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(54) IMAGE TRANSMISSION SYSTEM, IMAGE RELAY APPARATUS AND ELECTRONIC IMAGE DEVICE

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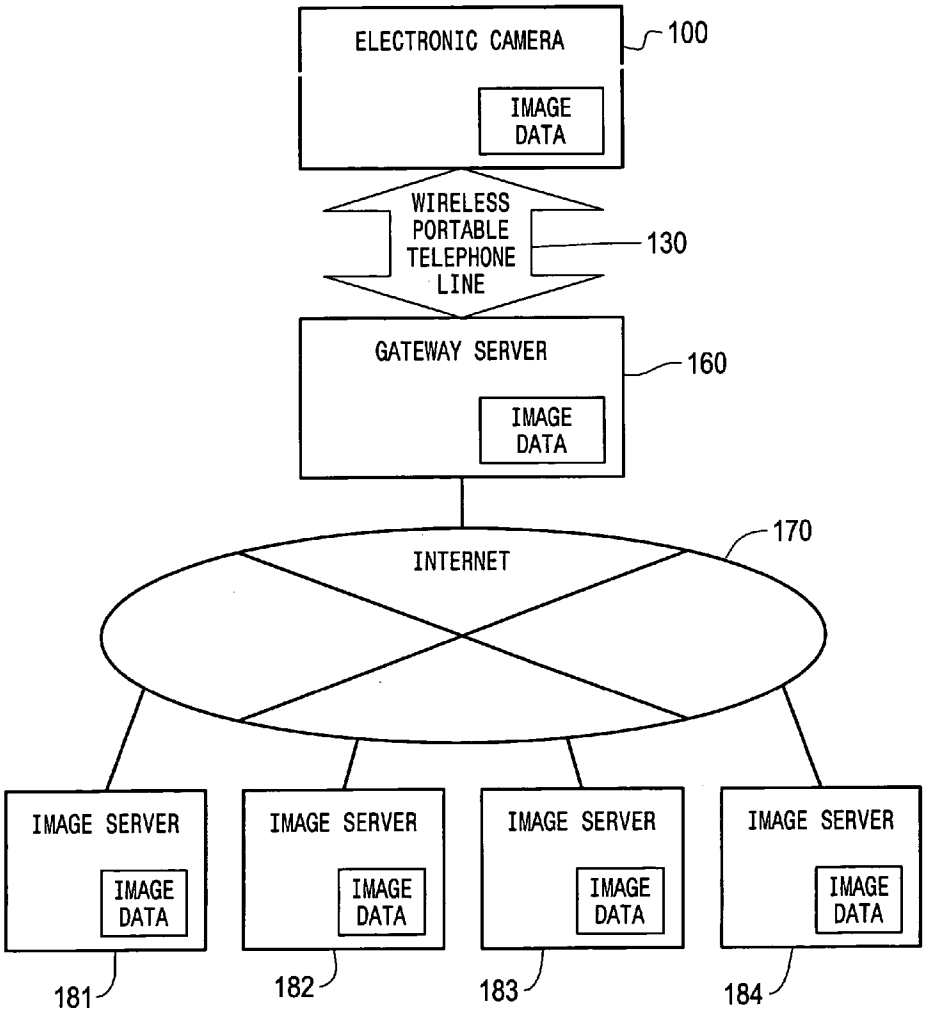
(57) **ABSTRACT**

An electronic camera **100** automatically transmits captured image data and user identification information to a gateway server **160** over a wireless portable telephone link **130.** The gateway server **160** manages image albums created on a per-user basis on multiple image servers on the Internet **170,** automatically selects one of the multiple image servers based on the user identification information received from the electronic camera **100,** and stores the image data received from the electronic camera **100** in an image album corresponding to the user identification information on the selected image server.



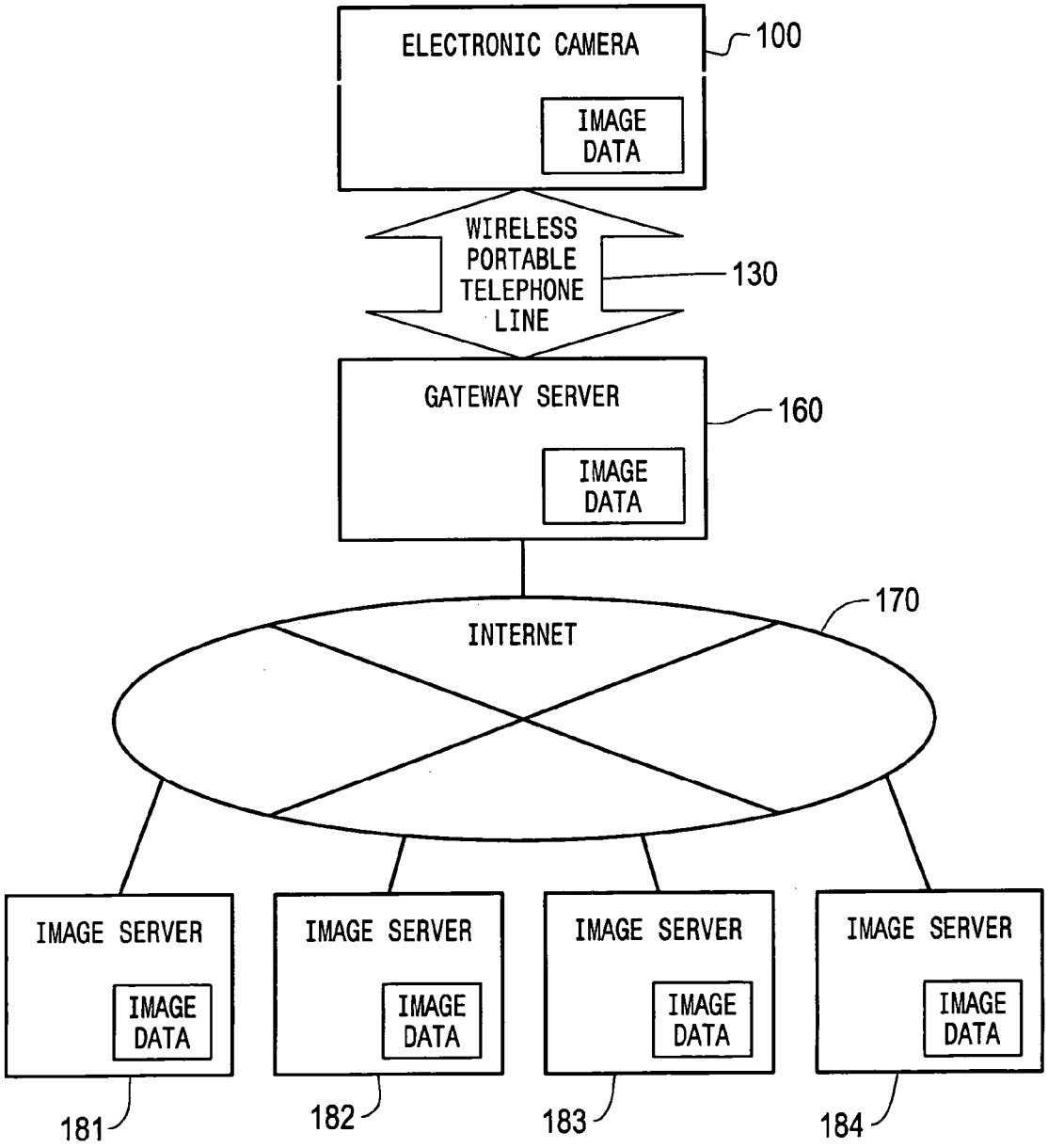

ELECTRONIC CAMERA
100
IMAGE DATA
WIRELESS PORTABLE TELEPHONE LINE
130
GATEWAY SERVER
160
IMAGE DATA
INTERNET
170
IMAGE SERVER
IMAGE DATA
181
IMAGE SERVER
IMAGE DATA
182
IMAGE SERVER
IMAGE DATA
183
IMAGE SERVER
IMAGE DATA
184

Fig. 1

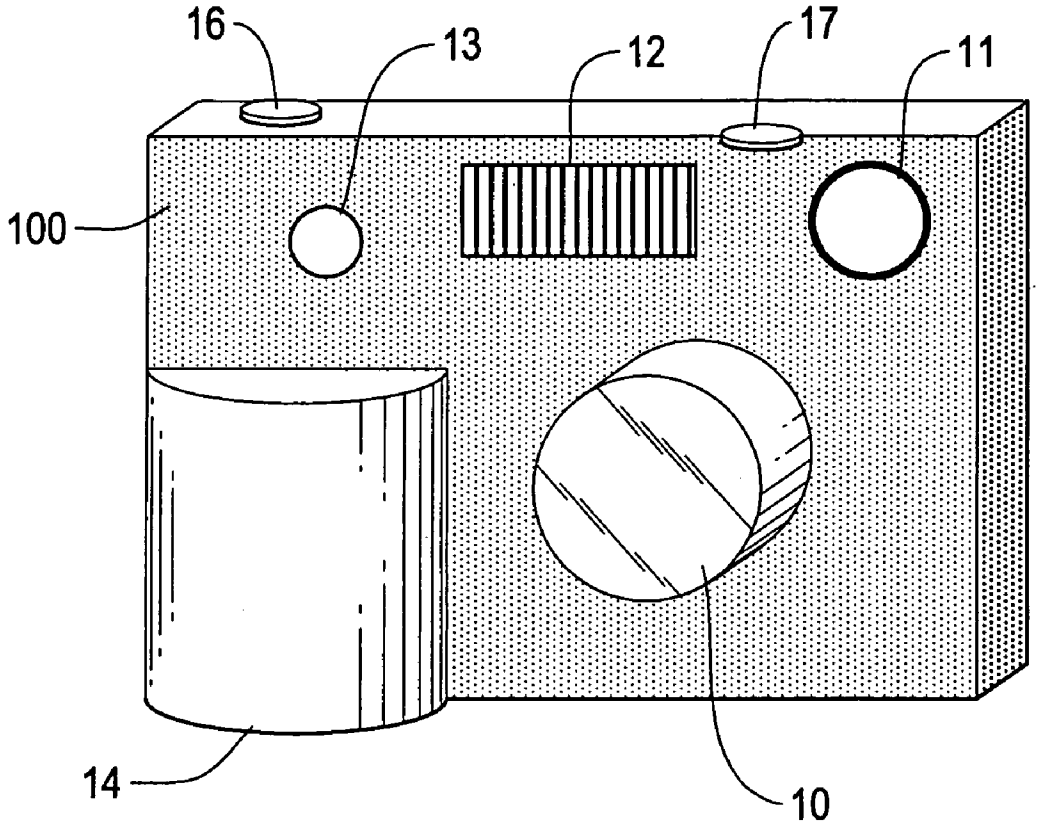


Fig. 2

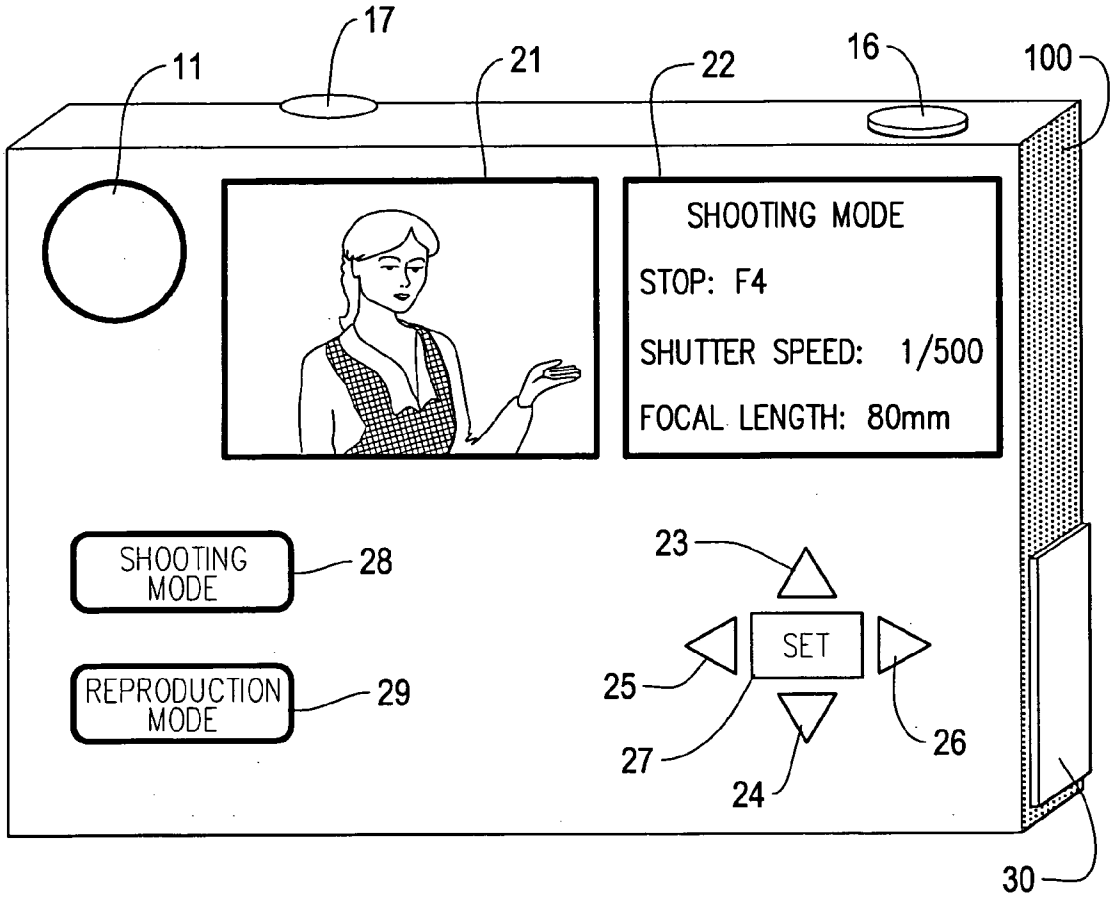

17
11
21
22
16
100
SHOOTING MODE
STOP: F4
SHUTTER SPEED: 1/500
FOCAL LENGTH: 80mm
SHOOTING MODE
28
REPRODUCTION MODE
29
23
SET
25
27
24
26
30

Fig. 3

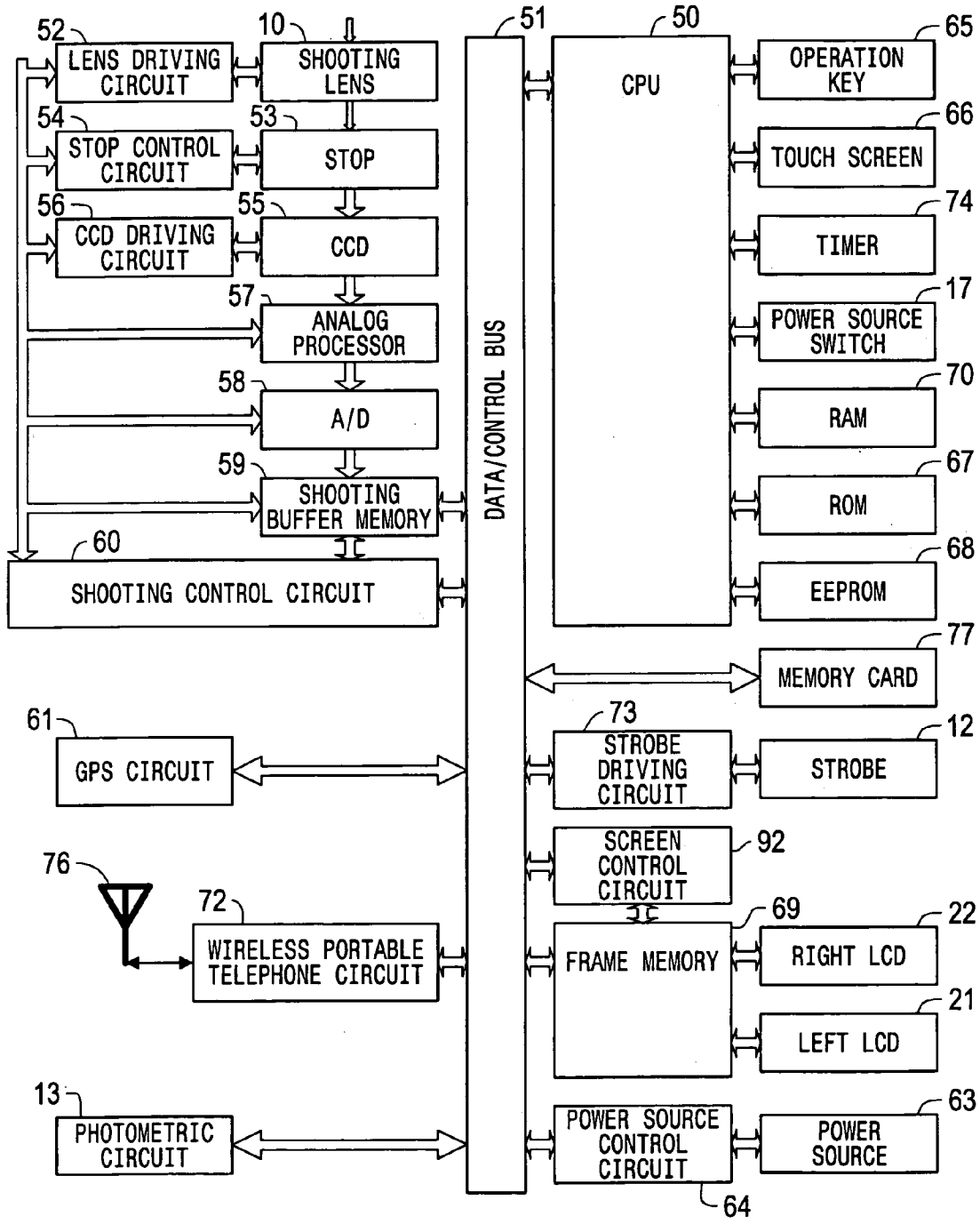

52
LENS DRIVING CIRCUIT
10
SHOOTING LENS
54
STOP CONTROL CIRCUIT
53
STOP
56
CCD DRIVING CIRCUIT
55
CCD
57
ANALOG PROCESSOR
58
A/D
59
SHOOTING BUFFER MEMORY
60
SHOOTING CONTROL CIRCUIT
61
GPS CIRCUIT
76
72
WIRELESS PORTABLE TELEPHONE CIRCUIT
13
PHOTOMETRIC CIRCUIT
51
DATA/CONTROL BUS
50
CPU
73
STROBE DRIVING CIRCUIT
SCREEN CONTROL CIRCUIT
92
69
FRAME MEMORY
POWER SOURCE CONTROL CIRCUIT
64
65
OPERATION KEY
66
TOUCH SCREEN
74
TIMER
17
POWER SOURCE SWITCH
70
RAM
67
ROM
68
EEPROM
77
MEMORY CARD
12
STROBE
22
RIGHT LCD
21
LEFT LCD
63
POWER SOURCE

Fig. 4

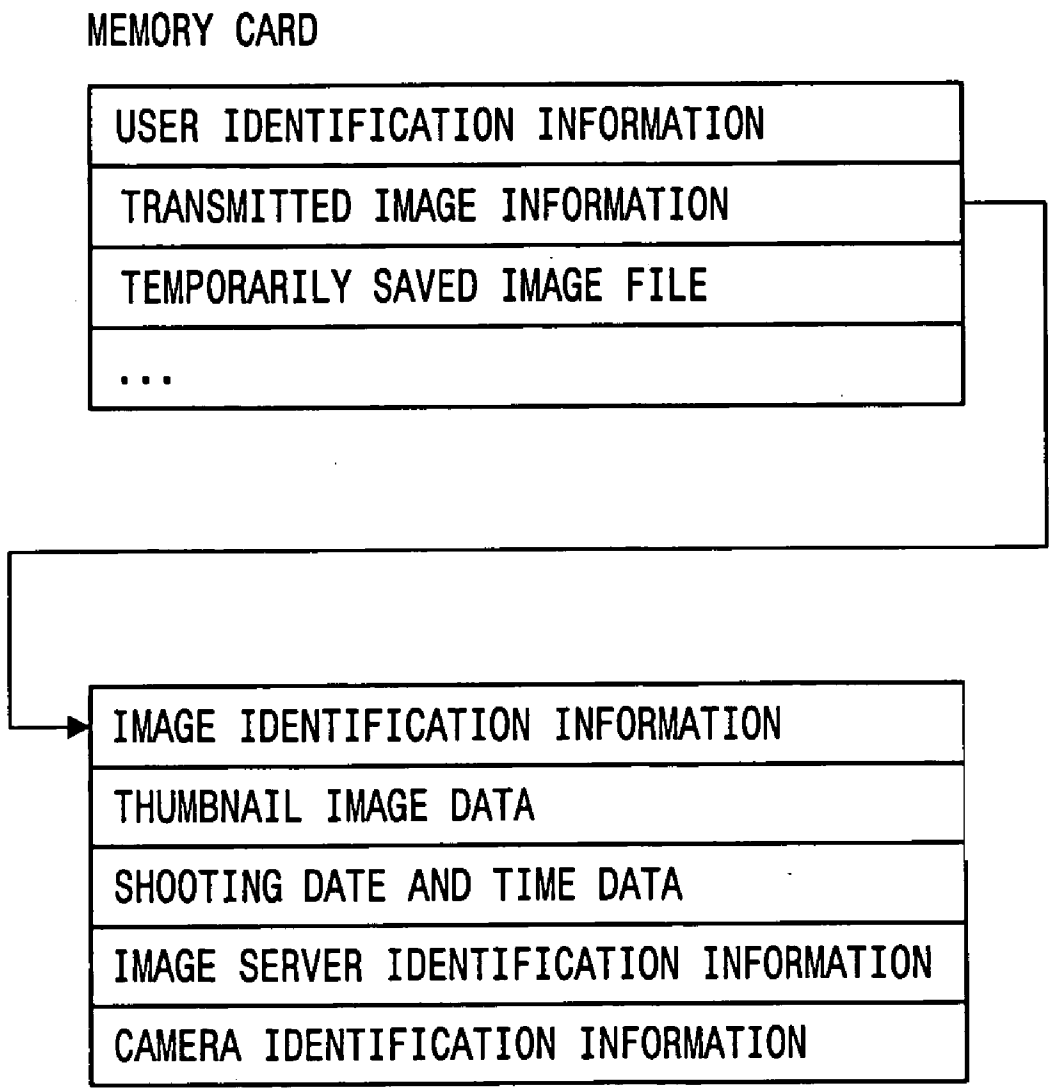

MEMORY CARD
USER IDENTIFICATION INFORMATION
TRANSMITTED IMAGE INFORMATION
TEMPORARILY SAVED IMAGE FILE
...
IMAGE IDENTIFICATION INFORMATION
THUMBNAIL IMAGE DATA
SHOOTING DATE AND TIME DATA
IMAGE SERVER IDENTIFICATION INFORMATION
CAMERA IDENTIFICATION INFORMATION

Fig. 5

IMAGE FILE

IMAGE DATA
ADDITIONAL INFORMATION DATA

ADDITIONAL INFORMATION DATA

ITEM	CONTENT
IMAGE IDENTIFICATION INFORMATION	I M G 0 0 1 2 3 4
CAMERA IDENTIFICATION INFORMATION	C I D 0 0 8 8 7 8
USER IDENTIFICATION INFORMATION	U I D 5 3 0 7 2 8
SHOOTING DATE AND TIME DATA	OCTOBER 31, 2001 10:58:47
SHOOTING POSITION DATA	137°50'E 38°21'N
SHOOTING LENS	50-100mm/f4
SHOOTING FOCAL LENGTH	80mm
SHOOTING STOP VALUE	f4
SHUTTER SPEED	1/250
EXPOSURE	+0.5 LEVEL
FOCUS	+50 MICRON
STROBE	YES
STROBE LIGHT AMOUNT	-1 LEVEL
...	...

Fig.6

E E P R O M

CAMERA IDENTIFICATION INFORMATION
GATEWAY SERVER ACCESS INFORMATION
...

Fig. 7

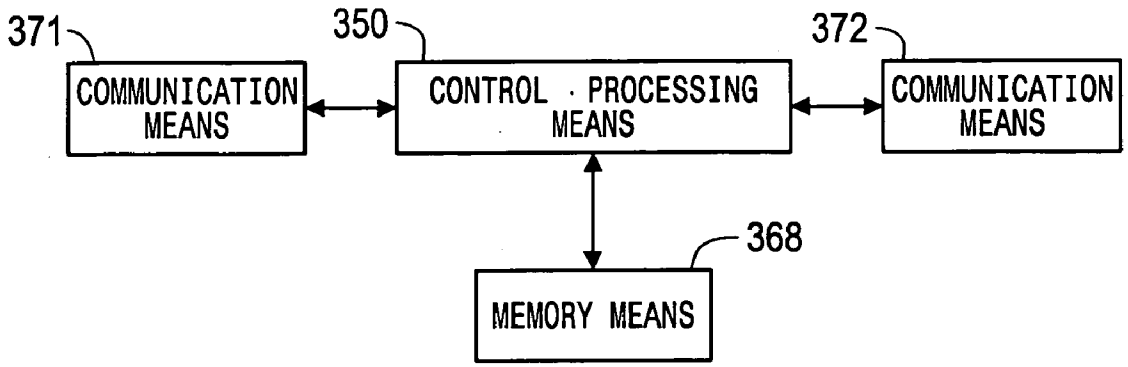

371
350
372
COMMUNICATION MEANS
CONTROL · PROCESSING MEANS
COMMUNICATION MEANS
368
MEMORY MEANS

Fig.8

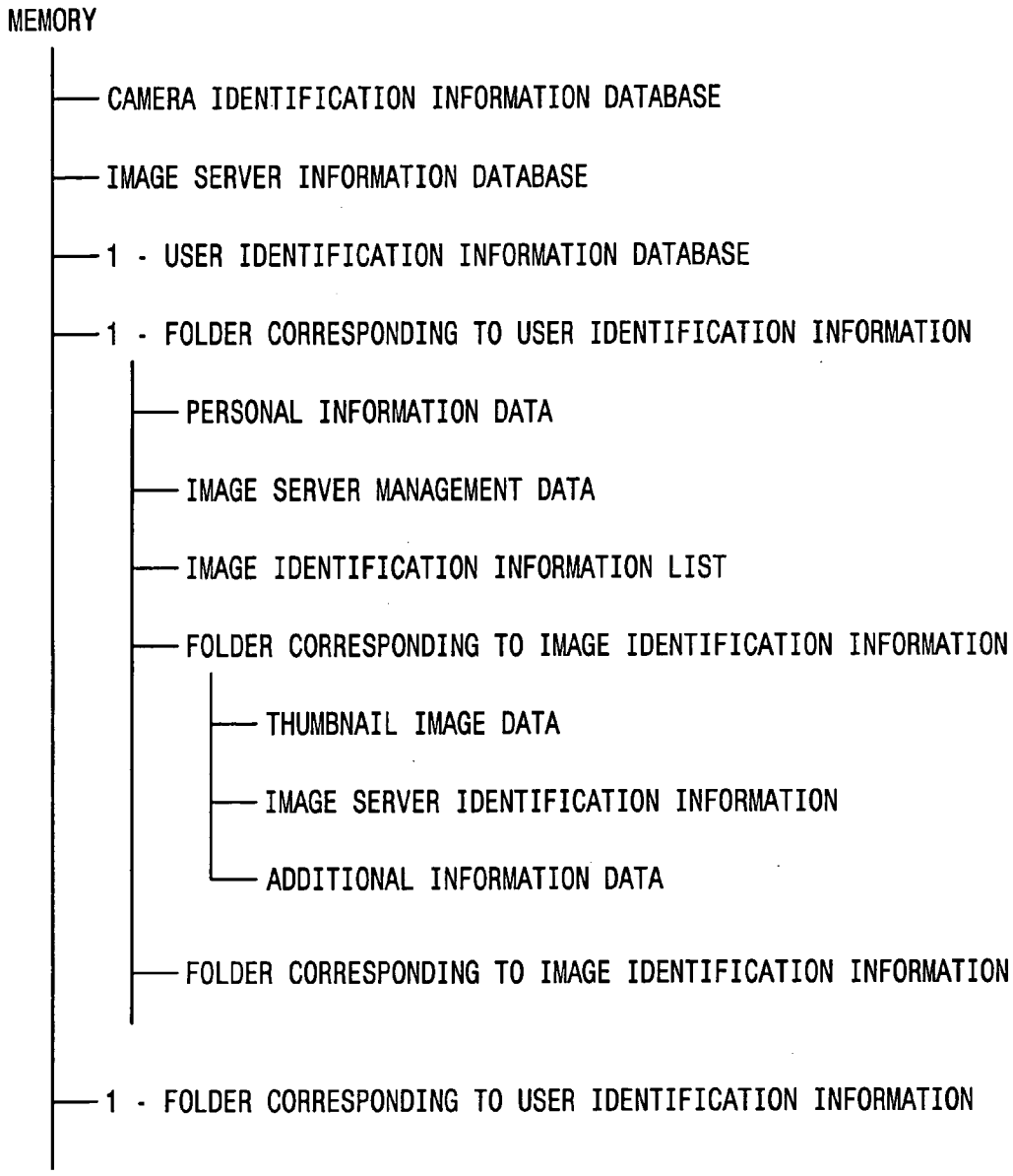

MEMORY
CAMERA IDENTIFICATION INFORMATION DATABASE
IMAGE SERVER INFORMATION DATABASE
1 - USER IDENTIFICATION INFORMATION DATABASE
1 - FOLDER CORRESPONDING TO USER IDENTIFICATION INFORMATION
PERSONAL INFORMATION DATA
IMAGE SERVER MANAGEMENT DATA
IMAGE IDENTIFICATION INFORMATION LIST
FOLDER CORRESPONDING TO IMAGE IDENTIFICATION INFORMATION
THUMBNAIL IMAGE DATA
IMAGE SERVER IDENTIFICATION INFORMATION
ADDITIONAL INFORMATION DATA
FOLDER CORRESPONDING TO IMAGE IDENTIFICATION INFORMATION
1 - FOLDER CORRESPONDING TO USER IDENTIFICATION INFORMATION

Fig.9

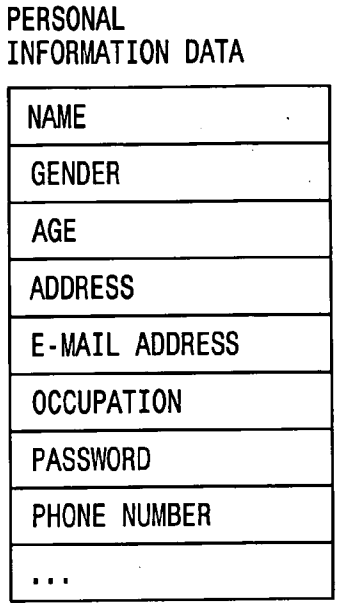

PERSONAL
INFORMATION DATA
NAME
GENDER
AGE
ADDRESS
E-MAIL ADDRESS
OCCUPATION
PASSWORD
PHONE NUMBER
...

Fig. 10

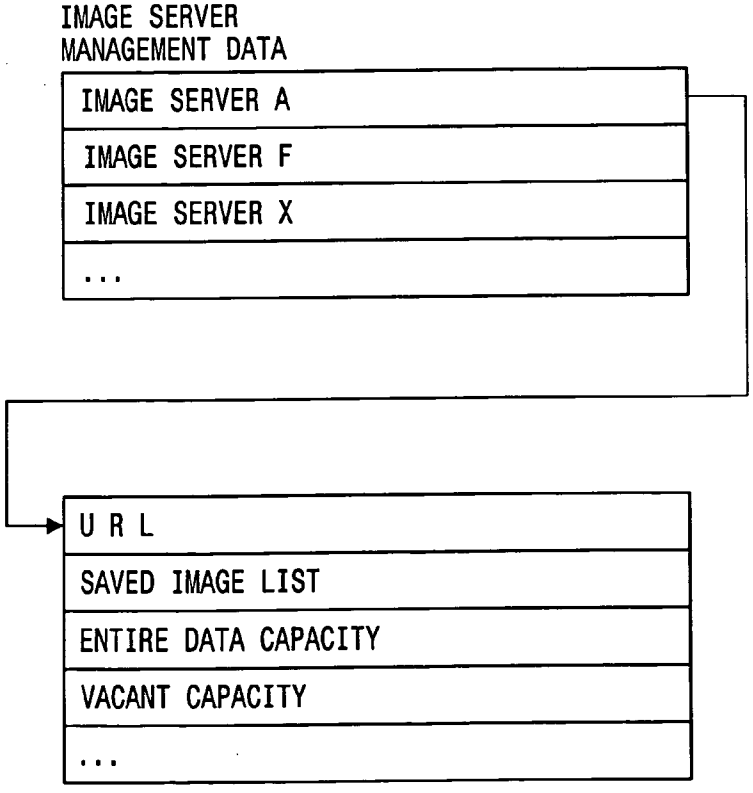


IMAGE SERVER
MANAGEMENT DATA
IMAGE SERVER A
IMAGE SERVER F
IMAGE SERVER X
...
U R L
SAVED IMAGE LIST
ENTIRE DATA CAPACITY
VACANT CAPACITY
...

