EP1247234A1 *	2000-01-14	2002-10-09	Marconi Commerce Systems Inc.	A data retail system
US7172112B2	2000-01-21	2007-02-06	American Express Travel Related Services Company, Inc.	Public/private dual card system and method
US7720756B2 *	2000-01-25	2010-05-18	Kavounas Gregory T	Methods, devices and bank computers for consumers using communicators to wire funds to sellers and vending machines
AU2876501A *	2000-02-02	2001-08-14	Image Reaction Limited	Data handling
US7353208B1	2000-02-02	2008-04-01	Transaction Network Services, Inc.	Transaction processing using intermediate server architecture
KR100629470B1 *	2000-02-08	2006-09-28	(주) 엘지텔레콤	Mobile phone with a subscriber identify module card
WO2001059569A2 *	2000-02-09	2001-08-16	Apriva, Inc.	Communication systems, components, and methods with programmable wireless devices
US8706627B2	2000-02-10	2014-04-22	Jon Shore	Apparatus, systems and methods for wirelessly transacting financial transfers , electronically recordable authorization transfers, and other information transfers
US6711414B1 *	2000-02-25	2004-03-23	Charmed Technology, Inc.	Wearable computing device capable of responding intelligently to surroundings
US6757719B1	2000-02-25	2004-06-29	Charmed.Com, Inc.	Method and system for data transmission between wearable devices or from wearable devices to portal
US20050021679A1 *	2000-02-25	2005-01-27	Alexander Lightman	Method and system for data transmission between wearable devices or from wearable devices to portal
IL134741A *	2000-02-27	2003-11-23	Adamtech Ltd	Mobile transaction system and method
WO2001067355A2	2000-03-07	2001-09-13	American Express Travel Related Services Company, Inc.	System for facilitating a transaction
US7895126B1 *	2000-03-10	2011-02-22	Kudelski S.A.	Method, communications system and receiver device for the billing of access controlled programmes and /or data from broadcast transmitters
FR2806578B1	2000-03-14	2002-08-23	Sagem	IMPROVED MOBILE TELEPHONE
US20060173790A1 *	2000-03-16	2006-08-03	Harexinfotech, Inc.	Optical payment transceiver and system using the same
EP1275262A4 *	2000-03-16	2006-04-19	Harex Infotech Inc	Optical payment transceiver and system using the same
GB0007360D0 *	2000-03-28	2000-05-17	Ncr Int Inc	Electronic wallet
JP2001344545A	2000-03-29	2001-12-14	Ibm Japan Ltd	Processing system, server, processing terminal, communication terminal, processing method, data managing method, processing performing method and program
GB2362070B *	2000-05-05	2004-06-16	Nokia Mobile Phones Ltd	Communication devices and method of communication
FR2809260B1 *	2000-05-16	2003-07-18	Gemplus Card Int	METHOD FOR PROVIDING A PREPAID ACCOUNT
US7650314B1	2001-05-25	2010-01-19	American Express Travel Related Services Company, Inc.	System and method for securing a recurrent billing transaction
US7725427B2	2001-05-25	2010-05-25	Fred Bishop	Recurrent billing maintenance with radio frequency payment devices
JP2002056338A *	2000-05-29	2002-02-20	Takashi Fujimoto	Purchase price payment method and purchase price payment system
AU6427401A *	2000-06-14	2001-12-24	Takako Jogu	Settling method using mobile phone and mobile phone
FR2810482B1 *	2000-06-15	2003-05-16	Sagem	METHOD FOR MANAGING A COMMUNICATION MODULE AND DEVICE COMPRISING SUCH A MODULE
US9684893B2	2000-06-30	2017-06-20	Tara Chand Singhal	Apparatus and method for a wireless point of sale terminal
US7529563B1 *	2000-07-10	2009-05-05	Pitroda Satyan G	System for distribution and use of virtual stored value cards
US7933589B1 *	2000-07-13	2011-04-26	Aeritas, Llc	Method and system for facilitation of wireless e-commerce transactions
FR2812105B1 *	2000-07-21	2003-01-10	Gemplus Card Int	AUTOMATIC AND SECURE ACCESS DEVICE TO VARIOUS DEVICES AND SERVICES
AU8295501A *	2000-07-21	2002-02-05	Telemac Corp	Multiple virtual wallets in wireless devices
AT261160T *	2000-08-01	2004-03-15	Mega Tel Ag	ELECTRONIC PAYMENT WITH SMS
US7113365982 *	2000-09-29	2006-11-07	Nokia Mobile Phones Limited	Methods of operating a reservation system using electronic device cover with embedded transponder

US6771981B1	2000-08-02	2004-08-03	Nokia Mobile Phones Ltd.	Electronic device cover with embedded radio frequency (RF) transponder and methods of using same
AU8082701A	2000-08-02	2002-02-13	Nokia Mobile Phones Ltd	Electronic device cover with embedded radio frequency (rf) transponder and methods of using same
FR2812744A1 *	2000-08-04	2002-02-08	Dassault Automatismes	ELECTRONIC PAYMENT DEVICE USING A CONSUMER APPARATUS AND A COMMERCIAL APPARATUS COMMUNICATING THROUGH A WIRELESS LINK
FR2812745B1 *	2000-08-04	2003-01-31	Dassault Automatismes	ELECTRONIC PAYMENT TERMINAL INCLUDING A WIRELESS LINK WITH A PORTABLE TELEPHONE USED AS A MODEM
US8504421B2	2000-08-05	2013-08-06	Ronald John Rosenberger	Method using a social network or website to enable an individual to promote an advertiser's advertising to the individual's personal contacts
US8504420B2 *	2000-08-05	2013-08-06	Ronald John Rosenberger	Method using advertising as compensation to a promoter for generating new account sign ups of end users for a product or service offering entity
GB0019419D0 *	2000-08-09	2000-09-27	Ericsson Telefon Ab L M	Paying for telephone services using electronic cash
US7386238B2 *	2000-08-15	2008-06-10	Lockheed Martin Corporation	Method and system for infrared data communications
US7215887B2 *	2000-08-15	2007-05-08	Lockheed Martin Corporation	Method and apparatus for infrared data communication
JP3756741B2 *	2000-08-21	2006-03-15	株式会社東芝	Information exchange device and cash register device
US20020025795A1 *	2000-08-24	2002-02-28	Msafe Inc.,	Method, system and device for monitoring activity of a wireless communication device
EP1187251A1 *	2000-09-01	2002-03-13	Marconi Commerce Systems S.r.l.	Wireless communicaton interface
EP1184818A1 *	2000-09-01	2002-03-06	Marconi Commerce Systems S.r.l.	Vending system for selling products or services to purchasers having mobile communicators
FI114348B *	2000-09-04	2004-09-30	Nokia Corp	Procedure for charging money, electronic device and system
JP2002176671A *	2000-09-28	2002-06-21	Takashi Fujimoto	Mobile phone
US6796490B1 *	2000-10-04	2004-09-28	Diebold, Incorporated	Automated banking machine system and method
US7209733B2 *	2000-10-06	2007-04-24	Pay X Pda, Llc	Credit manager method and system
US7979057B2	2000-10-06	2011-07-12	S.F. ip Properties 62 Llc	Third-party provider method and system
JP2002197388A *	2000-10-11	2002-07-12	Nec Corp	Settlement method, settlement system and portable telephone
US7460853B2 *	2000-10-12	2008-12-02	Sony Corporation	Wireless module security system and method
US7230939B2 *	2000-10-13	2007-06-12	Sony Corporation	Home network using wireless module
US20020080741A1 *	2000-10-13	2002-06-27	Akihiko Toyoshima	Multiple wireless format phone system and method
US7890947B2 *	2000-10-13	2011-02-15	Sony Corporation	System, method and apparatus for embedded firmware code update
US7020118B2 *	2000-10-13	2006-03-28	Sony Corporation	System and method for activation of a wireless module
US6980545B2	2000-10-13	2005-06-14	Sony Corporation	Default portal site access with wireless module
US7555537B2 *	2000-10-25	2009-06-30	Nokia Mobile Phones Ltd.	Downloadable multimedia content and method for accounting
US7333947B2 *	2000-11-13	2008-02-19	Anoto Ab	Network-based system
GB0027922D0 *	2000-11-15	2001-01-03	Haidar Mahmoud N Y	Electronic payment and associated systems
WO2002041601A2 *	2000-11-16	2002-05-23	Telefonaktiebolaget Lm Ericsson (Publ)	User authentication apparatus, controlling method thereof, and network system
US6772249B1 *	2000-11-27	2004-08-03	Hewlett-Packard Development Company, L.P.	Handheld option pack interface
US20020091647A1 *	2001-01-10	2002-07-11	Lopez Antonio Vazquez	Security system for commercial transactions via the internet or other communications networks
WO2007044500A2	2006-10-06	2007-04-19	C-Sam, Inc.	Transactional services
US7069047B2	2001-01-19	2006-06-27	Raze Technologies, Inc.	System and method for on-line insertion of line replaceable units in wireless and wireline access systems

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
US20020098869A1 *	2001-01-19	2002-07-25	Struhsaker Paul F.	System and method for on-line insertion of line replaceable units in wireless and wireline access systems
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
GB2371397B *	2001-01-20	2004-09-01	Ncr Int Inc	Self service terminal
US6942147B2	2001-02-08	2005-09-13	Nokia Corporation	Smart card reader
GB0103452D0 *	2001-02-13	2001-03-28	Williams Stuart	Identification system
FR2821231A1 *	2001-02-19	2002-08-23	Bull Cp8	METHOD FOR ADMINISTERING A SUBSCRIBER CARD FOR MOBILE TELEPHONY EQUIPMENT OF THE TYPE WITH AUXILIARY READER AND ON-BOARD SYSTEM FOR IMPLEMENTING THE PROCESS
US6934529B2 *	2001-02-20	2005-08-23	Sevket Ilhan Bagoren	Replenishment of pre-paid wireless telephone accounts using short message service (SMS)
US20020116329A1 *	2001-02-20	2002-08-22	Serbetcioglu Bekir Sami	Systems and methods for approval of credit/debit account transactions using a wireless device
KR100641824B1 *	2001-04-25	2006-11-06	주식회사 아렉스인포텍	A payment information input method and mobile commerce system using symmetric cipher system
NL1017947C2 *	2001-04-26	2002-10-29	Scm Microsystems Nederland B V	Communication system for the exchange of data comprises terminal for reception and transmission of data and at least one chip holder provided with at least one releasably coupled memory chip
FR2824217B1 *	2001-04-27	2003-10-10	Sagem	DEVICE FOR SPLITTING A CHIP CARD READER AND RELATED METHOD
CN100377027C *	2001-05-14	2008-03-26	株式会社NTT都科摩	System for managing program
CA2348353A1	2001-05-22	2002-11-22	Marc Arseneau	Local broadcast system
EP2273342A1	2001-05-24	2011-01-12	Sony Corporation	Service providing method and integrated circuit
FR2825495B1 *	2001-05-31	2003-09-26	Schlumberger Systems & Service	ELECTRONIC PAYMENT TERMINAL, CHIP CARD SUITABLE FOR SUCH A TERMINAL, AND METHOD FOR LOADING A SECRET KEY IN SUCH A TERMINAL
GB0113630D0 *	2001-06-05	2001-07-25	Koninkl Philips Electronics Nv	Payment authorisation through beacons
US20030033413A1 *	2001-06-19	2003-02-13	Willson Alan N.	Mobile wireless local area network
US6987986B2 *	2001-06-21	2006-01-17	Boesen Peter V	Cellular telephone, personal digital assistant with dual lines for simultaneous uses
US20030078890A1 *	2001-07-06	2003-04-24	Joachim Schmidt	Multimedia content download apparatus and method using same
US7746215B1	2001-07-10	2010-06-29	Fred Bishop	RF transactions using a wireless reader grid
US7503480B2	2001-07-10	2009-03-17	American Express Travel Related Services Company, Inc.	Method and system for tracking user performance
US7303120B2	2001-07-10	2007-12-04	American Express Travel Related Services Company, Inc.	System for biometric security using a FOB
US20040233037A1 *	2001-07-10	2004-11-25	American Express Travel Related Services Company, Inc.	Method and system for iris scan recognition biometrics on a fob
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
US8284025B2	2001-07-10	2012-10-09	Xatra Fund Mx, Llc	Method and system for auditory recognition biometrics on a FOB
US9454752B2	2001-07-10	2016-09-27	Chartoleaux Kg Limited Liability Company	Reload protocol at a transaction processing entity
US7889052B2	2001-07-10	2011-02-15	Xatra Fund Mx, Llc	Authorizing payment subsequent to RF transactions
US7493288B2	2001-07-10	2009-02-17	Xatra Fund Mx, Llc	RF payment via a mobile device
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
US8294552B2	2001-07-10	2012-10-23	Xatra Fund Mx, Llc	Facial scan biometrics on a payment 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
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
US9024719B1	2001-07-10	2015-05-05	Xatra Fund Mx, Llc	RF transaction system and method for storing user personal data
US9031880B2	2001-07-10	2015-05-12	Iii Holdings 1, Llc	Systems and methods for non-traditional payment using biometric data
US20090008441A1 *	2001-07-10	2009-01-08	Xatra Fund Mx, Llc	Tracking rf transaction activity using a transaction device identifier
US7735725B1	2001-07-10	2010-06-15	Fred Bishop	Processing an RF transaction using a routing number
US8960535B2	2001-07-10	2015-02-24	Iii Holdings 1, Llc	Method and system for resource management and evaluation
US7705732B2	2001-07-10	2010-04-27	Fred Bishop	Authenticating an RF transaction using a transaction counter
US7668750B2	2001-07-10	2010-02-23	David S Bonalle	Securing RF transactions using a transactions counter
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
US7762457B2 *	2001-07-10	2010-07-27	American Express Travel Related Services Company, Inc.	System and method for dynamic fob synchronization and personalization
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
US7542942B2 *	2001-07-10	2009-06-02	American Express Travel Related Services Company, Inc.	System and method for securing sensitive information during completion of a transaction
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
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
US8635131B1	2001-07-10	2014-01-21	American Express Travel Related Services Company, Inc.	System and method for managing a transaction protocol
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
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
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
US8548927B2	2001-07-10	2013-10-01	Xatra Fund Mx, Llc	Biometric registration for facilitating an RF transaction
US20030027549A1 *	2001-07-30	2003-02-06	Msafe Inc.	Prepaid communication system and method
WO2003021397A2 *	2001-09-04	2003-03-13	U.S. Wireless Data, Inc.	System for coordinating transaction for pos terminals
WO2003023727A1 *	2001-09-06	2003-03-20	Nokia Corporation	A method and network element for paying by a mobile terminal through a communication network
US8400296B2	2001-09-11	2013-03-19	Zonar Systems, Inc.	Method and apparatus to automate data collection during a mandatory inspection
US7557696B2	2001-09-11	2009-07-07	Zonar Systems, Inc.	System and process to record inspection compliance data
US8972179B2	2006-06-20	2015-03-03	Brett Brinton	Method and apparatus to analyze GPS data to determine if a vehicle has adhered to a predetermined route
US20150170521A1	2001-09-11	2015-06-18	Zonar Systems, Inc.	System and method to enhance the utility of vehicle inspection records by including route identification data in each vehicle inspection record
US20110068954A1	2006-06-20	2011-03-24	Zonar Systems, Inc.	Method and apparatus to collect object identification data during operation of a vehicle and analysis of such data
US8818088B2	2001-09-11	2014-08-19	Zonar Systems, Inc.	System and method to improve the efficiency of vehicle inspections by enabling

				remote actuation of vehicle components
US9230437B2 *	2006-06-20	2016-01-05	Zonar Systems, Inc.	Method and apparatus to encode fuel use data with GPS data and to analyze such data
US10056008B1	2006-06-20	2018-08-21	Zonar Systems, Inc.	Using telematics data including position data and vehicle analytics to train drivers to improve efficiency of vehicle use
FR2830099A1 *	2001-09-21	2003-03-28	Pierre Michel Guilhen	Data processing unit for an electronic purse, manages data exchange and maintains local and central balance data
US8489063B2	2001-10-24	2013-07-16	Sipco, Llc	Systems and methods for providing emergency messages to a mobile device
US7480501B2	2001-10-24	2009-01-20	Statsignal Ipc, Llc	System and method for transmitting an emergency message over an integrated wireless network
US7424527B2	2001-10-30	2008-09-09	Sipco, Llc	System and method for transmitting pollution information over an integrated wireless network
DE50212645D1 *	2001-11-29	2008-09-25	Zoltan Pal	METHOD FOR AN ALTERNATIVE MOBILE RADIO SYSTEM AND SERVICES
US7379920B2 *	2001-12-04	2008-05-27	Gary Leung	System and method for facilitating electronic financial transactions using a mobile telecommunication device
JP2003188949A *	2001-12-21	2003-07-04	Nec Corp	Portable telephone set, its data protecting method and program
US7200567B2 *	2002-01-04	2007-04-03	Lockheed Martin Corporation	Purchasing aid logistics appliance and method for use
US7996888B2 *	2002-01-11	2011-08-09	Nokia Corporation	Virtual identity apparatus and method for using same
BE1016829A3 *	2002-01-25	2007-08-07	Pierre Defise	Electronic payment card for e.g. product, has unique number and component storing information required for utilization of card, where card is loaded with preset amount and is not related to postal or bank account of carrier of card
US8190530B2	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
US7797233B2 *	2002-01-30	2010-09-14	Store Financial Services, Llc	Methods and systems for processing, accounting, and administration of stored value cards
US6816683B2 *	2002-02-04	2004-11-09	Nokia Corporation	Electronic device with cover including a radio frequency identification module
US20030172001A1 *	2002-03-06	2003-09-11	Masataka Yasuda	Information providing system, information providing method, storage medium and program
KR100531075B1 *	2002-04-29	2005-11-28	스마텍(주)	Charge approval system
US7509117B2 *	2002-05-31	2009-03-24	Nokia Corporation	Apparatus, and associated method, for notifying a user in a radio communication system of a commercially-related transaction
DE10225457A1 *	2002-06-05	2004-01-08	Siemens Ag	Use of a subscriber identity module by several mobile communication devices
WO2003107696A1 *	2002-06-14	2003-12-24	Tek Dagitim Ve Iletisim Hizmetleri A.S.	Mobile information distribution system
KR20040004765A *	2002-07-05	2004-01-16	김선삼	Mobile Telecommunication Terminal Having Manifold Settlement Route
US20040015451A1 *	2002-07-10	2004-01-22	Sahota Jagdeep Singh	Method for conducting financial transactions utilizing infrared data communications
US8543423B2	2002-07-16	2013-09-24	American Express Travel Related Services Company, Inc.	Method and apparatus for enrolling with multiple transaction environments
US7580873B1 *	2002-07-23	2009-08-25	At&T Intellectual Property I, L.P.	Electronic financial assistant
US20040230489A1 *	2002-07-26	2004-11-18	Scott Goldthwaite	System and method for mobile payment and fulfillment of digital goods
US7792758B2 *	2002-07-29	2010-09-07	Emv Co. Llc	Methods for performing transactions in a wireless environment
GB0219950D0 *	2002-08-29	2002-10-02	Barton Richard J	Control system
US6805287B2	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
US7720762B1	2002-10-03	2010-05-18	Goflgure Payments, Llc	System and method for electronically processing commercial transactions based upon threshold amount
JP4511459B2 *	2002-10-17	2010-07-28	ヴォウダフォン・グループ・ピーエルシー	Facilitating and authenticating transactions

US20050246277A1 *	2002-10-23	2005-11-03	Bloem Nicolaas C	Transaction processing system
JP2004172923A *	2002-11-20	2004-06-17	Nec Corp	Portable telephone terminal, and pay service restriction method used therefor
JP2004171416A *	2002-11-21	2004-06-17	Ntt Docomo Inc	Communication terminal, value substance providing server, application distribution server, electronic purchase support system, electronic purchase support method and electronic purchase support program
JP2004192289A *	2002-12-10	2004-07-08	Matsushita Electric Ind Co Ltd	Information processor
JP4272006B2 *	2002-12-10	2009-06-03	株式会社エヌ・ティ・ティ・ドコモ	Mobile communication terminal, server, communication system, communication control method, and communication control program
WO2004068582A1 *	2003-01-08	2004-08-12	Semiconductor Energy Laboratory Co., Ltd.	Semiconductor device and its fabricating method
US20040183790A1 *	2003-02-27	2004-09-23	Miller Richard L.	Customer order communication apparatus and methods
US7440771B2 *	2003-02-28	2008-10-21	American Express Travel Related Services Company, Inc.	Transaction card providing displayed information
JP4334247B2 *	2003-03-07	2009-09-30	ビットワレット株式会社	Portable terminal device and electronic money server
JP2004272561A *	2003-03-07	2004-09-30	Bitwallet Inc	Portable terminal device, portable terminal method, portable terminal program, providing server device, providing server method, and providing server program
US7831933B2	2004-03-17	2010-11-09	Leapfrog Enterprises, Inc.	Method and system for implementing a user interface for a device employing written graphical elements
US7853193B2	2004-03-17	2010-12-14	Leapfrog Enterprises, Inc.	Method and device for audibly instructing a user to interact with a function
US20040229195A1 *	2003-03-18	2004-11-18	Leapfrog Enterprises, Inc.	Scanning apparatus
US7004385B1 *	2003-04-01	2006-02-28	Diebold Self-Service Systems Division Of Diebold, Incorporated	Currency dispensing ATM with RFID card reader
US8270578B2 *	2003-04-07	2012-09-18	Paul Poniatowski	Mobile payment system
US7725842B2 *	2003-04-24	2010-05-25	Bronkema Valentina G	Self-attainable analytic tool and method for adaptive behavior modification
US8429041B2	2003-05-09	2013-04-23	American Express Travel Related Services Company, Inc.	Systems and methods for managing account information lifecycles
AU2003902911A0 *	2003-06-11	2003-06-26	The Commonwealth Of Australia	Credential communication device
FR2857207B1 *	2003-07-04	2005-10-14	Orange France	METHOD FOR ACCESSING A POINT OF COMMUNICATION WITH AN APPLICATION LOCATED ON A SIM CARD
EP1496714B1 *	2003-07-10	2006-02-01	Swisscom Mobile AG	Electronic switch for communication terminals with multiple SIM cards, and a communication method
EP1644872B1	2003-07-22	2009-12-09	Nokia Corporation	Reader device for radio frequency identification transponder with transponder functionality
KR20050016929A *	2003-08-04	2005-02-21	삼성전자주식회사	Multi-purpose terminal equipment capable of preparation for the fast task performance and the method thereof
JP2005136662A *	2003-10-30	2005-05-26	Matsushita Electric Ind Co Ltd	Radio communication system, portable terminal equipment, server device, memory card, and program
TWI256230B *	2003-11-07	2006-06-01	Wistron Neweb Corp	Mobile phone including a wireless network module and a memory module
JP2005167463A *	2003-12-01	2005-06-23	Sony Ericsson Mobilecommunications Japan Inc	Subscriber identification module and data access blocking method therefor
JP2005202914A *	2003-12-15	2005-07-28	Matsushita Electric Ind Co Ltd	Secure device and information processor
US20050137687A1 *	2003-12-23	2005-06-23	Sadra Medical	Heart valve anchor and method
US20050142263A1 *	2003-12-30	2005-06-30	Lauren Keilbach	Fish food flakes
JP4269162B2 *	2004-01-07	2009-05-27	日本電気株式会社	Wireless route selection method for portable communication terminal, portable communication terminal and wireless communication system
CN100474299C *	2004-01-23	2009-04-01		Method, device and system for automated context information based selective

			诺基亚公司	data provision by identification means
JP4362384B2 *	2004-02-02	2009-11-11	株式会社シマノ	Dual bearing reel and spool brake device used therefor
DE102004009544A1 *	2004-02-23	2005-09-22	Siemens Ag	Method for transmitting data
US7194438B2 *	2004-02-25	2007-03-20	Nokia Corporation	Electronic payment schemes in a mobile environment for short-range transactions
US7756068B2	2004-03-03	2010-07-13	Sipco, Llc	Method for communicating in dual-modes
US8031650B2 *	2004-03-03	2011-10-04	Sipco, Llc	System and method for monitoring remote devices with a dual-mode wireless communication protocol
WO2005093643A1 *	2004-03-17	2005-10-06	Nokia Corporation	Continuous data provision by radio frequency identification (rfid) transponders
DE602004029664D1	2004-03-19	2010-12-02	Nokia Corp	ND METHOD FOR IMPROVING TERMINAL OPERATION
US7284692B1 *	2004-03-31	2007-10-23	Diebold Self-Service Systems, Division Of Diebold, Incorporated	ATM with RFID card, note, and check reading capabilities
US20050221813A1 *	2004-04-05	2005-10-06	Jarno Rajahalme	System and method for initiating auxiliary communication interfaces via a primary communication interface
EP1741225B1	2004-04-30	2011-03-02	Research In Motion Limited	System and method for filtering data transfers within a mobile device
KR100818992B1 *	2004-05-31	2008-04-03	삼성전자주식회사	Apparatus and method for sending and receiving digital right objects in a transfomred format between device and portable storage
WO2005119607A2 *	2004-06-03	2005-12-15	Tyfone, Inc.	System and method for securing financial transactions
US20050269401A1 *	2004-06-03	2005-12-08	Tyfone, Inc.	System and method for securing financial transactions
US20060012479A1 *	2004-06-18	2006-01-19	Meir Ezra	Fuel dispensing system
US7693797B2 *	2004-06-21	2010-04-06	Nokia Corporation	Transaction and payment system security remote authentication/validation of transactions from a transaction provider
WO2005125230A1 *	2004-06-22	2005-12-29	Paysetter Pte Ltd	System and method for transferring credit between mobile phone subscribers
US7318550B2	2004-07-01	2008-01-15	American Express Travel Related Services Company, Inc.	Biometric safeguard method for use with a smartcard
TWI280770B *	2004-07-09	2007-05-01	Inventec Appliances Corp	System against illegal use of mobile phone
US7014107B2 *	2004-07-20	2006-03-21	Irek Singer	Wireless payment processing system
US8543723B2 *	2004-07-27	2013-09-24	Sony Corporation	Home network system with transmission error recovery
US20060045107A1 *	2004-08-25	2006-03-02	Ray Kucenas	Network solution for integrated control of electronic devices between different sites
EP1640896B1 *	2004-09-28	2016-03-09	Swisscom AG	Method for recycling products
US7774232B2 *	2004-09-30	2010-08-10	Alcatel-Lucent Usa Inc.	Wireless distribution of content files
US7124937B2 *	2005-01-21	2006-10-24	Visa U.S.A. Inc.	Wireless payment methods and systems
US9439126B2	2005-01-25	2016-09-06	Sipco, Llc	Wireless network protocol system and methods
US9910341B2	2005-01-31	2018-03-06	The Invention Science Fund I, Llc	Shared image device designation
US10003762B2	2005-04-26	2018-06-19	Invention Science Fund I, Llc	Shared image devices
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
US20060226217A1 *	2005-04-07	2006-10-12	Tyfone, Inc.	Sleeve for electronic transaction card
GB0507285D0 *	2005-04-11	2005-05-18	Innovision Res & Tech Plc	Nfc enabled high-speed data
CN101366054A *	2005-04-29	2009-02-11	斯普林自营零售网络特许有限公司	Systems and methods for enabling and managing ordering information within a network
TWI259385B *	2005-05-03	2006-08-01	Shooter Digital Co Ltd	Electronic transaction system capable of enhancing transaction security and electronic transaction method thereof
US9942511B2	2005-10-31	2018-04-10	Invention Science Fund I, Llc	Preservation/degradation of video/audio aspects of a data stream

US8670493B2	2005-06-22	2014-03-11	Eices Research, Inc.	Systems and/or methods of increased privacy wireless communications
USRE47633E1	2005-06-22	2019-10-01	Odyssey Wireless Inc.	Systems/methods of conducting a financial transaction using a smartphone
US7614082B2	2005-06-29	2009-11-03	Research In Motion Limited	System and method for privilege management and revocation
WO2007008560A2 *	2005-07-11	2007-01-18	Conrad Sheehan	Secure electronic transactions between a mobile device and other mobile, fixed or virtual devices
AU2006272401B2	2005-07-22	2011-03-31	Fanvision Entertainment Llc	System and methods for enhancing the experience of spectators attending a live sporting event
US8042140B2	2005-07-22	2011-10-18	Kangaroo Media, Inc.	Buffering content on a handheld electronic device
JP2009509210A *	2005-07-26	2009-03-05	テネトロゼド、ソシエダデノニマ	How to start an application
US7922099B1	2005-07-29	2011-04-12	Leapfrog Enterprises, Inc.	System and method for associating content with an image bearing surface
US7810721B2 *	2005-08-04	2010-10-12	Transaction Network Services, Inc.	Systems and method for vending machine settlement
US9818120B2 *	2015-02-20	2017-11-14	Innovative Global Systems, Llc	Automated at-the-pump system and method for managing vehicle fuel purchases
CN1924955B *	2005-08-31	2010-05-05	中国科学院声学研究所	Content analysis based short message ask/answer system implementing method
US7936339B2	2005-11-01	2011-05-03	Leapfrog Enterprises, Inc.	Method and system for invoking computer functionality by interaction with dynamically generated interface regions of a writing surface
US8599143B1	2006-02-06	2013-12-03	Leapfrog Enterprises, Inc.	Switch configuration for detecting writing pressure in a writing device
US20070187482A1 *	2006-02-13	2007-08-16	Castro Alberto J	Point of Sale Transaction Method and System
US7552867B2	2006-03-15	2009-06-30	Qualcomm Incorporated	M-commerce virtual cash system, method, and apparatus
US20070222865A1	2006-03-15	2007-09-27	Searete Llc, A Limited Liability Corporation Of The State Of Delaware	Enhanced video/still image correlation
US7769410B2 *	2006-03-29	2010-08-03	A-Men Technology Corporation	Module structure for expanding and enhancing functions of a SIM card
US20070265984A1 *	2006-04-24	2007-11-15	Prakash Santhana	Financial transaction using mobile devices
US7962159B2 *	2006-04-25	2011-06-14	International Business Machines Corporation	Method and system for receiving data on a portable device
US7568281B2 *	2006-05-10	2009-07-21	First Data Corporation	System and method for activating telephone-based payment instrument
US7764977B2 *	2006-05-24	2010-07-27	Nokia Corporation	Memory card removal guard
US8016192B2 *	2006-06-06	2011-09-13	Motorola Mobility, Inc.	User-configurable priority list for mobile device electronic payment applications
US10431020B2	2010-12-02	2019-10-01	Zonar Systems, Inc.	Method and apparatus for implementing a vehicle inspection waiver program
US8261987B1	2006-07-19	2012-09-11	Leapfrog Enterprises, Inc.	Techniques for interactively coupling electronic content with printed media
US7886962B2 *	2006-08-17	2011-02-15	Verizon Patent And Licensing Inc.	Multi-function transaction device
KR100763793B1	2006-10-12	2007-10-05	주식회사 하이스마텍	The multifunctional mobile communication terminal and communication method using it
US7637425B2 *	2006-11-28	2009-12-29	Motorola, Inc.	Method and system for wireless and credit card transactions
US7991158B2	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging
US10311427B2 *	2006-12-29	2019-06-04	Google Technology Holdings LLC	Method and system for monitoring secure application execution events during contactless RFID/NFC communication
US20080162312A1 *	2006-12-29	2008-07-03	Motorola, Inc.	Method and system for monitoring secure applet events during contactless rfid/nfc communication
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

US20080172698A1 *	2007-01-12	2008-07-17	Berger Adam L	Performing support functions on a portable device
US8665419B2 *	2007-02-01	2014-02-18	Microsoft Corporation	Providing a power state alter signal to a device based upon a position signal corresponding to the mobile device
US7533059B2 *	2007-03-14	2009-05-12	Microsoft Corporation	Purchasing using a physical object
WO2008114931A1 *	2007-03-16	2008-09-25	Lg Electronics Inc.	Performing contactless applications in battery off mode
US20080244208A1 *	2007-03-30	2008-10-02	Narendra Siva G	Memory card hidden command protocol
US8688570B2 *	2007-04-27	2014-04-01	American Express Travel Related Services Company, Inc	System and method for performing person-to-person funds transfers via wireless communications
US8078225B2 *	2007-07-02	2011-12-13	Infineon Technologies Ag	Communication device, mobile device and method of communication
KR20090011149A *	2007-07-25	2009-02-02	삼성전자주식회사	A method of purchasing a digital broadcast service in a portable terminal which is equipped a smart card and an apparatus thereof
TWI351211B *	2007-07-31	2011-10-21	Chunghwa Telecom Co Ltd	
US8838472B2	2007-08-14	2014-09-16	First Data Corporation	Mobile system and method for exchanging point value
US8912928B2 *	2007-09-06	2015-09-08	Shaunt Mark Sarkissian	Systems, methods and apparatuses for secure digital transactions
US20090070269A1 *	2007-09-06	2009-03-12	Shaunt Mark Sarkissian	Systems, methods and apparatuses for secure digital transactions
US20100019045A1 *	2007-09-06	2010-01-28	Shaunt Mark Sarkissian	Systems, methods and apparatuses for secure digital transactions
US8041338B2 *	2007-09-10	2011-10-18	Microsoft Corporation	Mobile wallet and digital payment
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
US8070057B2	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
US8915447B2	2007-09-12	2014-12-23	Devicefidelity, Inc.	Amplifying radio frequency signals
US9177313B1 *	2007-10-18	2015-11-03	Jpmorgan Chase Bank, N.A.	System and method for issuing, circulating and trading financial instruments with smart features
US20090117845A1 *	2007-11-05	2009-05-07	Apple Inc.	Media distribution kiosk with virtual connector for interfacing with a personal media device
US8290433B2 *	2007-11-14	2012-10-16	Blaze Mobile, Inc.	Method and system for securing transactions made through a mobile communication device
WO2009068088A1 *	2007-11-28	2009-06-04	Nokia Corporation	Data transmission between an apparatus and a smart card unit
US8352323B2 *	2007-11-30	2013-01-08	Blaze Mobile, Inc.	Conducting an online payment transaction using an NFC enabled mobile communication device
US20090144391A1 *	2007-11-30	2009-06-04	Searete Llc, A Limited Liability Corporation Of The State Of Delaware	Audio sharing
US9741027B2 *	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
TWI398155B *	2007-12-18	2013-06-01	Inventec Appliances Corp	Portable communication device having matching function and portable communication system and communication method therefor
KR100972604B1 *	2007-12-27	2010-07-28	고려대학교 산학협력단	Tag for RFID, wireless transmission system and method for large scale multimedia contents using the same
GB2455999A *	2007-12-31	2009-07-01	Cvon Innovations Ltd	Transaction processing
CA2650348A1 *	2008-01-22	2009-07-22	Accenture Global Services Gmbh	Knowledge transfer in a project environment
US20090216665A1 *	2008-02-21	2009-08-27	The Coca-Cola Company	Systems and Methods for Providing Vending Network Data Management
US8645273B2 *	2008-02-21	2014-02-04	The Coca-Cola Company	Systems and methods for providing a vending network
US20090216675A1 *	2008-02-21	2009-08-27	The Coca-Cola Company	Commission Centric Network Operation Systems and Methods

