magnetic sheet, method for producing the magnetic sheet, antenna, and portable communication device
RU2281742C2	2005-05-10	Non-contact or combined contact-non-contact chip-card
JP3478281B2	2003-12-15	IC card
US5837367A	1998-11-17	Memory card and method of producing same
JP4029681B2	2008-01-09	IC chip assembly
CN101310293A	2008-11-19	Noncontact IC card
JP2002373319A	2002-12-26	Non-contact data carrier package, and antenna magnetic core for non-contact data carrier used therefor
JP4800024B2	2011-10-26	Non-contact IC card
JP4969198B2	2012-07-04	Non-contact IC card
JP4825522B2	2011-11-30	IC card, inlet sheet, and IC card manufacturing method
JP2007157087A	2007-06-21	Non-contact ic card
JP2006091964A	2006-04-06	Double-sided non-contact ic sheet
JP4531473B2	2010-08-25	Information carrier
JP4701860B2	2011-06-15	Conductive transfer foil and IC card using the same
JP4822781B2	2010-08-11	Information carrier
JP2002304613A	2002-10-18	Non-contact type ic card and its manufacturing method
JP2006209734A	2006-08-10	Communication circuit holder
JP2003288567A	2003-10-10	Rf-id media
JPH11139054A	1999-05-25	Non-contact ic card
EP0823097B1	1998-12-23	Memory card and method of producing same
JP4777015B2	2011-09-21	Communication circuit holder
JP2000048151A	2000-02-18	Non-contact ic card
JP4713126B2	2011-06-29	Non-contact IC card

Priority And Related Applications

Priority Applications (4)

Application	Priority date	Filing date	Title
JP2005331965		2005-11-16	
JP2005355448A	2005-12-08	2005-12-08	Non-contact IC card
JP2006282819A	2005-11-16	2006-10-17	Non-contact IC card
PCT/JP2006/322677	2005-11-16	2006-11-14	Noncontact ic card

Legal Events

Date	Code	Title	Description
2008-07-18	PUAI	Public reference made under article 153(3) epc to a published international application that has entered the european phase	**Free format text:** ORIGINAL CODE: 0009012
2008-08-20	AK	Designated contracting states	**Kind code of ref document:** A1 **Designated state(s):** DE
2008-08-20	17P	Request for examination filed	**Effective date:** 20080618

IPR2025-00645 Page 02440

2009-12-02	A4	Supplementary search report drawn up and despatched	**Effective date:** 20091102
2009-12-02	RIC1	Information provided on ipc code assigned before grant	**Ipc:** G06K 19/08 20060101ALI20091027BH **Ipc:** G06K 19/07 20060101ALI20091027BH **Ipc:** B42D 15/10 20060101ALI20091027BH **Ipc:** G06K 19/16 20060101ALI20091027BH **Ipc:** G06K 19/077 20060101AFI20070718BH **Ipc:** G06K 19/073 20060101ALI20091027BH
2010-01-27	17Q	First examination report despatched	**Effective date:** 20091230
2011-11-04	GRAP	Despatch of communication of intention to grant a patent	**Free format text:** ORIGINAL CODE: EPIDOSNIGR1
2011-12-07	RBV	Designated contracting states (corrected)	**Designated state(s):** DE
2011-12-07	DAX	Request for extension of the european patent (deleted)	
2012-08-24	STAA	Information on the status of an ep patent application or granted ep patent	**Free format text:** STATUS: THE APPLICATION IS DEEMED TO BE WITHDRAWN
2012-09-19	18D	Application deemed to be withdrawn	**Effective date:** 20120328
2012-09-26	R18D	Application deemed to be withdrawn (corrected)	**Effective date:** 20120328

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

Patents cn100527159C

Storage card and terminal equipment combining storage card

Abstract

This invention provides a storage card with the RF identifying function including a storage unit and a storage card interface interacting stored data of the storage unit with outside devices, in which, data of the storage unit include RF identification matched information, the card also includes: a RF identification function unit connected with the storage unit used in RF identification after configuring information based on the RF identification configured information stored in the storage unit, besides, this invention provides a terminal device combining with said card.

Classifications

G06K19/0723 Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards also with resonating or responding marks without active components with integrated circuit chips the record carrier comprising an arrangement for non-contact communication, e.g. wireless communication circuits on transponder cards, non-contact smart cards or RFIDs

View 2 more classifications

CN100527159C

China

Download PDF Find Prior Art Similar

Other languages: Chinese

Inventor: 李劲, 杨芳

Current Assignee : Huawei Device Co Ltd

Worldwide applications

2005 CN 2006 CN WO 08 GE EP

Application CNB200510100762XA events

2005-10-31	Application filed by Shenzhen Huawei Communication Technologies Co Ltd
2005-10-31	Priority to CNB200510100762XA
2006-11-08	Publication of CN1858778A
2009-08-12	Application granted
2009-08-12	Publication of CN100527159C
Status	Active
2025-10-31	Anticipated expiration

Info: Patent citations (14), Cited by (17), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (14)

Hide Dependent

1. storage card, include storage unit and with the memory card interface of external unit data that mutual storage unit is stored, it is characterized in that, data that storage unit is stored include radio-frequency (RF) identification standard protocol configuration information, described radio-frequency (RF) identification standard protocol configuration information is stored so that the configuration management operation of the accurate agreement of radio frequency identification marking is discerned and carried out to external unit with the form of radio-frequency (RF) identification configuration virtual file in storage unit, described radio-frequency (RF) identification standard protocol configuration information can be operated by external unit by memory card interface, and described storage card also comprises:

The radio frequency recognition function unit links to each other with described storage unit, is used for carrying out radio-frequency (RF) identification after described radio-frequency (RF) identification standard protocol configuration information according to described cell stores is configured.

2. storage card according to claim 1 is characterized in that, described radio frequency recognition function unit is the radio-frequency (RF) identification reader unit.

3. storage card according to claim 2 is characterized in that, described radio-frequency (RF) identification reader unit comprises:

Codec unit is used for according to radio-frequency (RF) identification agreement card-reading function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

4. storage card according to claim 3 is characterized in that, described radio frequency identification signal Transmit-Receive Unit is a coupled antenna.

5. storage card according to claim 1 is characterized in that, described radio frequency recognition function unit is the radio-frequency (RF) identification sensor unit.

6. storage card according to claim 5 is characterized in that, described radio-frequency (RF) identification sensor unit comprises:

Codec unit is used for according to radio-frequency (RF) identification agreement inducing function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

7. the terminal device of a combining memory card, described storage card include storage unit and with the memory card interface of terminal device data that mutual storage unit is stored, it is characterized in that, data that storage unit is stored include radio-frequency (RF) identification standard protocol configuration information, described radio-frequency (RF) identification standard protocol configuration information is stored so that the configuration management operation of the accurate agreement of radio frequency identification marking is discerned and carried out to terminal device with the form of radio-frequency (RF) identification standard protocol configuration virtual file in storage unit, described radio-frequency (RF) identification standard protocol configuration information can be by being operated by terminal device with the memory card interface of terminal device, and described storage card also comprises:

The radio frequency recognition function unit links to each other with described storage unit, is used for carrying out radio-frequency (RF) identification after described radio-frequency (RF) identification standard protocol configuration information according to described cell stores is configured.

8. the terminal device of combining memory card according to claim 7 is characterized in that, described radio frequency recognition function unit is the radio-frequency (RF) identification reader unit.

9. the terminal device of combining memory card according to claim 8 is characterized in that, described radio-frequency (RF) identification reader unit comprises:

Codec unit is used for according to radio-frequency (RF) identification agreement card-reading function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

10. the terminal device of combining memory card according to claim 9 is characterized in that, described radio frequency identification signal Transmit-Receive Unit is a coupled antenna.

11. the terminal device of combining memory card according to claim 7 is characterized in that, described radio frequency recognition function unit is the radio-frequency (RF) identification sensor unit.

12. the terminal device of combining memory card according to claim 11 is characterized in that, described radio-frequency (RF) identification sensor unit comprises:

Codec unit is used for according to radio-frequency (RF) identification agreement inducing function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

13. the terminal device according to each described combining memory card of claim 7-12 is characterized in that, described terminal device is the hand-held terminal device with external memory card interface.

14. the terminal device of combining memory card according to claim 13 is characterized in that, described hand-held terminal device with external memory card interface is mobile phone, digital camera, MP3, PDA or DV.

Description

The terminal device of storage card and combining memory card

Technical field

The present invention relates to radio frequency identification equipment, in particular, the present invention relates to have the terminal device of radio frequency recognition function.

Background technology

Radio-frequency (RF) identification (Radio Frequency Identification, RFID), being commonly called as electronic tag, is that a kind of radiofrequency signal of utilizing realizes that by space coupling (alternating magnetic field or electromagnetic field) contactless information transmission and the information of passing through to be transmitted reach the technology of identifying purpose.

With reference to shown in Figure 1, radio frequency identification equipment is made up of three parts usually:

Label (Tag): be made up of coupling element and chip, each label has unique electronic code, attached to being used to identify destination object on the object;

Reader (Reader): read the equipment of (sometimes also can write) label information, can be designed to hand-held or fixed;

Antenna (Antenna): between label and reader, transmit radiofrequency signal.

The basic functional principle of RFID is also uncomplicated: after label enters magnetic field, rely on it will be stored in product information (Passive Tag on the label by the energy that induction current obtained, passive label or passive label) send, perhaps initiatively send the signal (ActiveTag, active label or active tag) of a certain frequency by label self, information on the reader reading tag, and this information decoded is delivered to it CIS at last and is carried out relevant data and handle.As a kind of contactless automatic identification technology, radio-frequency (RF) identification need not manual intervention, this technology has the not available waterproof of bar code, antimagnetic, high temperature resistant, long service life, read that distance is big, label data is encrypted, the storage data capacity reaches the canned data change greatly and waits advantage freely, and therefore current a lot of fields such as logistics and supplies management, aviation luggage are handled, mail/fast freight parcel is handled, gate inhibition's control/electronic entrance ticket or the like is all brought into use RFID.

IPR2025-00645 Page 02443

Can make terminal device have radio frequency recognition function by the expansion prior terminal, a kind of prior art that makes communication terminal have radio frequency recognition function please refer to U.S. Patent Application Publication No. 20050086285, " Mobile communication terminal with RFID function and RFIDprogramming method in the same " (communication terminal) with RFID function and RFID programmed method, this patent is that Korea S Samsung applied on October 28th, 2003, the technical scheme that patent disclosed is: a kind of communication terminal, this terminal comprises the radio frequency identification signal receiver, is used to receive the radio frequency identification signal that exists with first kind of form; One conversion equipment, the radio frequency identification signal that is used for existing with first kind of form convert second kind of form to; Memory storage is used to store the radio frequency identification signal that exists with second kind of form; Scrambler is used for the radio frequency identification signal of memory storage is encoded; Demoder is used for the radio frequency identification signal decoding from scrambler output; Conveyer is used for decoded radio frequency identification signal is sent to reader.

In the prior art that above-mentioned patent is described, by the RFID module is directly embedded into the purpose that can reach the terminal extension radio frequency recognition function in the communication terminal, but also there is following shortcoming:

At first, do not comprise the RFID module in most communication terminals of selling on the market at present, so if the user wants to make the portable terminal of oneself to have the RFID function, only way is to buy the communication terminal that is built-in with the RFID module in addition, such terminal price is comparatively expensive, increase consumer's purchase cost, also reduced the competitiveness of product in market virtually;

Secondly, for the developer of communication terminal,, also will improve developer's construction cycle and cost of development undoubtedly for product adds new function;

Once more, the RFID standard is various, and the RFID of various criterion requires also to be not quite similar, and different developers adopts different RFID standards to develop the mobile communication product of oneself, makes that RFID's between the different portable terminals is compatible relatively poor;

Once more, prior art is only considered extensive radio frequency recognition function on communication terminal, and application is comparatively narrow.

Summary of the invention

The technical matters that the present invention solves provides a kind of storage card with radio frequency recognition function and in conjunction with the terminal device of described storage card, with lower cost, the radio frequency recognition function of compatible terminal extension equipment preferably, meets the need of market.

For addressing the above problem, storage card of the present invention, include storage unit and with the memory card interface of external unit data that mutual storage unit is stored, wherein data that storage unit is stored include the radio-frequency (RF) identification configuration information, described storage card also comprises:

The radio frequency recognition function unit links to each other with described storage unit, is used for carrying out radio-frequency (RF) identification after described radio-frequency (RF) identification configuration information according to described cell stores is configured.

Alternatively, described radio frequency recognition function unit is the radio-frequency (RF) identification reader unit.

Wherein, described radio-frequency (RF) identification reader unit can comprise:

Codec unit is used for according to radio-frequency (RF) identification agreement card-reading function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal

Wherein, described radio frequency identification signal Transmit-Receive Unit can be pickup coil.

Alternatively, described radio frequency recognition function unit is the radio-frequency (RF) identification sensor unit.

Wherein, described radio-frequency (RF) identification sensor unit comprises:

Codec unit is used for according to radio-frequency (RF) identification agreement inducing function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

Accordingly, the terminal device of a kind of combining memory card provided by the invention, described storage card include storage unit and with the memory card interface of terminal device data that mutual storage unit is stored, wherein data that storage unit is stored include the radio-frequency (RF) identification configuration information, and described storage card also comprises:

The radio frequency recognition function unit links to each other with described storage unit, is used for carrying out radio-frequency (RF) identification after described radio-frequency (RF) identification configuration information according to described cell stores is configured.

Alternatively, described radio frequency recognition function unit can be the radio-frequency (RF) identification reader unit.

Wherein, described radio-frequency (RF) identification reader unit comprises:

Codec unit is used for according to radio-frequency (RF) identification agreement card-reading function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

Wherein, described radio frequency identification signal Transmit-Receive Unit can be pickup coil.

IPR2025-00645 Page 02444

Alternatively, described radio frequency recognition function unit is the radio-frequency (RF) identification sensor unit.

Wherein, described radio-frequency (RF) identification sensor unit comprises:

Codec unit is used for according to radio-frequency (RF) identification agreement inducing function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

Wherein, described terminal device is the hand-held terminal device with external memory card interface.

Alternatively, described hand-held terminal device with external memory card interface can be mobile phone, digital camera, MP3, PDA or DV.

Compared with prior art, the present invention has following beneficial effect:

At first, the present invention expands the radio frequency recognition function of handheld device indirectly by storage card, if the user wants to make the handheld device of oneself to have radio frequency recognition function, only needing to buy the storage card with radio frequency recognition function of the present invention also gets final product this storage card insertion handheld device, the handheld device that need not more renew greatly reduces user's purchase cost;

Secondly, for the developer of handheld device, need not prolong the construction cycle of oneself for add new function on handheld device, cost of development can not improve yet yet;

Once more, storage card can arbitrarily be changed, the user can make the handheld device of oneself compatible mutually with the handheld device that satisfies other RFID standard, and also making the application of RFID expand all to, the present invention has in the hand-held terminal device product of memory card interface, as long as this hand-held terminal device has memory card interface, the user just can the described storage card with radio frequency recognition function of the application of the invention expands the RFID function of its handheld device, and is very convenient.

Description of drawings

Fig. 1 is that radio-frequency recognition system constitutes synoptic diagram.

Fig. 2 is a storage card inner structure synoptic diagram of the present invention.

Fig. 3 is a handheld device of the present invention operating system software level synoptic diagram.

Fig. 4 is a handheld device radio frequency identification signal processing flow chart of the present invention

Embodiment

Development along with mechanics of communication, storage card more and more is applied on handheld device such as digital camera, smart mobile phone, MP3, PDA, the DV, by some certain functional modules is embedded in the storage card, the storage card that will have this specific function again combines with handheld device, can reach the purpose of the new function of expansion handheld device.

Fig. 2 is a kind of inner structure synoptic diagram of storage card of the present invention, and master controller 13 itself has certain storage space as the control device of storage card, can be used as cell stores information.Among the present invention, the information spinner that is stored in master controller 13 will comprise storage card configuration information, radio-frequency (RF) identification standard, radio frequency identification data and other necessary radio-frequency (RF) identification configuration information in the radio-frequency (RF) identification communication process.As required, in master controller 13, can write different radio-frequency (RF) identification standards, will well solve the problem of radio-frequency (RF) identification poor compatibility between the different product like this.Storage card is connected with external unit by memory card interface 10; Power supply 11 obtains electric energy from memory card interface 10, gives other circuit supply in the storage card.Contain a radio frequency recognition function unit 12 in the storage card of the present invention, described radio frequency recognition function unit 12 can be used as the radio-frequency (RF) identification reader unit, also can be used as the radio-frequency (RF) identification sensor unit, as a kind of embodiment, as shown in Figure 2, when this rfid uint 12 is radio-frequency (RF) identification functions of card reader unit, specifically can comprise:

Codec unit is used for according to radio-frequency (RF) identification agreement card-reading function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

Same principle when rfid uint is radio-frequency (RF) identification inductor functional unit, can comprise among the present invention equally:

Codec unit is used for according to radio-frequency (RF) identification agreement inducing function encoding and decoding radio frequency identification data;

Modem module links to each other with described codec unit, is used to modulate described radio frequency identification data and is corresponding radio frequency identification signal or radio frequency identification signal is demodulated into corresponding radio frequency identification data;

The radio frequency identification signal Transmit-Receive Unit links to each other with described modem module, is used to receive and dispatch described radio frequency identification signal.

Need explanation, in specific implementation, the pickup coil that described radio frequency identification signal Transmit-Receive Unit can coil form or other can be realized the device of radio frequency identification signal transmitting-receiving, owing to be prior art, are not described in detail here.

Master controller 13 can be by the relevant information in memory card interface 10 receptions or the transmission radio-frequency (RF) identification communication process among the present invention, if master controller 13 receives the information that is sended over by miscellaneous equipment, master controller 13 is at first issued codec with the information that receives, the information that codec is received according to the radio-frequency (RF) identification standard butt joint that writes in the master controller 13 is encoded, after modulation, information is sent by radio frequency identification signal Transmit-Receive Unit 12.As mentioned above,

IPR2025-00645 Page 02445

described storage card can be connected with other hand-held terminal device by memory card interface 10, as long as have the interface that inserts storage card on this hand-held terminal device, can realize the read-write control of handheld device to the driver of storage card to storage card by in the operating system of handheld device, installing.

Concrete application with handheld device describes below, and Fig. 3 is a handheld device of the present invention operating system software level synoptic diagram.As seen from Figure 3, comprised in the operating system of handheld device that the interface to handheld device drives, in the lower floor that this handheld device interface drives then is that memory card interface drives, therefore the operating system of handheld device has guaranteed that handheld device can operate the storage card that inserts on it, such operation comprises storing reading of data in the storage card, also the data of handheld device can be write storage card.At this moment, the storage card that inserts handheld device is equivalent to an addressable space that is mapped to the handheld device file system to handheld device, and handheld device can realize read-write operation to storage card by the driving on its operating system.Can also see that from Fig. 3 comprise a RFID virtual file on the memory card operating system, by this RFID virtual file, handheld device can realize the visit of rfid uint in the storage card and configuration.Handheld device makes that to the configuration of rfid uint the radio frequency identification data on the storage card is not unalterable, but data that can real-time update.

Operating system shown in Figure 3 operates mainly in (on the storage card of extended RFID) on the functional module.For the handheld device realization of reality and the storage card formats that matches with it, the operating system of handheld device itself has realized the driving to storage card.The Storage Card Drivers interface, this module realizes the transparent access of module to upper layer module shielding storage card feature.This part software is normally finished when carrying out software development by the handheld device developer, has considered compatibility in exploitation, can the storage card that handheld device had be provided support.For handheld device operating system, storage card as the part of handheld device operating system software file, to the visit of storage card, has been exactly the visit to the storage card file.By such method, avoided writing software-driven and application interface separately at every kind of host software system.

Fig 4 is a handheld device radio frequency identification signal processing flow chart of the present invention, and handheld device realizes the radio frequency recognition function expansion of himself by the control to storage card.Radio frequency identification signal is sent in the handheld device by storage card through the RFID receiving trap, and the data after handling through handheld device are returned along former road again, after the RFID dispensing device sends, finish the overall process of handheld device radio frequency recognition function.

The above only is a preferred implementation of the present invention; should be pointed out that for those skilled in the art, under the prerequisite that does not break away from the principle of the invention; can also make some improvements and modifications, these improvements and modifications also should be considered as protection scope of the present invention.

Patent Citations (14)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US5629981A *	1994-07-29	1997-05-13	Texas Instruments Incorporated	Information management and security system
US6014724A *	1995-10-27	2000-01-11	Scm Microsystems (U.S.) Inc.	Flash translation layer block indication map revision system and method
EP1339032B1 *	1998-08-14	2007-10-17	3M Innovative Properties Company	Applications for radio frequency identification systems
US6617962B1 *	2000-01-06	2003-09-09	Samsys Technologies Inc.	System for multi-standard RFID tags
CN1235227C *	2001-07-31	2006-01-04	台均实业有限公司	Portable readable and writable memory with USB interface and its data management method
KR20050040451A *	2003-10-28	2005-05-03	삼성전자주식회사	Mobile terminal equipment having radio frequency identification function and programming method thereof
US7218766B2 *	2003-11-17	2007-05-08	Dpd Patent Trust Ltd	Multi-interface compact personal token apparatus and methods of use
KR100566260B1 *	2003-11-27	2006-03-29	삼성전자주식회사	Mobile terminal integrated with a radio frequency identification transponder and smart card and radio frequency identification method thereof
CN100555302C *	2004-03-31	2009-10-28	深圳市朗科科技股份有限公司	Data read-write equipment and method based on radio frequency identification system
JP4599081B2 *	2004-04-05	2010-12-15	ルネサスエレクトロニクス株式会社	Memory card adapter and memory card
KR100596410B1 *	2004-11-04	2006-07-03	한국전자통신연구원	SD memory card for extension of function
US20060279413A1 *	2005-03-28	2006-12-14	Sirit Technologies, Inc.	Radio frequency identification device
EP1929425B1 *	2005-08-25	2014-11-05	IDtek Track-and-Trace S.A.	Element combining a usb key and an rfid reader
CN100527159C *	2005-10-31	2009-08-12	深圳华为通信技术有限公司	Storage card and terminal equipment combining storage card

* Cited by examiner, † Cited by third party

Cited By (17)

IPR2025-00645 Page 02446

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
CN100527159C *	2005-10-31	2009-08-12	深圳华为通信技术有限公司	Storage card and terminal equipment combining storage card
CN101438291B	2006-04-24	2012-11-21	Cypak股份公司	Device and method for identification and authentication
US7966355B2 *	2007-02-13	2011-06-21	Modu Ltd.	Interface for extending functionality of memory cards
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
WO2009131985A2 *	2008-04-21	2009-10-29	Inncom International Inc	Smart wall box
US8364319B2 *	2008-04-21	2013-01-29	Inncom International Inc.	Smart wall box
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
JP5234830B2 *	2010-03-15	2013-07-10	オムロン株式会社	Tag communication device, tag communication device control method, and tag communication device control program
DE102010041745A1	2010-09-30	2012-04-19	Bundesdruckerei Gmbh	Method for reading an RFID token, RFID card and electronic device
WO2012140249A1 *	2011-04-14	2012-10-18	Yubico Ab	A dual interface device for access control and a method therefor
CN102810175B *	2011-06-24	2015-11-04	深圳光启高等理工研究院	A kind of SD card and radio-frequency recognition system thereof
CN103729662A *	2012-10-15	2014-04-16	成都芯昊芯科技有限公司	Electronic tag reader-writer and electronic tag information identification system
FR3035252B1	2015-04-14	2017-04-28	Stmicroelectronics (Rousset) Sas	METHOD FOR MANAGING INFORMATION COMMUNICATION BETWEEN AN NFC CONTROLLER AND A SECURE ELEMENT IN AN APPARATUS, AND CORRESPONDING NFC APPARATUS AND CONTROLLER

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
CN100527159C	2009-08-12	Storage card and terminal equipment combining storage card
KR100584328B1	2006-05-26	Mobile Terminal Circuit Integrated With A Radio Frequency Identification Transponder And Radio Frequency Identification Method Thereof
CN103210597B	2016-03-02	Transponder, rfid system and method for operation
JP3993187B2	2007-10-17	Mobile communication terminal having radio frequency identification function and radio frequency identification programming method in the mobile communication terminal
US20060279413A1	2006-12-14	Radio frequency identification device
US9342776B2	2016-05-17	Method for storing data as well as transponder, a read/write-device, a computer readable medium including a program element and such a program element adapted to perform this method
WO2016011971A1	2016-01-28	Double-frequency multi-protocol multifunctional near field communication integrated system and application method
CN101237690A	2008-08-06	Dual interface SIM card
KR101367342B1	2014-02-28	Smart wireless Charging System having NFC Function
KR20040028834A	2004-04-03	Rfid tag reader/writer system using mobile communication unit
CN101833740A	2010-09-15	Electric power asset life cycle data management method based on RFID technology
KR20070027156A	2007-03-09	Usb memory having smart card and usb smart card reader chip
JP2001155120A	2001-06-08	Portable terminal with rfid reader/writer

KR101549531B1	2015-09-02	/ reader/writer communication processing device communication processing method data management system and communication system
Homby	1999	RFID solutions for the express parcel and airline baggage industry
KR20120005229A	2012-01-16	Method for supporting different types of uicc cards and terminal therefor
RU2713864C1	2020-02-07	Combined sensor rfid-label
JP2004094561A	2004-03-25	Ic card
KR20070058366A	2007-06-08	Apparatus for operating control of rfid
CN101101633A	2008-01-09	Electronic tag scanning method and system
KR100701124B1	2007-03-28	RFID devices and system for integrated wireless terminal
KR100779465B1	2007-11-26	Terminal with integrated rf card control and connecting internet function
Ferreira et al.	2018	Prototype for Consultation Cloud IoT Supported Medical Records on RFID Technology
US20110304440A1	2011-12-15	Rfid devices using a common master clock and methods thereof
KR20070027155A	2007-03-09	Smart card having usb smart card reader chip

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
CNB2005101007762XA	2005-10-31	2005-10-31	Storage card and terminal equipment combining storage card

Applications Claiming Priority (6)

Application	Filing date	Title
CNB2005101007762XA	2005-10-31	Storage card and terminal equipment combining storage card
CN200680012036SA	2006-10-16	Memory card and terminal equipment of combining memory card
PCT/CN2006/002710	2006-10-16	Memory card and terminal device with the memory card
US11/554,416	2006-10-30	Memory card and terminal equipment incorporating the same
EP06123247A	2006-10-31	Memory card and terminal equipment incorporating the same
DE202006020843U	2006-10-31	Memory card and this containing terminal

Legal Events

Date	Code	Title	Description
2006-11-08	PB01	Publication	
2006-11-08	C06	Publication	
2007-01-03	SE01	Entry into force of request for substantive examination	
2007-01-03	C10	Entry into substantive examination	
2009-08-12	GR01	Patent grant	
2009-08-12	C14	Grant of patent or utility model	
2010-06-23	CP01	Change in the name or title of a patent holder	**Address after**: 518129 Longgang District, Guangdong, Bantian HUAWEI base B District, building 2, building No. **Patentee after**: Huawei Device Co., Ltd. **Address before**: 518129 Longgang District, Guangdong, Bantian HUAWEI base B District, building 2, building No. **Patentee before**: Shenzhen Huawei Communication Technology Co., Ltd.
2010-06-23	C56	Change in the name or address of the patentee	**Owner name**: HUAWEI DEVICE CO., LTD.