Fig. 11

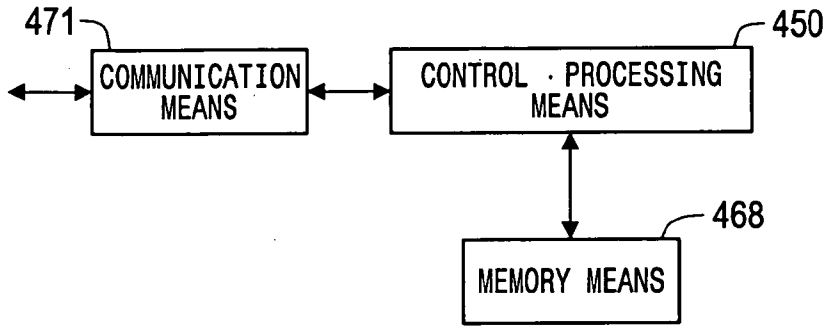

471
COMMUNICATION MEANS
CONTROL · PROCESSING MEANS
450
468
MEMORY MEANS

Fig.12

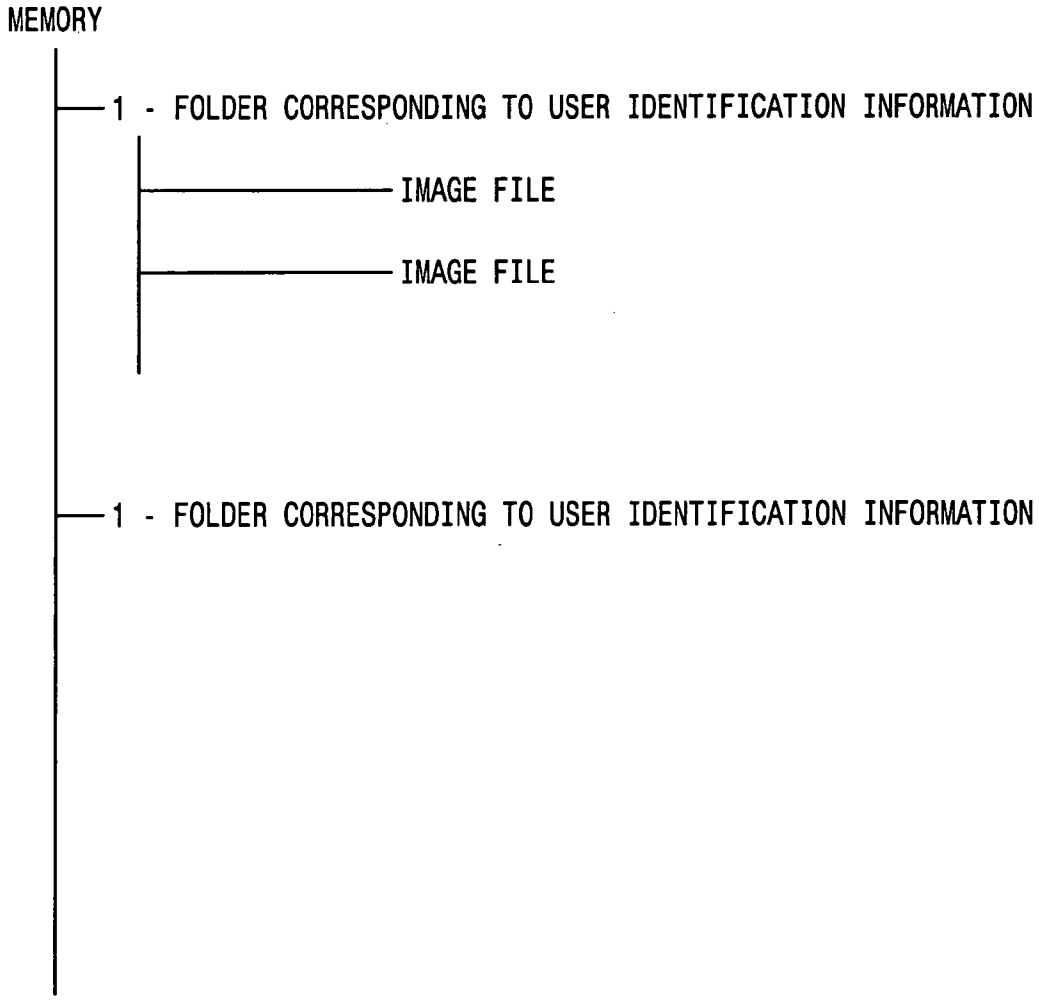

MEMORY
1 - FOLDER CORRESPONDING TO USER IDENTIFICATION INFORMATION
IMAGE FILE
IMAGE FILE
1 - FOLDER CORRESPONDING TO USER IDENTIFICATION INFORMATION

Fig.13

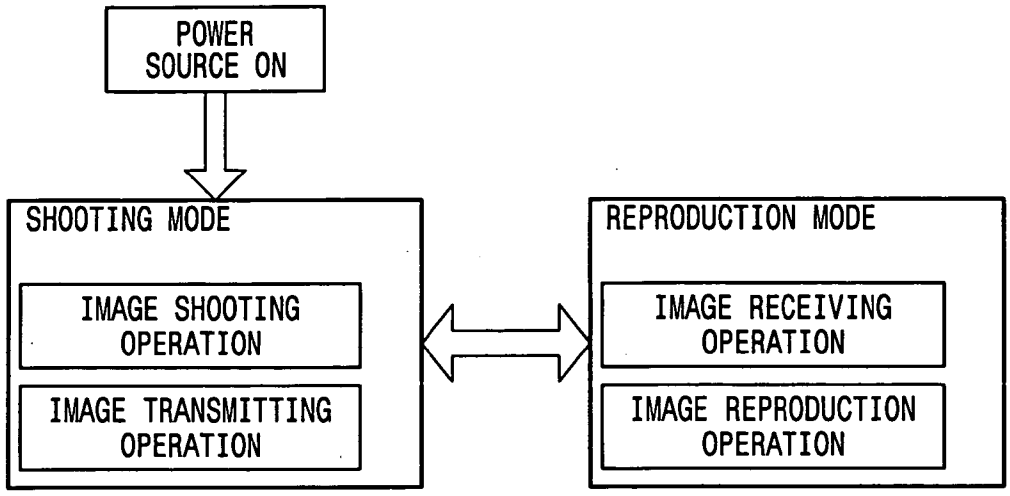

POWER SOURCE ON
SHOOTING MODE
IMAGE SHOOTING OPERATION
IMAGE TRANSMITTING OPERATION
REPRODUCTION MODE
IMAGE RECEIVING OPERATION
IMAGE REPRODUCTION OPERATION

Fig. 14

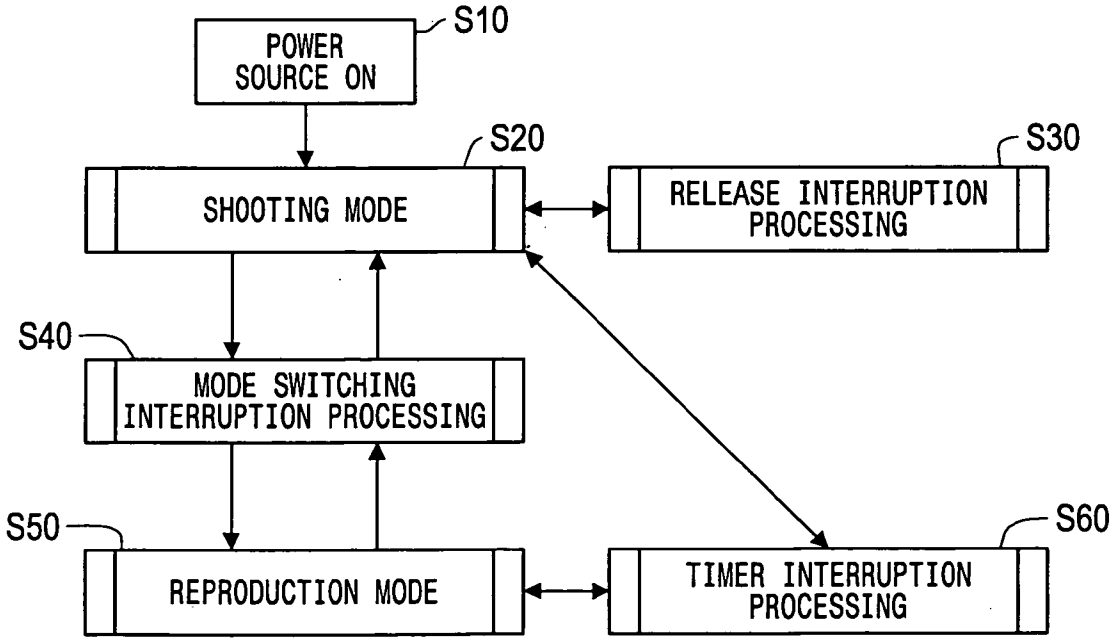

S10
POWER SOURCE ON
S20
SHOOTING MODE
S30
RELEASE INTERRUPTION PROCESSING
S40
MODE SWITCHING INTERRUPTION PROCESSING
S50
REPRODUCTION MODE
S60
TIMER INTERRUPTION PROCESSING

Fig.15

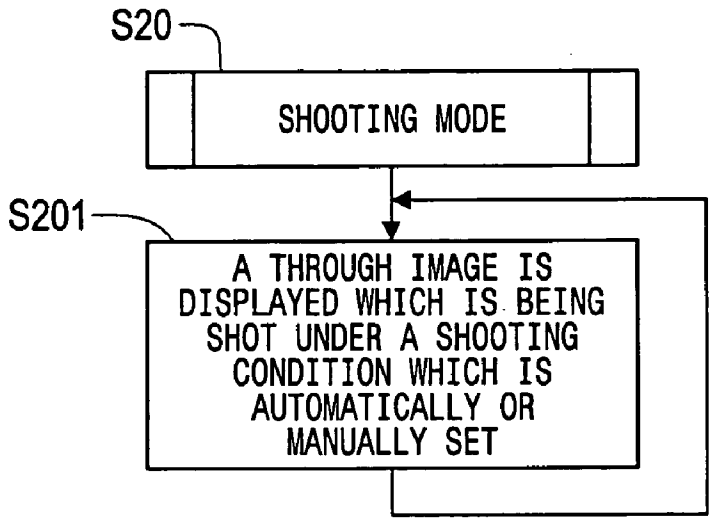

S20
SHOOTING MODE
S201
A THROUGH IMAGE IS DISPLAYED WHICH IS BEING SHOT UNDER A SHOOTING CONDITION WHICH IS AUTOMATICALLY OR MANUALLY SET

Fig. 16

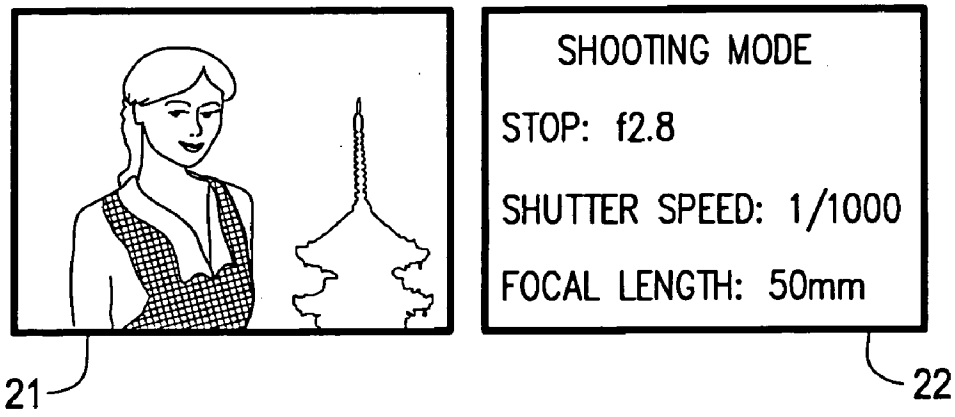

SHOOTING MODE
STOP: f2.8
SHUTTER SPEED: 1/1000
FOCAL LENGTH: 50mm
21
22

Fig. 17

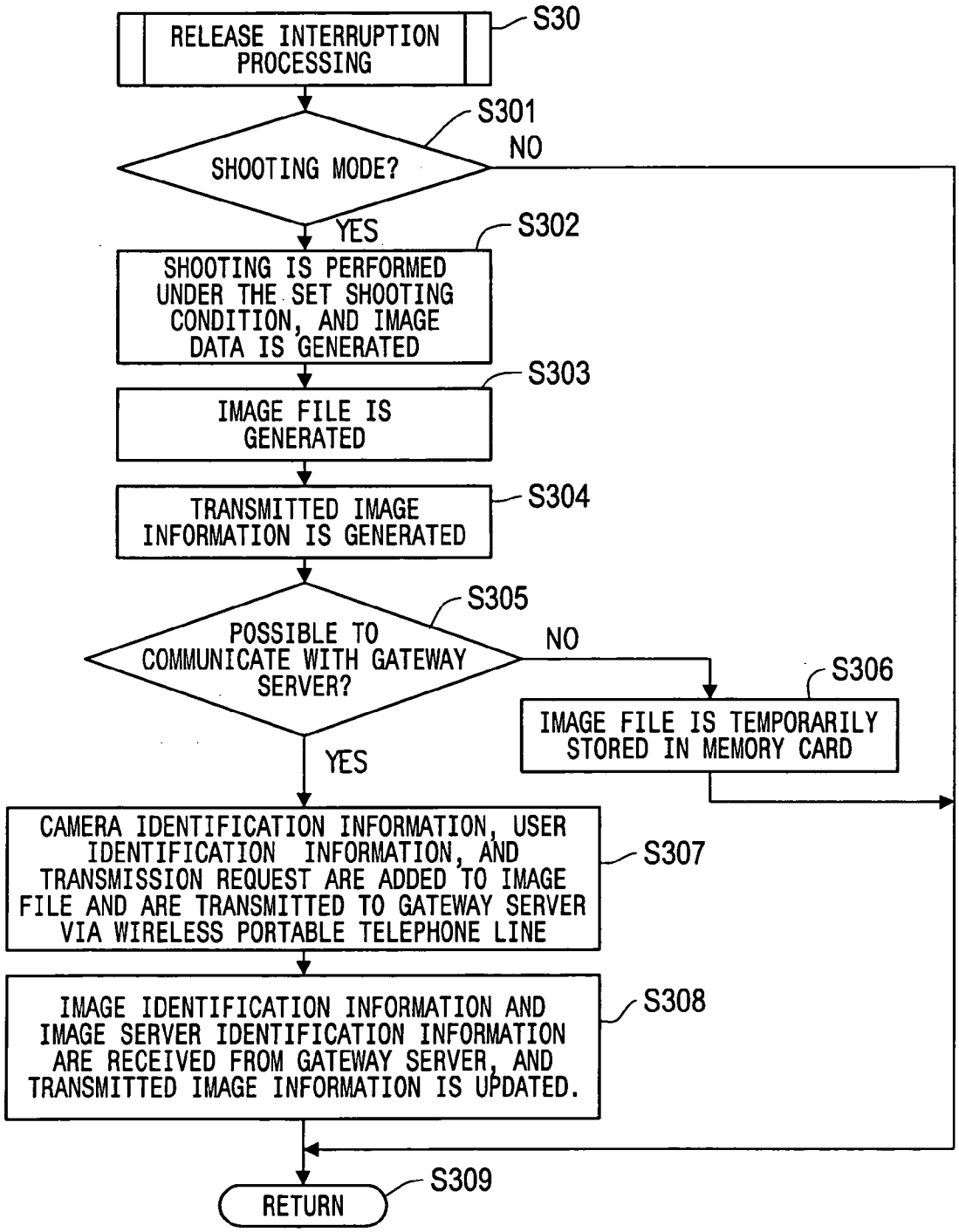

RELEASE INTERRUPTION PROCESSING
S30
SHOOTING MODE?
S301
NO
YES
S302
SHOOTING IS PERFORMED UNDER THE SET SHOOTING CONDITION, AND IMAGE DATA IS GENERATED
S303
IMAGE FILE IS GENERATED
S304
TRANSMITTED IMAGE INFORMATION IS GENERATED
S305
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
NO
S306
IMAGE FILE IS TEMPORARILY STORED IN MEMORY CARD
YES
CAMERA IDENTIFICATION INFORMATION, USER IDENTIFICATION INFORMATION, AND TRANSMISSION REQUEST ARE ADDED TO IMAGE FILE AND ARE TRANSMITTED TO GATEWAY SERVER VIA WIRELESS PORTABLE TELEPHONE LINE
S307
IMAGE IDENTIFICATION INFORMATION AND IMAGE SERVER IDENTIFICATION INFORMATION ARE RECEIVED FROM GATEWAY SERVER, AND TRANSMITTED IMAGE INFORMATION IS UPDATED.
S308
RETURN
S309

Fig. 18

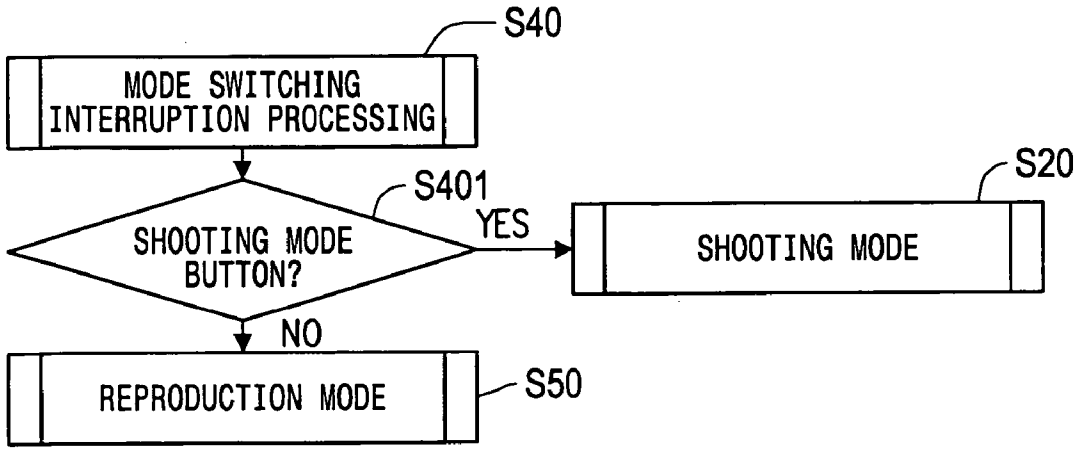

S40
MODE SWITCHING INTERRUPTION PROCESSING
S401
SHOOTING MODE BUTTON?
YES
S20
SHOOTING MODE
NO
REPRODUCTION MODE
S50

Fig. 19

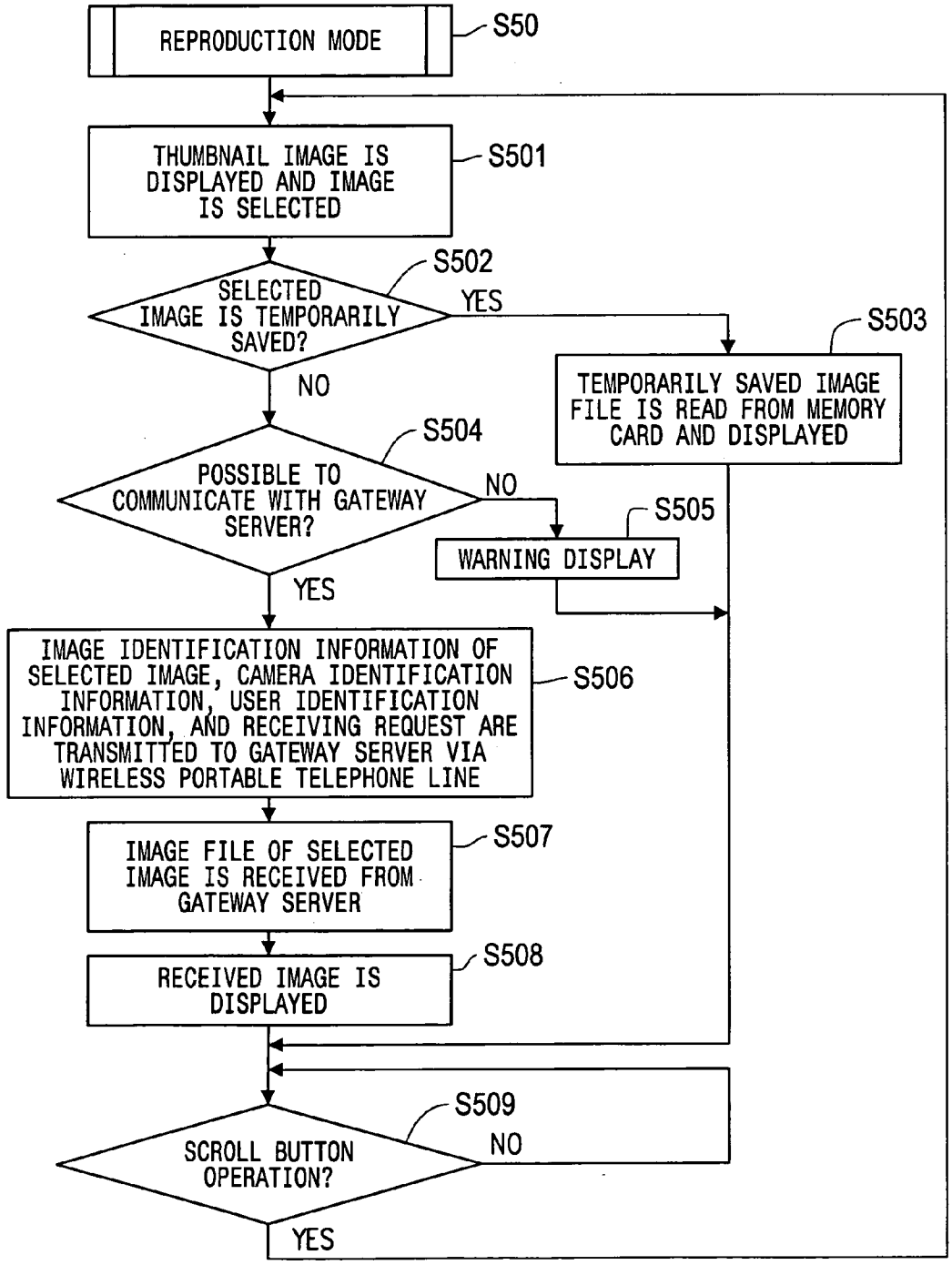

REPRODUCTION MODE
S50
THUMBNAIL IMAGE IS DISPLAYED AND IMAGE IS SELECTED
S501
SELECTED IMAGE IS TEMPORARILY SAVED?
S502
YES
NO
TEMPORARILY SAVED IMAGE FILE IS READ FROM MEMORY CARD AND DISPLAYED
S503
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
S504
NO
WARNING DISPLAY
S505
YES
IMAGE IDENTIFICATION INFORMATION OF SELECTED IMAGE, CAMERA IDENTIFICATION INFORMATION, USER IDENTIFICATION INFORMATION, AND RECEIVING REQUEST ARE TRANSMITTED TO GATEWAY SERVER VIA WIRELESS PORTABLE TELEPHONE LINE
S506
IMAGE FILE OF SELECTED IMAGE IS RECEIVED FROM GATEWAY SERVER
S507
RECEIVED IMAGE IS DISPLAYED
S508
SCROLL BUTTON OPERATION?
S509
NO
YES

Fig. 20

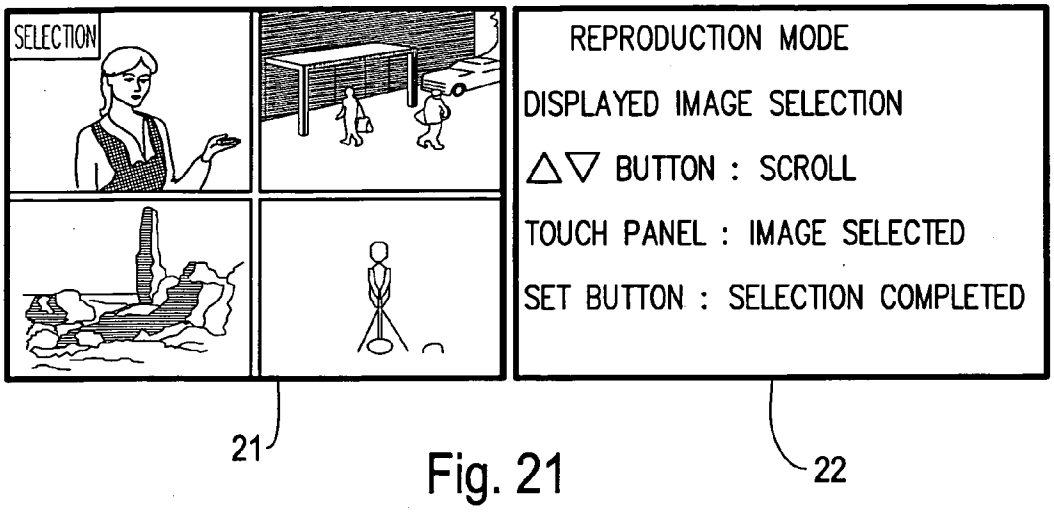

SELECTION
REPRODUCTION MODE
DISPLAYED IMAGE SELECTION
△▽ BUTTON : SCROLL
TOUCH PANEL : IMAGE SELECTED
SET BUTTON : SELECTION COMPLETED
21
22

Fig. 21

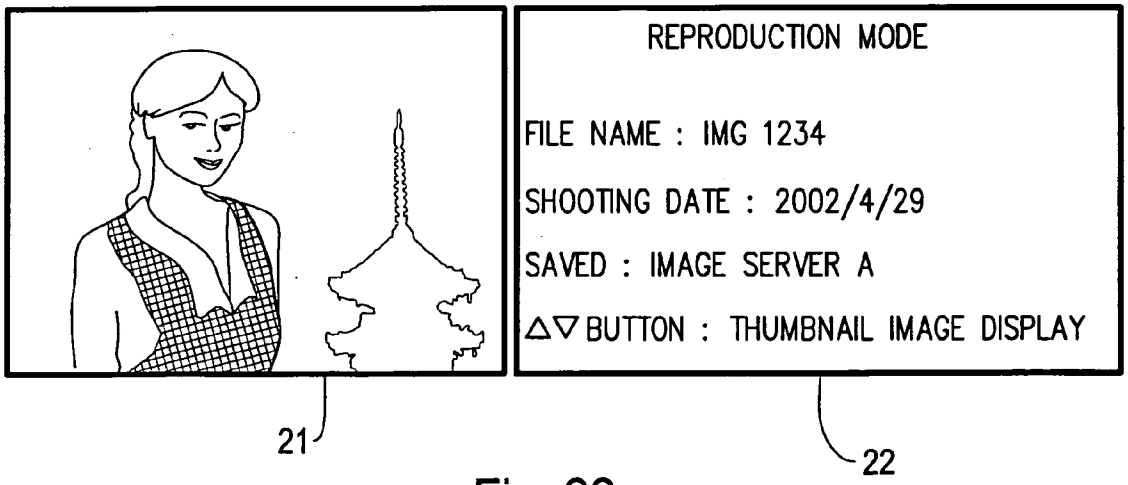

REPRODUCTION MODE
FILE NAME : IMG 1234
SHOOTING DATE : 2002/4/29
SAVED : IMAGE SERVER A
△▽ BUTTON : THUMBNAIL IMAGE DISPLAY
21
22

Fig. 22

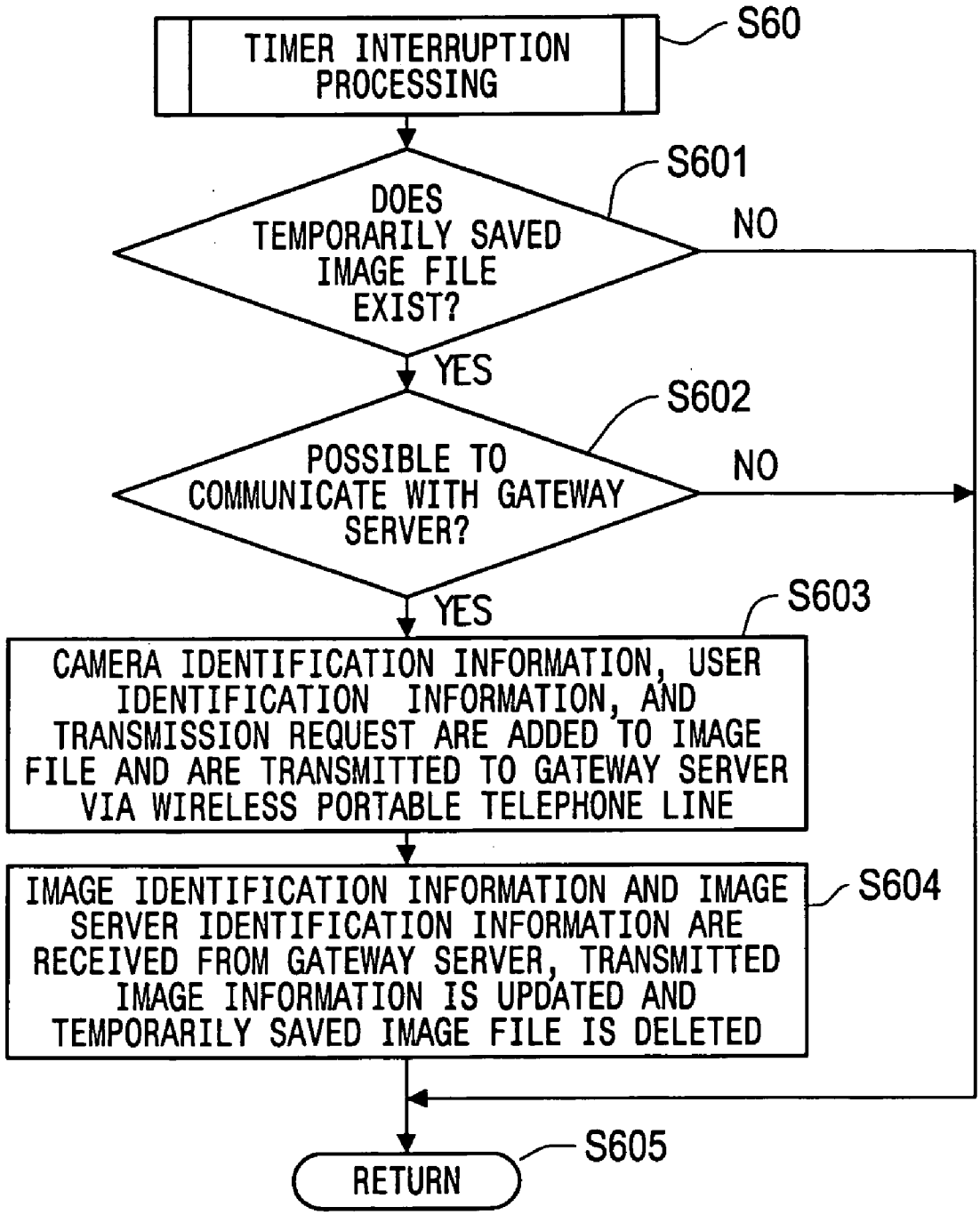

TIMER INTERRUPTION PROCESSING
S60
DOES TEMPORARILY SAVED IMAGE FILE EXIST?
S601
NO
YES
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
S602
NO
YES
S603
CAMERA IDENTIFICATION INFORMATION, USER IDENTIFICATION INFORMATION, AND TRANSMISSION REQUEST ARE ADDED TO IMAGE FILE AND ARE TRANSMITTED TO GATEWAY SERVER VIA WIRELESS PORTABLE TELEPHONE LINE
IMAGE IDENTIFICATION INFORMATION AND IMAGE SERVER IDENTIFICATION INFORMATION ARE RECEIVED FROM GATEWAY SERVER, TRANSMITTED IMAGE INFORMATION IS UPDATED AND TEMPORARILY SAVED IMAGE FILE IS DELETED
S604
RETURN
S605

Fig. 23

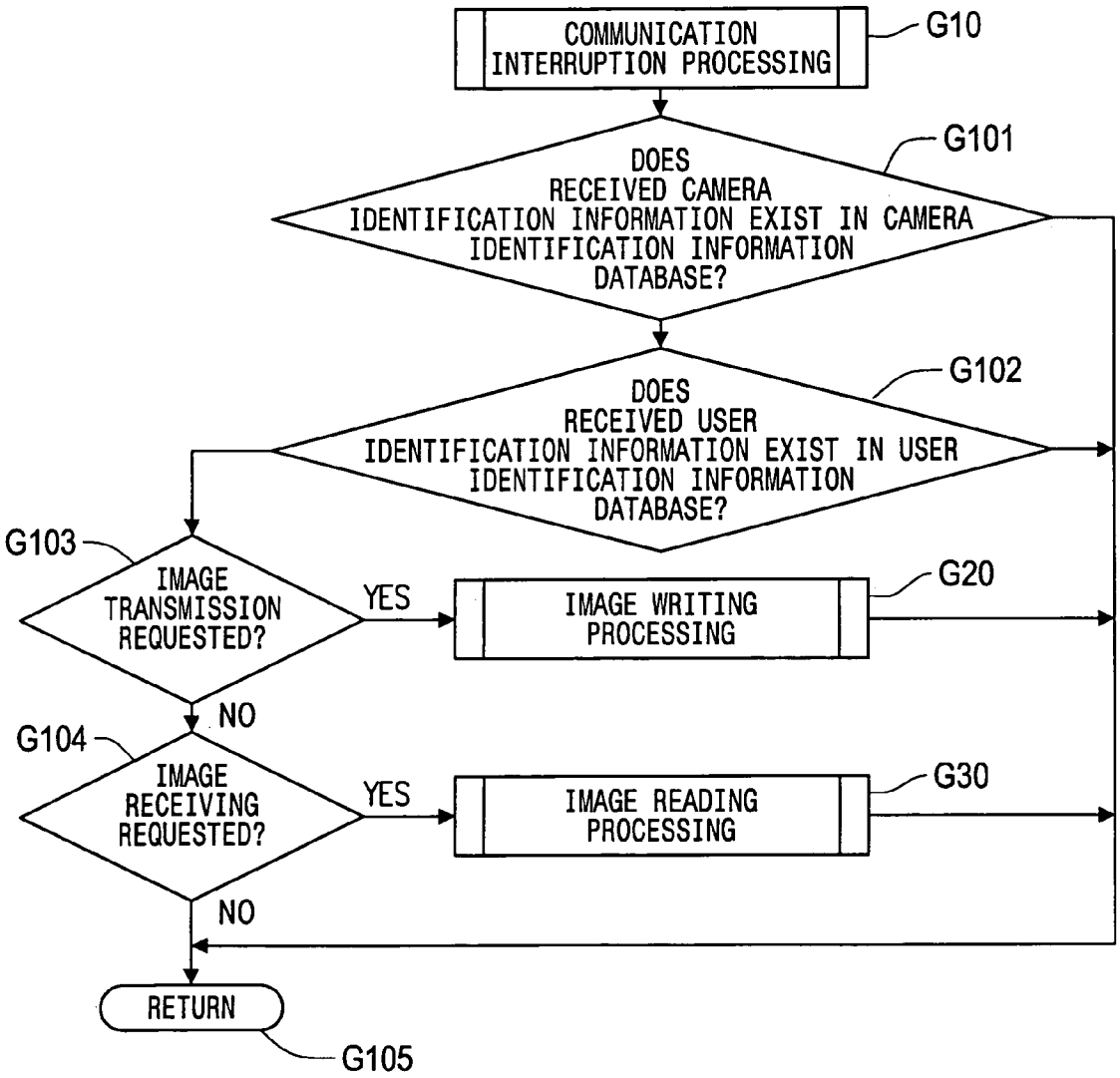

COMMUNICATION INTERRUPTION PROCESSING
G10
DOES RECEIVED CAMERA IDENTIFICATION INFORMATION EXIST IN CAMERA IDENTIFICATION INFORMATION DATABASE?
G101
DOES RECEIVED USER IDENTIFICATION INFORMATION EXIST IN USER IDENTIFICATION INFORMATION DATABASE?
G102
G103
IMAGE TRANSMISSION REQUESTED?
YES
IMAGE WRITING PROCESSING
G20
NO
G104
IMAGE RECEIVING REQUESTED?
YES
IMAGE READING PROCESSING
G30
NO
RETURN
G105

Fig. 24

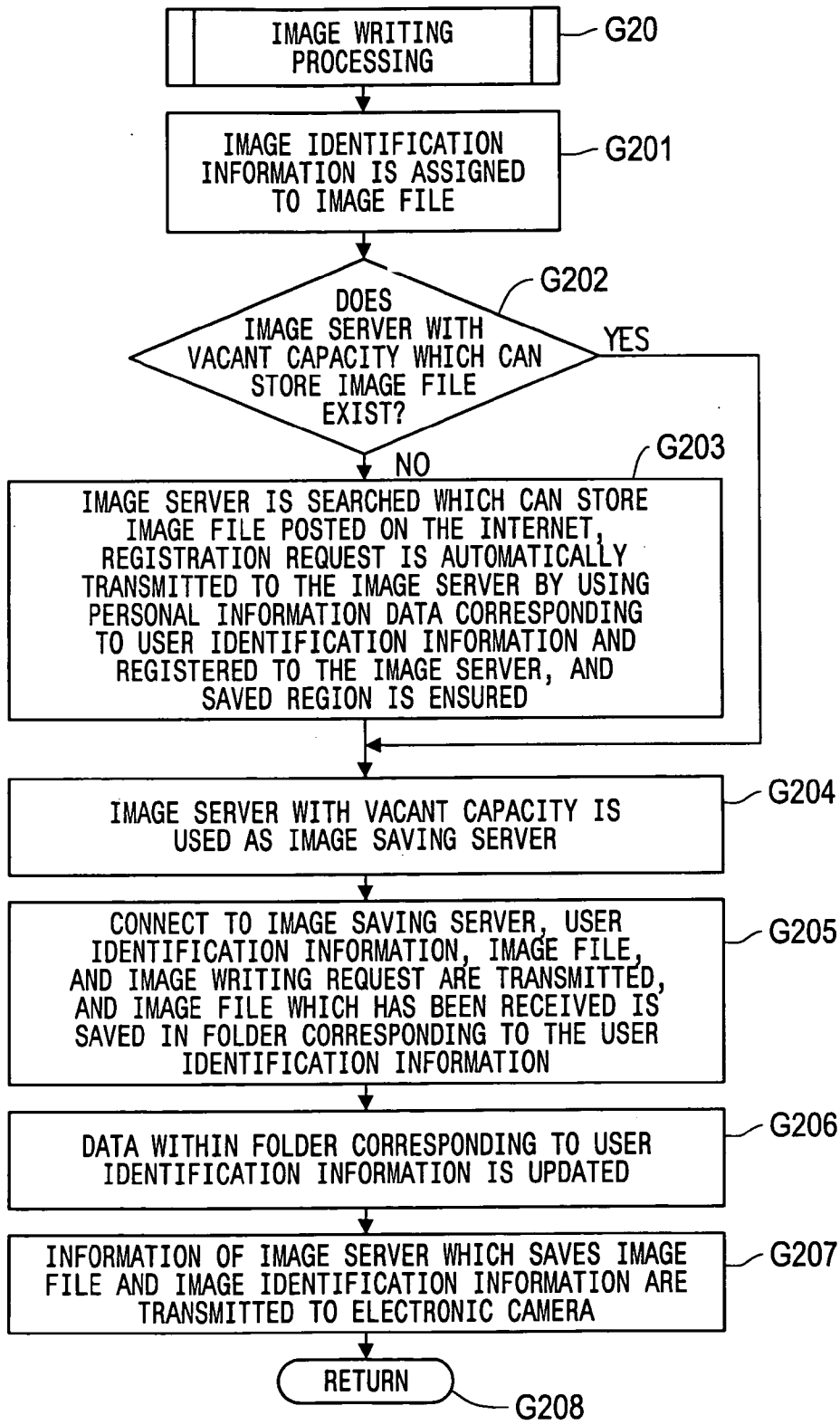


IMAGE WRITING PROCESSING
G20
IMAGE IDENTIFICATION INFORMATION IS ASSIGNED TO IMAGE FILE
G201
DOES IMAGE SERVER WITH VACANT CAPACITY WHICH CAN STORE IMAGE FILE EXIST?
G202
YES
NO
G203
IMAGE SERVER IS SEARCHED WHICH CAN STORE IMAGE FILE POSTED ON THE INTERNET, REGISTRATION REQUEST IS AUTOMATICALLY TRANSMITTED TO THE IMAGE SERVER BY USING PERSONAL INFORMATION DATA CORRESPONDING TO USER IDENTIFICATION INFORMATION AND REGISTERED TO THE IMAGE SERVER, AND SAVED REGION IS ENSURED
IMAGE SERVER WITH VACANT CAPACITY IS USED AS IMAGE SAVING SERVER
G204
CONNECT TO IMAGE SAVING SERVER, USER IDENTIFICATION INFORMATION, IMAGE FILE, AND IMAGE WRITING REQUEST ARE TRANSMITTED, AND IMAGE FILE WHICH HAS BEEN RECEIVED IS SAVED IN FOLDER CORRESPONDING TO THE USER IDENTIFICATION INFORMATION
G205
DATA WITHIN FOLDER CORRESPONDING TO USER IDENTIFICATION INFORMATION IS UPDATED
G206
INFORMATION OF IMAGE SERVER WHICH SAVES IMAGE FILE AND IMAGE IDENTIFICATION INFORMATION ARE TRANSMITTED TO ELECTRONIC CAMERA
G207
RETURN
G208