US9460440B2 *	2008-02-21	2016-10-04	The Coca-Cola Company	Systems and methods for providing electronic transaction auditing and accountability
US20090222339A1 *	2008-03-03	2009-09-03	The Coca-Cola Company	Systems and Methods for Providing a Personal Terminal for a Loyalty Program
US8121917B2	2008-03-03	2012-02-21	The Coca-Cola Company	Systems for implementing a loyalty program
US8015588B2 *	2008-03-03	2011-09-06	The Coca-Cola Company	Methods for implementing a loyalty program
US20090222300A1 *	2008-03-03	2009-09-03	The Coca-Cola Company	Systems and Methods of Marketing to Defined Consumer Groups
US8639267B2	2008-03-14	2014-01-28	William J. Johnson	System and method for location based exchanges of data facilitating distributed locational applications
US8634796B2	2008-03-14	2014-01-21	William J. Johnson	System and method for location based exchanges of data facilitating distributed location applications
US8897742B2	2009-11-13	2014-11-25	William J. Johnson	System and method for sudden proximal user interface
US8600341B2	2008-03-14	2013-12-03	William J. Johnson	System and method for location based exchanges of data facilitating distributed locational applications
US8761751B2	2008-03-14	2014-06-24	William J. Johnson	System and method for targeting data processing system(s) with data
US8566839B2	2008-03-14	2013-10-22	William J. Johnson	System and method for automated content presentation objects
ES2347113B1 *	2008-04-03	2011-09-07	Vodafone España, S.A.	METHOD AND SYSTEM FOR THE TRANSFER OF RESOURCES BETWEEN USER TERMINALS.
US20090271327A1 *	2008-04-23	2009-10-29	Raghav Lal	Payment portfolio optimization
US20090271305A1 *	2008-04-23	2009-10-29	Raghav Lal	Payment portfolio optimization
EP2294539A1	2008-05-16	2011-03-16	Google Inc.	Secured electronic transaction system
US10841839B2	2009-01-28	2020-11-17	Headwater Research Llc	Security, fraud detection, and fraud mitigation in device-assisted services systems
US9980146B2	2009-01-28	2018-05-22	Headwater Research Llc	Communications device with secure data path processing agents
US9955332B2	2009-01-28	2018-04-24	Headwater Research Llc	Method for child wireless device activation to subscriber account of a master wireless device
US10492102B2	2009-01-28	2019-11-26	Headwater Research Llc	Intermediate networking devices
US9565707B2	2009-01-28	2017-02-07	Headwater Partners I Llc	Wireless end-user device with wireless data attribution to multiple personas
US9270559B2	2009-01-28	2016-02-23	Headwater Partners I Llc	Service policy implementation for an end-user device having a control application or a proxy agent for routing an application traffic flow
US8452258B2 *	2008-06-20	2013-05-28	Movirtu Limited	Method and system to implement telephone billing to incentivize shared mobile phone usage
KR100938823081 *	2008-06-30	2010-10-18	주식회사 티모넷	The charge money transfer system and method of the electronic payment means using cellular phone
TWI503767B *	2008-08-01	2015-10-11	Chiun Mai Comm Systems Inc	Mobile device and method for using credit card for payment
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
CN101918817B *	2008-08-08	2017-04-26	Sk 普兰尼特有限公司	System for interfacing between a terminal and a smart card, method for same, and smart card applied to same
US8086269B2 *	2008-09-12	2011-12-27	A-Men Technology Corporation	Modular structure to expand and enhance subscriber identity module card functionality
FR2936630B1 *	2008-09-30	2013-03-29	Electricite De France	METHOD FOR CHARGING ELECTRIC ENERGY OF A MOBILE EQUIPMENT USING A REMOTE PAYMENT METHOD
US8275714B2 *	2008-10-06	2012-09-25	Eugenio Rafael A	Method for performing a digital cash transaction
US9462411B2	2008-11-04	2016-10-04	Telcom Ventures, Llc	Mobile device mode enablement responsive to a proximity criterion

US20100148928A1 *	2008-12-15	2010-06-17	Mobile Payment Skins Llc	Payment skin with contactless chip
US8315930B2	2008-12-22	2012-11-20	General Electric Company	Systems and methods for charging an electric vehicle using broadband over powerlines
US20100161393A1 *	2008-12-22	2010-06-24	Nathan Bowman Littrell	Systems and methods for charging an electric vehicle within a parking area
US9063153B2 *	2008-12-22	2015-06-12	General Electric Company	Systems and methods for delivering energy to an electric vehicle with parking fee collection
US9396462B2 *	2008-12-22	2016-07-19	General Electric Company	System and method for roaming billing for electric vehicles
US20100156349A1 *	2008-12-22	2010-06-24	Nathan Bowman Littrell	System and method for pay as you go charging for electric vehicles
US9505317B2	2008-12-22	2016-11-29	General Electric Company	System and method for electric vehicle charging and billing using a wireless vehicle communication service
US8583551B2 *	2008-12-22	2013-11-12	General Electric Company	Systems and methods for prepaid electric metering for vehicles
CN101771754B *	2008-12-31	2014-04-23	北京联想软件有限公司	Mobile terminal and method for near-field communication thereof
US20100191551A1 *	2009-01-26	2010-07-29	Apple Inc.	Systems and methods for accessing hotel services using a portable electronic device
US8406748B2	2009-01-28	2013-03-26	Headwater Partners I Llc	Adaptive ambient services
US8832777B2	2009-03-02	2014-09-09	Headwater Partners I Llc	Adapting network policies based on device service processor configuration
US10248996B2	2009-01-28	2019-04-02	Headwater Research Llc	Method for operating a wireless end-user device mobile payment agent
US9572019B2	2009-01-28	2017-02-14	Headwater Partners LLC	Service selection set published to device agent with on-device service selection
US10064055B2	2009-01-28	2018-08-28	Headwater Research Llc	Security, fraud detection, and fraud mitigation in device-assisted services systems
US10715342B2	2009-01-28	2020-07-14	Headwater Research Llc	Managing service user discovery and service launch object placement on a device
US8346225B2	2009-01-28	2013-01-01	Headwater Partners I, Llc	Quality of service for device assisted services
US9955475B2	2009-01-28	2018-04-24	Headwater Research Llc	Enhanced curfew and protection associated with a device group
US8402111B2	2009-01-28	2013-03-19	Headwater Partners I, Llc	Device assisted services install
US10326800B2	2009-01-28	2019-06-18	Headwater Research Llc	Wireless network service interfaces
US10779177B2	2009-01-28	2020-09-15	Headwater Research Llc	Device group partitions and settlement platform
US10783581B2	2009-01-28	2020-09-22	Headwater Research Llc	Wireless end-user device providing ambient or sponsored services
US8548428B2	2009-01-28	2013-10-01	Headwater Partners I Llc	Device group partitions and settlement platform
US8799451B2	2009-01-28	2014-08-05	Headwater Partners I Llc	Verifiable service policy implementation for intermediate networking devices
US9392462B2	2009-01-28	2016-07-12	Headwater Partners I Llc	Mobile end-user device with agent limiting wireless data communication for specified background applications based on a stored policy
US9706061B2	2009-01-28	2017-07-11	Headwater Partners I Llc	Service design center for device assisted services
US10237757B2	2009-01-28	2019-03-19	Headwater Research Llc	System and method for wireless network offloading
US10200541B2	2009-01-28	2019-02-05	Headwater Research Llc	Wireless end-user device with divided user space/kernel space traffic policy system
US10264138B2	2009-01-28	2019-04-16	Headwater Research Llc	Mobile device and service management
US10798252B2	2009-01-28	2020-10-06	Headwater Research Llc	System and method for providing user notifications

US8275830B2	2009-01-28	2012-09-25	Headwater Partners I Llc	Device assisted CDR creation, aggregation, mediation and billing
US8589541B2	2009-01-28	2013-11-19	Headwater Partners I Llc	Device-assisted services for protecting network capacity
US8326221B2 *	2009-02-09	2012-12-04	Apple Inc.	Portable electronic device with proximity-based content synchronization
US9092772B2 *	2009-02-16	2015-07-28	Xius Corp.	Integrated system and method for enabling mobile commerce transactions using "contactless identity modules in mobile handsets"
EP2401708A4 *	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
US9235831B2	2009-04-22	2016-01-12	Softigure Payments, Llc	Mobile payment systems and methods
EP2280580A1 *	2009-07-07	2011-02-02	Nokia Corporation	Data transfer with wirelessly powered communication devices
US9996825B1	2009-08-20	2018-06-12	Apple Inc.	Electronic device enabled payments
EP2478471A1	2009-09-14	2012-07-25	Ingecom Sàrl	Identification module with an active tag
UA51496U *	2009-10-15	2010-07-26	Олег Лескидович Савчук	System implementation method for mutual exchanges for information, goods and service sale-social market
US8290555B2	2009-11-10	2012-10-16	AT&T Mobility II Llc	Devices, systems and methods for identification through a mobile device
US10255591B2 *	2009-12-18	2019-04-09	Visa International Service Association	Payment channel returning limited use proxy dynamic value
US9065532B2 *	2010-02-03	2015-06-23	Google Inc.	Bump button
US8870065B2 *	2010-03-16	2014-10-28	Sherry Brennan	Multi-use electronic card balance reader
EP2371612A1 *	2010-03-31	2011-10-05	Deutsche Telekom AG	Charging system with an electricity charging point and method for interacting between electricity charging point and user
US10640357B2	2010-04-14	2020-05-05	Restaurant Technology Inc.	Structural food preparation systems and methods
GB2010083680	2010-05-20	2010-07-07	Moore Jesse K	Mobile meter
US10665040B2	2010-08-27	2020-05-26	Zonar Systems, Inc.	Method and apparatus for remote vehicle diagnosis
US9815681B2	2010-10-18	2017-11-14	Zonar Systems, Inc.	Apparatus for use in an automated fuel authorization program requiring data to be dynamically retrieved from a vehicle data bus during fuel authorization
US9881432B2	2010-10-18	2018-01-30	Zonar Systems, Inc	Method and apparatus for an automated fuel authorization program for fuel terminals using a camera as part of the authorization process
US9828233B2	2010-10-18	2017-11-28	Zonar Systems, Inc.	Method and apparatus for automatically monitoring fuel tank ullage in an automated fuel authorization program
US9856129B2	2010-10-18	2018-01-02	Zonar Systems, Inc.	Method and apparatus for automatically monitoring fuel tank ullage in an automated fuel authorization program
WO2012065264A1 *	2010-11-15	2012-05-24	Research In Motion Limited	Controlling data transfer on mobile devices
US10660096B2	2010-11-30	2020-03-24	Zonar Systems, Inc.	System and method for obtaining competitive pricing for vehicle services
US8736419B2	2010-12-02	2014-05-27	Zonar Systems	Method and apparatus for implementing a vehicle inspection waiver program
US10706647B2	2010-12-02	2020-07-07	Zonar Systems, Inc.	Method and apparatus for implementing a vehicle inspection waiver program
US8855805B2	2011-03-08	2013-01-15	D. Light Design, Inc.	Systems and methods for activation and deactivation of appliances
US20120253974A1 *	2011-03-30	2012-10-04	Nokia Corporation	Method and apparatus for providing memory tag-based payment methods
WO2012148842A1 *	2011-04-26	2012-11-01	Boku, Inc.	Systems and methods to facilitate repeated purchases
US10319174B2 *	2011-06-30	2019-06-11	Ncr Corporation	System and method for ordering items
DE102011051586A1 *	2011-07-05	2013-01-10	Huf Hülsbeck & Fürst Gmbh & Co. Kg	Mobile identification transmitter, which can be brought into a normal state and into a safety state
US20130018715A1 *	2011-07-18	2013-01-17	Tiger T G Zhou	Facilitating mobile device payments using product code scanning to enable self checkout
IN2014KN00998A	2011-10-12	2015-09-04	C Sam Inc	
US9161226B2	2011-10-17	2015-10-13	Blackberry Limited	Associating services to perimeters
US9949720B2	2011-10-17	2016-11-15	Blackberry Limited	Dynamically generating perimeters

US10339525B2	2011-10-27	2019-07-02	Boom! Payments, Inc.	Confirming local marketplace transaction consummation for online payment consummation
US8271394B1 *	2011-10-27	2012-09-18	Bogaard Erik T	Confirming local marketplace transaction consummation for online payment consummation
US9613219B2	2011-11-10	2017-04-04	Blackberry Limited	Managing cross perimeter access
US8799227B2	2011-11-11	2014-08-05	Blackberry Limited	Presenting metadata from multiple perimeters
US9171304B2	2011-11-22	2015-10-27	Aurus Inc.	Systems and methods for removing point of sale processing from PCI scope
US9047594B2	2012-02-27	2015-06-02	American Express Travel Related Services Company, Inc.	Smart phone system and method
CA2879180A1	2012-03-07	2013-09-12	Snap Trends, Inc.	Methods and systems of aggregating information of social networks based on geographical locations via a network
US10061745B2	2012-04-01	2018-08-28	Zonar Sytems, Inc.	Method and apparatus for matching vehicle ECU programming to current vehicle operating conditions
US9369466B2	2012-06-21	2016-06-14	Blackberry Limited	Managing use of network resources
US8875998B2	2012-07-23	2014-11-04	Sherry Brennan	Middle class americs card
US9384613B2	2012-08-16	2016-07-05	Google Inc.	Near field communication based key sharing techniques
US8410898B1	2012-08-16	2013-04-02	Google Inc.	Near field communication based key sharing techniques
US8963717B2 *	2012-09-28	2015-02-24	Mohammad MOHIUDDIN	Mobile device initiated retail transaction using wireless communication for security tag detachment
US8856916B1	2012-10-24	2014-02-18	Blackberry Limited	Managing application execution and data access on a device
US9075955B2	2012-10-24	2015-07-07	Blackberry Limited	Managing permission settings applied to applications
US20140136348A1	2012-11-12	2014-05-15	Restaurant Technology Inc.	System and method for receiving and managing remotely placed orders
WO2014159862A1	2013-03-14	2014-10-02	Headwater Partners I Llc	Automated credential porting for mobile devices
US9805538B2	2013-03-15	2017-10-31	Zonar Systems, Inc.	Method and apparatus for fuel island authorization for trucking industry using proximity sensors
US9787950B2	2013-03-15	2017-10-10	Zonar Systems, Inc.	Method and apparatus for an automated fuel authorization program for fuel terminals using a camera as part of the authorization process
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KR20090057558A	2009-06-08	Advice of charge method during conversation and therefor portable terminal

Priority And Related Applications

Priority Applications (2)

Application	Priority date	Filing date	Title
FI950685A	1995-02-15	1995-02-15	Procedure for use of applications in a mobile telephone as well as a mobile telephone
FI950685		1995-02-15	

Applications Claiming Priority (22)

Application	Filing date	Title
FI950685A	1995-02-15	Procedure for use of applications in a mobile telephone as well as a mobile telephone
US08/597,845	1996-02-07	Method for using applications in a mobile station, a mobile station and a system for effecting payments
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Legal Events

Date	Code	Title	Description
1995-02-15	FG	Patent granted	**Owner name:** NOKIA MOBILE PHONES LTD
1997-05-19	BB	Publication of examined application	
2014-09-18	MM	Patent lapsed	

Data provided by IFI CLAIMS Patent Services

Patents fi100137

FI100137B -- Real-time wireless telecom payment system

Real-time wireless telecom payment system

Classifications

H04L63/0428 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

View 34 more classifications

FI100137B

Patent

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Other languages: Finnish, Swedish

Inventor: Behruz Vazvan

Worldwide applications

1994 FI 1995 EP WO AT EP ES PT DK BE

Application FI945075A events

1994-10-28	Application filed by Vazvan Simin
1994-10-28	Priority to FI945075
1994-10-28	Publication of FI945075A0
1996-04-29	Publication of FI945075A
1997-09-30	Publication of FI100137B
1997-09-30	Application granted
1998-06-30	First worldwide family litigation filed

Show all events

Info: Patent citations (4), Cited by (206), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

Claims (11)

Hide Dependent

1 A method for paying users' bills and / or fees and checking their account information, characterized in that the method uses apparatus (1,2) consisting of a transmitter-receiver / mobile telephone and communication means in various fonts, such as table stations or the like. , in which / which is input or to which / which is sent or with which apparatus (1.2) is received / read the fee (telecash) and / or bill amount required / payable which is transmitted to a billing station (4) in real time or at the desired time to be transferred to the beneficiary's account, or to debit the payer's account therewith, and that said billing station (4) receives from said apparatus (1,2) the billing and / or charge amount (telecash) and / or other necessary information, checking them for need to transfer the received bill and / or fee amount to the recipient's account or to transfer the amount to be paid from the beta the lender's account to the recipient's account, and that the counting station (4) sends all the required information to said apparatus (1,2).

Method according to claim 1, characterized in that the billing and / or charge amount (telecash) entered into or transmitted to the apparatus (1, 2) or received / read with the apparatus (1.2) in question is shown on the apparatus (1.2).) screen (6) so that the user sees it and, if necessary, enters for the sending and payment of the bill and / or charge amount necessary identification codes such as the recipient's account number and other necessary information, whereby the charge and / or bill amount is sent from said device (1 , 2) to the billing station (4) for transfer to the recipient's account.

Method according to claims 1-2, characterized in that after receiving the data sent by the apparatus (1,2) and / or the bill / charge amounts, the billing station (4) checks these as needed for the transfer of the charge and / or bill amount to be paid / required into the recipient's account.

4 A method according to any preceding claim, characterized in that, when using wired data transmission, with the said device (1,2), the billing and / or fee amounts to be paid / required by the user and as required by the recipient's account details, identification codes and other necessary information are sent. to the billing station (s) (4) for checking the data and transferring the bill / fee amounts to the recipient's account.

5. Apparatus used in the method according to claims 1-4 consists of a transmitter-receiver / mobile telephone (1) and communication means (2) in various forms, such as table stations or the like, in which the communication means (2) also comprises means for tree-bound 10 100137 data transmission, characterized in that the apparatus (1,2) comprises, as needed, all means for wireless / cordless data transfer, a screen, a required user interface, a card reader, and means for entering / reading data and said apparatus (1). , 2) can display on a screen the received / read (telecash) and / or the billing amounts and the necessary data (6) received or read by the apparatus (1,2) received or transmitted therein, the user can see the charge and / or the amount of invoice required / payable and the necessary information on the screen of the said device, accept the fee and / or bill amount or enter the necessary information therein if necessary such as the recipient's account number and other necessary information and sending them to the billing station for checking the data and transferring the billing and / or charge amount to the recipient's account, and that said coit contains both the readable and transferable telecash (amount) as the user's account and other necessary information for identifying the user and checking his account if necessary; with the card reader of said apparatus (1,2) the necessary information and / or the amount (telecash) required / payable sent to the billing station (4) for checking the data and transferring the amount to the recipient's account is read from the user's coit.

6. Mobile telephony / transmitter-receiver (1) for payment of user's bills and / or fees, checking account information and receiving / transmitting data, characterized in that the mobile telephony-transmitter-receiver (1) contains all necessary means for wireless / cordless data transfer , a screen, a necessary user interface, a card reader and means for entering / reading data so that with said apparatus (1), processing, sending, receiving and / or reading the bill and / or charge (telecash) amount required / payable and other necessary data transmitted / received by utilizing wireless data transmission without the use of a modem, and that: said apparatus (1) shows on the screen the received / read charge and / or bill amounts received or read thereon or with the apparatus (1); other necessary information, the user can see the necessary information, the fee / bill amounts on the screen (6), accept the fee / invoice or, if necessary, enter necessary information such as the recipient's account number and other necessary information and send the bill / fee amount or other necessary information to the billing station (4); said apparatus (1) may, as needed, function both wirelessly and cordlessly so that it can connect with the billing station directly and / or via base stations (2, 3) and / or a mobile telephone network (3); with said appliance (1), the telecash fee required / read is received or read by the user / payable from the user's card and is transferred to the recipient's account at the desired time or in real time during the connection, or fi 11 100137 the charges which the appliance (1) shall pay Mη his account is transferred to the recipient's account in real time or at the desired time.

A billing station (4) intended for use in the method of claims 1-4, characterized in that the billing station comprises, as necessary, all means necessary for wireless / wired data transfer, user account information, identification codes, and other necessary information for identification of payer / recipient. and receiving, transmitting data and transmitting charge / bill amounts to the recipient's account, wherein: said billing station receives the data transmitted by the apparatus (1 or 2), the bill / charge amounts directly or via base stations, a network or billing stations (2 and / or 3 and / or 4) and also transmits all necessary information to said apparatus (1,2); said billing station (4) receives from the apparatus (1 or 2) broadcast telecash (amounts) and the bills and transfers them to the authorized recipient's account; said billing station (4) either transfers the transmitted from the devices (1,2) from the card of the user to the recipient's charge amount (telecash) to the recipient's account or transfers the required amount from the payer's account to the recipient's account.

Method of payment with a mobile telephone network (3) terminal equipment and transmission / reception of the required information, characterized in that the method is used: - as terminal equipment a mobile telephone (1); - connections from said mobile telephone (1) via base stations (2 and / or 3) to a mobile telephone network and / or directly to a billing station (4), wherein: - said mobile telephone operates as needed wirelessly, wirelessly and transmits / receives charge and / or bill amount (6) and / or other necessary information without using a modem; - said mobile telephony shows the user on his screen (6) the billing and / or charge amounts sent therein, entered or thereby, and other necessary information, whereby the user can process the data and / or send it to the billing station if necessary; - said mobile telephony (1) sends the bill and / or other necessary information such as the user's identification codes and account information to the billing station (4) for checking the user's account and transferring the charge and / or bill amount (telecash) to be paid to the recipient's account or said mobile telephony (1) transmits the telecash fee payable to the billing station (4) to be transferred to the recipient's account; - the amount of charge required / payable is transferred in real time or at the desired time from the user's account / account to the recipient's account; - said mobile telephony receives all the required information from the billing station (4).

Method according to any of claims 1-4, and 8, characterized in that, when paying, sending and receiving bill and / or charge amounts, the recipient's and / or billing station's connection codes, the recipient's account number and other required information are used as required. needs can be measured into said apparatus (1,2) or received or read from the user's card.

Method according to any of claims 1-4 and 8-9, characterized in that, by using said apparatus (1,2), the amount of telecash charge to be paid / required is read from the user's card and sent to the recipient's account / apparatus in real time. during the connection or at the desired time.

11. Wireless toll system for payment of users' bills and / or fees and control of users' account information, characterized in that the system comprises: at least one billing station (4) which either contains information about users and their accounts or which is linked to users' bank accounts and which either directly or via base stations (2) and / or a network (3) or other billing stations receive and transmit bills, tolls (telecash) and other necessary information from a transmitter-receiver / mobile telephone (1) and / or from communication means (2) in various forms, such as appliances consisting of desk stations, to appliances (1, 2) such that the user can pay fees / bills with said apparatus (1,2) either in real time or at a desired time by sending fee and / or bill amounts and necessary information transmitted to, entered into or received / read with said apparatus (1, 2), the checking station for checking the data as needed and transferring the fee and / or bill amount to the recipient's account or transfer the amount from the payer's account to the recipient's account; apparatus comprising a transmitter-receiver / mobile telephony (1) and communication means (2) in various forms, such as desk stations, containing as required all means for reading, receiving, processing and transmitting charge and bill amounts (telecash), a wireless / cordless transmitter receiver / mobile telephony (1) that transmits, receives, processes and displays on demand an estimated billing and / or charge amount (telecash) and data without the use of a modem and functions so that it can connect with a billing station (4) directly and / or via a base station (s) (2) and / or a mobile telephone network (3); wherein the billing station (4) after receiving the required information, billing and / or fee amounts from said apparatus (1,2) cancels the information and transfers the fee and / or billing amount required / payable to the recipient's account or debits the user's account with the amount to be paid either in real time during the connection or at a desired time. fi

Description

The present invention relates to a method according to the preamble of claims 1, 8 and 11 and to a system (Real Time Mobile Telecash System) for transferring payments / invoices from users of a service sector such as restaurants, shops, banks, service providers or an individual user. to the payee's / invoice payee's account. The present invention also relates to a base station / communication device (2), a computing station (4) and a transceiver / mobile station (1) according to the preamble of claim 6, with which invoices / payments and other necessary information can be sent, received, processed and method to implement.

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It is already known that so-called voice telephones based on voice frequency telephone banking services. If the caller uses a mobile phone, he sometimes has to listen to the instructions by ear, then hold the phone in his hand to dial and then to the ear again to listen to the instructions, etc. These payment methods do not use mobile and mobile communication features so that the user can easily receive or enter his / her bill. his payment to his mobile station so that he could see the invoice / payment receivable or payable on the display of the mobile station, enter the necessary information, and could send and receive the payments / invoices and other necessary information. In the methods already in use, the bank is called, and then the bank's computer questions are answered during the call to make payments and the invoices / payments 20 are not transferred from the user's device to the calculating station, but the service is a continuous dialogue between the user and the bank's computer. Even when using microcomputers, the phone must be of the pulse or tone dialing type. Nor is a method known in advance for transferring mobile user charges from the user's card or account to the payee's account in real time.

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The author of GB2276258 presents a kind of solution with the payer's credit card number, is sent by a separate transceiver to a separate transceiver connected to the car phone and from there to the computer, and from the computer via a modem to the car phone, which calls the credit card verification center to which the credit card number is sent for confirmation. 30 If the credit card number is correct and the card is valid, the confirmation center sends the confirmation information to the car phone, from where the information is sent to the car in the car and via a separate transmitter to the seller's transceiver. The entire operation takes place during the call and no invoices / payments are transferred from said transceiver to the confirmation center and the user does not have an account to which invoices / payments could be transferred or account information can be queried. In addition, only 35 credit card numbers are read from the user's card and the card does not contain transferable

money that could be transferred to the beneficiary's account (if such an account existed). All previously known methods are characterized in that the user's terminal calls the billing center (the bank's computer) or said terminal acts as a terminal of the bank's computer, whereby the user answers the questions of the center. to pay the bills and no charges / bills are transferred between the user equipment and the receiving machine 40 (the bank). In addition, all previously known solutions based on mobile networks and terminals 2 100137 use terminals that allow data to be sent and received by modem and computer, as the terminals do not utilize wireless data transmission so that data can be sent and received and monitored without using a modem.

S The present invention, as defined in the characterizing part of the appended claims, provides a location-independent, fast and completely reliable payment method and system in which user payments / invoices are transferred from user equipment to a billing station for transfer to a payee's account in real time or at a desired time. With the user's devices, payments / invoices are transferred to the recipient's account, using wireless or, if desired, wired 10 data transmission. Other advantages and features of the invention will now be described, by way of example, with reference to the accompanying drawings, to which, however, the invention is not intended to be exclusively limited.

Figure 1 shows by way of example a transceiver / mobile station according to the invention, in which a received / read or entered invoice / payment is monitored on a device display (6). The word "Restaurant Ltd." refers to the payee's account and / or contact information, eg the contact codes and name of the service provider. Reference numeral 1 refers to a user's wireless / wireless device (such as a mobile phone, etc.) capable of sending / receiving, processing and monitoring invoices and payments (telecash) and other necessary information without the use of a modem in the present invention and deducting payments from the user's card and transfer to the beneficiary's account in real time or at a desired time. The information (6) can be graphical, text-based, etc. Reference number 5 refers to the card reader and the user's bank, payment or similar smart card to / from which the necessary payments can be transferred and which may include information needed to use the payment service such as ID, user and billing, station information, etc. that readable and transferable 25 charges or telecash. Reference number 6 refers to both the device display and the monitored invoice. Reference number 7 refers to a possible printer, which may be included in the device if necessary. The term: telecash refers to an electronically readable and transferable payment, money, telegraph.

Figure 2 shows a payment system (Real Time Mobile Telecash System) according to the invention. 30 Reference numeral 1 refers to a wireless / wireless device with which payments / bills can be made. Reference number 2 refers both to communication devices (such as desktops, etc.) with which payments / bills can be transferred to the payee's account and to base stations where the mobile station (1) • can operate wirelessly. Reference numeral 3 refers both to telecommunication networks (such as mobile telephone, paging networks, the Internet, etc., through which the devices (1, 2) can communicate by radio or 35 by wire) and to their base stations and the like Reference numeral 4 refers to computing stations that contain the necessary user information, accounts, IDs, and other necessary information and means. The term "Telecash System" refers to a system in which payments (telecash), invoices, and account information are transferred between users' mobile devices, communication devices (1, 2) and the payee's account, or between the payer's account and the payee's account.

To a mobile station / communication device (1, 2), hereinafter referred to as a user device, which refers both to a transceiver / mobile station (such as a mobile phone, pager, etc) and to a device communicating via wireless / wired networks (e g. desktop, stationary or portable, or fixed). etc. on the device), 5 the necessary identifiers such as the contact codes of the calculating stations, the account information of the recipient, and other necessary information can be entered. Using the contact information of the billing stations (4), the payee's account information and / or other necessary information, invoices and / or payments (telecash) and the necessary information are sent from the user's device to the billing stations (4) to transfer the bill / payment to the payee's account. For example, by activating the contact codes of the recipient and / or the calculation stations (4), e.g. with a certain function 10, the invoices / payments can be transferred to the calculation station or receive the necessary information. The user's device can receive the required invoice / payment, or an invoice / payment can be entered into the device using the device's card reader and / or user interface. The mobile station (1) can be connected directly or via the network (3) or the base station (2) to the computing station (4), whereby the mobile station can operate wirelessly.

15 When a user uses a bank, payment or similar card, the necessary information and / or payment (telecash) is read, if necessary, from said card and sent to the accounting station. After receiving the data and invoices / payments from the user's device (1, 2), the calculation station (4) checks the received data as necessary to transfer the invoice / payment to the beneficiary's account. If the required 20 payments (telecash) are not sent from the user's card to the payee's account, the amount to be paid will be transferred from the payer's account to the payee's account. If the payer's account margin is sufficient, the billing can be performed immediately, if the margin is missing, the calculation station (4) can notify the user's device (1, 2). In the present invention, the computing station (4) sends to the user all the necessary information. The devices (1,2) monitor (6) the invoices / payments and other necessary information to the user, the user can see the invoice / payment (6), accept it and send it to the calculation station, to the recipient's account 25 for transfer.

For example, in a shop, restaurant, etc., if the customer does not have his own mobile device (1), he can give his card to the waiter / seller to make the payment. The seller's device (2 or 1) reads the necessary information from the payer's card (such as the required amount of telecash and other 30 necessary information) as needed. The data is sent to the accounting station (4) to check the data and transfer the payment (telecash) to the payee's account. The information read from the card and the payment are sent to the accounting station (4), as required, together with the invoice and other information such as the payee's account number, etc. The required telecash can be deducted from the customer's card and transferred to the recipient's account without the customer having to do anything. Payments can be sent to the payee's account in real time or at a desired time. 35 After making the payment, the device (1 or 2) is ready for the next service. For the service sector, the device (1,2) may also include a receipt printer, so that after payment, if necessary, the device can print a receipt for the customer. The invention does not exclude the use of a digital signature in which the user's signature is received and sent to the computing station (4) electronically (i.e. the user / card identification process). The data transmission of the system devices can be encrypted with encryption algorithms. The device (2) 40 can be both as a desktop station (fixed or portable, etc.), which can act as a device for both ordinary users and service providers such as shops, banks or other service providers, etc., as well as as a mobile communication device. The communication device (2) may also include cash register means such as means for processing the receipt printer and money. The devices (1, 2) can be connected directly to the computing station or via base stations and / or the network. The accounting station can 5 operate independently or online or be linked to the bank's customer accounts.

As one application of the invention, the short message communication features of mobile networks (3) and mobile stations (1) or other wireless and wireless data transmission services can be used for processing and transmitting payment and billing messages. Another advantage of the invention is that the computing stations 10 receive / send to the user's devices (1, 2) the necessary information (such as the required amount, account information, payments / invoices or information related to payment / invoice execution or other necessary information). Since the invoices are transferred to the accounting station in the invention, they can be used directly for accounting. The user of the method and device (1, 2) according to the invention can be anyone. For example, service providers can use it to transfer invoices / payments made by the customer to the recipient's 15 account, ordinary users can use it to make their own invoices / payments. Thanks to the invention, the user is not tied to a specific place but can use his method and equipment according to the invention to pay his bills / fees anywhere (at his cottage, train, restaurant, taxi, shop, hotel, petrol station, etc.) by transferring his bills and / or payments (telecash) to the accounting station for transfer to the payee's account. All service providers' equipment, such as cash registers, petrol-20 refueling equipment, coffee, refreshment or other automatic equipment, can use devices (1, 2) to transfer customer payments (telecash) and invoices to the payee's / invoice recipient's account.

The method of the invention can be implemented in all wireless / wireless networks such as GSM, CDMA, DECT, and wired Internet, etc., and in all mobile stations /

communication devices such as mobile telephones and the like and computers or their peripherals. It is clear to a person skilled in the art that a wireless device does not require a modem to send and receive data. The wireless / wireless transceiver / mobile station (1) according to the invention transmits / receives and monitors the necessary information such as payments / bills and other necessary information without the use of a modem, regardless of the length of the information (6). If desired, the device (1) can be connected / integrated, e.g. to a laptop, etc. and send / receive data without the use of a modem and monitored on a larger screen.

It will be apparent to those skilled in the art that the various embodiments of the invention are not limited to the 35 examples set forth above, but may vary within the scope of the claims below. The device (1) mentioned in the following claims refers to a transceiver / mobile station (such as a pager, a mobile phone and the like a wireless / wireless transceiver). The device (2) mentioned in the following claims refers both to a wireless / wired communication device (e.g. a portable, or 40 fixed or similar device, such as a user's microcomputer or other device) and to wireless base stations.