			Free format text: FORMER NAME: SHENZHEN HUAWEI COMMUNICATION TECHNOLOGY CO., LTD.
2017-11-17	TR01	Transfer of patent right	**Effective date of registration**: 20171031 **Address after**: Metro Songshan Lake high tech Industrial Development Zone, Guangdong Province, Dongguan City Road 523808 No. 2 South Factory (1) project B2 -5 production workshop **Patentee after**: HUAWEI terminal (Dongguan) Co., Ltd. **Address before**: 518129 Longgang District, Guangdong, Bantian HUAWEI base B District, building 2, building No. **Patentee before**: Huawei Device Co., Ltd.
2017-11-17	TR01	Transfer of patent right	
2019-05-31	CP01	Change in the name or title of a patent holder	**Address after**: 523808 Southern Factory Building (Phase I) Project B2 Production Plant-5, New Town Avenue, Songshan Lake High-tech Industrial Development Zone, Dongguan City, Guangdong Province **Patentee after**: Huawei Device Co., Ltd. **Address before**: 523808 Southern Factory Building (Phase I) Project B2 Production Plant-5, New Town Avenue, Songshan Lake High-tech Industrial Development Zone, Dongguan City, Guangdong Province **Patentee before**: HUAWEI terminal (Dongguan) Co., Ltd.
2019-05-31	CP01	Change in the name or title of a patent holder	

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/021,347	**01/10/2022 08:11:00 PM ET**	**18.115.001US9.10**

Title of Invention

MOBILE PHONE WITH MAGNETIC CARD EMULATION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	2310	FILED BY	Katherine Campbell
PATENT CENTER #	60480825	FILING DATE	09/15/2020
CUSTOMER #	35781	FIRST NAMED INVENTOR	Siva G. Narendra
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Usman Mughal

Documents

TOTAL DOCUMENTS: 25

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Fujimoto_WO2006057049A1.pdf	10	Foreign Reference	139 KB
Moshir_WO2007139909A3.pdf	11	Foreign Reference	157 KB
Soderstrom_WO2006052815B.pdf	4	Foreign Reference	78 KB
Narendra_TWI433560B.pdf	8	Foreign Reference	112 KB
Lee_TWI323424B.pdf	5	Foreign Reference	102 KB
Moshir_Sean_KR201001268	35	Foreign Reference	344 KB

50A.pdf			
Park_Young_Soo_KR100596410B1.pdf	10	Foreign Reference	189 KB
SUENAGA_HIROSHI_JP4931912B.pdf	26	Foreign Reference	272 KB
AOKI_SADATAKA_JP4864346B2.pdf	15	Foreign Reference	221 KB
FUKAZAWA_NOBUAKI_JP4766666B2.pdf	11	Foreign Reference	173 KB
WASHIRO_MASANORI_JP4403431B2.pdf	16	Foreign Reference	197 KB
Washiro_Masanori_JP4345850B2.pdf	27	Foreign Reference	249 KB
SAWAI_ATSUSHI_JP4192981B2.pdf	10	Foreign Reference	153 KB
MORIMOTO_YASUKAZU_JP3805347B2.pdf	10	Foreign Reference	177 KB
Ito_JP2008046923A.pdf	9	Foreign Reference	152 KB
Kakimoto_JP2008017440A.pdf	9	Foreign Reference	160 KB
Mizushima_JP2007317170A.pdf	13	Foreign Reference	216 KB
Irisawa_JP2006209643A.pdf	7	Foreign Reference	127 KB
Ito_JP2006172121A.pdf	7	Foreign Reference	144 KB
Ihi_JP2006106897A.pdf	18	Foreign Reference	256 KB

Fujita_EP1959377A1.pdf	10	Foreign Reference	167 KB
Masayuki_Ebara_CN101040240B.pdf	14	Foreign Reference	150 KB
Li_CN100527159C.pdf	8	Foreign Reference	128 KB
Narendra_EP2401708A4.pdf	11	Foreign Reference	157 KB
18P115001US9_10_IDS2.pdf	6	Information Disclosure Statement (IDS) Form (SB08)	1030 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Fujimoto_WO2006057049A1.pdf	37C6A414619E9F465A3C702070C65EB0C7C82623F1A56B6BB8C71AB5D22B96BF34F4BC099E40F2537BD54A8FBED319976BC196974521BD81682CBB8190DAF2C0
Moshir_WO2007139909A3.pdf	EDD6609635660F06B5557E39D65D09A52B06E8146AEE1D210C4D9F029FD1550CB04732B0A2DE48B5B5BA69C7E6513A47C4ED218CB95BFA99CADBE809FE5EA453
Soderstrom_WO2006052815B.pdf	BE3B5AA0642658E6AA157E42EEF3AB2353F19E475EFA1D67E45AFDE5CFAF1634ABC5EFE2F81754BE94E3305BAEB8DA8A39CB691517B7D1C4788BCA0B8A92EB1E
Narendra_TWI433560B.pdf	C1DB94202E9B280D73D345564F2E8BE564693442CDF6BBE73E91F92EE5D893E2E75985E41A475F41E17F484AB1EFF24FE9262D9187AC9CDAA63A4EE15F5AEF5A
Lee_TWI323424B.pdf	602EE7672E2234EFCCE78835AC0AB671562EFF28B6AFA227D5166ABAAB75AC0FC5B23D5B7D3524682FFAFAF2823E24BCDD467A06CE3AFF4077296B9A89FA0F89
Moshir_Sean_KR20100126850A.pdf	747BD5240F11651137BC0D84EA80234EDAE13DABCBF32BFA2E9D8295445C47062D371FCA7165FBEABAD0DEF91A9EF99F6

	32F5C219929639E928BFBB05FC7EBCB
Park_Young_Soo_KR100596410B1.pdf	D8FD4F35D84CB6DEAD0029EEC0817D0DCB616F922E6474CEEB6F69CB8DCCDB138692DFE13D2C5CB8ABA06F47619A29A7D8295ED83702CACBDCF26C9ACB816DAC
SUENAGA_HIROSHI_JP4931912B.pdf	464706255E0CAA8905FA65D2AEC8E2234E4DE20226E17F0B05BF3B1F428A95184AFAD9685CF2CDBEE4252B478599D687A01DBBC9ADA038AD10529E7CD0536E7E
AOKI_SADATAKA_JP4864346B2.pdf	0A092AE51BCD0882D537654A1DA1FA9F1457E4050C58053F5B8D7AC1FA86E4FAE298B9FB21502EB634A02C99DEC1E00A800ADC1C0614F2C813805F8DF426128C
FUKAZAWA_NOBUAKI_JP4766666B2.pdf	F8EA9004B2A3DE6E78EFD5EB7A02ABDF476D928979F55ACBF3F6EC79CA590E1AE904E757A07B52D4CF7736939A702DC6129D0FEC2AD3A5111D56635F705AC9E3
WASHIRO_MASANORI_JP4403431B2.pdf	A2BFC6C6DB794EAB2D54E92CFDFF15D12C5B1803217574DCE7658C60E6F36C8B1AB95C2C0D2D6CCA69570A6DEF2AD48BD471D89EF4EF22AD2A92161EA179E7D7
Washiro_Masanori_JP4345850B2.pdf	1C607C0B18AA263BD30B66FDBEABDE0091B5DF91ECF15883BDAF31E8D73E98855F129632547D2C651A1DBFA029B546787B23DB2A819F2F00E51AF3B3217A5EF1
SAWAI_ATSUSHI_JP4192981B2.pdf	1FBA088D7C419B67B47D0B85D3F2B8438FE959F172198A5BC82A42DB741753786C8A99B860157B2F1CC4D067B971232722B404F2D3B57ECD7C55188281BC17B9
MORIMOTO_YASUKAZU_JP3805347B2.pdf	53492850486F8D3C1F13D74181F7E93732BFBD3B3CD307D4299F4769F6203E84506C6EF2A03F5FD2763C5AA442E1094559BF247B3F41BCAC4A7F39C5334949EE
Ito_JP2008046923A.pdf	40C99A841FA8A67BA5E3C65EDBBE1CE6B8C5322A5ADB92BE1EE64C30FDF1F8DB384B47AD812B0C52F553FA9816602474CF75A286CD99F6F84032790389BD9C59
Kakimoto_JP2008017440A.pdf	0700260B002391A5E18B0F43A224E173ABA74D8CF95E2D0A1C570575215A9B7B9396D552C0D42855E8CB762A8B4AD31CB8

	7399FA973DCBC77D529D889A6E9BD5
Mizushima_JP2007317170A.pdf	FECBF879E74C0528CC3F54CA385281F0F9CFDF55669BC01680D9A5BC915CB856A5F1C67966E44B507123CA01DBA1E87496B9D7D418CD06E29666FC2AB0962BEC
Irisawa_JP2006209643A.pdf	8D8793533505C0F9C4F05E2CD74E71D1FB6F3B02A366BF32FD48AE6A0CE3902F885B8D3433CC0D890CB12C6C098C08F2780D944D1ADC815E89CC427453CC1AC9
Ito_JP2006172121A.pdf	AD8BD5B297705A5B569BECD06741DC98D3B7F2DBCFBC877C268C8C84717765594E66EAA63A52D4A560C70F5019EE65D2A1E08CB1DE62827E1B5B63ACEC7D606D
Ihi_JP2006106897A.pdf	5B2C68FEAEC76DA7BEC1C2702401A5401B30F514619BCE813768D904F300635335C49E5C5F23BCA4D678ECDA6E8D4A8947B80BAA0FBDAFAA478E8E9D01D92BC6
Fujita_EP1959377A1.pdf	8970C9BAD59392560E76F071B8AE8A230738C93FCAFFD030DDE1E27A9DA698D4C56DB534D6E86F2EBD19FE929B3730DCD005C69DCB27CE4873400D0933112163
Masayuki_Ebara_CN101040240B.pdf	CB9E5466EA148EE2012F338E2F0838CE97F0B02C03C5409D646438C92EE6DF051885EC3EA20DCA1A52437993051D865F80B4131470011C7DC4904C1969E0487A
Li_CN100527159C.pdf	B9954F44DEE2449E7BE618985D785FF07774F2F3FE8F5061F0C15C628124EA41CA4D1301D7C746923CE25C095EE7424EBB753769905FDF4CB3C9BC8CFAB59037
Narendra_EP2401708A4.pdf	7EED273BC143BCE1C88AA4D598FF5106E7DBAF7EB1EB336AD961D2517F653E7C55363F7AD6848910717 6F36E5D11FA99342A9B693907E40D4ABBAFE6E433681F
18P115001US9_10_IDS2.pdf	417363DA4B674674469E16BB9B9F0E90E877F6CD7E99239DEB99BE048B71B4FC51F10322E13272D7D6CA56A6E84E688497F641AC2337EAA46EE0EEBB973A5C52

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as

described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Patents 2006057049

Card and host device

Abstract

A host device (2) can read out information from a card (1), write information in the card, and supply a power supply voltage which belongs to a first voltage range or a second voltage range smaller than the first voltage range, and issues a voltage identification command (CMDV) to the card. The voltage identification command includes a voltage range identifying section (VOLS), an error detecting section (ED), and a check pattern section (CPS). The voltage range identifying section includes information indicating to which of the first voltage range and the second voltage range the power supply voltage belongs. The error detecting section has a pattern arranged such that the card receiving the voltage identification command can detect the error thereof. The check pattern section has a preset pattern

Classifications

G06K17/00 Methods or arrangements for effecting co-operative working between equipments covered by two or more of main groups G06K1/00 - G06K15/00, e.g. automatic card files incorporating conveying and reading operations

View 12 more classifications

WO2006057049A1
WIPO (PCT)

Download PDF Find Prior Art Similar

Other languages: French, Japanese

Inventor: Akihisa Fujimoto

Worldwide applications

2004 WO 2005 TW JP CN TW BR EP WO EP KR RU KR CA 2006 US 2008 US 2009 US 2010 US 2011 US 2012 US US 2013 US US 2014 US 2015 US 2017 US 2019 US

Application PCT/JP2004/017627 events

2004-11-26 Application filed by Kabushiki Kaisha Toshiba

2004-11-26 Priority to PCT/JP2004/017627

2006-06-01 Publication of WO2006057049A1

Info: Patent citations (56), Cited by (22), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, PatentScope, Discuss

Claims

Hide Dependent

The scope of the claims

[1] It is configured to read information from the card, write information to the card, and supply a power supply voltage belonging to either the first voltage range or the second voltage range lower than the first voltage range,

A host device configured to issue a voltage identification command including a voltage range identification unit, an error detection unit, and a check pattern unit to the card,

The voltage range identification unit includes information indicating whether the power supply voltage belongs to a deviation of the first voltage range or the second voltage range;

The error detection unit has a pattern configured such that a card that has received the voltage identification command can detect an error in the voltage identification command;

The check pattern portion has a preset pattern,

A host device characterized by that.

[2] A response to the voltage identification command is received,

The response includes a voltage range identification unit, an error detection unit or a check pattern unit,

The error detection unit has a pattern configured such that a device that receives the response from the card can detect the error of the response;

The voltage range identification unit of the voltage identification command and the voltage range identification unit of the response have the same pattern, and the error detection unit is used to confirm that the response has no error or the If the check pattern portion of the response has the same pattern as the check pattern portion of the command, issue a further command to the force;

The host device according to claim 1, wherein.

[3] The host device according to [1], wherein a power supply voltage belonging to the first voltage range is supplied when a response to the voltage identification command is not received.

[4] Issue an initialization command including information to initialize the memory of the card to the command,

Depending on whether there is a response to the voltage identification command, the initialization command Change the definition,

The host device according to claim 1, wherein:

IPR2025-00645 Page 02456

5. The host device according to claim 4, wherein when the response to the voltage identification command is received, the initialization command includes information indicating that the card is a large capacity card.

6. The host device according to claim 5, wherein the initialization command includes information indicating that the card is a small capacity card.

[7] The initialization command includes a first operating voltage identifying unit and a second operating voltage identifying unit, wherein the first operating voltage identifying unit includes a plurality of first bits each corresponding to a voltage having a first width. Consisting of

The second operating voltage identification unit is composed of a plurality of second bits each corresponding to a voltage having a second width smaller than the first width.

The host device according to claim 4, wherein

[8] It has a memory for recording information and a controller for controlling the memory, and can be operated by either the first voltage range or the voltage belonging to the second voltage range lower than the first voltage range. Yes,

A card configured to be supplied with a voltage identification command including a voltage range identification unit, an error detection unit, and a check pattern unit,

In response to the voltage identification command, a response including a voltage range identification unit and an error detection unit or a check pattern 、 is issued.

The voltage range identification unit of the response has the same pattern as the voltage range identification unit of the voltage identification command,

The error detection unit of the response has a pattern configured such that a device receiving the response can detect the error in the response,

The check pattern force of the response has the same pattern as the check pattern of the voltage identification command,

A card characterized by that.

[9] The memory records information according to a small capacity format or a large capacity format. If the card is supplied with an initialization command to initialize the memory, and the initialization command includes information to initialize the memory according to the small capacity format, the card is a small capacity card. Issue a response containing information to the effect,

The card according to claim 8.

The memory records information according to a small capacity format and a large capacity format, and the card is supplied with an initialization command to initialize the memory, and the initialization command initializes the memory according to the small capacity format. 9. The card according to claim 8, wherein a response to the initialization command is not issued when the information to be converted is not included.

Description

Specification

Card and host equipment

Technical field

TECHNICAL FIELD [0001] The present invention relates to a card and a host device, for example, confirmation of operating voltage and capacity of a memory card and a host device.

Background art

In recent years, in various portable electronic devices such as personal computers, PDAs, cameras, mobile phones and the like, a memory card which is one of removable storage devices is often used PC cards and small SD ™ cards are attracting attention as memory cards The SD ™ card is a memory card with built-in flash memory, card controller, etc., and is specifically designed to meet the demands for miniaturization, large capacity, and high-speed storage.

Conventionally, the operating voltage of a memory card and its host device is in the 3.3V (high voltage) range, and supports a voltage range of 2.7 to 3.6V. On the other hand, there is a need for operation that supports lower voltages, for example the 1.8V (low voltage) range, for example, the voltage range of 1.65 to 1.95V.

[0004] In addition, it is desired to realize an SD ™ card capable of storing a large amount of information that is not sufficient for storing data with a large capacity with the capacity of a conventional memory card.

Disclosure of the invention

[0005] An object of the present invention is to provide a memory card and a host device in which operating voltage and capacity can be mutually confirmed.

[0006] The host device according to the first aspect of the present invention reads information from the card and writes information to the card, and belongs to either the first voltage range or the second voltage range lower than the first voltage range. A host device configured to supply a power supply voltage, and configured to issue a voltage identification command including a voltage range identification unit, an error detection unit, and a check pattern unit to the card; The voltage range identification unit includes information indicating whether the power supply voltage belongs to the first voltage range or the second voltage range, and the error detection unit receives the voltage identification command from the card. Of the voltage identification command it has a pattern configured to detect an error, and the check pattern portion has a preset pattern.

The card according to the second aspect of the present invention has a memory for recording information, and a controller for controlling the memory, and has a first voltage range and a second voltage range lower than the first voltage range. A card configured to be supplied with a voltage identification command including a voltage range identification unit, an error detection unit, and a check pattern unit, In response to the voltage identification command, a response including a voltage range identification unit and an error detection unit or a check pattern unit is issued, and the voltage range identification unit of the response is the voltage range identification unit of the voltage identification command. And the error detection unit of the response is configured so that the device that has received the response can detect the error of the response. The a, the switch Eck pattern portion of the response have the same pattern and the check pattern of the voltage identification command, it is characterized.

IPR2025-00645 Page 02457

Brief Description of Drawings

[0008] FIG. 1 is a diagram schematically showing main parts of a card and a host device according to a first embodiment of the present invention.

FIG. 2 is a diagram showing a data arrangement in the NAND flash memory in the memory card of the first embodiment.

[FIG. 3] FIG. 3 is a diagram exemplifying commands issued by the host device immediately before memory initialization.

[FIG. 4] FIG. 4 is a diagram showing a main part of the contents of a voltage check command.

FIG. 5 is a diagram showing a main part of the content of a response to a voltage check command.

[FIG. 6] FIG. 6 is a flowchart showing processing for checking the operating voltage range when the host device operates in the high voltage range.

[FIG. 7] FIG. 7 is a flowchart showing processing for checking the operating voltage range when the host device operates in the low voltage range.

FIG. 8 is a diagram showing a main part of the contents of a memory initialization command according to the second embodiment of the present invention. FIG. 9 is a diagram showing a main part of the response contents of the memory initialization command according to the second embodiment.

FIG. 10 is a flowchart showing a memory initialization process according to the second embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Hereinafter, embodiments of the present invention will be described with reference to the drawings. In the following description, components having substantially the same functions and configurations are denoted by the same reference numerals, and redundant description will be provided only when necessary.

[0010] (First embodiment)

The first embodiment relates to mutual confirmation of operating voltage ranges supported by the host device and the card.

[0011] When a card capable of low voltage operation is realized, a conventional card (high voltage card) that supports only high voltage operation, a card that supports low voltage and high voltage (two voltage card), and low voltage It is expected that a host device that supplies high voltage and a host device that supplies high voltage will circulate together.

As a result, when a host device that supplies a low voltage (low voltage host device) and a high voltage card are combined, the following problems may occur. Each card is initialized by a command from the host device when it is inserted into the host device. At the time of initialization, the host device issues a command for acquiring information in a register provided on the card that stores information on operating conditions. From this information, the host device can obtain information on the voltage supported by the card.

[0013] At the time of obtaining information on the operation condition, the high voltage card operates with a low voltage power source supplied from the host even though the low voltage operation is not supported. May be supplied. However, since the card is operating at a voltage that is not originally supported by the card, the correctness of the transfer of the operating condition register information itself cannot be guaranteed. For this reason, if the host device attempts to initialize the inserted card and the initialization fails, it is determined that the card does not support low voltage operation. It becomes. [0014] In the case of a conventional host device that supplies a high voltage and a two-voltage card, since both operate at a high voltage, no particular problem occurs.

FIG. 1 schematically shows the main parts of a card and a host device according to the first embodiment of the present invention. As shown in Figure 1, card 1 contains memory 3 and card controller 4.

[0016] Card 1 supports both low voltage (eg, 1.8V) operation and high voltage (eg, 3.3V) operation. In the case of low-voltage operation, the card 1 and the host device 2 are actually configured to be able to handle voltages in the range including 1.8 V (eg, 1.65 to 1.95 V). Similarly, in the case of high-voltage operation, it is configured to be compatible with a voltage in the range including 3.3 V (for example, 2.7 to 3.6 V). Typically, the operating voltage range itself is the same between the card 1 and the host device 2. An unused voltage region is provided between the low voltage range and the high voltage range

The host device 2 includes a voltage supply unit 5, a reading Z writing unit 6, a command control unit 7, and the like. The voltage supply unit 5 operates with a high-voltage or low-voltage power supply potential Vdd and supplies the power supply potential Vdd and the common potential Vss to the card. Read Z writing unit 6 reads

data from and writes information to / from card 1. Command control unit 7 exchanges commands and responses with card 1. Reference numerals 11, 12, 13, 14 and 17 will be described in the second embodiment.

As the memory 3, for example, a NAND flash memory can be used. Figure 2 shows the data layout of NAND flash memory. Each page of NAND flash memory 11 168 6-minute redundant part) X 4), and 128 pages are one erasure unit (256k8byte + 8k8byte).

The NAND flash memory 21 includes a page buffer 21A for performing data input / output to / from the flash memory. The storage capacity of this page buffer 21A is 2112 bytes (2048 bytes + 64 bytes). When writing data, the page buffer 21A executes data input / output processing for the flash memory in units of one page corresponding to its own storage capacity.

[0020] When the storage capacity of the NAND flash memory 21 is, for example, 1 Gbit, 256 kByte The number of blocks (erase units) is 512. The NAND flash memory 21 is manufactured by using, for example, a 0.09 m process technology. In other words, the design rule of the NAND flash memory 21 is less than 0.1 m.

Note that FIG. 2 illustrates the case where the erase unit is a 256 kbyte block, but it is also practically effective to construct the erase unit to be, for example, a 16 kbyte block. In this case, each page has 528 bytes (512 bytes worth of data storage + 16 bytes of redundancy), and 32 pages are one erasure unit (16 kByte + 0.5 kByte (where k is 1024)). The NAND flash memory 21 may be a binary memory that stores 1-bit information in one memory cell, or a multi-value memory that stores information of 2 bits or more in one memory cell. Anyway.

Next, an initialization method using the card 1 and the host device 2 in FIG. 1 will be described with reference to FIGS. 3 to 7. Various processes are included in the initialization process. First, an outline of commands issued by the host device 2 immediately before the initialization of the memory will be described. FIG. 3 is a diagram exemplifying commands issued by the host device 2 immediately before the initialization of the memory. Note that the card 1 and the host device 2 operate according to the operation voltage until the operation condition register capability of the memory 2 is acquired by the memory initialization command described later. During this time, card 1 must be able to operate with the operating voltage.

[0023] As shown in FIG. 3, with the start of initialization, the host device 2 issues a reset command CMDR. When the reset command CMDR is issued to card 1, each circuit force S of card 1 is reset.

IPR2025-00645 Page 02458

[0024] Next, the host device 2 issues a voltage check command CMDV. This command is a command newly introduced in the present embodiment. For this reason, the conventional card 1 does not recognize this voltage check command CMDV, and does not return a response to the host device 2 even if this command is supplied. The supported operating voltage (operating voltage range) can be mutually confirmed between the host device 2 and the card 1 by using the voltage check command CMDV. The mutual confirmation method will be described in detail later.

Next, for example, when the card 1 supports various IZO functions with extended data storage capabilities, the host device 2 issues an initialization command CMDIO to the card 1. After this, Memory 1 initialization command is supplied. Memory initialization will be described in the second embodiment.

Next, the voltage check command CMDV will be described. Figure 4 shows the main parts of the contents of the voltage check command CMDV. As shown in FIG. 4, the voltage check command CM DV has at least a check pattern portion CPS and a voltage range identification portion VOLS. The voltage range identification unit VOLS has a pattern that uniquely indicates whether the host device 2 supports low voltage operation or high voltage operation.

[0027] The number of bits of the check pattern portion CPS and the voltage range identification portion VOLS can be arbitrarily set. However, it is desirable that the following conditions are satisfied. That is, as will be described later, the host device 2 and the card 1 recognize each other's operating voltage range by examining whether the bit pattern of the voltage range identifying unit VOLS matches or does not match. For this reason, the check pattern portion CPS can be set to about 8 bits and the voltage range identification portion VOLS can be set to about 4 bits, for example. The command section CM is provided with an index for identifying this command.

[0028] In order to confirm whether the command is correctly transmitted from the host device 2 to the card 1, an error detection code using an error detection code such as CRC (Cyclic Redundancy Check) in the voltage check command CMDV. Part ED is provided. Card 1 can detect an error in the voltage check command CMDV using the error detection code.