Fig. 25

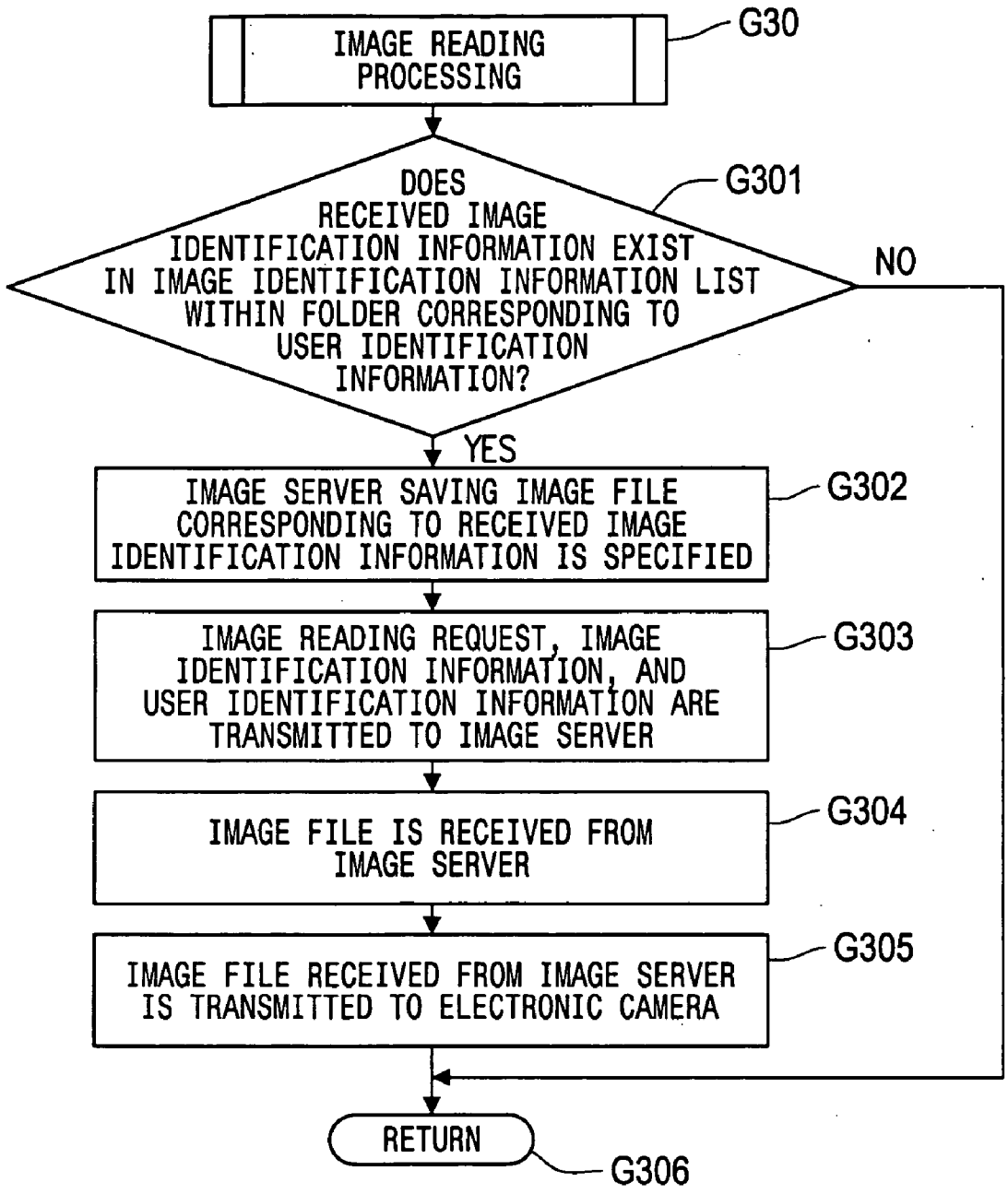


IMAGE READING PROCESSING
G30
DOES RECEIVED IMAGE IDENTIFICATION INFORMATION EXIST IN IMAGE IDENTIFICATION INFORMATION LIST WITHIN FOLDER CORRESPONDING TO USER IDENTIFICATION INFORMATION?
G301
NO
YES
IMAGE SERVER SAVING IMAGE FILE CORRESPONDING TO RECEIVED IMAGE IDENTIFICATION INFORMATION IS SPECIFIED
G302
IMAGE READING REQUEST, IMAGE IDENTIFICATION INFORMATION, AND USER IDENTIFICATION INFORMATION ARE TRANSMITTED TO IMAGE SERVER
G303
IMAGE FILE IS RECEIVED FROM IMAGE SERVER
G304
IMAGE FILE RECEIVED FROM IMAGE SERVER IS TRANSMITTED TO ELECTRONIC CAMERA
G305
RETURN
G306

Fig. 26

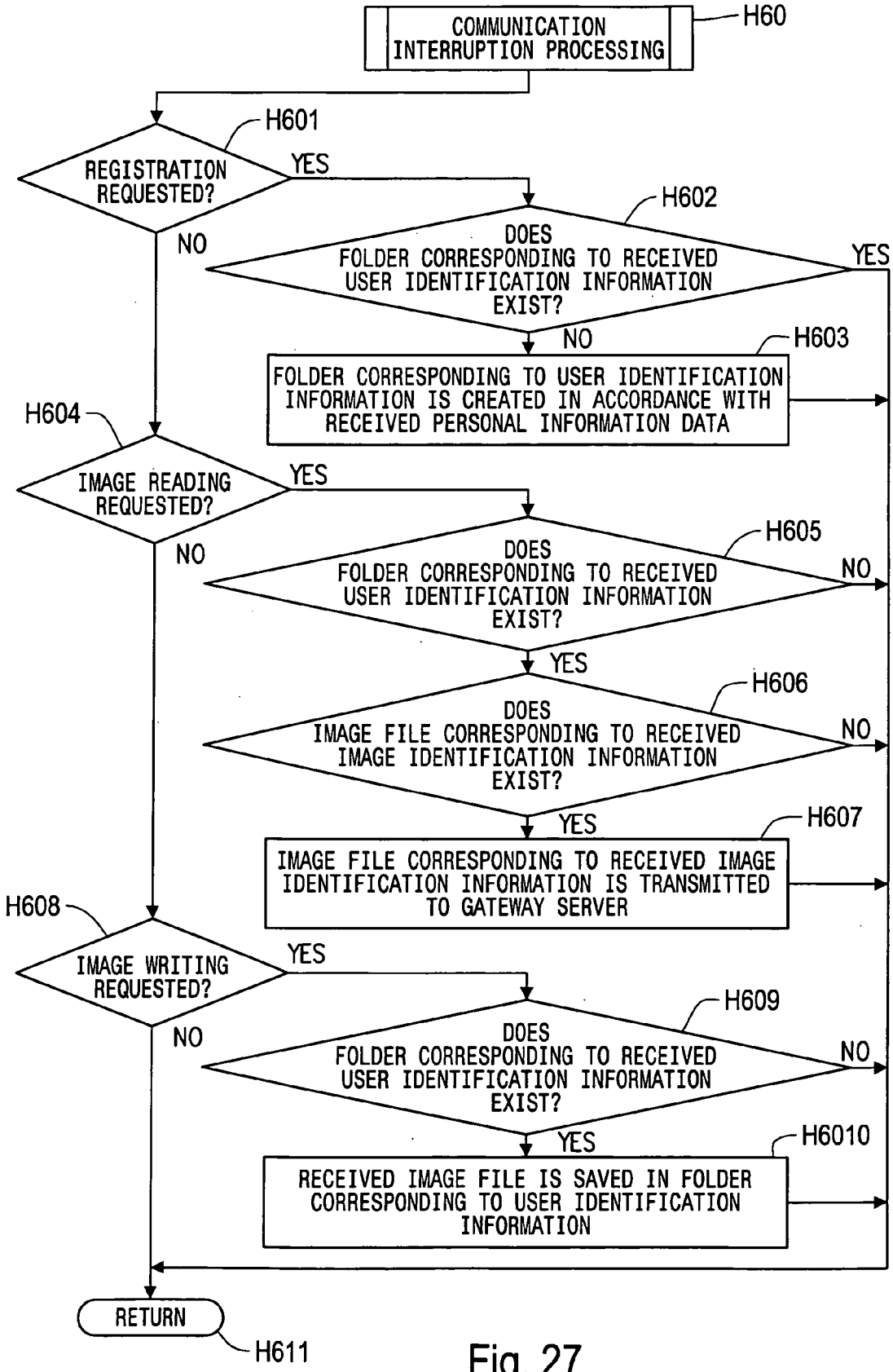

COMMUNICATION INTERRUPTION PROCESSING
H60
H601
REGISTRATION REQUESTED?
YES
NO
H602
DOES FOLDER CORRESPONDING TO RECEIVED USER IDENTIFICATION INFORMATION EXIST?
YES
NO
H603
FOLDER CORRESPONDING TO USER IDENTIFICATION INFORMATION IS CREATED IN ACCORDANCE WITH RECEIVED PERSONAL INFORMATION DATA
H604
IMAGE READING REQUESTED?
YES
NO
H605
DOES FOLDER CORRESPONDING TO RECEIVED USER IDENTIFICATION INFORMATION EXIST?
NO
YES
H606
DOES IMAGE FILE CORRESPONDING TO RECEIVED IMAGE IDENTIFICATION INFORMATION EXIST?
NO
YES
H607
IMAGE FILE CORRESPONDING TO RECEIVED IMAGE IDENTIFICATION INFORMATION IS TRANSMITTED TO GATEWAY SERVER
H608
IMAGE WRITING REQUESTED?
YES
NO
H609
DOES FOLDER CORRESPONDING TO RECEIVED USER IDENTIFICATION INFORMATION EXIST?
NO
YES
H6010
RECEIVED IMAGE FILE IS SAVED IN FOLDER CORRESPONDING TO USER IDENTIFICATION INFORMATION
RETURN
H611

Fig. 27

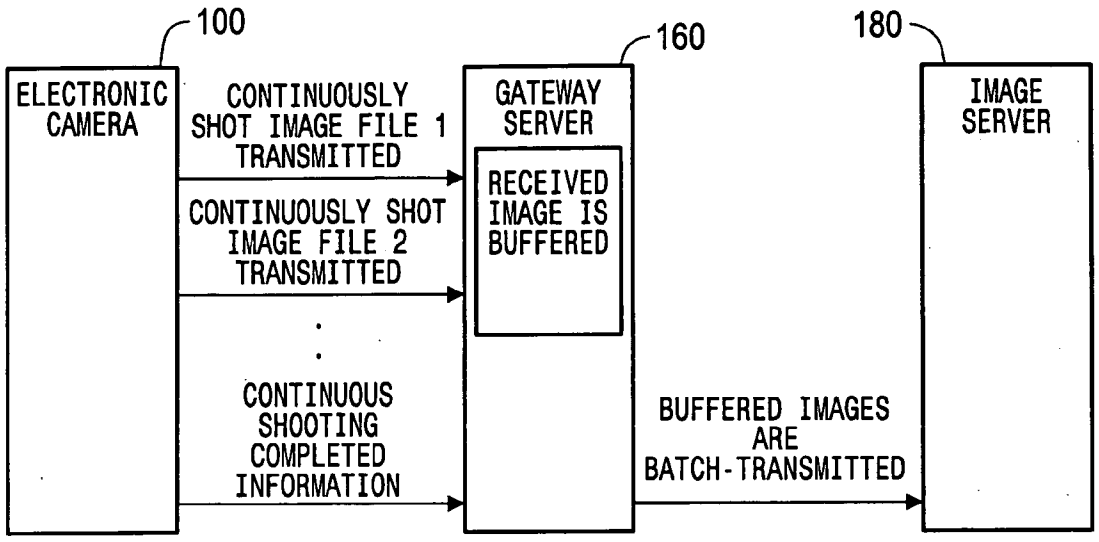

100
160
180
ELECTRONIC CAMERA
CONTINUOUSLY SHOT IMAGE FILE 1 TRANSMITTED
CONTINUOUSLY SHOT IMAGE FILE 2 TRANSMITTED
CONTINUOUS SHOOTING COMPLETED INFORMATION
GATEWAY SERVER
RECEIVED IMAGE IS BUFFERED
BUFFERED IMAGES ARE BATCH-TRANSMITTED
IMAGE SERVER

Fig. 28

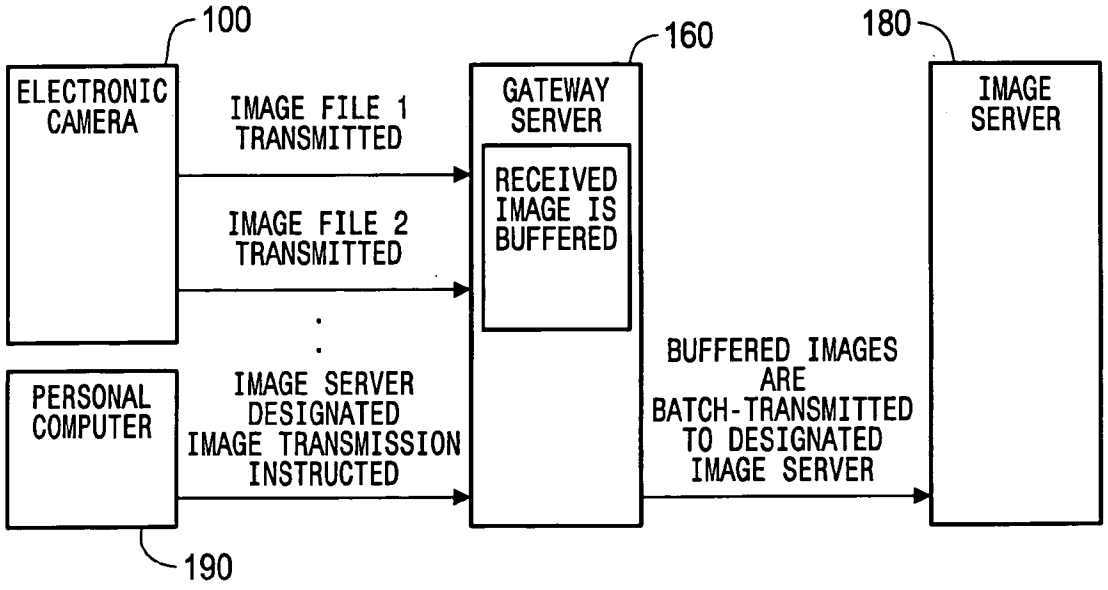

100
160
180
ELECTRONIC CAMERA
IMAGE FILE 1 TRANSMITTED
IMAGE FILE 2 TRANSMITTED
PERSONAL COMPUTER
IMAGE SERVER DESIGNATED IMAGE TRANSMISSION INSTRUCTED
190
GATEWAY SERVER
RECEIVED IMAGE IS BUFFERED
BUFFERED IMAGES ARE BATCH-TRANSMITTED TO DESIGNATED IMAGE SERVER
IMAGE SERVER

Fig. 29

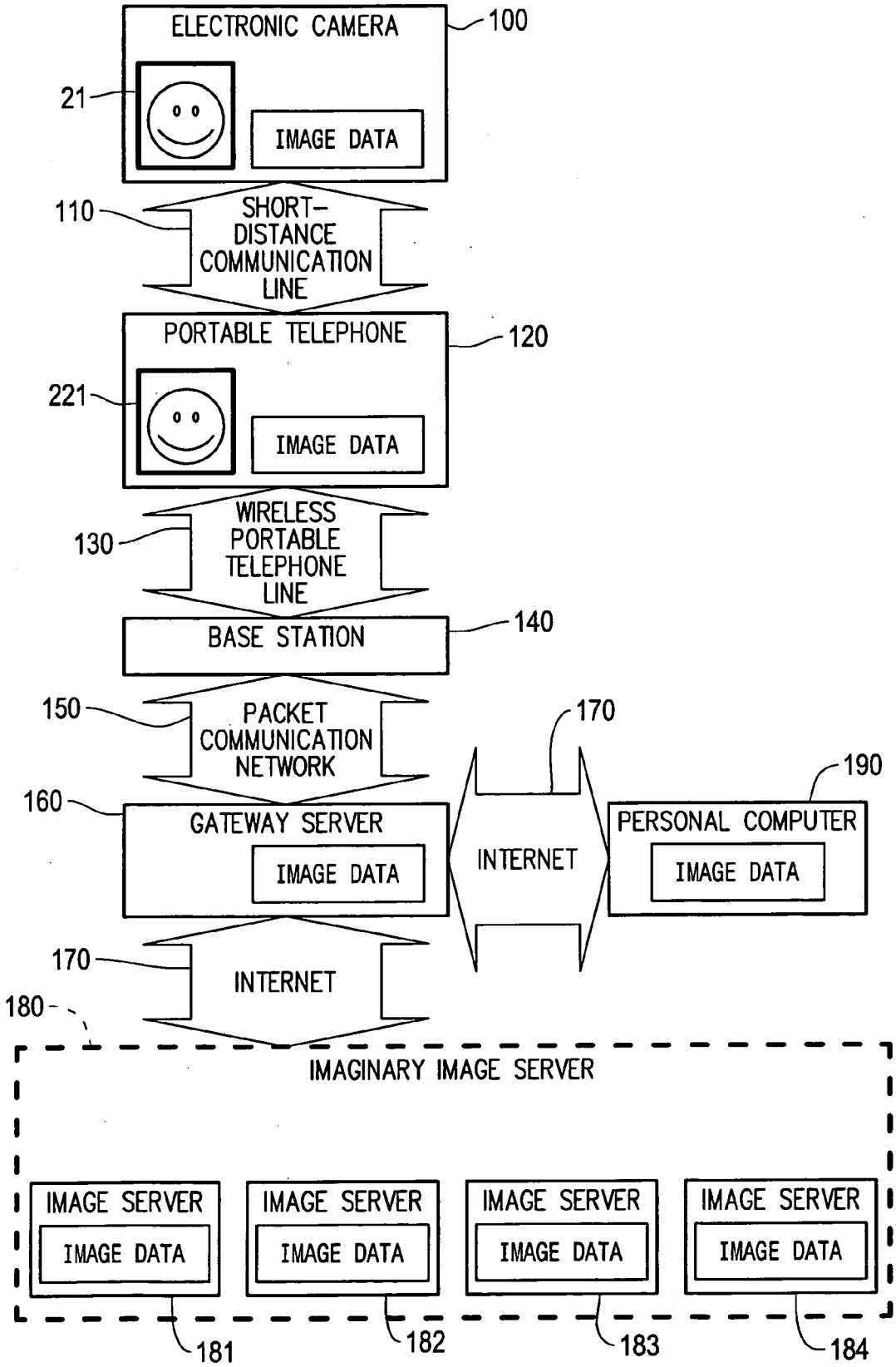

ELECTRONIC CAMERA
100
21
IMAGE DATA
110
SHORT-DISTANCE COMMUNICATION LINE
PORTABLE TELEPHONE
120
221
IMAGE DATA
130
WIRELESS PORTABLE TELEPHONE LINE
BASE STATION
140
150
PACKET COMMUNICATION NETWORK
170
190
160
GATEWAY SERVER
IMAGE DATA
INTERNET
PERSONAL COMPUTER
IMAGE DATA
170
INTERNET
180
IMAGINARY IMAGE SERVER
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
181
182
183
184

Fig. 30

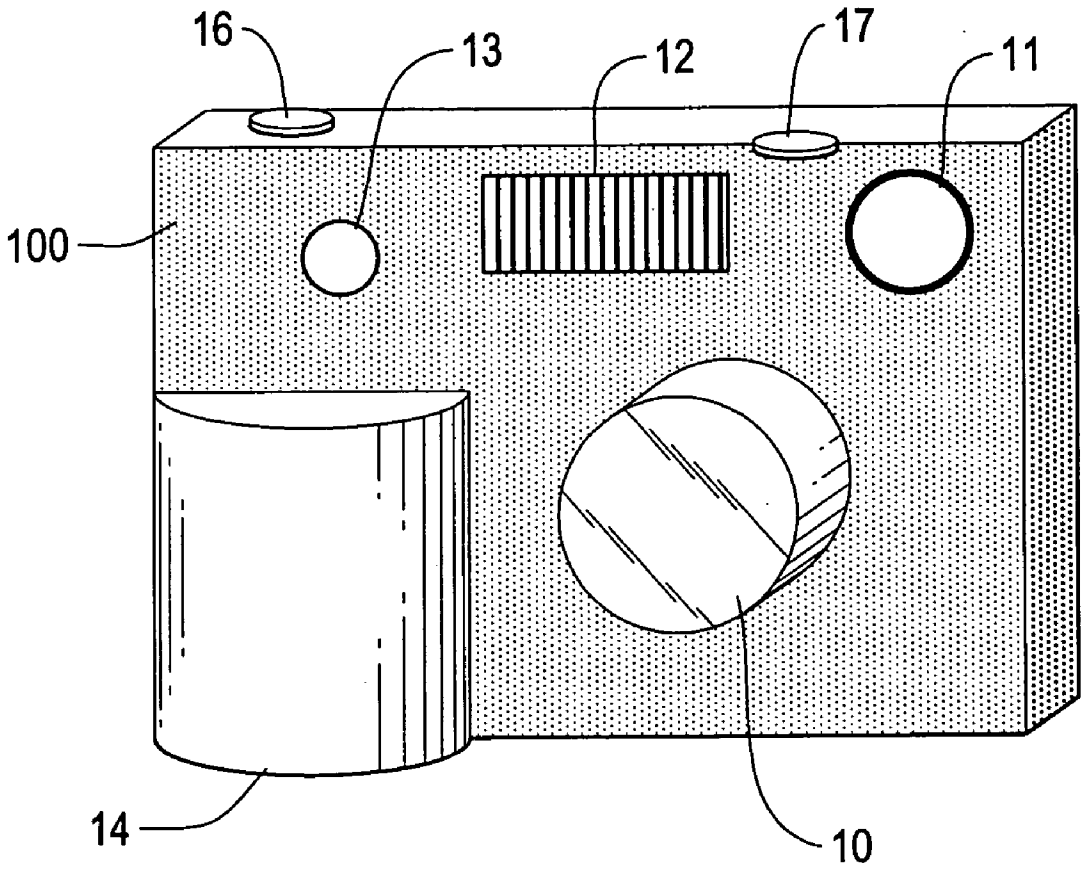


Fig. 31

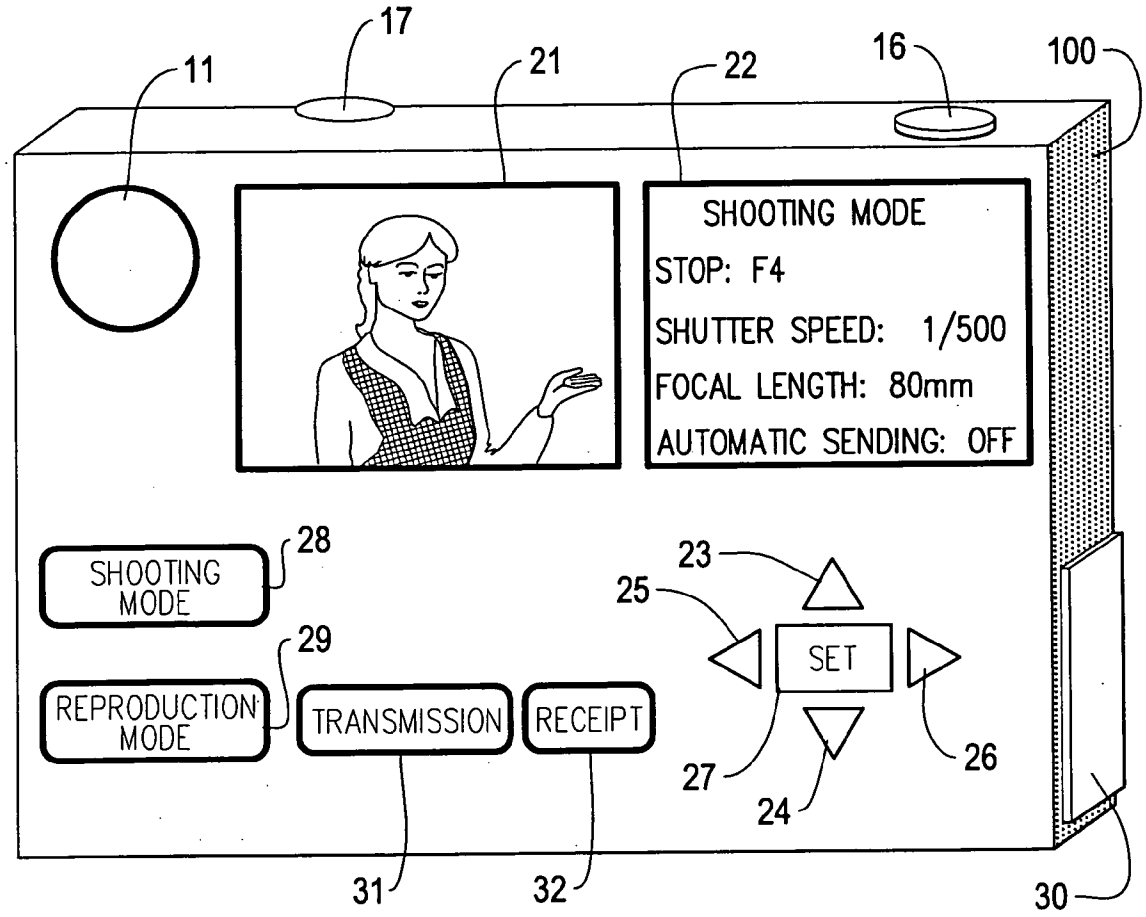

17
11
21
22
16
100
SHOOTING MODE
STOP: F4
SHUTTER SPEED: 1/500
FOCAL LENGTH: 80mm
AUTOMATIC SENDING: OFF
28
SHOOTING MODE
29
REPRODUCTION MODE
TRANSMISSION
RECEIPT
23
25
SET
27
24
26
31
32
30

Fig. 32

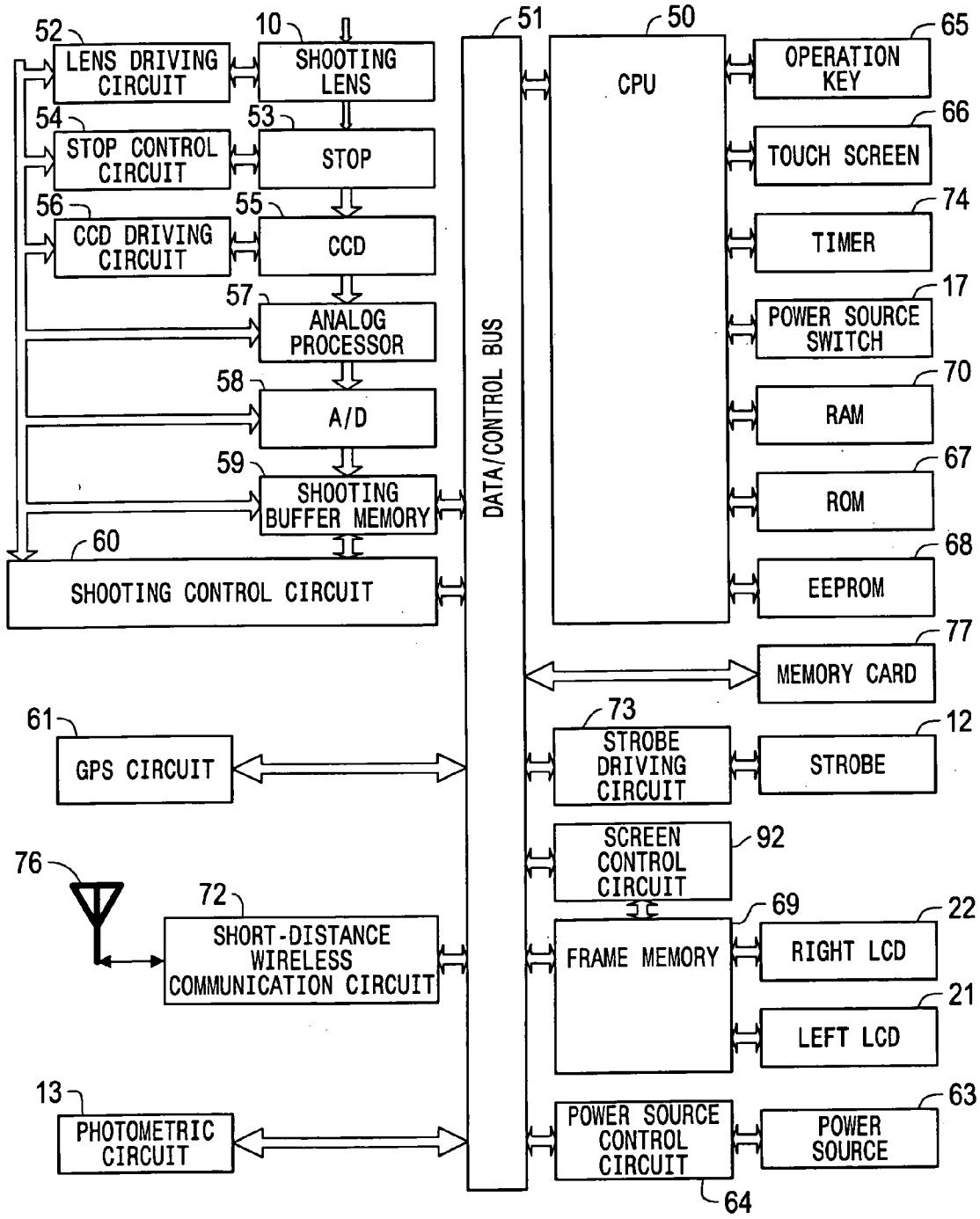
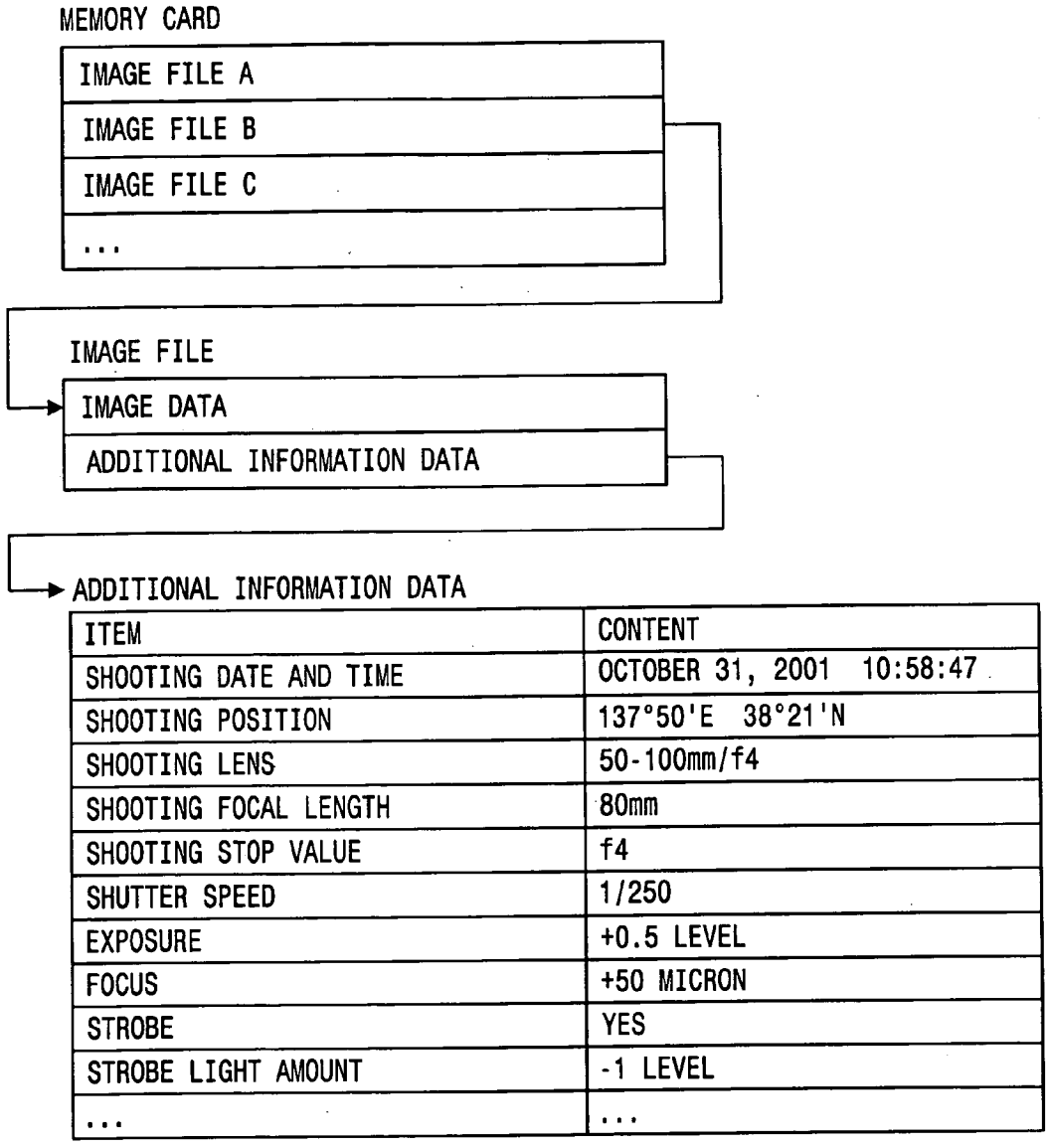

52
LENS DRIVING CIRCUIT
10
SHOOTING LENS
54
STOP CONTROL CIRCUIT
53
STOP
56
CCD DRIVING CIRCUIT
55
CCD
57
ANALOG PROCESSOR
58
A/D
59
SHOOTING BUFFER MEMORY
60
SHOOTING CONTROL CIRCUIT
51
DATA/CONTROL BUS
50
CPU
65
OPERATION KEY
66
TOUCH SCREEN
74
TIMER
17
POWER SOURCE SWITCH
70
RAM
67
ROM
68
EEPROM
77
MEMORY CARD
61
GPS CIRCUIT
73
STROBE DRIVING CIRCUIT
12
STROBE
92
SCREEN CONTROL CIRCUIT
76
72
SHORT-DISTANCE WIRELESS COMMUNICATION CIRCUIT
69
FRAME MEMORY
22
RIGHT LCD
21
LEFT LCD
13
PHOTOMETRIC CIRCUIT
POWER SOURCE CONTROL CIRCUIT
63
POWER SOURCE
64

Fig. 33



ITEM	CONTENT
SHOOTING DATE AND TIME	OCTOBER 31, 2001 10:58:47
SHOOTING POSITION	137°50'E 38°21'N
SHOOTING LENS	50-100mm/f4
SHOOTING FOCAL LENGTH	80mm
SHOOTING STOP VALUE	f4
SHUTTER SPEED	1/250
EXPOSURE	+0.5 LEVEL
FOCUS	+50 MICRON
STROBE	YES
STROBE LIGHT AMOUNT	-1 LEVEL
...	...