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Patent Citations (4)

Publication number	Priority date	Publication date	Assignee	Title
Family To Family Citations				
US5220593A *	1990-10-24	1993-06-15	Gte Mobile Communications Service Corporation	Cellular radiotelephone credit card paystation method
FI924801A *	1992-10-22	1994-04-23	Nokia Telecommunications Oy	Foerfarande, mobil teleforicentral och foermedlingssystem Foer att saenda kortmeddelande i ett cellulartradiosystem
EP0669031B1 *	1992-11-11	1997-10-22	Telecom Finland Oy	Method for carrying out financial transactions by means of a mobile telephone system
FI92364C *	1993-01-15	1994-10-25	Nokia Telecommunications Oy	A method for initiating a short message transmission in a mobile telephone network and a home register of the mobile telephone system

* Cited by examiner, † Cited by third party

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Publication number	Priority date	Publication date	Assignee	Title
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EP0669031B1	1992-11-11	1997-10-22	Telecom Finland Oy	Method for carrying out financial transactions by means of a mobile telephone system
EP0986402B1 *	1996-06-19	2007-09-26	Behruz Vazvan	Real time system and method for remote purchase payment and remote bill payment transactions and transferring of electronic cash and other required data
JPH08263438A	1994-11-23	1996-10-11	Xerox Corp	Distribution and use control system of digital work and access control method to digital work
US6963859B2	1994-11-23	2005-11-08	Contentguard Holdings, Inc.	Content rendering repository
US6973477B1	1995-05-19	2005-12-06	Cyberfone Technologies, Inc.	System for securely communicating amongst client computer systems
US20050119992A1	1995-05-19	2005-06-02	Martino Rocco L.	Telephone/transaction entry device and system for entering transaction data into databases
US7334024B2	1995-05-19	2008-02-19	Cyberfone Technologies, Inc	System for transmission of voice and data over the same communications line
US6742022B1	1995-12-11	2004-05-25	Openwave Systems Inc.	Centralized service management system for two-way interactive communication devices in data networks
US5809415A	1995-12-11	1998-09-15	Unwired Planet, Inc.	Method and architecture for an interactive two-way data communication network
US6466783B2	1995-12-11	2002-10-15	Openwave Systems Inc.	Visual interface to mobile subscriber account services
US6473609B1	1995-12-11	2002-10-29	Openwave Systems Inc.	Method and architecture for interactive two-way communication devices to interact with a network
JPH09212565A *	1996-02-07	1997-08-15	Nec Corp	Radio portable terminal system
FI102869B	1996-02-26	1999-02-26	Nokia Mobile Phones Ltd	A device, method, and system for transmitting and receiving information relating to various applications
US6505174B1	1996-03-25	2003-01-07	Hsx, Inc.	Computer-implemented securities trading system with a virtual specialist

				function
US10586282B2	1996-03-25	2020-03-10	Cfph, Llc	System and method for trading based on tournament-style events
FR2749424B1 *	1996-06-04	1998-07-10	Ckd Sa	PORTABLE ELECTRONIC TRANSACTION TERMINAL, ESPECIALLY PORTABLE PAYMENT TERMINAL
SI0907925T1 *	1996-06-27	2000-08-31	Mannesmann Ag	Communication system for transmitting accounting instructions
ES2127688B1 *	1996-07-26	1999-11-16	Bankinter Sa	PORTABLE DEVICE FOR TREATMENT OF PURSE CARDS.
FR2752123B1 *	1996-08-01	1999-01-22	Solaic Sa	METHOD FOR PERFORMING A SECURE TRANSACTION BETWEEN A SERVER AND A MOBILE STATION EQUIPPED WITH AN INTEGRATED CIRCUIT CARD
US5991749A	1996-09-11	1999-11-23	Morrill, Jr.; Paul H.	Wireless telephony for collecting tolls, conducting financial transactions, and authorizing other activities
DE59702957D1	1996-09-13	2001-03-01	Siemens Ag	CASHLESS PAYMENT WITH A MOBILE RADIO
EP0848360A1 *	1996-12-11	1998-06-17	BRITISH TELECOMMUNICATIONS public limited company	Electronic funds transfer authentication system
FI104937B	1997-01-27	2000-04-28	Sonera Oyj	A subscriber identity module, a mobile station and a method for performing a smart card operation
TW355899B *	1997-01-30	1999-04-11	Qualcomm Inc	Method and apparatus for performing financial transactions using a mobile communication unit
SE508844C2 *	1997-02-19	1998-11-09	Postgirot Bank Ab	Procedure for access control with SIM card
US6233684B1	1997-02-28	2001-05-15	Contenaguard Holdings, Inc.	System for controlling the distribution and use of rendered digital works through watermaking
FI1095058 *	1997-03-24	2002-08-15	Fd Finanssidata Oy	Use of banking services in a digital cellular radio system
WO1999057691A1 *	1997-03-28	1999-11-11	Sanyo Electric Co., Ltd.	Automatic vending machine
US6868391B1 *	1997-04-15	2005-03-15	Telefonaktiebolaget Lm Ericsson (Publ)	Tele/datacommunications payment method and apparatus
FI1096098	1997-06-03	2002-08-15	Nokia Corp	Billing for a short message to a mobile station
DK0992026T3	1997-06-27	2002-10-28	Swisscom Mobile Ag	Transaction method with a portable identification element
ES2218832T3 *	1997-06-27	2004-11-16	Swisscom Mobile Ag	TRANSACTION PROCEDURE WITH A MOBILE DEVICE.
SE512838C2 *	1997-06-30	2000-05-22	Satsafe Mls Ab	Payment operation execution system
FR2765979B1 *	1997-07-08	2005-05-27	Jacques Rivailler	INDIVIDUAL COMPUTER TERMINAL CAPABLE OF COMMUNICATING WITH COMPUTER EQUIPMENT IN A SECURE WAY, AS WELL AS AN AUTHENTICATION PROCESS IMPLEMENTED BY SAID TERMINAL
US5974146A *	1997-07-30	1999-10-26	Huntington Bancshares Incorporated	Real time bank-centric universal payment system
GB9718214D0 *	1997-08-29	1997-11-05	Philips Electronics Nv	Method of,and system for,transferring consumable data to a non-volatile memory and a secondary station for use in such a system
JP2001505698A *	1997-08-29	2001-04-24	コーニンクレッカ フィリップス エレクトロニクス エヌ ヴィ	Methods and systems for performing cashless transactions, and devices for such systems
CA2308386C	1997-10-28	2001-12-11	Brokat Infosystems Ag	Method for digital signing of a message
IT1297316B1 *	1997-10-31	1999-09-01	Marcello Lolli	METHOD AND COMMUNICATION SYSTEM.
FR2771875B1 *	1997-11-04	2000-04-14	Gilles Jean Antoine Kremer	METHOD FOR TRANSMITTING INFORMATION AND COMPUTER SERVER IMPLEMENTING IT
US6041314A *	1997-12-22	2000-03-21	Davis; Walter Lee	Multiple account portable wireless financial messaging unit
US6314519B1 *	1997-12-22	2001-11-06	Motorola, Inc.	Secure messaging system overlay for a selective call signaling system
US6311167B1 *	1997-12-22	2001-10-30	Motorola, Inc.	Portable 2-way wireless financial messaging unit
US7167711B1 *	1997-12-23	2007-01-23	Openwave Systems Inc.	System and method for controlling financial transactions over a wireless network
FI980427A †	1998-02-25	1999-08-26	Ericsson Telefon Ab L M	Procedure, arrangement and device for verification
AT334557T *	1998-06-12	2006-08-15	Teliasonera Finland Oyj	METHOD AND SYSTEM FOR SENDING A BRIEFCASE

US7490758B2 *	1998-04-17	2009-02-17	Dieboid, Incorporated	System and method of operating an automated banking machine system and method with inputs from a portable wireless device
US7445146B2	1998-04-17	2008-11-04	Dieboid, Incorporated	Card activated cash dispensing automated banking machine system and method
FR2780800B1 *	1998-07-03	2000-09-08	Sagem	ELECTRONIC PAYMENT PROCESS
AT442746T	1998-09-10	2009-09-15	Swisscom Ag	PROCEDURE FOR BUYING GOODS OR SERVICES WITH A MOBILE PHONE
FI113727B *	1998-09-17	2004-05-31	Elisa Oyj	Method and system for the advance payment of telephone charges
FR2787273B1 *	1998-12-14	2001-02-16	Sagem	SECURE PAYMENT PROCESS
US7451114B1	1999-02-19	2008-11-11	Visa International Service Association	Conducting commerce between individuals
US20060178986A1 *	2000-02-17	2006-08-10	Giordano Joseph A	System and method for processing financial transactions using multi-payment preferences
FR2790162B1 *	1999-02-19	2001-04-13	France Telecom	TELEPAYMENT PROCEDURE AND SYSTEM FOR IMPLEMENTING THIS PROCESS
GB2347255A *	1999-02-22	2000-08-30	Ericsson Telefon Ab L M	Method of loading a cash card using a mobile phone
FR2791451B1 *	1999-03-23	2001-06-22	Virgile	MOBILE TRANSACTION SYSTEM AND METHOD, AND MOBILE EQUIPMENT IMPLEMENTED IN THIS SYSTEM
FR2791450B1 *	1999-03-23	2001-06-08	Virgile	MOBILE TRANSACTION SYSTEM AND METHOD, AND MOBILE EQUIPMENT IMPLEMENTED IN THIS SYSTEM
EP1166239A1	1999-03-30	2002-01-02	Mark Russell Attieh	A method of conducting financial transactions
FI991105A *	1999-05-14	2000-11-15	Nokia Networks Oy	Method and digital mobile communication system
JP2000358275A *	1999-06-14	2000-12-26	Canon Inc	Radio wave reception recorder
SE518766C2 *	1999-07-20	2002-11-19	Patrik Mossberg	Procedure and system for identifying a legal entity
US7376583B1	1999-08-10	2008-05-20	Gofigure, L.L.C.	Device for making a transaction via a communications link
AU5405199A	1999-09-07	2001-04-10	Swisscom Ag	Ordering method
DE19946598A	1999-09-28	2010-04-29	T-Mobile Deutschland Gmbh	Method for billing Internet shops via mobile communications
FI19992197A *	1999-10-12	2001-04-30	Sonera Oyj	Assignment of certification tasks
EP1093097A3 *	1999-10-14	2004-01-07	International Business Machines Corporation	System and method for providing secure financial transactions
EP1263514A1 *	1999-12-03	2002-12-11	Secure Electronic Commerce (Proprietary) Limited	A method and system for facilitating the playing of a game
EP1117265A1 *	2000-01-15	2001-07-18	Telefonaktiebolaget Lm Ericsson	Method and apparatus for global roaming
DE10002032A1 *	2000-01-19	2001-07-26	Siemens Ag	Method for making cashless payment with a mobile telephone dials a computer for authorisation while identifying a person sending payment and allowing the entry of a money amount via the mobile telephone keypad with an ID number.
AU2699601A *	2000-01-28	2001-08-07	Fundamo Proprietary Ltd	Personal information data storage system and its uses
US20030004870A1 *	2000-01-28	2003-01-02	Van Rensburg Johannes Janse	Banking system with enhanced identification of financial accounts
IL134354D0 *	2000-02-03	2001-04-30	Ranit T S Technical Services L	Electronic transaction system
US8706627B2	2000-02-10	2014-04-22	Jon Shore	Apparatus, systems and methods for wirelessly transacting financial transfers , electronically recordable authorization transfers, and other information transfers
AU3371601A *	2000-02-11	2001-08-20	Daniel F Goldscheider	Method and apparatus for wap enabled commercial transactions
JP2005522782A *	2002-04-08	2005-07-28	エクソンモービル リサーチ アンド エンジニアリング カンパニー	System and method for processing monetary transactions using various payment preferences
US6968328B1 *	2000-02-28	2005-11-22	Claudine Kam	Data interpreter for RBOC bills
DE113696T1	2000-03-24	2003-05-28	Mobipay International S A	System and method for real-time remote payments and transactions using a mobile phone

ES2170647B2 *	2000-03-24	2003-09-16	Mobipay Espana S A	PROCEDURE AND SYSTEM OF DISTANCE PAYMENTS AND TRANSACTIONS IN REAL TIME BY MOBILE PHONE.
DE10015098A1 *	2000-03-28	2001-10-25	Giesecke & Devrient Gmbh	Process and terminal for data transactions using smart card used in network system
BR0109641A *	2000-03-31	2003-04-22	Siemens Ag	Process and disposition of data transmission
US8977559B2	2000-04-07	2015-03-10	Zyzeba Holding Limited	Interactive marketing system
FI20001054A	2000-05-05	2001-11-06	Sonera Oyj	Digital payment order
JP4243411B2	2000-05-09	2009-03-25	日本電気株式会社	Settlement method for transactions of goods or services
EP1281137B1 *	2000-05-09	2003-09-10	Swisscom Mobile AG	Transaction method and selling system
US9684893B2	2000-06-30	2017-06-20	Tara Chand Singhal	Apparatus and method for a wireless point of sale terminal
DE10037175A1 *	2000-07-31	2002-02-21	Orga Kartensysteme Gmbh	transaction confirmation
US7774231B2	2000-09-29	2010-08-10	Nokia Corporation	Electronic payment methods for a mobile device
US7743259B2	2000-08-28	2010-06-22	Contentguard Holdings, Inc.	System and method for digital rights management using a standard rendering engine
US7412605B2	2000-08-28	2008-08-12	Contentguard Holdings, Inc.	Method and apparatus for variable encryption of data
GB2366432A *	2000-09-04	2002-03-06	Sonera Smarttrust Oy	Secure electronic payment system
FI111117B *	2000-09-18	2003-05-30	Sonera Oyj	Reset service
CA2423899A1 *	2000-09-28	2003-03-26	James Jay Skinner	Electronic commerce system
US7299296B2	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
AT410403B *	2000-10-09	2005-09-26	Scherr Franz Dipl Ing	PROOF OF A SERVICE PAID ON THE INTERNET
DE10050805A1 *	2000-10-13	2002-04-18	Deutsche Telekom Ag	Mobile phone with integrated printer for printing of text, SMS, or Internet pages received with a WAP enabled phone, improving the ease and range of use of a mobile phone for minimal cost
JP2002140755A *	2000-10-31	2002-05-17	Yozan Inc	Merchandise transaction device, movile object communication equipment and management device
US7343324B2	2000-11-03	2008-03-11	Contentguard Holdings Inc.	Method, system, and computer readable medium for automatically publishing content
KR100469689B1 *	2000-11-08	2005-01-31	엘지전자 주식회사	Mobile phone to read card and operating method of mobile phone
GB0027922D0 *	2000-11-15	2001-01-03	Haidar Mahmoud N Y	Electronic payment and associated systems
AT5596U1 *	2000-11-29	2002-08-26	Mobilkom Austria Ag & Co Kg	DEVICE FOR TRANSMITTING FINANCIAL VALUES BETWEEN PARTICIPANTS OF A TELECOMMUNICATIONS NETWORK
NL1016853C2 *	2000-12-12	2002-06-13	Koninkl Kpn Nv	Method for the purchase of services and the control thereof, using a mobile terminal.
DE10061822B4 *	2000-12-12	2013-09-05	Bally Wulff Entertainment Gmbh	Method for operating a gaming machine
FI20002804A	2000-12-20	2002-06-21	Nokia Corp	Payment system
SE518059C2 *	2000-12-22	2002-08-20	Payment Security Sweden Ab	Procedure for increasing security when paying by credit and debit card
IES20001075A2 *	2000-12-22	2002-07-10	Global Digitaltechnology Holdi	A customer loyalty database reward system
US6912294B2	2000-12-29	2005-06-28	Contentguard Holdings, Inc.	Multi-stage watermarking process and system
US7242921B2	2000-12-29	2007-07-10	Intel Corporation	Anonymous electronic transactions
FR2819127A1 *	2001-01-02	2002-07-05	Smart Design	Securing of commercial transactions in shops, etc. where a purchaser uses a credit or banker's card by use of a customer's mobile phone to provide transaction confirmation and thus reduce fraud
US7028009B2	2001-01-17	2006-04-11	Contentguardholdings, Inc.	Method and apparatus for distributing enforceable property rights
US8069116B2	2001-01-17	2011-11-29	Contentguard Holdings,	System and method for supplying and managing usage rights associated with

			Inc.	an item repository
WO2002061699A1 *	2001-02-01	2002-08-08	Fournir Limited	A method for bill payment
FR2820853B1 *	2001-02-12	2003-04-11	France Telecom	TELEPAYING METHOD AND SYSTEM
US6934529B2 *	2001-02-20	2005-08-23	Sevket Ilhan Bagoren	Replenishment of pre-paid wireless telephone accounts using short message service (SMS)
US20030009374A1 *	2001-05-04	2003-01-09	Moodie Justin Charles	Schemes employing mobile communications
JP4560237B2 *	2001-05-24	2010-10-13	サンデン株式会社	Deposit system using vending machines
US7747699B2	2001-05-30	2010-06-29	Prueitt James K	Method and system for generating a permanent record of a service provided to a mobile device
US6876984B2	2001-05-31	2005-04-05	Contentguard Holdings, Inc.	Method and apparatus for establishing usage rights for digital content to be created in the future
US7725401B2	2001-05-31	2010-05-25	Contentguard Holdings, Inc.	Method and apparatus for establishing usage rights for digital content to be created in the future
US8099364B2	2001-05-31	2012-01-17	Contentguard Holdings, Inc.	Digital rights management of content when content is a future live event
US7774279B2	2001-05-31	2010-08-10	Contentguard Holdings, Inc.	Rights offering and granting
US8275709B2	2001-05-31	2012-09-25	Contentguard Holdings, Inc.	Digital rights management of content when content is a future live event
US8001053B2	2001-05-31	2011-08-16	Contentguard Holdings, Inc.	System and method for rights offering and granting using shared state variables
US8275716B2	2001-05-31	2012-09-25	Contentguard Holdings, Inc.	Method and system for subscription digital rights management
US6895503B2	2001-05-31	2005-05-17	Contentguard Holdings, Inc.	Method and apparatus for hierarchical assignment of rights to documents and documents having such rights
US7774280B2	2001-06-07	2010-08-10	Contentguard Holdings, Inc.	System and method for managing transfer of rights using shared state variables
BR0210930A	2001-06-07	2005-05-03	Contentguard Holdings Inc	Method and apparatus for supporting multiple trust zones in a digital rights management system
US6585598B2 *	2001-06-28	2003-07-01	Igt	Method for cashless gaming
GB2381633A *	2001-11-02	2003-05-07	Nokia Corp	Controlling transactions
EP1485833A4	2001-11-20	2005-10-12	Contentguard Holdings Inc	An extensible rights expression processing system
US7840488B2	2001-11-20	2010-11-23	Contentguard Holdings, Inc.	System and method for granting access to an item or permission to use an item based on configurable conditions
US7974923B2	2001-11-20	2011-07-05	Contentguard Holdings, Inc.	Extensible rights expression processing system
NL1019604C2 *	2001-12-19	2003-06-20	Mansvelder Man & Beheer	Text messaging system for e.g. SMS messages, used to carry out finanical transactions, based on unique current accounts assigned to phone numbers
US6726092B2	2001-12-28	2004-04-27	Interdigital Technology Corporation	Portable device service payments by multiple means
HU224788B1 *	2002-02-07	2006-02-28	Enigma Software Rt	Architecture for arranging bank card transaction requiring simplified hardware in a large customer base, transaction terminal unit, sim card with extended function, as well as, method for personalizing and performing transactions
DE10208637A1 *	2002-02-28	2003-10-02	Ali Hassan Al-Khaja	Process for processing transactions using wireless devices
US7809671B2	2002-03-14	2010-09-28	Contentguard Holdings, Inc.	Rights expression profile system and method
CN1653462A	2002-03-14	2005-08-10	康坦夫德控股股份有限公司	Rights expression profile system and method using templates and profiles
BG65608B1 *	2002-04-29	2009-02-27	Красимир ПОПОВ	Method of payment through a communications operator
WO2003094077A1	2002-04-29	2003-11-13	Contentguard Holdings, Inc.	System and method for specifying and processing legality expressions
CN1653461A *	2002-05-09	2005-08-10	凯斯特无线有限公司	Method and system for enabling electronic transactions via a personal device

BG106813A *	2002-06-12	2005-04-30	Румен СТОЯНОВ	Method for mobile payments
AU2002315981B2	2002-06-18	2009-02-19	Telefonaktiebolaget L M Ericsson (Publ)	Parallel coordinated operations in private domains
US7388321B2	2002-07-09	2008-06-03	Moyer Alan L	Method and system for communicating between a remote printer and a server
FR2842319A1 *	2002-07-15	2004-01-16	France Telecom	System for transferring information or money, comprises transmission from sender to receiver on network of sender/destination information and value using relation between network operator and sender
FR2842929B1 *	2002-07-29	2007-06-08	France Telecom	METHOD OF BUYING INITIATED BY THE USER ON MOBILE TERMINAL
EP1403792A1 *	2002-09-26	2004-03-31	Valentino Callegari	A three terminal network for off-line digital electronic payments-network
DE10258119A1 *	2002-12-06	2004-07-15	Deutsche Telekom Ag	Payment system via radio telephone
US8335763B2	2003-03-31	2012-12-18	Cantor Index, Llc	System and method for betting on a participant in a group of events
US7641549B2	2003-04-11	2010-01-05	Cantor Index Llc	Lottery and auction based tournament entry exchange platform
KR100423401B1 *	2003-06-24	2004-03-18	(주) 엘지텔레콤	Account transfer/remittance system by mobile-phone and the method
US7374079B2 *	2003-06-24	2008-05-20	Lg Telecom, Ltd.	Method for providing banking services by use of mobile communication system
US7685642B2	2003-06-26	2010-03-23	Contentguard Holdings, Inc.	System and method for controlling rights expressions by stakeholders of an item
US8335360B2	2003-06-30	2012-12-18	Toshiba Global Commerce Solutions Holdings Corporation	Method and system for secured transactions over a wireless network
US7698198B2	2004-01-16	2010-04-13	Bgc Partners, Inc.	System and method for purchasing a financial instrument indexed to entertainment revenue
US7567931B2	2004-01-16	2009-07-28	Bgc Partners, Inc.	System and method for forming a financial instrument indexed to entertainment revenue
WO2005119607A2 *	2004-06-03	2005-12-15	Tyfone, Inc.	System and method for securing financial transactions
US8016185B2	2004-07-06	2011-09-13	Visa International Service Association	Money transfer service with authentication
US8660961B2	2004-11-18	2014-02-25	Contentguard Holdings, Inc.	Method, system, and device for license-centric content consumption
GB2410113A *	2004-11-29	2005-07-20	Morse Group Ltd	A system and method of accessing banking services via a mobile telephone
US20060136901A1 *	2004-12-22	2006-06-22	Sony Ericsson Mobile Communications Ab	Mobile financial transaction management system and method
US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
EP1705941A1 *	2005-03-24	2006-09-27	BRITISH TELECOMMUNICATIONS public limited company	Secure communication of password information in a network
US7412419B1	2005-06-09	2008-08-12	Claudine Kam	Data interpreter for RBOC bills
US7720767B2	2005-10-24	2010-05-18	Contentguard Holdings, Inc.	Method and system to support dynamic rights and resources sharing
ITMI20060315A1 *	2006-02-21	2007-08-22	Tomo Mali	EQUIPMENT FOR IMPLEMENTING A METHOD OF MOBILE MONETARY TRANSACTION
US8145568B2	2006-07-06	2012-03-27	Firethorn Mobile, Inc	Methods and systems for indicating a payment in a mobile environment
US9911114B2	2006-07-06	2018-03-06	Qualcomm Incorporated	Methods and systems for making a payment via a stored value card in a mobile environment
US8510220B2	2006-07-06	2013-08-13	Qualcomm Incorporated	Methods and systems for viewing aggregated payment obligations in a mobile environment
US8121945B2	2006-07-06	2012-02-21	Firethorn Mobile, Inc.	Methods and systems for payment method selection by a payee in a mobile environment
US8489067B2	2006-07-06	2013-07-16	Qualcomm Incorporated	Methods and systems for distribution of a mobile wallet for a mobile device
US8467766B2	2006-07-06	2013-06-18	Qualcomm Incorporated	Methods and systems for managing payment sources in a mobile environment
US8160959B2	2006-07-06	2012-04-17	Firethorn Mobile, Inc	Methods and systems for payment transactions in a mobile environment
EP1980988A3 *	2006-07-06	2011-03-09	Firethorn Holdings, LLC	Methods and systems for distribution of a mobile wallet for a mobile device

US10068220B2	2006-10-11	2018-09-04	Visa International Service Association	Systems and methods for brokered authentication express seller links
US7991158B2	2006-12-13	2011-08-02	Tyfone, Inc.	Secure messaging
US7848980B2	2006-12-26	2010-12-07	Visa U.S.A. Inc.	Mobile payment system and method using alias
US9940627B2	2006-12-26	2018-04-10	Visa U.S.A. Inc.	Mobile coupon method and system
US8615426B2	2006-12-26	2013-12-24	Visa U.S.A. Inc.	Coupon offers from multiple entities
CN101595491A	2006-12-26	2009-12-02	维萨美国股份有限公司	Mobile vending purchasing
BRPI0810369B8	2007-04-17	2019-05-28	Visa Usa Inc	method, computer readable medium, directory server, and telephone
US8170527B2	2007-09-26	2012-05-01	Visa U.S.A. Inc.	Real-time balance on a mobile phone
US20090112767A1	2007-10-25	2009-04-30	Ayman Hammad	Escrow system and method
EP2056246A1 *	2007-10-30	2009-05-06	Nederlandse Organisatie voor toegepast-natuurwetenschappelijk Onderzoek TNO	Electronic payments using payment cards
US9741027B2	2007-12-14	2017-08-22	Tyfone, Inc.	Memory card based contactless devices
DE112009000137T5	2008-01-15	2011-02-17	Visa U.S.A. Inc., San Francisco	System and method for data completion with start detection
JP4546551B2 *	2008-03-18	2010-09-15	フェリカネットワークス株式会社	Information processing apparatus, information processing method, program, and information processing system
US9715709B2	2008-05-09	2017-07-25	Visa International Services Association	Communication device including multi-part alias identifier
US9542687B2	2008-06-26	2017-01-10	Visa International Service Association	Systems and methods for visual representation of offers
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
US9824355B2	2008-09-22	2017-11-21	Visa International Service Association	Method of performing transactions with contactless payment devices using pre-tap and two-tap operations
US8977567B2	2008-09-22	2015-03-10	Visa International Service Association	Recordation of electronic payment transaction information
US10706402B2	2008-09-22	2020-07-07	Visa International Service Association	Over the air update of payment transaction data stored in secure memory
US7827106B2	2008-11-21	2010-11-02	Visa U.S.A. Inc.	System and method of validating a relationship between a user and a user account at a financial institution
EP2401708A4	2009-02-24	2012-08-15	Tyfone Inc	Contactless device with miniaturized antenna
GB0903313D0 *	2009-02-26	2009-04-08	Sepura Plc	Mobile communications systems
US9235831B2	2009-04-22	2016-01-12	Gofigure Payments, Llc	Mobile payment systems and methods
US10255591B2	2009-12-18	2019-04-09	Visa International Service Association	Payment channel returning limited use proxy dynamic value
US10339525B2	2011-10-27	2019-07-02	Boom! Payments, Inc.	Confirming local marketplace transaction consummation for online payment consummation
US8271394B1 *	2011-10-27	2012-09-18	Bogaard Erik T	Confirming local marketplace transaction consummation for online payment consummation
US20140344083A1 *	2012-01-03	2014-11-20	Equatel (Uk) Ltd	Portable mobile money device
US10783515B2 *	2014-06-19	2020-09-22	IroFit Technologies Oy	Method and system for conducting wireless electronic credit card transactions
WO2016001821A1 *	2014-07-01	2016-01-07	Francesco Ricci	Electronic payment system and relative method
US11037114B2	2018-03-22	2021-06-15	Dieboid Nixdorf, Incorporated	System and method for financial transactions

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Similar Documents

Publication	Publication Date	Title
FI100137B	1997-09-30	Real-time wireless telecom payment system
EP0960402B1	2007-09-26	Real time system and method for remote purchase payment and remote bill payment transactions and transferring of electronic cash and other required data
AU780943B2	2005-04-28	Method of payment by means of an electronic communication device
US7660772B2	2010-02-09	Authentication in a telecommunications network
EP1334475B1	2006-08-23	Electronic payment and associated systems
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KR100350638B1	2003-01-06	Service device using communication terminal and its service method
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KR20010099003A	2001-11-09	accounting method by authentication of mobile telecommunication company
KR20110066841A	2011-06-17	System for processing mobile payment authentication, and method for processing mobile payment
CN101964125B	2014-05-21	Mobile phone payment system authenticated by double communication paths and corresponding method
CN101404077A	2009-04-08	Remote payment system and method for associated affirmation of goods inspection and payment
CN1394067A	2003-01-29	Network bank pay system using telephone's incoming display as dynamic encrypting code
WO2001073700A3	2002-01-31	A method and a system for ordering services
FI1020208	1998-09-30	Telepayment system in real time
KR100474306B1	2005-03-10	Cash withdraw method using infrared ray function of mobile communication terminal
FI108263B	2001-12-14	Mobile payment method and equipment
JP2002056331A	2002-02-20	Settlement system of credit card or prepaid card
KR100430485B1	2004-05-10	Method of distributing the personal identification number for multi prepaid cards by mobile communication system
FI117229B	2006-07-31	Utilization of a service in a telecommunications system
KR20020012075A	2002-02-15	credit card cash service method using a cellular phone

Priority And Related Applications

Priority Applications (2)

Application	Priority date	Filing date	Title
FI945075		1994-10-28	
FI945075A	1994-10-28	1994-10-28	Real-time wireless telecom payment system

Applications Claiming Priority (14)

Application	Filing date	Title
FI945075A	1994-10-28	Real-time wireless telecom payment system
EP95935472A	1995-10-25	Real time tele-payment system
PCT/FI1995/000591	1995-10-25	Real time tele-payment system
DE69524783T	1995-10-25	REAL-TIME PAYMENT SYSTEM TELE
EP0111413A	1995-10-25	Real time tele-payment system
ES95935472T	1995-10-25	MOBILE PAYMENT SYSTEM IN TIME.

AT95935472T	1995-10-25	REAL-TIME PAYMENT SYSTEM TELE
DK95935472T	1995-10-25	Real-time mobile payment system
PT95935472T	1995-10-25	REAL-TIME TELEPHONY SYSTEM
FI962553A	1996-06-19	Mobile payment method and equipment
FI962961A	1996-07-24	Telepayment system in real time
FI971009A	1997-03-11	A real-time method for monitoring, sending, and receiving user invoices and payments
FI971248A	1997-03-25	A method for monitoring an invoice and entering invoice information using a matching portion of a mobile station
FI971848A	1997-04-30	Method and mobile station for receiving / transmitting and processing data

Legal Events

Date	Code	Title	Description
1994-10-28	FG	Patent granted	~~Owner name~~: VAZVAN, BEHRUZ
1998-11-17	PC	Transfer of assignment of patent	~~Owner name~~: VAZVAN, BEHRUZ
1999-02-02	PC	Transfer of assignment of patent	~~Owner name~~: VAZVAN, BEHRUZ

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System for facilitating a transaction

Classifications

G06Q20/383 Anonymous user system

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WO2001067355A2
WIPO (PCT)

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Other languages: French

Inventor: Lydia Breck, Jessica Zoob, Glen Salow, Katie Cunningham, Martin Wittwer, Anant Nambiar, Fred Bishop, William Schwarz, David Johnstone, Elliott Glazer, Jan N. Belt, David Armes

Worldwide applications

2001 WO AU US TW 2004 US US US US

Application PCT/US2001/007245 events

2000-03-07 Priority to US18762000P
2000-03-07 Priority to US60/187,620
2000-04-28 Priority to US20062500P
2000-04-28 Priority to US60/200,625
2000-06-22 Priority to US60/213,323
2000-06-22 Priority to US21332300P
2001-03-07 Application filed by American Express Travel Related Services Company, Inc.
2001-09-13 Publication of WO2001067355A2

Info: Patent citations (885), Cited by (575), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, PatentScope, Discuss

Claims

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CLAIMSWhat is claimed is:

1. A method for facilitating a transaction, comprising the steps of: identifying at least one primary account; generating a secondary transaction number that is configured to facilitate a transaction; associating the secondary transaction number with said at least one primary account; and issuing the secondary transaction number to a first party to facilitate a transaction with a second party, wherein the secondary transaction number is configured to be immediately usable for facilitating the transaction.

2. The method of claim 1 , wherein the step of identifying said at least one primary account further comprises the steps of receiving information from the first party specifying a particular account; and verifying that the account exists and is valid.

3. The method of claim 1 , wherein the step of generating a secondary transaction number further comprises the steps of: generating a random number; determining if the random number is available for use, and if available for use, appending appropriate formatting and product identifier numbers to the random number to achieve a secondary transaction number that is configured to have the same format as the primary account number.

4. The method of claims 1 or 3, wherein the secondary transaction number is generated by a computer system.

5. The method of claims 1 or 3, wherein a portable data device is configured to generate the secondary transaction number.

6. The method of claims 1 or 3, wherein a portable data device is configured to support interaction with a card provider's user interface system to generate the secondary transaction number.

7. The method of claim 5, wherein a portable data device reader is configured to support interaction with the portable data device.

8. The method of claim 1 or 3, wherein the secondary transaction number is generated by a first party's computer system configured to support interaction with a card provider's user interface system.

9. The method of claim 1 , wherein the step of associating the secondary transaction number with the primary account further comprises the step of recording the secondary transaction number in a database associated with the primary account.

10. The method of claim 1 , wherein the primary account is associated with a physical charge card.

11. The method of claim 1 , wherein the step of issuing the secondary transaction number to a first party is facilitated by a user interface system.

12. The method of claim 11 , wherein the user interface system comprises at least one of the following: a web server system, a telephone system, and a mail handling system.

13. The method of claim 1 , further comprising the steps of registering a first party to use a transaction system configured to generate and issue a secondary transaction number; and upon proper registration, providing the first party with authentication information.

14. The method of claim 13, where the authentication information is a username and password.

15. The method of claim 1 , further comprising the steps of: prompting the first party for authentication information to confirm that the first party is a registered user; and receiving authenticating information from the first party, and upon verifying that the first party is registered, providing the first party access to a transaction system.

16. The method of claim 15, further comprising the step of receiving a request from the first party for a secondary transaction number.

17. The method of claim 1 , further comprising the steps of: allowing the first party to select and define conditions-of-use parameters, wherein the parameters place limits on how the secondary transaction number may be used; and associating the conditions-of-use parameters with the secondary transaction number.

18. The method of claim 17, further comprising the step of storing the condition of use parameters in one or more account database fields associated with the secondary transaction number.

19. The method of claim 17, wherein the conditions of use parameters comprise at least a secondary transaction number credit limit and an expiration date.

20. The method of claim 1 , comprising the following steps: receiving transaction information from a second party for authorization; forwarding the transaction information to a card authorization system for authorization processing; processing the transaction information with the card authorization system, wherein the card authorization system interfaces with a secondary transaction number system to determine if authorization is appropriate.

21. The method of claim 20, further comprising the steps of: recognizing that the transaction information comprises a secondary transaction number, retrieving account information that is associated with the secondary transaction number; determining if conditions of use associated with the primary account are satisfied; determining if conditions of use associated with the secondary transaction number are satisfied; returning an appropriate approval code to the second party, if conditions of use parameters associated with the secondary transaction number and the primary account are satisfied; and, declining the authorization request if either the conditions associated with the primary account or the secondary transaction number are not satisfied.

22. The method of 21 , wherein the conditions of use parameters associated with the primary account include at least an expiration date.

23. The method of claim 1 , comprising the following steps: receiving transaction settlement information from a second party, wherein the transaction was facilitated using a secondary transaction number; identifying the transaction settlement information as a transaction involving a secondary transaction number; and verifying that the secondary transaction number is a valid number; capturing the transaction settlement information in a financial capture system, and causing the second party to be paid

24. The method of claim 23, further comprising the steps of: identifying the primary account that is associated with the secondary transaction number; replacing the secondary transaction number with the primary account number; processing the transaction settlement information in an accounts receivable system; and generating a billing statement that includes at least the primary account number.

25. The method of claim 24, further comprising the steps of comparing the transaction settlement information with conditions of use parameters associated with the secondary transaction number to determine if the conditions of use have been satisfied.

26. The method of claim 1 , further comprising the step of configuring the secondary transaction number for use with an electronic line of credit system.

27. The method of claim 1 , further comprising the step of configuring the secondary transaction number for use with a stored value card system.

28. The method of claim 1 , further comprising the step of configuring the secondary transaction number for use with a non-currency based account program.

29. The method of claim 1 , further comprising the step of configuring the secondary transaction number to be used as a gift product.

30. The method of claim 1 , further comprising the step of configuring the secondary transaction number to be used in an online wallet system.

31 A method of processing authorization and settlement requests in a transaction system comprising the steps of: receiving an authorization request from a second party, where the authorization request involves a secondary transaction number with limited-use conditions associated therewith; routing the authorization request to a card authorization system to determine if limited use conditions have been satisfied; returning to the second party a message declining authorization if the conditions have not been satisfied; and returning to the second party a message approving authorization request if conditions have been satisfied.

32. The method of claim 31 , further comprising the step of receiving from the second party a settlement request for payment of a transaction involving a secondary transaction number; wherein the second party is paid if the secondary transaction number is valid.

33. A method of claim 32 further comprising the steps of: routing the second party settlement request for payment to a financial capture system, creating an accounts payable file and routing the accounts payable file to an accounts payable system for payment processing; and creating an accounts receivable file and routing the accounts receivable file to a service that retrieves the associated primary account number and replaces the secondary transaction number with the primary account number and forwards the resulting accounts receivable file to an accounts receivable system to generate the first party billing statement.

34 A host computer system for facilitating transactions comprising: a user interface system configured to allow a first party to interact with a host computer's transaction services; and a number generating and processing mechanism, including at least one application server and at least one database, configured for receiving input from the user interface system to generate a secondary transaction number and to associate therewith a designated primary account.

35. The host computer system in claim 34, further comprising a card authorization processing mechanism configured to receive transaction information from a second party, wherein the authorization mechanism interfaces with at least the number generating and processing mechanism to determine if the second party authorization request should be approved or denied.

36. The host computer system in claim 34 or 35, further comprising a settlement processing mechanism including at least a financial capture system configured for capturing transaction information relating to use of secondary transaction numbers, an accounts receivable system for billing the first party and an accounts payable system for paying the second party.

37. The system of claim 34, wherein the user interface system comprises at least one of the following: web server system, telephone system, and mail handling system.

38. A method for facilitating a transaction comprising the steps of: registering with a card provider to use a transaction system; logging in to the card provider's transaction system by providing authenticating information, and causing card provider to verify that a first party is a registered and authorized user; designating at least one transaction account as at least one primary account; requesting a secondary transaction number from the card provider, causing the card provider to generate a secondary transaction number and to associate the secondary transaction number with the previously selected said at least one primary account; and, receiving the secondary transaction number from the card provider.

39. The method of claim 38, further comprising the step of providing the secondary transaction number to a second party to facilitate a transaction.

40. The method of claim 38, further comprising the step of selecting conditions of use parameters to be associated with the secondary transaction number.

41. The method of claim 38, further comprising the step of defining conditions of use parameters to be associated with the secondary transaction number.

42. The method of claim 38, wherein the steps occur online.

43. The method of claim 38, wherein said at least one primary account is a non- currency based account.

44. The method of claim 38, wherein said at least one primary account is associated with an electronic line of credit system.

45. The method of claim 39, further comprising the step of disputing a charge for a transaction involving a secondary transaction number, and causing the card provider to charge back the charge to the second party.

46. A method for facilitating a non-currency based transaction system involving a secondary transaction number comprising the steps of: designating a non-currency based account as at least one primary account; generating a secondary transaction number and associating said secondary transaction number with at least one primary account, wherein said at least one primary account includes at least the designated non-currency based account; converting accumulated non-currency based tender into currency to fund the primary account.

47. The method of claim 46 further comprising the step of designating condition of use parameters and associating said parameters to the secondary transaction number.

48. The method of claim 47 further comprising the step of processing an authorization request from a second party relating to a transaction involving a secondary transaction number associated with at least a non-currency based account comprising the further steps of: recognizing the transaction as involving a non-currency based account; verifying the conditions of use have been satisfied; and if satisfied, reducing the non-currency based account balance by the transaction amount.

49. The method of claim 47 further comprising the step of processing a transaction settlement request from a second party relating to a transaction involving a secondary transaction number associated with at least a non-currency based account further comprising the steps of: capturing transaction settlement information in a financial capture system, wherein an accounts payable file is created and the second party is paid; forwarding the transaction settlement information to an accounts receivable system; recognizing that the transaction settlement information comprises a secondary transaction number that is associated with at least a non-currency based account; issuing a credit equal to the transaction charge amount from the non-currency based account to the accounts receivable system; wherein the credit from the non- currency based account offsets at least part of the transaction charge.

50. A method for facilitating an electronic line of credit system involving a secondary transaction number comprising the following steps: issuing a line of credit to a participating first or second party; causing to be processed an application from the first party requesting to be issued a secondary transaction number; causing to be issued to the first party a secondary transaction number that is associated with the line of credit; wherein the secondary number is used to facilitate a transaction.

51. The method of claim 50 further comprising the steps of: providing the secondary transaction number to a first party, wherein the secondary transaction number may only be used with a specified second party to facilitate a transaction.

52. A dispute handling method for facilitating a disputed transaction involving a secondary transaction number, comprising the steps of: receiving a dispute from a first party relating to a transaction involving a secondary transaction number associated with at least one primary account; retrieving transaction information from a database; replacing the primary account number with the secondary transaction number in order to initiate a second party inquiry; wherein the second party inquiry references only the secondary transaction number.