FIG. 5 shows a main part of the response content of the voltage check command CMDV. As shown in FIG. 5, the response of the voltage check command CMDV has at least a check pattern part CPA and a voltage range identification part VOLA. Card 1 forms the same bit pattern as the voltage check command CMDV in the check pattern section CPA, forms the same bit pattern as the voltage range identification section VOLS in the voltage range identification section VOLA, and returns a response to the host device. The response may be provided with the same error detection code part ED as in the case of the voltage check command CMDV. The host device 2 can detect an error in the response of the voltage check command CMDV by comparing the force using the error detection code and whether the response has the same pattern as the command. [0030] Next, a method for confirming the operating voltage range supported by the other party using the host device 2, the card 1, and the force voltage check command CMDV will be described. The processing differs depending on whether the host device 2 operates in the low voltage range or in the high voltage range. First, the case of high voltage range operation will be described. FIG. 6 is a flowchart showing the operation voltage range check process when the host device 2 operates in the high voltage range. As shown in FIG. 6, in step ST1, the host device 2 issues the voltage check command CMDV described above to the card 1.

[0031] In step ST2, the host device 2 determines whether or not there is a response to the voltage check command CMDV. As described above, since the conventional card does not recognize the voltage check command CMD V, it does not issue a response to this command. Therefore, the host device 2 determines that the card 1 is a conventional card, that is, the processing can be continued by the high voltage range operation, and shifts to a memory initialization process. Memory initialization will be described in the second embodiment.

On the other hand, when the card 1 being initialized is a card according to the present embodiment, the card 1 returns the response shown in FIG. At this time, the card 1 first observes the bit pattern of the voltage range identification unit VOLS of the voltage check command CMDV. A response having the same bit pattern in the voltage range identification unit VOLA is returned.

[0033] Next, in step ST3, the host device 2 confirms a match between the pattern of the voltage range identification unit VO LA in the response and the pattern of the voltage range identification unit VOLS in the voltage check command CMDV. When these matches are confirmed, the host device 2 knows that the card 1 is a new card capable of recognizing the voltage check command CMDV and supports the operating voltage range of the host device 2.

At the same time, the host device 2 confirms that the CRC check or the response bit pattern matches the command bit pattern. Thereby, it can be confirmed that the transfer of the voltage check command CMDV is reliable.

[0035] In the case of a path mode in which an error detection code is provided in the command, the correctness of the response is confirmed using, for example, the pattern of the error detection code part ED in the response as a CRC code. Also in the case of a bus mode in which the error detection code part ED is not provided in the voltage check command CMDV, the voltage range identification part VOLS and the voltage range identification part VOLA, and the check pattern parts CPS and CPA of the command and response respectively match. It is determined that the response is normal. If the response is determined to be normal, the voltage check process ends. Thereafter, the flow proceeds to memory initialization processing. This will be described in the second embodiment.

[0036] On the other hand, if the voltage range identification unit VOLS and the voltage range identification unit VOLA do not match, or (and) if the check pattern unit CPS and the check pattern unit CPA do not match, an error is detected by the error detection code. If so, the checking process of the operating voltage range is completed. As a result, the initialization process stops.

FIG. 7 is a flowchart showing the operation voltage range check process when the operation voltage of the host device 2 is within the low voltage range. The only difference from the high voltage range operation is the following. That is, if there is no response from card 1 in step ST2, it means that card 1 is a conventional card, that is, a high voltage card. Therefore, the initialization process stops to prevent the host device 2 operating in the low voltage range from processing the conventional card.

[0038] According to the card 1 and the host device 2 according to the first embodiment of the present invention, the card 1 and the host device 2 know the operating voltage range supported by the other party by exchanging newly provided commands. be able to. For this reason, subsequent initialization processing can be performed in normal operation according to the operating voltage range supported by both the card 1 and the host device 2. In addition, when the operating voltage ranges supported by the two do not match, the host device 2 can detect this and stop the initialization process. As a result, useless processing such as initialization in an abnormal state and host malfunction can be avoided.

[0039] Further, according to the first embodiment, the voltage check command CMDV has a check pattern, and the card 1 forms the same pattern as this check pattern during the response of the voltage check command CMDV. . For this reason, by comparing these check patterns, it is assured that the transfer of the voltage check command CMDV is reliable. For this reason, even in the bus mode where no code error detector is provided in each command, Error in the application can be detected.

[0040] (Second Embodiment)

The second embodiment relates to a memory initialization method according to whether a memory mounted on a card is a large capacity memory or a small capacity memory.

[0041] In order to realize a card capable of storing a large amount of information (a large capacity card), it is necessary to newly set a format corresponding to the large capacity card. The file system with the new format is different from the conventional low-capacity format file system. And conventional host devices that follow the low-

IPR2025-00645 Page 02459

capacity format cannot recognize the file system of a large-capacity card. For this reason, if a conventional host device mistakenly initializes a large-capacity card, the card data may be destroyed.

[0042] The following four combinations occur depending on whether the host device supports large capacity and whether the card being initialized supports large capacity!

[0043] (1) Conventional host device (not supporting large capacity) + Conventional card (not supporting large capacity)

(2) Conventional host device + large capacity card (large capacity support)

(3) Large capacity host device (large capacity support) + Conventional card

(4) Large capacity host device + Large capacity card

It is desirable for the host device or (and) card to detect any of the above cases and take action accordingly.

As shown in FIG. 1, a card 11 according to the second embodiment of the present invention includes a large capacity memory 13 and a card controller 14. The host device 12 includes a command control unit 17. In addition to the function of the command control unit 7 of the first embodiment, the command control unit 17 supports a memory initialization command according to the second embodiment to be described later, and a conventional capacity card (small capacity card). And large capacity cards are both supported.

[0045] The content of the memory initialization command differs depending on where the memory arrives in the flowchart of the first embodiment. As a result of the process of operating voltage range check, when the process reaches A in Fig. 6, the host device 12 has a function to issue the voltage check command CMDV. is also supported. If the force being initialized is a conventional card, this corresponds to case (3) above. In this case, the host device 1 2 issues a conventional memory initialization command. The card controller 14 of the card 1 receives this memory initialization command, and initializes the memory according to the conventional format.

On the other hand, when the processing reaches B in FIG. 6 or FIG. 7, the host device 12 initializes the memory using a new memory initialization command shown below. FIG. 8 shows the main part of the contents of a new memory initialization command according to the second embodiment of the present invention. As shown in FIG. 8, the memory initialization command includes a first voltage identification unit V1S, a second voltage identification unit V2S, a capacity identification unit HCS, and a busy notification unit BS.

The first voltage identification unit V1S is composed of, for example, a plurality of bits, and each bit corresponds to a voltage having an appropriate width (for example, 0. IV). The voltage range supported by the first voltage identification unit V1S is the same as the high voltage operation range of the first embodiment. The host device 12 sets the bit indicating the currently applied voltage to "1".

[0048] The second voltage identification unit V2S includes 1 bit. Multiple bits are also possible.

This bit is set when the host device 12 is applying a voltage in the low voltage range. When the second voltage identification unit VS2 has multiple bits, the width of the voltage covered by each bit of the second voltage identification unit V2S can be smaller than that of the first voltage identification unit V1S, for example, 0.05 V can do. By doing this, even if the operating voltage of the host device and card further decreases in the future, it will be possible to show its own operating voltage more finely. The voltage range supported by the second voltage identification unit V2S is the same as the low voltage operation range of the first embodiment.

[0049] An intermediate voltage range VM is provided between the voltage range covered by the first voltage identifying unit V1S and the voltage range covered by the second voltage identifying unit V2S. The host device 12 does not support the voltage range corresponding to the intermediate voltage range portion VM, and therefore, each bit in the intermediate voltage range portion VM cannot be "1"! /.

[0050] By providing the intermediate voltage range portion VM, the following advantages can be obtained. In order to enable the card 11 to support two operating voltage ranges, the card controller 14 has a voltage regulator. The voltage regulator determines whether the power supply voltage from the host device 12 is a high voltage or a low voltage, and converts this power supply voltage into the operating voltage of the card 11. At this time, if the two operating voltage ranges are continuous, for example, when a voltage approximately in the middle of the two operating voltage ranges is supplied, it is difficult to determine the voltage regulator. This results in slow operation Become. On the other hand, by providing an unused area, the voltage regulator can easily determine the range to which the supply voltage belongs.

[0051] The capacity identification unit HCS has a pattern indicating whether the host device 12 supports only a small capacity, both small capacity and large capacity. The busy notification unit BS is set to 0 or 1 in the response, and is unchanged (for example, "0") in the command. The new memory initialization command may have an error detection unit ED that has the same power as a CRC code.

FIG. 9 shows a main part of the response contents of the memory initialization command according to the second embodiment. As shown in Figure 9, each part of the response of the memory initialization command has the same format as the command, and includes the first voltage identification unit V1A, the second voltage identification unit V2A, the capacity identification unit HCA, and the busy notification unit BA. Contains.

The first voltage identification unit VIA has the same number of bits as the first voltage identification unit V1S in the command, and sets all the bits corresponding to the operation voltage supported by itself to, for example, "1".

[0054] Similarly, the second voltage identification unit V2A has the same number of bits as the second voltage identification unit V2S in the command. The card 11 sets all bits corresponding to the operating voltage supported by the card 11 to "1", for example.

The capacity identification unit HCA indicates whether the card 11 is a small capacity card or a large capacity card. The busy notification unit BS forms a bit pattern indicating that while the memory is being initialized.

Next, a memory initialization method will be described with reference to FIG. FIG. 10 is a flowchart showing a memory initialization process according to the second embodiment of the present invention. FIG. 10 shows the continuation of A and B in FIG. 6 and FIG. At least the card 11 and the host device 12 support the issue of the voltage check command CMDV as a condition for issuing the new memory initialization command. If the card 11 is a large capacity card, it is necessary to issue a new memory initialization command.

As shown in FIG. 10, in step ST11, the host device 2 issues a new memory initialization command shown in FIG. When the host device 2 supports a large capacity card, the capacity identification part HCS of this command is set to a bit pattern indicating that the large capacity card is supported. Note that when the host device is a conventional type, the voltage check command CMDV and the memory initialization command (new memory initialization command) according to the present embodiment are not issued. If the card being initialized is a conventional card, it corresponds to the case of (1) above, and the card 11 is initialized in the conventional small capacity format by the conventional memory initialization command.

small capacity format by the conventional memory initialization command.

[0059] Since the memory initialization command is a conventional type, the capacity identification unit HCS should have a bit pattern that does not support large capacity. The card 11 that supports large capacity, that is, the capacity identification unit HCS can recognize that the bit pattern power also does not support the large capacity of the host device 2. In this case, it corresponds to the case (2) above, and the card 11 does not return a response to the memory initialization command in order to stop the initialization process. This prevents large capacity cards from being accidentally initialized by a small capacity format.

[0060] Next, in step ST12, the host device 12 determines whether or not there is a response to the new memory initialization command. If there is no response, the process ends. If there is a response, in step ST13, the host device 12 checks the bit pattern of the capacity identification unit HCA in the response. The card 11 being initialized is a new card and should support large capacity, so a bit pattern to that effect appears. In other words, this case corresponds to the case of (4) above.

[0061] Next, in step ST14, the host device 12 issues a new memory initialization command again.

[0062] Next, in step ST15, the host device 12 checks the bit pattern of the busy notification unit BA in the response. The host device 12 continues to issue a memory initialization command until this bit pattern force memory initialization is completed and a pattern indicating that is obtained. At this time, when the initialization of the memory 13 is started, only a response is returned, and the card 11 continues to ignore the contents of the memory initialization command itself.

In addition, the host device 12 performs a time-out check with respect to the time during which the memory 13 is being initialized. When the initialization of the memory 13 is completed, the processing proceeds to further processing (for example, acquisition of the ID of the card 11). [0064] According to the host device 12 and the card 11 according to the second embodiment of the present invention, information on a small capacity card or a large capacity card is provided in the memory initialization command. Using this information, the host device 12 and the card 11 can confirm whether or not the other party supports a large capacity. Only when both the host device 12 and the card 11 support a large capacity, the memory 13 is initialized with the large capacity. If either one does not support large capacity, the initialization process is canceled. Therefore, malfunction can be prevented even when old and new host devices and old and new cards are mixed.

[0065] In addition, within the scope of the idea of the present invention, those skilled in the art can conceive of various modifications and corrections. It is understood that it belongs to the scope of the present invention.

Industrial applicability

[0066] According to the present invention, it is possible to provide a card and a host device capable of mutually confirming the operating voltage and capacity.

Patent Citations (56)

Publication number	Priority date	Publication date	Assignee	Title
JPH07311820A *	1994-05-18	1995-11-28	Dainippon Printing Co Ltd	Production of pattern file for ic card access
JPH09282426A *	1996-04-17	1997-10-31	Dainippon Printing Co Ltd	Card and its communicating method
JP2000250661A *	1999-02-26	2000-09-14	Hitachi Ltd	Semiconductor integrated circuit and memory card
Family To Family Citations				
US4827109A *	1987-02-18	1989-05-02	Fuji Photo Film Co., Ltd.	Photographic printing system
JP2580160B2 *	1987-04-18	1997-02-12	富士写真フイルム株式会社	LSI card reader / writer
FR2654235B1 *	1989-11-07	1992-01-17	Europ Rech Electr Lab	CARD READER WITH INTEGRATED CIRCUIT WITH CONTACTS.
TW199216B	1991-12-02	1993-02-01	Jin-Shan Li	Card identification system
JPH0612537A	1992-06-25	1994-01-21	Fuji Photo Film Co Ltd	Ic memory card
DE4243108A1	1992-12-18	1994-06-23	Eurosil Electronic Gmbh	IC card
JP3480746B2	1993-11-11	2003-12-22	株式会社東芝	Portable electronic devices
US5404460A	1994-01-28	1995-04-04	Vlsi Technology, Inc.	Method for configuring multiple identical serial I/O devices to unique addresses through a serial bus
JP3209634B2	1994-03-28	2001-09-17	株式会社日立製作所	Computer system
FR2730328B1 *	1995-02-03	1997-04-04	Connectors Pontarlier	CONNECTOR FOR MICROCIRCUIT CARD READING APPARATUS AND MICROCIRCUIT CARD READING APPARATUS INCLUDING SAME
JP3337050B2 *	1995-12-27	2002-10-21	日本電信電話株式会社	IC card
TW384611B	1997-02-14	2000-03-11	Canon Kk	Data communication apparatus and method

IPR2025-00645 Page 02461

FR2764073B1 *	1997-05-30	1999-07-16	Sgs Thomson Microelectronics	COMMUNICATION PROTOCOL FOR ASYNCHRONOUS MEMORY CARDS
JP3364133B2 *	1997-10-16	2003-01-08	富士通株式会社	Card, host device, and drive device
TW364102B	1997-10-24	1999-07-11	Soulstar Technology Corp	Method for storing and playing sound cards and device thereof
JPH11212887A *	1998-01-30	1999-08-06	Ntt Data Corp	Communication system
JP2000010668A *	1998-06-18	2000-01-14	Hitachi Ltd	Memory card supply voltage control system
JP3593460B2 *	1998-07-29	2004-11-24	富士通株式会社	Memory card
US6230274B1	1998-11-03	2001-05-08	Intel Corporation	Method and apparatus for restoring a memory device channel when exiting a low power state
US6279114B1 *	1998-11-04	2001-08-21	Sandisk Corporation	Voltage negotiation in a single host multiple cards system
JP2000250665A *	1999-02-26	2000-09-14	Hitachi Ltd	Semiconductor integrated circuit and memory card
US6364208B1 *	1999-03-29	2002-04-02	Transmo Limited	Card changing system
US7778855B2	2000-01-06	2010-08-31	Super Talent Electronics, Inc.	Mass production testing of USB flash cards with various flash memory cells
US6820148B1	2000-08-17	2004-11-16	Sandisk Corporation	Multiple removable non-volatile memory cards serially communicating with a host
JP4676600B2 *	2000-10-02	2011-04-27	大日本印刷株式会社	IC card, reader / writer, IC card system and IC card operating condition setting method
US6753758B2	2001-01-03	2004-06-22	Gerald Adolph Colman	System and method for switching voltage
TW561414B *	2001-12-24	2003-11-11	Winbond Electronics Corp	Universal memory card reader
JP4204226B2	2001-12-28	2009-01-07	日本テキサス・インスツルメンツ株式会社	Device identification method, data transmission method, device identifier assigning apparatus, and device
KR100440969B1	2002-05-23	2004-07-21	삼성전자주식회사	Method and apparatus of networking
KR100440972B1 *	2002-07-27	2004-07-21	삼성전자주식회사	Apparatus and method for establishing data transfer mode by card insertion identification
JP3806077B2 *	2002-08-26	2006-08-09	株式会社東芝	Memory card recognition system, capacity switching type memory card / host device, capacity switching type memory card, storage capacity setting method and storage capacity setting program
JP3866635B2	2002-08-26	2007-01-10	株式会社東芝	Memory card and storage area switching method
DE10261174B3	2002-12-20	2004-06-17	Daimlerchrysler Ag	Automatic addressing method for control devices connected to data bus system with series or ring structure
WO2004084127A1 *	2003-03-20	2004-09-30	Renesas Technology Corp.	Memory card and initialization setting method thereof
KR100524988B1 *	2003-10-02	2005-10-31	삼성전자주식회사	Multimedia card apparatus capable of interfacing USB host and interfacing method of the same
US7441053B2 *	2003-12-15	2008-10-21	Nokia Corporation	Support of an interaction between a host device and a peripheral device
US7249763B1	2004-07-16	2009-02-17	Applied Micro Circuits Corporation	User-specified key creation from attributes independent of encapsulation type
JP4637526B2 *	2004-07-28	2011-02-23	ルネサスエレクトロニクス株式会社	Memory card and nonvolatile storage device
US20060044926A1 *	2004-08-27	2006-03-02	Nokia Corporation	Method and system for accessing performance parameters in memory devices
US7196958B2 *	2004-08-31	2007-03-27	Micron Technology, Inc.	Power efficient memory and cards
WO2006057049A1 *	2004-11-26	2006-06-01	Kabushiki Kaisha Toshiba	Card and host device

IPR2025-00645 Page 02462

TWI319160B *	2005-07-11	2010-01-01	Via Tech Inc	Memory card capable of supporting various voltage supply and control chip and method of supporting voltage thereof
US20070076502A1	2005-09-30	2007-04-05	Pyeon Hong B	Daisy chain cascading devices
US8364861B2	2006-03-28	2013-01-29	Mosaid Technologies Incorporated	Asynchronous ID generation
US8700818B2	2006-09-29	2014-04-15	Mosaid Technologies Incorporated	Packet based ID generation for serially interconnected devices
US7925854B2	2006-12-06	2011-04-12	Mosaid Technologies Incorporated	System and method of operating memory devices of mixed type
US8984249B2	2006-12-20	2015-03-17	Novachips Canada Inc.	ID generation apparatus and method for serially interconnected devices
US8010710B2	2007-02-13	2011-08-30	Mosaid Technologies Incorporated	Apparatus and method for identifying device type of serially interconnected devices
JP2009026296A	2007-06-21	2009-02-05	Toshiba Corp	Electronic device, memory device, and host apparatus
WO2009027802A1	2007-08-28	2009-03-05	Nokia Corporation	Method for bus testing and addressing in mass memory components
US20100169535A1	2008-12-30	2010-07-01	Celio Technology Corporation	Data stream management
TWM364102U	2009-05-13	2009-09-01	Shen Chuen Entpr Co Ltd	Corner joint
US8392614B2	2009-07-27	2013-03-05	Sandisk Il Ltd.	Device identifier selection

* Cited by examiner, † Cited by third party

Cited By (22)

Publication number	Priority date	Publication date	Assignee	Title
US8321697B2	2008-03-19	2012-11-27	Kabushiki Kaisha Toshiba	Memory device, host device, memory system, memory device control method, host device control method and memory system control method
US8423679B2	2004-12-27	2013-04-16	Kabushiki Kaisha Toshiba	Card and host apparatus
JP2016081099A *	2014-10-16	2016-05-16	パナソニックＩｐマネジメント株式会社	Host device, slave device, interface semiconductor device, and removable system
Family To Family Citations				
WO2006057049A1 *	2004-11-26	2006-06-01	Kabushiki Kaisha Toshiba	Card and host device
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
JPWO2006117966A1 *	2005-04-27	2008-12-18	松下電器産業株式会社	Card-type electronic device and host device
US8548819B2 *	2007-04-17	2013-10-01	Ridemakerz, Llc	Method of providing a consumer profile accessible by an on-line interface and related to retail purchase of custom personalized toys
WO2008130959A2 *	2007-04-17	2008-10-30	Ridemakerz, Llc	Programmable toy sound module
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotiation for small rfid card
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
EP2513743B1	2009-12-17	2017-11-15	Toshiba Memory Corporation	Semiconductor system, semiconductor device, and electronic device initializing method
US8868747B2 *	2012-05-15	2014-11-04	Dell Products, L.P.	Endpoint device discovery system

JP6300202B2 *	2014-03-03	2018-03-28	パナソニックＩｐマネジメント株式会社	Memory card and memory card control device
JP2016029556A	2014-07-15	2016-03-03	株式会社東芝	Host device and expandable device
JP2017097825A	2015-11-16	2017-06-01	株式会社東芝	Host apparatus and expansion device
US10235312B2	2016-10-07	2019-03-19	Samsung Electronics Co., Ltd.	Memory system and host device that maintain compatibility with memory devices under previous standards and/or versions of standards
KR20180101760A *	2017-03-06	2018-09-14	에스케이하이닉스 주식회사	Storage device, data processing system and operating method thereof
US11133075B2 *	2017-07-07	2021-09-28	Micron Technology, Inc.	Managed NAND power management
JP6854407B2	2017-08-08	2021-04-07	パナソニックＩｐマネジメント株式会社	Card device, host device and communication method

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
WO2006057049A1	2006-06-01	Card and host device
JP4896450B2	2012-03-14	Storage device
US8555144B2	2013-10-08	Memory system, memory system controller, and a data processing method in a host apparatus
US10191533B2	2019-01-29	Method of enabling sleep mode, memory control circuit unit and storage apparatus
US9760509B2	2017-09-12	Memory storage device and control method thereof and memory control circuit unit and module
CN110648696A	2020-01-03	Power supply apparatus and electronic apparatus including the same
JP2009122909A	2009-06-04	Memory system
KR20180060121A	2018-06-07	Data storage device and data processing system

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
PCT/JP2004/017627	2004-11-26	2004-11-26	Card and host device

Applications Claiming Priority (26)

Application	Filing date	Title
PCT/JP2004/017627	2004-11-26	Card and host device
TW094100263A	2005-01-05	Card and host device
RU2006137709/09A	2005-11-25	Card and master device
CA2563281A	2005-11-25	Card and host device
PCT/JP2005/021689	2005-11-25	Card and host device
KR1020067022176A	2005-11-25	Card and host device
TW094141585A	2005-11-25	
EP18153178.1A	2005-11-25	Card and host device
EP05809616.5A	2005-11-25	Card and host device
CN200580013127A	2005-11-25	Card and host device
BRPI0510243-0A	2005-11-25	"Card and host device"
KR1020097006198A	2005-11-25	Card and host device

IPR2025-00645 Page 02464

JP2006320563A	2005-11-25	Memory device and host device
US11/553,002	2006-10-26	Card and host device
US12/043,005	2008-03-05	Card and host device
US12/468,886	2009-05-20	Card and host device
US12/861,114	2010-08-23	Card and host device
US13/010,346	2011-01-20	Card and host device
US13/422,916	2012-03-16	Card and host device
US13/614,749	2012-09-13	Card and host device
US13/772,016	2013-02-20	Card and host device
US14/079,130	2013-11-13	Card and host device
US14/457,720	2014-08-12	Card and host device
US14/700,411	2015-04-30	Card and host device
US15/456,857	2017-03-13	Card and host device
US16/449,606	2019-06-24	Card and host device

Legal Events

Date	Code	Title	Description
2006-06-01	AK	Designated states	**Kind code of ref document:** A1 **Designated state(s):** AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
2006-06-01	AL	Designated countries for regional patents	**Kind code of ref document:** A1 **Designated state(s):** BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW AM AZ BY KG KZ MD RU TJ TM AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LU MC NL PL PT RO SE SI SK TR BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
2006-07-19	121	Ep: the epo has been informed by wipo that ep was designated in this application	
2007-05-30	NENP	Non-entry into the national phase	**Ref country code:** DE
2007-12-19	122	Ep: pct application non-entry in european phase	**Ref document number:** 04822440 **Country of ref document:** EP **Kind code of ref document:** A1

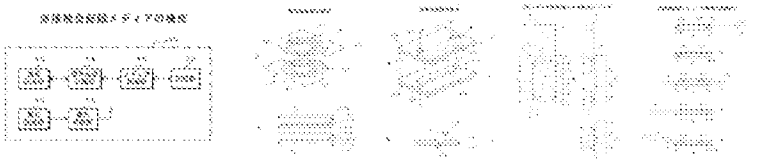
Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

Patents 4192981

Recording media holding device

Images (12)



Classifications

G06K13/08 Feeding or discharging cards

JP4192981B2
Japan

Download PDF Find Prior Art Family

Other languages: Japanese

Inventor: 浚 澤井, 昇 大宅, 努 下里

Worldwide applications

2006 JP 2007 TW US

Application JP2006239411A events

2006-02-23 Priority to JP2006046826
2006-09-04 Application filed by ソニー株式会社
2006-09-04 Priority to JP2006239411A
2007-02-16 Priority claimed from CN200910161441488A
2007-10-04 Publication of JP2007257504A
2008-12-10 Application granted
2008-12-10 Publication of JP4192981B2
Status Expired - Fee Related
2026-09-04 Anticipated expiration

Info: Patent citations (9), Cited by (8), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (9) Hide Dependent

1. An insertion slot into which a non-contact type recording medium provided with an engagement portion on the rear side with respect to the insertion direction is inserted;
In conjunction with the insertion of the non-contact type recording medium from the insertion port, a discharge port through which the inserted non-contact type recording medium is discharged,
A first engagement for holding the inserted non-contact type recording medium by engaging with an engaging portion of the non-contact type recording medium when the non-contact type recording medium is inserted to a preset position. With the joint,
A second engagement portion that is provided on the discharge port side and engages with an engagement portion of the non-contact type recording medium discharged from the discharge port, and holds the discharged non-contact type recording medium. that having a record media holding device.

2. With the non-contact type recording medium inserted from the insertion port, the inserted non-contact type recording medium is pushed out and discharged from the discharge port,
The second engagement portion engages with the engagement portion of the non-contact type recording medium pushed out from the discharge port when the non-contact type recording medium is inserted to the preset position. provided at the position
Recording medium holding device 請 Motomeko 1 wherein.