Fig.34

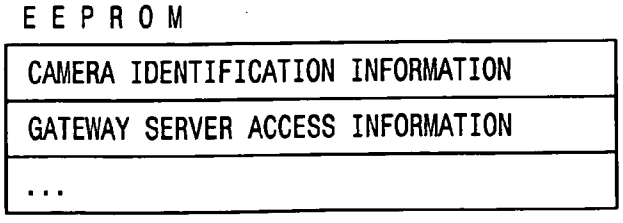


Fig. 35

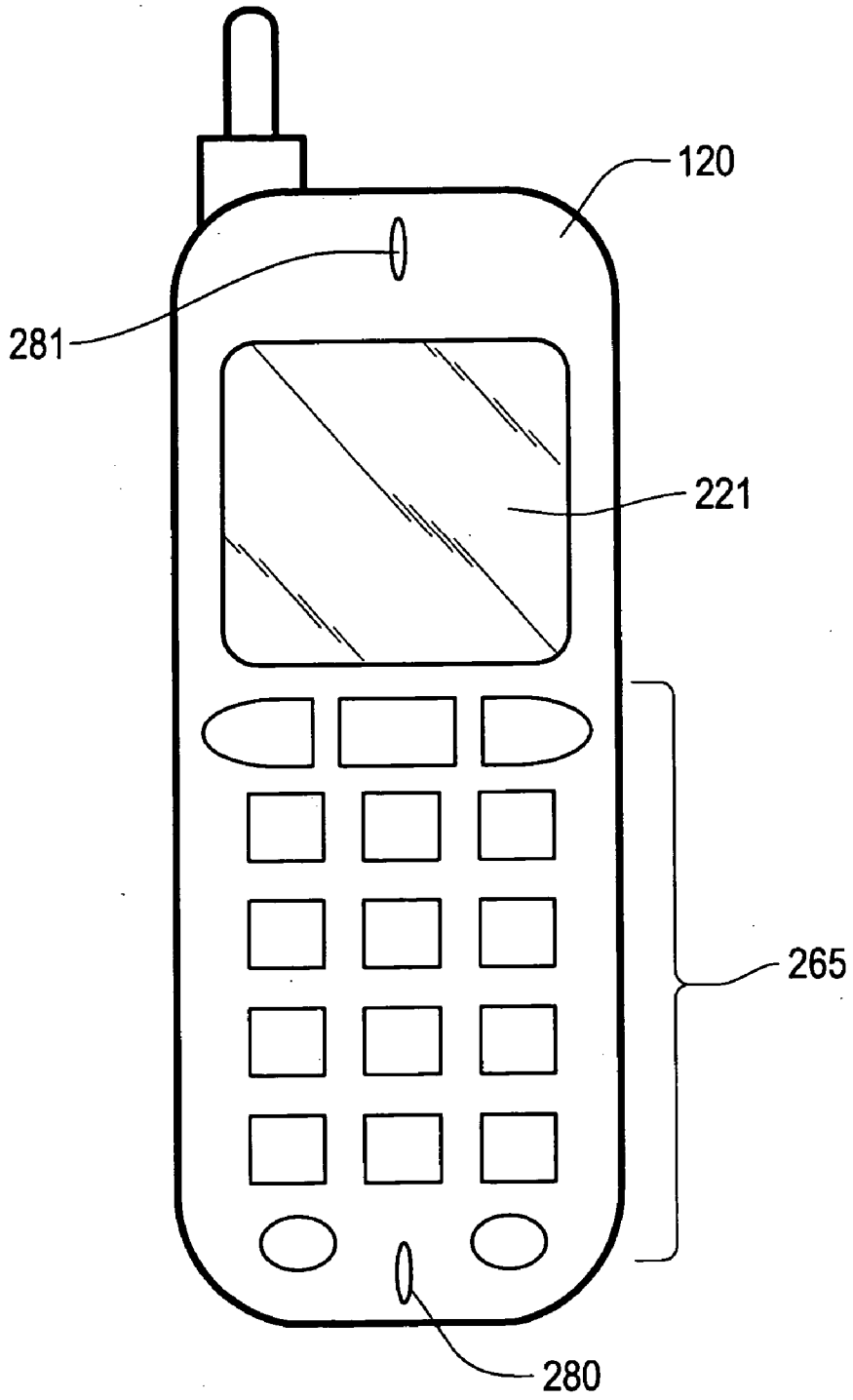


Fig. 36

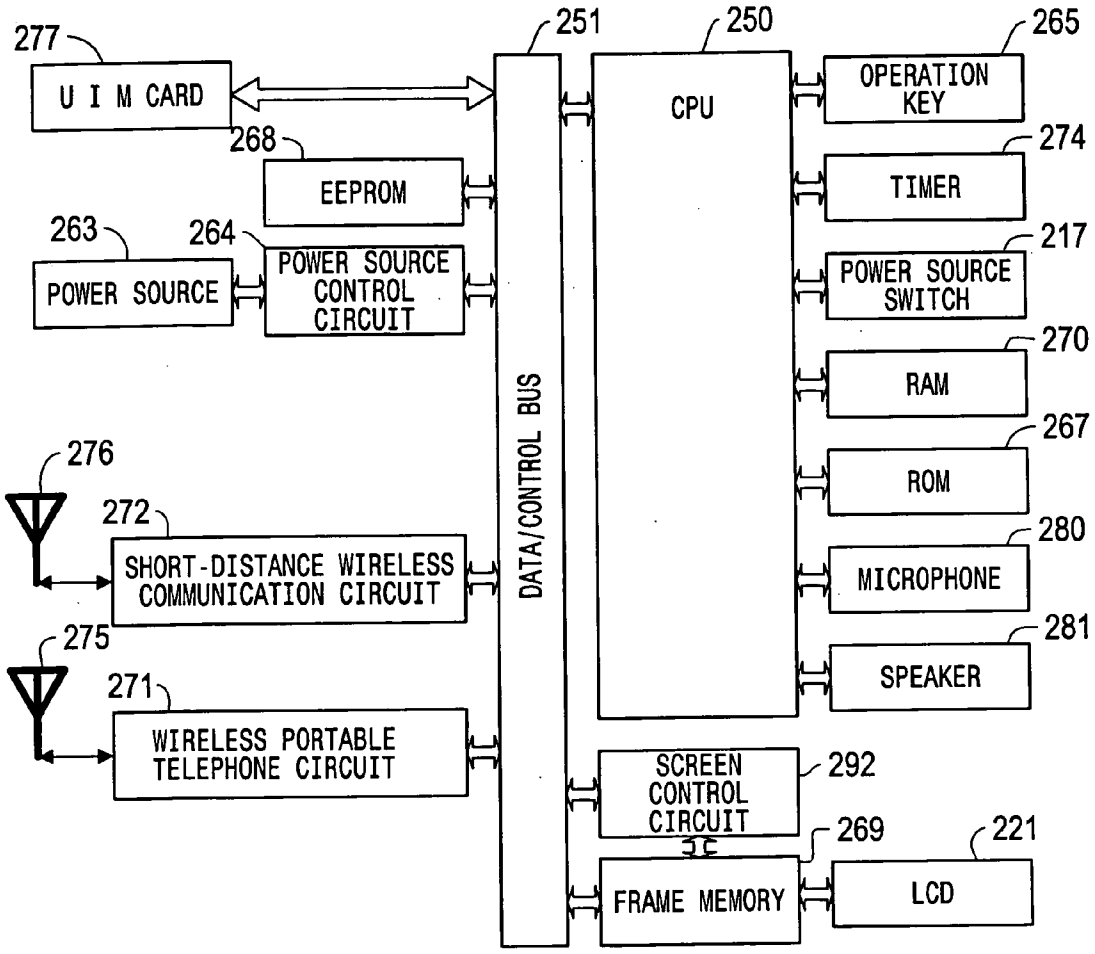

277
U I M CARD
268
EEPROM
263
POWER SOURCE
264
POWER SOURCE CONTROL CIRCUIT
276
272
SHORT-DISTANCE WIRELESS COMMUNICATION CIRCUIT
275
271
WIRELESS PORTABLE TELEPHONE CIRCUIT
251
DATA/CONTROL BUS
250
CPU
265
OPERATION KEY
274
TIMER
217
POWER SOURCE SWITCH
270
RAM
267
ROM
280
MICROPHONE
281
SPEAKER
SCREEN CONTROL CIRCUIT
292
269
221
FRAME MEMORY
LCD

Fig. 37

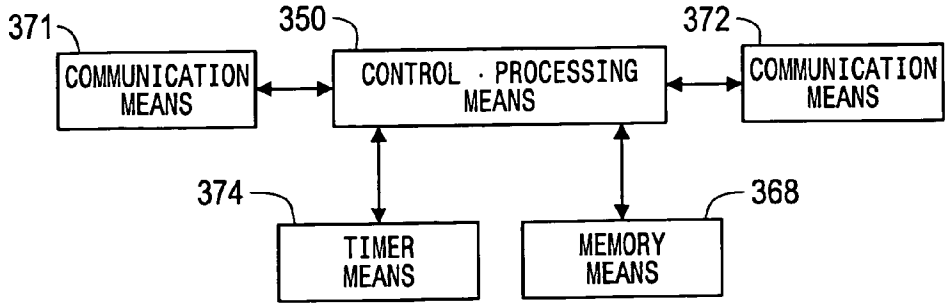

371
COMMUNICATION MEANS
350
CONTROL · PROCESSING MEANS
372
COMMUNICATION MEANS
374
TIMER MEANS
368
MEMORY MEANS

Fig.38

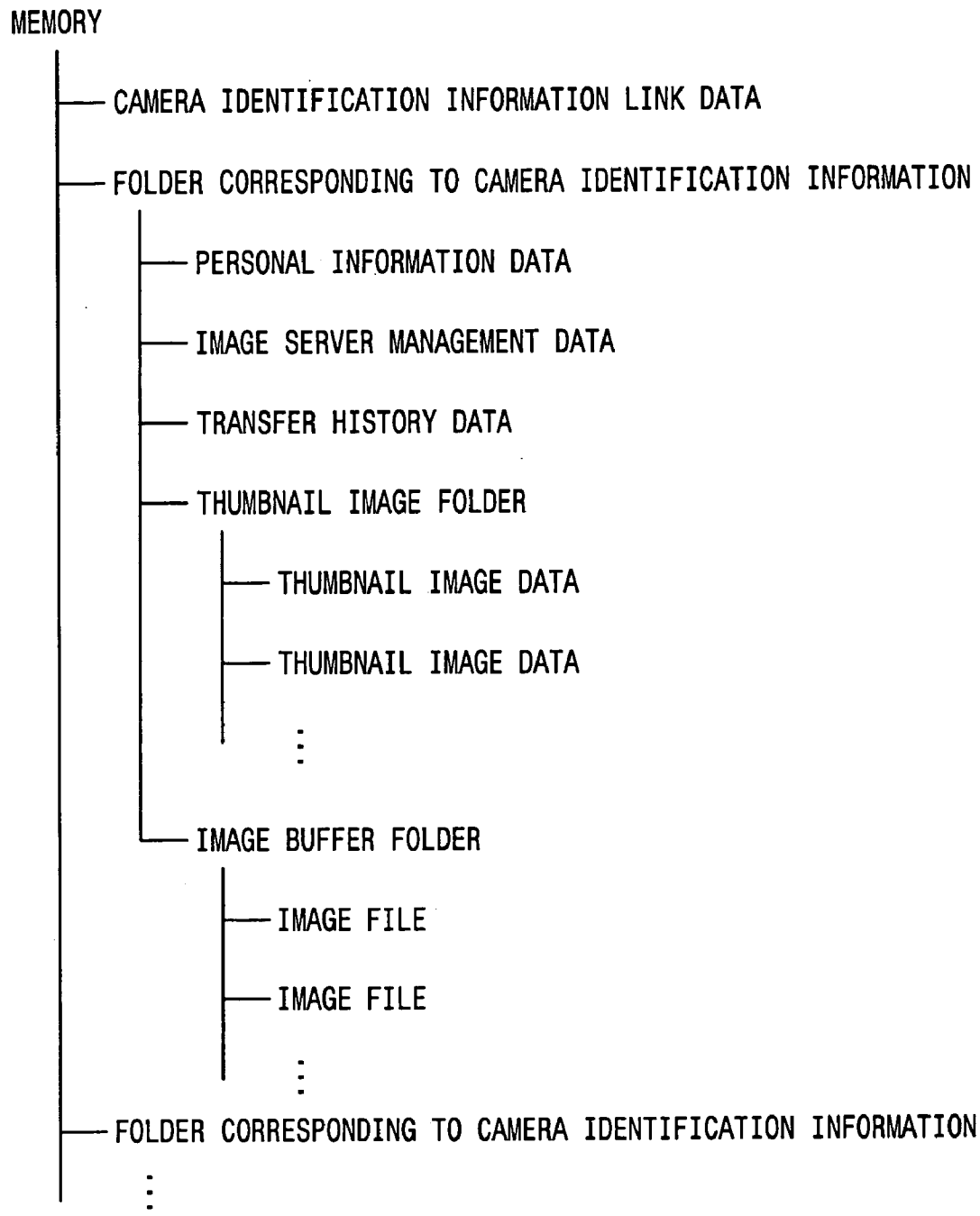

MEMORY
CAMERA IDENTIFICATION INFORMATION LINK DATA
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION
PERSONAL INFORMATION DATA
IMAGE SERVER MANAGEMENT DATA
TRANSFER HISTORY DATA
THUMBNAIL IMAGE FOLDER
THUMBNAIL IMAGE DATA
THUMBNAIL IMAGE DATA
IMAGE BUFFER FOLDER
IMAGE FILE
IMAGE FILE
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION

Fig. 39

CAMERA IDENTIFICATION INFORMATION A : PARENT
CAMERA IDENTIFICATION INFORMATION B → CAMERA IDENTIFICATION INFORMATION A
CAMERA IDENTIFICATION INFORMATION C → CAMERA IDENTIFICATION INFORMATION A
CAMERA IDENTIFICATION INFORMATION D : PARENT
CAMERA IDENTIFICATION INFORMATION E → CAMERA IDENTIFICATION INFORMATION D
CAMERA IDENTIFICATION INFORMATION F : NO LINK
CAMERA IDENTIFICATION INFORMATION H : NOT YET USED
...

Fig.40

PERSONAL
INFORMATION DATA

NAME
GENDER
AGE
ADDRESS
E-MAIL ADDRESS
OCCUPATION
PASSWORD
PHONE NUMBER
...

Fig. 41

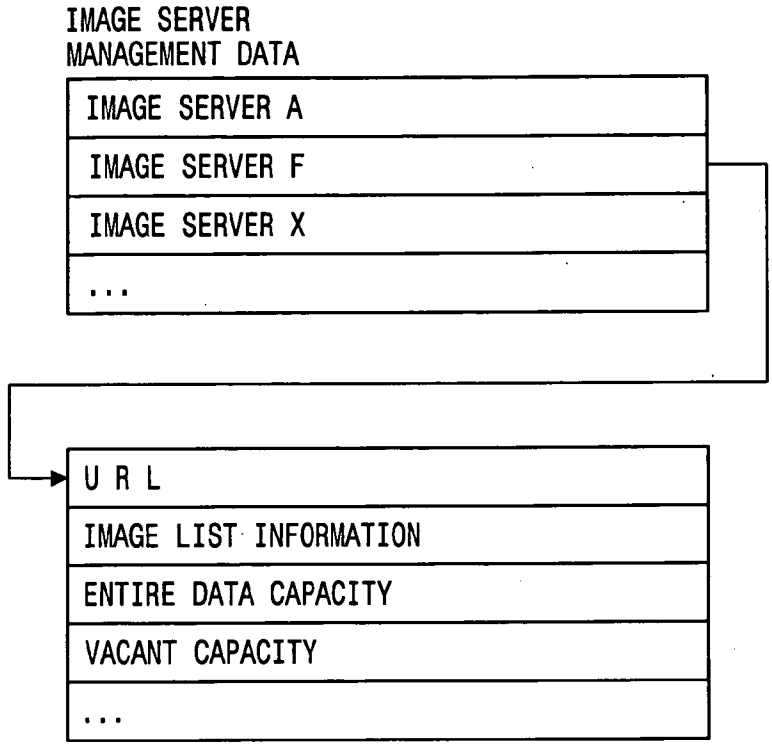


IMAGE SERVER
MANAGEMENT DATA
IMAGE SERVER A
IMAGE SERVER F
IMAGE SERVER X
...
U R L
IMAGE LIST INFORMATION
ENTIRE DATA CAPACITY
VACANT CAPACITY
...

Fig. 42

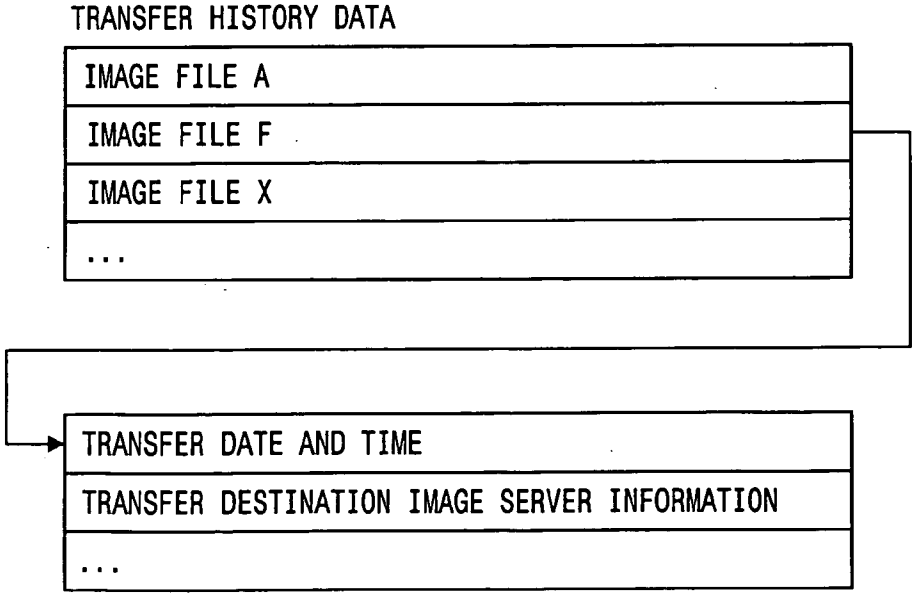

TRANSFER HISTORY DATA
IMAGE FILE A
IMAGE FILE F
IMAGE FILE X
...
TRANSFER DATE AND TIME
TRANSFER DESTINATION IMAGE SERVER INFORMATION
...

Fig. 43

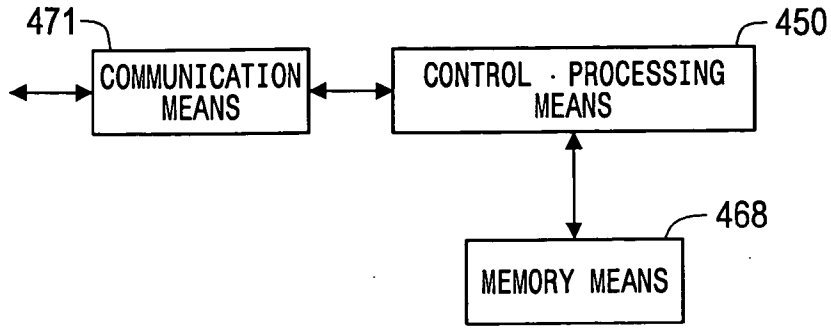

471
COMMUNICATION MEANS
450
CONTROL · PROCESSING MEANS
468
MEMORY MEANS

Fig.44

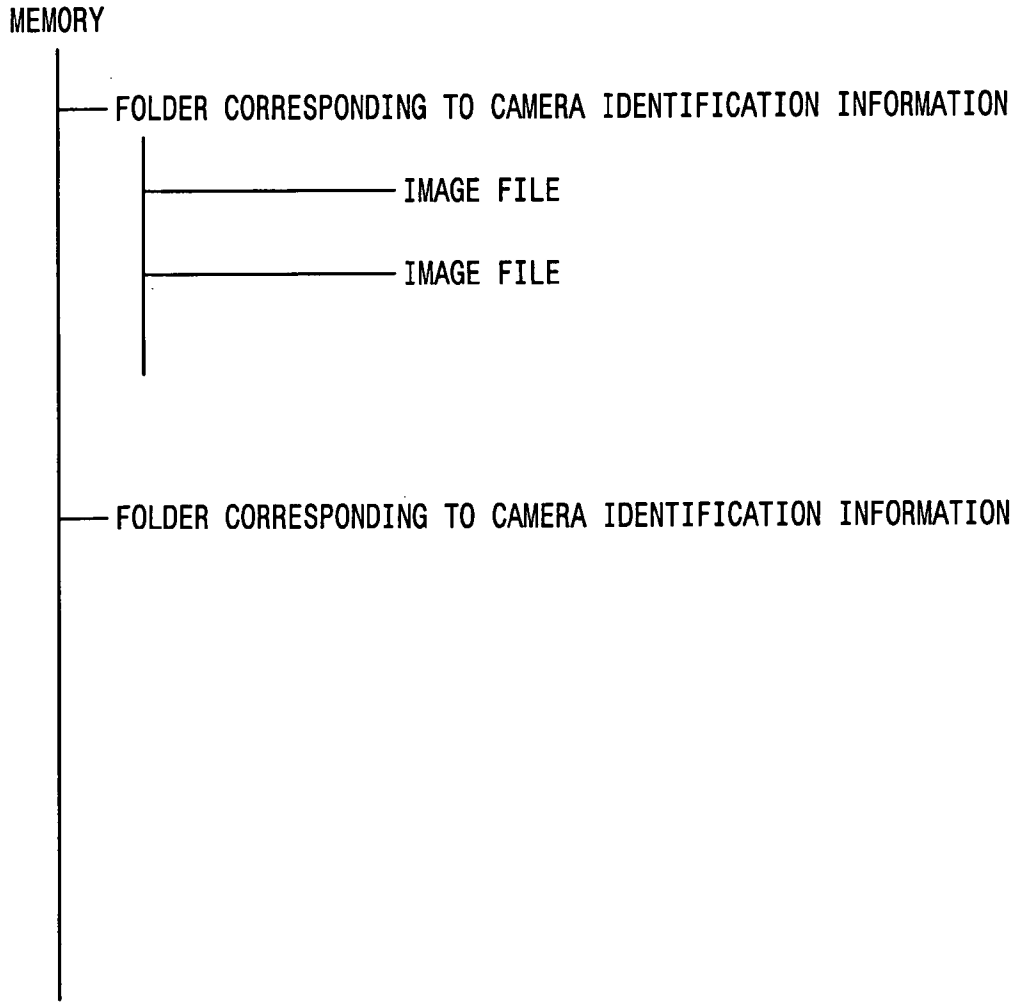

MEMORY
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION
IMAGE FILE
IMAGE FILE
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION

Fig.45

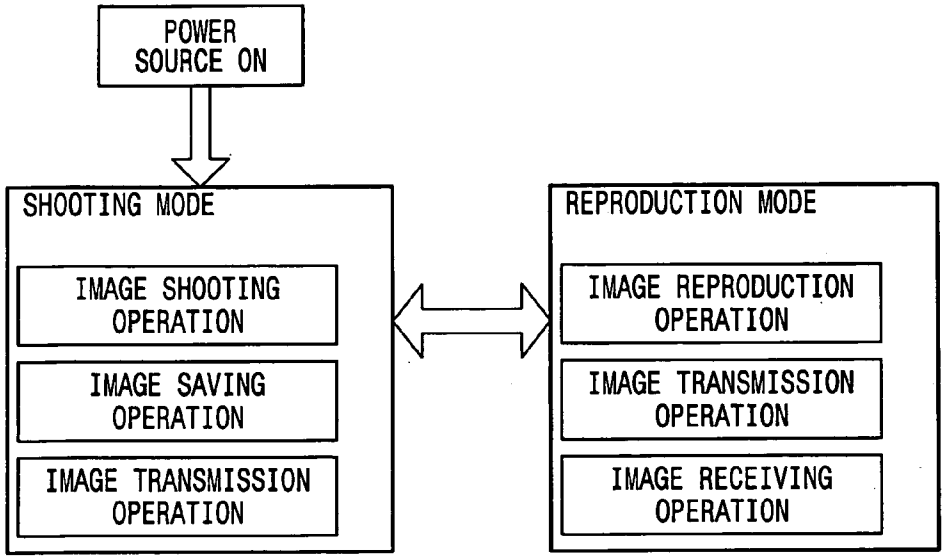

POWER SOURCE ON
SHOOTING MODE
IMAGE SHOOTING OPERATION
IMAGE SAVING OPERATION
IMAGE TRANSMISSION OPERATION
REPRODUCTION MODE
IMAGE REPRODUCTION OPERATION
IMAGE TRANSMISSION OPERATION
IMAGE RECEIVING OPERATION

Fig. 46

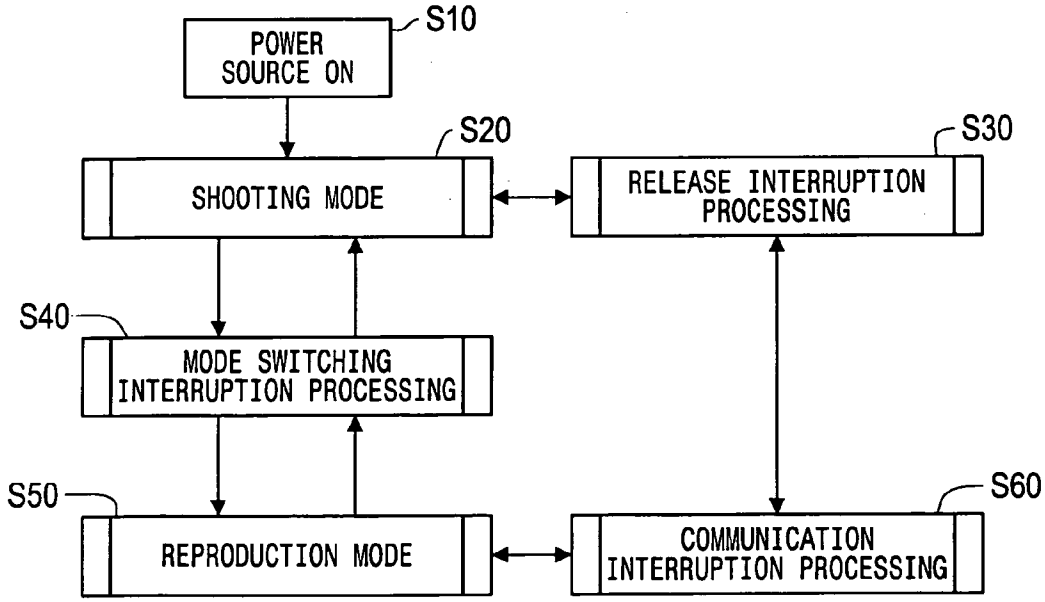

POWER SOURCE ON
S10
S20
SHOOTING MODE
S30
RELEASE INTERRUPTION PROCESSING
S40
MODE SWITCHING INTERRUPTION PROCESSING
S50
REPRODUCTION MODE
S60
COMMUNICATION INTERRUPTION PROCESSING

Fig.47

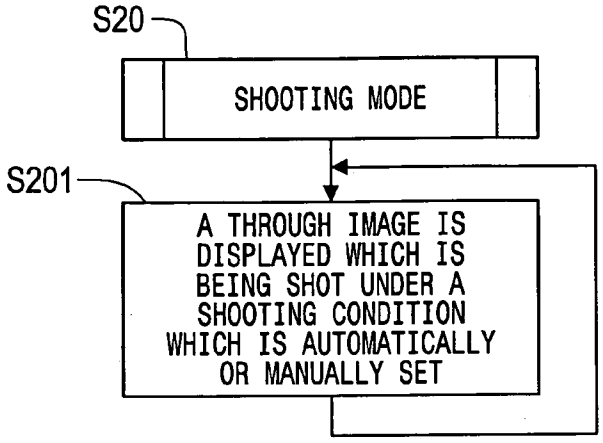

S20
SHOOTING MODE
S201
A THROUGH IMAGE IS DISPLAYED WHICH IS BEING SHOT UNDER A SHOOTING CONDITION WHICH IS AUTOMATICALLY OR MANUALLY SET

Fig. 48

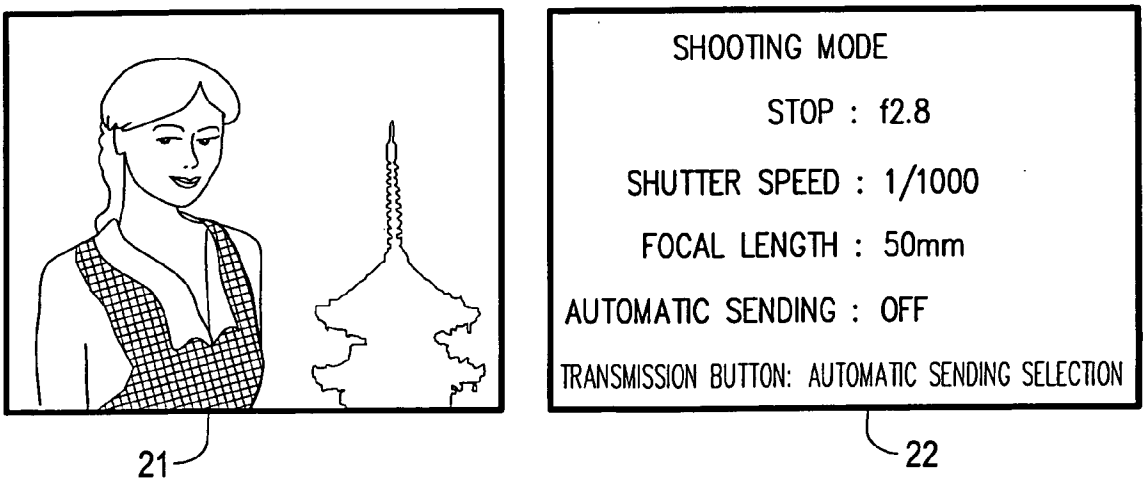

SHOOTING MODE
STOP : f2.8
SHUTTER SPEED : 1/1000
FOCAL LENGTH : 50mm
AUTOMATIC SENDING : OFF
TRANSMISSION BUTTON: AUTOMATIC SENDING SELECTION
21
22

Fig. 49

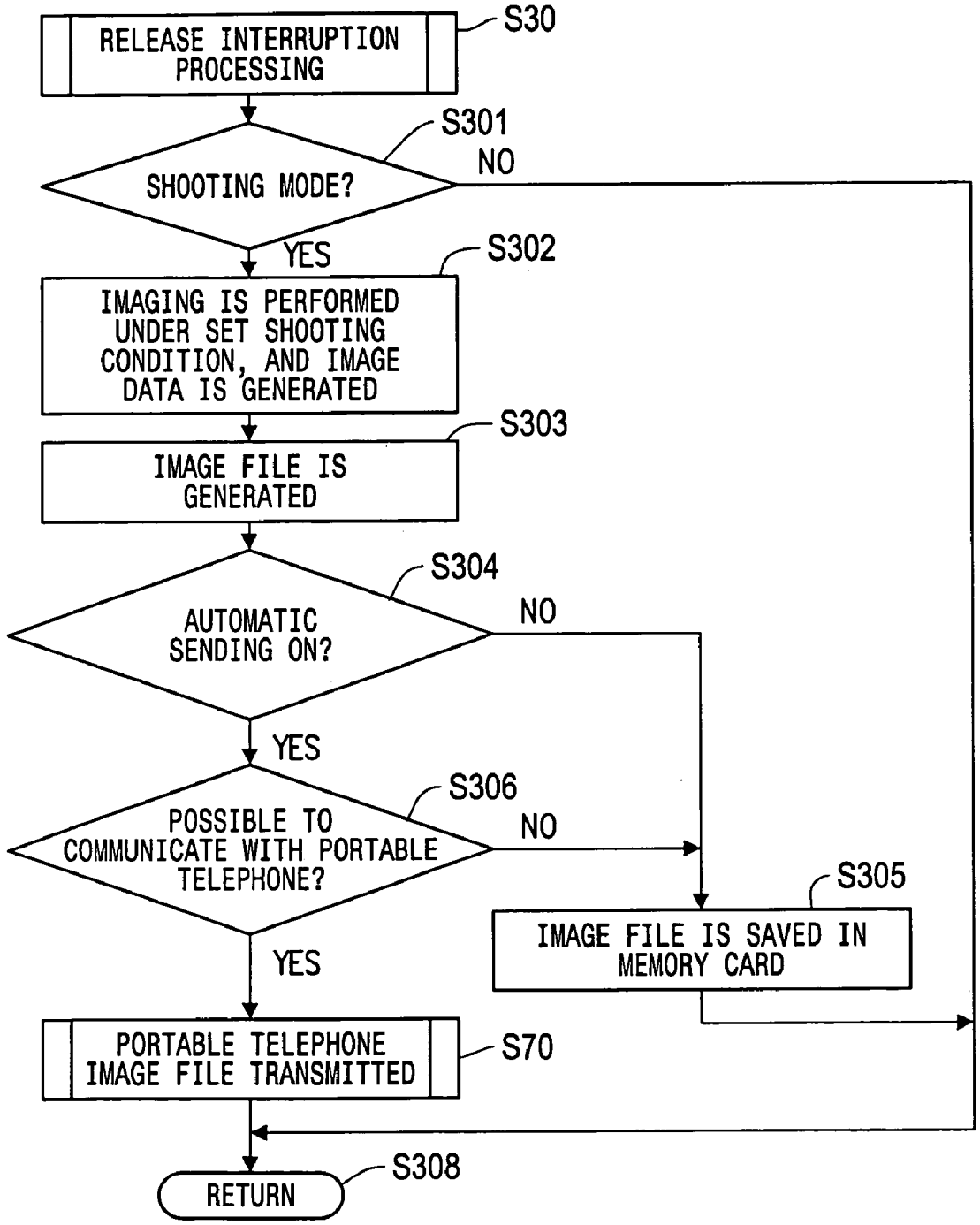

RELEASE INTERRUPTION PROCESSING
S30
SHOOTING MODE?
S301
NO
YES
IMAGING IS PERFORMED UNDER SET SHOOTING CONDITION, AND IMAGE DATA IS GENERATED
S302
IMAGE FILE IS GENERATED
S303
AUTOMATIC SENDING ON?
S304
NO
YES
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S306
NO
YES
IMAGE FILE IS SAVED IN MEMORY CARD
S305
PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
RETURN
S308