53. The method of claim 52, further comprising the steps of: determining if a valid approval code is associated with the secondary transaction number; and charging back to the second party the amount of the transaction, if a valid approval code does not exist.

54. A method for facilitating a transaction, comprising the steps of: receiving a primary account number from a first party to initiate a transaction, sending the primary account number to a card provider, requesting that the card provider generate and return a secondary transaction number that is associated with the primary account number; receiving from the card provider the secondary transaction number associated with the primary account, wherein the secondary number is then used to facilitate a transaction settlement.

55. A method of claim 54, wherein the step of sending the primary account number to a card provider occurs during a card authorization process.

56. A method of claim 54, further comprising the step of purging the primary account number from the second party's records and replacing with the associated secondary transaction number.

Description

SYSTEM FOR FACILITATING A TRANSACTION

FIELD OF THE INVENTION

The present invention generally relates to a system for facilitating transactions utilizing a secondary transaction number that is associated with a primary transaction card. More particularly, the system allows a cardholder to pay a merchant with a private, limited-use, transaction number without the need to disclose to the merchant or others the cardholder's primary charge card number. Moreover, the present invention provides registration, number generation and association, authorization, settlement and customer service processes that achieve an improved secure and private transaction system.

BACKGROUND OF THE INVENTION

The proliferation of the internet has resulted in a thriving electronic commerce industry, where more and more products and services are available to consumers in a variety of non-traditional ways, e.g., internet, telephone sales, wireless, interactive TV, etc. For example, in traditional online consumer-merchant transactions, consumers typically provide merchants with transaction numbers (e.g, charge card numbers) from their existing debit, phone, credit or other transaction/service cards (e.g., American Express®, VISA®, MasterCard® and Discover Card®, AT&T®, MCI®, etc.). Transmission of transaction numbers via these traditional means has created increased opportunities for fraud. Namely, it is possible for these numbers to be intercepted during transmission, after transmission, while being stored electronically or at the merchant's online or offline location. In light of the increase in charge card fraud involving situations where the physical charge card is not actually presented to the merchant, consumers are becoming increasingly cautious and leery of giving out their actual charge card number to merchants (or other unknown third parties asserting to be merchants).

In traditional online purchases, a consumer often browses the internet for items to purchase. When the consumer finds an item that he or she is interested in purchasing, the consumer typically selects an item to add to a virtual shopping cart.

When the consumer has finished shopping, and desires to purchase an item, the consumer usually proceeds to a virtual checkout, where the consumer is prompted for payment and delivery information. The consumer then typically is required to enter the appropriate delivery and credit card information, where the the consumer reads the credit card number directly from the consumer's physical credit card. This information is then transmitted electronically to the merchant via a public internet network. Although the transmission is often encrypted, there exists the possibility that the number will be intercepted en route to the merchant. More likely, however, is that the number will be fraudulently used by an unscrupulous third party, such as a dishonest employee of the merchant.

In addition to the previous example, various other means of credit card skimming are common in the industry. In an attempt to minimize these and similar problems relating to credit card fraud, banks and other credit card institutions have begun to explore various ways to provide customers with temporary transaction numbers to facilitate online transactions, where the actual credit card is not disclosed to the merchant or any other third party. For example, U.S. Patent No. 5,883,810 issued to Franklin, et al, which is hereby incorporated by reference, discloses a system to facilitate online commerce where a customer is able to register and sign-up for an "online commerce card." This online commerce card does not exist in physical form, but instead exists in a digital form that can be electronically configured for online commerce. The issuing bank issues the digital card to the customer in the form of a signed digital certificate binding the customer to the bank and provides the customer a software module that can be invoked when using the commerce card to conduct an online transaction. This online commerce card is assigned a permanent customer account number that resides with the issuing bank and is not given to the customer. In Franklin, when a customer desires to make an online purchase, the customer requests from the bank a transaction number that is good for a single transaction and with a limited life. This single transaction number is provided to a merchant to complete a purchase and is then processed by the merchant for authorization and settlement, with the issuing bank substituting and re-substituting the single transaction number and the customer account number as necessary in order to insure that the actual account number is not released to any third party.

Although the single use transaction number disclosed by Franklin provided some improvement over the traditional online transaction methods, several problems remained. For example, Franklin's system, which requires the generation of a digitally keyed online commerce card that does not exist in the physical form, requires customers to register and use an assigned digital certificate. Furthermore, this system requires the customer to download modules to facilitate the registration and transaction processes. Although Franklin notes that the commerce card is configured to be used by the customer in one or more areas of commerce in which the customer typically employs a charge card, Franklin fails to disclose how a consumer's existing plastic credit card number could be used to facilitate transactions. Specifically, Franklin requires instead, for the cardholder to sign-up and register in advance for an online commerce card that is not the cardholder's existing physical credit card, but is a non- physical digital card. Furthermore, the Franklin single transaction number will not work for multiple payment arrangements, i.e., where there is one purchase but multiple payment components.

Additional publications also disclose efforts to make transactions more secure, such as, for example, PCT Application, WO 99\49424, published on September 30, 1999, and PCT Application WO 99\49586, published on August 24, 2000 (collectively "Orbis"), hereby incorporated by reference, which attempt to expand and improve on the use of temporary transaction numbers. Specifically, Orbis discloses the use of a limited use credit card number that is associated with a master credit card (e.g., a physical credit card). Orbis discloses using this limited use credit card number for transactions with merchants so that the physical credit card is not disclosed to the merchant or other third parties. In Orbis, for example, the bank or credit card provider issues the cardholder a non-activated limited use credit card number that is associated with the cardholder's master credit card. In an online transaction, the cardholder activates the limited use credit card and provides that number to the merchant to complete a transaction. On presentment to the card provider for authorization, the card provider verifies, inter alia, that the conditions of use have been met. If the conditions have been met, the card provider provides the merchant with an approval code that will accompany the payment request during settlement. If, however, during the authorization process, it is determined that certain conditions of use have not been met, the card provider de-activates the limited-use card. With the limited-use credit card de-activated, the merchant will not be paid and the transaction is not able to proceed through settlement. Conversely, if the limited use number is not submitted at all for authorization, and the merchant chooses to process this transaction for settlement, settlement may later occur and the merchant may be paid, with the incumbent risk to the merchant, however, that charge-back is likely if the charge is later disputed by the cardholder.

In prior art systems, if a transaction involving a temporary number is not authorized for failing to meet certain limited-use conditions, the number is deactivated and will not be processed through settlement. In real world environments, this creates certain problems. For instance, many online or telephonic purchases are multiple payment purchases, where one product may be purchased but multiple periodic payments are used to complete the transaction. Although the consumer is usually provided with the product up front, there may be occasions where the product is not delivered until all payments have been completed. The prior art systems occasionally create situations where the temporary transaction number is deactivated at some point in the multiple payment process where the merchant is not fully paid, possibly resulting in the product not being delivered to the consumer. As previously noted, prior art systems typically use the authorization process to determine whether limited-use conditions are satisfied. The resultant comparison utilized in the authorization process is then used to update a conditions database. However, the consumer rarely knows exactly how many authorization requests will be submitted by the merchant. For example, a consumer may purchase an item online for $1000, agreeing to apply ten monthly $100 payments to complete the purchase. Initially, one employing a prior art system may think to apply a number of different limited use conditions to facilitate this transaction, e.g., one transaction for $1000, ten transactions for $100, or any combination. Additionally, different merchants may handle authorization requests in a number of different ways. A merchant may send to the card provider (i) only one authorization request for $1000; (ii) one authorization request for $1000, followed by subsequent authorization requests for each $100 payment; (iii) one authorization request for each $100 payment, or (iv) only a few periodic authorization requests. It is also common in the industry for merchants to submit pre-authorization requests followed by a subsequent request for authorization. In sum, it can be difficult for the consumer to guess exactly what method will be employed by the merchant to facilitate the authorization process.

As such, the prior art systems create situations where a temporary transaction number may be inadvertently deactivated prior to completion of the periodic payments. If, for example, the consumer only authorized one transaction, the card would be deactivated where the merchant submits one pre-authorization request, followed by a second authorization request prior to the first payment.

SUMMARY OF THE INVENTION

The present invention facilitates transactions between a first party (referred to herein as "cardholder") and a second party (referred to herein as "merchant") by providing the cardholder with a secondary transaction number that is associated with a cardholder's primary account, (e.g., charge card), wherein the cardholder presents or transmits the transaction number - not the primary charge card number - to the merchant to initiate a transaction. More particularly, the system involves the process of

registering a cardholder (if not already pre-registered) to participate in a transaction system; generating a secondary transaction number and issuing this number to the cardholder, where the cardholder presents this number to a merchant to complete a sales transaction; the merchant processing this secondary transaction number, similar to any other credit card number, where the number is typically presented to the credit card provider for authorization. Throughout this process, the cardholder's primary charge card number is never passed to the merchant or any other third party. Additionally, the secondary transaction number may also carry with it certain limitations-on-use conditions, where the transaction is not authorized unless these conditions are met. In generating a secondary transaction number, upon a cardholder's request, the card provider generates a random number and associates this number with the cardholder's primary charge card account. This instantaneous and immediate generation of a random number allows for the number to be used by the cardholder immediately upon receipt. This process obviates the need for separate activation of the secondary transaction number, and minimizes the possibility that a secondary transaction number, once issued, will not be utilized because the cardholder or card provider failed to "activate" it.

During the authorization phase of the transaction process, the card provider receives the merchant's authorization request and verifies that certain limitations-on- use conditions, if any, have been satisfied. If the conditions have been satisfied, the request is approved and the card provider sends the merchant an approval code. If conditions have not been met, the request is declined. Although the request is declined, in an exemplary embodiment, the secondary transaction number is not "deactivated," and, as a result, may still continue through the payment process.

An exemplary settlement process of the present invention involves receiving a request from a merchant to be paid for a particular transaction and paying the merchant. As noted above, even a secondary transaction number that has not been authorized or that has been denied authorization by the card provider, may proceed through settlement, with the incumbent risk to the merchant that the transaction (if not accompanied by a valid approval code) may later be charged back to the merchant if the transaction is ever disputed. During the settlement process, the accounts payable system pays the merchant, referencing only the secondary transaction number. However, prior to the accounts receivable processing, the secondary transaction number is replaced with the primary account for cardholder billing. The cardholder's statement may reflect, as desired, the secondary transaction number(s), the primary account number(s), all numbers or any combination of these numbers The dispute handling and customer service processes of an exemplary embodiment of this invention enable customer service representatives to retrieve information and initiate customer or merchant inquiries based on the primary account number, the secondary transaction number or other transaction specific information provided by either the cardholder or the merchant. Therefore, the cardholder may provide either the primary account number or the secondary transaction number to the customer service representative to initiate a dispute. With either number, the representative is able to look-up the associated account number and account information. The system provides seamless integration of the secondary transaction number and the primary account (i.e., charge card) number to ensure that the merchant only sees statements, reports, letters, or financial adjustments bearing the secondary transaction number - not the charge card number, while the cardholder need only reference the primary charge card account. Additionally, it is through the dispute handling process that the cardholder may dispute a transaction involving, inter alia, an unauthorized use of the secondary transaction number and it is during this process that the transaction amount is charged back to the merchant. Other situations involving a merchant charge-back may include duplicate billing; service or item not received; item returned; or wrong amount billed. Various embodiments of the present transaction system incorporate, and improve upon, existing or developing technologies, such as, for example, non-currency based programs and loyalty systems, electronic lines of credit, online banking, etc.

BRIEF DESCRIPTION OF THE DRAWINGS Additional aspects of the present invention will become evident upon reviewing the non-limiting embodiments described in the specification and the claims taken in conjunction with the accompanying figures, wherein like reference numerals denote like elements.

FIG. 1 is an overview of an exemplary system for facilitating a transaction. FIG. 2 is a flow diagram of exemplary processes of the present invention;

FIG. 3 is a web page screen shot of a card provider's exemplary splash page for a transaction system;

FIG. 4 is a web page screen shot of a card provider's exemplary online registration page for a transaction system; FIG. 5 is a web page screen shot of a card provider's exemplary online log-in page for a transaction system;

FIG. 6 is a web page screen shot of a card provider's exemplary online dropdown menu used to select a primary charge card in the foreground and an online merchant's payment web page in the background; FIG. 7 is a web page screen shot, displaying in the foreground, an exemplary secondary transaction number (e.g., Private Payments™ number) returned to the user; and in the background, a merchant's payment web page;

FIG. 8 is a block diagram of exemplary components of the present invention; FIG. 9 is a block diagram of an example of some of the exemplary data structure of the STN database of the present invention;

FIG. 10 is a flow chart of an exemplary secondary transaction number generation process of the present invention;

FIG. 11 is a flow diagram of an exemplary transaction authorization phase of the present invention; FIG. 12 is an screen shot of an exemplary transaction history report of the present invention;

FIG. 13 is a flow diagram depicting an exemplary embodiment of the present invention involving an electronic line of credit system; FIG. 14 is a flow diagram depicting one embodiment of an exemplary transaction system of the present invention used to facilitate a non-currency based membership rewards program;

FIG. 15 is a flow diagram depicting a second embodiment of an exemplary transaction system of the present invention used to facilitate a membership rewards program.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

As background, the various prior art methods for implementing transactional systems utilizing temporary numbers have failed to satisfy certain consumer demands for more secure and confident transactions. Specifically, the prior art systems have typically required, inter alia, (i) additional software to provide registration and transaction processes, (ii) the generation of a separate digital certificate embodying a non-physical online commerce card, (iii) separate activation of the temporary transaction number; or (vi) a deactivation of the temporary number if predefined conditions are not met. In short, previous transaction systems have not sufficiently adapted to real world demands for a more secure and confident transaction system that is readily compatible with existing banking and electronic commerce systems.

The present invention includes a unique system for facilitating transactions that is easily and readily adaptable to existing commercial transaction processing systems. While the system may contemplate upgrades or reconfigurations of existing processing systems, changes to cardholder or merchant systems are not necessarily required by the present invention. For example, the present system may contemplate, but does not require downloading of software modules; a digitally-based, non-physical commerce card; activation or deactivation of the secondary transaction number; and certain embodiments do not require the existing online customer to separately register for the service. Moreover, the transaction system herein described can be seamlessly integrated into current electronic commerce processes with minimal to no changes to existing systems used by cardholders or merchants. The transaction system of the present invention may be described herein in terms of functional block components, flow charts, screen shots, optional selections and various processing steps. It should be appreciated that such functional blocks may be realized by any number of hardware and/or software components configured to perform the specified functions. For example, the present invention may employ various integrated circuit components, e.g., memory elements, processing elements, logic elements, look-up tables, and the like, which may carry out a variety of functions under the control of one or more microprocessors or other control devices. Similarly, the software elements of the present invention may be implemented with any

programming or scripting language such as C, C++, Java, COBOL, assembler, PERL, or the like, with the various algorithms being implemented with any combination of data structures, objects, processes, routines or other programming elements. Further, it should be noted that the present invention may employ any number of conventional techniques for data transmission, signaling, data processing, network control, and the like. For a basic introduction of cryptography, please review a text written by Bruce Schneider which is entitled "Applied Cryptography: Protocols, Algorithms, And Source Code In C," published by John Wiley & Sons (second edition, 1996), which is hereby incorporated by reference.

It should be appreciated that the particular implementations shown and described herein are illustrative of the invention and its best mode and are not intended to otherwise limit the scope of the present invention in any way. Indeed, for the sake of brevity, conventional data networking, application development and other functional aspects of the systems (and components of the individual operating components of the systems) 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 couplings between the various elements. It should be noted that many alternative or additional functional relationships or physical connections may be present in a practical electronic transaction system. It will be appreciated, that many applications of the present invention could be formulated. One skilled in the art will appreciate that a network may include any system for exchanging data or transacting business, such as the Internet, an intranet, an extranet, WAN, LAN, satellite or wireless communications, and/or the like. The cardholder may interact with the card provider's transaction system or a merchant via any input device such as a telephone, keyboard, mouse, kiosk, personal digital assistant, touch screen, voice recognition device, transponder, biometrics device, handheld computer (e.g., Palm Pilot®), cellular phone, web TV, web phone, blue tooth/beaming device and/or the like. Similarly, the invention could be used in conjunction with any type of personal computer, network computer, workstation, minicomputer, mainframe, or the like running any operating system such as any version of Windows, Windows NT, Windows2000, Windows 98, Windows 95, MacOS, OS/2, BeOS, Linux, UNIX, or the like. Moreover, although the invention uses protocols such as TCP/IP to facilitate network communications, it will be readily understood that the invention could also be implemented using IPX, Appletalk, IP-6, NetBIOS, OSI or any number of existing or future protocols. Moreover, the system contemplates the use, sale, exchange, transfer, or any other distribution of any goods, services or information over any network having similar functionality described herein.

As will be appreciated by one of ordinary skill in the art, the present invention may be embodied as a method, a data processing system, a device for data processing, and/or a computer program product. Accordingly, the present invention may take the form of an entirely software embodiment, an entirely hardware embodiment, or an embodiment combining aspects of both software and hardware. Furthermore, the present invention may take the form of a computer program product on a computer-readable storage medium having computer-readable program code means embodied in the storage medium. Any suitable computer-readable storage medium may be utilized, including hard disks, CD-ROM, optical storage devices, magnetic storage devices, flash card memory and/or the like.

Communication between the parties (e.g., cardholder, card provider, and/or merchant) to the transaction and the system of the present invention may be accomplished through any suitable communication means, such as, for example, a telephone network, intranet, Internet, point of interaction device (point of sale device, personal digital assistant, cellular phone, kiosk, etc.), online communications, off-line communications, wireless communications, and/or the like. One skilled in the art will also appreciate that, for security reasons, any databases, systems, or components of the present invention may consist of any combination of databases or components at a single location or at multiple locations, wherein each database or system includes any of various suitable security features, such as firewalls, access codes, encryption, de- encryption, compression, decompression, and/or the like. The present invention is described below with reference to block diagrams and flowchart illustrations of methods, apparatus (e.g., systems), and computer program products according to various aspects of the invention. It will be understood that each functional block of the block diagrams and the flowchart illustrations, and combinations of functional blocks in the block diagrams and flowchart illustrations, respectively, can be implemented by computer program instructions. These computer program instructions may be loaded onto a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions which execute on the computer or other programmable data processing apparatus create means for implementing the functions specified in the flowchart block or blocks.

These computer program instructions may also be stored in a computer- readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means which implement the function specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer-implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart block or blocks.

Accordingly, functional blocks of the block diagrams and flowchart illustrations support combinations of means for performing the specified functions, combinations of steps for performing the specified functions, and program instruction means for performing the specified functions. It will also be understood that each functional block of the block diagrams and flowchart illustrations, and combinations of functional blocks in the block diagrams and flowchart illustrations, can be implemented by either special purpose hardware-based computer systems which perform the specified functions or steps, or suitable combinations of special purpose hardware and computer instructions.

Referencing the computer networked aspect of a preferred embodiment of this invention, each participant is equipped with a computing system to facilitate online commerce transactions. The computing units may be connected with each other via a data communication network. The network is a public network and assumed to be insecure and open to eavesdroppers. In the illustrated implementation, the network is embodied as the Internet. In this context, the computers may or may not be connected to the Internet at all times. For instance, the cardholder computer may employ a modem to occasionally connect to the Internet, whereas the card provider computing center might maintain a permanent connection to the Internet. It is noted that the network may be implemented as other types of networks, such as an interactive television (ITV) network.

The merchant computer and the card provider computer may be interconnected via a second network, referred to as a payment network. The payment network represents existing proprietary networks that presently accommodate transactions for credit cards, debit cards, and other types of financial/banking cards. The payment network is a closed network that is assumed to be secure from eavesdroppers. Examples of the payment network include the American Express®, VisaNet® and the Veri phone® network.

As depicted in FIG. 1 , the present invention generally relates to a transaction system where a first party to a transaction ("cardholder 1") provides to a second party to a transaction ("merchant 2") a secondary transaction number (STN) 15 that was generated by an issuer ("card provider 3"). In a preferred embodiment, although not required, the STN 15 is immediately usable by the cardholder 1 without need for activation and may have associated therewith cardholder 1, card provider 3, or merchant 2 defined conditions or parameters of use restrictions which limit use of the STN 15. A "transaction," as defined herein, includes, inter alia, any exchange or delivery of value, exchange or delivery of data, gifting of value or data, etc. The term "transaction" not only contemplates an exchange of goods or services for value from one party to another, but also the gifting of something from one party to another. Additionally, transaction or charge card numbers are account numbers that are used to facilitate any type of transaction.

While an exemplary embodiment of the invention is described in association with a transaction system, the invention contemplates any type of networks or transaction systems, including, for example, unsecure networks, public networks, wireless networks, closed networks, open networks, intranets, extranets, and/or the like.

The first party to the transaction (referred to herein as a "cardholder 1") is any individual, business or other entity who uses a STN 15 to facilitate any transaction. In a preferred embodiment, the cardholder 1 establishes a new or has an existing relationship or association with a card provider 3. For example, in one embodiment, a

cardholder 1 may be an American Express® card member. In another embodiment, a cardholder 1 may be a participant in a frequent flyer rewards program. In a further embodiment, the cardholder 1 is a member of any suitable organization that provides transaction products or services. Another embodiment contemplates the cardholder gifting a secondary transaction number to a second party. The term cardholder 1 may also be referred to herein as "consumer," "card member," "user," "customer" or the like. The second party to the transaction (referred to herein as a "merchant 2") is any individual, business, or other entity who receives a secondary transaction number, whether or not in exchange for goods or services. For example, in one embodiment, a merchant 2 may be an online bookstore such as Amazon.com®. In another embodiment, a merchant 2 may be a local plumber. In yet another embodiment, a merchant 2 may be a local hardware store. In some instances, the cardholder 1 and the merchant 2 may be the same. In other situations, the merchant 2 and the card provider 3 are the same. Although referred to herein as a "merchant," this term contemplates situations where any second party receives a secondary transaction number from the first party: such as, for example, where a cardholder 1 gifts a secondary transaction number to another individual (i.e., second party merchant).

The issuer ("card provider 3") includes any provider of products and/or services that facilitates any type of transaction. As contemplated by an exemplary embodiment of the present invention, the card provider 3 establishes and maintains account and/or transaction information for the cardholder 1. The card provider 3 may issue products to the cardholder 1 and may also provide both the cardholder 1 and the merchant 2 with the processes to facilitate the transaction system of the present invention. The card provider 3 includes banks; credit unions; credit, debit or other transaction-related companies, telephone companies; or any other type of card or account issuing institutions, such as card-sponsoring companies, incentive rewards companies, or third party providers under contract with financial institutions. Unless otherwise specifically set forth herein, although referred to as "card provider," this term should be understood to mean any entity issuing any type of account to facilitate any transaction, exchange or service; and should not be limited to companies possessing or issuing physical cards. In an exemplary system, the card provider 3 may be any transaction facilitating company such as a charge card provider like American Express®, VISA®, Mastercard®, Discover®, etc. In another embodiment, the card provider 3 could be any membership organization or union. In some instances, the card provider 3 and the merchant 2 may be the same, for example, where the STN 15 is issued by the same entity that provides the product or service. A STN 15 phone card issued by a telephone company, where the STN 15 phone card is tied to a primary telephone account is one such occasion.

An exemplary STN 15 is any transaction number, code, symbol, indicia, etc. that is associated with another number or account that has been designated by the cardholder 1 or the card provider 3 as a primary charge card (PCC 20), i.e., primary account number. In an exemplary embodiment, the STN 15 is a purchasing number that acts as a charge card number and is associated with a PCC 20 account (e.g., a main charge card, credit, debit card or other account number, such as a bank or brokerage account, reward program account, etc.). In an exemplary embodiment, a PCC 20 account is not identified by a STN 15. In certain embodiments, the PCC 20 account may have some identifying elements related to the STN 15. The PCC 20 is defined herein to include any type of transaction card that references any account, membership, affiliation or association. When more than one cardholder 1 account exists, the PCC 20 is the account that has been designated by the cardholder 1 or the card provider 3 as the primary account. Alternatively, there may be a hierarchy of accounts where the STN 15 is associated with one or more PCCs 20 in a designated order. Additionally, as depicted in at least one embodiment described herein, a STN 15 may be associated with two or more accounts. For example, a STN 15 could be associated with a non-currency based account and also a PCC 20 account. As shown in FIG. 1 , in a preferred embodiment, the STN 15 and the PCC 20 have the same format, although additional embodiments may provide for account numbers with varying formats. In an exemplary embodiment involving credit, debit or other banking cards, the STN 15 has the same industry standard format that is used for the regular banking cards (e.g., 15 or 16 digit numbers). Preferably, the numbers are formatted such that one is unable to tell the difference between a STN 15 and a regular physical charge card. Alternatively, however, the card provider/product identifier (e.g., BIN range, first 6 digits, etc.) numbers may be different so as to differentiate the STNs from regular charge card numbers. In referencing the STN 15 and the PCC 20 number, it should be appreciated that the number may be, for example, a sixteen-digit credit card number, although each card provider has its own numbering system, such as the fifteen-digit numbering system used by American Express. Each company's card numbers comply with that company's standardized format such that a company using a sixteen-digit format will generally use four spaced sets of numbers, as represented by the number "0000 0000 0000 0000." The first five to seven digits are reserved for processing purposes and identify the issuing bank, card type etc. In this example, the last sixteenth digit is used as a sum check for the sixteen-digit number. The intermediary eight-to-ten digits are used to uniquely identify the cardholder 1. The invention contemplates the use of other numbers, indicia, codes or other security steps in addition to the use of the STN 15, but in an exemplary embodiment, only the STN 15 is provided to the merchant 2.

In a preferred embodiment, the STN 15 is randomly and instantaneously generated by the card provider 3, usually upon a cardholder's request, and can be distributed to the cardholder 1 by a variety of methods (online, telephone, wireless, email, regular mail, etc.) all of which should be secure and dependent upon verification of the cardholder's identity. Unlike the temporary transaction numbers disclosed in the prior art previously discussed, in a preferred embodiment, although not required, the STN 15 is immediately active (and usable) once it is associated with the cardholder's designated PCC 20 and provided to the cardholder 1. This feature minimizes the possibility that a merchant 2 will obtain a transaction number that will be worthless because it was not properly activated by the cardholder 1. While the present invention may contemplate a previously allocated pool of numbers that needs to be activated, an exemplary embodiment of the present invention includes STNs 15 that are instantaneously and randomly generated, and are usable upon receipt by the cardholder 1 without the need for separate activation.

In another preferred embodiment, the STN 15 may have limited-use (or conditions-of-use) parameters placed upon it by either the cardholder 1 , merchant 2, or the card provider 3 in order for the numbers to be restricted for particular uses. Alternatively, the cardholder 1 is able to choose system default parameters of use. Parameters may include, for example: (i) use of the STN 15 is good for a predetermined number of transactions; (ii) cardholder-determined expiration dates (i.e., STN 15 will be generated with expiration dates that are associated but unrelated to the expiration date of the cardholder's PCC 20 number, other than that it cannot exceed the expiration date of the PCC 20 account); (iii) limiting use of the STN 15 to a specified dollar amount, dollar amount per transaction, total dollar amount for pre- designated number of transactions, maximum dollar amount per month, etc.; (iv) use of the STN 15 for a specified merchant only; (v) restricting use to a specified user, other than primary cardholder (e.g., child, spouse, gift recipient, etc.); or (vi) any combination of these or similar features. for example, a number can be used at a specified merchant only for a pre-designated number of transactions and for a maximum dollar amount. In an exemplary online embodiment, a cardholder 1 may desire to require all online transactions (e g., purchases) be performed using only STNs, or alternatively, be performed only with specific merchants as defined. If the cardholder (or another individual) uses a physical charge card number for an online payment in violation of this condition, the card provider 3 would decline the authorization.

These parameters not only provide increased security, allowing a cardholder 1 to tailor the STN 15 to a particular use, but an ancillary benefit is the ability of a cardholder to select preferences to control spending for themselves or others who have registered eligibility to use the card (e.g., spouse, children, etc.). These preferences may include: Restrictions (cardholder 1 may choose to restrict use on certain sites or can pre-approve spending at particular sites); date range (cardholder 1 can select a period of time when transactions may occur); maximum budget amount (cardholder 1 can pre-set spending limits within certain periods of time or in certain categories (e.g. groceries, books, clothing)); credit and balance availability (cardholder 1 can check credit or demand deposit balance availability prior to transacting); non- currency based accounts, such as Reward Points as Currency (cardholder 1 can use reward points (e.g. Membership Rewards™, Blue Loot™) as currency to pay for purchases), and Gift Products (cardholder 1 can use a STN 15 to fund gift products to others for designated amounts).

As shown in FIG. 2, an exemplary embodiment of the present invention includes steps for: (i) registering a cardholder 1 to use the card provider's 3 transaction services (step 100); (ii) receiving from a cardholder 1 a request for a STN 15 (step 105); (Hi) generating a STN 15, associating the STN 15 with a PCC 20, applying limited-use conditions, if desired, and issuing the STN 15 to the cardholder 1 (step 110); (iv) processing a merchant's 2 authorization request involving the STN 15 to determine if use of the STN is authorized (step 115); (v) processing a settlement request, paying the merchant, and billing the cardholder 1 (step 120); and (vi) handling disputes and other customer service issues from the merchant or cardholder relating to use of the STN 15 (step 125)

FIG. 8 depicts an overview of the components of an exemplary transaction system. In general, the card provider's computer system utilizes front end 13 and backend 14 processing systems. The front end 13 system comprises, inter alia, a user interface system 4 (e.g., web server, IVR, etc), an application server 5, a STN database 6, and a card authorization system (CAS) 7. The application server 5 and STN database 6 may, at times, be referred to collectively as the STN transaction system (or service) 18. Referencing FIGS. 2 and 8, these front end 13 components facilitate (i) cardholder registration (step 100), (ii) request for a STN 15 (step 105), (iii) generation and issuance of the STN 15 (step 110), and (iv) the STN authorization process (step 115). The backend 14 system comprises, inter alia, a financial capture system 10, a back-end application service 8, an accounts payable system 9 and an accounts receivable system 11. Again referencing FIGS 2 and 8, the backend 14 components facilitate transaction settlement (step 120). In an exemplary system, the dispute handling and customer service processes (step 125) include, inter alia, in addition to the above mentioned systems, a system for identifying a PCC 20 from a STN 15, a letter generating system for sending dispute inquiries to cardholders 1 and merchants 2, and a system that accepts incoming communication from merchants 2 and converts the STN 15 received to the PCC 20 for the purpose of facilitating the dispute handling process. More specifically, as shown in FIG. 8, the card provider 3 user interface system 4 provides the cardholder 1 with access to the card provider's transaction services. It is through this interface that the cardholder 1 may register with the card provider 3, may request a STN 15, and, in response thereto, will receive from the card provider 3 a STN 15 that is associated with his PCC 20. The front end 13 system also utilizes at least one application server 5 that processes incoming information, applies the appropriate business rules/condition sets as necessary, and generates appropriate outgoing responses. The application server 5 is configured to support interaction with, inter alia, the user interface system 4 and a STN database 6. An exemplary STN database 6 is a relational database comprising various tables for managing and translating a variety of information, such as cardholder 1 profiles, charge card data, transaction data, merchant data, conditions/rules set profiles, etc. FIG. 9 illustrates two examples of exemplary tables within the STN database 6. STN table 166 may contain a variety of database fields 170 relating to the cardholder's STN account. These fields may contain, in addition to general STN 15 and PCC 20 account information, the business rule/condition set profiles associated with use of the STN 15. A STN Transaction Information Table 168 contains database fields 172 for storing information relating ,to a particular transaction. As a skilled programmer can appreciate, the processing mechanisms and data structure methods can be structured in a variety of ways. In short, the user interface system 4, application server 5, and the STN database 6 are suitably connected to facilitate the generation and issuance of a STN 15 and are further associated with a card authorization system (CAS) 7, in order to process from the merchant 2 an authorization request involving a STN 15.

When processing a merchant's request for settlement, i e., to be paid for a transaction, the financial capture (FINCAP) 10 system receives and captures the financial information (e.g., transaction amount, date, merchant identification (SE) number, STN 15, etc.). The back end application service 8 interfaces with the STN transaction system 18, as necessary, to determine if the number is a valid STN 15 (i.e., not a phony number). If the STN 15 is valid, the AP system 9 pays the merchant 2. The STN database 6 is updated to reflect the transaction information. The STN transaction system 18 (or alternatively the backend application service 8) substitutes the PCC 20 number for the STN 15 and forwards to the AR system 11 for billing.

Although the present system for facilitating transactions may exist within one card provider system, exemplary embodiments contemplate use with other third party authorization and settlement systems and networks. FIGS. 8 and 11, for example, depict third party authorization networks (FIG. 11 , 91 and 92) and settlement networks (FIG. 8, 93-95) that may be integrated to form parts and/or processes of the present invention.

Exemplary processes of the present invention are discussed in greater detail below.

Registration (FIG. 2, step 100)

Two exemplary screen shots relating to an exemplary registration process are shown at FIGS. 3 and 4. FIG. 3 depicts a splash page for an American Express® Private Payments℠ program. The Private Payments℠ program is an exemplary embodiment of the present invention. Here, a new user 23 may enroll to use the program or an existing user may access a number of program features 25, e.g., review account, request a new STN 15 number or download software. The cardholder 1 generally enters this site by entering an appropriate card provider URL into her browser, by clicking on a link provided by a merchant's website, or alternatively, by an automatic pop-up feature that may appear upon recognizing particular URL or HTML codes.

To enroll (or register), the cardholder 1 is linked to a registration page (FIG. 4) and prompted for information. Information may include the cardholders name 30, email address 31 , card account number 32 (e.g., PCC 20), last four digits of social security number 33, cardholder's date of birth 34, etc. Any suitable authenticating information will suffice. By selecting "continue," the cardholder 1 is provided with a username and password, or preferably, the cardholder is allowed to select her own username and password. The user interface system 4 processes this information and suitably interfaces with the STN transaction system 18 (FIG. 8) to register the cardholder. As one of skill in this art will appreciate, registration may take many forms and may be accomplished in a variety of ways. For example, a card provider 3 may choose to automatically enroll all new charge card applicants and return to the cardholder a username and password with the physical credit card. Although FIGS. 3 and 4 show an online registration process, it should be appreciated that this process may take place via any suitable user interface system.

In one embodiment, during the registration process, the cardholder 1 may choose to select or define various parameters, preferences, and programs to tailor the transaction system to the cardholder's particular needs. Additional embodiments allow the cardholder 1 to select or define parameters, preferences or programs at any point in the transaction process. In other words, the cardholder 1 has the flexibility to select parameters each time (e.g., during registration, log-in, upon STN request, etc.) a STN 15 is generated or may apply universal parameters to every STN 15 generated. With these selections, for example, the cardholder 1 may (i) designate a specific credit card to function as the primary charge card number; (ii) associate the transaction system with other programs such as a non-currency based membership rewards program, an online digital wallet, an online shopping gateway (e.g., American Express's "ShopAMEX"), an online gift check program (e g. E-Gift), preferred buyer's programs, etc.; (iii) provide password protected access to family members; (iv) activate a smartcard feature allowing remote random generation of secondary transaction numbers; (v) designate cell phone, email or pager numbers to utilize with the voice or automated response secondary transaction number generation feature; (vi) and other banking and transaction features that may be apparent to those skilled in the art. For more information on loyalty systems, transaction systems, electronic commerce systems and digital wallet systems, see, for example, the Shop AMEX™ system as disclosed in Serial No. 60/230,190 filed September 5, 2000; the MR as Currency™ System disclosed in Serial No. 60/200,492 filed April 28, 2000 and Serial No. 60/201 ,114 filed May 2, 2000; Wireless MR as disclosed in Serial No 60/192,197,296 filed on April 14, 2000; a digital wallet system disclosed in U.S. Serial No. 09/652,899 filed August 31 , 2000; a stored value card as disclosed in serial number 09/241 ,186 filed on February 1 , 1999, all of which are herein incorporated by reference. Log-in and Request for STN 15 (FIG 2, step 105):

A registered cardholder 1 generally accesses the card provider's transaction system by logging into the system via any suitable user interface system 4. FIG. 5 depicts an exemplary online log-in screen 130, where the cardholder 1 is prompted for authenticating information such as a username 132 and password 134. Alternative systems contemplate authentication via any suitable user interface system. For example, an embodiment employing a portable data device such as a smart card facilitates authentication by swiping the smart card through a smart card reader and providing the appropriate PIN. After entering the appropriate authenticating information and clicking the log in button 135, the information is routed through the user interface system 4 (e.g., web server) to the application server 5, where, as shown in FIG. 5, the application server 5 retrieves information relating to the cardholder's account from the STN database 6. If the cardholder 1 has registered multiple charge card accounts, in one embodiment 136, as depicted in FIG. 6, the program prompts the cardholder 1 to choose from a list of accounts from a pull-down menu 138. The cardholder 1 then selects at least one account to be the primary account or to be included in a primary group of accounts (when it is desired for the STN 15 to be associated with more than one account). In other embodiments, the user interface system 4 (e.g., web server) will return additional options for the cardholder 1 , such as prompting the cardholder 1 to choose from several condition fields such as those previously mentioned (e.g., restricting use to a particular merchant, amount, allowing use by other recipients, etc.). STN 15 generation and issuance (distribution) to Cardholder 1 (Step 110):

An exemplary online transaction process begins with a cardholder 1 desiring to purchase products or services from an online merchant's website. In this exemplary online system, the cardholder 1 selects products from a merchant's online website 2, is routed or clicks to the merchant's payment page 2a (FIG. 5). The cardholder 1 is hyperlinked (manually or automatically) to a card provider's web site to log in 130 (FIG. 5), which resides on and is managed by the card provider's user interface system 4 (e.g., web server), and, upon logging in, obtains a STN 15 that may then be "cut and pasted," "dragged and dropped" (or alternatively, automatically filled by the card provider 3 or downloaded from a digital wallet) into the payment fields 144, 146, 148 (FIG. 7) on the payment web page 2b (FIG. 7). In alternative embodiments, the system includes one or more of the following: the card provider 3 sends the STN 15 directly to the merchant 2, the STN 15 is encrypted or encoded, the cardholder 1 enters additional security numbers or other indicia or a biometric sample is required from the card provider 3. In an exemplary embodiment, the STN 15, as will be discussed next, is generated by the card provider's application server 5 and STN database 6.