3. A pressing portion for pressing the non-contact type recording medium is provided in a direction in which a reader / writer for reading and writing data to the non-contact type recording medium is provided 。
Recording medium holding device 請 Motomeko 1 wherein.

4. The preset position is a position of the reader / writer that reads / writes data from / to the non-contact type recording medium and the position of the non-contact type recording medium that can perform at least data transmission 。
Recording medium holding device 請 Motomeko 1 wherein.

5. When the non-contact type recording medium is inserted to a preset position, a latching portion provided with a latching claw for latching the front end and the rear end of the non-contact type recording medium,
A biasing portion that biases the latching portion so that the position of the latching claw is a first position for latching the non-contact type recording medium;
In the latching claw, the contact surface with which the front end of the non-contact type recording medium comes into contact when the non-contact type recording medium is inserted is formed so that the inserted non-contact type recording medium slides,
When the non-contact type recording medium is inserted, the non-contact type recording medium is slid on the contact surface, thereby generating a force against the

IPR2025-00645 Page 02466

urging force of the urging portion, and the latching claw To a second position where the non-contact type recording medium is not latched,
When the non-contact type recording medium is inserted to a preset position, the non-contact type recording medium is passed through a latching claw that forms a contact surface on which the non-contact type recording medium slides, and the latching claw is moved by the biasing portion. Ru the position is moved to the first position
Record media holding device.

6. The latching portion includes a first arm in which a latching claw for latching a rear end of the non-contact type recording medium is provided at one end, and a connecting portion is provided at the other end, A latching claw for latching the front end of the non-contact type recording medium is provided at one end, and a second arm having a connecting portion connected to the connecting portion of the first arm is provided at the other end. Have
The connected first arm and the second arm are swingably supported, and the latching claws of the first arm and the second arm are moved to the first position or the second position. It can move in conjunction with each other
Recording medium holding device 請 Motomeko 5 wherein.

7. The latching part is provided with a release operation part for performing an operation of moving the latching claw from the first position to the second position ,
Recording medium holding device 請 Motomeko 5 wherein.

8. When the non-contact type recording medium is slid on the contact surface, there is provided a deterring unit that prevents the non-contact type recording medium from moving in the urging direction due to urging by the urging unit. The
Recording medium holding device 請 Motomeko 5 wherein.

9. The preset position is a position of the reader / writer that reads / writes data from / to the non-contact type recording medium and the position of the non-contact type recording medium that can perform at least data transmission ,
Recording medium holding device 請 Motomeko 5 wherein.

Description

The present invention relates to a recording medium holding device. Specifically, when a non-contact type recording medium provided with an engaging portion on the rear side in the insertion direction is inserted from the insertion port to a preset position, the non-contact type recording medium is engaged with the engaging portion of the non-contact type recording medium. Then, the first engagement portion that holds the inserted non-contact type recording medium is engaged with the engagement portion of the non-contact type recording medium that is discharged from the discharge port, and is discharged. It has a 2nd engaging part holding a medium.

Conventionally, a portable contact-type recording medium capable of reading and writing data, for example, a memory card that is configured using a storage element such as a semiconductor memory, and provided with a contact point for signal transmission and power supply, has a slot. Data is read and written using a type reader / writer. In this slot type reader / writer, by inserting a memory card into the card loading slot of the reader / writer, the contacts of the memory card and the contacts provided on the reader / writer are connected to read / write data. Further, in order to make it possible to easily remove the inserted memory card, as shown in Patent Document 1, an ejection mechanism is provided. In Patent Document 1, when the eject knob is slid, the memory card is removed by pushing the end face of the ejection groove of the memory card with the ejection claw.

2004-288202 gazette

By the way, as a portable recording medium as described above, not only a contact type recording medium having a contact as described above (for example, a memory card) but also a non-contact type recording medium without a contact (for example, an IC card). Etc.) is also used. Since this non-contact type recording medium is not provided with a contact, the recording medium is inserted into the card loading slot of the reader / writer, and the contact of the non-contact type recording medium and the contact of the reader / writer are connected or inserted. By removing the recording medium from the card loading slot of the reader / writer, it is not necessary to release the connection between the contact of the non-contact type recording medium and the contact of the reader / writer.

However, when the recording medium is inserted into and removed from the card loading slot like a conventional reader / writer, when replacing the recording medium, the recording medium loaded in the card loading slot is pulled out and then a new recording medium is inserted. Needs to be inserted into the slot, and it takes time to replace the recording medium. For this reason, for example, when an image captured by a video camera is written on a recording medium, if it takes time to replace the recording medium, an important scene may be missed. Further, in order to facilitate insertion and removal of the recording medium, injected mechanism and eject mechanism of a recording medium becomes costly required.

Therefore, in the present invention is to provide a recording medium holding equipment that can exchange non-contact type recording medium easily.

The recording medium holding device according to the present invention includes an insertion port into which a non-contact type recording medium provided with an engagement portion on the rear side in the insertion direction is inserted, and a non-contact type recording medium inserted from the insertion port. For example, when the inserted non-contact type recording medium is pushed out in the inserting direction, and when the non-contact type recording medium is inserted at a preset position, that is, with respect to the non-contact type recording medium, A first holding the inserted non-contact type recording medium by engaging with the engaging portion of the non-contact type recording medium when inserted in a position where at least data transmission with a reader / writer for reading and writing can be performed. And the engagement portion of the non-contact type recording medium that is provided on the discharge port side and pushed out from the discharge port when the non-contact type recording medium is inserted to a preset position. Engage with, and has a second engaging portion for holding the non-contact type recording medium to be discharged.

The recording medium holding device according to the present invention is provided with a latching claw for latching the front end and the rear end of the non-contact type recording medium when the non-contact type recording medium is inserted to a preset position. And a biasing portion that biases the latching portion so that the position of the latching claw is a first position for latching the non-contact type recording medium. The contact surface with which the front end of the non-contact type recording medium abuts when the contact type recording medium is inserted is formed so that the inserted non-contact type recording medium slides, and when the non-contact type recording medium is inserted, By sliding the non-contact type recording medium on the contact surface, a force against the urging by the urging portion is generated, and the non-contact type recording medium is not latched by the second claw. The non-contact type recording media should be When the non-contact type recording medium is inserted to the set position, the non-contact type recording medium is passed through the latching claw that forms a contact surface, and the urging portion moves the position of the latching claw to the first position Ru der things to be.

According to the present invention, when a non-contact type recording medium provided with an engagement portion on the rear side with respect to the insertion direction is inserted from the insertion port, the insertion is performed in conjunction with the insertion of the non-contact type recording medium. The non-contact type recording media is discharged from the discharge port. Further, when the non-contact type recording medium is inserted to a preset position, the engaging part and the first engaging part of the non-contact type recording medium are engaged, and the inserted non-contact type recording medium is inserted. Media is retained.

IPR2025-00645 Page 02467

Furthermore, the engagement portion of the non-contact type recording medium to be ejected engages with the second engagement portion provided on the discharge port side, and the non-contact type recording medium to be ejected is held. Further, when the non-contact type recording medium is inserted to a preset position, the front end and the rear end of the non-contact type recording medium are hooked by the hooking claws, and the non-contact type recording medium is also held. .

For this reason, since the non-contact type recording medium can be replaced simply by inserting the non-contact type recording medium from the insertion port, the time required for replacing the non-contact type recording medium is shortened. When the recording medium holding device is provided, it is possible to reduce the probability of missing an important scene. Further, when the inserted non-contact type recording medium is discharged from the discharge port, the non-contact type recording medium to be discharged engages with the engaging portion and the second engaging portion to be discharged. Since the moid recording medium is held, it is possible to reduce damage and loss due to dropping of the taken out non-contact recording medium when replacing the non-contact recording medium. Further, since the structure is simple, the recording medium holding device can be configured at low cost. Further, when holding the non-contact type recording medium by hooking the latching claw on the non-contact type recording medium, the non-contact type recording medium held can be made less likely to fall off. The contact-type recording medium can be reliably held.

Hereinafter, an embodiment of the present invention will be described with reference to the drawings. FIG. 1 is a block diagram showing a configuration of a non-contact type recording medium held by a recording medium holding device.

The non-contact type recording medium 10 includes a power transmission unit 11 for receiving power supply from a reader / writer (not shown) by non-contact power transmission, and a signal transmission unit 13 for reading / writing data with the reader / writer without contact. have. The reader / writer also includes a power transmission unit configured similarly to the power transmission unit 11 and a signal transmission unit configured similar to the signal transmission unit 13

FIG. 2 illustrates a power transmission unit used when performing non-contact power transmission. As shown in FIG. 2A, the power transmission unit 11 of the non-contact type recording medium 10 is configured using, for example, a planar coil 112 in which an insulated single wire 111 is spirally wound in the same plane. Similarly to the power transmission unit 11, the power transmission unit 21 of the reader / writer is configured by using a planar coil 212 in which an insulated single wire 211 is wound in a spiral shape in the same plane.

Further, as shown in FIG. 2B, sheet-like insulating portions 113 and 114 are provided on both surfaces of the planar coil 112. Further, a metal sheet 115 is provided on the surface opposite to the surface facing the reader / writer to prevent leakage magnetic flux and the like. Similarly, sheet-like insulating portions 213 and 214 are provided on both surfaces of the planar coil 212. Further, a metal sheet 215 is provided on the surface opposite to the surface facing the non-contact type recording medium 10 to prevent leakage magnetic flux and the like

Here, when an alternating current is supplied to the terminal of the planar coil 212 of the power transmission unit 21 to generate an alternating magnetic field, the planar coil 112 of the power transmission unit 11 is electromagnetically coupled between the power transmission unit 11 and the power transmission unit 21. An induced voltage is generated between the two terminals. The generated induced voltage is supplied to the power supply unit 12 shown in FIG

The power supply unit 12 rectifies and smoothes the induced voltage generated by electromagnetic coupling between the power transmission unit 11 and the power transmission unit 21, and supplies the obtained DC voltage to each unit of the non-contact type recording medium 10. .

FIG. 2 shows the case of using the planar coils 112 and 212 in which the single wires 111 and 211 are spirally wound in the same plane. However, for example, a planar coil is formed by providing a spiral pattern on the substrate. May be. In this case, a coil having a large number of turns can be formed easily and inexpensively.

In signal transmission between the non-contact type recording medium and the reader / writer, a frequency band higher than that used in non-contact power transmission is used so that data can be read and written at high speed. In addition, when data is read / written by bringing a non-contact type recording medium and a reader / writer into close contact with each other, it is possible to perform data transmission using line-to-line coupling without transmitting and receiving radio waves.

FIG. 3 shows a configuration of a signal transmission unit that performs data transmission using line-to-line coupling. 3B is a schematic cross-sectional view taken along the line H ' in FIG. 3A.

As shown in FIG. 3A, the signal transmission unit 13 of the non-contact type recording medium 10 has a microstrip line structure in which one surface of a dielectric substrate 131 is a ground pattern 132 and a signal pattern 133 is formed on the other surface. One terminal of the signal pattern 133 is grounded via a via 134 provided through the dielectric substrate 131 and a termination resistor 135. Further, the other terminal is connected to the signal transmission processing unit 14 shown in FIG. 1 through a via 136 provided through the dielectric substrate 131.

The reader / writer 20 is also provided with a signal transmission unit 23 in the same manner as the signal transmission unit 13 of the non-contact type recording medium 10. That is, a microstrip line structure is formed in which one surface of the dielectric substrate 231 is a ground pattern 232 and a signal pattern 233 is formed on the other surface. One terminal of the signal pattern 233 is grounded via a via 234 provided through the dielectric substrate 231 and a termination resistor 235. The other terminal is connected to a signal transmission processing unit (not shown) of the reader / writer 20 through a via 236 provided through the dielectric substrate 231.

Further, when reading / writing data from / to the non-contact type recording medium 10, the signal pattern 133 and the signal pattern 233 face each other so that coupling between lines is likely to occur between the signal pattern 133 and the signal pattern 233. The non-contact type recording medium 10 and the reader / writer 20 are brought into close contact with each other.

Here, when a high-frequency signal is supplied from the signal transmission processing unit of the reader / writer to the signal transmission unit 23, line-to-line coupling occurs between the signal pattern 133 and the signal pattern 233, and the signal transmission processing unit of the non-contact type recording medium 10 14 is supplied with a high-frequency signal output from the signal transmission processing unit of the reader / writer. Further, when a high frequency signal is supplied from the signal transmission processing unit 14 to the signal transmission unit 13, line-to-line coupling occurs, and the signal transmission processing unit 14 of the non-contact type recording medium 10 is connected to the signal transmission unit 23 of the reader / writer. The high frequency signal output from is supplied.

The signal transmission processing unit 14 shown in FIG. 1 returns the high-frequency signal supplied from the signal transmission unit 13 to the signal before being processed by the signal transmission processing unit of the reader / writer and supplies the signal to the media control unit 15. The signal transmission processing unit 14 converts the signal supplied from the media control unit 15 into a high-frequency signal for transmission and supplies the signal to the signal transmission unit 13.

The media control unit 15 determines what instruction is given from the reader / writer based on the signal supplied from the signal transmission processing unit 14, and performs processing based on the determination result. For example, when it is determined that a writing request has been made from the reader / writer, the data supplied from the reader / writer is stored in the storage unit 16. When it is determined that a reading request is made from the reader / writer, the data requested from the reader / writer is read from the storage unit 16 and supplied to the signal transmission processing unit 14 as a signal of a predetermined format.

In the non-contact type recording medium 10 configured as described above, the power transmission unit 11, the power supply unit 12, the signal transmission unit 13, the signal transmission processing unit 14, the media control unit 15, and the storage unit 16 are hermetically sealed. Provide and integrate inside. In addition, the power transmission unit 11 and the signal transmission unit 13 are provided on the inner surface of the casing that is in close contact with the reader / writer so that power

IPR2025-00645 Page 02468

transmission and signal transmission can be performed efficiently. As described above, since the non-contact type recording medium 10 is not provided with a contact, there is no contact failure due to adhesion of dust to the contact, and the possibility of damage to the internal circuit due to static electricity can be reduced. High reliability can be secured.

FIG. 4 illustrates the appearance of the recording medium holding device and the non-contact type recording medium. 4A is a front view, FIG. 4B is a plan view, and FIG. 4C is a left side view. The non-contact type recording medium 10 is inserted from the insertion port 32 of the recording medium holding device 30 attached to the reader / writer 20 with the surface on which the power transmission unit 11 and the signal transmission unit 13 are provided as the reader / writer 20 side. Further, the inserted non-contact type recording medium 10 is discharged from a discharge port 33 provided on the opposite side to the insertion port 32.

The non-contact type recording medium 10 is provided with an engaging portion that can hold the non-contact type recording medium 10 in a positioned state on the rear end side when the non-contact type recording medium 10 is inserted into the recording medium holding device 30. For example, the concave portions 19 are formed on both side surfaces of the non-contact type recording medium 10 as the engaging portion.

Further, the non-contact type recording medium 10 is inserted into the recording medium holding device 30, and the power transmission unit 11 of the non-contact type recording medium 10, the power transmission unit 21 of the reader / writer 20, and the signal transmission of the non-contact type recording medium 10. When the portion 13 and the signal transmission portion 23 of the reader / writer 20 are positioned to face each other, the first engagement portion that engages with the engagement portion of the non-contact type recording medium 10 at this position is held by the recording medium. Provided on both sides of the inside of the device 30. For example, convex portions 35 that engage with the concave portions 19 of the non-contact type recording medium 10 are provided on both side surfaces inside the recording medium holding device 30.

The convex portion 35 can be pushed outward by the inserted non-contact type recording medium 10, and is configured to apply an urging force so as to return to the original position when pushed out. For example, a part of the housing is used as an elastic body by cutting out the housing of the portion provided with the convex portion 35 into a U shape. Alternatively, the convex portion 35 is connected to the housing of the recording medium holding device 30 via an elastic body such as a leaf spring.

Further, the engaging surface of the concave portion 19 and the convex portion 35 is pushed out to the outer side when a predetermined force or more is applied to the inserted non-contact type recording medium in the insertion direction. It is formed so that the engagement with is released. For example, the engaging surface of the concave portion 19 and the convex portion 35 is formed in a spherical shape as shown in FIG. Further, the engaging surface of the concave portion 19 and the convex portion 35 may have a shape like a side surface of a cylinder, the concave portion 19 may have a valley shape, and the convex portion 35 may have a mountain shape.

When the concave portion 19 and the convex portion 35 are formed in this way, when the non-contact type recording medium 10 is inserted from the insertion port 32 of the recording medium holding device 30, the concave portion 19 and the convex portion 35 are engaged, and the non-contact type recording medium 10 The media 10 is positioned and held so that power transmission and signal transmission can be performed efficiently

Further, the non-contact type recording medium inserted into the recording medium holding device 30 is pushed out from the discharge port 33, and a new non-contact type recording medium is inserted into the recording medium holding device 30. When the engagement portion of the non-contact type recording medium and the first engagement portion of the recording medium holding device 30 are engaged, the discharge port 33 is engaged with the engagement portion of the pushed non-contact type recording medium. The second engaging portion is provided on both side surfaces on the inside. That is, when the newly inserted concave portion 19 of the non-contact type recording medium and the convex portion 35 of the recording medium holding device 30 are engaged, it is discharged so as to be engaged with the concave portion 19 of the extruded non-contact type recording medium. Protrusions 36 are provided on both side surfaces inside the outlet 33. The convex portion 36 has a shape similar to that of the convex portion 35 and can be pushed outward by a non-contact type recording medium to be pushed out. When pushed outward, a biasing force is applied so as to return to the original position.

When the convex portion 36 is provided in this way, when a new non-contact type recording medium is inserted and the concave portion 19 and the convex portion 35 are engaged so that the inserted non-contact type recording medium is pushed out from the discharge port 33. The recessed portion 19 of the extruded non-contact type recording medium and the convex portion 36 provided at the discharge port 33 can be engaged to hold the extruded non-contact type recording medium so as not to drop off.

On the inner surface of the casing 31 of the recording medium holding device 30, pressing portions 39a and 39b for pressing the non-contact type recording medium in the direction of the reader / writer 20 are provided. Thus, by providing the pressing portions 39a and 39b, the non-contact type recording medium 10 is held so that the distance from the reader / writer 20 does not fluctuate at a minimum, so that the stability of the transmission path is increased and the power is increased. Transmission and signal transmission can be performed more efficiently. Further, rattling of the inserted non-contact type recording medium 10 can be prevented.

Furthermore, if the pressing portion 39a is provided in the vicinity of the convex portion 35, the concave portion 19 of the inserted non-contact type recording medium 10 is in a direction opposite to the pressing direction of the pressing portion 39a (upward direction in FIG. 4A).), When the engaging surface of the concave portion 19 and the convex portion 35 is formed in a spherical shape, for example, the non-contact type recording medium 10 is inserted to a preset position. The concave portion 19 and the convex portion 35 can be reliably engaged with each other.

Further, the pressing portion 39b is inserted if provided so as to press the leading end side of the non-contact type recording medium newly inserted up to a preset position and the rear end of the non-contact type recording medium that has been pushed out. In addition, the non-contact type recording medium can be pressed in the direction of the reader / writer 20, and the extruded non-contact type recording medium can be stably held.

If the notch 311 is provided on the insertion port 32 side of the housing 31, the non-contact type recording medium inserted using the notch 311 without newly inserting a non-contact type recording medium. Can be pushed out with a finger

Next, a non-contact type recording medium loading / exchanging operation will be described with reference to FIG. In FIG. 5, the recording media holding device 30 is shown in a cross section for easy understanding of the operation.

As shown in FIG. 5A, the non-contact type recording medium 10 a provided with the engaging portion on the rear side with respect to the insertion direction is inserted by the user from the insertion port 32 of the recording medium holding device 30. The inserted non-contact type recording medium 10a is pressed by the pressing portion 39 in the direction in which the reader / writer is provided.

As shown in FIG. 5B, the non-contact type recording medium 10a is set at a preset position, that is, a reader / writer that reads / writes data from / to the non-contact type recording medium, and a position that performs signal transmission and power transmission. Sometimes, the concave portion 19 of the non-contact type recording medium 10a and the convex portion 35 of the recording medium holding device 30 are engaged to hold the non-contact type recording medium 10a.

When replacing the non-contact type recording medium 10a, a new non-contact type recording medium 10b is inserted from the insertion port 32 of the recording medium holding device 30, and the non-contact type recording medium 10a is pushed out and discharged as shown in FIG. 5C. The gas is discharged from the outlet 33.

IPR2025-00645 Page 02469

Thereafter, when the inserted non-contact type recording medium 10b is at a preset position as shown in FIG. 5D, the concave portion 19 of the non-contact type recording medium 10b and the convex portion 35 of the recording medium holding device 30 are engaged. The non-contact type recording medium 10b is held at a preset position. Further, the concave portion 19 of the discharged non-contact type recording medium 10 a and the convex portion 36 of the recording medium holding device 30 are engaged. For this reason, the non-contact type recording medium 10 a discharged from the discharge port 33 of the recording medium holding device 30 is held without dropping from the recording medium holding device 30. Thereafter, the non-contact type recording medium 10a held on the discharge port 33 side of the recording medium holding device 30 is inserted if it is pulled out from the discharge port 33 of the recording medium holding device 30 as shown in FIG. 5E. The non-contact type recording medium 10 a that has been stored can be detached from the recording medium holding device 30.

As described above, the non-contact type recording medium can be held at a position where signal transmission and power transmission with the reader / writer are performed only by inserting the non-contact type recording medium from the insertion port of the recording medium holding device. In addition, when replacing the non-contact type recording medium, it is only necessary to insert a new non-contact type recording medium from the insertion port of the recording medium holding device. It can be done easily. Further, even if the inserted non-contact type recording medium is discharged from the discharge port of the recording medium holding device, the discharged non-contact type recording medium is held by the recording medium holding device. It is possible to prevent the recording medium from dropping from the recording medium holding device and causing damage or the like.

By the way, when the above-described recording medium holding device 30 is used in, for example, a portable electronic device, an impact or the like is applied to the electronic device, and the non-contact type recording medium 10 and the recording medium holding device 30 are not connected. If a force in the loading direction of the contact type recording medium or a direction opposite to the loading direction is applied, the non-contact type recording medium 10 may be detached from the recording medium holding device 30. Accordingly, a recording medium holding device 30a that can reliably hold a non-contact type recording medium will be described as a recording medium holding device having another configuration.

The recording medium holding device 30a is configured to latch a non-contact type recording medium by hooking hooks on the front end and the rear end of the non-contact type recording medium when the non-contact type recording medium is inserted to a preset position. Make sure to hold the recording media. Also, the latching state by the latching claw is released, and the held non-contact type recording medium is taken out.

FIG. 6 shows the appearance of a recording medium holding device having another configuration, and FIG. 7 shows an exploded perspective view. 8 shows the configuration of the latching portion 40 for latching the non-contact type recording medium in the recording medium holding device, FIG. 8A is a front view, and FIG. 8B is a II ' line in FIG. 8A. It is the cross-sectional schematic of a position. 6 and 7, the same reference numerals are given to portions corresponding to those in FIG. 4, and detailed description thereof is omitted.

The non-contact type recording medium 10 is inserted from the insertion port 32 of the recording medium holding device 30a attached to the reader / writer 20 with the surface on which the power transmission unit 11 and the signal transmission unit 13 are provided as the reader / writer 20 side. The insertion port 32 is formed by a housing 31 a fixed to the reader / writer 20. In addition, the casing 31a suppresses the non-contact type recording medium 10 so that the inserted non-contact type recording medium 10 is positioned and the inserted non-contact type recording medium 10 is not separated from the reader / writer 20. To do. The casing 31a is notched so that the non-contact type recording medium 10 inserted from the insertion port 32 provided between the casing 31a and the reader / writer 20 can be easily inserted to a preset position. 312 is formed. When the non-contact type recording medium 10 can be inserted from an opening located on the opposite side to the insertion port 32, a notch 313 may be formed in the opening.

In the reader / writer 20, a groove-shaped storage portion 25 is formed on the surface facing the non-contact type recording medium 10 in the insertion direction of the non-contact type recording medium 10

The latching portion 40 of the recording medium holding device 30a has a latching claw that is latched with the non-contact type recording medium 10 when the inserted non-contact type recording medium 10 reaches a preset position. Yes. The latching portion 40 is disposed in the storage portion 25 formed in the reader / writer 20.

The latching portion 40 includes a first latching claw that is latched with the rear end in the insertion direction of the non-contact type recording medium 10 when the inserted non-contact type recording medium 10 reaches a preset position; The second latching claw that is latched with the front end in the insertion direction is set to a first position at which the non-contact type recording medium 10 can be latched. In addition, when removing the held non-contact type recording medium 10 or replacing it with a new non-contact type recording medium, the first and second latching claws are attached so that the latching state is released. Move to the second position.

Here, in order to link the first latching claw and the second latching claw to the first or second position, the latching portion 40 has a configuration in which, for example, the first arm 41 and the second arm 42 are connected. To do. A first hooking claw 411 is formed at one end of the first arm 41. A connecting portion 412 is formed at the other end of the first arm 41. A second hooking claw 421 is formed at one end of the second arm 42. A connecting portion 422 that is connected to the connecting portion 412 of the first arm 41 is formed at the other end of the second arm 42.

The first arm 41 is fixed so as to be swingable about the shaft 413. Similarly to the first arm 41, the second arm 42 is also fixed so as to be swingable about the shaft 423. Further, the first arm 41 and the second arm 42 are connected via connecting parts 412 and 422 so that when one of the first arm 41 or the second arm 42 swings, the other swings. To do. Here, an axis extending in the direction of the connecting portion 422 is formed in the connecting portion 412. Further, a shaft hole is formed in the connecting portion 422 in the direction of the connecting portion 422. By inserting the shaft of the connecting portion 412 into the shaft hole of the connecting portion 422 and connecting the first arm 41 and the second arm 42, the first arm 41 or the second arm 42 can be interlocked.

In the first latching claw 411, the contact surface 411p with which the front end of the non-contact type recording medium 10 contacts when the non-contact type recording medium 10 is inserted is formed so that the inserted non-contact type recording medium 10 slides. To do. For example, the contact surface 411p is formed like a slope or a curved surface. In the figure, the contact surface 411p is formed as a curved surface.