Fig. 50

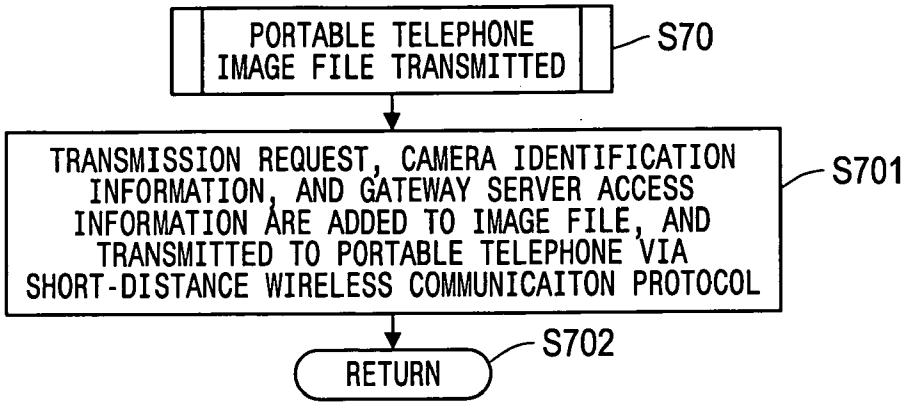

PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
TRANSMISSION REQUEST, CAMERA IDENTIFICATION INFORMATION, AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO IMAGE FILE, AND TRANSMITTED TO PORTABLE TELEPHONE VIA SHORT-DISTANCE WIRELESS COMMUNICAITON PROTOCOL
S701
RETURN
S702

Fig. 51

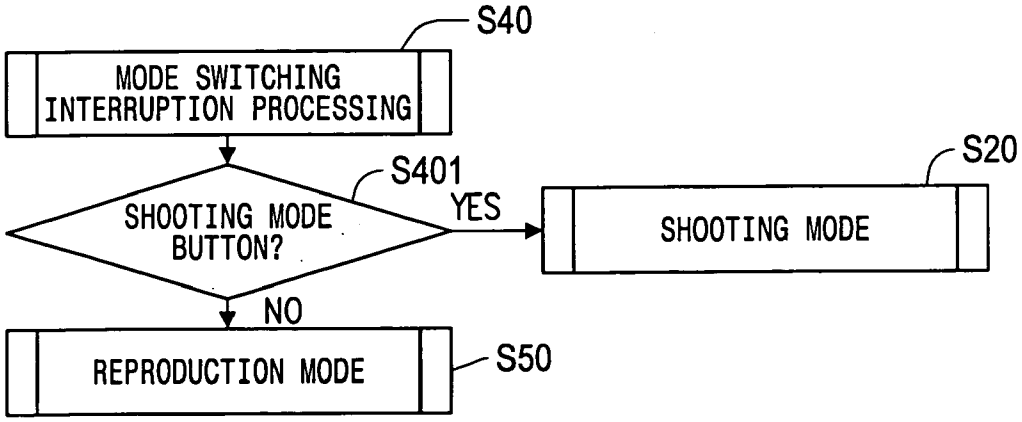

S40
MODE SWITCHING INTERRUPTION PROCESSING
S401
SHOOTING MODE BUTTON?
YES
S20
SHOOTING MODE
NO
REPRODUCTION MODE
S50

Fig. 52

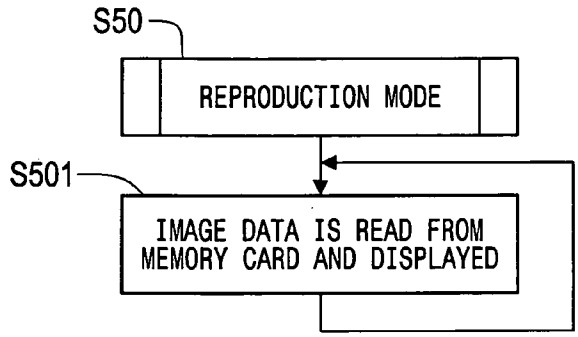

S50
REPRODUCTION MODE
S501
IMAGE DATA IS READ FROM MEMORY CARD AND DISPLAYED

Fig. 53

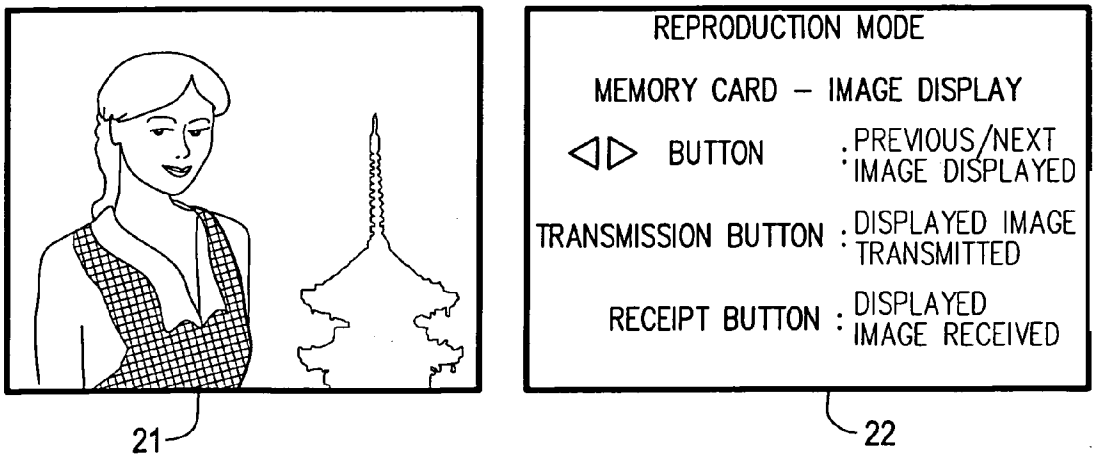

REPRODUCTION MODE
MEMORY CARD – IMAGE DISPLAY
◁▷ BUTTON : PREVIOUS/NEXT IMAGE DISPLAYED
TRANSMISSION BUTTON : DISPLAYED IMAGE TRANSMITTED
RECEIPT BUTTON : DISPLAYED IMAGE RECEIVED
21
22

Fig. 54

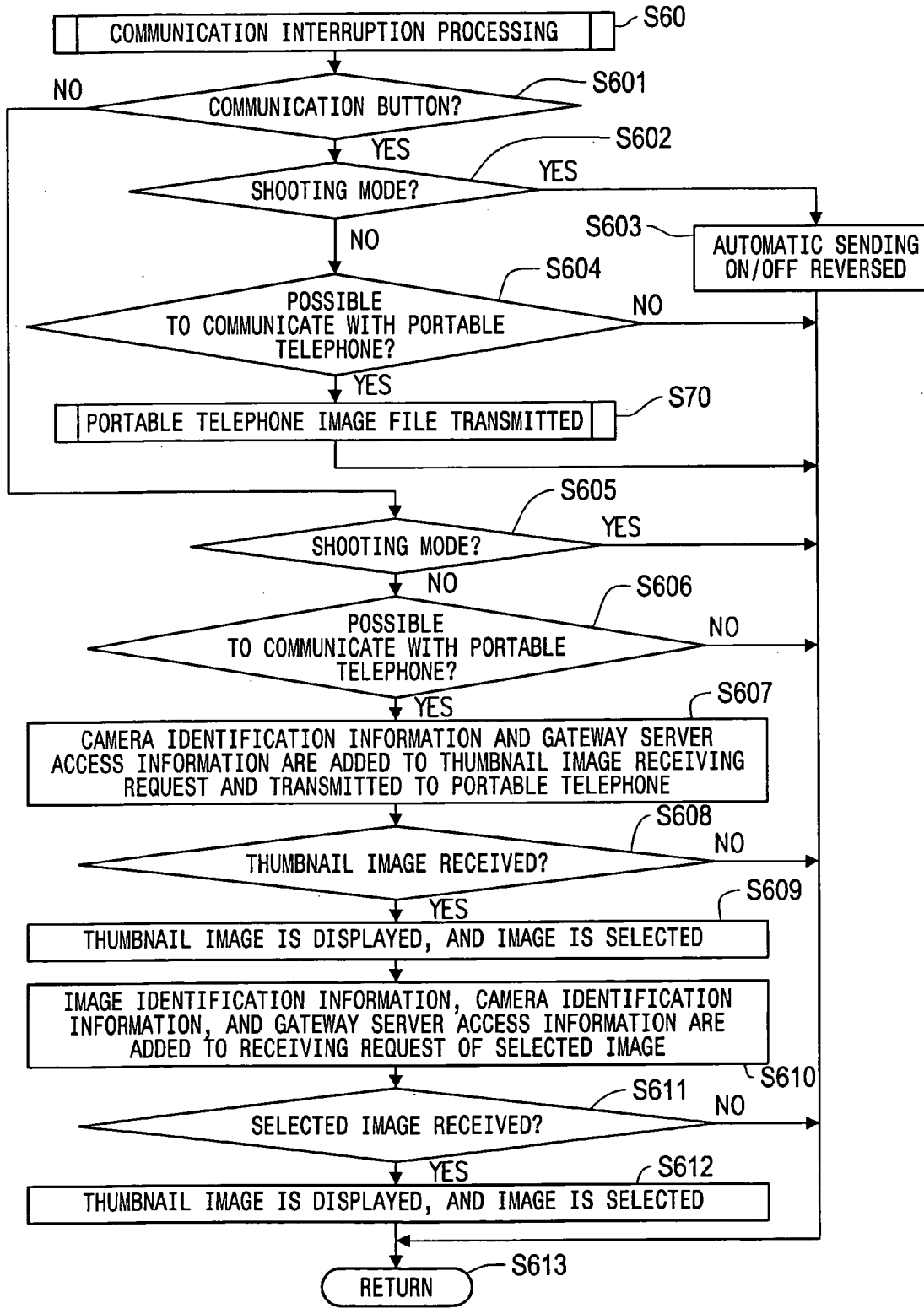

COMMUNICATION INTERRUPTION PROCESSING
S60
COMMUNICATION BUTTON?
S601
NO
YES
SHOOTING MODE?
S602
YES
NO
S603
AUTOMATIC SENDING ON/OFF REVERSED
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S604
NO
YES
PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
SHOOTING MODE?
S605
YES
NO
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S606
NO
YES
CAMERA IDENTIFICATION INFORMATION AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO THUMBNAIL IMAGE RECEIVING REQUEST AND TRANSMITTED TO PORTABLE TELEPHONE
S607
THUMBNAIL IMAGE RECEIVED?
S608
NO
YES
THUMBNAIL IMAGE IS DISPLAYED, AND IMAGE IS SELECTED
S609
IMAGE IDENTIFICATION INFORMATION, CAMERA IDENTIFICATION INFORMATION, AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO RECEIVING REQUEST OF SELECTED IMAGE
S610
SELECTED IMAGE RECEIVED?
S611
NO
YES
THUMBNAIL IMAGE IS DISPLAYED, AND IMAGE IS SELECTED
S612
RETURN
S613

Fig. 55

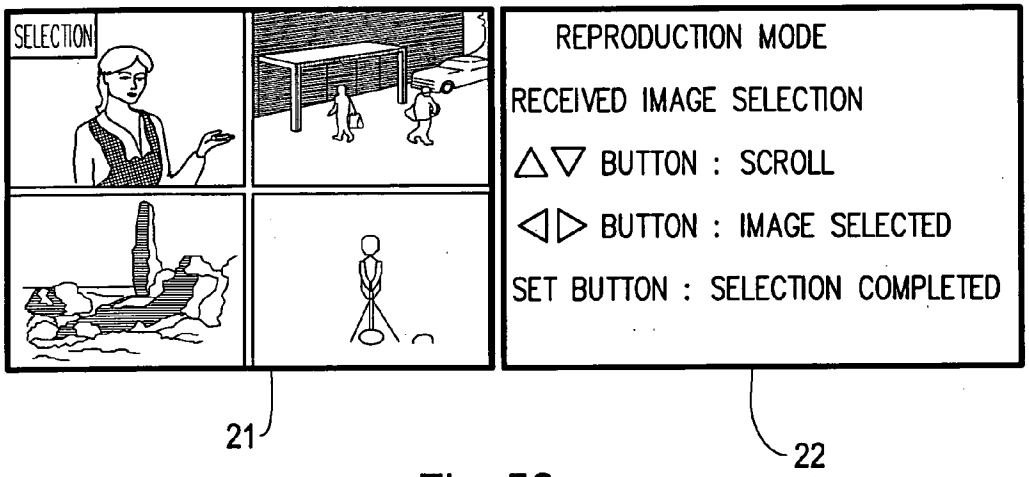

SELECTION
REPRODUCTION MODE
RECEIVED IMAGE SELECTION
△▽ BUTTON : SCROLL
◁▷ BUTTON : IMAGE SELECTED
SET BUTTON : SELECTION COMPLETED
21
22

Fig. 56

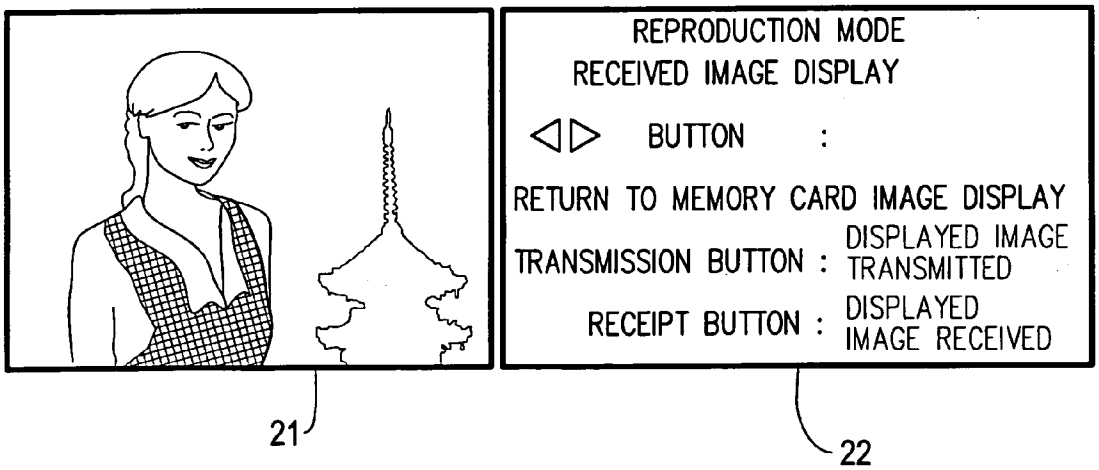

REPRODUCTION MODE
RECEIVED IMAGE DISPLAY
◁▷ BUTTON :
RETURN TO MEMORY CARD IMAGE DISPLAY
TRANSMISSION BUTTON : DISPLAYED IMAGE TRANSMITTED
RECEIPT BUTTON : DISPLAYED IMAGE RECEIVED
21
22

Fig. 57

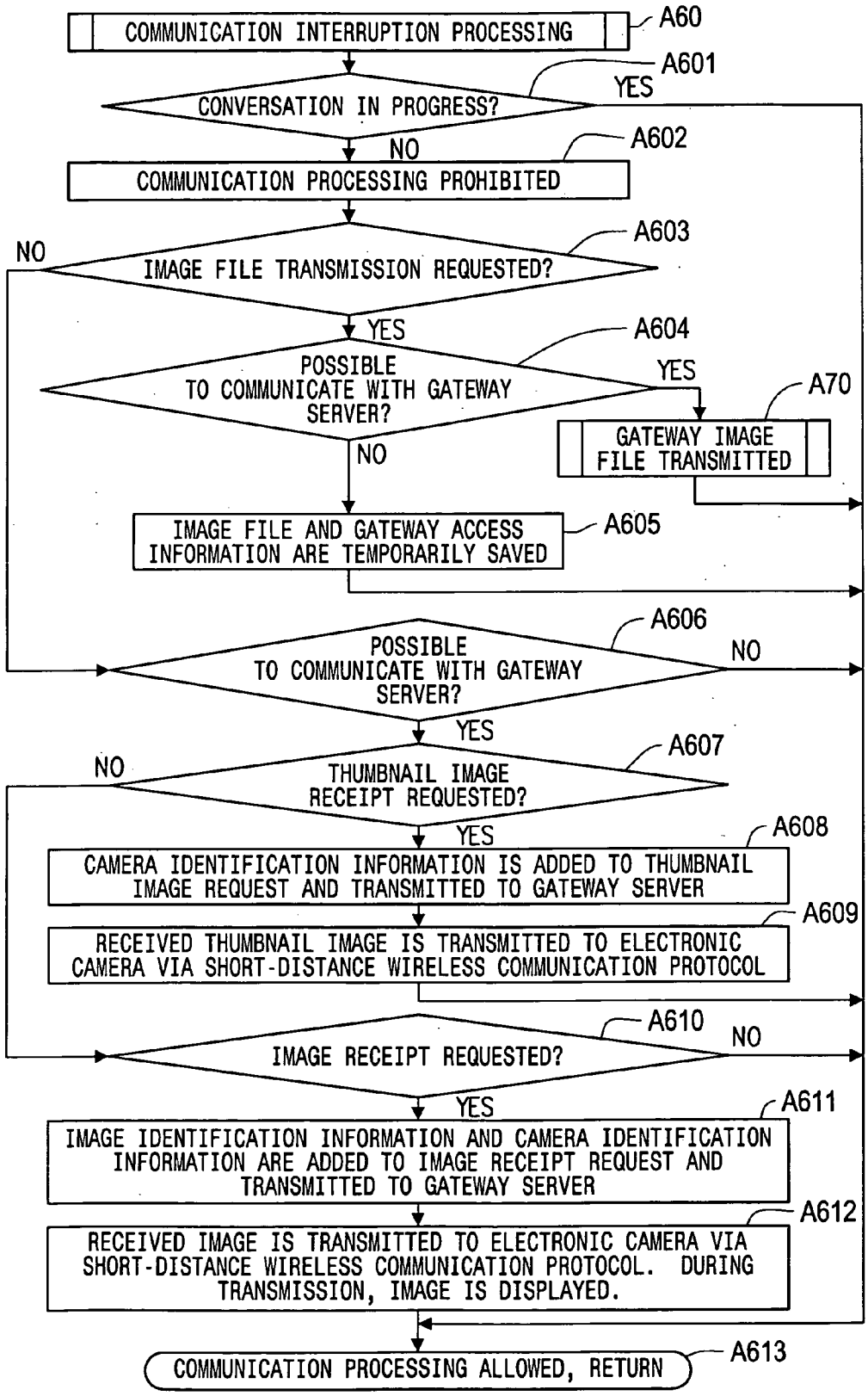

COMMUNICATION INTERRUPTION PROCESSING
A60
CONVERSATION IN PROGRESS?
A601
YES
NO
A602
COMMUNICATION PROCESSING PROHIBITED
IMAGE FILE TRANSMISSION REQUESTED?
A603
NO
YES
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
A604
YES
A70
GATEWAY IMAGE FILE TRANSMITTED
NO
IMAGE FILE AND GATEWAY ACCESS INFORMATION ARE TEMPORARILY SAVED
A605
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
A606
NO
YES
THUMBNAIL IMAGE RECEIPT REQUESTED?
A607
NO
YES
CAMERA IDENTIFICATION INFORMATION IS ADDED TO THUMBNAIL IMAGE REQUEST AND TRANSMITTED TO GATEWAY SERVER
A608
RECEIVED THUMBNAIL IMAGE IS TRANSMITTED TO ELECTRONIC CAMERA VIA SHORT-DISTANCE WIRELESS COMMUNICATION PROTOCOL
A609
IMAGE RECEIPT REQUESTED?
A610
NO
YES
IMAGE IDENTIFICATION INFORMATION AND CAMERA IDENTIFICATION INFORMATION ARE ADDED TO IMAGE RECEIPT REQUEST AND TRANSMITTED TO GATEWAY SERVER
A611
RECEIVED IMAGE IS TRANSMITTED TO ELECTRONIC CAMERA VIA SHORT-DISTANCE WIRELESS COMMUNICATION PROTOCOL. DURING TRANSMISSION, IMAGE IS DISPLAYED.
A612
COMMUNICATION PROCESSING ALLOWED, RETURN
A613

Fig. 58

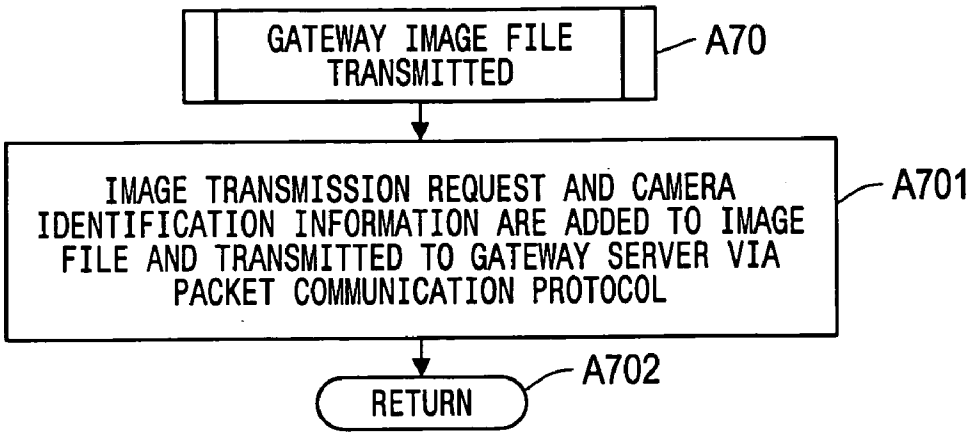

GATEWAY IMAGE FILE TRANSMITTED
A70
IMAGE TRANSMISSION REQUEST AND CAMERA IDENTIFICATION INFORMATION ARE ADDED TO IMAGE FILE AND TRANSMITTED TO GATEWAY SERVER VIA PACKET COMMUNICATION PROTOCOL
A701
RETURN
A702

Fig. 59

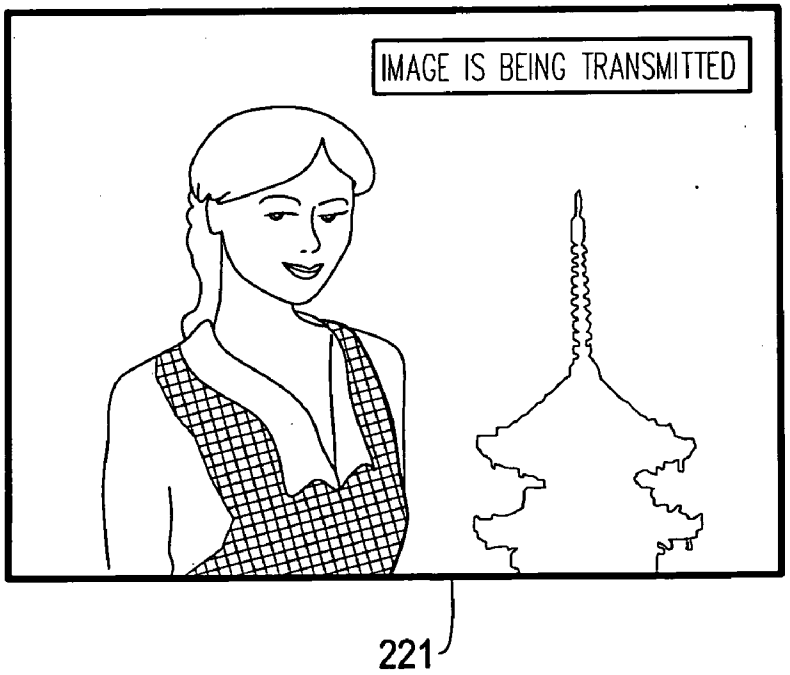


IMAGE IS BEING TRANSMITTED
221

Fig. 60

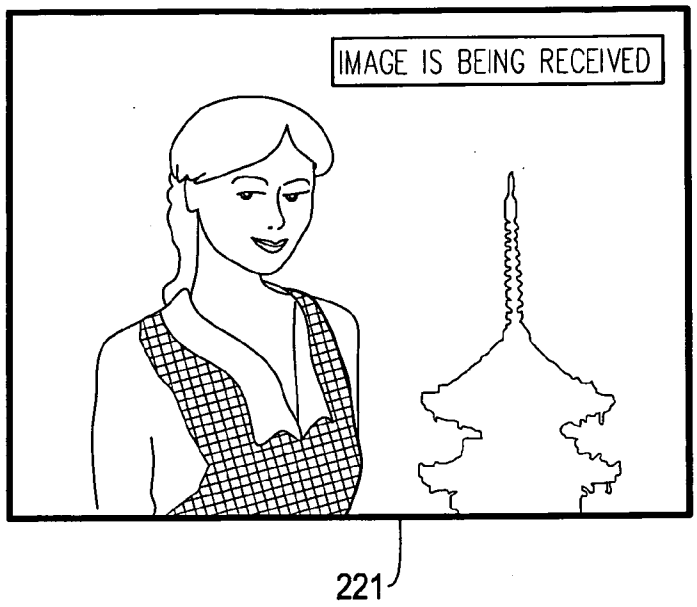


IMAGE IS BEING RECEIVED
221

Fig. 61

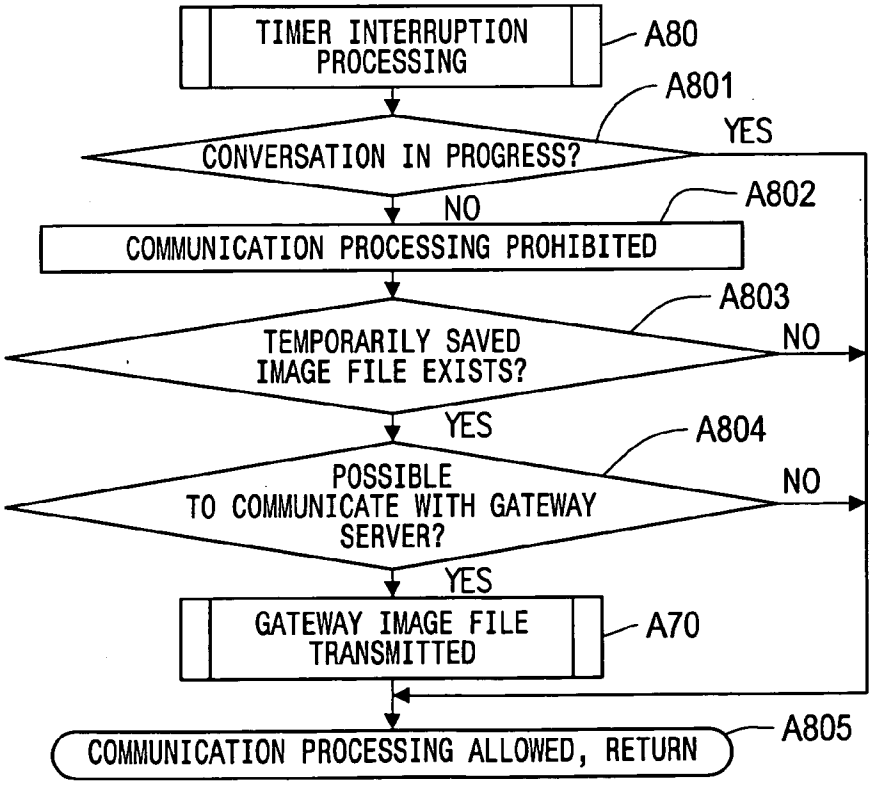

TIMER INTERRUPTION PROCESSING
A80
A801
CONVERSATION IN PROGRESS?
YES
NO
A802
COMMUNICATION PROCESSING PROHIBITED
A803
TEMPORARILY SAVED IMAGE FILE EXISTS?
NO
YES
A804
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
NO
YES
GATEWAY IMAGE FILE TRANSMITTED
A70
A805
COMMUNICATION PROCESSING ALLOWED, RETURN

Fig. 62

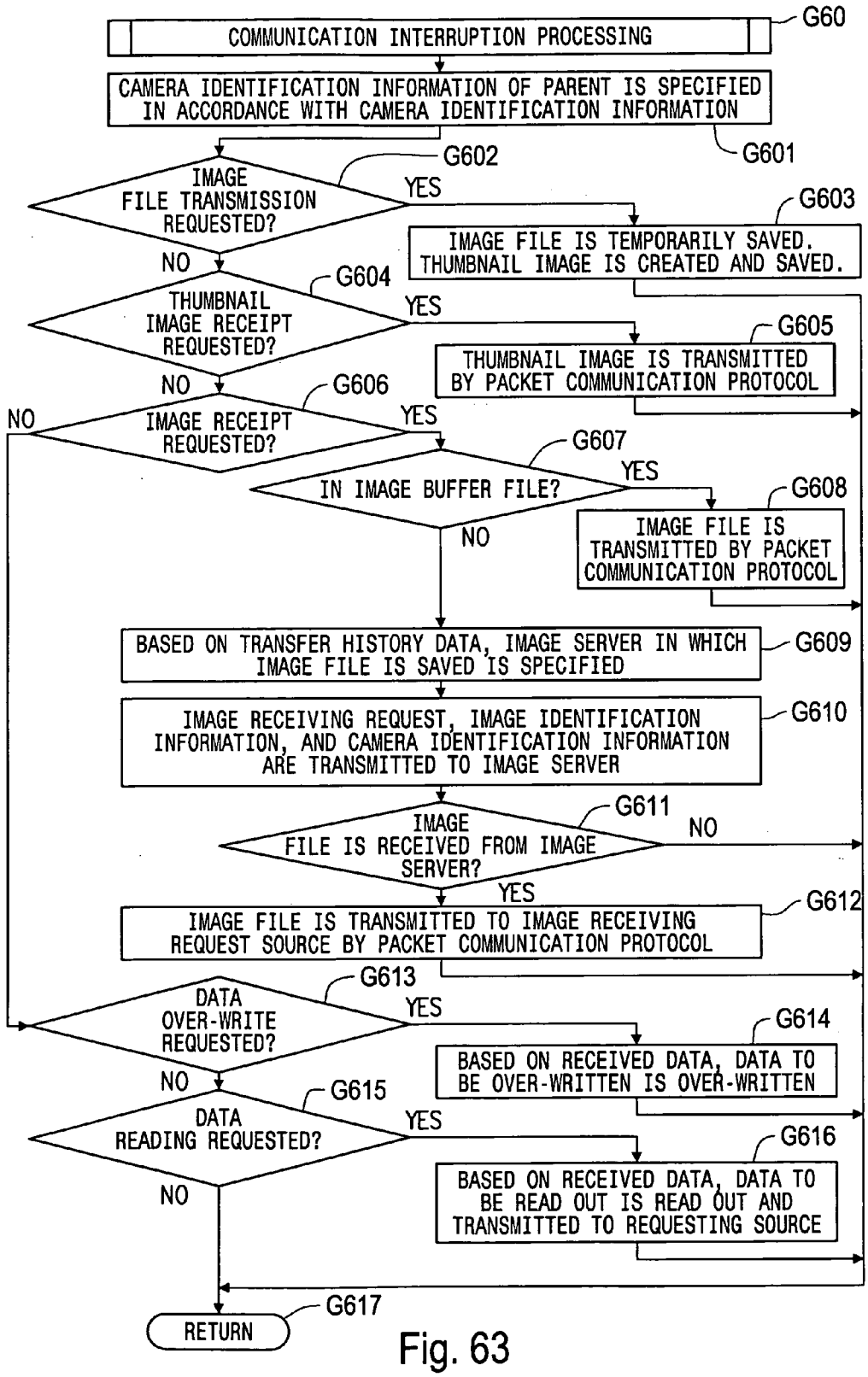

COMMUNICATION INTERRUPTION PROCESSING
G60
CAMERA IDENTIFICATION INFORMATION OF PARENT IS SPECIFIED IN ACCORDANCE WITH CAMERA IDENTIFICATION INFORMATION
G601
IMAGE FILE TRANSMISSION REQUESTED?
G602
YES
NO
IMAGE FILE IS TEMPORARILY SAVED. THUMBNAIL IMAGE IS CREATED AND SAVED.
G603
THUMBNAIL IMAGE RECEIPT REQUESTED?
G604
YES
NO
THUMBNAIL IMAGE IS TRANSMITTED BY PACKET COMMUNICATION PROTOCOL
G605
IMAGE RECEIPT REQUESTED?
G606
NO
YES
IN IMAGE BUFFER FILE?
G607
YES
NO
IMAGE FILE IS TRANSMITTED BY PACKET COMMUNICATION PROTOCOL
G608
BASED ON TRANSFER HISTORY DATA, IMAGE SERVER IN WHICH IMAGE FILE IS SAVED IS SPECIFIED
G609
IMAGE RECEIVING REQUEST, IMAGE IDENTIFICATION INFORMATION, AND CAMERA IDENTIFICATION INFORMATION ARE TRANSMITTED TO IMAGE SERVER
G610
IMAGE FILE IS RECEIVED FROM IMAGE SERVER?
G611
NO
YES
IMAGE FILE IS TRANSMITTED TO IMAGE RECEIVING REQUEST SOURCE BY PACKET COMMUNICATION PROTOCOL
G612
DATA OVER-WRITE REQUESTED?
G613
YES
NO
BASED ON RECEIVED DATA, DATA TO BE OVER-WRITTEN IS OVER-WRITTEN
G614
DATA READING REQUESTED?
G615
YES
NO
BASED ON RECEIVED DATA, DATA TO BE READ OUT IS READ OUT AND TRANSMITTED TO REQUESTING SOURCE
G616
RETURN
G617