After authenticating a cardholder 1 during the log-in process, and receiving a request for a STN 15, the process begins for generating a STN 15. The user interface system 4 prompts the initiation of the number generation process in the STN transaction system 18. In an exemplary random number generation process, the STN 15 is generated (preferably immediately) and provided to the cardholder 1 (preferably contemporaneous with the cardholder's request). As previously noted, this allows the number to be usable immediately upon receipt by the cardholder 1 without the need for separate activation (although separate activation features are contemplated by the present invention), while minimizing any increased risk of theft or fraud.

An exemplary random number generation process is depicted in FIG. 10. In this exemplary embodiment, each card provider 3 (FIG. 1) is generally identified by a range of numbers on the physical card, typically called the bank identification number (BIN). Each card possesses a product identifier (e.g., first 6 digits. BIN, etc) that is not part of the random number generation process, but in order to initiate the process, this number must first be selected (step 40). It may be preferable for a card provider 3 to set aside a set of product identification numbers relating to secondary transaction numbers for specific use with the transaction system. Alternatively, however, some card providers may find it desirable to use the same BIN number designation for both STNS 15 and regular charge card numbers so that one cannot distinguish between the two types of numbers. As depicted in FIG. 10, a random eight digit number is generated by the card provider's application server 5 using an algorithmic process (step 41). The application server 5 verifies that the randomly generated number is available (i.e., it is not in use nor has it been used within a certain period of time) (step 42). If the transaction number is free (i.e., not in use), a check digit and the selected product identification number is appended to the number (step 43). This newly created STN 15 is then associated with the cardholder's PCC 20 and is provided to the cardholder 1 (step 45), whereupon the STN database 6 is updated to reflect that this particular STN 15 is in use and associated with a PCC 20 account. If, during step 42, it is determined that the number is in use, the number generation process is repeated up to a preset number of times (e.g., 3) (step 44). After attempting and failing to generate a non-used random number for a preset number of times, a non-used random number is physically selected from the STN database 6 (step 46).

After the STN 15 is generated, conditions of use parameters are applied, and are associated with the PCC 20, the STN 15 is then distributed (i.e., issued) to a cardholder 1 for use in facilitating a transaction. Communication of the STN 15 may occur via a number of use interface systems 4. For example, FIG. 7 depicts an exemplary online interface where the STN 15 (Private Payment number) is returned to the cardholder 1. This embodiment shows how the card provider window 140 overlays a merchant's online payment page 2b. The cardholder 1 selects the appropriate charge card (e.g., American Express®) from the credit type filed 144. The cardholder 1 is then able to "cut and paste" or "drag and drop" the STN 15 (present in the STN field 142) into the credit card field 146 on the webpage 2b. Finally, the cardholder 1 chooses the appropriate expiration date 148 and completes the transaction by selecting the "purchase now" button 150. Although this embodiment describes linking to a card provider's web site to receive a STN 15, an additional embodiment configures the user interface 4 (e.g., web server) and STN transaction system 18 to seamlessly interact with the merchant's website to eliminate the need to separately link to the card provider 3. In this instance, the generation and issuance of the STN 15 would use the merchant 2 as a gateway to the card provider 3. Any number of interface systems 4 can be used to facilitate the processes described above (FIG. 2 steps 100, 105, 110).

For example, as just described, distribution of the STN 15 may occur via a "server to desktop" arrangement where a connection is established between the card provider's web-server 4 and the cardholder's 1 desktop computer, using SSL 3.0. With this exemplary system, the number is generated by the application server 5 (according to an algorithmic processing feature) utilizing a random number generation process such as that previously described and delivered to the web server 4. The number is then displayed on the cardholder's 1 desktop. While pre-registration is not required, in an exemplary embodiment, a cardholder 1 will have previously registered at the card provider's 3 online web site providing all required personal information, primary charge card account numbers, and establishing a cardholder ID and password (if not already established). The cardholder ID and password are then used for verification of cardholder 1 identity when logging into the card provider's web server 4.

Distribution of STNs 15 may also occur via a "server to IVR" arrangement, where a cardholder 1 calls the card provider 3 in order to obtain a STN 15. In this exemplary embodiment, a voice response menu enables the cardholder 1 to choose the transaction option, and allows the cardholder 1 to enter a main account number. Once identity is verified, a link to the application server 5 is established, prompting generation and delivery of a STN 15 over the phone. In this embodiment, the cardholder 1 provides authenticating information by providing date of birth (DOB), a PIN, etc. Once this verification number is matched to customer's records, the STN 15 is distributed. Of course, this process would also work with a live operator arrangement.

Additional distribution embodiments include a number of different delivery vehicles and/or portable data devices, such as use of wireless devices, smart chip encoded devices, personal digital assistants (PDAs), pagers, interactive TVs, etc. For example, a "server to wireless device" is used where a wireless phone with internet browser is able to access the card provider's transaction site via the card provider's online service web site. The STN 15 can be delivered via text or voice. Additionally, with the use of encryption keys, the wireless device can be used as payment vehicles (e.g., STN 15 is delivered from the cardholder 1 to merchant 2 or other customer with Blue Tooth or other beaming technology). Again, verification of identity can be accomplished by a variety of means, including cardholder ID and password, DOB, PIN number, SIM cards in phones, etc.

Another exemplary embodiment of the transaction system, utilizing one or more of the distribution arrangements above, includes situations where a Point of Sale terminal (POS) is not present (e.g., submitting a STN 15 to a merchant 2 such as, for example, a plumber at home). In this exemplary embodiment, the cardholder 1 may not have cash or may not want to provide her PCC 20 number to the vendor due to concerns about unauthorized re-use. As such, the cardholder 1 calls the card provider 3 seeking to obtain a STN 15 with either pre-defined conditions of use or cardholder determined conditions of use. A voice recognition system asks for a PCC 20 number, the amount she wants to authorize, a merchant ID (e.g., SE number), or any other conditions of use. The voice recognition system communicates with the application server 5 and, alternatively, also CAS 7, to generate the STN 15. The STN 15 is then transmitted to the cardholder 1 who in turn provides to the merchant 2. Additionally, the merchant 2 can also receive, if desired, an immediate call from the voice response unit to provide an approval code. One skilled in the art will appreciate that this system can be used in association with landline phones, cellular phones, pagers, handheld computers or any other PDA devices. Another exemplary embodiment of the present invention utilizes a smart card system or similar portable data device to generate and/or distribute a STN 15 to the card provider 1 or merchant 2. The smart card may facilitate the generation of a STN 15 in a number of different ways. In one embodiment, the smart card device itself generates the STN 15 from a self-contained processing chip. In another embodiment, the smart card interfaces with the card provider's user interface system 4 to cause the card provider 3 to generate a number. In another embodiment, the smart card supports interaction with a merchant's transaction processing system. "Smart card" is referred to herein to include any microchip enabled transaction card that is capable of being read by a smart card reader, and is also referred herein to generally refer to any portable data device that is capable of processing information. In an online embodiment, the cardholder 1 installs a smart card reader and associated software to be used with the cardholder's computer system that is capable of connecting to the internet. When desiring to make an online purchase, the cardholder 1 swipes or inserts his smart card through a card reader and enters an appropriate PIN. Once properly authenticated, the card provider transaction system generates and issues a STN 15 to the cardholder 1. In another embodiment, the merchant 2 may have a smart card reader capable of interfacing with the card holder's smart card. In this embodiment, the cardholder 1 swipes or

inserts the smart card through the merchant's reader, a PIN is entered and the STN 15 is displayed to the merchant 2. Additional information relating to smart card and smart card reader payment technology is disclosed in Serial No. 60/232,040, filed on September 12, 2000, and U.S. Patent Nos. 5,742,845; 5,898,838 and 5,905,908, owned by Datascape; which are hereby incorporated by reference. With an exemplary online smart card embodiment, the cardholder 1 interfaces with the card provider's user interface system 4 (e.g., website) and registers the smart card for use with the transaction system option. The cardholder 1 downloads a program and the program is stored on the cardholder's computer. A STN transaction icon (e.g., Private Payments℠ button) appears on the cardholder's browser or an icon appears on the display (e.g., Microsoft Windows® system tray). This button, driven by a card provider specific application (activator) that resides on the cardholder's computer, appears each time the cardholder 1 launches the browser (or alternatively the button appears at any predetermined intervals, cycles or URLs). The cardholder 1 suitably links to an online shopping site, orders a product or service or fills a shopping cart and goes to the payment page. The cardholder 1 clicks the STN payments button on the browser or the icon on the display (or the activator automatically launches the STN button) and a pop-up window appears, asking the cardholder 1 to enter the smart card into the smart card reader and, in a preferred embodiment, enter his PIN number. In an alternative embodiment, a PIN may not be necessary. In another embodiment, any other security data or functionality may be included. Upon entering this information, the STN 15 will be generated by the card provider's STN transaction system 18 (FIG. 8), or, in another embodiment (discussed below) will be generated directly from the smart card chip; and a pop-up screen containing the STN 15 number will be displayed on the computer. The cardholder 1 then "drags and drops" or "cuts and pastes" the randomly generated STN 15 and other transaction information (e.g., card type, expiration date) into the online order form and completes the transaction. In an alternative embodiment, the STN 15 and other transaction information are automatically filled into the web shopping page by the card provider's web server.

Another exemplary embodiment of the present invention integrates a smart card with an online merchant's website, which may or may not be utilized by the cardholder 1. For example, in one aspect of this embodiment the smart card cardholder goes to a merchant website and a "smartchip" payments checkout button appears on the credit card payments page. The card provider's transaction system will be invoked if the card holder 1 checks out via the smartchip payments button. In a preferred embodiment, the transaction system option is "behind the scenes." The cardholder 1 goes to an online shopping site, orders a product or service or fills a shopping cart and goes to checkout page. The cardholder 1 clicks the smartchip payments button on the browser and a pop-up window appears, asking the cardholder 1 to enter the smart card into the smart card reader and, optionally, enter his PIN number. Upon entering this information, the system logs the cardholder 1 into smartchip payments checkout process. The cardholder 1 will hit "check out" and the smartchip payments checkout process may auto-generate and auto-fill the STN 15 and transaction information into the appropriate payment field (an applet may be read off of the smartcard to transfer number to merchant site.) In this embodiment, the STN 15 will be auto-generated off the chip, where the smart card chip may use the Java or Multos operating systems and may use a random number generating algorithm. In one embodiment, the smart card chip is able to access the card provider's transaction system or, alternatively, contain a pool of possible numbers (in order to avoid generating the same number twice). The number is also need sent back to the STN transaction system 18 in order to match the PPC 20 number with the STN 15.

In another embodiment using a smart card, a secure electronic transaction (SET) protocol is used to avoid or minimize system/server contact. In this embodiment, the PCC 20 number is on the chip but is encoded. The SET protocol is preferably an encryption algorithm on the chip where part of the initial data would be the cardholder's PCC 20 number. The algorithm could be decoded by the card provider 3 but not by the merchant 2 to come up with the real account number. In one embodiment, the merchant 2 routes the authorization to the card provider via a BIN number rather than the PCC 20 number. When the transaction is sent from the merchant 2 to the card provider 3 for authorization, the CAS 7 preferably triggers the decode algorithm to complete the process, linking the STN 15 to the PCC 20 account.

Another embodiment contemplates the use of the STN 15 with a transponder system comprising a first means for generating or storing a signal that includes an encoded STN 15 and a second means for reading or receiving the signal. In an exemplary embodiment, a cardholder 1 waves a small transponder unit in front of the merchant's 2 receiving unit. The STN 15 information can be sent/received by a number of known methods (e.g. optical, magnetic, infrared, radio frequency, etc). The merchant 2 reader captures the STN 15 and forwards the STN 15 (with the associated transaction information) to the card provider's CAS 7 as previously described. The transponder units may be set up in a number of ways. Each transponder device may hold one STN 15 with certain predefined parameters or each transponder device may have several STNs 15. STN 15 Authorization Process (FIG. 2, step 115):

Referencing FIGS 1 and 11 , after the secondary transaction number (STN 15) is provided to the merchant 2, the merchant 2 submits an authorization request to the card provider 3, as it would with any other credit card transaction. This request is routed to a card authorization system (CAS) 7 for authorization (step 80). The CAS 7 recognizes the transaction as involving a STN 15 and forwards the transaction information to the Authorization Request Listener 77 program on the application server 5 (step 81). The Authorization Request Listener 77 passes the transaction information to a CAS Authentication Component 78 (step 82). The CAS Authentication Component 78 determines if use of the STN 15 has satisfied the previously defined conditions of use parameters. To determine this, the CAS Authentication component 78 looks to the STN database 6 for the conditions-of-use rules and the primary charge card number (PCC 20) that are associated with the particular STN 15 (step 83). If the use of the STN 15 complies with the rules of use, the CAS Authentication component 78 returns an authorization message and the associated PCC 20 to CAS 7 (step 84). CAS 7 then performs an authorization request for the PPC 20, as is typically done with any physical charge card, to ensure that the primary charge card conditions (e.g., credit limit, expiration date, etc.) have been met.

If CAS 7 authorizes use of the PCC 20, the transaction involving the STN 15 is approved and an approval code will be generated. However, the PCC 20 must first be replaced with the STN 15 and the STN database 6 must be updated to reflect this transaction data. This is accomplished by CAS 7 returning to the CAS Authentication component 78 an approval message with the transaction data (step 85) and CAS Authentication component 78 forwarding to a reversal processing engine 79 (step 86). The reversal processing engine 79 interfaces with the STN database 6 to re-substitute the STN 15 for the PCC 20 and also to update the STN database 6 to reflect the transaction information (step 87). For example, if the conditions of use parameters associated with the STN 15 authorized two transactions, this step 87 updates the cardholder account in the STN database 6 to reflect that only one transaction remains. The reversal engine 79 substitutes the PCC 20 with the STN 15 and forwards to CAS 7 (step 88) CAS 7 then provides the results to the merchant 2 (step 89). If the CAS Authentication Component 78 does not authorize use under the STN 15 conditions or if CAS 7 does not authorize use under the PCC 20 conditions, the transaction will not be approved. When the use conditions of both the primary charge card and the secondary transaction numbers are satisfied, the transaction is approved. In this preferred embodiment, however, the STN 15 is not deactivated to prevent settlement. To the contrary, settlement may proceed (as discussed next) even when an authorization was declined. Additionally, use of other third party networks and systems are contemplated by the present system. One exemplary system allows a card provider 3 to associate STNs to third party accounts, offering the same fraud reduction benefits to external card issuers. Here, in this exemplary system for authorizing STN, a merchant 2 submits an authorization request to a card provider 3. CAS 7, recognizing the STN 15 forwards the request to application server 5. The conditions of use are checked and the authorization request is modified to substitute the STN 15 with the associated primary account (PCC 20). In some cases a merchant identifier may be included in the authorization request. Therefore a translation may occur to substitute the card provider 3 merchant ID with the corresponding third party card issuer merchant ID. The request is then returned back to CAS 7 for a normal authorization. CAS 7 then recognizes the account as originating from another issuer (third party issuer 92), forwards the authorization request to a third party issuer's network for processing (step 84a). The network 91 routes the request to the appropriate third party issuer 92 for an authorization determination. The third party issuer 92 processes the authorization request and returns the result to CAS 7 for forwarding back to application server 5 (step 84b). Application server 5 saves the authorization result (approval or denial) and substitutes the PCC 20 with the STN 15 and returns to CAS 7 for forwarding to the merchant 2.

The authorization and settlement processes may occur as separate steps or as a single step. In one embodiment, referred to herein as an electronic data capture (EDC) system, the merchant 2 sends an authorization request and if the authorization request is approved, a receipt of charges is created and submitted for the merchant 2. Separate sequences of file transmissions or messages are therefore not required. Various embodiments, hybids, and modifications of these processes should be apparent to one skilled in this art.

STN 15 Transaction Settlement (FIG. 2, step 120):

Prior art systems typically deactivate a temporary transaction number during the authorization process if limited-use conditions are not met. As previously explained, because of the uncertainty and variability of the authorization processing, this often results in a transaction numbers being unintentionally deactivated, thereby bringing the transaction processing to a sudden halt. An exemplary embodiment of the present invention overcomes this problem by not 'deactivating' the secondary transaction number when predetermined conditions are not met. But instead, allowing the transaction to proceed through settlement, albeit without a valid approval code, where the merchant bears the risk that the amount will later be charged back by the card provider 3 if the transaction is disputed by the cardholder 1.

An exemplary settlement process of this invention involves the backend systems shown in FIG. 8. Specifically, referencing FIGS 1 and 8, the backend process utilizes a financial capture system (FINCAP) 10 to capture the settlement information (e g., receipt of charges "ROC" and summary of charges "SOC") from the merchant 2, a backend application service 8 to ensure that proper account information is processed, an accounts payable system 9 to pay the merchant 2, and an accounts receivable system 11 to process the account statement that is provided to the cardholder 1. An exemplary embodiment of the settlement process involves a settlement request being made by a merchant 2 for a transaction involving a STN 15. All settlement requests are forwarded to the card provider's back end system 14 for processing where the request is initially sent to FINCAP 10. FINCAP 10 captures the ROC and SOC data and identifies, via the card product identifier (or by any other suitable means), the transaction as involving a STN 15. In another embodiment, the product identifier (or BIN number) does not differentiate between a STN 15 and a regular charge card number. In that instance, it will be necessary for FINCAP 10 to call the backend application service 8 (which interfaces with the STN database 6) to identify the STN 15 from other charge numbers. After the STN 15 is distinguished from the ordinary physical charge cards, FINCAP 10 verifies that the number is valid (i.e , exists in the STN database 6). If the STN 15 is a valid number, FINCAP 10 creates a payment (accounts payable) file including the transaction data and sends a payment message to the AP system 9 instructing the merchant 2 to be paid. In paying the merchant 2, the card provider 3 references only the STN 15 and does not release the PCC 20 or any other regular charge card numbers.

The back-end system 14 processes the cardholder 1 STN account information as follows. After capturing the transaction information (ROC and SOC) from the merchant 2, FINCAP 10 creates a cardholder account (accounts receivable) file and sends a message to the back-end application service 8 to process the information for cardholder billing. Recognizing that the transaction involves a STN 15, the back-end application service 8 replaces the STN 15 with the PCC 20, updates the cardholder STN account information in the STN database 6 to reflect the appropriate transaction settlement information, and processes the transaction as with any other transaction. The backend application service 8 sends the transaction details to the AR system 11 , where the AR system 11 sends the proper statement to the cardholder 1 , typically referencing only the PCC 20 number. In another embodiment, the AR system 11 may process the statement where the transactions are further categorized and itemized by both the PCC 20 number and the STN 15. As previously noted, it may often be the case with prior art systems, that the temporary transaction number is inadvertently deactivated during the authorization phase and completion of the transaction is not possible, e.g., multiple payment purchases. The present transaction system overcomes this problem by ensuring that valid transaction numbers will be processed. If the conditions-of-use parameters are not met, the cardholder 1 is, under an exemplary embodiment of the present system, able to dispute the transaction and have the transaction charged back to the merchant 2 during the dispute handling process (discussed next). During this dispute handling phase, the card provider 3 will retrieve information from the STN database 6 to determine if the disputed information was "authorized", i.e., has an associated approval code. If the transaction was not "authorized" because the conditions of use parameters were not satisfied, the amount will be charged back to the merchant 2 according to predefined business rules.

Another embodiment provides for checking the approval codes and other conditions during settlement. Here, transaction information (approval code, SE number, or other information) may be checked during settlement. For example, the backend application service 8 (or the application server 5) may compare transaction information to a business rule or conditions set associated with a cardholder 1 STN account. If conditions of use have not been met or if a valid approval code is missing, the service 8 or server 5 may cause a charge back to be issued to the merchant to offset the previous merchant payment. In other words, in this alternative embodiment, where an STN 15 transaction is processed through settlement, the following events may occur in sequence. First, a payment file is established once it is determined that the STN 15 is a valid number. Second, the merchant is paid. Third, the system applies the business rules or conditions for the particular account associated with the STN 15.. Fourth, if it is determined that the merchant 2 should not have been paid in the first instance because the transaction conditions were not met or an approval code was not present, the system will execute a charge back to the merchant 2. This settlement processing may be transparent to the cardholder 1 since, before the AR system releases a cardholder billing statement, the merchant is paid and then charged-back resulting in no outstanding balance to the cardholder 1.

As shown in FIG. 8, the present invention contemplates the interaction of clearing and settlement systems other than those of the card provider 3. This exemplary system allows a card provider 3 to clear and settle STN transactions where an STN 15 is associated to a third party account, meaning that the merchant 2 is paid and the charge is billed to the cardholder 1. As such, an exemplary embodiment of the present invention is configured to support interaction with third party networks and systems. Here, the backend application service 8, upon receiving a STN 15, recognizes that the associated PCC 20 originated with another card issuer 92. The backend service 8 separates the transaction into two transactions (a clearing transaction and a settlement transaction). A substitution occurs in the clearing transaction where the STN 15 is replaced by the associated PCC 20. Also, a translation may occur to substitute the card provider 3 merchant ID with the corresponding third party card issuer ID. The transactions are then forwarded to a third party clearing and settlement network 93. The third party clearing and settlement network 93 handles the routing, as appropriate, to a merchant acquirer's accounts payable system 91 and an issuer's accounts receivable system 92. As noted above, the accounts payable system ensures that all correspondence with the merchant 2 references the STN 15. Dispute Handling and Customer Service Process (step 125):

The dispute handling process of the present invention involves situations where a cardholder 1 or merchant 2 disputes charge that is associated with a transaction involving a STN 15. Generally, a cardholder 1 disputes a charge by contacting the charge card provider 3 via phone, mail, or internet. As previously noted, an exemplary AR system 11 typically bills the cardholder 1 with reference to only the PCC 20 number. The computer systems of the present invention allow the card provider's customer service representatives to lookup information based on, inter alia, the STN 15 or the PCC 20 number. FIG. 12 depicts an exemplary look-up screen 175 for reviewing the primary charge card account 20 and the transactions associated with the STNs 15.

With respect to a cardholder initiated dispute, the representative initiates a dispute through a dispute handling system (DHS) to obtain the case avoidance or case set rules for cardholder disputed transactions. One of the case avoidance or case set rules provides for a look up from the STN database 6 to verify that the transaction was processed with an approval code. The rule set may provide for, inter alia, an automatic charge back of the transaction amount to the merchant if an STN 15 transaction is submitted without an approval code. The DHS or the representative initiates a cardholder 1 or merchant 2 contact (via phone, mail, internet). Disputes involving STNs 15 may be automatically routed to predefined STN queues based on industry type (i.e., airline, car rental, etc). Contact letters may be automatically filled with information retrieved from the STN database 6. The adjustment file accesses the application server 5 (or backend application service 8) to substitute the PCC 20 number with the STN 15. A letter file is then generated and an electronic transmission system routes electronic contacts to and from various merchant interfaces.

In an exemplary system for handling disputes from merchant 2, a merchant 2 contacts the card provider 3 via normal channels. The card provider's representative generally accesses a customer service application that is used to service merchants. This customer service application identifies the account by a STN 15 in dispute. A case is set-up with the STN 15 and is managed via adjustment management systems. The adjustment management system and a letter generating system access the STN transaction system 18 for the account number swap, where the PCC 20 number is replaced with the STN 15 for financial adjustments intended for the cardholder 1. The remaining inquiry is processed as with existing dispute handling systems.

Although the previously described embodiments generally relate to a cardholder's 1 request for a STN 15, the merchant 2 may also find it desirable to request secondary transaction numbers from the card provider 3 in order to limit exposure to credit card fraud. In traditional transaction processes, upon completing a transaction, the merchant 2 stores transaction information (including the customer's credit card number) in a merchant database. This database of information is subject to credit card fraud in that a thief could hack into the merchant's computers to steal its customer's credit card numbers. To limit exposure, the merchant 2 may desire to replace those customer credit card numbers with STNs 15 that are associated with the cardholder's primary credit card number (e.g., PCC 20), i.e., the merchant may not want its database filled with actual customer credit card numbers. In this situation, only the card provider 3 maintains the actual credit card number and the merchant 2 retains only the STN 15. In an exemplary process, the merchant 2 receives a regular credit card number from a cardholder 1 to facilitate a transaction. The merchant 2 submits the number to a card provider 3 for authorization, requesting that the card provider 3 instead of returning the regular credit card number, return a STN 15 (and approval code) that is associated with the regular credit card. In response, the card provider generates a STN 15, associates the number to the regular credit card number (which becomes the primary account (e.g., PCC 20)), checks to see if authorization is appropriate and returns the authorization record (only referencing the STN 15) to the merchant 2. The merchant 2 processes the transaction through the normal settlement channels, referencing the STN 15 instead of the regular credit card number. When retaining transaction records, the merchant 2 replaces the primary credit card number with the STN 15 and maintains the STN 15 in its database.

In another embodiment, the merchant 2 accepts only STNs 15 - not regular credit card numbers - from cardholders to complete transactions. For the same reasons stated above, the merchant 2 may desire to limit receipt of regular charge card numbers to limit exposure to credit card fraud. In one exemplary embodiment, the merchant 2 computer system differentiates between STNs and regular charge card numbers and will not allow customers to use regular charge card numbers to facilitate a transaction (i.e., will refuse the transaction). As previously described, however, the STN 15 and the regular charge card may be transparent to the merchant 2 making it difficult for the merchant 2 to differentiate between the STN 15 and the regular charge card. In this situation, in an exemplary embodiment, the STN 15 will be identified during the authorization process by the card provider 3, where if the STN 15 does not meet certain conditions defined by the merchant 2, the transaction will not be authorized. For example, the merchant could require that all customer transactions be completed with a STN 15 that has limited-use conditions restricting use to the amount of the transaction or restricting use to the particular merchant. During the authorization process, the STN 15 is compared with the merchant-defined conditions where if the conditions are not satisfied, the authorization request will be denied. After completion of the transaction, and upon satisfying the merchant 2 conditions, the STNs 15 have little to no value and would be of minimal value to a potential thief. Several additional embodiments of the transaction system are provided below. In one embodiment, the STN database 6 is used to facilitate the merging of a newly acquired cardholder base with an established cardholder base. For example, when a bank or other institution sells a cardholder base to a card provider 3, the card provider 3 creates new physical accounts for the acquired cardholders and does not issue new cards. The STN database 6 is updated to associate the acquired cardholder account numbers to the newly created accounts. This allows the cardholders' existing physical cards to still be used and processed appropriately. The card provider (BIN) routing is modified for the acquired accounts so authorization requests and settlements are sent to the card provider 3 instead of to the bank or other institution. CAS 7 and FINCAP 10 recognize these acquired accounts as STN 15 accounts and translate the numbers appropriately. The end result is that charges made by the acquired cardholders end up on a statement generated by the card provider 3. In another exemplary embodiment of the transaction system, a card provider 3 may provide a line of credit to a customer or to a merchant 2 or group of merchants who can private label for use by their customers. This allows the merchant 2 to provide a branded line of credit with minimal or no changes to the credit card authorization and settlement process. In one embodiment, the merchant 2 approves a line of credit or asks the card provider 3 to approve a line of credit for the customer. The card provider would then issue a STN 15 to the customer via the merchant 2. This STN 15 is generally used with the merchants 2 who are issuing the line of credit. When the customer wants to make a purchase using the merchant's line of credit, the merchant forwards a standard credit request to the card provider 3 with the STN 15 used as the credit card number in the transaction protocol. The card provider 3 verifies that the line of credit is authorized and was submitted by the merchant 2 issuing the line of credit associated with this STN 15. The card provider transaction system (via the STN transaction system 18) is capable of denying usage of this line of credit at another non-participating site. The card provider 3 may provide a private label or co- branded web site to apply for the line of credit. The card provider's back end system 14 then bills the customer and pays the merchant. The merchant 2 may keep the electronic line of credit privately at their site, or provide it to the customer. The authorization system would not authorize usage at other sites. FIG. 13 depicts an exemplary transaction process for use in providing lines of credit to merchants 2. A cardholder 1 or customer (who may or may not be an existing card member of the participating card provider 3) applies for an electronic line of credit (ELOC) with a merchant 2 (step 221), the merchant 2 redirects the cardholder 1 to the card provider's 3 website to fill out the ELOC application 30 (step 222). A fraud check 31 is performed (step 223) and a credit inquiry is typically performed by any credit bureau company 33 (step 224). If a card processing system 32 determines that credit is acceptable, an account is set up (step 225). A physical card 34 is not generated as with typical processes and may need to be purged depending on the particular system set-up (step 226). The account is sent to the account management system 35 (step 227) and then forwarded to the STN database 6 and the application server 5 (step 228). The cardholder 1 account is then related to a valid merchant identification number such as the SE number 36 (step 229). An account is then set-up with a ELOC profile 37 and at this point the secondary transaction ELOC number is passed back to the cardholder 1 (step 230). The merchant 2 submits the ELOC payment request to CAS 7 (step 231), and CAS 7 routes the ELOC to the STN system (step 232), where the STN system verifies that the SE number is approved for this particular ELOC (step 233). The STN system translates the ELOC STN to the related account in the account management system and returns the ELOC STN to merchant (step 234). The merchant is then required to submit the authorization code with the receipt of charges (ROC) and summary of charges (SOC). The merchant submits the ROC and/or SOC to the card provider's FINCAP 10 (step 235), whereupon FINCAP forwards the ELOC to the STN system (step 236). The STN system verifies that (i) this SE number is valid for the particular ELOC account (step 237) and (ii) the particular transaction was authorized for the specific ELOC account (step 238). The STN system then flips the card number, returns it to FINCAP 10, whereupon, the number is forwarded to the card provider's accounts receivable system 11 (step 239). FINCAP forwards the ELOC STN and associated information to the Accounts Payable system 9 (step 240) and pays the merchant 2 (step 241). Another exemplary embodiment allows a cardholder to fund an online digital wallet with the secondary transaction number. In this embodiment, after generation and association with the primary charge card, the secondary transaction number is provided to the cardholder to use within a designated digital wallet, which may reside locally at the cardholder's computer or may be stored in an online password protected account.

In yet another alternative embodiment, the secondary transaction system may be used to facilitate programs involving non-currency tender, such as the American Express® Membership Rewards as Currency™ system that is detailed in U.S. Provisional Application No. 60/200,492, filed on April 28, 2000, and U.S. Provisional Application No. 60/201 ,114, filed on May 2, 2000, which are hereby incorporated by reference. One embodiment of this system, depicted in FIG. 14, allows a cardholder 1 to create a STN 15 to be used to spend membership rewards points. In general, a membership or incentive rewards program is a loyalty program that rewards cardholders for using their charge card to make purchases. Cardholders accumulate points by using a participating charge card or by purchasing products at a participating merchant. These points may then be converted to a monetary value and redeemed to purchase merchandise. As depicted in FIG. 14, a cardholder 1 accesses and logs onto the card provider's services via a user interface system 4 (e.g., an internet connection) (step 251). The cardholder 1 proceeds (clicks on hyperlink) to the membership rewards (MR) system 95, where she indicates that she would like to use her membership reward points that are available in her MR account (step 252). The MR system 95 reports to the cardholder 1 how much the available MR points are worth (step 253). The cardholder 1 indicates how many of the MR points (converted to monetary value) should be loaded into an account that can be used for purchases (step 254). In an exemplary embodiment, the STN 15 can be associated with a MR account, i.e., a primary charge card account that is funded with these MR points. Use of this MR account may be limited by the card holder 1 or the card provider 3, or could be further limited by the MR system rules of use that may have been predefined by participating merchants (step 255). Once the MR system 95 has approved the request and allocated the requested MR points, the STN system 18 associates a STN 15 and establishes an MR-STN 15 profile (256). The MR-STN profile contains the options that will be applied and the amount that will be available to the resulting STN 15. The STN system 18 returns the STN 15 (and other account information) to the MR system 95 to provide to the cardholder 1 for use in completing subsequent transactions (e.g., online purchases) (step 257). When desiring to purchase products using the MR point-funded STN 15, the cardholder 1 proceeds to a merchant site (e.g., online website), selects goods and is requested by the merchant to provide payment information (e.g., via an online payment web page). The cardholder 1 chooses the appropriate card provider 3 as the form of payment (e.g., American Express®, Visa®, etc.) and enters the STN 15 (and other needed information) into the appropriate payment fields (step 258). The merchant processes the STN

15 authorization as discussed above (step 259), where the card provider CAS 7 recognizes the transaction as involving a STN 15, and forwards the request to the STN system 18 containing, inter alia, an application server (FIG. 8, number 5) and a STN database (FIG. 8, number 6). It should be appreciated that profile information may be stored in a MR database, STN database 6 or any other suitable database (step 260). The STN system 18 recognizes the account as a MR account, and verifies that optional conditions, if any, are met. If the conditions are not met, an error is returned to CAS 7 and then to the merchant (step 261). If the conditions are met, the balance available on the MR-STN profile is reduced by the purchase amount, a record of the purchase is recorded in the MR-STN profile, and an approval code is returned to the authorization system (step 262) and then to the merchant (step 263). Although additional CAS 7 processing is contemplated by this embodiment, application of additional rules and validations - which would typically be applied - are not required for this type of account. The approved purchase is finalized by the merchant with the STN 15 transaction being submitted through the merchant's existing POS network for settlement (step 264). The STN 15 transaction is received by the card provider's financial capture system (FINCAP) 10 (step 265). The FINCAP 10 forwards the STN transaction to the appropriate AP system 9 (step 266). The AP system 9 then pays the merchant according to the appropriate settlement terms and conditions (step 267). The FINCAP 10, having identified the transaction as involving an STN 15, sends the transaction information to the STN system 18 (via a backend application service 8) to identify the actual account number (i.e, PCC 20) (step 268). The STN system 18 recognizes that the STN 15 is associated with a MR account, searches for the MR-STN profile and passes a credit request to the appropriate cardholder 1 MR account to reduce the available MR points (step 269), and (ii) the transaction record is used to build a credit against the actual charge card account (e.g., PCC 20) that will offset the charged STN 15 transaction (step 269b). In the first instance (step 269), the STN system 18 passes a request to the MR system 95 to deduct the appropriate number of MR points. In the second instance (step 269b), both the original transaction and the credit are passed back to FINCAP 10 with the actual charge card account number (e.g., PCC 20 number). The FINCAP 10 then forwards the charge and credit transactions to the appropriate AR system 11 for normal billing processing.

As shown, the embodiment depicted in FIG. 14 allows the cardholder 1 to spend the MR points in at least two ways. First, the membership reward points can be deducted at the time of the transaction processing, or second, the transaction can be reflected on the cardholder's bill along with an associated credit that reflects the payment with reward points. It should also be appreciated that a cardholder 1 may choose to use MR points on a transaction by transaction basis, and preferably, is able to combine variations of currency (e.g., credit, debit cards etc.) and non-currency tender (MR points), as desired, to effectuate a transaction. Additionally, both currency and non-currency tender may be integrated into a STN gift, where a first party gifts to a second party a secondary transaction number that has some currency or non-currency value.