The recording medium holding device 30a is provided with a latching portion 40 so that the positions of the first latching claw 411 and the second latching claw 421 are the first position for latching the non-contact type recording medium 10. An energizing part is provided. For example, elastic members 43 and 44 such as springs are interposed between the first arm 41 and the storage unit 25 and between the second arm 42 and the storage unit 25, respectively. In this way, by providing the elastic members 43 and 44 that are urging portions, the first hooking claw 411 and the second hooking claw 421 protrude from the surface of the reader / writer 20, and the non-contact type recording medium 10. It is possible to set the first position where it can be hooked.

Further, when the protruding amount of the first latching claw 411 increases, when the non-contact type recording medium 10 is inserted, the end of the first arm 41 and the front end of the non-contact type recording medium 10 are in contact with each other. Therefore, the non-contact type recording medium 10 cannot be slid on the contact surface 411p of the first latching claw 411. For this reason, it restrict | limits so that the protrusion amount of the 1st latching claw 411 may not become larger than the protrusion amount set beforehand. For example, when the protrusion amount of the first latching claw 411 becomes a preset protrusion amount, the first arm 41 and the second arm 42 come into contact with the stop portion 26 provided in the storage portion 25 and swing. Configure to be regulated. In this way, since the protruding amount of the first latching claw 411 is limited, the inserted non-contact type recording medium 10 can be reliably slid on the contact surface 411p. In the second arm 42, the distance from the shaft 423 to the second latching claw 421 and the distance from the shaft 423 to the connecting portion 422 are set in the same

IPR2025-00645 Page 02470

manner as the first arm 41, so that the second latching claw 421 is set. Can be set to the first position or the second position in conjunction with the first latching claw 411.

The position of the non-contact type recording medium 10 inserted from the insertion port 32 is regulated by the housing 31a. That is, when the non-contact type recording medium 10 is slid on the contact surface 411p of the first latching claw 411, the non-contact type recording medium 10 moves in the urging direction due to the urging by the elastic members 43 and 44. It is suppressed so that there is no. Therefore, when the inserted non-contact type recording medium 10 slides on the contact surface 411p, a force against the urging force of the elastic members 43 and 44 is applied to the latching portion 40. For this reason, the position of the first latching claw 411 is stored in the storage unit 25 from the first position where the non-contact type recording medium 10 is latched, and the non-contact type recording medium 10 is not latched. Moved to the second position. Further, since the first arm 41 and the second arm 42 are connected, the second latching claw 421 also moves from the first position to the second position in conjunction with the first latching claw 411. .

The interval between the first latching claw 411 and the second latching claw 421 is an interval corresponding to the length in the insertion direction of the non-contact type recording medium 10, and the non-contact type recording medium 10 reaches a preset position. When inserted, the latching portion 40 is disposed so that the non-contact type recording medium 10 passes through the first latching claw 411. For this reason, when the non-contact type recording medium 10 reaches a preset position, the first hooking claw 411 and the second hooking claw 421 are moved from the surface of the reader / writer 20 by the urging force of the elastic members 43 and 44. Also moves to the protruding first position. That is, the first latching claw 411 is in a state of latching the rear end of the non-contact type recording medium 10 inserted at a preset position, and the second latching claw 421 is inserted at a preset position. Then, the front end of the non-contact type recording medium 10 is hooked. Therefore, the non-contact type recording medium 10 is held at a preset position by the first hooking claw 411 and the second hooking claw 421.

The first arm 41 is formed with a release operation unit 415. The release operation unit 415 moves the first hooking claw 411 and the second hooking claw 421 from the first position to the second position to release the hooked state of the non-contact type recording medium 10. It is something that is operated by the user.

Next, the loading operation of the non-contact type recording medium will be described with reference to FIG. In FIG. 9, the release operation unit 415 is omitted.

As shown in FIG. 9A, when the non-contact type recording medium 10 is inserted from the insertion port 32 of the recording medium holding device 30a, the non-contact type recording medium 10 slides on the contact surface 411p of the first latching claw 411. It becomes. Here, when the non-contact type recording medium 10 slides on the contact surface 411p, the urging force of the elastic members 43 and 44 is applied to the non-contact type recording medium 10. However, since the non-contact type recording medium 10 is restrained by the housing 31a, the first hooking claw 411 moves from the first position and is stored in the storage unit 25 as shown in FIG. It becomes the position. In addition, since the second hooking claw 421 is configured to be interlocked with the first hooking claw 411, the second hooking claw 421 is also stored in the storage unit 25.

When the rear end of the inserted non-contact type recording medium 10 passes through the first hooking claws 411, the first hooking claws 411 and the second hooking claws 421 are elastic members 43, 44 as shown in FIG. 9C. Accordingly, the first position protruding from the surface of the reader / writer 20 is restored. The distance between the first hooking claw 411 and the second hooking claw 421 is slightly wider than the length in the insertion direction of the non-contact type recording medium 10 as described above. Accordingly, the rear end of the non-contact type recording medium 10 is hooked by the first hooking claws 411, and the front end of the non-contact type recording medium 10 is hooked by the second hooking claws 421. Therefore, the non-contact type recording medium 10 can be held at a preset position by the first hooking claw 411 and the second hooking claw 421.

When the non-contact type recording medium 10 held by the recording medium holding device 30a is taken out, as shown in FIG. 9D, the release operation part (not shown) is operated in the direction of arrow F to 411 is moved to the second position stored in the storage unit 252. At this time, since the second hooking claw 421 moves to the second position in conjunction with the first hooking claw 411, the non-contact type recording medium by the first hooking claw 411 and the second hooking claw 421 is used. Ten hooking states are released. Therefore, if the orientation of the recording medium holding device 30a is set so that the non-contact type recording medium 10 falls, as shown in FIG. 9E, the held non-contact type recording medium 10 becomes the recording medium holding device 30a. It will be discharged from. Further, the non-contact type recording medium 10 may be sandwiched and extracted at the position of the notch 312 provided in the housing 31a.

Further, in the recording medium holding device 30a, when a non-contact type recording medium is loaded, the non-contact recording medium can be easily replaced only by inserting a new non-contact type recording medium.

FIG. 10 is a diagram for explaining the exchange operation of the non-contact recording medium, and the release operation unit 415 is omitted as in FIG.

As shown in FIG. 10A, the recording medium holding device 30a holds a non-contact type recording medium 10c. Here, when a new non-contact type recording medium 10d is inserted from the insertion port 32 of the recording medium holding device 30a, the non-contact type recording medium 10d slides on the contact surface 411p of the first latching claw 411. . For this reason, the 1st latching claw 411 moves to the 2nd position accommodated in the accommodating part 25, as shown to FIG. 10B. Further, the second latching claw 421 also moves to the second position in conjunction with the first latching claw 411. That is, by inserting a new non-contact type recording medium 10d, the latched state of the held non-contact type recording medium 10c is released and it becomes a removable state.

When the newly inserted non-contact type recording medium 10d passes through the position of the first hooking claw 411, the first hooking claw 411 and the second hooking claw 421 are moved to the elastic member 43 as shown in FIG. 10C. , 44 move to a first position protruding from the surface of the reader / writer 20. Therefore, the rear end of the non-contact type recording medium 10d is hooked by the first hooking claw 411, and the front end of the non-contact type recording medium 10d is hooked by the second hooking claw 421. Therefore, the new non-contact type recording medium 10d can be held at a desired position by the first hooking claw 411 and the second hooking claw 421. That is, the exchange operation of the non-contact recording medium is completed.

As described above, the non-contact type recording medium is securely held by the latching claw at a position where signal transmission and power transmission with the reader / writer are performed simply by inserting the non-contact type recording medium from the insertion port of the recording medium holding device. be able to. Furthermore, when an impact or the like is applied, it is possible to make it difficult to remove the non-contact type recording medium from the recording medium holding device. In addition, when replacing the non-contact type recording medium, it is only necessary to insert a new non-contact type recording medium from the insertion port of the recording medium holding device. It can be done easily.

The second hooking claw 421 is also formed so that the inserted non-contact type recording medium slides on the contact surface with which the front end of the non-contact type recording medium contacts when the non-contact type recording medium is inserted. For example, it is possible to provide a recording medium holding device in which the insertion direction of the non-contact recording medium is not limited.

Such a recording medium holding device can be used for an electronic device that can write data to or read data from an exchangeable recording medium. For example, in an electronic device using a video tape, a magnetic disk, an optical disk, or a contact type recording medium as an exchangeable recording medium, a non-contact type recording medium is used instead of these recording media, or a non-contact type recording medium is used. In addition, a recording medium holding device is provided in an electronic device in which this non-contact type recording medium can be used.

IPR2025-00645 Page 02471

FIG. 11 shows a case where a non-contact type recording medium can be used by providing a reader / writer function in the image pickup apparatus, for example, and the recording medium holding device is provided in the image pickup apparatus in which the non-contact type recording medium can be used. Is shown. FIG. 12 is a block diagram showing the configuration of an imaging apparatus that can use a non-contact type recording medium together with the configuration of the non-contact type recording medium. In FIG. 12, portions corresponding to those in FIG. 1 are denoted by the same reference numerals, and detailed description thereof is omitted.

In the imaging device 50, the light incident through the imaging lens 51 enters the imaging element 521 of the imaging unit 52, and a subject image is formed on the imaging surface. The imaging element 521 is configured using a solid-state imaging element such as a CCD or a CMOS, and outputs an imaging signal based on a subject image obtained by photoelectric conversion.

The video signal processing unit 522 performs noise removal and A / D conversion of the imaging signal output from the imaging element 521. In addition, process processing such as γ processing and knee correction processing is performed using image data obtained by performing A / D conversion. In addition, processing for compressing the image data after the process processing, processing for expanding the compressed image data, and the like are performed. Further, the video signal processing unit 522 supplies the image data to the connected electronic viewfinder 60 to display the image being captured or the recorded image.

The signal transmission processing unit 53 is connected to a signal transmission unit 54 configured similarly to the signal transmission unit 13. The signal transmission processing unit 53 processes the image data supplied from the video signal processing unit 522 so that signal transmission can be performed using the line-to-line coupling between the signal transmission unit 13 and the signal transmission unit 54. The obtained high frequency signal is supplied to the signal transmission unit 54. Further, the high-frequency signal supplied from the signal transmission unit 54 is processed and the image data read from the non-contact type recording medium 10 is supplied to the video signal processing unit 522. For example, the signal transmission processing unit 53 transmits the image data supplied from the video signal processing unit 522 on the assumption that a wireless communication method called UWB (Ultra Wide Band) is used.

The power supply unit 55 supplies power to each unit of the imaging device 50. The power transmission processing unit 56 supplies an alternating current to the planar coil of the power transmission unit 57 configured similarly to the power transmission unit 11. For example, the power transmission processing unit 56 performs switching of the DC voltage supplied from the power supply unit 55 and supplies the AC current by switching the polarity of the voltage applied between the terminals of the planar coil at a predetermined frequency.

The control unit 58 is provided with a user interface 59. The control unit 58 generates a control signal based on the operation signal supplied from the user interface 59, and controls the operations of the imaging unit 52, the signal transmission processing unit 53, and the power transmission processing unit 56 by this control signal.

In the imaging device 50 configured as described above, for example, when a recording operation is performed by the user, the operation of the power transmission processing unit 56 is controlled by the control unit 58 based on the operation signal supplied from the user interface 59, and non-recording is performed. Power is supplied to the contact recording medium 10. In addition, the control unit 58 controls the operation of the signal transmission processing unit 53 to transmit the image data of the captured image to the non-contact type recording medium 10 and perform the writing process.

When a user operation for reproducing the recorded captured image is performed, the control unit 58 controls the operation of the power transmission processing unit 56 based on the operation signal supplied from the user interface 59 to the contactless recording medium 10. To supply power. Further, the operation of the signal transmission processing unit 53 is controlled to request image data from the non-contact type recording medium 10, and based on the image data read from the non-contact type recording medium 10, for example, with the electronic viewfinder 60. Display an image.

Here, when exchanging the non-contact type recording medium, the user only has to insert a new non-contact type recording medium from the insertion port of the recording medium holding device. Can be exchanged. For this reason, it becomes possible to shorten the interruption time of imaging. In addition, even if the non-contact type recording medium is discharged from the discharge port of the recording medium holding device, the discharged non-contact type recording medium is held, so that mechanical impacts due to dropping or the like are applied to the non-contact type recording medium. It can prevent being added.

Further, the recording medium holding device can be applied not only to the imaging device but also to various electronic devices such as a television device, an audio device, a communication device, and an information terminal device provided with a reader / writer function. Further, although the above-described signal transmission processing unit 53 uses UWB, other transmission processing methods can be used by changing the frequency band characteristics of the signal transmission unit 54.

It is a figure which shows the structure of a non-contact-type recording medium. It is a figure which shows the structure of an electric power transmission part. It is a figure which shows the structure of a signal transmission part. It is a figure which shows the external appearance of a recording medium holding | maintenance apparatus and a non-contact type recording medium. It is a figure which shows the loading / exchange operation | movement of a non-contact-type recording medium. It is a figure which shows the external appearance of the recording-medium holding | maintenance apparatus of another structure. It is a disassembled perspective view of the recording media holding | maintenance apparatus of another structure. It is a figure which shows the structure of a latching | locking part. It is a figure which shows the loading operation | movement of a non-contact-type recording medium. It is a figure which shows exchange operation | movement of a non-contact-type recording medium. It is a figure which shows the external appearance of an imaging device. It is a figure which shows the structure of an imaging device.

Explanation of symbols

10, 10a, 10b, 10c, 10d ... Non-contact type recording media, 11, 57 ... Power transmission unit, 12 ... Power supply unit, 13, 54 ... Signal transmission unit, 14, 53. ..Signal transmission processing unit, 15 ... Media control unit, 16 ... Storage unit, 19 ... Recess, 20 ... Reader / writer, 21 ... Power transmission unit, 23 ... Signal transmission unit , 25 ... storage part, 26 ... stop part, 30, 30a ... recording medium holding device, 31, 31a ... casing, 32 ... insertion port, 33 ... discharge port, 35 , 36 ... convex part, 39, 39a, 39b ... pressing part, 40 ... latching part, 41 ... first arm, 42 ... second arm, 43, 44 ... elastic 50, imaging device, 51, imaging lens, 52, imaging unit, 55, power supply unit, 56 Power transmission processing unit, 58 ... control unit, 59 ... user interface, 60 ... electronic viewfinder, 111, 211 ... single wire, 112, 212 ... planar coil, 113, 114, 213 , 214 .. insulating part, 115, 215 ... Metal sheet, 131, 231 ... Dielectric substrate, 132, 232 ... Ground pattern, 133, 233 .. Signal pattern, 134, 136, 234 , 236. . Via, 135, 235... Termination resistor, 311, 312, 313... Notch, 411... First hooking claw, 411 p. Connection unit, 413, 423, shaft, 415, release knob, 421, second latching claw, 521, image sensor, 522, video signal processing unit

Patent Citations (9)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				

IPR2025-00645 Page 02472

JPH08526682	1988-02-24	1996-01-24	日本ケミコン株式会社	Combination of IC card and reader / writer
JP3575042B2	1994-01-24	2004-10-06	ソニー株式会社	Memory card
JPH10232908A	1997-02-19	1998-09-02	Omron Corp	Communication equipment
JP3492167B2 *	1997-10-17	2004-02-03	富士通株式会社	adapter
JP3836979B2 *	1998-06-05	2006-10-25	ヒロセ電機株式会社	Card ejector
JP2002083658A *	2000-07-18	2002-01-31	Hirose Electric Co Ltd	Connector for card
JP3380530B2 *	2000-07-21	2003-02-24	日本圧着端子製造株式会社	Electrical connector for card
JP2002133377A	2000-10-25	2002-05-10	Glory Ltd	Noncontact ic card transaction device
DE102004040448B4 *	2004-08-20	2010-01-21	Amphenol-Tuchel Electronics Gmbh	Pushmatic Smart Card Connector

* Cited by examiner, † Cited by third party

Cited By (8)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
JP5786483B2 *	2011-06-20	2015-09-30	ソニー株式会社	Communication device
JP6894594B2 *	2015-03-31	2021-06-30	株式会社Ｎｅｊｉ Ｌａｗ	Parts, information acquisition system

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP4192981B2	2008-12-10	Recording media holding device
KR101035429B1	2011-05-18	Connector for memory card
JP4116484B2	2008-07-09	Electronic component storage case and electronic device
US20050152670A1	2005-07-14	Auxiliary memory in a tape cartridge
JP2002083640A	2002-03-22	Connector, connecting device and recording device
US7525807B2	2009-04-28	Semiconductor memory device
US20170302023A1	2017-10-19	Card-type storage device having heat dissipation structure and slot device
JP2005026211A	2005-01-27	Contact structure and device equipped it
WO2005078643A1	2005-08-25	Memory card connector
US20020064023A1	2002-05-30	Portable information terminal apparatus
US20100270878A1	2010-10-28	Connector device
JP2006127808A	2006-05-18	Connector device for card
JP2004185822A	2004-07-02	Connector device for card
JP4752883B2	2011-08-17	Non-contact type recording media
US20020094726A1	2002-07-18	Card connector

KR20010098556A	2001-11-08	Adaptor device and input/output device
EP1248327A2	2002-10-09	Card connector device having slide member for discharging card
JP2006127811A	2006-05-18	Connector device for card
WO2005078642A1	2005-08-25	Low profile memory card connector
WO2018062090A1	2018-04-05	Magnetic data processing device and magnetic data processing method
JP3839495B2	2006-11-01	Electronic camera and playback device
JP2007242470A	2007-09-20	Card connector device
JP2006215792A	2006-08-17	Cassette-shaped recording medium and recording/reproduction apparatus
JP2005078279A	2005-03-24	Card type device and control unit
KR200322549Y1	2003-08-14	Coupling apparatus for a connector

Priority And Related Applications

Child Applications (1)

Application	Priority date	Filing date	Relation	Title
JP2008201177A	2006-02-23	2008-08-04	Division	Non-contact type recording media

Priority Applications (2)

Application	Priority date	Filing date	Title
JP2006046826		2006-02-23	
JP2006239411A	2006-02-23	2006-09-04	Recording media holding device

Applications Claiming Priority (5)

Application	Filing date	Title
JP2006239411A	2006-09-04	Recording media holding device
TW096105767A	2007-02-15	Recording medium and apparatus for holding the same
CN200910164148A	2007-02-16	Recording medium and apparatus for holding the same
CN200710103587A	2007-02-16	Recording medium and apparatus for holding the same
US11/676,851	2007-02-20	Recording medium and apparatus for holding the same

Legal Events

Date	Code	Title	Description
2008-05-19	A977	Report on retrieval	**Free format text**: JAPANESE INTERMEDIATE CODE: A971007 **Effective date**: 20080519
2008-06-04	A131	Notification of reasons for refusal	**Free format text**: JAPANESE INTERMEDIATE CODE: A131 **Effective date**: 20080603
2008-08-05	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20080804
2008-08-20	TRDD	Decision of grant or rejection written	
2008-08-27	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01 **Effective date**: 20080826

2008-08-28	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01
2008-09-29	A61	First payment of annual fees (during grant procedure)	**Free format text**: JAPANESE INTERMEDIATE CODE: A61 **Effective date**: 20080908
2008-10-06	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20111003 **Year of fee payment**: 3
2011-10-04	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20121003 **Year of fee payment**: 4
2012-10-02	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20131003 **Year of fee payment**: 5
2013-10-03	LAPS	Cancellation because of no payment of annual fees	

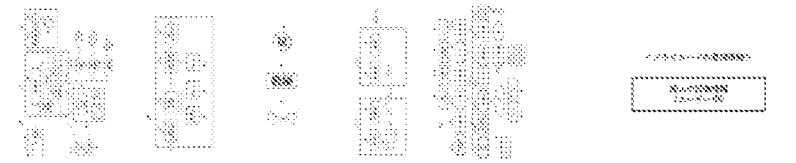
Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

Patents 3805347

Control processing apparatus and image forming apparatus provided with the same

Images (13)



Classifications

G03G15/507 Machine control of apparatus for electrographic processes using a charge pattern, e.g. regulating differents parts of the machine, multimode copiers, microprocessor control by using information from an external support, e.g. magnetic card being interleaved with the original or directly written on he original, e.g. using a control sheet

View 2 more classifications

JP3805347B2
Japan

Download PDF Find Prior Art Similar

Other languages: Japanese

Inventor: 安和 森本, 伸宏 茂木, 秀夫 斎藤

Worldwide applications

2004 JP 2005 US EP CN

Application JP2004256008A events

2004-09-02 Application filed by 松下電器産業株式会社
2004-09-02 Priority to JP2004256008A
2006-03-16 Publication of JP2006074490A
2006-08-02 Application granted
2006-08-02 Publication of JP3805347B2
Status Expired - Fee Related
2024-09-02 Anticipated expiration

Info: Patent citations (8), Cited by (26), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (6)

Hide Dependent

1. Detection means for detecting specific image data present in the input image data, information reading means for transmitting an electromagnetic wave signal to a memory card carried by the user who entered the detection area, and reading the user's recognition information; storage means for use function restriction information is stored that indicates the availability function for image data to which the specific image data which is previously set for each user is detected that the authentication based on the recognition information that the user read from the memory card portable , And a function whose use is restricted according to the use function restriction information when the user selects a function whose use is restricted for the image data in which the specific image data is detected by the use function restriction information. Has a control means which is not implemented .

    2. The control means is configured such that when a user selects a function whose use is restricted with respect to the image data in which the specific image data is detected by the use function restriction information, the use is restricted according to the use function restriction information. The control processing apparatus according to claim 1, wherein an available function that can be replaced without being implemented is determined and implemented .

3. The said control means performs the image conversion process which converts the characteristic of the image data for which use is restricted to the characteristic of the usable image data when implementing the substitutable usable function. The control processing device described.

    4. When the control unit implements the replaceable usable function, the function that is restricted in use by the use function restriction information after being converted into image data in which a predetermined portion of the image data including the specific image data is deleted, control processor according to claim 2, wherein the implement.

    5. The said control means, when the use function with respect to the image data from which the specific image data is detected is implemented, the implemented use function, the type of image data, and the authenticated user are stored in the storage means. The control processing apparatus according to any one of claims 1 to 4 .

    6. An image forming apparatus comprising the control processing device according to claim 1.

Description

The present invention relates to a control processing apparatus that restricts a use function such as an image forming process for a specific document such as a confidential document, and an image forming apparatus including the control processing apparatus.

IPR2025-00645 Page 02476

In recent image forming apparatuses (printers, fax machines, copiers, multifunction machines, etc.), the image forming apparatus is improved in image quality and equipped with multiple functions (reading, editing, printing, sending, filing, etc. of image data). Along with this, there is known one that restricts a use function such as an image forming process for a specific document including a specific original image such as a confidential document or a color document depending on a user.

As a specific example, there has been proposed a color copier that prohibits copying of a manuscript image on a printer unit when the manuscript image data read by the scanner unit of the color copier includes a specific manuscript image. When the control center receives a notification from a customer of a color copier whose copying is prohibited, the customer notifies the customer of the password of the color copier, and when the customer enters the password in the color copier, The prohibited copying is canceled and the original image is copied (see, for example, Patent Document 1).

In addition, the RFID sheet of a document set on a paper feed stand by allowing a user to carry an RFID (Radio Frequency-Identification) card and affixing an RFID sheet to a confidential document and providing a reader / writer in the copier, and the copier A copying machine has been proposed that reads the user's RFID card in front of the printer. In such a copying machine, the copying machine can copy the document only when the access right of the user read from the RFID card of the user is higher than the confidential level of the document read from the RFID sheet of the document on the sheet feeding table. (See, for example, Patent Document 2).
Japanese Patent Laying-Open No. 2003-50525 (FIG. 1) JP 2001-160117 A (FIG. 2)

However, this conventional technique has the following problems.

In other words, when it is recognized that the read original image data includes a specific original image, copying by the printer unit is prohibited, and when the original image is copied after waiting for a password input from the customer, the customer There was a problem that required a series of troublesome work of contacting the customer and entering the password received from the control center.

In addition, the copying machine can copy the document only when the access right of the user read from the RFID card of the user is higher than the confidential level of the document read from the RFID of the document on the sheet feeding table. In this case, there is a problem that a troublesome work of attaching an RFID sheet to a specific document is required, leading to an increase in cost, and degrading the quality of the specific document.

The present invention has been made in view of the above problems, and does not require troublesome work for the user, and image forming processing for a specific document including a specific original image is simple and low cost for each user. An object of the present invention is to provide a control processing apparatus capable of limiting the use functions such as the above and an image forming apparatus provided with the control processing apparatus.

The present invention detects a specific image data present in the input image data and sends the electromagnetic wave signal to enter the memory card a user mobile in the detection area read the recognition information for the user, the user There thus the user authenticated based on the recognition information read from the memory card portable, based on the usage function restriction information indicating an availability function for image data specific image data set in advance is detected, the detection is specific image data When a function whose use is restricted with respect to the image data thus selected is selected, the function whose use is restricted is not executed .

According to the present invention, without requiring troublesome work on the user, in a simple and low cost per user, it is possible to restrict the use functions such as image forming processing for the specific document including the specific original image.

The control processing device according to the first aspect of the present invention includes a detection unit that detects specific image data present in input image data, and an electromagnetic wave signal to a memory card carried by a user who enters the detection area. Information reading means for reading the user's recognition information and whether or not the specific image data set in advance for each user authenticated based on the recognition information read from the memory card carried by the user can be used for the detected image data A storage unit storing use function restriction information indicating a function, and the user selects a function whose use is restricted for the image data in which the specific image data is detected by the use function restriction information. In this case, a configuration having a control unit that does not implement a function that is restricted in accordance with the use function restriction information is adopted.

According to this configuration, for a user who is authenticated based on the recognition information read from the memory card carried by the user, the function whose use is restricted for the image data in which the specific image data is detected by the use function restriction information. When the function is selected, the function whose use is restricted according to the use function restriction information is not executed. Accordingly, it is possible to easily set a use function restriction on image data in which specific image data existing in the image data is detected for each user for various functions installed in the main body apparatus. As a result, it is possible to avoid a situation in which various functions for image data in which specific image data existing in the image data in the main apparatus is detected by an arbitrary user are used without limitation.

Further, since the specific image data exists in the input image data , it is detected in the image data. Thereby, it is possible to detect from a part of a normal image without requiring a special seal such as RFID in order to detect specific image data. As a result, it is possible to prevent the user from performing troublesome work, to prevent an increase in cost, and to prevent the quality of a specific document including specific image data from deteriorating.