Fig. 63

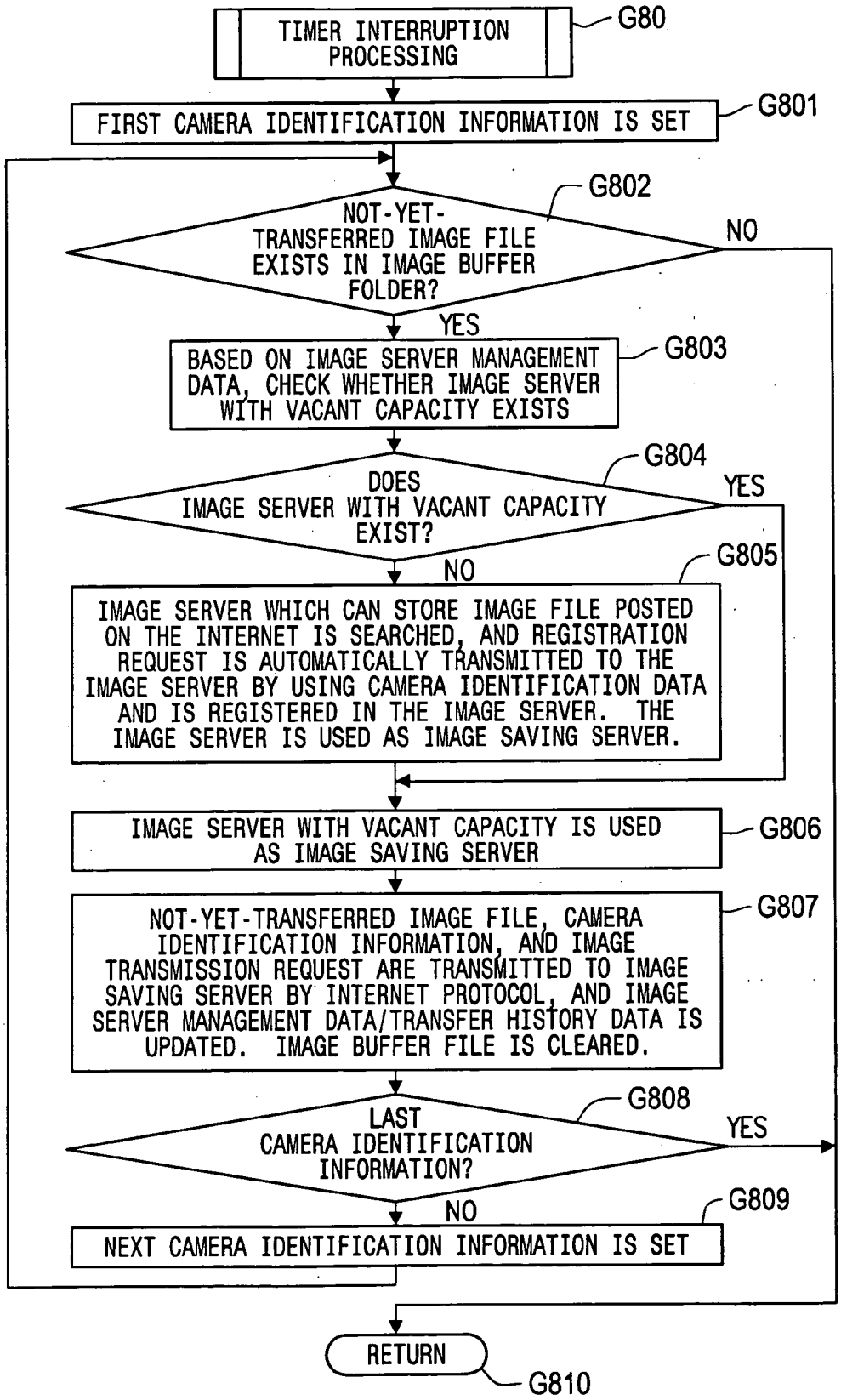

TIMER INTERRUPTION PROCESSING
G80
FIRST CAMERA IDENTIFICATION INFORMATION IS SET
G801
NOT-YET-TRANSFERRED IMAGE FILE EXISTS IN IMAGE BUFFER FOLDER?
G802
NO
YES
BASED ON IMAGE SERVER MANAGEMENT DATA, CHECK WHETHER IMAGE SERVER WITH VACANT CAPACITY EXISTS
G803
DOES IMAGE SERVER WITH VACANT CAPACITY EXIST?
G804
YES
NO
G805
IMAGE SERVER WHICH CAN STORE IMAGE FILE POSTED ON THE INTERNET IS SEARCHED, AND REGISTRATION REQUEST IS AUTOMATICALLY TRANSMITTED TO THE IMAGE SERVER BY USING CAMERA IDENTIFICATION DATA AND IS REGISTERED IN THE IMAGE SERVER. THE IMAGE SERVER IS USED AS IMAGE SAVING SERVER.
IMAGE SERVER WITH VACANT CAPACITY IS USED AS IMAGE SAVING SERVER
G806
NOT-YET-TRANSFERRED IMAGE FILE, CAMERA IDENTIFICATION INFORMATION, AND IMAGE TRANSMISSION REQUEST ARE TRANSMITTED TO IMAGE SAVING SERVER BY INTERNET PROTOCOL, AND IMAGE SERVER MANAGEMENT DATA/TRANSFER HISTORY DATA IS UPDATED. IMAGE BUFFER FILE IS CLEARED.
G807
LAST CAMERA IDENTIFICATION INFORMATION?
G808
YES
NO
G809
NEXT CAMERA IDENTIFICATION INFORMATION IS SET
RETURN
G810

Fig. 64

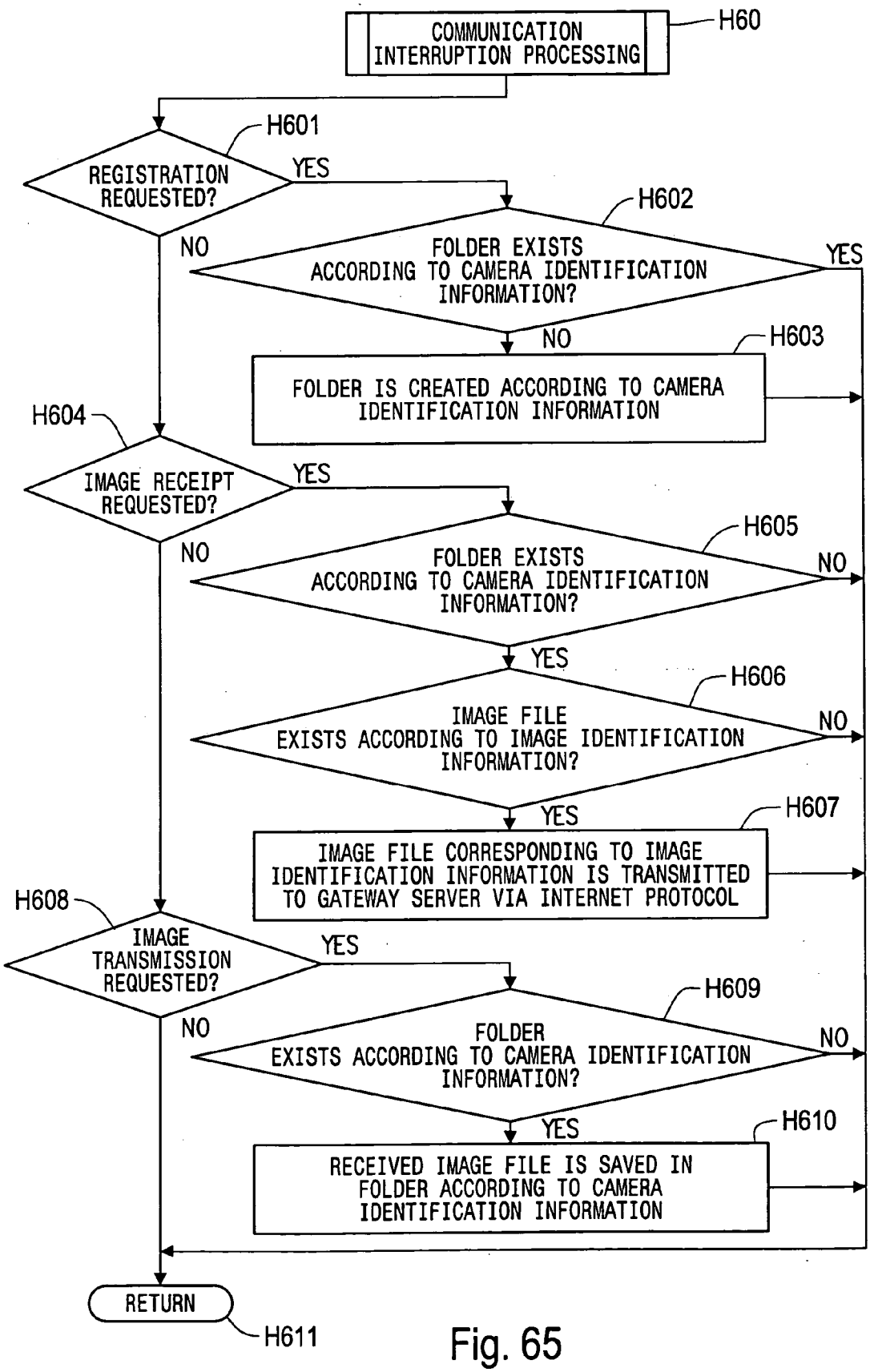

COMMUNICATION INTERRUPTION PROCESSING
H60
H601
REGISTRATION REQUESTED?
YES
NO
H602
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
YES
NO
H603
FOLDER IS CREATED ACCORDING TO CAMERA IDENTIFICATION INFORMATION
H604
IMAGE RECEIPT REQUESTED?
YES
NO
H605
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
NO
YES
H606
IMAGE FILE EXISTS ACCORDING TO IMAGE IDENTIFICATION INFORMATION?
NO
YES
H607
IMAGE FILE CORRESPONDING TO IMAGE IDENTIFICATION INFORMATION IS TRANSMITTED TO GATEWAY SERVER VIA INTERNET PROTOCOL
H608
IMAGE TRANSMISSION REQUESTED?
YES
NO
H609
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
NO
YES
H610
RECEIVED IMAGE FILE IS SAVED IN FOLDER ACCORDING TO CAMERA IDENTIFICATION INFORMATION
RETURN
H611

Fig. 65

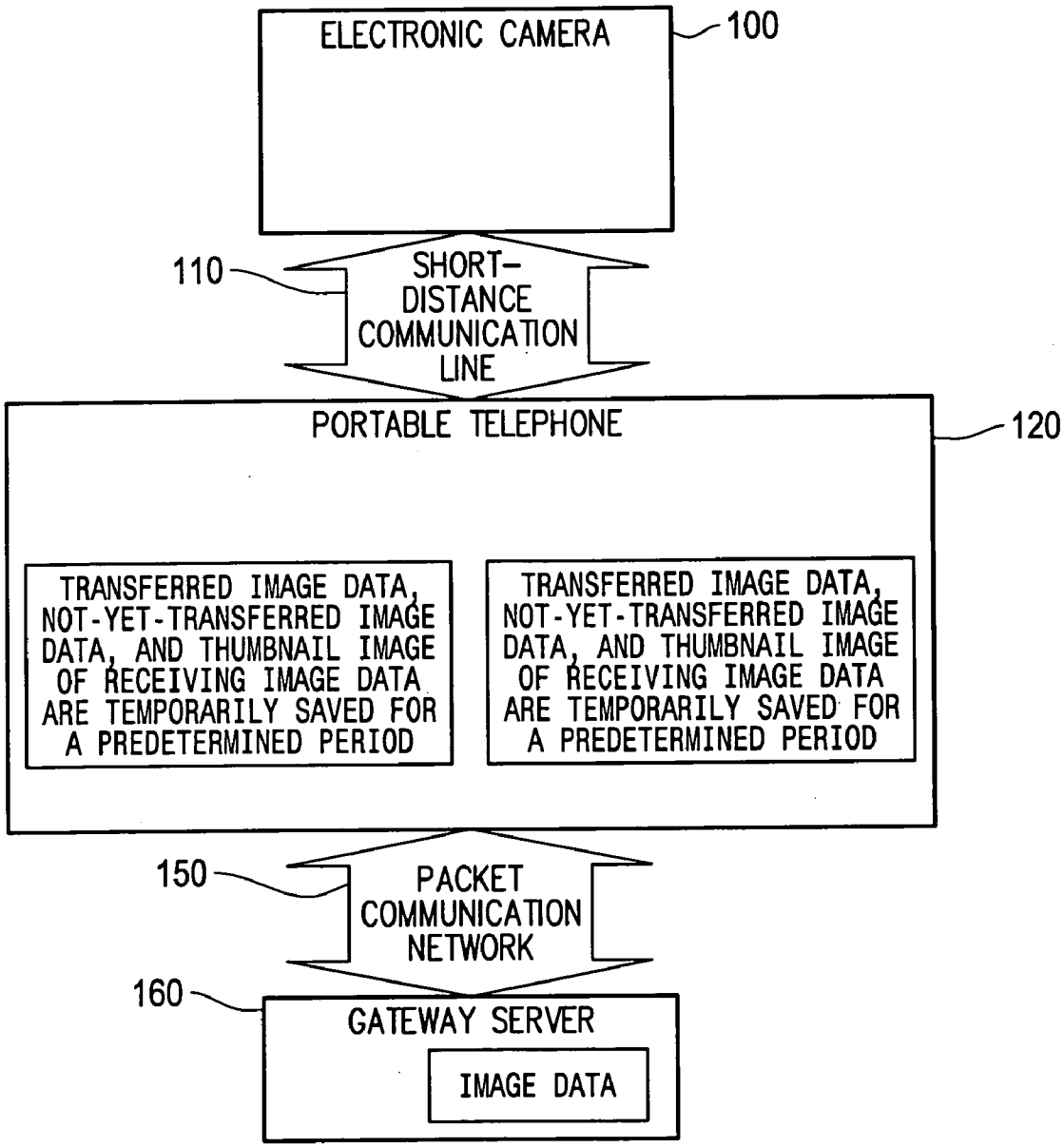

ELECTRONIC CAMERA
100
110
SHORT-DISTANCE COMMUNICATION LINE
PORTABLE TELEPHONE
120
TRANSFERRED IMAGE DATA, NOT-YET-TRANSFERRED IMAGE DATA, AND THUMBNAIL IMAGE OF RECEIVING IMAGE DATA ARE TEMPORARILY SAVED FOR A PREDETERMINED PERIOD
TRANSFERRED IMAGE DATA, NOT-YET-TRANSFERRED IMAGE DATA, AND THUMBNAIL IMAGE OF RECEIVING IMAGE DATA ARE TEMPORARILY SAVED FOR A PREDETERMINED PERIOD
150
PACKET COMMUNICATION NETWORK
160
GATEWAY SERVER
IMAGE DATA

Fig. 67

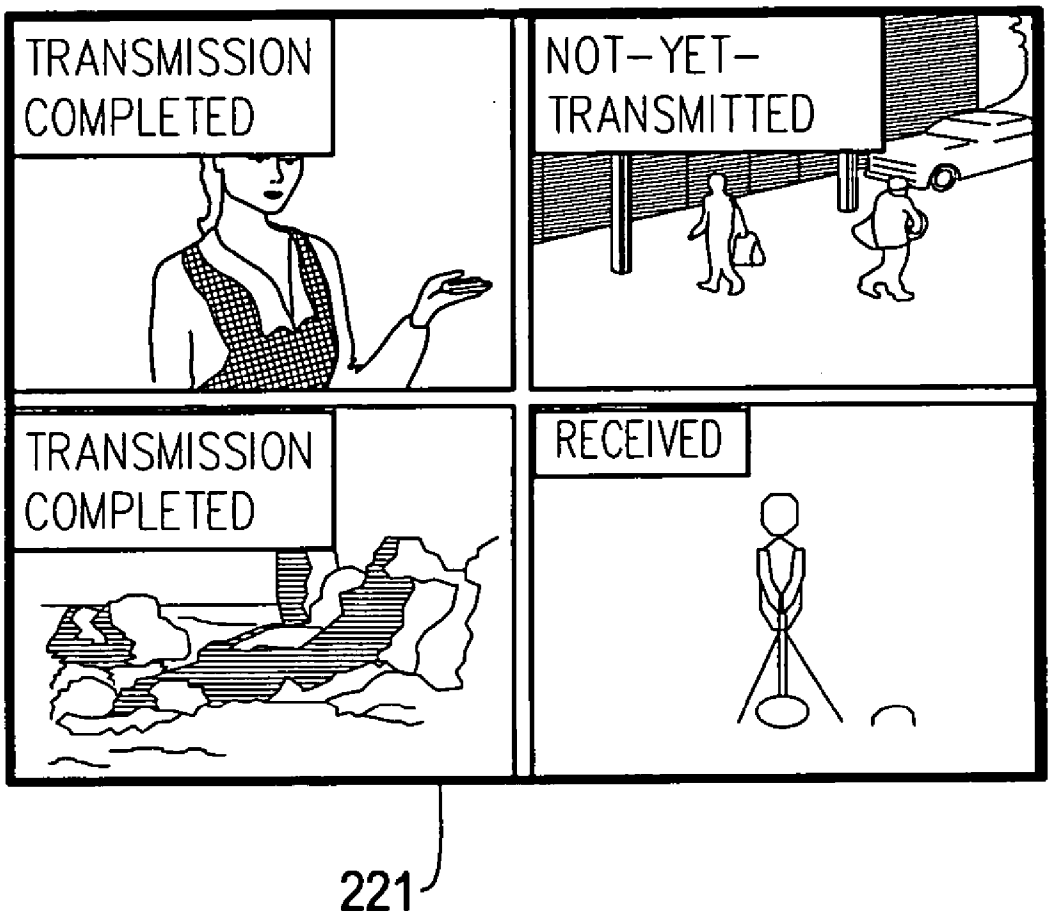

TRANSMISSION COMPLETED
NOT-YET-TRANSMITTED
TRANSMISSION COMPLETED
RECEIVED
221

Fig. 68

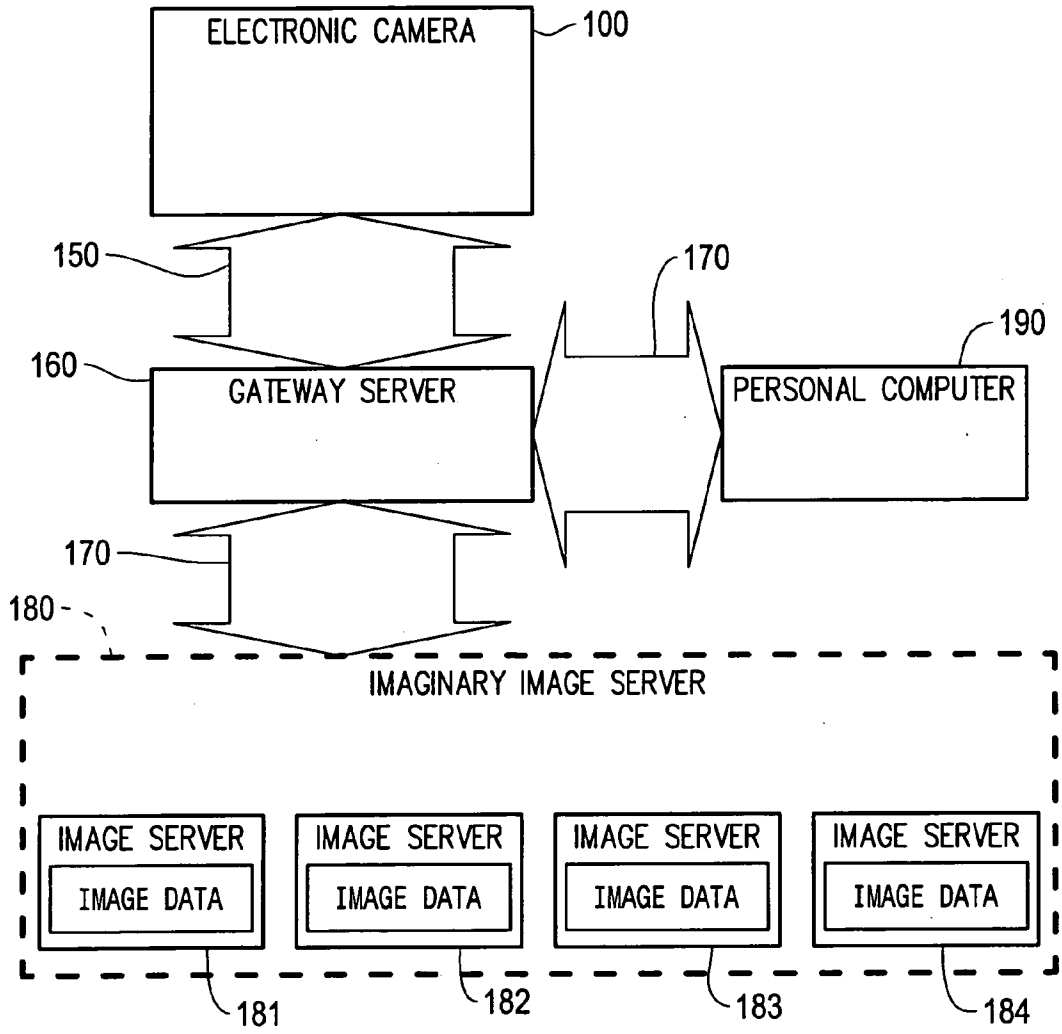

ELECTRONIC CAMERA
100
150
170
190
160
GATEWAY SERVER
PERSONAL COMPUTER
170
180
IMAGINARY IMAGE SERVER
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
181
182
183
184

Fig. 69

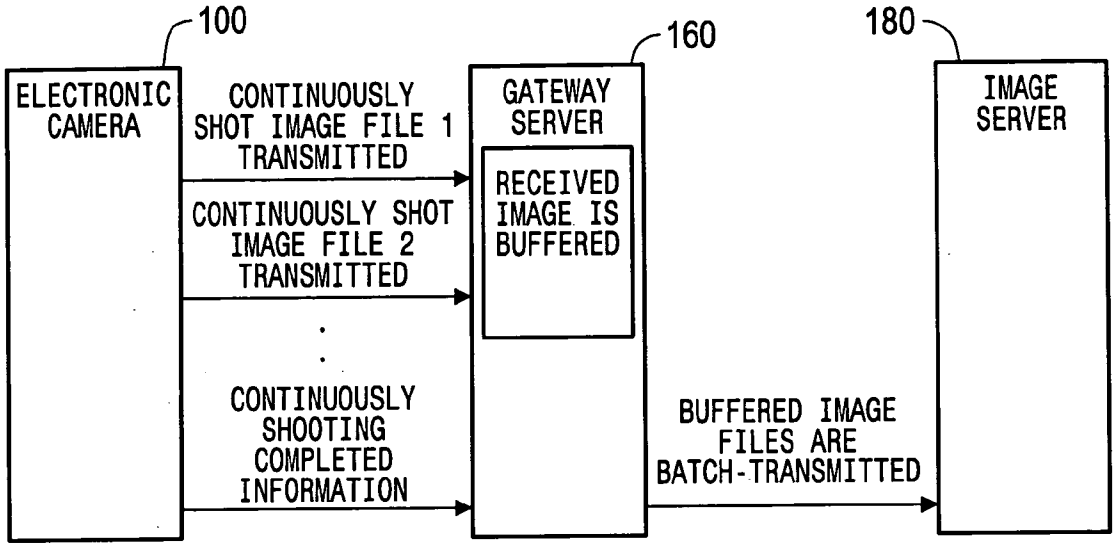

100
ELECTRONIC CAMERA
CONTINUOUSLY SHOT IMAGE FILE 1 TRANSMITTED
CONTINUOUSLY SHOT IMAGE FILE 2 TRANSMITTED
CONTINUOUSLY SHOOTING COMPLETED INFORMATION
160
GATEWAY SERVER
RECEIVED IMAGE IS BUFFERED
BUFFERED IMAGE FILES ARE BATCH-TRANSMITTED
180
IMAGE SERVER

Fig. 70

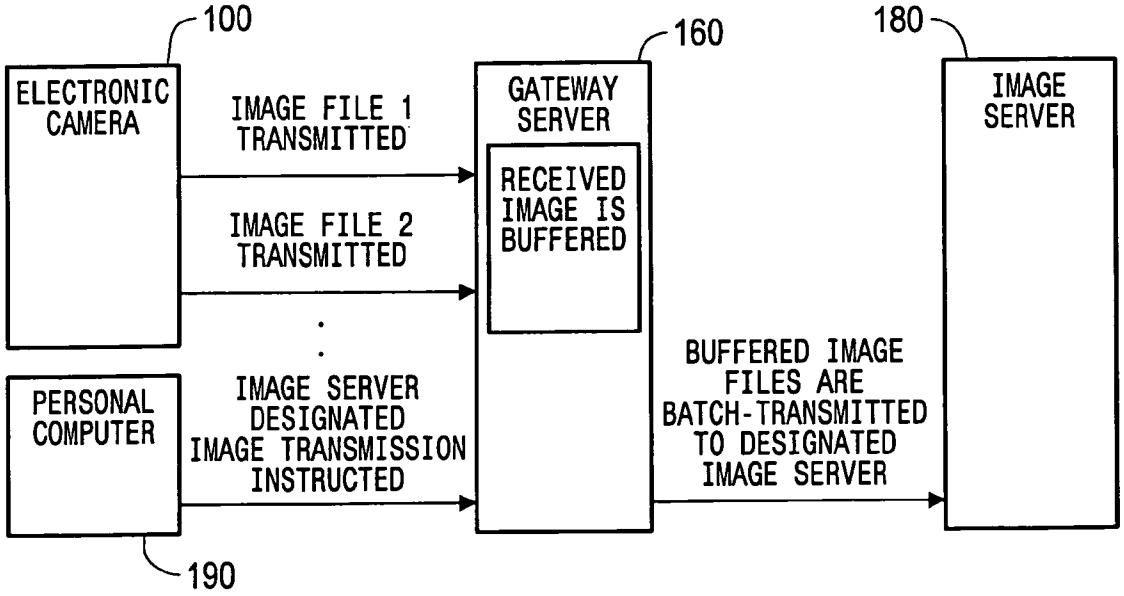

100
ELECTRONIC CAMERA
IMAGE FILE 1 TRANSMITTED
IMAGE FILE 2 TRANSMITTED
PERSONAL COMPUTER
IMAGE SERVER DESIGNATED IMAGE TRANSMISSION INSTRUCTED
190
160
GATEWAY SERVER
RECEIVED IMAGE IS BUFFERED
BUFFERED IMAGE FILES ARE BATCH-TRANSMITTED TO DESIGNATED IMAGE SERVER
180
IMAGE SERVER

Fig. 71

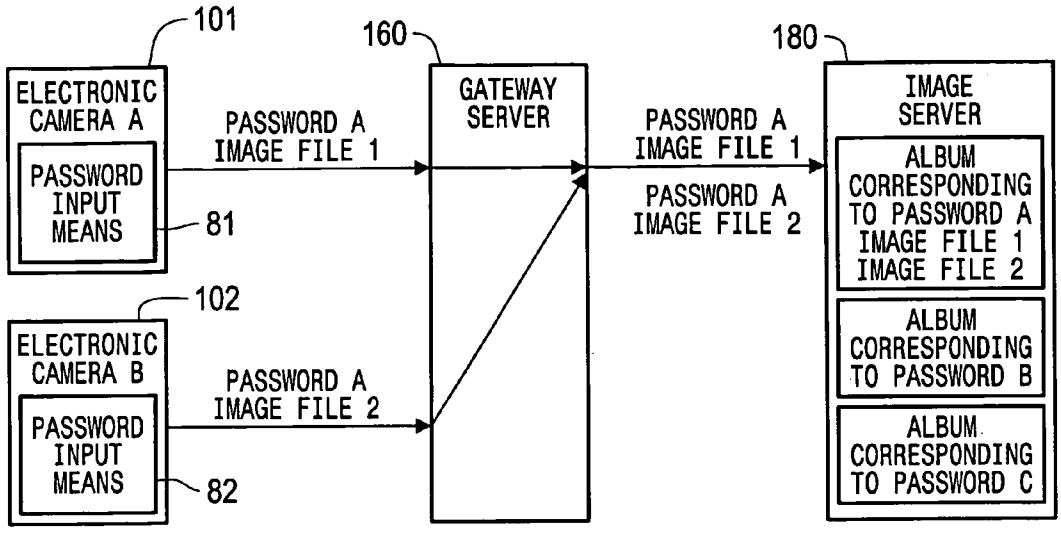

101
ELECTRONIC CAMERA A
PASSWORD INPUT MEANS
81
PASSWORD A IMAGE FILE 1
102
ELECTRONIC CAMERA B
PASSWORD INPUT MEANS
82
PASSWORD A IMAGE FILE 2
160
GATEWAY SERVER
PASSWORD A IMAGE FILE 1
PASSWORD A IMAGE FILE 2
180
IMAGE SERVER
ALBUM CORRESPONDING TO PASSWORD A IMAGE FILE 1 IMAGE FILE 2
ALBUM CORRESPONDING TO PASSWORD B
ALBUM CORRESPONDING TO PASSWORD C

Fig. 72

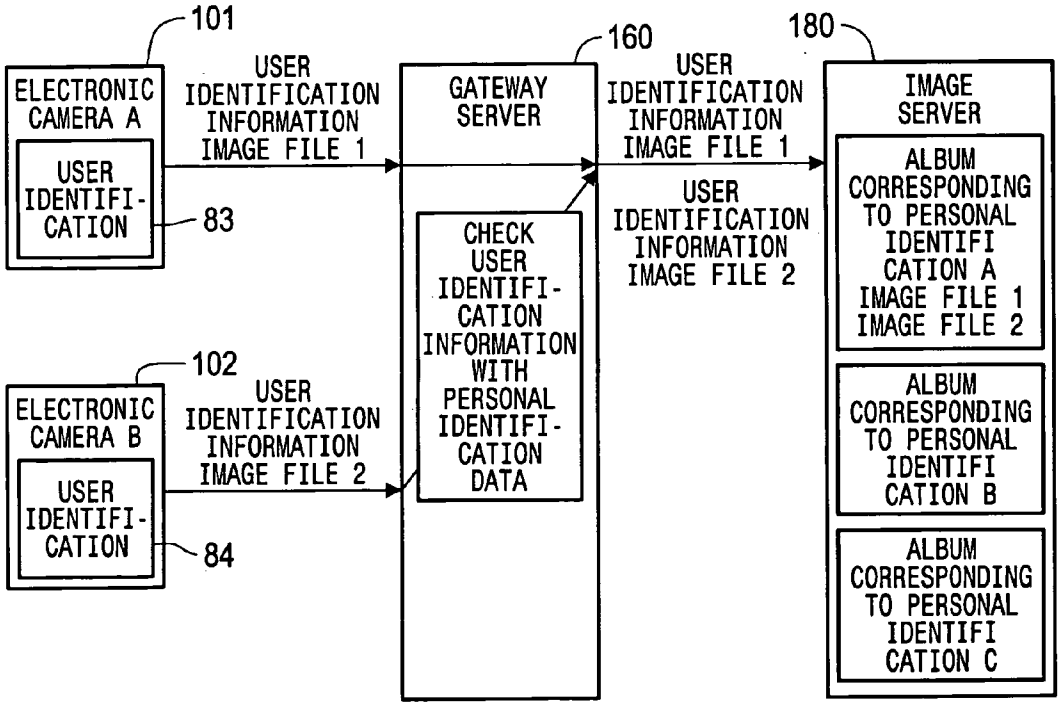

101
ELECTRONIC CAMERA A
USER IDENTIFI-CATION
83
USER IDENTIFICATION INFORMATION IMAGE FILE 1
102
ELECTRONIC CAMERA B
USER IDENTIFI-CATION
84
USER IDENTIFICATION INFORMATION IMAGE FILE 2
160
GATEWAY SERVER
CHECK USER IDENTIFI-CATION INFORMATION WITH PERSONAL IDENTIFI-CATION DATA
USER IDENTIFICATION INFORMATION IMAGE FILE 1
USER IDENTIFICATION INFORMATION IMAGE FILE 2
180
IMAGE SERVER
ALBUM CORRESPONDING TO PERSONAL IDENTIFI CATION A IMAGE FILE 1 IMAGE FILE 2
ALBUM CORRESPONDING TO PERSONAL IDENTIFI CATION B
ALBUM CORRESPONDING TO PERSONAL IDENTIFI CATION C

Fig. 73

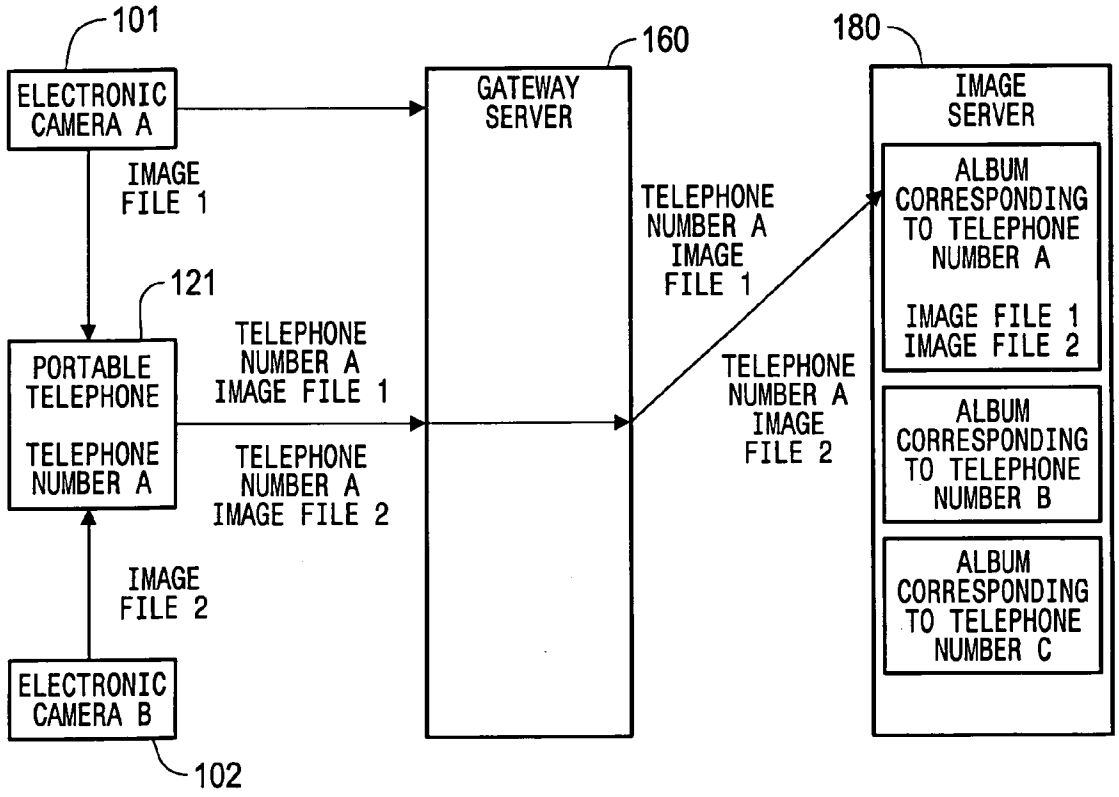

101
ELECTRONIC CAMERA A
IMAGE FILE 1
121
PORTABLE TELEPHONE
TELEPHONE NUMBER A
IMAGE FILE 2
ELECTRONIC CAMERA B
102
TELEPHONE NUMBER A IMAGE FILE 1
TELEPHONE NUMBER A IMAGE FILE 2
160
GATEWAY SERVER
TELEPHONE NUMBER A IMAGE FILE 1
TELEPHONE NUMBER A IMAGE FILE 2
180
IMAGE SERVER
ALBUM CORRESPONDING TO TELEPHONE NUMBER A
IMAGE FILE 1
IMAGE FILE 2
ALBUM CORRESPONDING TO TELEPHONE NUMBER B
ALBUM CORRESPONDING TO TELEPHONE NUMBER C

Fig. 74

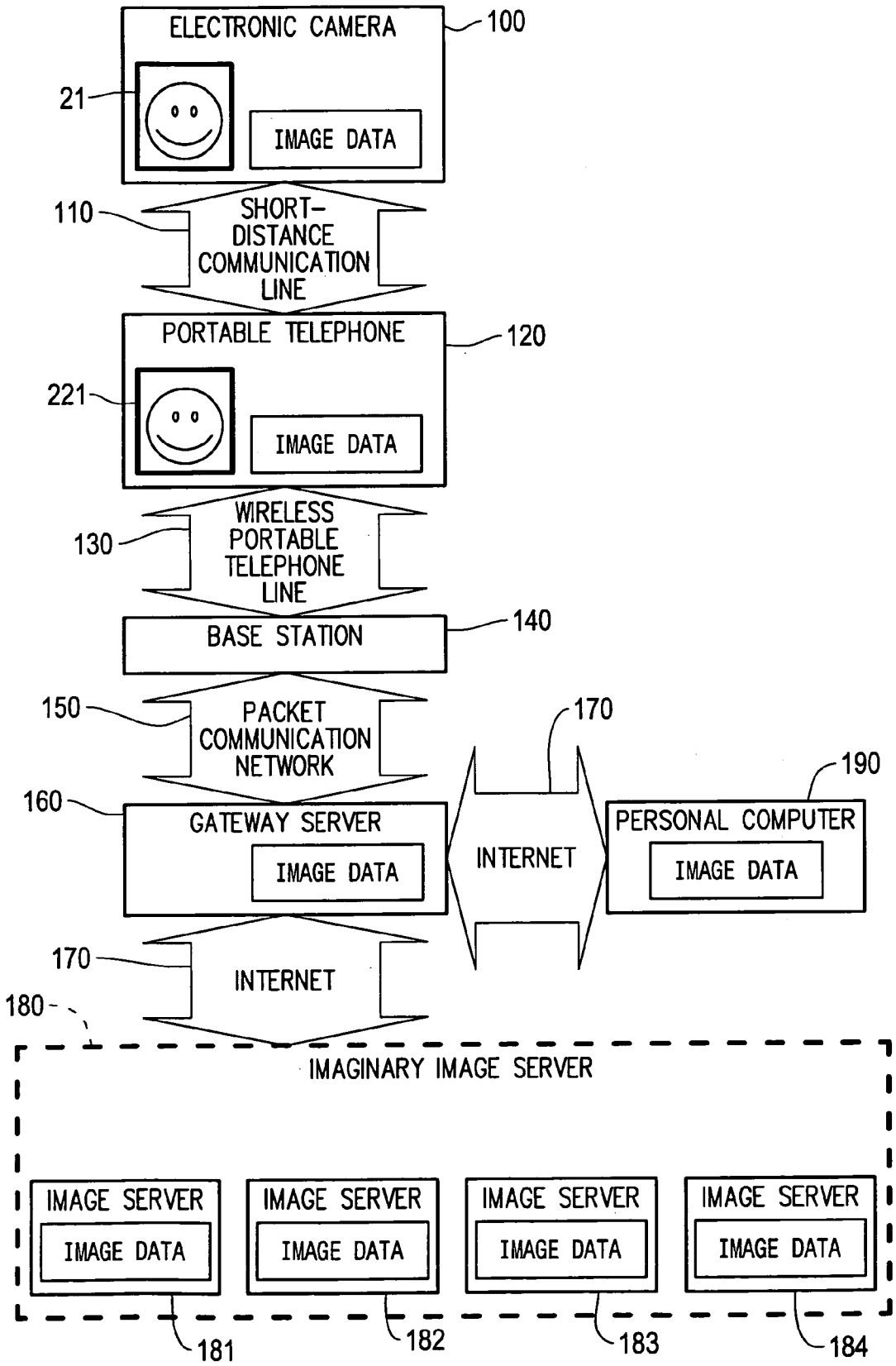

ELECTRONIC CAMERA
100
21
IMAGE DATA
110
SHORT-DISTANCE COMMUNICATION LINE
PORTABLE TELEPHONE
120
221
IMAGE DATA
130
WIRELESS PORTABLE TELEPHONE LINE
BASE STATION
140
150
PACKET COMMUNICATION NETWORK
170
190
160
GATEWAY SERVER
IMAGE DATA
INTERNET
PERSONAL COMPUTER
IMAGE DATA
170
INTERNET
180
IMAGINARY IMAGE SERVER
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
181
182
183
184