Another membership rewards embodiment is shown in FIG. 15. Here, the cardholder 1 is able to choose to use membership reward points when shopping at a merchant 2 site that supports the membership rewards as a payment option. Referencing FIG. 15, the cardholder 1 goes to a participating merchant's site (e.g., online website) to shop for goods or services. The cardholder 1 selects merchandise and continues to a payment site, where the card provider's MR points is one of the payment options (step 301). When the cardholder selects this option, a secure connection is established with the card provider 3 that authenticates both the cardholder 1 and the merchant 2 (step 302). The card provider 3 requests the cardholder's user ID and Password, either through a pop up screen, a http redirect link, or an applet downloaded by the merchant (step 303). The cardholder 1 supplies the User ID and Password which is returned to the card provider with the purchase amount (step 304). The card provider user interface 4 (e.g., online services) causes the cardholder 1 to be authenticated, collects the associated registered card accounts and invokes the MR system 95 (step 305). The MR system 95 uses these card accounts to identify the cardholder's MR account (step 306). If none of the registered accounts are related to a MR account, the cardholder 1 is not able to use MR points to pay for her purchase and an error is returned to the cardholder 1. After identifying the MR account, the MR points available are converted to the corresponding cash equivalent and compared to the purchase amount being requested. If the purchase amount is greater than the MR cash equivalent, an error is returned to the cardholder 1 (step 307). If the MR cash equivalent is greater than the purchase amount, all card accounts participating in the MR account are collected and returned to the cardholder 1 (step 308). The cardholder 1 designates the card account to be used to house all succeeding financial activity, which is then returned to the card provider 3 (step 309). The card provider 3 then triggers the STN system 18 to establish a STN 15 that is associated to the selected MR account number and a MR-STN account profile is setup (step 310). The STN system 18 returns the STN 15 to the User Interface System 4 and then onto the cardholder 1 (step 311). The cardholder 1 cuts and pastes, drags and drops, or auto-fills the STN 15 (and needed information) into the appropriate merchant payment field (step 312). As previously noted, the merchant uses the existing authorization network to request authorization for the STN transaction (step 313). The CAS 7 recognizes the transaction as one involving a STN 15 and forwards to the STN system 18 (step 314). The STN system 18 identifies the associated actual account number (e.g., PCC 20 number) for the STN 15 (step 315) and also recognizes the account as a MR account. At this point, although all MR transactions would have been previously verified, the MR account balance is again checked to minimize possible fraud (e.g., fraud involving two requests using the same MR points). The cash equivalent for the MR points for the actual account are then retrieved from the MR system 95 and if the purchase amount is greater than the available amount, a denial is returned to the authorization system and to the merchant 2 (step 316). If the cash equivalent value of the MR points exceeds the purchase amount, the STN system records the purchase in the MR-STN profile and returns the STN 15 to the CAS 7 (step 317). The CAS 7 then completes the authorization for the actual account (e.g., ensuring that the limits for the PCC 20 are complied with) (step 318), and returns the results (e.g., approval code) to the merchant 2 (step 319).

The approved transaction is finalized by the merchant 2 with the STN transaction being submitted through the existing point of sale network for settlement (step 320). As before, the transaction information is received by the card provider FINCAP 10 (step 321) and then forwarded to the appropriate AP system 9 (step 322) for payment (step 323). Since the transaction involves a STN 15, FINCAP 10 directs the transaction to the STN system 18 to identify the PCC 20 (step 324). The STN system 18 identifies the PCC20 (step 325) and also recognizes the STN 15 account is set up using MR points, where the STN system 18 searches the MR-STN profile for the associated purchase record (step 326). The STN system either (i) passes a credit request to MR to reduce the MR points (step 326a), or (ii) creates a credit against the billing transaction (step 326b). In step 326a, the STN system 18 passes a request to the MR system 95 to deduct the appropriate number of MR points. Here it is not necessary to return the AR transaction information to FINCAP for forwarding to the AR system 11 , but a reconciliation entry is created to reconcile the AR for FINCAP 10. In step 326b, a transaction record is used to build a credit against a real account number (e.g., PCC 20) that will offset the charge transaction. The STN system 18 forwards this credit to the FINCAP 10. The original billing transaction is returned to the FINCAP to appear on the cardholder's 1 statement. The FINCAP 10 then forwards the charge transaction to the appropriate AR system for normal processing. The FINCAP 10 forwards the credit issued by the MR system 95 to the appropriate AR system 11 for normal billing processing. Accordingly, the cardholder 1 will see on her statement a credit reflecting the currency value of the MR points used and a charge in the amount of the transaction.

Another embodiment provides for the generation of one or more STNs that are subordinate to and associated with a main secondary transaction number that, as described above, is associated with the cardholder's PCC 20 account. As noted above, these subordinate numbers may also be digitally stored in devices such as wireless telephones, PDAs, handheld computers, and the like. Providing multiple layers of secondary transaction number provides the cardholder 1 with greater flexibility. For example, a cardholder on vacation could structure the main STN 15 to be valid for the duration of the vacation. The cardholder 1 is then able to generate subordinate secondary transaction numbers (or tertiary numbers) with varying preferences to take into account various activities that may occur during the vacation. A cardholder 1 could structure the main secondary transaction number to have a maximum credit limit of $3,000 (this assumes that the associated primary charge card credit limit is equal to or greater than $3,000) that is good for the duration of the vacation. A subordinate secondary transaction number may then be provided to the spouse with a $1 ,000 limit and additional secondary transaction numbers, restricted to $500 limits, could be provided to the children. Each subordinate card would be valid only for the duration of the vacation and would only be valid for the maximum dollar amount specified.

Patent Citations (885)

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US5450088A	1992-11-25	1995-09-12	Texas Instruments Deutschland Gmbh	Transponder arrangement
US5365551A	1992-12-15	1994-11-15	Micron Technology, Inc.	Data communication transceiver using identification protocol
US6192255B1	1992-12-15	2001-02-20	Texas Instruments Incorporated	Communication system and methods for enhanced information transfer
US5396251A	1992-12-15	1995-03-07	Texas Instruments Deutschland Gmbh	Electronic transponder tuning procedure
US5581630A	1992-12-21	1996-12-03	Texas Instruments Incorporated	Personal identification
US5832068A *	1994-06-01	1998-11-03	Davox Corporation	Data processing system with real time priority updating of data records and dynamic record exclusion
US5983207A	1993-02-10	1999-11-09	Turk; James J.	Electronic cash eliminating payment risk
US6112191A	1993-02-18	2000-08-29	Every Penny Counts, Inc.	Method and system to create and distribute excess funds from consumer spending transactions
US5701127A	1993-02-23	1997-12-23	Texas Instruments Incorporated	Automatic vehicle identification system capable of vehicle lane discrimination
US5326964A	1993-03-10	1994-07-05	Risser J Marlin	Separable multi-account safety credit card
GB9308805D0	1993-04-01	1993-05-26	Jonhig Ltd	Smart card reader
US5555877A	1993-04-16	1996-09-17	George S. Lockwood	Cover for pond used to collect solar radiation
EP0625714A1	1993-05-19	1994-11-23	Texas Instruments Deutschland Gmbh	Method of transmitting a data message stored in a transponder device to an interrogating device
US6109525A	1993-05-28	2000-08-29	Saab-Scania Combitech Aktiebolag	Method and device for registering vehicles in a road toll facility
EP0701718A4	1993-06-02	2000-03-29	Verifone Inc	System and method for revaluation of stored tokens in ic cards
US5432518A	1993-06-15	1995-07-11	Texas Instruments Incorporated	Closed slot antenna having outer and inner magnetic loops
US5491715A	1993-06-28	1996-02-13	Texas Instruments Deutschland Gmbh	Automatic antenna tuning method and circuit
US5412192A	1993-07-20	1995-05-02	American Express Company	Radio frequency activated charge card
US5844230A	1993-08-09	1998-12-01	Laionde; Michael G.	Information card
US5407893A	1993-08-19	1995-04-18	Konica Corporation	Material for making identification cards
US5666493A *	1993-08-24	1997-09-09	Lykes Bros , Inc	System for managing customer orders and method of implementation
US5649118A	1993-08-27	1997-07-15	Lucent Technologies Inc.	Smart card with multiple charge accounts and product item tables designating the account to debit
US5541604A	1993-09-03	1996-07-30	Texas Instruments Deutschland Gmbh	Transponders, interrogators, systems and methods for elimination of interrogator synchronization requirement
US6089611A	1993-09-10	2000-07-18	Arthur Blank & Co., Inc.	Card with identifying feature and removable element
FR2710050B1 *	1993-09-17	1995-11-10	Saint Gobain Vitrage Int	Glass composition intended for the manufacture of glazing.
US5544246A	1993-09-17	1996-08-06	At&T Corp.	Smartcard adapted for a plurality of service providers and for remote installation of same
US5557279A	1993-09-28	1996-09-17	Texas Instruments	Unitarily-tuned transponder/shield assembly

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JPH085731A	1993-10-04	1996-01-12	Texas Instr Deutschland Gmbh	Determination of position of rf -id transponder
EP0650074A1	1993-10-22	1995-04-26	Texas Instruments Holland B.V.	Highly accurate RF-ID positioning system
USRE36365E	1993-10-25	1999-11-02	Visa International Service Association	Method and apparatus for distributing currency
EP0650216B1	1993-10-26	2000-01-19	Texas Instruments Deutschland Gmbh	Antenna circuit
US5930776A	1993-11-01	1999-07-27	The Golden 1 Credit Union	Lender direct credit evaluation and loan processing system
JP3368953B2 *	1993-11-12	2003-01-20	旭硝子株式会社	UV absorbing colored glass
US5397881A	1993-11-22	1995-03-14	Mannik; Kallis H.	Third millenium credit card with magnetically onto it written multiple validity dates, from which is one single day as the credit card's validity day selected day after day by the legitimate card owner
FR2713419B1	1993-12-02	1996-07-05	Gemplus Card Int	Method for generating DSA signatures with low cost portable devices.
EP0657297B2	1993-12-10	2003-04-23	Agfa-Gevaert	Security document having a transparent or translucent support and containing interference pigments.
DE69431306T2	1993-12-16	2003-05-15	Open Market Inc	NETWORK-BASED PAYMENT SYSTEM AND METHOD FOR USING SUCH A SYSTEM
US5530232A	1993-12-22	1996-06-25	Datamark Services, Inc.	Multi-application data card
US5578808A	1993-12-22	1996-11-26	Datamark Services, Inc.	Data card that can be used for transactions involving separate card issuers
US5826243A	1994-01-03	1998-10-20	Merrill Lynch & Co., Inc.	Integrated system for controlling master account and nested subaccount(s)
US6108641A	1994-01-03	2000-08-22	Merrill Lynch, Pierce, Fenner & Smith	Integrated nested account financial system with medical savings subaccount
US5491483A	1994-01-05	1996-02-13	Texas Instruments Incorporated	Single loop transponder system and method
JP2783971B2	1994-01-26	1998-08-06	日本信販株式会社	How to issue a credit card
US5606594A	1994-01-27	1997-02-25	Dell Usa, L.P.	Communication accessory and method of telecommunicating for a PDA
GB9401924D0	1994-02-01	1994-03-30	Jonhig Ltd	System for road toll payment
US5557516A	1994-02-04	1996-09-17	Mastercard International	System and method for conducting cashless transactions
DE4403753C1	1994-02-08	1995-07-20	Angewandte Digital Elektronik	Combined chip card
US5461386A	1994-02-08	1995-10-24	Texas Instruments Incorporated	Inductor/antenna for a recognition system
US5461217A	1994-02-08	1995-10-24	At&T Ipm Corp.	Secure money transfer techniques using smart cards
US5552789A	1994-02-14	1996-09-03	Texas Instruments Deutschland Gmbh	Integrated vehicle communications system
JPH07271939A	1994-03-30	1995-10-20	Mitsubishi Denki Semiconductor Software Kk	Non-contact ic card, card reader/writer and card device
US5450087A	1994-04-06	1995-09-12	Texas Instruments Incorporated	Transponder maintenance mode method
US5537314A *	1994-04-18	1996-07-16	First Marketrust Intl.	Referral recognition system for an incentive award program
US5471212A	1994-04-26	1995-11-28	Texas Instruments Incorporated	Multi-stage transponder wake-up, method and structure
US5488376A	1994-04-26	1996-01-30	Texas Instruments Incorporated	Transponder interface circuit
US5557518A *	1994-04-28	1996-09-17	Citibank, N.A.	Trusted agents for open electronic commerce
US6088797A	1994-04-28	2000-07-11	Rosen; Sholom S.	Tamper-proof electronic processing device
US5446007A *	1994-05-10	1995-08-29	Schott Glass Technologies, Inc.	Brown contrast enhancement glass

US5500513A	1994-05-11	1996-03-19	Visa International	Automated purchasing control system
US5792337A	1994-05-12	1998-08-11	Texas Instruments Incorporated	Method and apparatus for detection of corrosion
US5477040A	1994-05-23	1995-12-19	Lalonde; Michael G.	Structure for a method of facilitating charge transactions
US5878215A	1994-05-23	1999-03-02	Mastercard International Incorporated	System and method for processing multiple electronic transaction requests
JP3326292B2 *	1994-05-24	2002-09-17	株式会社東芝	Communication device and communication method thereof
EP0775082A1	1994-05-27	1997-05-28	GUNNARSSON, Staffan	System at a vehicle for debiting at automatic fuelling
US5504808A	1994-06-01	1996-04-02	Hamrick, Jr.; James N.	Secured disposable debit card calling system and method
US5577109A	1994-06-06	1996-11-19	Call Processing, Inc.	Pre-paid card system and method
US5785680A	1994-06-13	1998-07-28	Texas Instruments Incorporated	Injector and object to be injected by the injector
US5673106A	1994-06-17	1997-09-30	Texas Instruments Incorporated	Printing system with self-monitoring and adjustment
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
FR2721600B1 *	1994-06-23	1996-08-09	Saint Gobain Vitrage	Clear glass composition intended for the manufacture of glazing.
US5500651A	1994-06-24	1996-03-19	Texas Instruments Incorporated	System and method for reading multiple RF-ID transponders
US5621396A	1994-06-30	1997-04-15	Texas Instruments Incorporated	Method and apparatus with adaptive transponder plucking
US5597534A	1994-07-05	1997-01-28	Texas Instruments Deutschland Gmbh	Apparatus for wireless chemical sensing
US5625370A	1994-07-25	1997-04-29	Texas Instruments Incorporated	Identification system antenna with impedance transformer
US5489908A	1994-07-27	1996-02-06	Texas Instruments Deutschland Gmbh	Apparatus and method for identifying multiple transponders
US5602538A	1994-07-27	1997-02-11	Texas Instruments Incorporated	Apparatus and method for identifying multiple transponders
US5600175A	1994-07-27	1997-02-04	Texas Instruments Incorporated	Apparatus and method for flat circuit assembly
US5629981A	1994-07-29	1997-05-13	Texas Instruments Incorporated	Information management and security system
JP4095680B2	1994-08-01	2008-06-04	富士通株式会社	Security management method for card type storage device and card type storage device
US5569187A	1994-08-16	1996-10-29	Texas Instruments Incorporated	Method and apparatus for wireless chemical supplying
US5550536A	1994-08-17	1996-08-27	Texas Instruments Deutschland Gmbh	Circuit frequency following technique transponder resonant
US5490079A	1994-08-19	1996-02-06	Texas Instruments Incorporated	System for automated toll collection assisted by GPS technology
US5797133A	1994-08-31	1998-08-18	Strategic Solutions Group, Inc	Method for automatically determining the approval status of a potential borrower
DE4431605C2	1994-09-05	1998-06-04	Siemens Ag	Method for producing a chip card module for contactless chip cards
US5528222A	1994-09-09	1996-06-18	International Business Machines Corporation	Radio frequency circuit and memory in thin flexible package
US5826241A *	1994-09-16	1998-10-20	First Virtual Holdings Incorporated	Computerized system for making payments and authenticating transactions over the internet
US5608778A	1994-09-22	1997-03-04	Lucent Technologies Inc.	Cellular telephone as an authenticated transaction controller
US5533656A	1994-09-27	1996-07-09	Bonaldi; Jeffrey P.	Combination wallet with removeable clip
US5841364A	1994-10-07	1998-11-24	Texas Instruments Incorporated	Method and apparatus for transfering information from a transponder
US5715314A	1994-10-24	1998-02-03	Open Market, Inc.	Network sales system

US5592150A	1994-10-27	1997-01-07	Texas Instruments Incorporated	Air coil and method of making the same
JPH08123919A	1994-10-28	1996-05-17	Mitsubishi Electric Corp	Noncontact ic card system and communication method thereof
US5563582A	1994-10-28	1996-10-08	Texas Instruments Incorporated	Integrated air coil and capacitor and method of making the same
GB9422803D0	1994-11-11	1995-01-04	At & T Global Inf Solution	A card reader
US5748737A	1994-11-14	1998-05-05	Daggar; Robert N.	Multimedia electronic wallet with generic card
US5525992A	1994-11-14	1996-06-11	Texas Instruments Deutschland Gmbh	Method and system for conserving power in a recognition system
US6636682B1	1994-11-28	2002-04-02	Indivos Corporation	Tokenless electronic transaction system
US6006869A	1994-11-28	1999-12-21	Bosch Telecom Gmbh	Point-to-multipoint communications system
US6012039A	1994-11-28	2000-01-04	Smarttouch, Inc.	Tokenless biometric electronic rewards system
US5764789A *	1994-11-28	1998-06-09	Smarttouch, Llc	Tokenless biometric ATM access system
US6269348B1	1994-11-28	2001-07-31	Veristar Corporation	Tokenless biometric electronic debit and credit transactions
US6839719B1	1994-11-28	2002-05-28	Indivos Corporation	Tokenless biometric electronic transactions using an audio signature to identify the transaction processor
DE69525425T2	1994-11-30	2002-10-10	Texas Instruments Inc	Lock with an inductive search device for key detection and manufacturing processes
DE69531334T2	1994-11-30	2004-05-27	Texas Instruments Inc., Dallas	Key with an air coil antenna and manufacturing method
US5497121A	1994-11-30	1996-03-05	Texas Instruments Incorporated	Automatically correcting data detection circuit and method for FSK modulated signals
US5592767A	1994-12-05	1997-01-14	Treske; Dieter	Holder for identification cards
US5705798A	1994-12-16	1998-01-06	Mastercard International Inc.	System and method for processing a customized financial transaction card
FR2728981B1	1994-12-28	1997-02-14		
US5614703A	1995-01-05	1997-03-25	Martin; Jay R.	Hotel check-in system with wireless communication
JPH08307308A	1995-01-12	1996-11-22	Texas Instr Deutschland Gmbh	Charging capacitor discharge controller in transponder
EP0721850A3	1995-01-12	1997-02-05	De La Rue Thomas & Co Ltd	Security document
US5660319A	1995-01-17	1997-08-26	Texas Instruments Incorporated	Ultrasonic bonding process
US5835894A	1995-01-19	1998-11-10	Ann Adcock Corporation	Speaker and command verification method
US5577100A	1995-01-30	1996-11-19	Telemac Cellular Corporation	Mobile phone with internal accounting
DE19503607A1	1995-02-03	1996-08-08	Angewandte Digital Elektronik	Chip cards for displaying different card information
JPH10512074A	1995-02-13	1998-11-17	インタートラストテクノロジーズコーポレイション	System and method for secure transaction management and electronic rights protection
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
US5689100A *	1995-03-21	1997-11-18	Martiz, Inc.	Debit card system and method for implementing incentive award program
US5594227A	1995-03-28	1997-01-14	Microsoft Corporation	System and method for protecting unauthorized access to data contents
US5715399A	1995-03-30	1998-02-03	Amazon.Com, Inc.	Secure method and system for communicating a list of credit card numbers over a non-secure network
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
US6725202B1	1995-04-10	2004-04-20	Texas Instruments	Transaction accounting of toll transactions in transponder systems

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US5602919A	1995-04-10	1997-02-11	Texas Instruments Incorporated	Speedup for monetary transactions using a transponder in conjunction with a smartcard
US6317721B1	1995-04-10	2001-11-13	Texas Instruments Incorporated	Transaction accounting of toll transactions in transponder systems
JP2814477B2	1995-04-13	1998-10-22	ソニーケミカル株式会社	Non-contact IC card and method of manufacturing the same
US6099043A	1995-04-14	2000-08-08	Story; Gerald A.	Coupon catalogue apparatus
US5729236A	1995-04-28	1998-03-17	Texas Instruments Incorporated	Identification system reader with multiplexed antennas
EP0767945B1	1995-04-28	2004-06-30	Koninklijke Philips Electronics N.V.	Wireless communication system for reliable communication between a group of apparatuses
US5577120A	1995-05-01	1996-11-19	Lucent Technologies Inc.	Method and apparatus for restrospectively identifying an individual who had engaged in a commercial or retail transaction or the like
US5734838A *	1995-05-04	1998-03-31	American Savings Bank, F.A.	Database computer architecture for managing an incentive award program and checking float of funds at time of purchase
GB9509582D0	1995-05-11	1995-07-05	Jonhig Ltd	Value transfer system
ZA9608218	1995-05-15	1996-11-14	Nat Westminster Bank Plc	Transaction recovery in a value transfer systems
US5880675A	1995-05-19	1999-03-09	Texas Instruments Incorporated	Reusable package for identification devices
CA2150215C	1995-05-25	2003-02-25	John Xidos	Distributed gaming system
US5694596A	1995-05-25	1997-12-02	Kangaroo, Inc.	On-line database updating network system and method
WO1996038814A2	1995-06-02	1996-12-05	Philips Electronics N.V.	Chip-card
US5692132A	1995-06-07	1997-11-25	Mastercard International, Inc.	System and method for conducting cashless transactions on a computer network
FR2735261B1	1995-06-08	1997-07-11	France Telecom	METHOD OF MAKING A PAYMENT USING AN ACCOUNT MANAGER
US5828044A	1996-03-14	1998-10-27	Kookmin Credit Card Co., Ltd.	Non-contacting type radio frequency recognizing credit card system
US5742845A	1995-06-22	1998-04-21	Datascape, inc.	System for extending present open network communication protocols to communicate with non-standard I/O devices directly coupled to an open network
US5790677A	1995-06-29	1998-08-04	Microsoft Corporation	System and method for secure electronic commerce transactions
US5794221A	1995-07-07	1998-08-11	Egendorf; Andrew	Internet billing method
US6115458A	1995-07-14	2000-09-05	American Express Travel Related Services Company, Inc	Method and apparatus for summaries of prepaid instrument transaction activity
WO1997004422A1	1995-07-18	1997-02-06	Philips Electronics N.V.	Data transmission system between at least one write-read station and several data carriers
US5956024A	1995-08-08	1999-09-21	Continental Cablevision, Inc.	Graphical user interface for customer service representatives for subscriber management systems
US5640002A	1995-08-15	1997-06-17	Ruppert; Jonathan Paul	Portable RF ID tag and barcode reader
US5852812A	1995-08-23	1998-12-22	Microsoft Corporation	Billing system for a network
US5826244A	1995-08-23	1998-10-20	Xerox Corporation	Method and system for providing a document service over a computer network using an automated brokered auction
US5878141A	1995-08-25	1999-03-02	Microsoft Corporation	Computerized purchasing system and method for mediating purchase transactions over an interactive network
US5768385A	1995-08-29	1998-06-16	Microsoft Corporation	Untraceable electronic cash
JPH0973487A	1995-09-01	1997-03-18	Fujitsu Ltd	System and method for content proceeds distribution
US5878403A	1995-09-12	1999-03-02	Cmsi	Computer implemented automated credit application analysis and decision routing system
US5721781A	1995-09-13	1998-02-24	Microsoft Corporation	Authentication system and method for smart card transactions
US5889419A	1995-09-28	1999-01-12	Sol H. Wynn	Programmable multiple company credit card system

US5748740A	1995-09-29	1998-05-05	Dallas Semiconductor Corporation	Method, apparatus, system and firmware for secure transactions
US6138917A	1995-10-02	2000-10-31	International Card Technology	Multiple magnetic stripe transaction cards and systems for the utilization thereof
US5774670A	1995-10-06	1998-06-30	Netscape Communications Corporation	Persistent client state in a hypertext transfer protocol based client-server system
US6029175A	1995-10-26	2000-02-22	Teknowledge Corporation	Automatic retrieval of changed files by a network software agent
US5699528A	1995-10-31	1997-12-16	Mastercard International, Inc.	System and method for bill delivery and payment over a communications network
US5737710A	1995-11-07	1998-04-07	Amtech Corporation	Automated vehicle parking system for a plurality of remote parking facilities
US5796832A	1995-11-13	1998-08-18	Transaction Technology, Inc.	Wireless transaction and information system
US5883377A	1995-11-20	1999-03-16	International Card Technologies, Inc.	Multiple magnetic stripe transaction cards and systems for the utilization thereof
US20030177347A1	1995-11-22	2003-09-18	Bruce Schneier	Methods and apparatus for awarding prizes based on authentication of computer generated outcomes using coupons
KR970066968A	1995-12-06	1997-10-13	히로아키 고하리	How to issue a service right in commodity trading using a communication line
US6088686A	1995-12-12	2000-07-11	Citibank, N.A.	System and method to performing on-line credit reviews and approvals
US5774870A	1995-12-14	1998-06-30	Netcentives, Inc.	Fully integrated, on-line interactive frequency and award redemption program
JP3133243B2	1995-12-15	2001-02-05	株式会社エヌケーインベストメント	Online shopping system
US5978348A	1995-12-20	1999-11-02	Canon Kabushiki Kaisha	Optical recording medium and process for production thereof
EP0782214B1	1995-12-22	2004-10-06	Texas Instruments France	Ring antennas for resonant circuits
US6014634A	1995-12-26	2000-01-11	Supermarkets Online, Inc.	System and method for providing shopping aids and incentives to customers through a computer network
US5798709A	1996-01-03	1998-08-25	Texas Instruments Incorporated	Wireless transmitter carrier phase synchronization
EP0784301B1	1996-01-08	2002-10-16	Jürgen Dethloff	Method and system for the payment of services and portable data carrier to be used in such a system
US6016482A	1996-01-11	2000-01-18	Merrill Lynch & Co., Inc.	Enhanced collateralized funding processor
WO1997025801A1	1996-01-12	1997-07-17	International Business Machines Corporation	Secure anonymous information exchange in a network
US5700037A	1996-01-16	1997-12-23	Keller; John A	Security improved card
US5793324A	1996-01-19	1998-08-11	Texas Instruments Incorporated	Transponder signal collision avoidance system
US5777903A	1996-01-22	1998-07-07	Motorola, Inc.	Solar cell powered smart card with integrated display and interface keypad
GB9601924A0	1996-01-31	1996-04-03	Certicom Corp	Transaction verification protocol for smart cards
EP0791706B1	1996-01-31	2004-07-14	Texas Instruments Deutschland Gmbh	Improvements in or relating to full-wave rectifiers
JPH1044936A	1996-01-31	1998-02-17	Texas Instr Deutschland Gmbh	Attenuation modulating circuit for fully double transponder
JP3068483B2	1996-02-08	2000-07-24	株式会社東芝	Pattern reading method and optical signal reading device
US5878138A	1996-02-12	1999-03-02	Microsoft Corporation	System and method for detecting fraudulent expenditure of electronic assets
US5742756A	1996-02-12	1998-04-21	Microsoft Corporation	System and method of using smart cards to perform security-critical operations requiring user authorization
US6076078A	1996-02-14	2000-06-13	Carnegie Mellon University	Anonymous certified delivery
US5987498A	1996-02-16	1999-11-16	Atcom, Inc.	Credit card operated computer on-line service communication system
US5983915A	1996-02-21	1999-10-05	Infoseek Corporation	Secure, convenient and efficient system and method of performing trans-internet purchase transactions

US5761306A	1996-02-22	1998-06-02	Visa International Service Association	Key replacement in a public key cryptosystem
US5948116A	1996-02-23	1999-09-07	Texas Instruments Deutschland, Gmbh	Bit error correction algorithm
US5838720A	1996-02-23	1998-11-17	Teletransactions, Inc.	Transceiver control with sleep mode operation
US5862325A	1996-02-29	1999-01-19	Intermind Corporation	Computer-based communication system and method using metadata defining a control structure
AU1987097A	1996-03-07	1997-09-22	American Express Travel Related Services Company, Inc.	Methods and apparatus for providing a prepaid, remote memory transaction account with voice indicia
US6038551A	1996-03-11	2000-03-14	Microsoft Corporation	System and method for configuring and managing resources on a multi-purpose integrated circuit card using a personal computer
US6029147A	1996-03-15	2000-02-22	Microsoft Corporation	Method and system for providing an interface for supporting multiple formats for on-line banking services
JPH09259193A	1996-03-19	1997-10-03	Fujitsu Ltd	Transaction method for electronic money system
US5970471A	1996-03-22	1999-10-19	Charles E. Hill & Associates, Inc.	Virtual catalog and product presentation method and apparatus
US6097292A	1997-04-01	2000-08-01	Cubic Corporation	Contactless proximity automated data collection system and method
US5778069A	1996-04-10	1998-07-07	Microsoft Corporation	Non-biased pseudo random number generator
US5889941A	1996-04-15	1999-03-30	Ubiq Inc.	System and apparatus for smart card personalization
US5991608A	1996-04-16	1999-11-23	U.S. Phillips Corporation	Portable communication device with optimized transmission loss
US6044360A *	1996-04-16	2000-03-28	Picciallo; Michael J.	Third party credit card
KR100354362B1	1996-04-18	2003-03-10	가네보 가부시키가이샤	Near Infrared Absorption Film, and Multilayer Panel Including This Film
US5932502A *	1996-04-19	1999-08-03	Guardian Industries Corp.	Low transmittance glass
US6014645A	1996-04-19	2000-01-11	Block Financial Corporation	Real-time financial card application system
US6016484A	1996-04-26	2000-01-18	Verifone, Inc.	System, method and article of manufacture for network electronic payment instrument and certification of payment and credit collection utilizing a payment
US5987140A	1996-04-26	1999-11-16	Verifone, Inc.	System, method and article of manufacture for secure network electronic payment and credit collection
US5963924A	1996-04-26	1999-10-05	Verifone, Inc.	System, method and article of manufacture for the use of payment instrument holders and payment instruments in network electronic commerce
US5905798A	1996-05-02	1999-05-18	Texas Instruments Incorporated	TIRIS based kernal for protection of "copyrighted" program material
US5825007A	1996-05-06	1998-10-20	Jesadanont; Mongkol	Automatic non-computer network no-stop collection of expressway tolls by prepaid cards and method: pay according to category of vehicle and the distance it travels
US5748137A	1996-05-08	1998-05-05	Texas Instruments Incorporated	Wireless flywheel synchronization method
US5838257A	1996-05-24	1998-11-17	Trw Inc.	Keyless vehicle entry system employing portable transceiver having low power consumption
US5924080A	1996-05-28	1999-07-13	Incredicard Llc	Computerized discount redemption system
US5704046A	1996-05-30	1997-12-30	Mastercard International Inc.	System and method for conducting cashless transactions
US5834756A	1996-06-03	1998-11-10	Motorola, Inc.	Magnetically communicative card
US5983208A	1996-06-17	1999-11-09	Verifone, Inc.	System, method and article of manufacture for handling transaction results in a gateway payment architecture utilizing a multichannel, extensible, flexible architecture
US6002767A	1996-06-17	1999-12-14	Verifone, Inc.	System, method and article of manufacture for a modular gateway server architecture
US6072870A	1996-06-17	2000-06-06	Verifone Inc.	System, method and article of manufacture for a gateway payment architecture utilizing a multichannel, extensible, flexible architecture
FR2750274B1	1996-06-21	1998-07-24	Arditti David	PROCEDURE FOR TAKING INTO ACCOUNT A REQUEST FOR THE USE OF A VIRTUAL PREPAID CARD ALLOWING THE REUSE OF ITS SERIAL NUMBER

US5731957A	1996-06-24	1998-03-24	Texas Instruments Incorporated	Transponder including a fluid cushioning medium and a method for its production
JP3709946B2	1996-06-28	2005-10-26	ソニー株式会社	Communication method and information processing apparatus
US6125352A	1996-06-28	2000-09-26	Microsoft Corporation	System and method for conducting commerce over a distributed network
US5770843A	1996-07-02	1998-06-23	Ncr Corporation	Access card for multiple accounts
US5943624A	1996-07-15	1999-08-24	Motorola, Inc.	Contactless smartcard for use in cellular telephone
US5844218A	1996-07-16	1998-12-01	Transaction Technology, Inc.	Method and system for using an application programmable smart card for financial transactions in multiple countries
US5903880A	1996-07-19	1999-05-11	Biffar; Peter C.	Self-contained payment system with circulating digital vouchers
US5956693A	1996-07-19	1999-09-21	Geerlings; Huib	Computer system for merchant communication to customers
US5974238A	1996-08-07	1999-10-26	Compaq Computer Corporation	Automatic data synchronization between a handheld and a host computer using pseudo cache including tags and logical data elements
US5878337A	1996-08-08	1999-03-02	Joao; Raymond Anthony	Transaction security apparatus and method
US5854891A	1996-08-09	1998-12-29	Tritheim Technologies, Inc.	Smart card reader having multiple data enabling storage compartments
US6260026B1	1996-08-12	2001-07-10	Kabushiki Kaisha Media Marketing Network	Credit card information management system
US5809142A	1996-08-14	1998-09-15	Texas Instruments Incorporated	Method and system for calculating a user account balance in a recognition system
US6088683A	1996-08-21	2000-07-11	Jalili; Reza	Secure purchase transaction method using telephone number
US5918216A	1996-08-22	1999-06-29	Microsoft Corporation	Automatic recognition of periods for financial transactions
US5923884A *	1996-08-30	1999-07-13	Gemplus S.C.A.	System and method for loading applications onto a smart card
US6041308A	1996-09-04	2000-03-21	Priceline.Com Incorporated	System and method for motivating submission of conditional purchase offers
US5979757A	1996-09-05	1999-11-09	Symbol Technologies, Inc.	Method and system for presenting item information using a portable data terminal
US5845267A	1996-09-06	1998-12-01	At&T Corp	System and method for billing for transactions conducted over the internet from within an intranet
US6011487A	1996-09-17	2000-01-04	Ncr Corporation	System and method of locating wireless devices
AU4415697A	1996-09-17	1998-04-14	Sherry Brennan	Electronic card valet
US5789733A	1996-09-20	1998-08-04	Motorola, Inc.	Smart card with contactless optical interface
US5859587A	1996-09-26	1999-01-12	Sensormatic Electronics Corporation	Data communication and electronic article surveillance tag
US5931917A	1996-09-26	1999-08-03	Verifone, Inc	System, method and article of manufacture for a gateway system architecture with system administration information accessible from a browser
US5978840A	1996-09-26	1999-11-02	Verifone, Inc.	System, method and article of manufacture for a payment gateway system architecture for processing encrypted payment transactions utilizing a multichannel, extensible, flexible architecture
US5859779A	1996-10-02	1999-01-12	Mobil Oil Corporation	Portable point-of sale terminal with device for inputting security code access key
US5913203A	1996-10-03	1999-06-15	Jaesent Inc.	System and method for pseudo cash transactions
US6029150A	1996-10-04	2000-02-22	Certco, Llc	Payment and transactions in electronic commerce system
US5983200A	1996-10-09	1999-11-09	Slotznick, Benjamin	Intelligent agent for executing delegated tasks
US5953710A	1996-10-09	1999-09-14	Fleming; Stephen S.	Children's credit or debit card system
US6021943A	1996-10-09	2000-02-08	Chastain; Robert H.	Process for executing payment transactions
US6323566B1	1996-10-10	2001-11-27	Texas Instruments Incorported	Transponder for remote keyless entry systems
US6343159B1	1996-10-15	2002-08-13	Motorola, Inc	Transaction system and method therefor
US5897622A	1996-10-16	1999-04-27	Microsoft Corporation	Electronic shopping and merchandising system