According to a second aspect of the present invention, in the control processing device according to the first aspect, the control means is a function whose use is restricted for the image data in which the specific image data is detected by the use function restriction information. Is selected by the user, a function that is restricted according to the use function restriction information is not executed, and a replaceable usable function is determined and executed .

According to this configuration, when a user selects a function whose use is restricted with respect to image data in which specific image data is detected based on the use function restriction information, a replaceable usable function is determined according to the use function restriction information. And implement. For this reason, it is possible not only to restrict the use function but also to implement an alternative use function. As a result, while avoiding a situation in which various functions for image data by Ritoku constant image data is detected on any of the user is unlimited, it can be user experience is also maintained.

According to a third aspect of the present invention, in the control processing device according to the second aspect, the control means can use the characteristics of the image data whose use is restricted when the replaceable usable function is performed. A configuration is adopted in which image conversion processing is performed to convert the characteristics of image data .

According to this configuration, since the image conversion process for converting the characteristics of the image data whose use is restricted to the characteristics of the usable image data is performed, an alternative use function that requires image format conversion is performed. be able to. For example, when copy of image data including color data is instructed as specific image data, use of color data is restricted, while color data is converted to black and white data when copy of black and white data is allowed It is possible to carry out copying.

According to a fourth aspect of the present invention, in the control processing device according to the second aspect, the control unit deletes a predetermined portion of the image data including the specific image data when performing the replaceable usable function. After the conversion to the image data, a configuration is adopted in which a function whose use is restricted by the use function restriction information is implemented .

IPR2025-00645 Page 02477

According to this configuration, when performing a substitutable use function, a process of converting a predetermined portion of image data including specific image data into image data is performed, so that no special processing is required from the user. Alternative use functions can be implemented .

A fifth aspect of the present invention, the control processor according to the first to fourth one aspect, the control means, if the specific image data is performed utilizing function for image data detected, the A configuration is adopted in which the used function, the type of image data, and the authenticated user are stored in the storage means.

According to this configuration, when the use function is performed on the image data in which the specific image data is detected, the used use function, the type of image data, and the authenticated user are stored in the storage unit . By reading the history, it is possible to monitor the usage function status of the authenticated user and specific image data such as confidential information as needed. As a result, risk management for specific image data such as confidential information can be more thoroughly performed.

An image forming apparatus according to a sixth aspect of the present invention employs a configuration including a control processing apparatus according to any one of the first to fifth aspects.

According to this configuration, the effect of the control processing device according to any one of the first to fifth aspects can be obtained in the image forming apparatus.

FIG. 1 is a block diagram showing a main configuration of a multifunction machine 100 equipped with a control processing apparatus according to the present embodiment.

As shown in the figure, a multifunction peripheral 100 according to the present embodiment includes a control processing apparatus 101 that controls the entire apparatus and performs image processing of input image data, and a document placed on a document table. A reading device 102 for reading, a printing device 103 for printing image data read by the reading device 102 or image data received via the PSTN or LAN, and an operation input from the user to the multifunction peripheral 100 and a current status And the like.

The control processing device 101 includes a main control unit 105, a program memory 106, a data memory 107, a reading control unit 108, an image processing unit 109, and an RFID control unit 110.

The main control unit 105 controls the control processing apparatus 101 and controls the entire multifunction peripheral 100. When performing various controls, the main control unit 105 reads and executes a control program stored in the program memory 106. When executing the control program, the data memory 107 is used as a work area. The reading control unit 108 controls the reading device 102 under the control of the main control unit 105.

The image processing unit 109 determines whether or not specific image data (described later) is present in the image data output from the CCD sensor 111 of the reading device 102 and performs image conversion processing according to the specific image data. image data that has been subjected to image processing by the image processing unit 109 is input to the printing control unit 112 of the printing apparatus 103 and visualized on the surface of the photosensitive drum 114 via the LSU 113.

The RFID control unit 110 includes an antenna 115, and reads user identification information recorded in a memory card 116 carried by the user who enters the detection area. The memory card 116 includes an RFID chip 117 and transmits data registered in the card (hereinafter referred to as "registered data" as appropriate) to the RFID controller 110 via the antenna 118.

The panel device 104 includes a panel control unit 119 that controls the entire panel device under the control of the main control unit 105. The panel control unit 119 controls display on a display panel such as a touch panel while receiving input from operation keys and a large touch panel.

The multifunction device 100 also includes a FAX control unit 120, a LAN control unit 121, and a file control unit 122. The FAX control unit 120, the LAN control unit 121, and the file control unit 122 perform the following control under the control of the main control unit 105. The FAX control unit 120 performs communication control of facsimile data via the PSTN. The LAN control unit 121 performs communication control with a server or personal computer (hereinafter referred to as "PC") connected on the LAN. The file control unit 122 performs processing such as registration, editing, and deletion of a file in the storage unit 123 such as a hard disk (HD).

FIG. 2 is a block diagram illustrating a configuration of the image processing unit 109 included in the control processing apparatus 101 according to the present embodiment.

In the image processing unit 109 shown in the figure, a read image processing circuit 201 performs a shading correction process and a scanner γ conversion process on the image data received from the reading apparatus 102. In the shading correction processing, light amount variation correction and CCD sensor 111 characteristic variation correction are performed. In the scanner γ conversion process, the read image data is γ-converted from reflectance data to density data so as to be easily handled by the printing apparatus 103.

The specific image detection circuit 202 detects specific image data in the image data received from the read image processing circuit 201. The specific image data refers to image data that is subject to restriction on the use of each function in the multifunction peripheral 100. For example, image data or color image data indicating a confidential document corresponds to the specific image data. The former is for avoiding disadvantages caused by free copying of confidential documents, facsimile transmission, and the like, and the latter is set as specific image data to avoid cost increase due to free copying of color images.

As shown in FIG. 2, a specific image data memory 203 and an image memory 204 are connected to the specific image detection circuit 202. The specific image data memory 203 stores sample data of specific image data in advance. On the other hand, the image memory 204 stores the image data received from the read image processing circuit 201. The specific image detection circuit 202 detects specific image data in the image data received from the read image processing circuit 201 by performing a matching process on the image data stored in both memories.

Here, sample data of specific image data stored in the specific image data memory 203 will be described. FIG. 3 is a diagram illustrating an example of sample data of specific image data stored in the specific image data memory 203.

In the figure, sample data of specific image data as image data indicating a confidential document is shown. FIG. 3A shows specific image data (specific image data A) composed of specific characters indicating "handle as secret". FIG. 3B shows specific image data (specific image data B) made up of specific characters indicating "handle as a secret that must be strictly guarded". Further, FIG. 3C shows specific image data having a specific shape indicating the meaning of "prohibit copying".

When the specific image data is color image data, the RGB components of the image data read by the reading device 102 are analyzed, and if each color component is equal to or greater than a predetermined threshold value, the color image data (specific image data) To be recognized as.

The image processing circuit 205 such as editing / conversion performs image processing such as editing or conversion of the image data received from the specific image detection circuit 202. In particular, the editing / conversion image processing circuit 205 performs image processing such as editing and conversion on the image

IPR2025-00645 Page 02478

data when the designated function is restricted for the image data in which the specific image data is detected. When performing image processing, the image processing circuit 205 such as editing / conversion uses the image memory 206 as its work area. If the image data input from the specific image detection circuit 202 is not the image data from which the specific image data is detected, the image processing circuit 205 such as editing / conversion prints the image data without performing image processing. Output to the image processing circuit 207.

The print image processing circuit 207 performs halftone conversion processing, print area processing, and printer γ conversion processing on the image data received from the image processing circuit 205 such as editing / conversion. In the halftone conversion process, a pseudo gradation conversion process corresponding to the printing capability of the printing apparatus 103 is performed on the image data. In print area processing, white data is added in margin processing, mask processing in book processing, and the like are performed. In the printer γ conversion process, the output data is γ converted in accordance with the printing characteristics of the printing apparatus 103.

FIG. 4 is a block diagram showing the configuration of the RFID control unit 110 and the memory card 116 to be detected by the RFID control unit 110 included in the control processing apparatus 101 according to the present embodiment.

As shown in the figure, the RFID control unit 110 includes a control circuit 401, a modem circuit 402, and an antenna 115. The control circuit 401 performs control for reading and writing registration data (recognition information) stored in the memory card 116. The modem circuit 402 modulates and demodulates signals communicated with the memory card 116 instructed by the control circuit 401. The signal modulated by the modem circuit 402 is sent to the memory card 116 via the antenna 115. On the other hand, a signal coming from the memory card 116 via the antenna 115 is demodulated by the modem circuit 402 and then output to the control circuit 401.

On the other hand, the memory card 116 includes a control circuit 403, a memory 404, a modem circuit 405, a capacitor 406, and an antenna 118. The control circuit 403 performs control for performing processing according to the read / write instruction for the registered data in the memory card 116 from the RFID control unit 110. The memory 404 stores recognition information (user ID) of a user carrying the memory card 116 as registration data. The control circuit 403 reads or writes the recognition information stored in the memory 404 in response to an instruction from the RFID control unit 110. The modem circuit 405 modulates and demodulates signals communicated with the RFID control unit 110 instructed by the control circuit 403. The signal modulated by the modem circuit 405 is sent to the RFID control unit 110 via the antenna 118. On the other hand, a signal arriving from the RFID controller 110 via the antenna 118 is demodulated by the modem circuit 405 and then output to the control circuit 403. The capacitor 406 stores electromagnetic wave energy supplied from the RFID controller 110 via the antenna 118 as electric power.

FIG. 5 is a functional block diagram of the MFP 100 according to the present embodiment. In the figure, a part of the network is also illustrated. Further, the MFP 100 according to the present embodiment is equipped with a printer function, a copy function, a scanner function, a FAX function, an e-mail function, and a filing function. In FIG. Only the blocks related to are shown. In FIG. 5, the same reference numerals are given to the configurations common to the configurations shown in FIG. 1.

The multi-function device 100 can be connected to various servers 501 and client PCs 502 via a LAN. The server 501 includes a personal information server that holds a personal information table and performs personal authentication and distribution of personal information, and a WEB server that executes a job selected from a menu by a remote procedure method.

The multi-function peripheral control unit 503 is a part that performs overall control of the multi-function peripheral 100. The control executed by the main control unit 105 and the image processing unit 109 shown in FIG. The print control unit 112 is a part that executes processing for converting print data given from the client PC 502 or the like into image data of a predetermined format, and in particular, warms up the heater unit (fixing device) 504 of an image forming unit (not shown). A start instruction is given, and a cassette selection instruction is given to the cassette controller 505. The cassette control unit 505 selects a designated cassette from the cassettes (1) to (n) equipped in a plurality of stages and feeds the selected cassette to the image forming unit. The FAX control unit 120 includes a modem that is connected to the PSTN and executes a procedure for facsimile communication. The panel control unit 119 displays an operation screen or the like on the large touch panel 506 and interprets the operation content input by the user from the touch position and display content of the large touch panel 506.

The RFID control unit 110 has a function of reading and writing data from and to the memory card 116 using electromagnetic wave signals. When a magnetic field is applied from the RFID control unit 110 to the memory card 116, the return magnetic field at that time includes an influence (information) corresponding to the stored contents of the memory card 116. The RFID control unit 110 detects the stored contents of the memory card 116 from the return magnetic field. Conversely, information is written by electromagnetically changing the memory card 116 with an electromagnetic wave signal applied to the memory card 116 from the RFID controller 110. The RFID controller 110 reads / writes registration data to / from the memory card 116 in a detection area having a radius of about 1 m in a non-contact manner via an electromagnetic wave signal.

The personal information control unit 507 manages the write destination of the registration data read from the memory card 116. The personal information control unit 507 is a part that notifies the RFID control unit 110 of data to be written to the memory card 116. The LAN control unit 121 performs communication control with the server 501 and the client PC 502 on the LAN. The personal information server I / F unit 508 executes processing for communicating with the personal information server among the servers 501 on the LAN. The data memory 107 functions as a storage unit that stores data received from the memory card 116 and the personal information server. The job control unit 509 is a part that gives instructions to the corresponding units when executing each job provided by each function such as a copy function, a printer function, a FAX function, a scanner function, an electronic mail function, and a file function.

The voice control unit 510 holds voice data for voice guidance. When a voice guidance instruction is given from the panel control unit 119 and the job control unit 509 in synchronization with a user operation, the voice control unit 510 outputs corresponding voice data to the speaker 511. The voice guidance is preferably voice for assisting the operation on the operation screen displayed on the large touch panel 506, but may have other contents. The panel angle position sensor 512 detects the angle of the large touch panel 506, and the panel angle drive motor 513 receives the control signal from the panel control unit 119 and adjusts the angle of the large touch panel 506. In this embodiment, the angle of the large touch panel 506 is adjustable, but a fixed configuration may be used.

FIG. 6 is a diagram showing registration information of the memory card 116.

As shown in the figure, the memory card 116 stores only the user ID as personal recognition information. Although it is preferable from the viewpoint of security that the registration information of the memory card 116 is limited to the user ID and no other personal information is stored, other personal information or group information may be stored.

FIG. 7 is a diagram showing the data structure of a personal information table registered in the personal information server as the server 501.

In the personal information server, there is a personal information table for each registered user. As shown in the figure, the personal information table includes a user ID serving as personal recognition information, personal information such as a department to which the user belongs, function information restricted by the registered user (hereinafter referred to as "function restriction information"), and it includes history information of functions used by the registered user (hereinafter referred to as "used function history information"). The usage function history information will be described later.

FIG. 8 is a diagram illustrating a configuration example of the function restriction information in the personal information table.

IPR2025-00645 Page 02479

As shown in the figure, the function restriction information includes a function list in which functions to be restricted are listed in a list format, and information indicating whether or not each item of the function list is restricted (usability) (Referred to as "usability information"). The availability information is divided according to the type of image data to be processed for each item in the function list. In the figure, the image data to be processed is normal image data not including specific image data (normal image shown in FIG. 8), and image data including color image data as specific image data (color shown in FIG. 8). Image), image data including the specific image data A shown in FIG. 3A (image A shown in FIG. 8), and image data including the specific image data B shown in FIG. 3B (image B shown in FIG. 8). Are divided according to the type of the four image data.

More specifically, the availability information and remarks of each function are registered corresponding to each item of the function list composed of the function name and its function. In this embodiment, "copy", "FAX", "InternetFAX / E-Mail", "scanner", and "file" are registered as function names.

Multiple functions are registered for each function name. For example, in the function name "copy", functions such as "color copy", "monochrome copy", and "double-sided copy" are registered. Among these functions, only the function that permits the use of the image data to be processed is set with "○" indicating the permission in the availability information.

For example, in the figure, in the function "color copy" of the function name "copy", when the image data to be processed is "color image", the use is not permitted, and "image A" and "image" in the case of "B", the use is permitted. In addition, the function "FAX" function "external transmission" is allowed to be used only when the image data to be processed is "normal image", and is allowed to be used for other image data. It shows the case of not doing. Further, in the function "monochrome file" of the function name "file", any image data is allowed to be used.

It should be noted that a specific number (numerical value) may be set for the availability as shown in the function "restricted transmission number" of the function name "FAX" and the function "restriction of resolution" of the function name "scanner". In the remarks, for example, a standard for determining availability is registered.

Next, an operation when an operation is instructed by the user to the multifunction peripheral 100 according to the present embodiment will be described with reference to FIGS. 9 and 10.

When the user instructing the operation to the multifunction device 100 carries the memory card 116 and approaches, it is detected by the RFID control unit 110 (S200). For example, the memory card 116 in which the identification information (user ID) of the person is written is put in an employee card holder carried by the employee (user) by dropping from the neck. The user ID in the memory card 116 is read by the RFID controller 110 when the user carrying the memory card 116 enters the detection area of the RFID controller 110 (assuming that it is about 1 m in this case).

The RFID control unit 110 stores the user ID read from the memory card 116 in the data memory 107 (S201). The multi-function peripheral control unit 503 reads the user ID stored in the data memory 107 and notifies the personal information server I / F unit 508 (S202).

As will be described later, when receiving the user ID, the server for personal information as the server 501 checks whether or not the personal information table of the user who has registered the user ID that matches the user ID is registered. Returns presence / absence information.

The personal information server I / F unit 508 confirms whether or not the user is registered in the personal information server from the registration presence / absence information (S203). If the personal information table of the user is not registered ("NO" in S204), the personal information server I / F unit 508 outputs an "unregistered user detection notification" to the panel control unit 119. Upon receiving the "unregistered user detection notification", the panel control unit 119 displays a message indicating that the device cannot be used on the large touch panel 506 (S205).

On the other hand, if the personal information table of the user has been registered ("YES" in S204), the personal information server I / F unit 508 extracts the personal information table data of the detected user from the personal information server, and the data memory 107 (S206).

The panel control unit 119 extracts the name of the detected user from the personal information table data stored in the data memory 107, and displays the name as a person who can use the device on the large touch panel 506 (S207). For example, if the name registered in the personal information of the personal information table is "Taro Matsushita", a character such as "Taro Matsushita has been authenticated" is displayed.

A menu screen is displayed together with the name of the detected user. On the menu screen, various function buttons for inputting instructions to the multifunction peripheral 100 are displayed. After this menu screen is displayed on the large touch panel 506, the user starts the operation (S208). Specifically, when a user selects a function button from the large touch panel 506, an operation such as color copying or external line transmission by FAX is started.

If the operation is started, the multifunction peripheral control unit 503 reads the image data of the document image to be processed by the reading device 102 (S209). Then, the presence or absence of specific image data in the read image data and the type of the specific image data are detected (S210). Information indicating the presence and type of the detected specific image data is notified to the job control unit 509.

Upon receiving this information, the job control unit 509 reads the function restriction information in the personal information table of the user stored in the data memory 107. Then, it is determined whether the function corresponding to the read image data among the functions designated by the function button corresponds to the function restriction information (S211).

If it does not correspond to the function restriction information, the job control unit 509 starts a job provided by the instructed function (S212). When the job is completed (S213), the personal information server I / F unit 508 records the usage function history in the usage function history information in the personal information table (S214). After recording the use function history in the personal information table, the multifunction peripheral control unit 503 ends the process.

FIG. 11 is a diagram illustrating a configuration example of usage function history information in the personal information table. FIG. 11 shows the user use function history information indicated by the user ID "0825abX".

As shown in the figure, the usage function history information includes a date, a user ID, a type of image data, and a usage function. In FIG. 11, the function history when color copying was performed on image data including specific image data A on August 25, 2004, and the image data including color image data on August 28, 2004 was displayed with a color scanner. It shows the case where the usage function history when reading is registered.

As described above, according to the MFP 100 according to the present embodiment, the usage function, the type of image data, and the like when stored without limiting the usage function for the image data in which the specific image data is detected are stored. Therefore, by reading the history of the stored information, it is possible to monitor the use function status for the authenticated user and the specific image data such as confidential information as needed. As a result, risk management for specific image data such as confidential information can be further thorough.

On the other hand, if it is determined in step S211 that the function restriction information is satisfied, the MFP control unit 503 determines whether an alternative function can be used by image processing such as editing / conversion (S215). If the alternative function is available, the MFP control unit 503 performs image processing on the image data (S216). After performing the image processing, the MFP overall control unit 503 ends the processing through the processing of S212 to S214.

IPR2025-00645 Page 02480

Here, a case where an alternative function can be used by image processing such as editing / conversion will be described. In the following description, an example in which a color copy of image data including color image data is instructed by a certain user will be described. It is assumed that data shown in FIG. 8 is registered as function restriction information in the personal information table of the user.

As shown in FIG. 8, color copying of image data including color image data is restricted for the user. For this reason, the operation is not executed. However, as shown in the figure, the user is not limited to monochrome copying of image data including color image data. In such a case, the multifunction peripheral control unit 508 converts the color image data to be processed into monochrome image data, and then executes monochrome copying as an alternative function. The multifunction peripheral overall control unit 503 determines whether or not such an alternative function can be used, and executes the alternative function if possible.

As described above, according to the multifunction peripheral 100 according to the present embodiment, when a function whose use is restricted by the function restriction information is selected by the user, a substitute use function is executed according to the function restriction information. For this reason, it is possible not only to restrict the use function but also to execute a substitute use function. As a result, it is possible to maintain user convenience while avoiding a situation in which various functions for image data in which specific image data is detected in the main device by an arbitrary user are used without limitation.

In particular, in the MFP 100 according to the present embodiment, the necessary image processing is performed when the replaceable use function is performed, and thus the replaceable use function can be performed without requiring a special process from the user. be able to. As necessary image processing, for example, image conversion processing for converting the characteristics of image data is performed. For this reason, it is possible to execute an alternative use function that requires image format conversion.

Note that in the multifunction peripheral 100 according to the present embodiment, an arbitrary alternative function can be executed by advance setting. As described above, when color copying of image data including color image data is not permitted, monochrome copying of image data including monochrome image data is executed as an alternative function, or monochrome copying of image data including specific image data A is performed. When the image data is not allowed, a monochrome copy of the image data in which a predetermined portion (for example, a portion to be kept as confidential information) of the image data including the specific image data A is deleted can be executed as an alternative function. In the former case, it is possible to perform image processing such as adding gradation to monochrome image data in accordance with color image data before conversion.

On the other hand, if the alternative function is not available in the processing of S215, the job control unit 509 gives an "error notification" to the panel control unit 119 and the voice control unit 510 that the function cannot be used due to the use function restriction. Output. When the panel control unit 119 receives this "error notification", the panel control unit 119 displays an error message on the large touch panel 506 indicating that the use of the function is restricted. Upon receiving this "error notification", the voice control unit 510 emits an error sound from the speaker 511. At this time, the job control unit 509 does not accept the function instructed by the user (S217).

As described above, in the MFP 100 according to the present embodiment, when a function whose use is restricted is selected by the user, an error message indicating that the function is restricted is displayed on the large touch panel 506. The user can easily recognize that the function cannot be used, and can prompt the next processing.

The error message displayed on the large touch panel 506 is provided with a confirmation button. The confirmation button is used when canceling the error message and returning the process to S208. When the error message is displayed, the user presses the confirmation button to return to the original menu screen (S208) (S218). Then, such processing is repeated, and whether the job instructed by the user is completed (S213), or when the user gives up the operation, the job control unit 509 ends the processing.

FIG. 12 is a functional block diagram of the server 501 connected to the MFP 100 according to the present embodiment via a LAN. A server 501 shown in the figure includes a CPU 1201 that controls the entire apparatus. The memory 1202 stores a control program used when the CPU 1201 reads and controls the entire apparatus, and has a function as a work memory of the CPU 1201. A hard disk (HD) 1203 stores information to be distributed to the multifunction peripheral 100 according to the present embodiment. For example, when the server 501 functions as a personal information server, the above personal information table is stored for each registered user. When functioning as a WEB server, a menu for the MFP 100 and a job group associated therewith are stored. The network I / F unit 1204 is an interface part with the LAN.

The operation when the server 501 having the above configuration functions as a personal authentication server will be described with reference to FIG. FIG. 13 is a flowchart for explaining the operation when the server 501 according to the present embodiment functions as a server for personal authentication.

A server 501 serving as a personal authentication server monitors reception of various types of information from the multifunction peripheral 100 according to the present embodiment in a standby state. Specifically, reception of recognition information (user ID) (S1301), reception of a table information read request (S1302), and reception of other information (S1303) are monitored.

If the recognition information is received in S1301 while monitoring the reception of various types of information, the table information of the registered user is retrieved from the personal information table stored in the HD 1203 (S1304). Thereby, it is determined whether or not the received recognition information is registered in the personal information table. Then, the search result, that is, the presence / absence of registration of the recognition information is transmitted to the accessing multifunction device 100 (S1305).

On the other hand, if a table information read request is received in S1302, the table information of the registered user is extracted from the personal information table stored in the HD 1203 (S1306). As a result, the registered user table information associated with the previously received recognition information is extracted. Then, the table information is transmitted to the accessing multifunction device 100 (S1307).

If other information is received in S1303, the corresponding process corresponding to the information is performed (S1308). If the various processes are completed in S1305, S1307, and S1308, the server 501 ends the process. As described above, the server 501 determines a process according to various information received from the multi-function peripheral 100 and executes the process.

As described above, according to the multifunction peripheral 100 of the present embodiment, the function restriction information set in advance for the user authenticated based on the personal identification information (user ID) read from the memory card 116 is read from the server 501 and the data memory The function which is stored in 107 and usable by the authenticated user for the image data in which the specific image data is detected is restricted according to the function restriction information. Thereby, it is possible to set a use function restriction on image data in which specific image data is easily detected for each user for various functions installed in the main device. As a result, it is possible to avoid a situation in which various functions for image data in which specific image data is detected in the main device by an arbitrary user are used without limitation.

The specific image data is detected from the input image data. Thereby, it is possible to detect from a part of a normal image without requiring a special RFID seal or the like to detect the specific image data. As a result, it is possible to prevent the user from performing troublesome work, to prevent an increase in cost, and to prevent the quality of a document including specific image data from deteriorating.

IPR2025-00645 Page 02481

Furthermore, in MFP 100 according to the present embodiment, a personal information table in which personal information is registered is held on server 501 and user function restriction information corresponding to personal recognition information read from memory card 116 is stored. Read from server 501. According to this, since it is not necessary to register a personal information table on the multi-function peripheral 100, it is possible to realize function use restrictions in the multi-function peripheral 100 without preparing a large-capacity hard disk device or the like.

In particular, in the MFP 100 according to the present embodiment, the specific image data is configured with a specific shape or specific characters, so that the user can easily and reliably recognize that the specific document includes the specific image data. The specific image data can be detected easily and reliably. Further, since the image data is added as character image data, the quality of the specific document is not deteriorated. Furthermore, since the specific image data is configured with a specific color such as red, the user can more easily and reliably recognize that the specific image data includes the specific image data.

Also, in the multifunction peripheral 100 according to the present embodiment, the specific image data is composed of image data including color image data, so that the user can easily and reliably recognize that the specific document is a specific document, and Detection can be performed easily and reliably.

In this embodiment, personal information, function restriction information, and the like are registered in the server 501 functioning as a personal information server, and the personal information is read by the multi-function peripheral 100 and stored in the data memory 107. Explains the case. However, the present invention is not limited to this, and a storage device such as a large-capacity hard disk device may be provided in the multi-function device 100, and a personal information table may be registered and read out from the storage device. When such a change is made, it is possible to implement function use restrictions in the multifunction peripheral 100 only by the apparatus main body.