Fig. 75

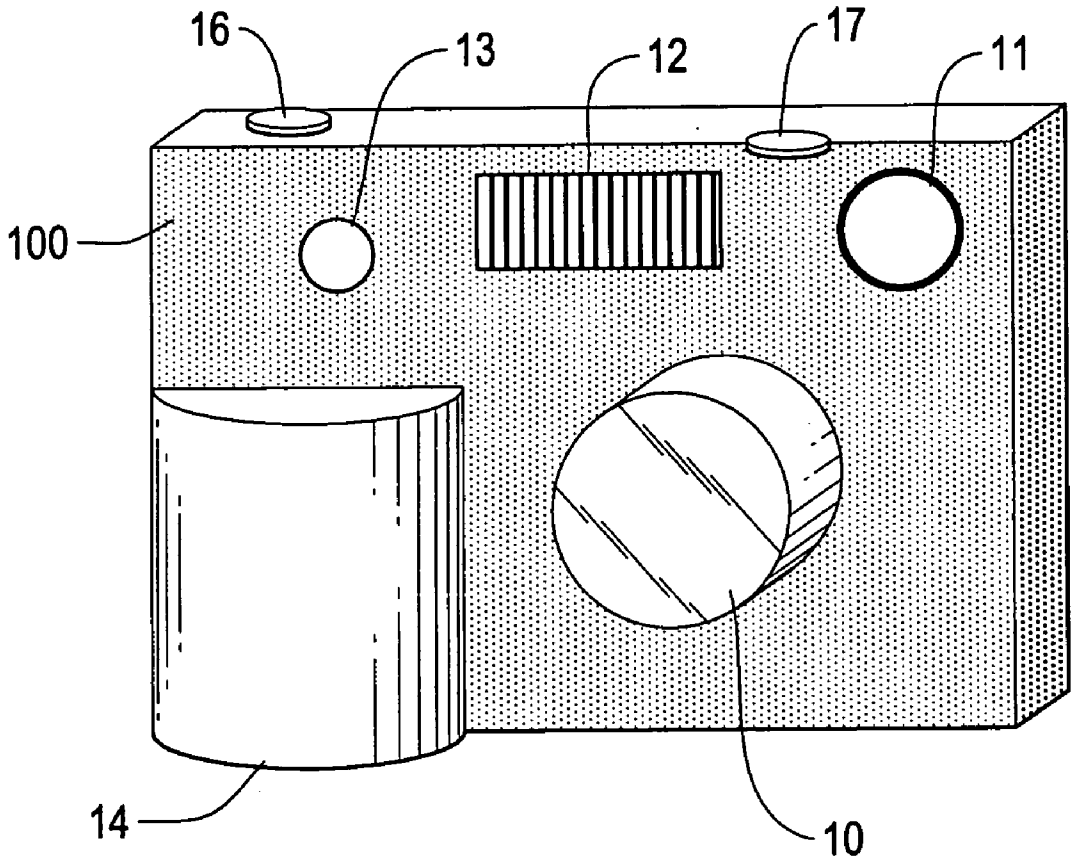


Fig. 76

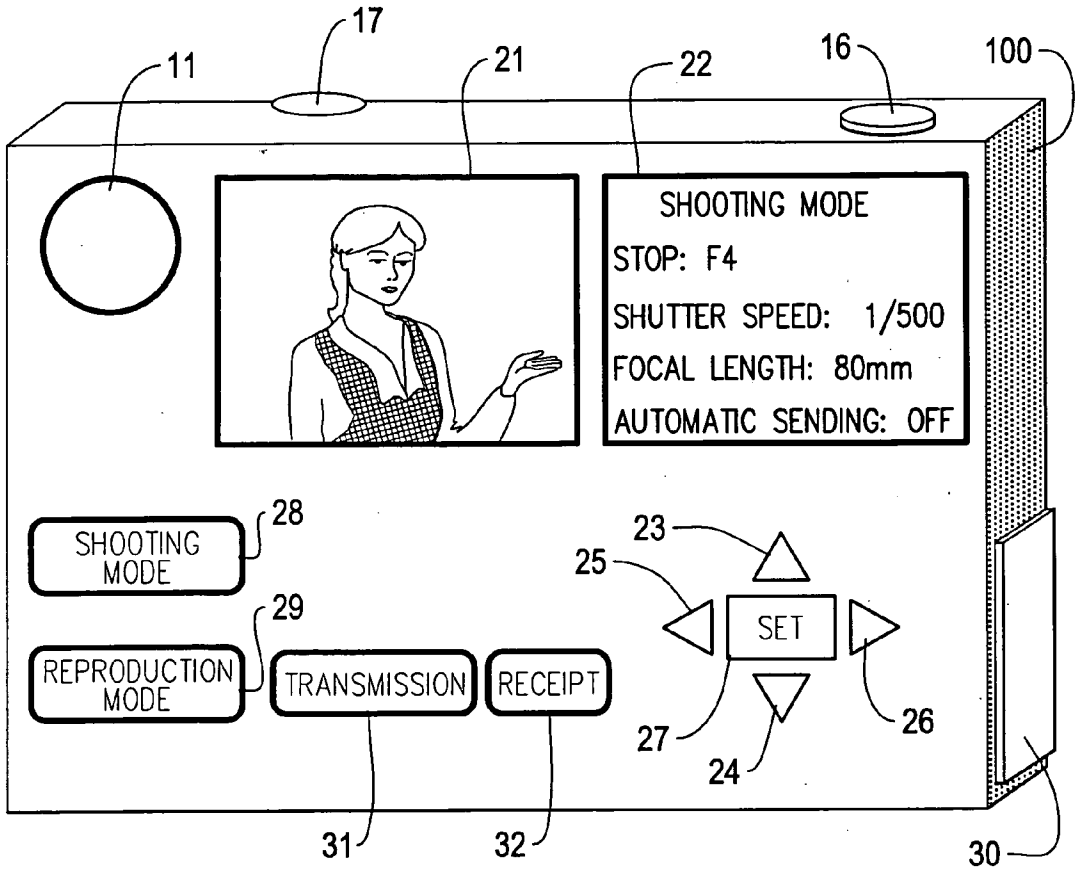

17
11
21
22
16
100
SHOOTING MODE
STOP: F4
SHUTTER SPEED: 1/500
FOCAL LENGTH: 80mm
AUTOMATIC SENDING: OFF
28
SHOOTING MODE
29
REPRODUCTION MODE
TRANSMISSION
RECEIPT
23
25
SET
27
24
26
31
32
30

Fig. 77

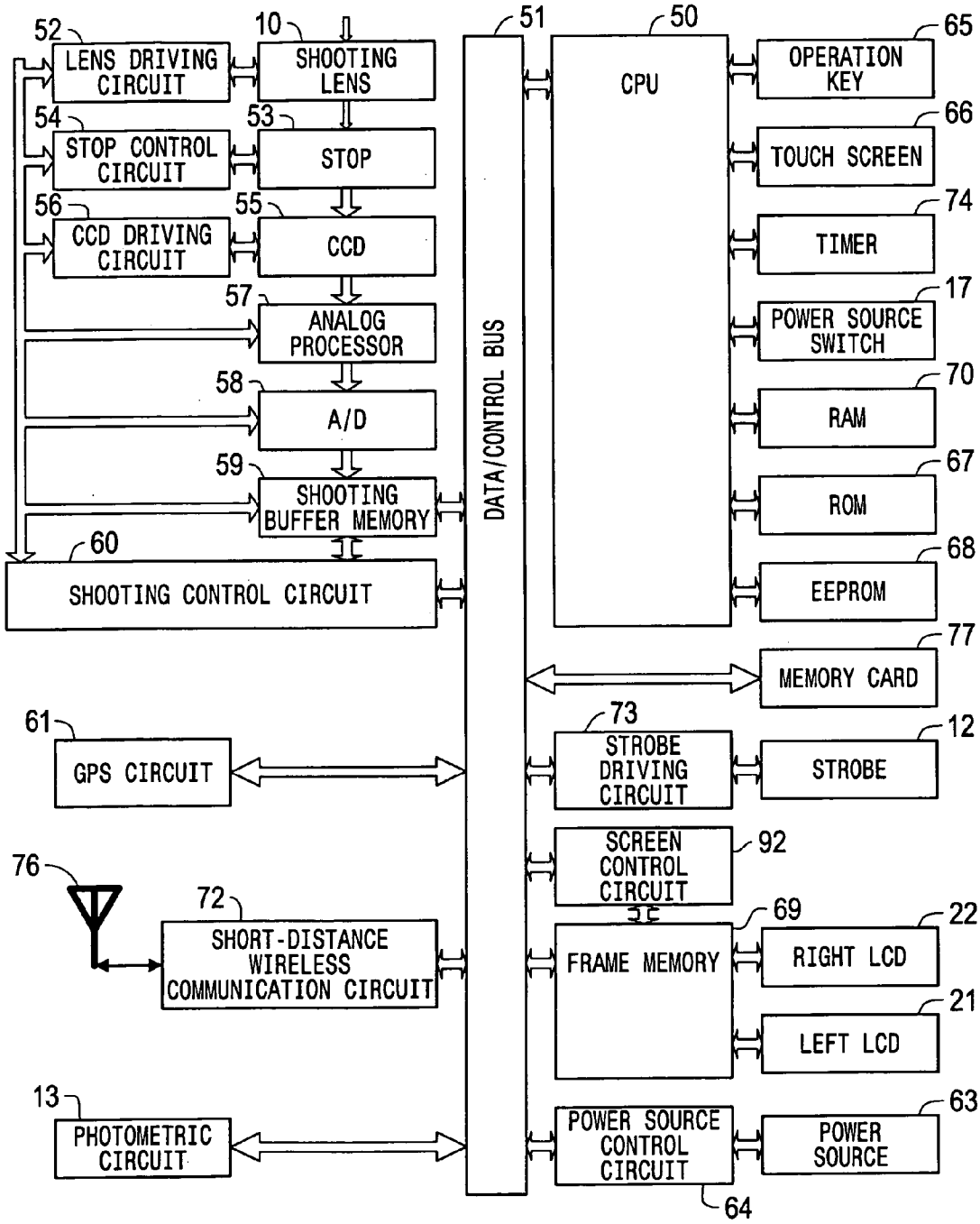

52
LENS DRIVING CIRCUIT
10
SHOOTING LENS
54
STOP CONTROL CIRCUIT
53
STOP
56
CCD DRIVING CIRCUIT
55
CCD
57
ANALOG PROCESSOR
58
A/D
59
SHOOTING BUFFER MEMORY
60
SHOOTING CONTROL CIRCUIT
61
GPS CIRCUIT
76
72
SHORT-DISTANCE WIRELESS COMMUNICATION CIRCUIT
13
PHOTOMETRIC CIRCUIT
51
DATA/CONTROL BUS
50
CPU
65
OPERATION KEY
66
TOUCH SCREEN
74
TIMER
17
POWER SOURCE SWITCH
70
RAM
67
ROM
68
EEPROM
77
MEMORY CARD
73
STROBE DRIVING CIRCUIT
12
STROBE
SCREEN CONTROL CIRCUIT
92
69
FRAME MEMORY
22
RIGHT LCD
21
LEFT LCD
POWER SOURCE CONTROL CIRCUIT
63
POWER SOURCE
64

Fig. 78

MEMORY CARD

IMAGE FILE A
IMAGE FILE B
IMAGE FILE C
...

IMAGE FILE

IMAGE DATA
ADDITIONAL INFORMATION DATA

ADDITIONAL INFORMATION DATA

ITEM	CONTENT
SHOOTING DATE AND TIME	OCTOBER 31, 2001 10:58:47
SHOOTING POSITION	137°50'E 38°21'N
SHOOTING LENS	50-100mm/f4
SHOOTING FOCAL LENGTH	80mm
SHOOTING STOP VALUE	f4
SHUTTER SPEED	1/250
EXPOSURE	+0.5 LEVEL
FOCUS	+50 MICRON
STROBE	YES
STROBE LIGHT AMOUNT	-1 LEVEL
...	...

Fig.79

E E P R O M

CAMERA IDENTIFICATION INFORMATION
GATEWAY SERVER ACCESS INFORMATION
...

Fig. 80

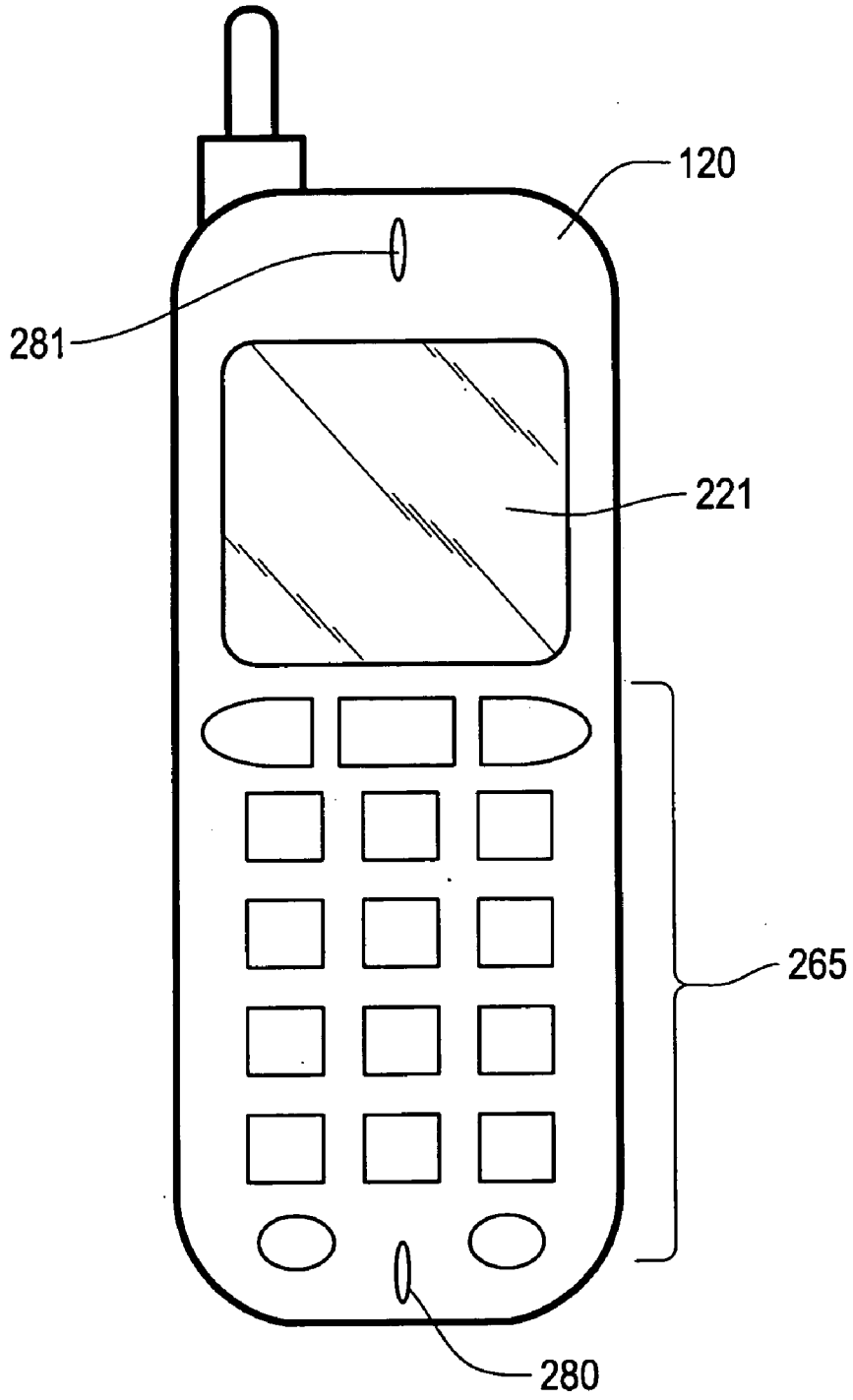


Fig. 81

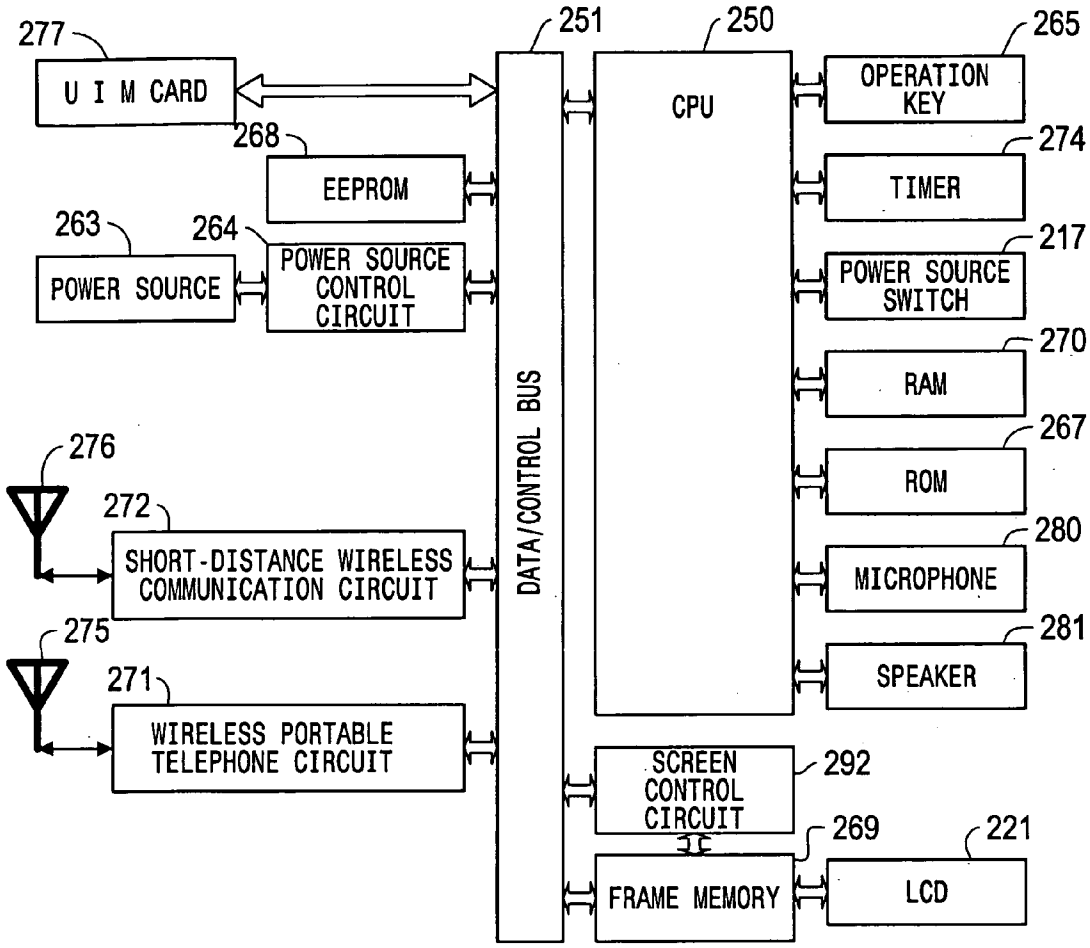

277
U I M CARD
268
EEPROM
263
264
POWER SOURCE
POWER SOURCE CONTROL CIRCUIT
276
272
SHORT-DISTANCE WIRELESS COMMUNICATION CIRCUIT
275
271
WIRELESS PORTABLE TELEPHONE CIRCUIT
251
DATA/CONTROL BUS
250
CPU
265
OPERATION KEY
274
TIMER
217
POWER SOURCE SWITCH
270
RAM
267
ROM
280
MICROPHONE
281
SPEAKER
SCREEN CONTROL CIRCUIT
292
269
221
FRAME MEMORY
LCD

Fig. 82

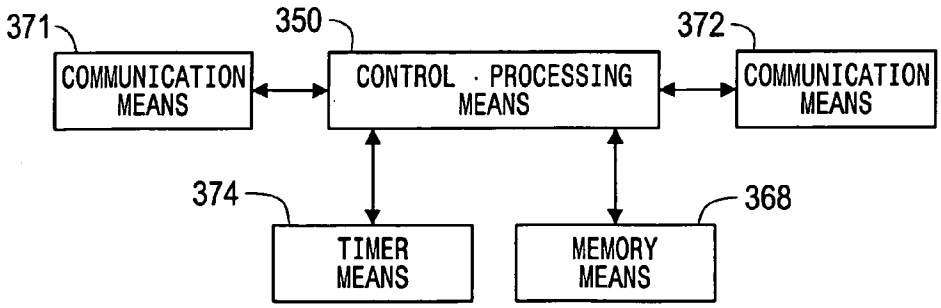

371
COMMUNICATION MEANS
350
CONTROL · PROCESSING MEANS
372
COMMUNICATION MEANS
374
TIMER MEANS
368
MEMORY MEANS

Fig. 83

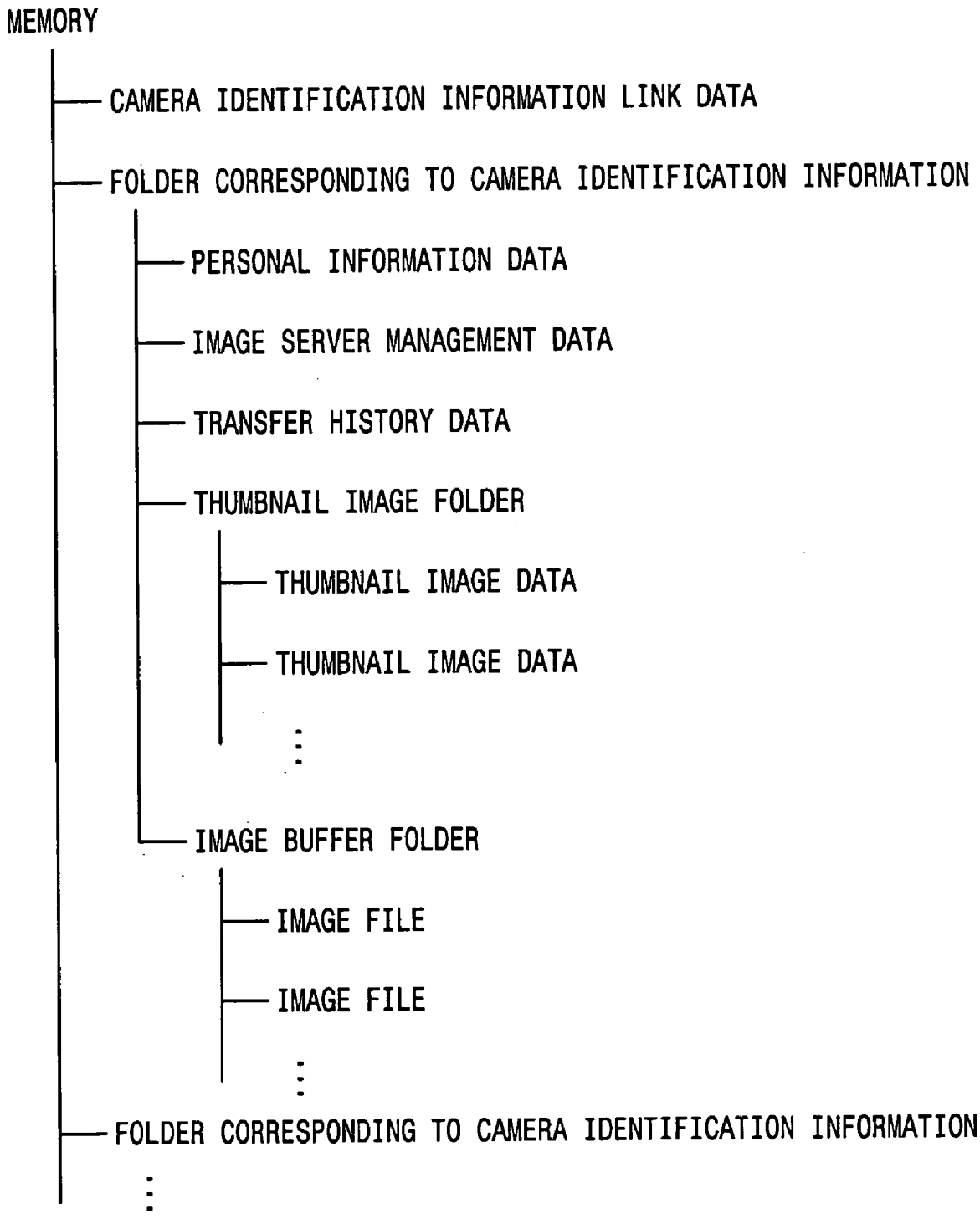

MEMORY
CAMERA IDENTIFICATION INFORMATION LINK DATA
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION
PERSONAL INFORMATION DATA
IMAGE SERVER MANAGEMENT DATA
TRANSFER HISTORY DATA
THUMBNAIL IMAGE FOLDER
THUMBNAIL IMAGE DATA
THUMBNAIL IMAGE DATA
IMAGE BUFFER FOLDER
IMAGE FILE
IMAGE FILE
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION

Fig. 84

CAMERA IDENTIFICATION INFORMATION A : PARENT
CAMERA IDENTIFICATION INFORMATION B → CAMERA IDENTIFICATION INFORMATION A
CAMERA IDENTIFICATION INFORMATION C → CAMERA IDENTIFICATION INFORMATION A
CAMERA IDENTIFICATION INFORMATION D : PARENT
CAMERA IDENTIFICATION INFORMATION E → CAMERA IDENTIFICATION INFORMATION D
CAMERA IDENTIFICATION INFORMATION F : NO LINK
CAMERA IDENTIFICATION INFORMATION H : NOT YET USED
...

Fig.85

PERSONAL
INFORMATION DATA

NAME
GENDER
AGE
ADDRESS
E-MAIL ADDRESS
OCCUPATION
PASSWORD
PHONE NUMBER
...

Fig. 86

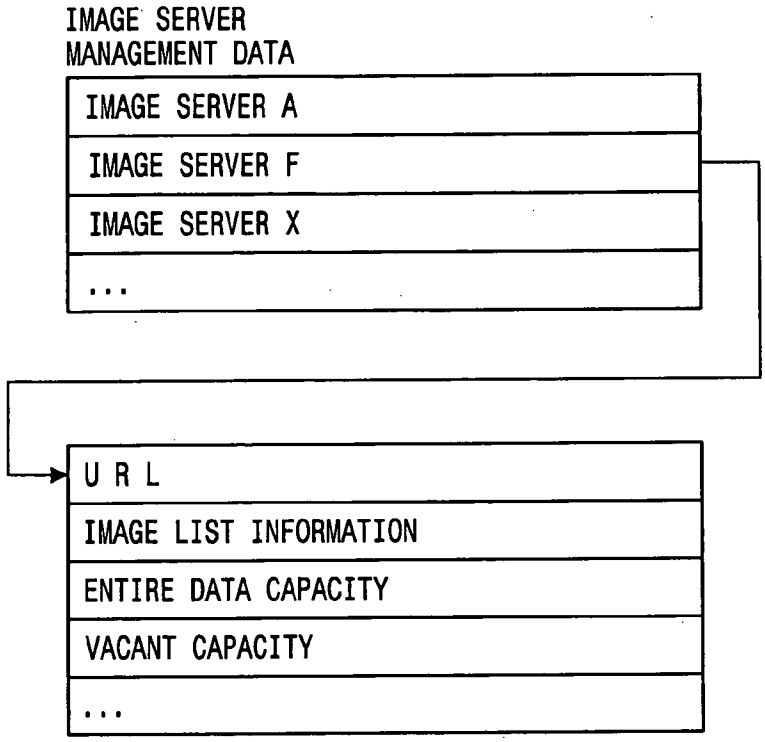


IMAGE SERVER
MANAGEMENT DATA
IMAGE SERVER A
IMAGE SERVER F
IMAGE SERVER X
...
U R L
IMAGE LIST INFORMATION
ENTIRE DATA CAPACITY
VACANT CAPACITY
...

Fig. 87

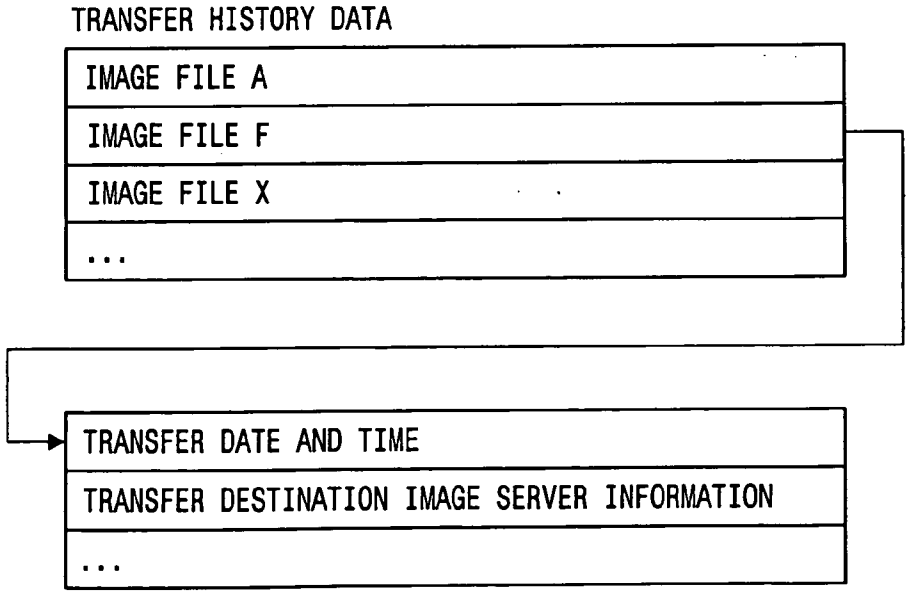

TRANSFER HISTORY DATA
IMAGE FILE A
IMAGE FILE F
IMAGE FILE X
...
TRANSFER DATE AND TIME
TRANSFER DESTINATION IMAGE SERVER INFORMATION
...