US5999914A	1996-10-16	1999-12-07	Microsoft Corporation	Electronic promotion system for an electronic merchant system
WO1998016849A1	1996-10-17	1998-04-23	Pinpoint Corporation	Article tracking system
US6070150A	1996-10-18	2000-05-30	Microsoft Corporation	Electronic bill presentment and payment system
US6002438A	1996-10-25	1999-12-14	Texas Instruments Incorporated	Method and apparatus for storing decoded video information
US6138913A	1997-11-05	2000-10-31	Isotag Technology, Inc.	Security document and method using invisible coded markings
DE69718826T2	1996-11-05	2003-08-07	Isotag Technology Inc	SECURITY DOCUMENT AND METHOD WHICH INVISIBLE CODED MARKINGS USES
US5898783A	1996-11-14	1999-04-27	Lucent Technologies, Inc.	System and method for employing a telecommunications network to remotely disable a SIM or smartcard
JPH10143570A	1996-11-15	1998-05-29	Susumu Miyake	Electronic transfer method for individual information of credit card, and miniature ic card, adapter card, terminal adapter, slip issuing machine and portable terminal therefor
US5825302A	1996-11-20	1998-10-20	Texas Instruments Incorporated	System and method for transmitting data using reflected electromagnetic radiation
FR2756648B1	1996-11-29	1999-01-08	Solaic Sa	NON-CONTACT TYPE MEMORY CARD
US5950179A	1996-12-03	1999-09-07	Providian Financial Corporation	Method and system for issuing a secured credit card
US5995898A	1996-12-06	1999-11-30	Micron Communication, Inc.	RFID system in communication with vehicle on-board computer
US5991748A	1996-12-06	1999-11-23	American Express Travel Related Services Company, Inc.	Methods and apparatus for regenerating a prepaid transaction account
FR2756955B1	1996-12-11	1999-01-08	Schlumberger Ind Sa	METHOD FOR PRODUCING AN ELECTRONIC CIRCUIT FOR A CONTACTLESS MEMORY CARD
US6198728B1	1996-12-19	2001-03-06	Phillips Electronics North America Corp.	Medium access control (MAC) protocol for wireless ATM
US6198875B1	1996-12-20	2001-03-06	Texas Instruments Incorporated	Tiris based bios for protection of "copyrighted" program material
US6130623A	1996-12-31	2000-10-10	Lucent Technologies Inc.	Encryption for modulated backscatter systems
US6216219B1	1996-12-31	2001-04-10	Texas Instruments Incorporated	Microprocessor circuits, systems, and methods implementing a load target buffer with entries relating to prefetch desirability
US5953512A	1996-12-31	1999-09-14	Texas Instruments Incorporated	Microprocessor circuits, systems, and methods implementing a loop and/or stride predicting load target buffer
US6230270B1	1997-01-03	2001-05-08	Texas Instruments Incorporated	Integrated circuit identification system
US5915023A	1997-01-06	1999-06-22	Bernstein; Robert	Automatic portable account controller for remotely arranging for transfer of value to a recipient
US5920628A	1997-01-09	1999-07-06	Washington University	Method and apparatus for fingerprinting and authenticating various magnetic media
US6095567A	1997-01-13	2000-08-01	Buell; Robert	Key locator
US5864306A	1997-01-17	1999-01-26	Raytheon Company	Detection regions for transponder tracking
US6331972B1	1997-02-03	2001-12-18	Motorola, Inc.	Personal data storage and transaction device system and method
DE29702538U1	1997-02-13	1997-04-03	Pixyfoto Gmbh	ID card in the format of a credit or check card
US5988510A	1997-02-13	1999-11-23	Micron Communications, Inc.	Tamper resistant smart card and method of protecting data in a smart card
US5864830A	1997-02-13	1999-01-26	Armetta; David	Data processing method of configuring and monitoring a satellite spending card linked to a host credit card
US6519565B1	1998-11-10	2003-02-11	Voice Security Systems, Inc.	Method of comparing utterances for security control
AU7194602B2	1997-02-14	2000-05-11	Citibank, N.A.	Cyclotomic polynomial construction of discrete logarithm cryptosystems over finite fields
FR2759795B1	1997-02-14	1999-05-07	Francois Charles Oberthur Fidu	METHOD FOR STORING DATA IN A WRITTEN CARD MEMORY

US6058418A	1997-02-18	2000-05-02	E-Parcel, Llc	Marketing data delivery system
US5996076A	1997-02-19	1999-11-30	Verifone, Inc.	System, method and article of manufacture for secure digital certification of electronic commerce
US6092198A	1997-02-25	2000-07-18	International Business Machines Corporation	System and method for enabling and controlling anonymous file transfer protocol communications
US5960416A	1997-02-27	1999-09-28	Block; Robert S.	Real time subscriber billing at a subscriber location in an unstructured communication network
US6133834A	1997-03-06	2000-10-17	Texas Instruments Deutschland, Gmbh	Method of trimming film type antennas
JP2001514777A	1997-03-10	2001-09-11	プレシジョンダイナミクスコーポレイション	Reactively connected elements of a circuit provided on a flexible substrate
US6112984A	1997-03-14	2000-09-05	Snavely; John D.	Electronic wallet or purse with means for funds transfer
GB2323329B	1997-03-19	2002-02-06	Time & Data Syst Int	Identification card with concealed coding
US6119099A	1997-03-21	2000-09-12	Walker Asset Management Limited Partnership	Method and system for processing supplementary product sales at a point-of-sale terminal
AT281680T	1997-03-24	2004-11-15	Visa Int Service Ass	SYSTEM AND METHOD FOR A MULTIPURPOSE CHIP CARD WHICH ALLOWS AN EXTRA STORAGE OF AN APPLICATION ON THIS CARD
US6064320A	1997-04-04	2000-05-16	Texas Instruments Incorporated	Automatic vehicle identification system capable of vehicle lane discrimination
US5955969A	1997-04-09	1999-09-21	Texas Instruments Incorporated	Method to prevent rouge transponder responses in automatic vehicle identification systems
KR100234317B1	1997-04-10	1999-12-15	윤종용	Method for downloading the chosen data on PDA
FR2762119B1	1997-04-11	1999-07-09	Gemplus Card Int	SYSTEM OF TRANSFER OF DATA AND UNITS OF VALUE ON A NETWORK OF SLOT MACHINES
US5912678A	1997-04-14	1999-06-15	Texas Instruments Incorporated	Process flow design at the module effects level through the use of acceptability regions
US5930777A	1997-04-15	1999-07-27	Barber; Timothy P.	Method of charging for pay-per-access information over a network
US6012636A	1997-04-22	2000-01-11	Smith; Frank E.	Multiple card data system having first and second memory elements including magnetic strip and fingerprints scanning means
US5950174A	1997-04-25	1999-09-07	AT&T Corp.	Affiliation-based arrangement for billing
DE19718103A1	1997-04-29	1998-06-04	Kim Schmitz	Data transmission system authorise method e.g. for telebanking
US6282522B1	1997-04-30	2001-08-28	Visa International Service Association	Internet payment system using smart card
US6105008A	1997-10-16	2000-08-15	Visa International Service Association	Internet loading system using smart card
US5970148A	1997-05-02	1999-10-19	Texas Instruments Deutschland, Gmbh	Low cost encryption transponder
US6297727B1	1997-05-05	2001-10-02	George N. Nelson, Jr.	Transponder identification and record assembly
US6014636A	1997-05-06	2000-01-11	Lucent Technologies Inc.	Point of sale method and system
CH691749A5	1997-05-09	2001-09-28	Njc Innovations	smartcard and RF transmission means to communicate with the smart card.
JP3728366B2	1997-05-13	2005-12-21	株式会社ルネサステクノロジ	IC card
US5970472A	1997-05-13	1999-10-19	Fogdog Sports	Performing electronic commerce on the internet providing links from product manufacturers to authorized dealers where the authorized dealer provides a custom order interface for the manufacturer's products
US6220510B1	1997-05-15	2001-04-24	Mondex International Limited	Multi-application IC card with delegation feature
US6330544B1 *	1997-05-19	2001-12-11	Walker Digital, Llc	System and process for issuing and managing forced redemption vouchers having alias account numbers
US5930767A	1997-05-28	1999-07-27	Motorola, Inc.	Transaction methods systems and devices
JP3104646B2	1997-06-04	2000-10-30	ソニー株式会社	External storage device

US6050494A	1997-06-09	2000-04-18	Samsung Display Devices Co., Ltd.	Smart card
US5949044A	1997-06-13	1999-09-07	Walker Asset Management Limited Partnership	Method and apparatus for funds and credit line transfers
US6144948A	1997-06-23	2000-11-07	Walker Digital, Llc	Instant credit card marketing system for reservations for future services
LU90084B1 *	1997-06-25	1998-12-28	Glaverbel	Dark green soda lime glass
US5945653A	1997-06-26	1999-08-31	Walker Asset Management Limited Partnership	System and method for establishing and executing functions to affect credit card accounts and transactions
IL121192D0 *	1997-06-30	1997-11-20	Ultimus Ltd	Processing system and method for a heterogeneous electronic cash environment
FI105637B	1997-07-02	2000-09-15	Sonera Oyj	A method for managing applications stored on a subscriber identity module
WO1999001823A1 *	1997-07-03	1999-01-14	Citicorp Development Center	System and method for transferring value to a magnetic stripe on a transaction card
US5970470A	1997-07-08	1999-10-19	Walker Asset Management Limited Partnership	System and method for establishing and managing subscription purchase agreements including commitments to purchase goods over time at agreed upon prices
US6000608A	1997-07-10	1999-12-14	Dorf; Robert E.	Multifunction card system
US5929801A	1997-07-11	1999-07-27	Texas Instruments Incorporated	Method for repeating interrogations until failing to receive unintelligible responses to identify plurality of transponders by an interrogator
US6078888A	1997-07-16	2000-06-20	Gilbarco Inc.	Cryptography security for remote dispenser transactions
US5963134A	1997-07-24	1999-10-05	Checkpoint Systems, Inc.	Inventory system using articles with RFID tags
US5982914A	1997-07-29	1999-11-09	Smarttouch, Inc.	Identification of individuals from association of finger pores and macrofeatures
US6006216A	1997-07-29	1999-12-21	Lucent Technologies Inc.	Data architecture for fetch-intensive database applications
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
CH689070A5	1997-08-13	1998-08-31	Bresch Peter	Key fob acting as car-park access card, for automatic charging for parking
US6014650A	1997-08-19	2000-01-11	Zampese; David	Purchase management system and method
US6003014A	1997-08-22	1999-12-14	Visa International Service Association	Method and apparatus for acquiring access using a smart card
EP0899703B1	1997-08-25	2002-10-30	Texas Instruments France	A navigational system
US6163771A *	1997-08-28	2000-12-19	Walker Digital, Llc	Method and device for generating a single-use financial account number
US6018718A	1997-08-28	2000-01-25	Walker Asset Management Limited Partnership	Method and system for processing customized reward offers
US6213391B1	1997-09-10	2001-04-10	William H. Lewis	Portable system for personal identification based upon distinctive characteristics of the user
US6102672A	1997-09-10	2000-08-15	Turbodyne Systems, Inc.	Motor-driven centrifugal air compressor with internal cooling airflow
US5960411A	1997-09-12	1999-09-28	Amazon.Com, Inc.	Method and system for placing a purchase order via a communications network
US5914472A	1997-09-23	1999-06-22	At&T Corp	Credit card spending authorization control system
US6000832A	1997-09-24	1999-12-14	Microsoft Corporation	Electronic online commerce card with customer generated transaction proxy number for online transactions
US5883810A *	1997-09-24	1999-03-16	Microsoft Corporation	Electronic online commerce card with transactionproxy number for online transactions
US20020113082A1	1997-09-26	2002-08-22	Leatherman Russel Dean	Antenna placement in a fueling and retail system
US6611498B1	1997-09-26	2003-08-26	Worldcom, Inc.	Integrated customer web station for web based call management
US6073840A	1997-09-26	2000-06-13	Gilbarco Inc.	Fuel dispensing and retail system providing for transponder prepayment
US6098879A	1997-09-26	2000-08-08	Gilbarco, Inc.	Fuel dispensing system providing customer preferences
US5946669A *	1997-09-30	1999-08-31	Lockheed Martin Corporation	Method and apparatus for payment processing using debit-based electronic funds transfer and disbursement processing using addendum-based electronic data interchange

US6768415B1	1997-10-03	2004-07-27	Micron Technology, Inc.	Wireless identification device, RFID device with push-on/push-off switch, method of manufacturing wireless identification device
US5984180A *	1997-10-06	1999-11-16	Albrecht; Jerry L.	Method and system for gift credit card
US5970475A	1997-10-10	1999-10-19	Intelisys Electronic Commerce, Llc	Electronic procurement system and method for trading partners
EP1023703B1	1997-10-14	2004-06-09	Visa International Service Association	Personalization of smart cards
US6177859B1	1997-10-21	2001-01-23	Micron Technology, Inc.	Radio frequency communication apparatus and methods of forming a radio frequency communication apparatus
US6024286A	1997-10-21	2000-02-15	At&T Corp	Smart card providing a plurality of independently accessible accounts
US5991750A	1997-10-24	1999-11-23	Ge Capital	System and method for pre-authorization of individual account transactions
US5987155A	1997-10-27	1999-11-16	Dew Engineering And Development Limited	Biometric input device with peripheral port
US5958004A	1997-10-28	1999-09-28	Microsoft Corporation	Disabling and enabling transaction committal in transactional application components
US6442533B1 *	1997-10-29	2002-08-27	William H. Hinkle	Multi-processing financial transaction processing system
US5966697A	1997-10-30	1999-10-12	Clearcommerce Corporation	System and method for secure transaction order management processing
IL122105D0	1997-11-04	1998-04-05	Rozin Alexander	A two-way radio-based electronic toll collection method and system for highway
US6038292A	1997-11-07	2000-03-14	American Express Travel Related Services Company, Inc.	Methods and apparatus for language registration of prepaid, remote entry customer account
DE19749755A1	1997-11-11	1999-05-12	Meiller Comcard Gmbh	Transportable card unit
US6177860B1	1997-11-17	2001-01-23	International Business Machines Corporation	Method and economical direct connected apparatus for deploying and tracking computers
US6205151B1	1997-11-21	2001-03-20	Texas Instruments Incorporated	ATM cell scheduler which uses a heap memory and associates timestamps with each channel
US6115360A	1997-11-21	2000-09-05	Texas Instruments Incorporated	Fair scheduling of ATM cell transmissions during overscheduled conditions
US5969318A	1997-11-24	1999-10-19	Mackenthun; Holger	Gateway apparatus for designing and issuing multiple application cards
US6014635A	1997-12-08	2000-01-11	Shc Direct, Inc.	System and method for providing a discount credit transaction network
CH689680A5	1997-12-12	1999-08-13	Electrowatt Tech Innovat Corp	Smart card with durably-protected security elements, e.g. holograms
US6092057A	1997-12-12	2000-07-18	Commstar, Inc.	Unattended POS system for automatic control of bank system rejections
KR100382181B1	1997-12-22	2003-05-09	모토로라 인코포레이티드	Single account portable wireless financial messaging unit
US6023510A	1997-12-24	2000-02-08	Philips Electronics North America Corporation	Method of secure anonymous query by electronic messages transported via a public network and method of response
US6471127B2	2000-07-06	2002-10-29	Bank Of America Corporation	Data card
US20030222153A1	2000-07-06	2003-12-04	Jamily Pentz	Data card
US5970473A	1997-12-31	1999-10-19	At&T Corp.	Video communication device providing in-home catalog services
US6121544A	1998-01-15	2000-09-19	Petsinger; Julie Ann	Electromagnetic shield to prevent surreptitious access to contactless smartcards
US6101477A	1998-01-23	2000-08-08	American Express Travel Related Services Company, Inc.	Methods and apparatus for a travel-related multi-function smartcard
US5989950A	1998-01-26	1999-11-23	Texas Instruments - Acer Incorporated	Reduced mask CMOS salicided process
US6098053A	1998-01-28	2000-08-01	Citibank, N.A.	System and method for performing an electronic financial transaction
US8346663B2	1998-01-30	2013-01-01	Citicorp Development Center, Inc.	Method and system of contactless interfacing for smart card banking
US6889198B2	1998-01-30	2005-05-03	Citicorp Development	Method and system for tracking smart card loyalty points

			Center, Inc.	
US6742128B1	1998-02-03	2004-05-25	Mondex International Limited	System and method for controlling access to computer code in an IC card
US6012049A	1998-02-04	2000-01-04	Citicorp Development Center, Inc.	System for performing financial transactions using a smartcard
US6681344A	1998-02-19	2000-05-09	Micron Technology, Inc.	Method of addressing messages and communications system
US6157824A	1998-03-02	2000-12-05	Bailey; Kenneth S.	Virtual credit card access device for mobile communications equipment
US6421650B1	1998-03-04	2002-07-16	Goetech Llc	Medication monitoring system and apparatus
US6179205B1	1998-03-05	2001-01-30	Visa International Service Association	System and method for locking and unlocking and application in a smart card
US6329920B1	1998-03-09	2001-12-11	Agrifolink Holdings Inc.	Apparatus and method for reading radio frequency identification transponders used for livestock identification and data collection
US6578768B1	1998-03-20	2003-06-17	Mastercard International Incorporated	Method and device for selecting a reconfigurable communications protocol between and IC card and a terminal
US6081790A	1998-03-20	2000-06-27	Citibank, N.A.	System and method for secure presentment and payment over open networks
US6636833B1 *	1998-03-25	2003-10-21	Obis Patents Ltd.	Credit card system and method
SG92632A1	1998-03-30	2002-11-19	Citicorp Dev Ct Inc	Method and system for managing applications for a multi-function smartcard
IL123949A	1998-04-03	2001-07-24	On Track Innovations Ltd	Data transaction card having extended range
US6173899B1	1998-04-03	2001-01-16	Alexander Rozin	Method and system for contactless energy transmission and data exchange between a terminal and IC card
US6505773B1	1998-04-03	2003-01-14	International Business Machines Corporation	Authenticated electronic coupon issuing and redemption
US6158655A	1998-04-08	2000-12-12	Donnelly Corporation	Vehicle mounted remote transaction interface system
US6376403B1 *	1998-04-17	2002-04-23	Nippon Sheet Glass Co., Ltd.	Glass composition and process for producing the same
US6315195B1	1998-04-17	2001-11-13	Diebold, Incorporated	Transaction apparatus and method
US6082675A	1998-04-21	2000-04-18	At&T Corp.	Method and apparatus for preauthorizing credit card type transactions
US6710701B2	1998-04-22	2004-03-23	Gilbarco Inc.	Rfid tag location using tag or host interaction record
US5955961A	1998-04-24	1999-09-21	Sensormatic Electronics Corporation	Combined article surveillance and product identification system
US6178272B1	1998-04-27	2001-01-09	The Clearing House Service Company L.L.C.	Electronic funds transfer method and system and bill presentment method and system
US6068184A	1998-04-27	2000-05-30	Barnett; Donald A	Security card and system for use thereof
US6141752A	1998-05-05	2000-10-31	Liberate Technologies	Mechanism for facilitating secure storage and retrieval of information on a smart card by an internet service provider using various network computer client devices
DE69922082T2	1998-05-11	2005-12-15	Citicorp Development Center, Inc., Los Angeles	System and method for biometric authentication of a user with a smart card
FR2778475B1	1998-05-11	2001-11-23	Schlumberger Systems & Service	NON-CONTACT TYPE MEMORY CARD, AND METHOD FOR MANUFACTURING SUCH A CARD
US6411611B1	1998-05-18	2002-06-25	Koninklijke Philips Electronics N.V.	Communication systems, communication methods and a method of communicating data within a DECT communication system
EP0959440A3	1998-05-22	2000-05-17	Citicorp Development Center, Inc.	System and method for automated electronic scrip transactions
US6085976A	1998-05-22	2000-07-11	Sehr; Richard P.	Travel system and methods utilizing multi-application passenger cards
DE19823532C2	1998-05-26	2003-08-21	T Mobile Deutschland Gmbh	Method for controlling a subscriber identity module (SIM) in mobile radio systems
DE19823731A1	1998-05-27	1999-12-02	Bayerische Motoren Werke Ag	Remote control device for vehicles
US6266754B1	1998-05-29	2001-07-24	Texas Instruments Incorporated	Secure computing device including operating system stored in non-relocatable page of memory
US6131811A	1998-05-29	2000-10-17	E-Micro Corporation	Wallet consolidator

US6129274A	1998-06-09	2000-10-10	Fujitsu Limited	System and method for updating shopping transaction history using electronic personal digital shopping assistant
US6107920A	1998-06-09	2000-08-22	Motorola, Inc.	Radio frequency identification tag having an article integrated antenna
FR2779850A1	1998-06-16	1999-12-17	Roland Moreno	METHOD AND SYSTEM FOR USING A MICROCIRCUIT CARD IN A PLURALITY OF APPLICATIONS
US6141651A	1998-06-19	2000-10-31	First Data Corporation	Funding and settlement integrated suspense processing system
US6029890A	1998-06-22	2000-02-29	Austin; Frank	User-Specified credit card system
US6250554B1	1998-06-23	2001-06-26	Agfa-Gevaert	Chip card comprising an imaged-receiving layer
US6446794B1	1998-06-24	2002-09-03	Benyamin Ron	System and method for synchronizing one time pad encryption keys for secure communication and access control
JP3531481B2	1998-06-29	2004-05-31	日立プラント建設株式会社	Wastewater treatment method and apparatus
US6219439B1	1998-07-09	2001-04-17	Paul M. Burger	Biometric authentication system
US6240989B1	1998-07-14	2001-06-05	Mahmoud Masoud	Business card holder and dispenser
US6105865A	1998-07-17	2000-08-22	Hardesty; Laurence Daniel	Financial transaction system with retirement saving benefit
US6116505A	1998-07-21	2000-09-12	Gilbarco Inc.	Fuel transaction system for enabling the purchase of fuel and non-fuel items on a single authorization
US6173897B1	1998-07-27	2001-01-16	John W. Halpern	Universal card interface module for contact free cards
JP2000048153A	1998-07-31	2000-02-18	Sony Corp	Non-contact ic card
US6438235B2	1998-08-05	2002-08-20	Hewlett-Packard Company	Media content protection utilizing public key cryptography
EP1339032B1	1998-08-14	2007-10-17	3M Innovative Properties Company	Applications for radio frequency identification systems
US6250557B1	1998-08-25	2001-06-26	Telefonaktiebolaget Lm Ericsson (Publ)	Methods and arrangements for a smart card wallet and uses thereof
US6315193B1	1998-08-31	2001-11-13	Mastercard International Incorporated	Financial transaction card with installment loan feature
US6222914B1	1998-09-02	2001-04-24	Mcmullin John L.	System and method for administration of an incentive award system having a delayed award payment using a credit instrument
DE19839847A1	1998-09-02	2000-03-09	Ibm	Storage of data objects in the memory of a chip card
EP1116699B1 *	1998-09-04	2006-02-15	NIPPON SHEET GLASS CO., Ltd.	Light-colored glass of high transmittance and method for production thereof, glass plate with electrically conductive film and method for production thereof, and glass article
US6738749B1 *	1998-09-09	2004-05-18	Ncr Corporation	Methods and apparatus for creating and storing secure customer receipts on smart cards
US6549912B1	1998-09-23	2003-04-15	Visa International Service Association	Loyalty file structure for smart card
US6513015B2	1998-09-25	2003-01-28	Fujitsu Limited	System and method for customer recognition using wireless identification and visual data transmission
US6102162A	1998-10-08	2000-08-15	Teicher; Mordechai	Automated self-service cafeteria system
DE19847135B4	1998-10-13	2007-10-31	Texas Instruments Deutschland Gmbh	Method for reading the data stored in a transponder and transponder system for carrying out the method
US6573884B1	1998-10-16	2003-06-03	Gilbarco Inc.	ADA convertible input display
EP1125262A1	1998-10-27	2001-08-22	Visa International Service Association	Delegated management of smart card applications
US6473500B1	1998-10-28	2002-10-29	Mastercard International Incorporated	System and method for using a prepaid card
US6100804A	1998-10-29	2000-08-08	Intecmec Ip Corp.	Radio frequency identification system
DE29819347U1 *	1998-10-30	2000-01-27	Flachglas Ag	Soda lime silicate glass composition
US6395652B2 *	1998-11-09	2002-05-28	Nippon Sheet Glass Co., Ltd.	Ultraviolet/infrared absorbent glass

US6032136A	1998-11-17	2000-02-29	First Usa Bank, N.A.	Customer activated multi-value (CAM) card
US6353811B1	1998-11-18	2002-03-05	Steven I. Weissman	Credit card billing system for identifying expenditures on a credit card account
US6076296A	1998-11-20	2000-06-20	Schaeffer; Robert	Combined holder and handle for machine readable entry card
US6257486B1	1998-11-23	2001-07-10	Cardis Research & Development Ltd.	Smart card pin system, card, and reader
US20040016796A1	1998-11-25	2004-01-29	Diebold, Incorporated	Automated banking apparatus and method
US6070154A	1998-11-27	2000-05-30	Activepoint Ltd	Internet credit card security
JP2000163538A	1998-11-30	2000-06-16	Dainippon Printing Co Ltd	Information storage medium
US6179206B1	1998-12-07	2001-01-30	Fujitsu Limited	Electronic shopping system having self-scanning price check and purchasing terminal
US6173269B1	1998-12-16	2001-01-09	Zowi.Com, Inc	Method and apparatus for executing electronic commercial transactions with minors
DE19858840A1	1998-12-19	2000-06-21	Orga Kartensysteme Gmbh	Method for bidirectional data transfer between a terminal and a chip card and chip card
EP1014320A1	1998-12-21	2000-06-28	Ncr International Inc.	Method of and apparatus for maintaining a customer loyalty program on a smart card
JP2000177229A	1998-12-21	2000-06-27	Alps Electric Co Ltd	Information recorded matter and information recording method
US6123223A	1998-12-21	2000-09-26	Watkins; Kenneth M.	Automated vending system for floral arrangements
US20030050831A1	1998-12-22	2003-03-13	John Klayh	System for distribution and redemption of loyalty points and coupons
JP4242494B2	1998-12-24	2009-03-25	大日本印刷株式会社	Portable signal processor
EP1016947A3	1998-12-31	2006-04-26	Texas Instruments Incorporated	Portable electronic equipment key
US6327573B1	1998-12-31	2001-12-04	Walker Digital, Llc	Multiple party reward system utilizing single account
US6481621B1	1999-01-12	2002-11-19	International Business Machines Corporation	System method and article of manufacture for accessing and processing smart card information
US6546373B1	1999-01-18	2003-04-08	Mastercard International Incorporated	System and method for recovering refundable taxes
US6829711B1 *	1999-01-26	2004-12-07	International Business Machines Corporation	Personal website for electronic commerce on a smart java card with multiple security check points
US6263316B1	1999-02-02	2001-07-17	Momente, Llc	Automated process for retailing to a vehicle occupant
JP2000222176A	1999-02-03	2000-08-11	Mitsubishi Electric Corp	Random-number generating circuit, noncontact ic card and reader/writer having same random-number generating circuit inside, and method for testing device having same random-number generating circuit inside
US8538801B2	1999-02-19	2013-09-17	Exxonmobile Research & Engineering Company	System and method for processing financial transactions
US7481114B1	1999-02-19	2008-11-11	Visa International Service Association	Conducting commerce between individuals
JP4204133B2	1999-02-26	2009-01-07	ローム株式会社	Communications system
JP4289710B2	1999-03-01	2009-07-01	ローム株式会社	Communication system having authentication function
US6687714B1	1999-03-01	2004-02-03	Citicorp Development Center, Inc.	Method and system for managing transaction card data
US6483477B1	1999-03-10	2002-11-19	Harris Corporation	RF receiving antenna system
US8498898B1	1999-03-19	2013-07-30	Citicorp Development Center, Inc.	System and method for point of use reward determination
US6510998B1	1999-03-29	2003-01-28	Transmo Limited	Card charging system
US6235666B1 *	1999-03-29	2001-05-22	Guardian Industries Corporation	Grey glass composition and method of making same
US6364208B1	1999-03-29	2002-04-02	Transmo Limited	Card changing system
US6507762B1	1999-03-31	2003-01-14	International Business Machines Corporation	Method and system for remotely controlling an appliance using a personal digital assistant

US6400272B1	1999-04-01	2002-06-04	Presto Technologies, Inc.	Wireless transceiver for communicating with tags
US6404341B1	1999-04-06	2002-06-11	1175634 Ontario Limited	Security tag and method of making the same
US6402028B1	1999-04-06	2002-06-11	Visa International Service Association	Integrated production of smart cards
US20040083184A1 *	1999-04-19	2004-04-29	First Data Corporation	Anonymous card transactions
US20020095298A1	1999-04-19	2002-07-18	Frogmagic, Inc.	Blind Gift Method and System
US6685089B2	1999-04-20	2004-02-03	Gilbarco, Inc.	Remote banking during fueling
JP2000306056A	1999-04-22	2000-11-02	Sankyo Seiki Mfg Co Ltd	Magnetic card reader
US6674786B1	1999-04-23	2004-01-06	Sankyo Seiki Mfg. Co., Ltd.	Data demodulation
US6248199B1	1999-04-26	2001-06-19	Soundcraft, Inc.	Method for the continuous fabrication of access control and identification cards with embedded electronics or other elements
US6353420B1	1999-04-28	2002-03-05	Amerasia International Technology, Inc.	Wireless article including a plural-turn loop antenna
US6415978B1	1999-05-03	2002-07-09	Psc Scanning, Inc.	Multiple technology data reader for bar code labels and RFID tags
US6259769B1	1999-05-04	2001-07-10	Cubic Corporation	Portable smart card communication device
US6227447B1	1999-05-10	2001-05-08	First Usa Bank, Na	Cardless payment system
US6883870B1	1999-05-11	2002-03-05	Socket Communications Inc.	Closed case removable expansion card having interconnect and adapter circuitry for both I/O and removable memory
US6304223B1	1999-05-12	2001-10-16	Cubic Corporation	Contactless card automatic check-in check-out device
US6456984B1 *	1999-05-28	2002-09-24	Qwest Communications International Inc.	Method and system for providing temporary credit authorizations
US6577229B1	1999-06-10	2003-06-10	Cubic Corporation	Multiple protocol smart card communication device
US6064981A	1999-06-17	2000-05-16	Barni, Neil A.	Method for online display and negotiation of cargo rates
JP2001005931A	1999-06-18	2001-01-12	Tohken Co Ltd	Barcode seal having rfid function and method for giving rfid function to bar code label
AU774910B2 *	1999-06-23	2004-07-15	Richard Postrel	System for electronic barter, trading and redeeming points accumulated in frequent use reward programs
US6784789B2	1999-07-08	2004-08-31	Intermec Ip Corp.	Method and apparatus for verifying RFID tags
US6116423A	1999-07-23	2000-09-12	Texas Instruments Incorporated	Multi-functional shipping system for integrated circuit devices
US6317755B1	1999-07-26	2001-11-13	Motorola, Inc.	Method and apparatus for data backup and restoration in a portable data device
JP4315530B2	1999-07-29	2009-08-19	富士通株式会社	Detection circuit for contactless IC card device
US6386444B1	1999-07-30	2002-05-14	First Usa Bank, N.A.	System and methods for card payment instrument with rebate applied to an insurance premium
CN1148044C	1999-08-06	2004-04-28	英业达集团(上海)电子技术有限公司	Device and method for connecting external keyboard to mobile telephone
US6224109B1	1999-08-07	2001-05-01	James Yung Chien Yang	Credit card with driver's license or identification
US6886742B2	1999-08-09	2005-05-03	First Data Corporation	Systems and methods for deploying a point-of sale device
US7308426B1 *	1999-08-11	2007-12-11	C-Sam, Inc.	System and methods for servicing electronic transactions
US6575361B1	1999-08-19	2003-06-10	E-2 Interactive, Inc.	System and method for managing stored-value card data
AU6801600A	1999-08-26	2001-03-19	Gamut Interactive, Inc.	Smart card database
USD442629S1	1999-09-01	2001-05-22	American Express Travel Related Services Company, Inc.	Card with an ornamental rectangle
USD442627S1	1999-09-01	2001-05-22	American Express Travel Related Services Company, Inc.	Transparent card with an opacity gradient ornamental rectangle, machine readable stripe and IC chip
WO2001017298A1	1999-09-02	2001-03-08	Automated Business Companies	Communication and proximity authorization systems

US7093767B2	1999-09-07	2006-08-22	American Express Travel Related Services Company, Inc.	System and method for manufacturing a punch-out RFID transaction device
US6748123B2	1999-09-07	2004-06-15	American Express Travel Related Services Company, Inc.	Transaction card
US6764014B2	1999-09-07	2004-07-20	American Express Travel Related Services Company, Inc.	Transaction card
US7070112B2	1999-09-07	2006-07-04	American Express Travel Related Services Company, Inc.	Transparent transaction device
US6581839B1	1999-09-07	2003-06-24	American Express Travel Related Services Company, Inc.	Transaction card
US6608551B1	1999-09-13	2003-08-19	Intermec Ip Corp	Low-cost radio replacement utilizing RFID technology
US20020028704A1	2000-09-05	2002-03-07	Bloomfield Mark E.	Information gathering and personalization techniques
US6286763B1	1999-09-21	2001-09-11	Intermec Ip Corp	Method and apparatus to automatically search data carriers, such as RFID tags and machine-readable symbols
US6318636B1	1999-09-21	2001-11-20	Intermec Ip Corp.	Method and apparatus to read different types of data carriers, such RFID tags and machine-readable symbols, and a user interface for the same
JP2001160105A	1999-09-22	2001-06-12	Sony Corp	Information processing system, portable telephone set, and information processing method
US7340439B2	1999-09-28	2008-03-04	Chameleon Network Inc.	Portable electronic authorization system and method
US6290137B1	1999-10-01	2001-09-18	Perfect Plastic Printing Corporation	Transparent/translucent financial transaction card including an infrared light filter
US6296188B1	1999-10-01	2001-10-02	Perfect Plastic Printing Corporation	Transparent/translucent financial transaction card including an infrared light filter
US20020095389A1	1999-10-05	2002-07-18	Gaines Robert Vallee	Method, apparatus and system for identity authentication
GB9923804D0	1999-10-08	1999-12-08	Hewlett Packard Co	Electronic commerce system
US6681328B1	1999-10-08	2004-01-20	Mastercard International Incorporated	System and method for global internet digital identification
WO2001029789A1	1999-10-15	2001-04-26	Zacharias Ajit K	Secure multi-application card system
DE19950524A1	1999-10-20	2001-04-26	Philips Corp Intellectual Pty	Smart card
US6853987B1	1999-10-27	2005-02-08	Zixit Corporation	Centralized authorization and fraud-prevention system for network-based transactions
JP2001134536A	1999-11-05	2001-05-18	Soriton Syst:Kk	Individual authentication and identification system
US6325285B1	1999-11-12	2001-12-04	At&T Corp.	Smart card with integrated fingerprint reader
IT1311360B1	1999-11-15	2002-03-12	Smartel S P A	INTELLIGENT MULTIFUNCTIONAL PAPER.
FR2801709B1	1999-11-29	2002-02-15	A S K	CONTACTLESS OR CONTACT-FREE HYBRID CHIP CARD TO REDUCE THE RISK OF FRAUD
FR2801707B1	1999-11-29	2002-02-15	A S K	METHOD FOR MANUFACTURING A CONTACT-FREE CONTACT HYBRID CHIP CARD WITH AN ANTENNA SUPPORT OF FIBROUS MATERIAL
US7207478B1	1999-11-30	2007-04-24	Diebold, Incorporated	Check accepting and cash dispensing automated banking machine system and method
WO2001041032A1	1999-11-30	2001-06-07	David Russell	Methods, systems, and apparatuses for secure interactions
US6529880B1	1999-12-01	2003-03-04	Intermec Ip Corp.	Automatic payment system for a plurality of remote merchants
WO2001042938A1	1999-12-10	2001-06-14	Fujitsu Limited	Personal authentication system and portable electronic device having personal authentication function using body information
JP2001167242A	1999-12-10	2001-06-22	Sony Corp	Embossable ic card, producing method therefor and information read confirming system for the same
WO2001045008A1	1999-12-16	2001-06-21	Debit.Net, Inc	Secure networked transaction system
US6427910B1	1999-12-17	2002-08-06	International Business Machines Corporation	Method for managing and updating overloaded cards

FR2802689B1	1999-12-20	2004-08-27	Ordicam Rech Et Dev	METHOD AND DEVICE FOR TIME CONTROL OF THE MOVEMENT OR POSITION OF PEOPLE, ANIMALS OR OBJECTS
US6264106B1	1999-12-27	2001-07-24	Symbol Technologies, Inc.	Combination bar code scanner/RFID circuit
DE10055602A1	1999-12-30	2001-07-12	Ibm	Exit control system for supermarket or department store, produces receipt based on contactlessly received information and updates payment status
EP1113387A3	1999-12-31	2001-11-21	SCHLUMBERGER Systèmes	Smart card having a non-volatile memory with a novel mapping
FR2803675B1	2000-01-11	2002-03-29	Sagem	CHIP CARD WITH FINGERPRINT SENSOR
US6535726B1	2000-01-12	2003-03-18	Gilbarco Inc.	Cellular telephone-based transaction processing
DE10001929A1	2000-01-19	2001-08-09	Skidata Ag	Authorization control facility
US7172112B2	2000-01-21	2007-02-06	American Express Travel Related Services Company, Inc.	Public/private dual card system and method
US6587835B1	2000-02-09	2003-07-01	G. Victor Treyz	Shopping assistance with handheld computing device
US8706627B2	2000-02-10	2014-04-22	Jon Shore	Apparatus, systems and methods for wirelessly transacting financial transfers , electronically recordable authorization transfers, and other information transfers
US7003501B2	2000-02-11	2006-02-21	Maurice Ostroff	Method for preventing fraudulent use of credit cards and credit card information, and for preventing unauthorized access to restricted physical and virtual sites
US7921186B2	2000-02-18	2011-04-05	Intermec Ip Corp.	Method and apparatus for accessing product information using RF tag data
USD447515S1	2000-02-24	2001-09-04	American Express Travel Related Services Company, Inc.	Card with an ornamental rectangle
WO2001065494A2 *	2000-02-28	2001-09-07	Sprarkcharge, Inc.	System, and method for prepaid anonymous and pseudonymous credit card type transactions
US6834270B1 *	2000-02-28	2004-12-21	Carlo Pagani	Secured financial transaction system using single use codes
US6422532B1	2000-03-01	2002-07-23	Invensys Systems, Inc.	Severe service valve positioner
US6388533B2	2000-03-02	2002-05-14	Texas Instruments Incorporated	Programmable ring oscillator
JP2001316128A *	2000-03-02	2001-11-13	Nippon Sheet Glass Co Ltd	Pale colored high transmittance plate-glass and method for manufacturing same
WO2001067355A2 *	2000-03-07	2001-09-13	American Express Travel Related Services Company, Inc.	System for facilitating a transaction
US20030001459A1	2000-03-23	2003-01-02	Cross Match Technologies, Inc.	Secure wireless sales transaction using print information to verify a purchaser's identity
US20010049628A1	2000-03-23	2001-12-06	Robert Icho	On-line system for aggregation of purchase bonuses
SE0001056L	2000-03-24	2001-09-25	Wolf Fernlund	Arrangement and procedure for verifying a person's identity
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
JP2001283122A	2000-03-31	2001-10-12	Dainippon Printing Co Ltd	Transaction system using smart card, and smart card used for the system
WO2001077856A1	2000-04-06	2001-10-18	Brightstreet.Com, Inc.	Loyalty and rewards program over distributed network
US6309098B1	2000-04-07	2001-10-30	Ye Ping Wong	Contactless-IC-card receive and read-write mechanism for an on-street parking meter
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
NO312530B1	2000-04-13	2002-05-21	Bertil Hoggarvik	short Magazine
US6976725B1	2000-04-14	2005-12-13	Sony Corporation	Method for standardizing the use of ISO 7816 smart cards in conditional access systems
AUPQ702900A0	2000-04-20	2000-05-18	Grosvenor Leisure Incorporated	Secure biometric loop