According to the multifunction peripheral of the present invention, it is possible to limit the use function such as image forming processing for a specific document including a specific document image for each user easily and at a low cost without requiring a troublesome operation from the user. This is useful in that a situation in which various functions of the multifunction peripheral can be used without any limitation by an arbitrary user.

A block diagram showing a main configuration of a multi-function peripheral equipped with a control processing apparatus according to the present embodiment The block diagram which shows the structure of the image process part which the control processing apparatus which concerns on the said embodiment has. The figure which shows an example of the sample data of the specific image data stored in the specific image data memory of the image processing part which concerns on the said embodiment. The block diagram which shows about the structure of the memory card used as the detection target of the RFID control part and RFID control part which the control processing apparatus which concerns on the said embodiment has Functional block diagram of the MFP according to the above embodiment The figure which shows the registration information of the memory card read / written by the multifunctional device which concerns on the said embodiment The figure which shows the data structure of the personal information table registered into the server (personal information server) connected to the multifunctional device which concerns on the said embodiment. The figure which shows an example of the function restriction | limiting information contained in the personal information table which the personal information server connected to the multifunctional device which concerns on the said embodiment registers. Flow chart for explaining the operation when an operation is instructed by the user to the multifunction peripheral according to the above embodiment Flow chart for explaining the operation when an operation is instructed by the user to the multifunction peripheral according to the above embodiment The figure shown about an example of the utilization function log | history registered into the utilization function log | history table provided on the personal information table of the server for personal information connected to the multifunctional device which concerns on the said embodiment. Functional block diagram of a server connected to the MFP according to the above embodiment Flow chart for explaining the operation of the server for personal authentication connected to the MFP according to the above embodiment

Explanation of symbols

DESCRIPTION OF SYMBOLS 100 MFP 101 Control processing device 102 Reading device 103 Printing device 104 Panel device 105 Main control unit 107 Data memory 109 Image processing unit 110 RFID control unit 116 Memory card 202 Specific image detection circuit 203 Specific image data memory 205 Image such as editing / conversion Processing circuit 501 Server 503 Multi-function peripheral control unit 507 Personal information control unit 508 Personal information server I / F unit 509 Job control unit 1201 CPU
1202 Memory 1203 Hard disk (HD)
1204 Network I / F part

Patent Citations (8)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
JP3618801B2 *	1994-10-31	2005-02-09	キヤノン株式会社	Image processing device
JP4081947B2 *	1999-12-03	2008-04-30	富士ゼロックス株式会社	Device security management system
JP2003050525A	2001-08-08	2003-02-21	Ricoh Co Ltd	Image forming system, image forming method and recording medium
JP2003160117A	2001-11-26	2003-06-03	Sato Corp	Label sticking device
US6694411582 *	2002-01-29	2004-02-17	Hewlett-Packard Development Company, L.P.	Altering print configurations for authorized users
JP4021356B2	2002-10-15	2007-12-12	株式会社リコー	Recording medium reader
JP2004223989A	2003-01-27	2004-08-12	Ricoh Co Ltd	Image forming system
US6782217B1 *	2003-02-14	2004-08-24	Kyocera Mita Corporation	Image forming device which detects and processes control data on original document

* Cited by examiner, † Cited by third party

Cited By (26)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US8249559B1 *	2005-10-26	2012-08-21	At&T Mobility Ii Llc	Promotion operable recognition system
JP4404059B2 *	2006-02-21	2010-01-27	ユニカミノルタビジネステクノロジーズ株式会社	Image forming apparatus
JP4801468B2	2006-03-02	2011-10-26	株式会社リコー	Management apparatus and image forming apparatus management system
JP4817930B2 *	2006-03-31	2011-11-16	キヤノン株式会社	Print control apparatus, control method, and program
JP4804302B2 *	2006-10-06	2011-11-02	キヤノン株式会社	Image processing apparatus, control method therefor, program for executing the control method, and storage medium
JP2008118363A *	2006-11-02	2008-05-22	Murata Mach Ltd	Image processor
JP4301288B2 *	2006-12-25	2009-07-22	ブラザー工業株式会社	Compound machine
JP4283315B2 *	2007-02-01	2009-06-24	シャープ株式会社	Image history storage method, image history storage system, image history storage program, and recording medium
JP5142551B2 *	2007-02-22	2013-02-13	キヤノン株式会社	Electronic document processing apparatus, electronic document processing method, and computer program
JP2008244518A *	2007-03-23	2008-10-09	Ricoh Co Ltd	Image forming apparatus management system, image forming apparatus, management device, terminal device, image forming apparatus managing method, and image forming program
JP4899397B2 *	2007-04-18	2012-03-07	京セラミタ株式会社	Operating device and image forming apparatus
JP2008268588A *	2007-04-20	2008-11-06	Oki Data Corp	Multifunction system and multifunction equipment
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
JP2009207120A *	2008-02-01	2009-09-10	Ricoh Co Ltd	System and method for managing image forming apparatus
JP4521482B2 *	2008-03-27	2010-08-11	シャープ株式会社	Image forming apparatus, image forming method, and program
US20090260080A1 *	2008-04-14	2009-10-15	Sameer Yami	System and method for verification of document processing device security by monitoring state transitions
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
JP5274203B2 *	2008-10-31	2013-08-28	キヤノン株式会社	Data processing apparatus, method, program, and data processing system
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US20100313239A1 *	2009-06-09	2010-12-09	International Business Machines Corporation	Automated access control for rendered output
JP5950543B2 *	2011-11-10	2016-07-13	キヤノン株式会社	Data transmitting apparatus, data transmitting apparatus control method and program
KR20180126794A *	2017-05-18	2018-11-28	에이치피프린팅코리아 유한회사	Method for controlling image forming apparatus and image forming apparatus using thereof
JP2019057092A *	2017-09-20	2019-04-11	富士ゼロックス株式会社	Information processor and program

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP3805347B2	2006-08-02	Control processing apparatus and image forming apparatus provided with the same

KR100679624B1	2007-02-06	Multifunction apparatus
JP4725726B2	2011-07-13	Image processing apparatus, job log management program, and image processing system
JP4079159B2	2008-04-23	Facsimile apparatus, facsimile transmission processing method, and reception processing method
US8155656B2	2012-04-10	Information processing apparatus, image forming apparatus, image forming system, information processing method, and image forming method
JP2004222085A	2004-08-05	Composite image processor
US9313346B2	2016-04-12	Information processing system, information processing apparatus, information processing method, and program therefor
JP4254838B2	2009-04-15	Image processing system, image processing apparatus, and program
US20080201775A1	2008-08-21	Multifunction peripheral, password setting system, method and computer readable medium for password setting
TWI466012B	2014-12-21	Document processing methods
US20120229835A1	2012-09-13	Image processing apparatus and operating method thereof
JP6008644B2	2016-10-05	Image forming apparatus and image forming method
JP5911795B2	2016-04-27	Image forming apparatus and image forming method
JP5528075B2	2014-06-25	Image processing apparatus, image processing apparatus control method, and program
US20160295052A1	2016-10-06	Image processing device and image processing system
US8781410B2	2014-06-10	Charging system for charging for image processing conducted based on image data, image processing apparatus, and charging program embodied on computer readable medium
JP4176068B2	2008-11-05	Image processing system
JP2007076130A	2007-03-29	Image forming method, image forming device, and program
JP2020145493A	2020-09-10	Image reading device and image reading method
JP2000353171A	2000-12-19	Document reader
JP2007221333A	2007-08-30	Document processing apparatus and document processing method
JP5337664B2	2013-11-06	Electronics
JP2013012043A	2013-01-17	Image processing device, image processing system, and authentication device
JP4173081B2	2008-10-29	Image processing device
JP5960046B2	2016-08-02	Image forming apparatus

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
JP2004256008A	2004-09-02	2004-09-02	Control processing apparatus and image forming apparatus provided with the same

Applications Claiming Priority (4)

Application	Filing date	Title
JP2004256008A	2004-09-02	Control processing apparatus and image forming apparatus provided with the same
US11/188,870	2005-07-26	Image forming apparatus and control method
EP05018620A	2005-08-26	Image forming apparatus with a controller for restricting its printing functions
CN200510099842A	2005-09-02	Image forming apparatus and control method

Legal Events

Date	Code	Title	Description
2006-01-25	A131	Notification of reasons for refusal	**Free format text:** JAPANESE INTERMEDIATE CODE: A131

IPR2025-00645 Page 02484

			Effective date: 20060124
2006-03-25	A521	Written amendment	**Free format text**: JAPANESE INTERMEDIATE CODE: A523 **Effective date**: 20060324
2006-04-17	TRDD	Decision of grant or rejection written	
2006-04-26	A01	Written decision to grant a patent or to grant a registration (utility model)	**Free format text**: JAPANESE INTERMEDIATE CODE: A01 **Effective date**: 20060425
2006-05-18	A61	First payment of annual fees (during grant procedure)	**Free format text**: JAPANESE INTERMEDIATE CODE: A61 **Effective date**: 20060509
2006-05-19	R150	Certificate of patent or registration of utility model	**Free format text**: JAPANESE INTERMEDIATE CODE: R150
2009-05-07	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20100519 **Year of fee payment**: 4
2010-05-11	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20110519 **Year of fee payment**: 5
2011-04-28	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20110519 **Year of fee payment**: 5
2011-05-10	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20120519 **Year of fee payment**: 6
2012-04-26	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20120519 **Year of fee payment**: 6
2012-05-08	FPAY	Renewal fee payment (event date is renewal date of database)	**Free format text**: PAYMENT UNTIL: 20130519 **Year of fee payment**: 7
2013-05-19	LAPS	Cancellation because of no payment of annual fees	

Data provided by IFI CLAIMS Patent Services

About Send Feedback Public Datasets Terms Privacy Policy

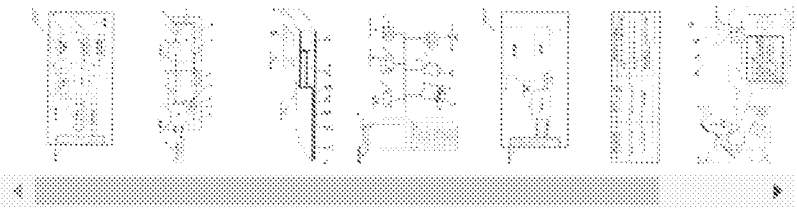
Patents 2008017440

Modem card, modem card utilization system, and terminal

Abstract

<P>PROBLEM TO BE SOLVED: To utilize a public wireless network for another terminal using a modem card with a communication enterpriser according to a telephone subscription right contract using the relevant modem card, and to provide a position information function. <P>SOLUTION: A present modem card 10 comprises an interface unit 12 which inputs/outputs a signal with a terminal to which the relevant modem card 10 is connected; an authentication unit 15 which authenticates the right of usage of a speech or data communication using the modem card; a position information unit 16 which provides position information of the modem card 10; and a communication unit 17 which performs required communication. <P>COPYRIGHT: (C)2008,JPO&INPIT

Images (8)



Classifications

» H04B1/3805 Transceivers, i.e. devices in which transmitter and receiver form a structural unit and in which at least one part is used for functions of transmitting and receiving with built-in auxiliary receivers

View 7 more classifications

JP2008017440A

Japan

Download PDF Find Prior Art Similar

Other languages: Japanese

Inventor: Takashi Kakimoto, 隆司 垣本

Worldwide applications

2007 JP WO US

Application JP2007014781A events

2006-06-05 Priority to JP2006156095

2007-01-25 Application filed by Matsushita Electric Ind Co Ltd, 松下電器産業株式会社

2007-01-25 Priority to JP2007014781A

2008-01-24 Publication of JP2008017440A

Status Withdrawn

Info: Patent citations (6), Cited by (12), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (16)

Hide Dependent

1. An interface unit for inputting / outputting standardized signals to / from one or more terminals to which the modem card is connected,
An authentication unit that authenticates the right to use the modem card for calls and data communications;
A location information section for providing location information of the modem card;
A communication unit that performs the required communication;
A modem card characterized by comprising:

2. 2. The modem card according to claim 1, further comprising a power source for storing information based on a function maintained by the terminal and maintaining the storage state.

3. 3. The modem card according to claim 2, wherein the information based on the function maintained by the terminal is an incoming state by voice communication

4. The modem card according to claim 1, further comprising a function of storing an incoming record of voice communication.

5. 2. The device according to claim 1, further comprising a function of detecting that the terminal has been removed from the terminal without performing a predetermined procedure on the terminal side, and notifying a predetermined organization based on the detection. Modem card.

6. The modem card according to claim 1, wherein the authentication is performed by a SIM.

7. The modem card according to claim 1, wherein the position information is obtained by GPS.

8. The modem card according to claim 1, wherein the modem card is configured by SDIO.

9. The modem card according to claim 1, further comprising a large-capacity memory for storing data used in the application of the terminal.

10. The modem card according to claim 9, further comprising a function of downloading data used in an application of the terminal from the Internet using the communication unit.

11. The data used in the application of the terminal is obtained by transferring data taken from an external recording medium such as a CD-ROM or an arbitrary device from the Internet to the large-capacity memory of the modem card. Item 10. The modem card according to item 9.

12. 10. The modem card according to claim 9, wherein the data in the large-capacity memory includes any of map information, tourist spot information, transportation operation information, and shopping information

13. 10. The modem card according to claim 9, further comprising a function of transferring data in the large-capacity memory based on position information provided by the position information unit to the terminal.

IPR2025-00645 Page 02486

14. A modem for using the modem card according to any one of claims 1 to 13 as a modem card for public wireless network communication by a one-line contract with a communication carrier, and for using the modem card for public wireless network communication with a plurality of terminals A modem card utilization system that is commonly used as a card.

15. 15. A terminal comprising a card slot that can be used by connecting the modem card according to claim 1 to the modem card utilization system according to claim 14.

16. A means for selecting arbitrary data from data stored in the large-capacity memory of the modem card according to any one of claims 9 to 13 according to a user's instruction and appending to the content in the application of the terminal, The system for using a modem card according to claim 9.

Description

The present invention relates to a modem card that can be attached to a mobile phone terminal or the like (inserted into a card slot), a modem card using system using the same, and a terminal such as a mobile phone terminal or an application device terminal.

In W-CDMA mobile phone systems such as GSM (Global System for Mobile Communication) and FOMA (trademark), a one-chip IC card with a built-in CPU is used as a SIM card for subscriber authentication . In this cellular phone terminal, subscriber-related information is stored in the SIM card. Therefore, even if the model of the cellular phone is changed, the SIM card is replaced to immediately perform communication according to the contract with the communication carrier. You can receive service. That is, in these mobile phone terminals, a terminal function for making a call, data communication, and the like is separated from a use right authentication function given to a user by a communication carrier. When purchasing a mobile phone, a user selects a mobile phone terminal and a communication carrier that provides a SIM card. A communication carrier sells an IC card called a SIM card in which subscription right information (telephone number) is written. The user is provided with a SIM card under a contract with a communication carrier. The user can use the mobile phone terminal by attaching the received SIM card to the purchased mobile phone terminal regardless of the carrier. When using another mobile phone terminal, the other mobile phone terminal can be used with the same telephone number by replacing the SIM card with the other mobile phone terminal.

However, the SIM card can use a plurality of mobile phone terminals with the same telephone number. However, in order to use it for a terminal other than the mobile phone, the SIM card currently required for those terminals, such as a PCMCIA card or a compact flash (It was necessary to purchase a registered trademark card and install a SIM card. For example, in various information terminals and various information devices such as a notebook PC (personal computer) and PDA (personal digital assistant), voice communication and data communication are performed via a public wireless network. In this case, in most cases, a PCMCIA card or a CompactFlash (registered trademark) card cannot be mounted on a mobile phone, and only a SIM card needs to be mounted again, which is very inconvenient for the user. Absent. In order to avoid this inconvenience, it is necessary to conclude a new contract with the telecommunications carrier, which is different from the contract being used, and the telephone number is also different. In this way, mobile phone terminals and other terminals individually contract with a telecommunications carrier, and telephone numbers increase according to the number of contracts, which makes management complicated and costly It was.

Also, recent mobile phone terminals are provided with a location information function. This location information can include the location of the terminal user or the terminal owner. However, there are few terminals other than the mobile phone terminal equipped with the position information function, and the provision of the position information function causes problems such as high cost and large size of the terminal. In addition, when a plurality of terminals are held at the same time, providing each terminal with a location information function is redundant.

Furthermore, in a system that obtains location information by GPS or base station cooperation, which is installed in a conventional car navigation system or mobile phone, and provides regional information (area map, restaurant, shopping information, etc.) associated with the location information, information is previously taken into an external recording medium such as a DVD or CD or a hard disk in the terminal via the Internet, or information is sequentially read from the external recording medium and used in a terminal application. In order to use the information recorded on the hard disk in the terminal also in other terminals, it is necessary to separately transfer data by wire or wirelessly. In this case, operations such as data transfer cooperation between both terminals are required, and it is necessary to place a terminal that holds data and a transfer destination terminal in the vicinity. I had to take a configuration that would damage it.

In view of the above, the applicant of the present invention can perform voice communication and data communication between a mobile phone terminal and other terminals with a one-line contract with a communication carrier, and is easy and inexpensive to manage. To prevent location information functions from being installed in terminals such as application devices, including mobile phone terminals, to ensure miniaturization of the terminals, and to provide location information functions at low cost when using the terminals. Researched earnestly.

The modem card according to the present invention includes an interface unit for inputting / outputting a standardized signal to / from one or a plurality of terminals to which the modem card is connected, and a right to use a telephone call or data communication by the modem card. An authentication unit that performs the above authentication, a location information unit that provides location information of the modem card, and a communication unit that performs required communication.

The position information is information on a position where the modem card is located.

The authentication unit can be configured by a SIM. The SIM information is information such as communication connection information such as a telephone number, connection information to the GSM network, and a personal identification number as user contract information. This information is authenticated.

In addition to the SIM, a UIM (user identity module) or an IC card may be used. This UIM card is also called a USIM card, and is a third-generation mobile phone card extended based on the SIM card used in the GSM mobile phone, and is sometimes referred to as a SIM card without any particular distinction. Personal information such as a telephone number is written on the UIM card Used with FOMA FOMA cards and other cards.

Although the terminal is not particularly limited, for example, in addition to the information portable terminal, there are application devices such as a desktop computer, a notebook computer, a mobile phone, an audio device, and a home appliance.

The location information section includes location information that has been devised so far, including three-point positioning systems that use radio waves from mobile phone base stations, hyperbolic navigation systems, systems that use RFID, and those that use WiFi radio waves. Although it will not specifically limit if it can provide, Preferably it can comprise by GPS. GPS is a system that uses satellites to accurately determine where you are on the earth. In addition to GPS, the position information unit can be composed of a satellite-based positioning system (SPS) such as the Russian global navigation satellite system (GLONASS) and the European Galileo system

The modem card can be configured by SDIO (security digital input / output). The SD (security digital) memory card is a memory card with a copyright protection function suitable for online music distribution. SDIO stores various functions in an SD card, which is a small memory card standard. The SDIO may be either SD or mini-SD, and may be a standard of a semiconductor memory card such as a PC card (PC card) or CF (compact flash) in addition to SDIO.

IPR2025-00645 Page 02487

According to the modem card of the present invention, standardized signals are input / output to / from the terminal in the interface unit, so that the modem card can be used in common by a plurality of terminals and attached to each terminal. In this state, the authentication unit authenticates the user and enables communication such as voice and data. That is, voice, data, etc. can be communicated with a plurality of terminals with a one-line contract with a communication carrier using the modem card. Also, a location information section is built in the modem card, and the location information can be obtained at the terminal by attaching the modem card to the terminal.

The modem card of the present invention may further include a storage unit that stores information based on the function maintained by the terminal and a power supply unit that maintains the storage state of the storage unit.

The information based on the function maintained by the terminal is, for example, an incoming state by voice communication.

By configuring in this way, in addition to the operation of the modem card of the present invention, for example, when the modem card is attached to a terminal that does not support voice communication, the incoming state by voice communication at the modem card By attaching to a terminal capable of voice communication later, a conversation by voice communication can be performed based on the incoming state by voice communication maintained.

The modem card of the present invention may further include a storage unit for storing incoming records of voice communications.

By configuring in this way, in addition to the operation of the modem card of the present invention described above, even if the voice communication is not supported or the incoming call cannot be answered immediately, the incoming call record is stored, so that the voice communication can be performed later. it is possible to make a return call based on the stored incoming call record after waiting for the terminal to be attached or to be able to respond.

The modem card of the present invention further includes a detection unit that detects that the terminal has been removed without going through a predetermined procedure on the terminal side, and an abnormality notification unit that notifies a predetermined engine based on the abnormality detection. It may be provided.

With this configuration, in addition to the operation of the modem card of the present invention, when the modem card is removed without going through a predetermined procedure on the terminal side, the abnormality is detected and notified to a predetermined engine. Therefore, damage due to theft can be prevented.

In addition, the modem card of the present invention may further include a large-capacity memory that stores data to be used in a terminal-side application.

By configuring in this way, in addition to the operation of the modem card of the present invention, information that can be commonly used by a plurality of terminals is recorded on the modem card, and information can be commonly used by each terminal by replacing the card. This eliminates the need for complicated data transfer between the terminals, and eliminates the need to place the data holding terminal and the transfer destination terminal in the vicinity, thereby improving user convenience.

In the modem card of the present invention, the data used in the terminal application may be downloaded from the Internet via the modem card communication unit.

With this configuration, in addition to the operation of the modem card of the present invention, data used on the terminal side can be obtained by using the communication unit provided in the modem card itself without connecting the modem card to other devices. Can be acquired.

In the modem card of the present invention, the data used in the terminal application is obtained by transferring data taken from an external recording medium such as a CD-ROM or any device from the Internet to the large capacity memory of the modem card. It may be.

By configuring in this way, in addition to the operation of the modem card of the present invention, the modem card is also connected to a CD or the like even when information desired to be used on the terminal side is stored only in an external recording medium such as a CD. Necessary data can be acquired in the modem card via any device (for example, a PC) that can read information from an external medium. Further, by transferring information downloaded from the Internet in advance to the modem card without using the communication function of the modem card, the charge for data communication can be reduced.

In the modem card of the present invention, the data in the large-capacity memory is map information, tourist spot information, transportation operation information, shopping information, and the like.

With such a configuration, the modem card of the present invention can provide useful information to the user at a travel destination or the like.

In the modem card of the present invention, data in a large-capacity memory that relies on the position information provided by the position information unit may be transferred to the terminal side.

With this configuration, the modem card of the present invention can provide information based on the location where the owner of the large-capacity memory modem card exists, so that it is useful at any point according to the movement of the user. Information can be provided. Furthermore, it is also possible to store the above-mentioned arbitrary information in the terminal in combination with the content produced by the user himself such as a photograph in a digital camera.

The modem card utilization system using the modem card according to the present invention selects arbitrary data from the data stored in the large capacity memory of the modem card according to a user instruction, and appends it to the content in the application on the terminal side. May be.

According to the modem card utilization system using the modem card of the present invention, out of the data in the large-capacity memory of the modem card, the user selects any information that the user wants to display on the terminal side and reads it to the terminal side. Arbitrary data read from the modem card can be appended to the contents on the terminal side, such as displaying the character information transferred from the modem card on the image being reproduced on the monitor.

A modem card utilization system using a modem card according to the present invention uses a modem card that communicates with a public wireless network with a one-line contract with a communication carrier, and a modem for communicating the modem card with a plurality of terminals through a public wireless network. Commonly used as a card.

According to the modem card utilization system using the modem card of the present invention, voice, data, etc. can be communicated with a plurality of terminals by a one-line contract with a communication carrier using the modem card, the telephone number of the mobile phone terminal, etc. Can be managed easily by sharing the subscription right information, and the cost can be reduced as compared with a plurality of contracts with a telecommunications carrier. In addition, by mounting a modem card with a built-in position information section, position information can be easily provided at each terminal without causing an increase in cost and an increase in size.

The terminal of the present invention is provided with a card slot that can be used by connecting a modem card.

According to the present invention, it is possible to perform voice communication and data communication between a mobile phone terminal and other terminals with a one-line contract with a communication carrier, facilitating management of subscription right information such as a telephone number, and the like. Only one line contract

with a telecommunications carrier is required and it is inexpensive. In addition, since the location information section is built in the modem card, the location information function can be provided at a low cost while maintaining the miniaturization of the terminal even in terminals other than the mobile phone terminal.

An embodiment of the present invention will be described with reference to FIGS. FIG. 1 is a block diagram of a modem card, FIG. 2 is a partial detail view of the modem card, FIG. 3 is a cutaway perspective view of the modem card, and FIG. 4 is an explanatory diagram of a modem card utilization system using the modem card.

Referring to FIG. 1, a modem card 10 according to the embodiment has a rectangular shape in a plan view that can be inserted into a memory card slot of an application device (terminal), and is a longitudinal side that is the side inserted into the memory card slot. The connection terminal portion 11 is provided on the direction insertion end side.

The application device provided with the memory card slot is not particularly limited, and examples thereof include a portable information terminal, a desktop computer, a notebook computer, a mobile phone, an audio device, and a home appliance.

The modem card 10 has contacts arranged in a plurality of staggered two rows connected to a large number of contacts inside the card slot of the application device at the connection terminal portion 11 thereof.

The modem card 10 is mainly composed of a one-chip microcomputer. In FIG. 1, the modem card 10 includes a one-chip microcomputer as a modem card 10 and its functions are expressed in blocks for understanding.

The modem card 10 includes a digital signal interface unit 12, a power supply control unit 13, a control unit 14, a user / device authentication function unit 15, a position information unit 16, and a communication unit 17.

The digital signal interface unit 12 is an interface for standardizing the signal in the modem card and inputting / outputting signals such as packet data and audio data to / from the application device side.

The power supply control unit 13 includes a charger (not shown), preferably a high-capacity charger (Power Cap) such as an electric double layer capacitor, and stably supplies power to all functional blocks in the modem card 10. I do.

The control unit 14 controls the internal block.

The user / device authentication function unit 15 is an authentication unit that performs processing for user authentication and device authentication of a SIM / UIM / IC card or the like

By this user / device authentication function unit 15, the modem card 10 has a SIM function.