US6853894B1	2000-04-24	2005-02-08	Usa Technologies, Inc.	Global network based vehicle safety and security telematics
US6859310B1	2000-04-24	2005-05-17	Usa Technologies, Inc.	Vehicle related wireless scientific instrumentation telematics
GB0010422D0 *	2000-04-28	2000-06-14	Cast Technologies Limited	Payment apparatus and method
US20020011519A1	2000-05-04	2002-01-31	Shults John R.	System and method for consumer identification using optical and electronic means
AU6083001A	2000-05-09	2001-11-20	Cadmus Technology Ltd	Method and apparatus for providing an integrated loyalty system
JP4453162B2	2000-05-09	2010-04-21	凸版印刷株式会社	Transparent magnetic card and manufacturing method thereof
US6915277B1	2000-05-10	2005-07-05	General Electric Capital Corporation	Method for dual credit card system
US6686847B1	2000-05-12	2004-02-03	Hewlett-Packard Development Company, L.P.	Indicator with daylight visibility using a single light emitting diode
FR2809894B1	2000-05-31	2002-10-25	France Telecom	CRYPTOGRAPHY METHOD, MICROCIRCUIT FOR CHIP CARD AND CHIP CARDS INCLUDING SUCH MICROCIRCUIT
US6745008B1	2000-06-06	2004-06-01	Battelle Memorial Institute K1-53	Multi-frequency communication system and method
US6483929B1	2000-06-08	2002-11-19	Tarian Llc	Method and apparatus for histological and physiological biometric operation and authentication
US6505772B1	2000-06-22	2003-01-14	First Data Corporation	System for utilizing a single card to provide multiple services in an open network environment
US6609656B1	2000-06-26	2003-08-26	Martha F. Harrell	Smart card system for providing financial, travel, and entertainment-related services
EP1299856B1	2000-07-07	2009-04-15	Gemalto SA	Transparent data card
US20020043566A1	2000-07-14	2002-04-18	Alan Goodman	Transaction card and method for reducing frauds
AU7708401A	2000-07-21	2002-02-05	Dresser Inc	Wireless communication in a retail refueling environment
TW504864B	2000-09-19	2002-10-01	Nanopierce Technologies Inc	Method for assembling components and antennae in radio frequency identification devices
WO2002011019A1	2000-08-01	2002-02-07	First Usa Bank, N.A.	System and method for transponder-enabled account transactions
US7774231B2	2000-09-29	2010-08-10	Nokia Corporation	Electronic payment methods for a mobile device
US6771981B1	2000-08-02	2004-08-03	Nokia Mobile Phones Ltd.	Electronic device cover with embedded radio frequency (RF) transponder and methods of using same
US20020052843A1	2000-08-04	2002-05-02	Canon Eduardo Gomez	Smart card for and method of executing transactions
JP2002052356A *	2000-08-09	2002-02-19	Yasuki Nakayama	Fountain apparatus
US20020026419A1	2000-08-24	2002-02-28	Sony Electronics, Inc.	Apparatus and method for populating a portable smart device
US6466804B1	2000-08-25	2002-10-15	Motorola, Inc.	Method and apparatus for remote multiple access to subscriber identity module
US7103575B1	2000-08-31	2006-09-05	International Business Machines Corporation	Enabling use of smart cards by consumer devices for internet commerce
WO2002023321A1	2000-09-12	2002-03-21	Canon Kabushiki Kaisha	Card for service access
DE10045736A1	2000-09-15	2002-04-18	Mario Witte	Method and device for creating row and group cultures
US6624102B2 *	2000-09-18	2003-09-23	Nippon Sheet Glass Co., Ltd.	Ultraviolet and infrared radiation absorbing green glass
US6915279B2	2001-03-09	2005-07-05	Mastercard International Incorporated	System and method for conducting secure payment transactions
US6588660B1	2000-09-29	2003-07-08	Hewlett-Packard Development Company, L.P.	Passive contactless smartcard security system
US20020074398A1	2000-09-29	2002-06-20	Lancos Kenneth J.	System and method for making monetary transactions within a coverage area
JP3524483B2	2000-10-03	2004-05-10	東日本旅客鉄道株式会社	Method and system for charging stored fair
US6824066B2	2000-10-06	2004-11-30	Leon H. Weyant	Electronic access security key card pamphlet

US8924267B1	2000-10-10	2014-12-30	Gilbarco Inc.	Remote payment account relational system and method for retail devices
JP2002133335A	2000-10-20	2002-05-10	Omron Corp	Electronic settlement system and electronic settlement method
US20020183882A1	2000-10-20	2002-12-05	Michael Dearing	RF point of sale and delivery method and system using communication with remote computer and having features to read a large number of RF tags
JP2002140769A	2000-11-02	2002-05-17	Yozan inc	Method for collecting charge
US6339384B1	2000-11-13	2002-01-15	Robert Valdes-Rodriguez	Toll booth credit device
AU4323302A	2000-11-17	2002-06-18	Bradley G Trimble	Object locating system employing rf signaling
JP2002157530A	2000-11-17	2002-05-31	Nec Fielding Ltd	Settlement method and system utilizing prepaid card for electronic commerce
US6877665B2	2000-11-20	2005-04-12	Ecrio, Inc.	System, method, and apparatus for communicating information encoded in a light-based signal using a fob device
EP1337940B1	2000-11-20	2004-04-28	BRITISH TELECOMMUNICATIONS public limited company	Method of managing resources
US20020065716A1	2000-11-30	2002-05-30	Kuschill James E.	Methods and system for processing loyalty transactions
US6631849B2	2000-12-06	2003-10-14	Bank One, Delaware, National Association	Selectable multi-purpose card
US7290364B2	2000-12-08	2007-11-06	Discover Financial Services Llc	Non-rectangular shaped credit card with case
US6950939B2	2000-12-08	2005-09-27	Sony Corporation	Personal transaction device with secure storage on a removable memory device
US6377034B1	2000-12-11	2002-04-23	Texas Instruments Incorporated	Method and circuits for inductor current measurement in MOS switching regulators
US20020077895A1	2000-12-18	2002-06-20	Steve Howell	Electronic consumer incentive distribution system
US20020111210A1	2001-02-15	2002-08-15	Luciano Robert Anthony	Anonymous player identifiers in a gaming environment
US20020079367A1	2000-12-27	2002-06-27	Montani John J.	Method and apparatus for operating a self-service checkout terminal to access a customer account
US20020095343A1	2001-01-12	2002-07-18	Barton Steven P.	Apparatus and method for providing point of purchase products
KR10090514281	2001-01-15	2009-06-29	쓰리엠 이노베이티브 프로퍼티즈 컴파니	Multilayer Infrared Reflecting Film With High and Smooth Transmission in Visible Wavelength Region and Laminate Articles Made Therefrom
US20020095587A1	2001-01-17	2002-07-18	International Business Machines Corporation	Smart card with integrated biometric sensor
US6466126B2	2001-01-19	2002-10-15	Motorola, Inc.	Portable data device efficiently utilizing its available power and method thereof
US6521558B2 *	2001-01-23	2003-02-18	Guardian Industries Corp.	Grey glass composition including erbium
US20020107742A1	2001-02-02	2002-08-08	Magill J. Breck	System for and method of transacting non-fuel purchases using an island transaction terminal
US6429776B1	2001-02-07	2002-08-06	Sensormatic Electronics Corporation	RFID reader with integrated display for use in a product tag system
WO2002065246A2	2001-02-12	2002-08-22	Stockback Holdings, Inc.	Customer loyalty programs and systems and methods for such programs
GB0103452D0	2001-02-13	2001-03-28	Williams Stuart	Identification system
US20020109580A1	2001-02-15	2002-08-15	Shreve Gregory A.	Wireless universal personal access system
US7006834B2	2001-02-21	2006-02-21	International Business Machines Corporation	Method to address security and privacy issue of the use of RFID systems to track consumer products
US20020138438A1	2001-02-23	2002-09-26	Biometric Security Card, Inc.	Biometric identification system using biometric images and copy protect code stored on a magnetic stripe and associated methods
US20020196963A1	2001-02-23	2002-12-26	Biometric Security Card, Inc.	Biometric identification system using a magnetic stripe and associated methods
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
JP2004532448A	2001-02-27	2004-10-21	ビザ・インターナショナル・サービス・アソシエーション	Distributed quantum encrypted pattern generation and scoring

GB2372865B	2001-03-02	2004-06-16	Nokia Mobile Phones Ltd	Electronic transactions
US6480100B1	2001-03-09	2002-11-12	Sat Corporation	Radio frequency identification tag formatting method
WO2002073512A1	2001-03-13	2002-09-19	3M Innovative Properties Company	Radio frequency identification reader with removable media
JP2002274087A	2001-03-15	2002-09-25	Dainippon Printing Co Ltd	Transparent card
US20020131567A1	2001-03-16	2002-09-19	Maginas Stephen Paul	Device and method for repetitive communication of messages
US6523042B2	2001-03-19	2003-02-18	Kenneth Thompson	Promotional two-piece in one postcard housing an integral coupon card
US6623039B2	2001-03-19	2003-09-23	Kenneth Thompson	Multi-purpose card
US6760581B2	2001-03-26	2004-07-06	International Business Machines Corporation	System and method for improved mobile phone functionality
US6850147B2	2001-04-02	2005-02-01	Mikos, Ltd.	Personal biometric key
US20020147913A1	2001-04-09	2002-10-10	Lun Yip William Wai	Tamper-proof mobile commerce system
US20020145037A1	2001-04-09	2002-10-10	Goodwin John C.	Item processing device with barcode reader and integrated RFID interrogator
US20040177045A1	2001-04-17	2004-09-09	Brown Kerry Dennis	Three-legacy mode payment card with parametric authentication and data input elements
AU2002258852A1	2001-04-18	2002-11-05	United States Postal Service	Apparatus and methods for a united states postal service smart card system
US6671358B1	2001-04-25	2003-12-30	Universal Identity Technologies, Inc	Method and system for rewarding use of a universal identifier, and/or conducting a financial transaction
US6869013B2	2001-05-04	2005-03-22	Outsite Networks, Inc.	Systems and methods for the identification and displaying of information
EP1257106B1	2001-05-08	2005-03-23	Telefonaktiebolaget LM Ericsson (publ)	Secure remote subscription module access
US6925565B2	2001-05-25	2005-08-02	Pen-One, Inc	Pen-based transponder identity verification system
US20020176522A1	2001-05-25	2002-11-28	Koninklijke Philips Electronics N.V.	Quadrature envelope-sampling of intermediate frequency signal in receiver
US20020178063A1	2001-05-25	2002-11-28	Kelly Gravelle	Community concept for payment using RF ID transponders
US7401049B2	2001-05-29	2008-07-15	American Express Travel Related Services Company, Inc.	System and method for a prepaid card issued by a foreign financial institution
US20020194303A1	2001-05-29	2002-12-19	Nokia Corporation	Portable shopping assistant
EP1265202A1 *	2001-06-04	2002-12-11	Orbis Patents Limited	Business-to-business commerce using financial transaction numbers
US20020179704A1	2001-06-05	2002-12-05	Ncr Corporation	Enhanced digital wallet
US7588185B2	2001-06-07	2009-09-15	3M Innovative Properties Company	RFID data collection and use
US20020188501A1	2001-06-11	2002-12-12	David Lefkowith	Method and system for providing rebates to automobile owners based on purchases made at participating retailer locations
WO2002101512A2	2001-06-12	2002-12-19	Paytronix Systems, Inc.	Customer identification, loyalty and merchant payment gateway system
US6626356B2	2001-06-14	2003-09-30	General Electric Company	Multi-use credit card for financial transactions and vehicle configuration
FR2826153B1	2001-06-14	2004-05-28	A S K	METHOD FOR CONNECTING A CHIP TO AN ANTENNA OF A RADIO FREQUENCY IDENTIFICATION DEVICE OF THE CONTACTLESS CHIP CARD TYPE
US6457996B1	2001-06-22	2002-10-01	Jess-Link Products Co., Ltd.	Connector to PDA external keyboard
US6498118B1 *	2001-06-27	2002-12-24	Guardian Industries Corp.	Grey glass composition including erbium and holmium
US8960535B2	2001-07-10	2015-02-24	Iii Holdings 1, Llc	Method and system for resource management and evaluation
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
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

US7542942B2	2001-07-10	2009-06-02	American Express Travel Related Services Company, Inc.	System and method for securing sensitive information during completion of a transaction
US7889052B2	2001-07-10	2011-02-15	Xatra Fund Mx, Llc	Authorizing payment subsequent to RF transactions
US20030014307A1	2001-07-16	2003-01-16	General Motors Corporation	Method and system for mobile commerce advertising
US20030014457A1	2001-07-16	2003-01-16	General Motors Corporation	Method and system for conducting user defined mobile commerce
US20030018532A1	2001-07-23	2003-01-23	General Motors Corporation	Method and device for conducting mobile commerce
US6669086B2	2001-07-23	2003-12-30	Faisal H. Abdi	Self service check cashing system and method
US20030033697A1	2001-08-16	2003-02-20	Hicks Bryan K.	Buckle lanyard connector and system
US20030046228A1	2001-08-28	2003-03-06	Jean-Marc Berney	User-wearable functional jewelry with biometrics and smartcard to remotely sign and/or authenticate to e-services
WO2003022574A1	2001-09-05	2003-03-20	Sony Corporation	Plastic card
CA2459352A1	2001-09-06	2003-03-20	Mastercard International Incorporated	Method and device for control by consumers over personal data
US20030055727A1	2001-09-18	2003-03-20	Walker Jay S.	Method and apparatus for facilitating the provision of a benefit to a customer of a retailer
US6811082B2	2001-09-18	2004-11-02	Jacob Y. Wong	Advanced magnetic stripe bridge (AMSB)
US6695166B2	2001-09-26	2004-02-24	Vending Management Services, Ltd.	Vending machine inventory system and method
US20030069828A1	2001-10-04	2003-04-10	Eastman Kodak Company	System for and managing assets using priority tokens
US6859672B2	2001-10-04	2005-02-22	Cryovac, Inc.	Method of linking a food source with a food product
CA2459726C	2001-10-05	2013-09-03	Mastercard International Incorporated	System and method for integrated circuit card data storage
US7996318B2	2001-10-09	2011-08-09	Robert Victor Marcon	Multi-function electronic transaction card
US6830193B2	2001-11-29	2004-12-14	Matsushita Electric Industrial Co., Ltd.	Non-contact IC card
US6857566B2	2001-12-06	2005-02-22	Mastercard International	Method and system for conducting transactions using a payment card with two technologies
US7805376B2	2002-06-14	2010-09-28	American Express Travel Related Services Company, Inc.	Methods and apparatus for facilitating a transaction
US6817530B2	2001-12-18	2004-11-16	Digimarc Id Systems	Multiple image security features for identification documents and methods of making same
US20030112972A1	2001-12-18	2003-06-19	Hattick John B.	Data carrier for the secure transmission of information and method thereof
US6675093B1	2001-12-21	2004-01-06	Garmin Ltd.	Systems, functional data, and methods for generating a route
US7127736B2	2001-12-26	2006-10-24	Vivotech, Inc.	Micropayment financial transaction process utilizing wireless network processing
US7051932B2	2001-12-26	2006-05-30	Vivotech, Inc.	Adaptor for magnetic stripe card reader
US20030225623A1	2002-01-04	2003-12-04	John Wankmueller	Method and system for conducting transactions using a payment card with account information encoded in bar code
US20030130820A1	2002-01-07	2003-07-10	Lane George H.	Work order system
US7069444B2	2002-01-25	2006-06-27	Brent A. Lowensohn	Portable wireless access to computer-based systems
US6610622B1 *	2002-01-28	2003-08-26	Guardian Industries Corp.	Clear glass composition
US6732919B2	2002-02-19	2004-05-11	Hewlett-Packard Development Company, L.P.	System and method for using a multiple-use credit card
US6691904B2	2002-02-25	2004-02-17	Gerardo Pineda	ID badge lanyard combination necktie holdown apparatus
GB0204620D0	2002-02-28	2002-04-10	Europay Internat N V	Chip authentication programme

US20030225713A1	2002-03-08	2003-12-04	Atkinson Roger F.	Prepayment system for power distribution using RFID technology
US7426479B2	2002-03-12	2008-09-16	Nec Corporation	Customer activity data system and method
RU2324979C2	2002-03-19	2008-05-20	Мастеркард Интернэшнл Инкорпорейтед	Method and system for conducting transaction using proximity device
US20050127164A1	2002-03-19	2005-06-16	John Wankmueller	Method and system for conducting a transaction using a proximity device and an identifier
US20030187786A1	2002-03-26	2003-10-02	Amy Swift	Merchant transponder systems using electronic check processing
US7925576B2	2002-03-26	2011-04-12	First Data Corporation	Systems for processing transponder-based transactions
US20030187790A1	2002-03-26	2003-10-02	Amy Swift	Electronic check processing systems
US7131571B2	2002-03-26	2006-11-07	First Data Corporation	Alternative payment devices using electronic check processing as a payment mechanism
US20020107007A1	2002-03-27	2002-08-08	Howard Gerson	Method for wireless telephony payment and an apparatus therefor
AU2003230751A1	2002-03-29	2003-10-13	Bank One, Delaware, N.A.	System and process for performing purchase transaction using tokens
JP3940014B2	2002-03-29	2007-07-04	富士通株式会社	Semiconductor integrated circuit, wireless tag, and contactless IC card
US20030195037A1	2002-04-11	2003-10-16	Vt Tech Corp.	Video gaming machine for casino games
US20030195842A1	2002-04-15	2003-10-16	Kenneth Reece	Method and device for making secure transactions
US7707120B2	2002-04-17	2010-04-27	Visa International Service Association	Mobile account authentication service
US6851617B2	2002-04-19	2005-02-08	Avery Dennison Corporation	Laser imageable RFID label/tag
US20030227550A1	2002-06-06	2003-12-11	Manico Joseph A.	System and method for providing a customized imaging product or service
WO2003106283A1	2002-06-17	2003-12-24	Mars, Incorporated	Container with integral card holder
US8060139B2	2002-06-24	2011-11-15	Toshiba American Research Inc. (Tari)	Authenticating multiple devices simultaneously over a wireless link using a single subscriber identity module
US20040015451A1	2002-07-10	2004-01-22	Sahota Jagdeep Singh	Method for conducting financial transactions utilizing infrared data communications
US8412623B2	2002-07-15	2013-04-02	Citicorp Credit Services, Inc.	Method and system for a multi-purpose transactional platform
US20040011877A1	2002-07-19	2004-01-22	Reppermund Hans U.	System for a card having data embedded therein
US6793141B1	2002-07-23	2004-09-21	R. William Graham	Credit card
US20040127256A1	2002-07-30	2004-07-01	Scott Goldthwaite	Mobile device equipped with a contactless smart card reader/writer
US6842106B2	2002-10-04	2005-01-11	Battelle Memorial Institute	Challenged-based tag authentication model
US20040139021A1	2002-10-07	2004-07-15	Visa International Service Association	Method and system for facilitating data access and management on a secure token
US6889711B2 *	2002-11-25	2005-05-17	Ford Global Technologies, Llc	Inline fuel cooling of the carbon canister
US7005965B2	2003-02-14	2006-02-28	Winbond Electronics Corporation	Radio frequency identification device
US6708875B1	2003-02-24	2004-03-23	Maria Ward Johnson	Harness wallet
US20040193676A1	2003-03-24	2004-09-30	Nokia Corporation	System, terminal and method of transmitting information utilizing a variable-string uniform resource locator (URL)
US7004385B1	2003-04-01	2006-02-28	Diebold Self-Service Systems Division Of Diebold, Incorporated	Currency dispensing ATM with RFID card reader
US7268667B2	2003-05-09	2007-09-11	American Express Travel Related Services Company, Inc.	Systems and methods for providing a RF transaction device operable to store multiple distinct accounts
US7100821B2 *	2003-05-15	2006-09-05	Mehran Randall Rasti	Charge card and debit transactions using a variable charge number
WO2004105359A2	2003-05-19	2004-12-02	Einar Rosenberg	An apparatus and method for increased security of wireless transactions

US20040236680A1	2003-05-22	2004-11-25	International Business Machines Corporation	Method and apparatus for displaying embedded chip states and embedded chip end-user application states
USD509243S1	2003-05-22	2005-09-06	Mastercard International Incorporated	Card
US6981591B2	2003-07-31	2006-01-03	Umbra Inc.	Case with elastic-secured end cap
US20050040272A1	2003-08-19	2005-02-24	Argumedo Armando Jesus	Cartridge with slanted memory chip and conforming wall
US8156042B2	2003-08-29	2012-04-10	Starbucks Corporation	Method and apparatus for automatically reloading a stored value card
US7104446B2	2003-09-03	2006-09-12	Visa U.S.A., Inc.	Method, system and portable consumer device using wildcard values
WO2005029231A2	2003-09-12	2005-03-31	Moebs Services, Inc.	Risk identification system and methods
US7039440B2	2003-11-20	2006-05-02	International Business Machines Corporation	Wireless rechargeable money card
US7386305B2	2003-12-03	2008-04-22	Pen-One Inc	Security authentication method and system
US20050149358A1	2004-01-06	2005-07-07	Lisa M. Sacco And Lynn Greenky	RFID tracking of anesthesiologist and patient time
US20050221855A1	2004-03-31	2005-10-06	Silvester Kelan C	User authentication using a mobile phone SIM card
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WO2008059465A3 *	2006-11-16	2008-07-10	Net 1 Ueps Technologies Inc	Secure financial transactions
GB2446179A *	2007-02-01	2008-08-06	Monitise Group Ltd	Obtaining credit card data using a mobile telephone
US7774370B2	2002-09-30	2010-08-10	Sampson Scott E	Controlling the validity status of communicated messages
ES2348432A1 *	2006-11-16	2010-12-07	Net1 Ueps Technologies Inc.	Secure financial transactions
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US8266441B2	2005-04-22	2012-09-11	Bank Of America Corporation	One-time password credit/debit card
US8381995B2	2007-03-12	2013-02-26	Visa U.S.A., Inc.	Payment card dynamically receiving power from external source
CN103106380A *	2013-01-11	2013-05-15	聚辰半导体(上海)有限公司	Protective method for radio frequency system
US8732005B2	2000-07-26	2014-05-20	Rewards Network Incorporated	System and method for providing consumer rewards
CN106911764A *	2017-01-19	2017-06-30	浙江维融电子科技股份有限公司	Meet different financial machine and tool cut-in methods
US10387632B2	2017-05-17	2019-08-20	Bank Of America Corporation	System for provisioning and allowing secure access to a virtual credential
US10574651B2	2017-05-17	2020-02-25	Bank Of America Corporation	System for electronic authentication with live user determination
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US7437313B1	1998-03-11	2008-10-14	West Direct, Llc	Methods, computer-readable media, and apparatus for offering users a plurality of scenarios under which to conduct at least one primary transaction
US20020198806A1 *	1998-04-24	2002-12-26	First Data Corporation	Systems and methods for accessing and modifying usage parameters associated with a financial transaction account

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US7076465B1 *	1998-04-24	2006-07-11	First Data Corporation	Methods for processing a group of accounts corresponding to different products
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US7050996B1 *	1998-04-24	2006-05-23	First Data Corporation	Method for linking accounts corresponding to different products together to create a group
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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
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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
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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

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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
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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

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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

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

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
WO2004008641A2 *	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
US6805287B2	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 *	2003-12-16	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

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
US7866544B2 *	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
US7578430B2 *	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

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
US7708367B2	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

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	国际签证服务协会	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
US7836094B2 *	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

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

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
US8321489B2	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
US8589296B2	2009-05-15	2013-11-25	Visa International Service Association	Secure Communication of payment information to merchants using a verification token
US8554564B2	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

				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
US8635159B1 *	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	Bml 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

			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

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

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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

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
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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*
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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

			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)	

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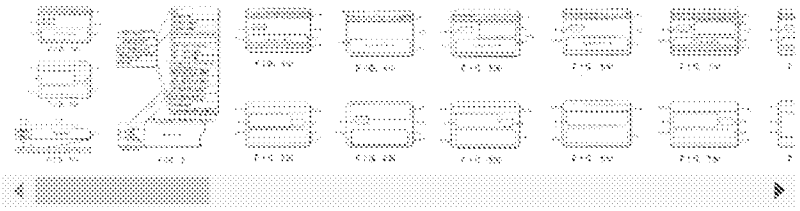
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Electronic bankbook and cash transaction information processing system using the same

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

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Other languages: German, French

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Worldwide applications

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Application EP95925144A events

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1996-07-03	Publication of EP0720102A1
1997-09-03	Publication of EP0720102A4
Status	Ceased

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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

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

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

[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.

[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

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.

[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 than 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

[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.

(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.

[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.

[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

[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.

[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.

[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

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.

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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

				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
US9330784B1	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

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

			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
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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

			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

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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

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
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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

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

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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

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

External links: Espacenet, Global Dossier, Discuss

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Publication number	Priority date	Publication date	Assignee	Title
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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 Coburn 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
US7581678B2	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
US8315717B2	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
US7887878B2	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
CN107209946A	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
DE60133851D1	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	

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PTO/SB/08a (02-18)
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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

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	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

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	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)		
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	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	

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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]
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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.**

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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.

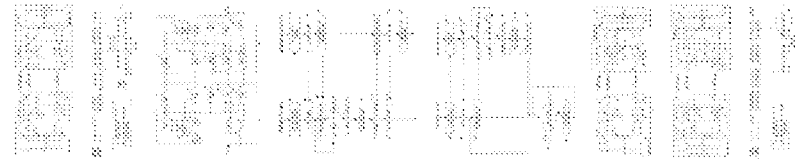
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Patents 4931912

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, 憲明 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

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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.

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.

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.

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.

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.

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

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.

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.

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

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

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

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.

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

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,

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

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

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Priority And Related Applications

Priority Applications (4)

Application	Priority date	Filing date	Title
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JP2008513094A	2006-04-26	2007-02-20	Signal transmission method, transmission / reception apparatus, and communication system
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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
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Patents 4345850

Communication system and communication apparatus

Classifications

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

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Claims (12)

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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 ε_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 μ_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.

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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.

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".

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.

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.

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

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

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

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.

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

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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

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
US10848391B2	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

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

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
US9997940B2	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
US10559983B1	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

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
US9882277B2	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
US10223858B2 *	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

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
US10755542B2	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

				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

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
US10419974B1	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

				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
US10651619781	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
US10977773B2	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

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

			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

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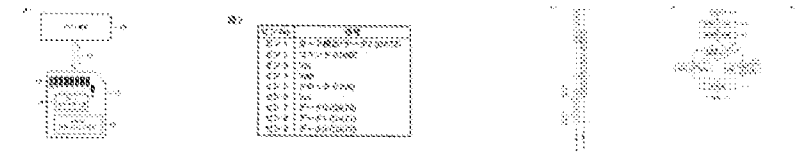
Patents 2008046923

Method of controlling semiconductor memory card system

Abstract

<P>PROBLEM TO BE SOLVED: To provide a method of co, troIli, g a semico, ductor memory card system for commu, icati, g i, formatic, 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, troIli, 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, Ii, 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)



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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

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, Ii, e as the comma, d.

2. 2. The method of co, troIli, 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, troIli, 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, troIli, 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,
tssui, 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, troI method for tra, smitti, g war, i, g i, formatio, i, a semico, ductor memory card system.

Semico, ductor memory cards such as SD™ 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, formatic, 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 L 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 SDTM 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

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JP2000181805A *	1998-12-16	2000-06-30	Hagiwara Sys-	Storage device

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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, a, 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

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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
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US9741027B2	2007-12-14	2017-08-22	Tyfo, e, i, c.	Memory card based co, tactless devices
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FR2990539B1 *	2012-05-11	2016-03-11	Morpho	METHOD AND DEVICE FOR SENDING A MESSAGE
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Applications Claiming Priority (3)

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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

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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

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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

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Status Withdrawn

Info: Patent citations (230), Non-patent citations (1), Cited by (31), Legal events, Similar documents, Priority and Related Applications

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JP2005202914A *	2003-12-15	2005-07-28	Matsushita Electric Ind Co Ltd	Secure device and information processor
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TWI457835B	2004-02-04	2014-10-21	Semiconductor Energy Lab	An article carrying a thin film integrated circuit
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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
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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
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JP2006209643A	2005-01-31	2006-08-10	Ricoh Co Ltd	Interface circuit and system device using the same
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JP5741782B1 *	2013-08-13	2015-07-01	株式会社村田製作所	ANTENNA DEVICE, CARD-TYPE DEVICE, AND ELECTRONIC DEVICE
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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



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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) .

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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) .

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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
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EP1213690A3	2004-04-07	Efficient and secure bill payment method and system via mobile IP terminals
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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
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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

			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

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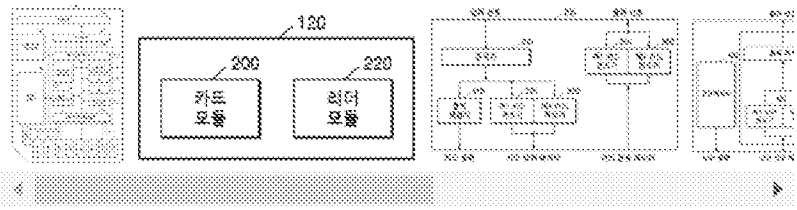
Patents 100596410

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

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Other languages: Korean

Inventor: 박영수, 하지완, 김영세, 전성익

Worldwide applications

2004 KR 2005 US JP

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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

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

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

/ 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
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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
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US7581678B2	2005-02-22	2009-09-01	Tyfone, Inc.	Electronic transaction card
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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
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US8041388B2 *	2008-09-26	2011-10-18	Apple Inc	Adapter
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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	

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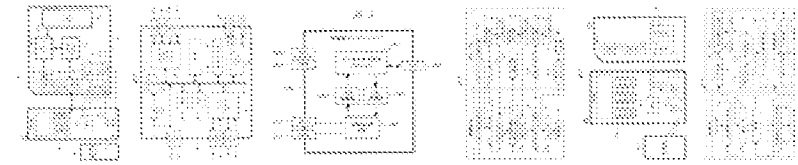
Patents 2007317170

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

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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

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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

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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.

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.

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.

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

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)

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,

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

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

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.

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Priority And Related Applications

Priority Applications (2)

Application	Priority date	Filing date	Title
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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

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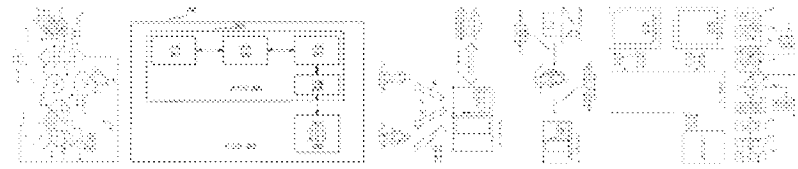
Patents 20100126850

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

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Other languages: Korean

Inventor: 선 에스. 모살, 제인 제이 모살, 하우안 사피자데

Worldwide applications

2009 KR MX UA SG EP AU CN CA MY AP WO HK 2010 IL ZA 2011 US

Application KR1020107024143A events

2008-03-28 Priority to US4052608P

2008-03-28 Priority to US61/040,926

2009-03-28 Application filed by 엘프리스트 엘피

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.

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

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

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

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.

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

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

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,

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.

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

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).

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

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

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 (! 5). 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

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

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

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31, 32, 33: Third Party 40: Mobile Phone Network

41-42-43: telephone

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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
US7447510B2 *	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
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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
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US9572033B2 *	2006-05-25	2017-02-14	Celltrust Corporation	Systems and methods for encrypted mobile voice communications
US8225388B2 *	2006-05-25	2012-07-17	Celltrust Corporation	Methods to authenticate access and alarm as to proximity to location
KR101690850B1 *	2012-02-22	2016-12-28	셀트러스트 코포레이션	Systems and methods for encrypted mobile voice communications
US7991158B2 *	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

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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
AU2009286866B2 *	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
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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
US8373004B2 *	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
US9626831B2	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
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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
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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
US20140067675A1 *	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
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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
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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
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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
US9694882B2	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]

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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
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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

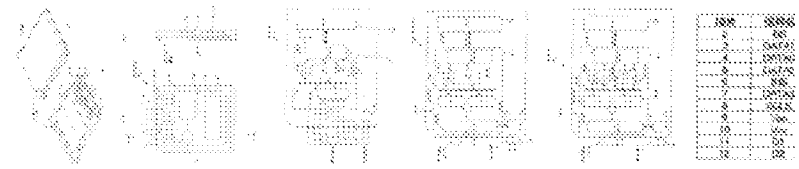
Date	Code	Title	Description
2014-02-04	A201	Request for examination	
2014-02-04	AMND	Amendment	
2014-11-25	E902	Notification of reason for refusal	
2015-05-26	AMND	Amendment	
2015-10-07	E601	Decision to refuse application	
2016-01-07	J201	Request for trial against refusal decision	
2016-02-04	AMND	Amendment	
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

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Patents 4864346

Memory card and card adapter

Images (24)



JP4864346B2
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Other languages: Japanese

Inventor: 禎孝 青木, 敬… 岡井, 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
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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

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

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,

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

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).

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.

(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.

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.

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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
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Legal Events

Date	Code	Title	Description
2008-04-11	A621	Written request for application examination	**Free format text:** JAPANESE INTERMEDIATE CODE: A621

			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
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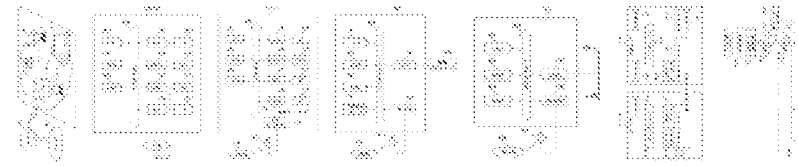
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Patents 4766666

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

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Worldwide applications

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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

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_W 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.

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.

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.

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.

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)
618 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

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US7216802B1 *	1997-10-21	2007-05-15	Carlos De La Huerga	Method and apparatus for verifying information
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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
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US7580989B2	2009-08-25	Information processing device, printing device, printing system, system setting method, storage medium storing computer-readable program, and program
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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
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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

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	

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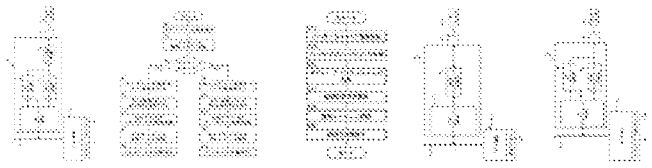
Patents 2006209643

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.

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

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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

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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

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Claims (13)

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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.

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.

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;

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.

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.

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

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

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).

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.

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.

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).

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

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 *	2010-04-06	2014-04-16	ソニモ一株式会社	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

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

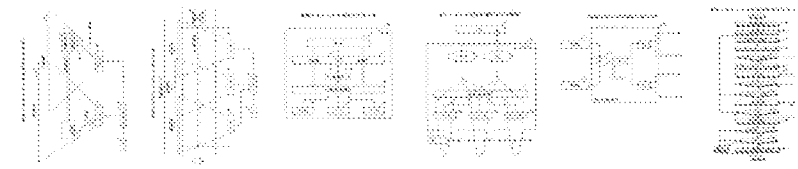
Patents 2006106897

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, o 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

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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.