The position information unit 16 includes a positioning satellite signal receiving antenna unit 16a, a positioning satellite signal receiving unit 16b, and a positioning algorithm processing unit 16c. The positioning satellite signal receiving antenna unit 16a is a small antenna that receives an RF carrier wave of a positioning signal such as a GPS satellite. The positioning satellite signal receiving unit 16b performs a reception process on an RF carrier wave of a satellite signal such as a GPS satellite. The positioning algorithm processing unit 16c processes the satellite signal transmitted from the GPS satellite, and determines the position information of the application device in which the modem card 10 is inserted.

The location information unit 16 has a GPS function due to the above configuration.

The communication unit 17 includes a public radio signal transmission / reception antenna unit 17a and a public radio signal RF transceiver unit 17b. The public radio signal transmitting / receiving antenna unit 17a is a small antenna that transmits and receives an RF carrier wave of a public radio signal. The public radio signal RF transceiver unit 17b performs transmission / reception processing on the RF carrier wave of the public radio signal.

In addition, the arrow of the connection line shown with the continuous line between each block shows the flow of various signals, and the arrow of the connection line shown with a broken line shows power supply control.

By inserting the modem card 10 having the above configuration into the memory card slot of the application device, the application device in which the modem card 10 is inserted can directly access the public wireless network, and the modem Using the card 10, public wireless network communication by a plurality of application devices is possible while having one contract with a communication carrier.

In addition, the modem card 10 can be used in common with a mobile phone terminal having a public wireless network function by inserting and connecting to a memory card slot of an application device that requires a public wireless network communication function. Become.

Also, the modem card 10 acquires packet communication, voice communication, system power supply stability, an interface for the communication, a SIM including a subscriber authentication function of the mobile phone system, and location information of the mobile phone itself from the satellite. A function such as GPS is provided, and wireless connection to the application device is possible.

In the system using the modem card 10, when the modem card 10 is taken out from the memory card slot of the application device, the control unit 14 includes the power control unit 13, the position information unit 16, the communication unit 17, and the user. / The device authentication function unit 15 is controlled to maintain a function desired by the user such as an incoming call within a certain period of time with the charging power in the modem card 10, and the memory card slot without a recognition procedure in advance. Function that can be notified to a third party by charging power inside the modem card 10, recording the incoming call record in the modem card 10, and attaching the modem card 10 to another application device Even in such a case, the function that can be transmitted to the called party is controlled based on the record.

In addition, with reference to FIG. 2, the outline of a structure of the control part 14 and the communication part 17 is shown. The control unit 14 includes, for example, a DSP (digital signal processor) 31, a CPU 32, an SRAM (static random access memory) 33, a flash memory 34, an A / D converter 35, and a prefilter (pre-filter). Filter) 36, a D / A converter 37, and a PostFilter (post filter) 38.

The communication unit 17 includes a public radio signal transmitting / receiving antenna unit 17a and a public radio signal RF transceiver unit 17b. The public radio signal RF transceiver unit 17b includes an Rx (receiver) 41, an LNA (low noise amplifier) 42, a Tx (transmitter) 43, a PA (power amplifier) 44, and a public radio signal transmission / reception unit. It is comprised by SW (switch) 45 which switches transmission / reception by the antenna part 17a.

In the communication unit 17, when the switching SW 45 switches to the receiving side (Rx), the signal received by the public radio signal transmitting / receiving antenna unit 17a is input into the public radio signal RF transceiver unit 17b. In the public radio signal RF transceiver unit 17b, the received signal is amplified by an LNA (low noise amplifier) 42, received by an Rx (receiver) 41, and then given to the control unit 14. In the control unit 14, the received signal is filtered by the pre-filter 36, AD-converted by the AD converter 35, and input to the DSP 31. The DSP 31 performs DSP processing on the received signal and outputs it to the digital signal interface unit 12. Further, in the control unit 14, when the DSP 31 receives the digital signal from the digital signal interface unit 12, the DSP 31 performs a necessary DSP process,

IPR2025-00645 Page 02489

performs DA conversion by the DA converter 37, filters by the post filter 38, and performs communication processing. 17 to output. In the communication unit 17, the switching SW 45 switches to the transmission side (Tx), and the Tx (transmitter) 43, the PA (power amplifier) 44 of the public radio signal RF transceiver unit 17b, and the public radio signal transmission / reception antenna unit 17a are connected. Send through.

In the above configuration, the control unit 14 is configured to be able to execute the above functions by the CPU 32, SRAM 33, and flash memory 34.

The description of the control unit 14 and the communication unit 17 is not described in detail above, but the incoming call state and the incoming call history are stored in the SRAM 33 and the flash memory 34 in the control unit 14.

The hardware of the modem card 10 will be described with reference to FIG. FIG. 3 is a perspective view in which the side surface of the modem card 10 is broken. The connection terminal portion 11 is not shown. The modem card 10 in this embodiment is an SDIO modem card that is used by being inserted into a memory card slot having the same shape as the SD memory card of various application devices.

Reference numeral 51 denotes an SDIO LSI corresponding to the digital signal interface unit 12.

Reference numeral 52 denotes a BB (baseband) LSI corresponding to the control unit 14.

Reference numeral 53 denotes a PM (power management) IC corresponding to the power supply control unit 13 for regulating the power supply.

Reference numeral 54 denotes an RF module corresponding to the communication unit 17.

Reference numeral 55 denotes a GPS receiver corresponding to the position information unit 16

Reference numeral 56 denotes a SIM corresponding to the user / device authentication function unit 18. In the SIM 56, subscription right information (telephone number) is written, and is attachable / detachable so that the manufacturer can write it.

Reference numeral 57 denotes a PowerCap (electric double layer capacitor).

Reference numeral 58 denotes an ANT (antenna). The antenna 58 corresponds to the antennas 16a and 17a of the position information unit 16 and the communication unit 17, respectively.

FIG. 4 shows a digital home appliance ubiquitous network modem card utilization system as an example of a modem card utilization system using the modem card 10 of the embodiment. The modem card 10 is removed from the memory card slot of the mobile phone 61 and is inserted into a card slot (for example, SD memory card slot) of an application device such as the PC 62, PDA 63, car navigation device 64, game machine 65, video camera 66, digital camera 67, etc. Installing.

That is, each application device 61-67 has a card slot having a common structure for mounting the modem card 10, and by mounting the modem card 10, the application devices 61-67 are directly connected to the public wireless network. It becomes possible to connect to a network, and voice communication and data communication can be performed.

When the modem card 10 according to the embodiment is used, the modem function provided in the modem card 10 is not limited to the cellular phone 61 after the single contract with the communication carrier for use of the cellular phone 61 by the SIM function. By simply inserting the card into the card slot of each of the plurality of other application devices 62-67, each application device 62-67 can perform public wireless network communication.

In this way, by connecting the modem card 10 having the public wireless network communication function contracted with the communication carrier to the application devices 62-67 that require the public wireless network communication function, the public wireless network communication function is provided to the mobile phone. 61 can be used in common. Therefore, each application device 61-67 can perform voice communication and data communication with only a one-line contract with a communication carrier, management of subscription right information such as a telephone number is easy, and only a contract with a communication carrier. It is inexpensive because it only takes

Further, by attaching the modem card 10 having the GPS function to the mobile phone 61 and the application devices 62-67, information on the current position provided in the mobile phone 61 is also provided free of charge in each application device 62-67. be able to. In addition, since the position information unit 16 is built in the modem card 10, the application devices 62-67 are not increased in size.

Further, since the modem card 10 handles digital information, data input / output to / from the application devices 62-67 including the mobile phone 61 via the digital signal interface unit 12 is clear. Furthermore, since it is an SDIO modem card, the modem card 10 can be miniaturized, and as a result, the application devices 62-67 including the cellular phone 61 can be miniaturized.

In addition to the basic configuration described above, the following functions can be added as needed: function maintenance, incoming call history maintenance, function stop / notification in case of abnormality, and large-capacity memory.

First, functional maintenance will be described.

When the modem card 10 is attached to an application device (mobile digital home appliance) 62-67 other than the mobile phone 61, the application device 62-67 basically supports packet data communication but supports voice communication. A case that cannot be fully conceived can be assumed. In such a case, the incoming call state is maintained for a while until the modem card 10 is replaced with an application device capable of voice communication (for example, the mobile phone 61), and the telephone can be immediately called after the replacement. It is assumed that a certain charge is charged in the PowerCap 57 in the system. Specifically, an incoming voice communication may be received when the modem card 10 is inserted into the application device 62-67 that does not support voice communication. The modem card 10 detects an incoming call by the public radio signal transmission / reception antenna unit 17a, notifies the control unit 14 of the incoming call from the public radio signal RF transceiver unit 17b, and receives an incoming call state in a register in the SRAM 33 serving as a storage unit. Is set. While the public radio signal RF transceiver unit 17b detects an incoming call, the incoming state of the register remains set, and the setting is canceled when the incoming call is cut off.

The purpose of PowerCap 57 is to stably supply power to the modem card 10. Specifically, the instantaneous power at the time of transmission often exceeds the maximum rating of the power supplied in the modem card 10. When non-transmission, power is constantly stored in the PowerCap 57, and when the maximum transmission power exceeds the average power supplied in the card, the power stored in the PowerCap 57 is used, so that the average allowable power supplied from outside the card is exceeded. It is deployed for the purpose of designing so that there is no.

When the modem card 10 is removed from the application device 62-67, the modem card 10 detects this and supplies power to the PMIC 53 from the PowerCap 57 serving as a power supply unit according to a command from the CPU 32. The PMIC 53 supplies power to the SRAM 33 and the public radio signal RF transceiver unit 17b, and maintains the incoming state of the modem card 10.

Thereafter, when the modem card 10 is connected to a voice communication-compatible device (for example, the mobile phone 61), the modem card 10 detects it and the CPU 32 checks the incoming state setting register in the SRAM 33. When the incoming state is detected, the incoming state is notified from the modem card 10 to the application device 61 by the instruction of the CPU 32, and the user can immediately start a conversation.

In the above example, the function for maintaining the application device is an incoming state by voice communication. However, the present invention is not limited to this. For example, the incoming of the packet data communication in an application device that does not support packet data communication. You may hold | maintain a state. Specifically, when new music information and new information from a music or video download site are received and it is free trial content, there is a case where it is desired to immediately start downloading. In that case, if the application device with the modem card attached is not suitable for playing the content after downloading, change the attachment destination to an application device suitable for playback while maintaining the incoming state. The content can be reproduced.

Next, the reception history holding will be described.

It can be assumed that there is an incoming voice communication while using an application device that does not support voice communication, or that an incoming call response cannot be made immediately even when an application device that supports voice communication is used. In such a case, the incoming call record is stored in the modem card 10 and connected to a device capable of voice communication later so that a return call can be made.

Specifically, when the modem card 10 is inserted into the application device 62-67 that does not support voice communication, there is a case where an incoming voice communication is received and a response cannot be made immediately. The modem card 10 detects an incoming call by the public radio signal transmission / reception antenna unit 17a, notifies the control unit 14 of the incoming call from the public radio signal RF transceiver unit 17b, and receives the incoming call number in the flash memory 34 serving as a storage unit. The date and time are recorded, and the incoming call history is maintained.

Thereafter, when the modem card 10 is connected to a voice communication compatible device (for example, the mobile phone 61), the modem card 10 detects this and confirms the presence or absence of incoming history data in the flash memory 34. When the incoming call history is detected, the incoming call history information is notified from the modem card 10 to the application device 61 by the instruction of the CPU 32, and the user can make a return call.

Next, the function stop / notification at the time of abnormality will be described.

When the modem card 10 is removed without following the predetermined procedure on the application device side, the predetermined institution is notified that the abnormal withdrawal has been detected, and the function of the modem card 10 is stopped (theft) Prevention function).

For example, since the modem card 10 can hold the IC card function in the SIM chip in the SIM function unit, the fact is detected when the modem card 10 is removed without following the predetermined procedure on the application device side. The control unit 14 determines the charge of a card company or the like that provides an IC card function via the public radio signal RF transceiver unit 17b and the public radio signal transmission / reception antenna unit 17a serving as a notification unit. Notification is given to the company (predetermined organization). In this case, the IC card function and the SIM function are stopped if there is no report such as "not theft" within a predetermined time. Specifically, the card company receives anomaly information transmitted from the modem card 10 and automatically detects user information and anomaly information. Thereafter, the card company prepares to stop the IC card function / SIM function in the modem card and notifies the user by some preset means. If there is no report such as "not abnormal" from the user within a certain period of time, complete function stop will be implemented. In addition, when the IC card function or SIM function is executed by the user at the stage of function stop preparation, the card company can also notify "abnormality detection". At that time, after some identity authentication, "not abnormal" You can also file a declaration.

In addition, when the modem card 10 held by an employee handling confidential information at a corporate corporation or the like is stolen, the fact that the modem card 10 is removed without going through the predetermined procedure on the application device side is the fact. The control unit 14 is input to the control unit 14 serving as the detection unit, and the control unit 14 receives the invalidation application for the modem card 10 through the public radio signal RF transceiver unit 17b and the public radio signal transmission / reception antenna unit 17a serving as the notification unit. This is notified to the corporation (predetermined institution), and the modem card 10 is invalidated within a predetermined time. Specifically, although depending on the security level of the application device to which the modem card 10 is attached, if high security is required, the invalidation process is performed in cooperation with the IC card company immediately after removal. . Also, in some cases, an invalidation application is sent out without permission, and if there is no declaration through identity verification to the company corporation (predetermined institution) or card company within a certain period of time, the invalidation process is automatically performed. Apply.

In the above example of function maintenance and incoming call history retention, the incoming call state and incoming call history are stored in the SRAM 33 and flash memory 34 in the control unit 14, but in the SRAM and flash memory outside the control unit 14. You may make it memorize | store

Next, mounting of a large capacity memory will be described.

When common data can be used in multiple terminals connected to the modem card, a large capacity memory is provided in the modem card, data acquired from the Internet via the communication unit is stored in the large capacity memory, and the modem card is By transferring data to each connected terminal, it is possible to use common data among a plurality of arbitrary devices only by replacing the card. At this time, the current position information of the owner of the modem card is acquired via the position information section, and the data based on the current position information is selected from the data stored in the large-capacity memory and transferred to the terminal side. .

Specifically, the memory card 10 inserted in the digital camera 67 as shown in FIGS. 4 and 5 acquires data from the Internet via the communication unit 17 and stores the acquired data in the large-capacity memory 18. The data acquired at this time is, for example, a database in which tourist spot information as shown in FIG. 6 is associated with information on a geographical position (latitude / longitude) where the tourist spot exists. When the user performs a predetermined operation on an application installed in the digital camera 67, the digital camera 67 requests the modem card 10 to provide information depending on the current position. In response to this request, the modem card 10 transfers information on the tourist spot based on the position information obtained via the position information unit 16 from the large-capacity memory 18 to the application of the digital camera 67. For example, when the latitude / longitude information "48.85 / 2.35" of the current position is acquired via the position information unit 16, "Notre Dame" is the closest tourist spot to the position information obtained in the database in the large-capacity memory 18. "Temple" is selected, and the tourist spot name and additional information are transferred to the digital camera 67. A monitor based on the information transferred from the large-capacity memory 18 is displayed on the monitor of the digital camera 67 as shown in FIG.

In the example shown in FIG. 7, only the character information acquired from the large-capacity memory 18 is displayed on the monitor, but the content stored on the terminal side can be displayed by the user among the information stored in the large-capacity memory 18. You may display in the form which adds the designated arbitrary information. For example, during moving image shooting with the digital video camera 66, information depending on the shooting point can be transferred from the modem card 10 to the camera 66 side and displayed by superimposing the information on the image being shot. In the digital video camera 66 of FIG. 8, the explanatory text related to the shooting point is displayed on the monitor as a telop together with the moving image being shot.

In the above example, data is taken into the large-capacity memory 18 via the communication unit 17 of the modem card 10. However, the modem card 10 is taken into the large-capacity memory 18 in advance via an arbitrary device such as a PC May be.

IPR2025-00645 Page 02491

In addition, depending on the capacity of the large-capacity memory 18, the type of information to be stored and the amount of information can be increased or decreased.

FIG. 5 shows only the minimum necessary blocks for explaining the embodiment peculiar when the large-capacity memory 18 is mounted. The basic configuration and operation of the modem card 10 are shown in FIG. It is the same as that.

As in the examples of the digital camera 67 and the digital video camera 66 described above, in the system using the modem card 10 of the present invention, a plurality of terminals have specifications such as hardware and software corresponding to the modem card 10. In this case, the information recorded in the large-capacity memory 18 can be shared by simply replacing the modem card 10 from the digital camera 67 to the digital video camera 66. The same applies to other terminals such as the mobile phone 61 shown in FIG. In addition, information (not only latitude / longitude data but also neighboring famous land information) transferred from the modem card 10 is combined and stored in the terminal with respect to contents produced by the user himself / herself on the terminal owned by the user such as the digital video camera 66. It is also possible to make it. As a result, users can obtain much higher value information compared to simple content created by the users, and by providing such information to content providers, the value of the content on the provider side is also expected to increase. It can.

The modem card and the modem card utilization system using the same according to the present invention can be applied to various VoIP terminals such as a cellular phone, a PC, a PDA, a digital camera, and a game machine.

It is a block diagram of a modem card in an embodiment of the present invention. It is a block diagram of the control part and communication part of FIG. FIG. 2 is a cutaway perspective view of a hardware configuration of the modem card in FIG. 1. It is explanatory drawing of the system using the modem card of FIG. FIG. 2 is a diagram in which a large-capacity memory is mounted on the modem card of FIG. 1. It is a figure which shows the example of the data stored in a mass memory. It is explanatory drawing of the system using the modem card of FIG. It is explanatory drawing of the system using the modem card of FIG.

Explanation of symbols

DESCRIPTION OF SYMBOLS 10 Modem card 11 Connection terminal part 12 Digital signal interface part 13 Power supply control part 14 Control part 15 User / apparatus authentication function part (authentication part)
16 Position information section 16a Positioning satellite signal receiving antenna section 16b Positioning satellite signal receiving section 16c Positioning algorithm processing section 17 Communication section 17a Public radio signal transmitting / receiving antenna section 17b Public radio signal RF transceiver section 18 Large capacity memory

Patent Citations (6)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
WO2000059243A1 *	1999-03-26	2000-10-05	Swisscom Mobile Ag	Chip card with integrated time determination system
JP2000292522A *	1999-04-12	2000-10-20	Japan Radio Co Ltd	Positioning card
JP3835085B2 *	1999-11-15	2006-10-18	ソニー株式会社	Semiconductor memory device and electronic device
JP3921057B2 *	2001-05-11	2007-05-30	株式会社エヌ・ティ・ティ・ドコモ	Access method and communication terminal
FR2864648B1 *	2003-12-31	2006-02-24	Radiotelephone Sfr	METHOD OF ALARMING AN AUTONOMOUS COMPUTER
JP4759934B2 *	2004-05-06	2011-08-31	株式会社豊田自動織機	Delivery container and delivery system

* Cited by examiner, † Cited by third party

Cited By (12)

Publication number	Priority date	Publication date	Assignee	Title
JP2013518484A *	2010-01-28	2013-05-20	ゼットティーイー コーポレイション	Method and data card for shielding of short message reception function
KR101758394B1 *	2010-09-15	2017-07-03	엘지이노텍 주식회사	Secure Digital Input/Output Modem
Family To Family Citations				
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US20090124215A1 *	2007-09-04	2009-05-14	Sierra Wireless, Inc.	Antenna Configurations for Compact Device Wireless Communication
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
US20100033310A1 *	2008-08-08	2010-02-11	Narendra Siva G	Power negotation for small rfid card
US8451122B2	2008-08-08	2013-05-28	Tyfone, Inc.	Smartcard performance enhancement circuits and systems
US7961101B2	2008-08-08	2011-06-14	Tyfone, Inc.	Small RFID card with integrated inductive element

EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US8553849B2 *	2009-06-17	2013-10-08	Avaya Inc.	Personal identification and interactive device for internet-based text and video communication services
CN102622056B *	2012-03-31	2016-05-11	惠州Tcl移动通信有限公司	The intelligent terminal of the replaceable radio communication device of a kind of user
JP2015179882A *	2012-07-23	2015-10-08	パナソニック株式会社	Electronic apparatus

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
JP2008017440A	2008-01-24	Modem card, modem card utilization system, and terminal
US20150004959A1	2015-01-01	Mobile device activation
CN101488986B	2011-12-14	Portable terminal card and function limiting method
US20070254711A1	2007-11-01	Accessing a SIM card to obtain configuration information by a remote embedded communication module
CN105556941B	2020-01-07	Notification device, method for notifying device, notification system, and storage medium
JP2002218536A	2002-08-02	Mobile terminal
JP4304376B2	2009-07-29	Mobile phone terminal and mobile phone system including the same
KR20120025331A	2012-03-15	Method and system for managing communication of a dual stand-by portable terminal
CN101253789A	2008-08-27	Customization of mobile stations
KR101184350B1	2012-09-20	Communication terminal device and recording medium storing control program thereof
US9160827B2	2015-10-13	Automatically adjusting country and area codes when doing a business card or telephone number exchange
JP4304377B2	2009-07-29	Mobile phone terminal and mobile phone system
JP2007259289A	2007-10-04	Mobile base station apparatus and accounting method
CN105246069A	2016-01-13	SIM (subscriber identity module) data usage and mobile terminal
JP5626102B2	2014-11-19	TERMINAL DEVICE AND USE LIMIT RELEASE METHOD IN TERMINAL DEVICE
EP2114098A1	2009-11-04	Subcriber identity module transceiver
JP2005033378A	2005-02-03	Update method for roaming list for mobile communication terminal and mobile communication terminal
US8787879B2	2014-07-22	Multiple SIM card secure global mobile device
JP4853660B2	2012-01-11	Mobile terminal management system, mobile terminal and mobile phone management method
JP2002330223A	2002-11-15	Portable recorder capable of recording anywhere
KR20080034644A	2008-04-22	Method for reading a phonebook data in subscriber identity module card, and terminal thereof
KR102211044B1	2021-02-02	Wireless terminal and its control method
US9161206B1	2015-10-13	Secure global mobile device and home base station
KR100614744B1	2006-08-21	Method for using smart card and mobile phone implementing the same
CN101461215A	2009-06-17	Modem card

Priority And Related Applications

Priority Applications (2)

Application	Priority date	Filing date	Title
JP2006156095		2006-06-05	
JP2007014781A	2006-06-05	2007-01-25	Modem card, modem card utilization system, and terminal

Applications Claiming Priority (4)

Application	Filing date	Title
JP2007014781A	2007-01-25	Modem card, modem card utilization system, and terminal
PCT/JP2007/060966	2007-05-30	Modem card
US12/303,515	2007-05-30	Modem card
GB0821992A	2007-05-30	Modem card

Legal Events

Date	Code	Title	Description
2010-01-20	A621	Written request for application examination	**Free format text**: JAPANESE INTERMEDIATE CODE: A621 **Effective date**: 20100119
2011-01-07	A761	Written withdrawal of application	**Free format text**: JAPANESE INTERMEDIATE CODE: A761 **Effective date**: 20110106

Data provided by IFI CLAIMS Patent Services

Patents I433560

Power negotiation for small rfid card

Classifications

G06K19/07 Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards also with resonating or responding marks without active components with integrated circuit chips

View 2 more classifications

TWI433560B
Taiwan

Download PDF Find Prior Art Similar

Other languages: Chinese

Inventor: Siva G Narendra, Prabhakar Tadepalli, Saurav Chakraborty

Worldwide applications

2009 TW CN

Application TW98126588A events

2008-08-08 Priority to US18938208P

2009-08-06 Application filed by Tyfone Inc

2010-06-16 Publication of TW201023662A

2014-04-01 Application granted

2014-04-01 Publication of TWI433560B

Info: Patent citations (1), Cited by (7), Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (13)

Hide Dependent

1. A method performed by a device having an additional slot compatible with a memory card, the additional slot compatible with the memory card is powered off after an inactivity cycle to save power, the method comprising: Optionally transmitting a memory card write command to the additional slot compatible with the memory card for maintaining undisturbed power to the additional slot compatible with the memory card, wherein the memory card write command includes a data A hidden command within the column causes the hidden command to be periodically sent to a radio frequency identification (RFID) card coupled to the additional slot compatible with the memory card to maintain power to provide RFID functionality.

    2. The method of claim 1, wherein the memory card write command includes a unique data string to identify the memory card write command as having the hidden command.

    3. The method of claim 1, wherein the step of periodically transmitting the memory card write command comprises: setting the hidden command ignored by the RFID card in an additional slot compatible with the memory card Form the memory card write command.

    4. The method of claim 1, wherein the step of periodically transmitting the memory card write command to the additional slot compatible with the memory card including, sending the memory card write command to one of the following: an SD slot, a mini SD slot, or a micro SD slot.

5. A method of modifying power transfer to a dual interface smart card controller, the dual interface smart card controller being located on a memory card compatible radio frequency identification (RFID) card, the method comprising a device having a memory card slot Executing, the method includes the steps of: embedding a hidden command into a memory card write command, the hidden command being to the dual interface smart card controller on the memory card compatible radio frequency identification (RFID) card Determining a modification of the power transfer; and transmitting the memory card write command to the memory card compatible RFID card, the memory card write command including the hidden command such that when the hidden command is determined not to transition to the double The interface smart card controller performs power transfer modification on the dual interface smart card controller, wherein the step of embedding a hidden command into a memory card write command includes including a data string to the memory card Writing a command in one of the data fields to identify the memory card write command as having the hidden command, and including a command index in the data column of the memory card write command To identify the type of the hidden command.

    6. The method of claim 5, wherein the step of transmitting the memory card write command to the memory card compatible RFID card comprises transmitting the memory card command to the memory card slot.

    7. The method of claim 6, wherein the step of transmitting the memory card write command to the memory card slot comprises: transmitting the memory card write command to one of: an SD slot, a mini SD slot, or a micro SD slot.

8. A method of modifying power transfer to a dual interface smart card controller, the dual interface smart card controller being located on a memory card compatible radio frequency identification (RFID) card, the method being inserted into a memory card slot of a device The memory card is implemented by a compatible RFID card, the method comprising the steps of: receiving, at a memory card controller, a memory card write command from the memory card slot of the device, the memory card write command comprising a data string is written in one of the memory card write commands to identify the memory card write command to include a hidden command,

IPR2025-00645 Page 02495