Fig. 88

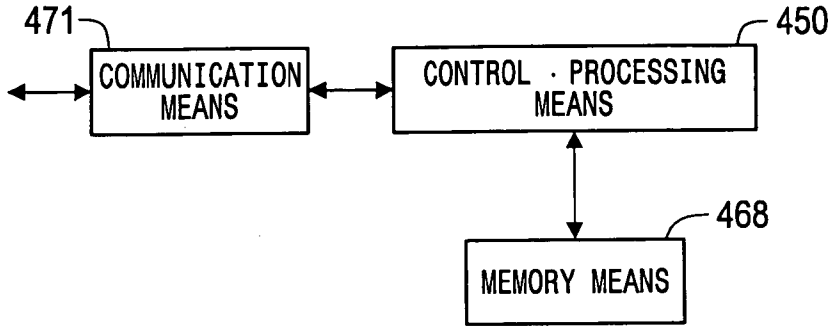

471
COMMUNICATION MEANS
CONTROL · PROCESSING MEANS
450
468
MEMORY MEANS

Fig.89

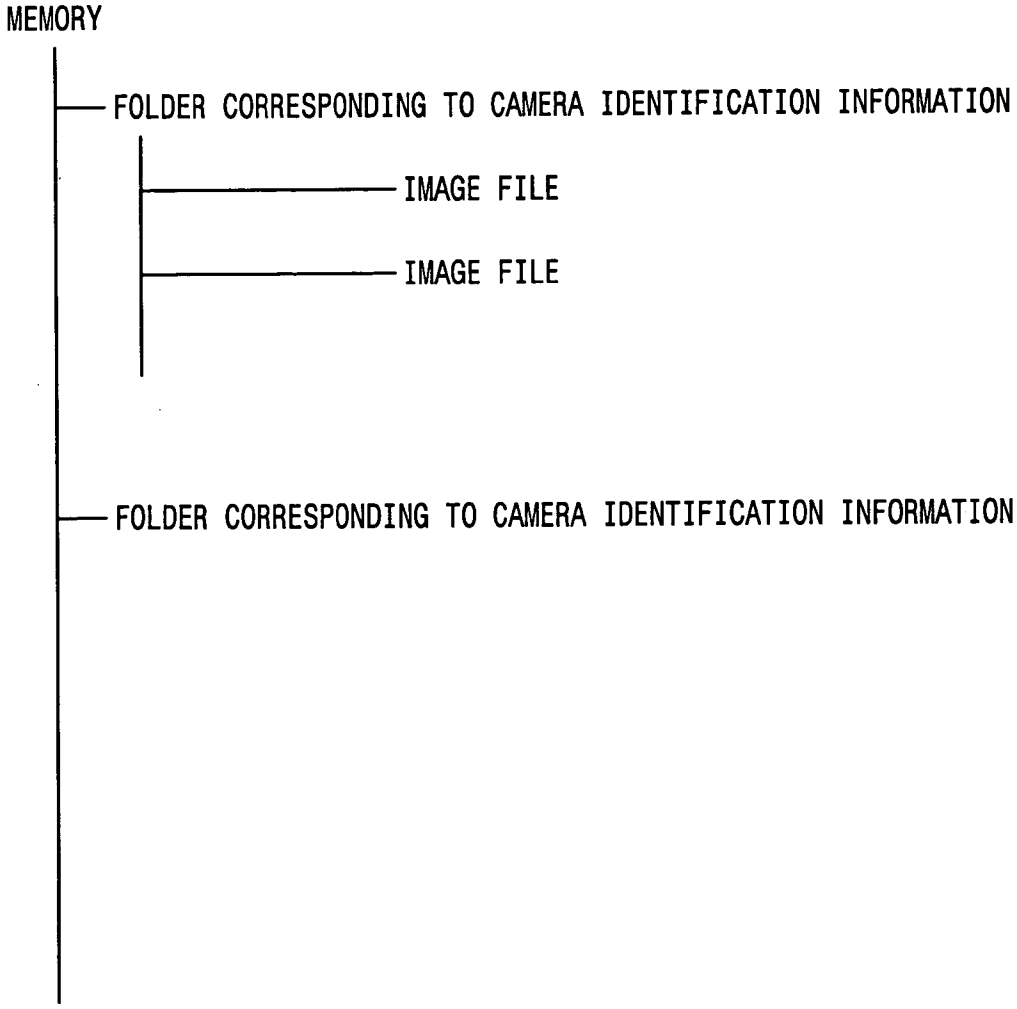

MEMORY
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION
IMAGE FILE
IMAGE FILE
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION

Fig.90

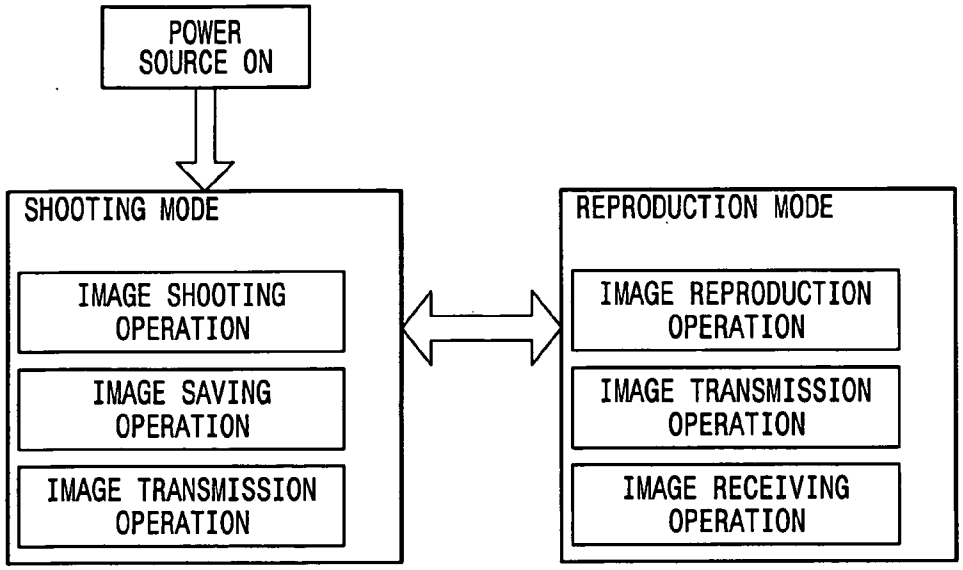

POWER SOURCE ON
SHOOTING MODE
IMAGE SHOOTING OPERATION
IMAGE SAVING OPERATION
IMAGE TRANSMISSION OPERATION
REPRODUCTION MODE
IMAGE REPRODUCTION OPERATION
IMAGE TRANSMISSION OPERATION
IMAGE RECEIVING OPERATION

Fig. 91

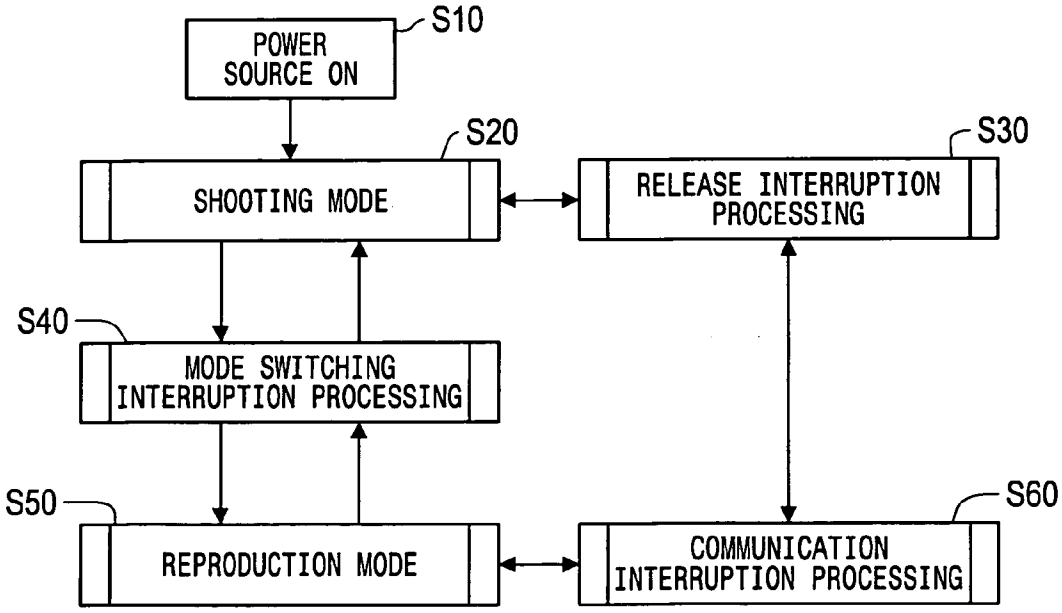

S10
POWER SOURCE ON
S20
SHOOTING MODE
S30
RELEASE INTERRUPTION PROCESSING
S40
MODE SWITCHING INTERRUPTION PROCESSING
S50
REPRODUCTION MODE
S60
COMMUNICATION INTERRUPTION PROCESSING

Fig.92

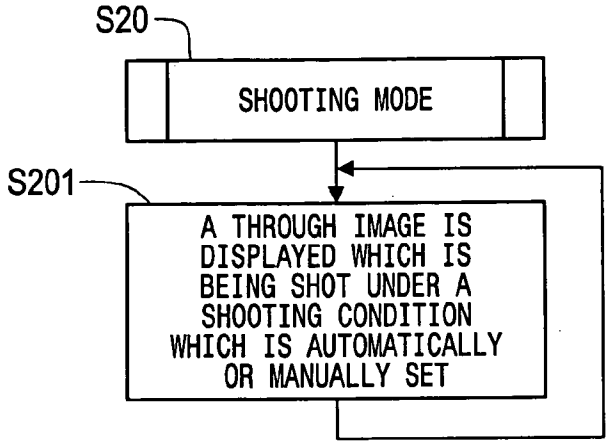

S20
SHOOTING MODE
S201
A THROUGH IMAGE IS DISPLAYED WHICH IS BEING SHOT UNDER A SHOOTING CONDITION WHICH IS AUTOMATICALLY OR MANUALLY SET

Fig. 93

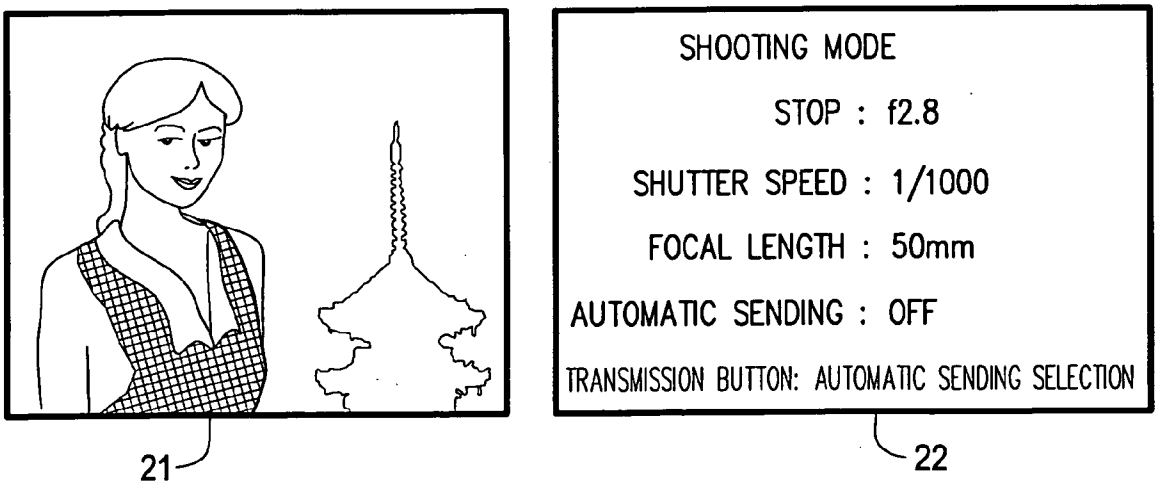

SHOOTING MODE
STOP : f2.8
SHUTTER SPEED : 1/1000
FOCAL LENGTH : 50mm
AUTOMATIC SENDING : OFF
TRANSMISSION BUTTON: AUTOMATIC SENDING SELECTION
21
22

Fig. 94

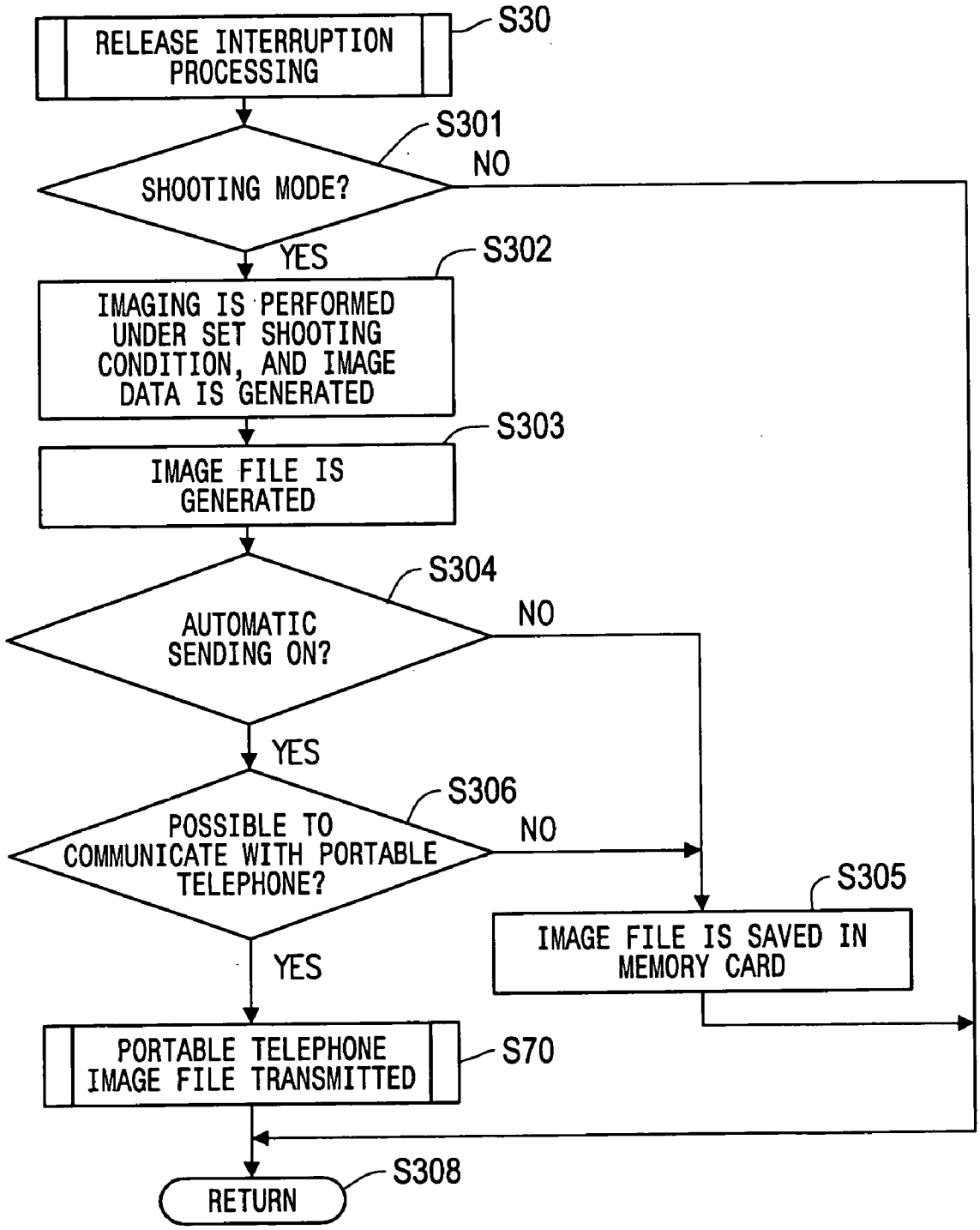

RELEASE INTERRUPTION PROCESSING
S30
SHOOTING MODE?
S301
NO
YES
IMAGING IS PERFORMED UNDER SET SHOOTING CONDITION, AND IMAGE DATA IS GENERATED
S302
IMAGE FILE IS GENERATED
S303
AUTOMATIC SENDING ON?
S304
NO
YES
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S306
NO
IMAGE FILE IS SAVED IN MEMORY CARD
S305
YES
PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
RETURN
S308

Fig. 95

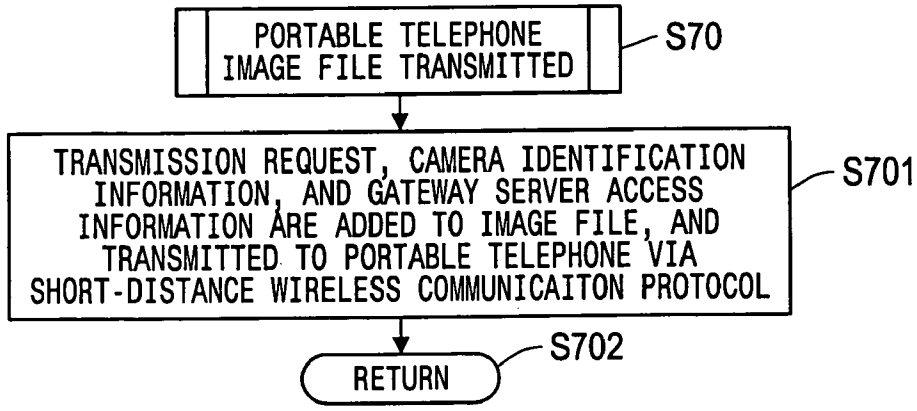

PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
TRANSMISSION REQUEST, CAMERA IDENTIFICATION INFORMATION, AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO IMAGE FILE, AND TRANSMITTED TO PORTABLE TELEPHONE VIA SHORT-DISTANCE WIRELESS COMMUNICAITON PROTOCOL
S701
RETURN
S702

Fig. 96

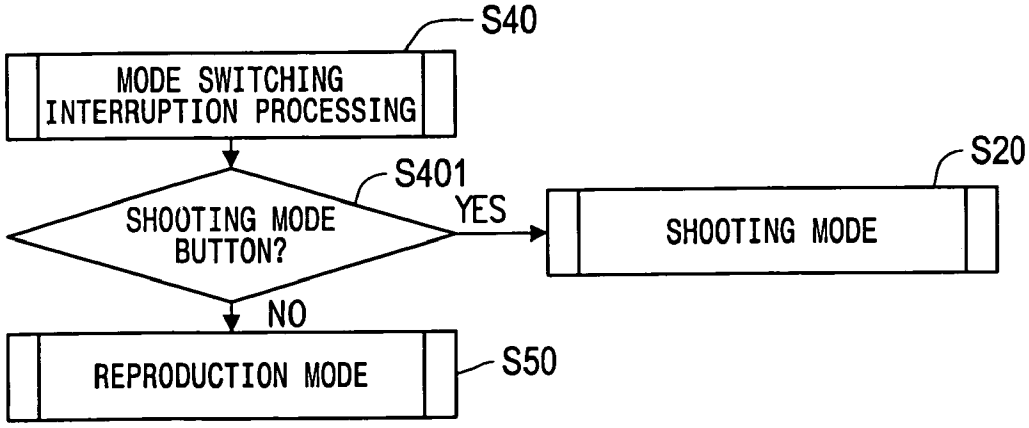

S40
MODE SWITCHING INTERRUPTION PROCESSING
S401
SHOOTING MODE BUTTON?
YES
S20
SHOOTING MODE
NO
REPRODUCTION MODE
S50

Fig. 97

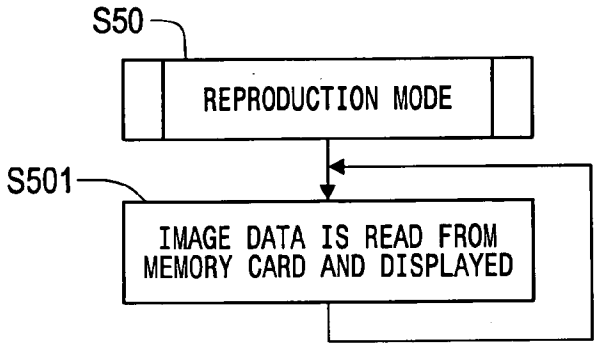

S50
REPRODUCTION MODE
S501
IMAGE DATA IS READ FROM MEMORY CARD AND DISPLAYED

Fig. 98

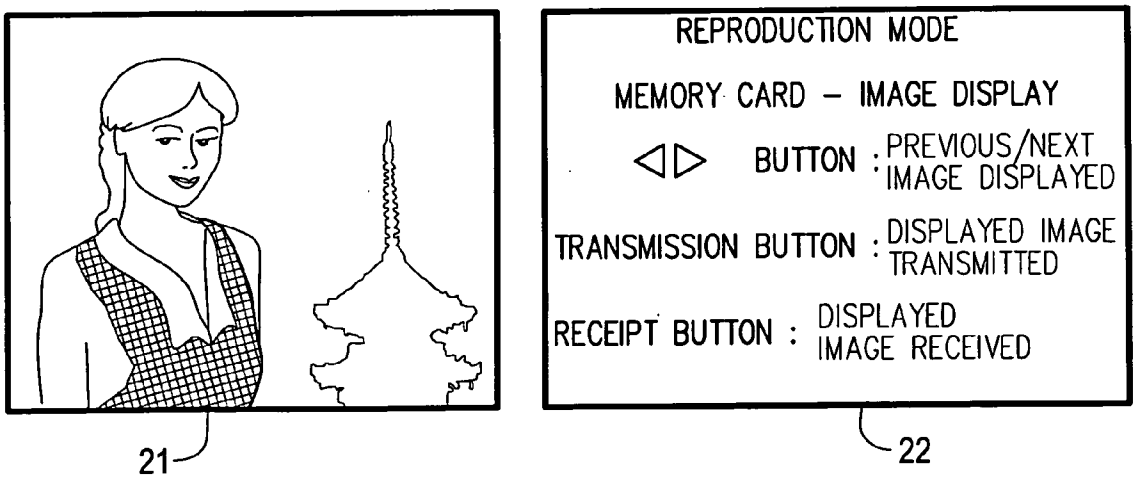

21
REPRODUCTION MODE
MEMORY CARD – IMAGE DISPLAY
◁▷ BUTTON : PREVIOUS/NEXT IMAGE DISPLAYED
TRANSMISSION BUTTON : DISPLAYED IMAGE TRANSMITTED
RECEIPT BUTTON : DISPLAYED IMAGE RECEIVED
22

Fig. 99

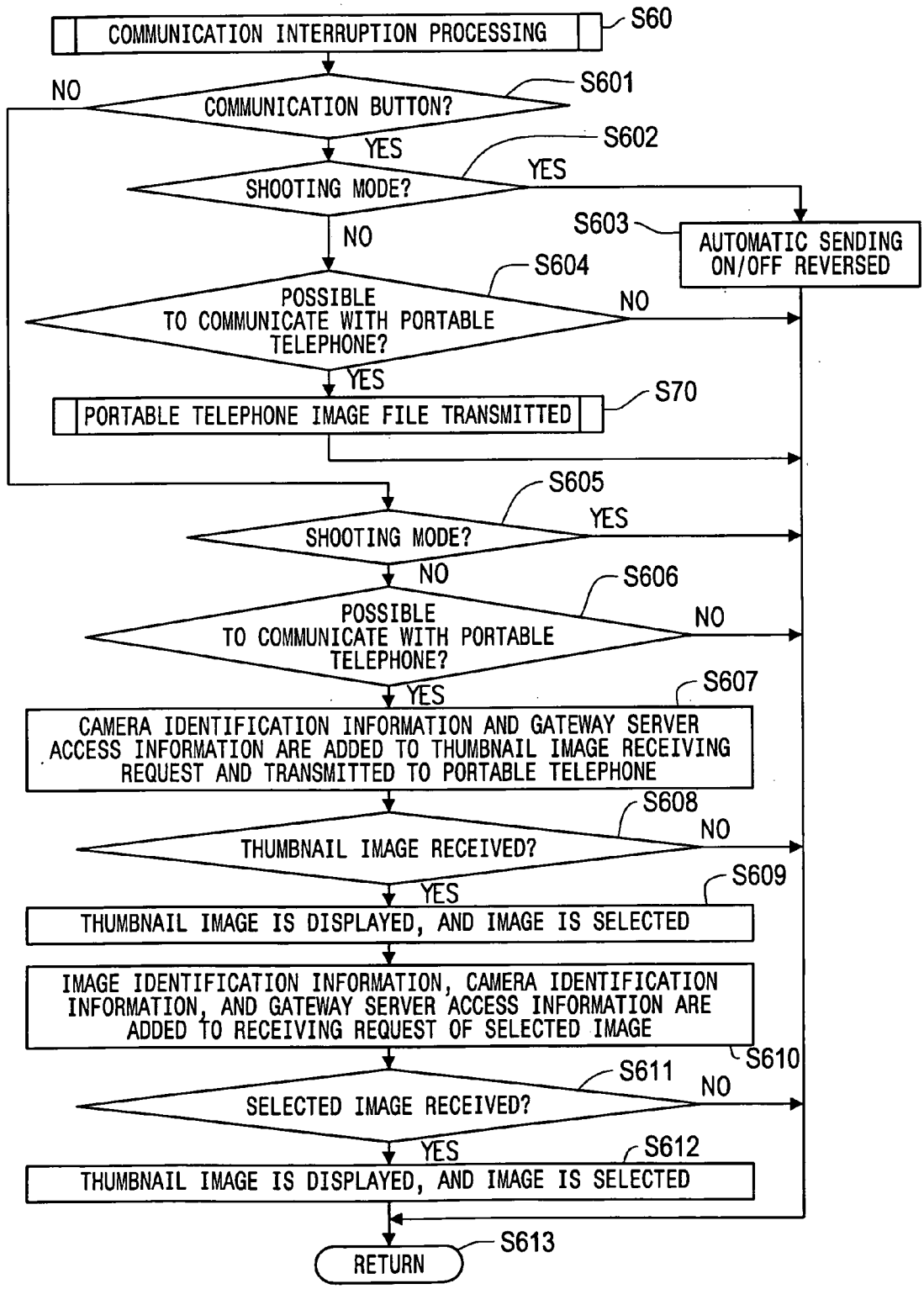

COMMUNICATION INTERRUPTION PROCESSING
S60
COMMUNICATION BUTTON?
S601
NO
YES
SHOOTING MODE?
S602
YES
NO
S603
AUTOMATIC SENDING ON/OFF REVERSED
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S604
NO
YES
PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
SHOOTING MODE?
S605
YES
NO
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S606
NO
YES
CAMERA IDENTIFICATION INFORMATION AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO THUMBNAIL IMAGE RECEIVING REQUEST AND TRANSMITTED TO PORTABLE TELEPHONE
S607
THUMBNAIL IMAGE RECEIVED?
S608
NO
YES
THUMBNAIL IMAGE IS DISPLAYED, AND IMAGE IS SELECTED
S609
IMAGE IDENTIFICATION INFORMATION, CAMERA IDENTIFICATION INFORMATION, AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO RECEIVING REQUEST OF SELECTED IMAGE
S610
SELECTED IMAGE RECEIVED?
S611
NO
YES
THUMBNAIL IMAGE IS DISPLAYED, AND IMAGE IS SELECTED
S612
RETURN
S613

Fig. 100

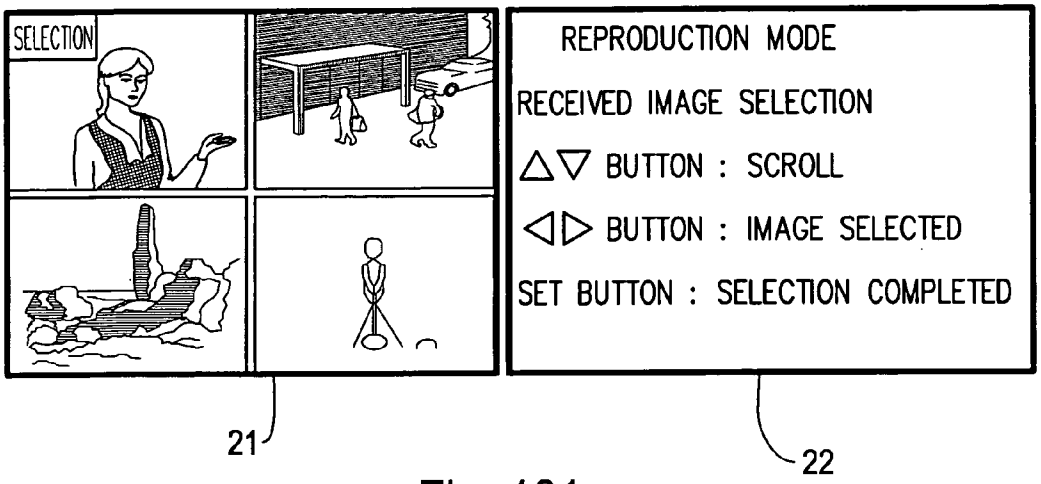


Fig. 101

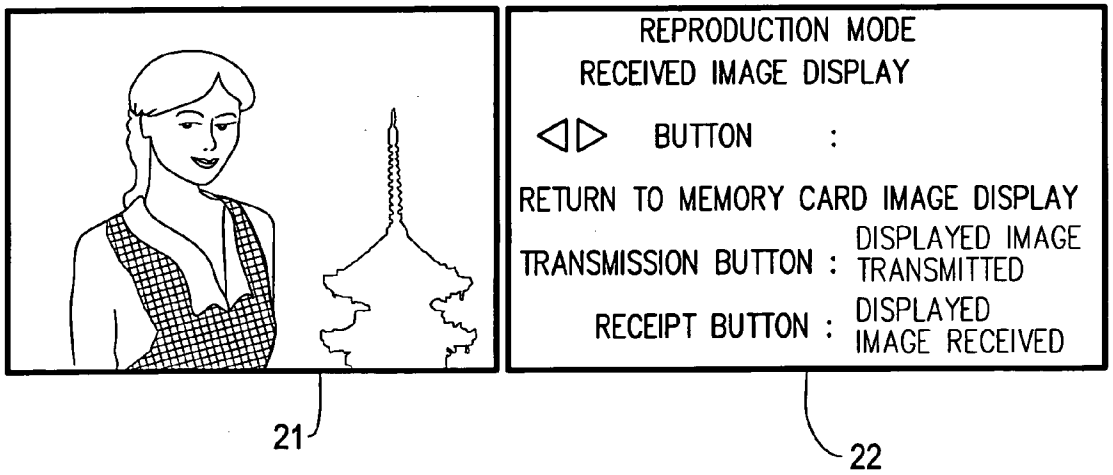


Fig. 102

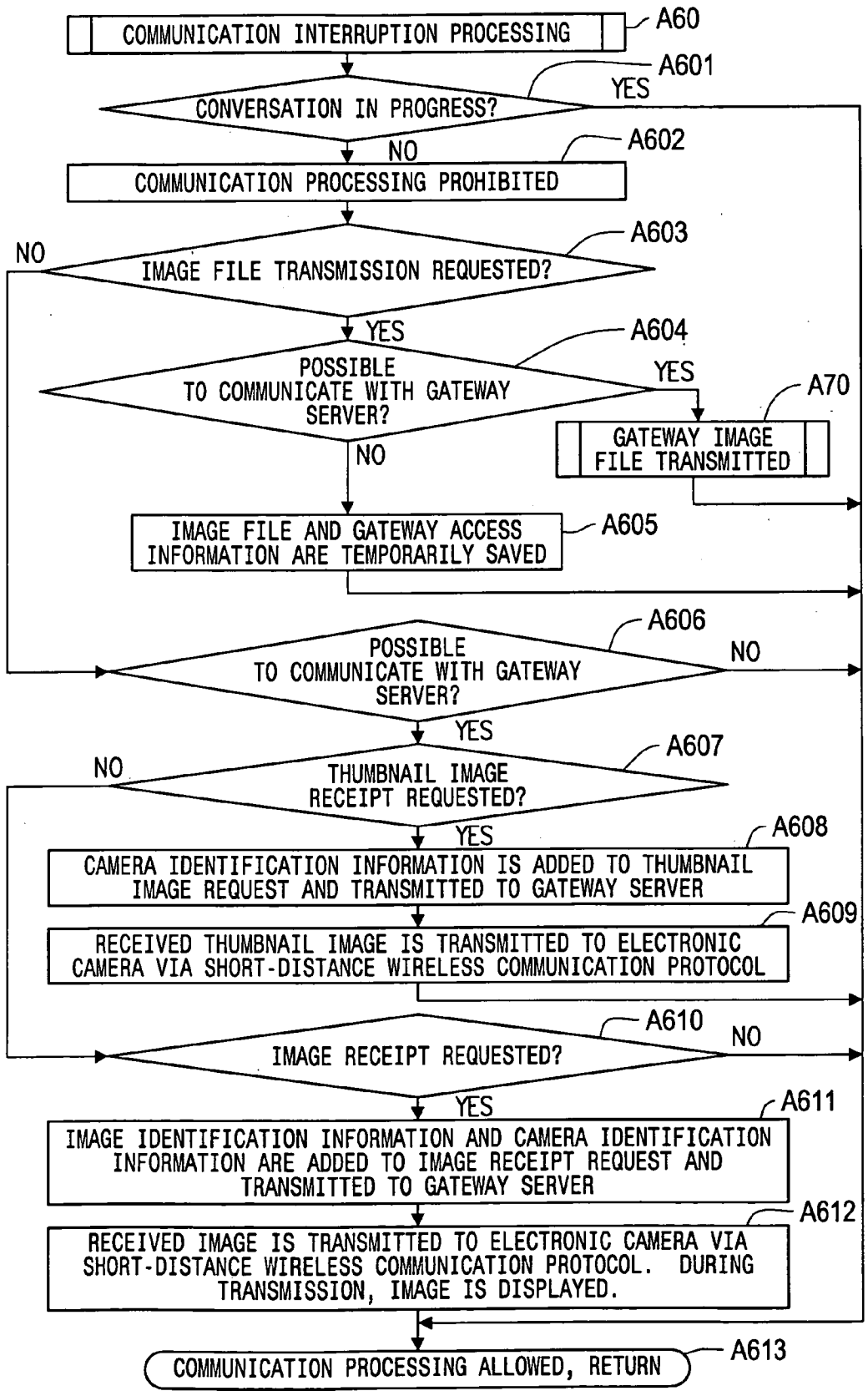

COMMUNICATION INTERRUPTION PROCESSING
A60
CONVERSATION IN PROGRESS?
A601
YES
NO
COMMUNICATION PROCESSING PROHIBITED
A602
IMAGE FILE TRANSMISSION REQUESTED?
A603
NO
YES
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
A604
YES
NO
GATEWAY IMAGE FILE TRANSMITTED
A70
IMAGE FILE AND GATEWAY ACCESS INFORMATION ARE TEMPORARILY SAVED
A605
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
A606
NO
YES
THUMBNAIL IMAGE RECEIPT REQUESTED?
A607
NO
YES
CAMERA IDENTIFICATION INFORMATION IS ADDED TO THUMBNAIL IMAGE REQUEST AND TRANSMITTED TO GATEWAY SERVER
A608
RECEIVED THUMBNAIL IMAGE IS TRANSMITTED TO ELECTRONIC CAMERA VIA SHORT-DISTANCE WIRELESS COMMUNICATION PROTOCOL
A609
IMAGE RECEIPT REQUESTED?
A610
NO
YES
IMAGE IDENTIFICATION INFORMATION AND CAMERA IDENTIFICATION INFORMATION ARE ADDED TO IMAGE RECEIPT REQUEST AND TRANSMITTED TO GATEWAY SERVER
A611
RECEIVED IMAGE IS TRANSMITTED TO ELECTRONIC CAMERA VIA SHORT-DISTANCE WIRELESS COMMUNICATION PROTOCOL. DURING TRANSMISSION, IMAGE IS DISPLAYED.
A612
COMMUNICATION PROCESSING ALLOWED, RETURN
A613

Fig. 103

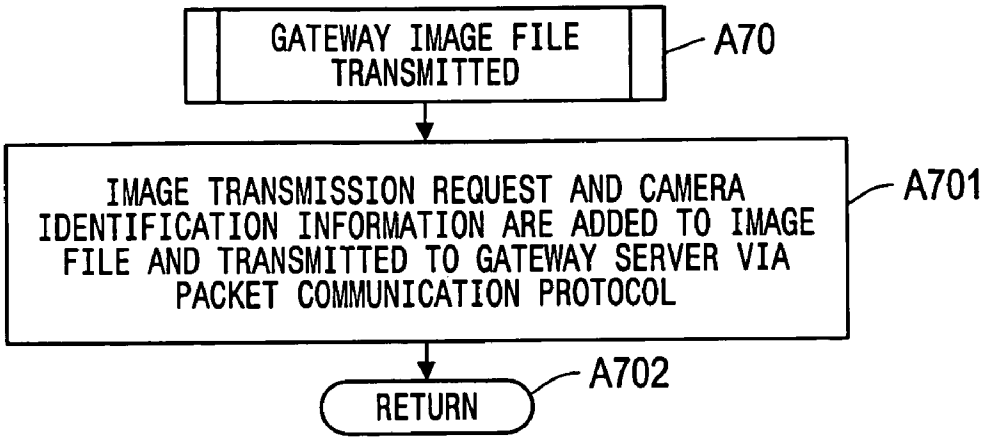


Fig. 104

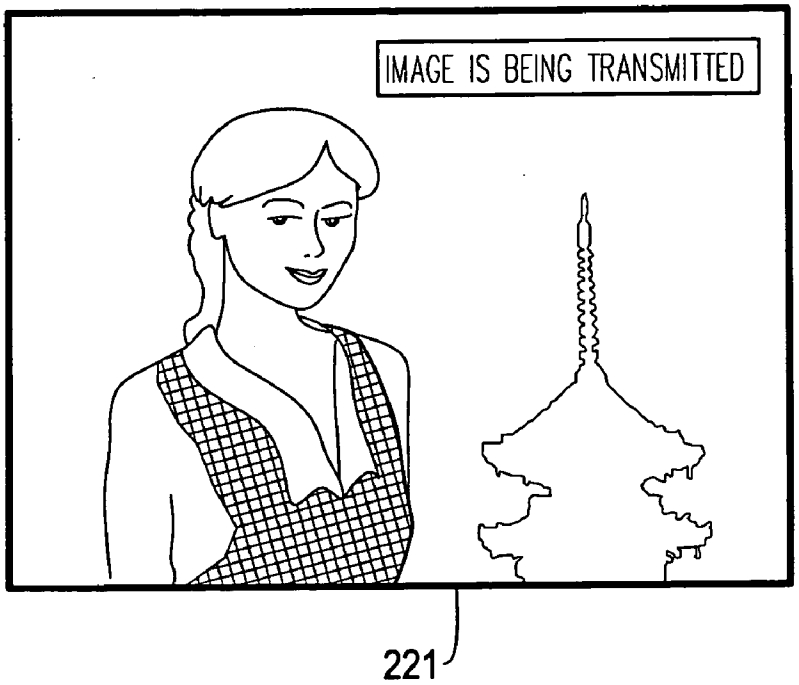


Fig. 105

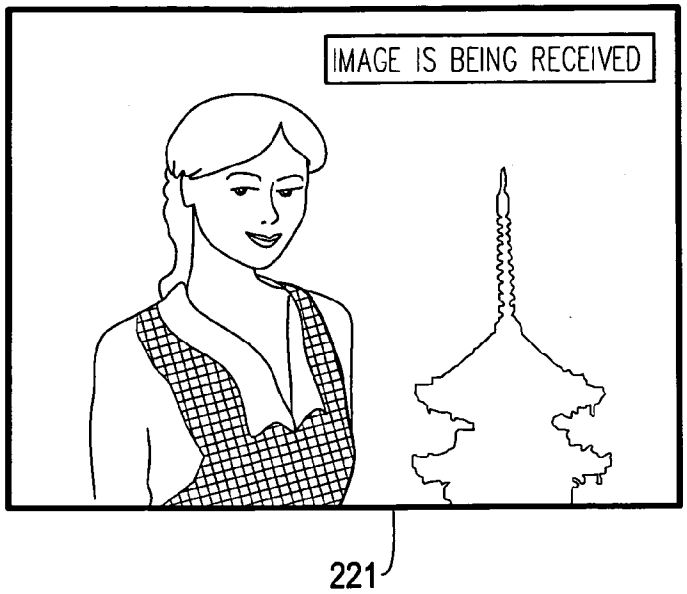


Fig. 106

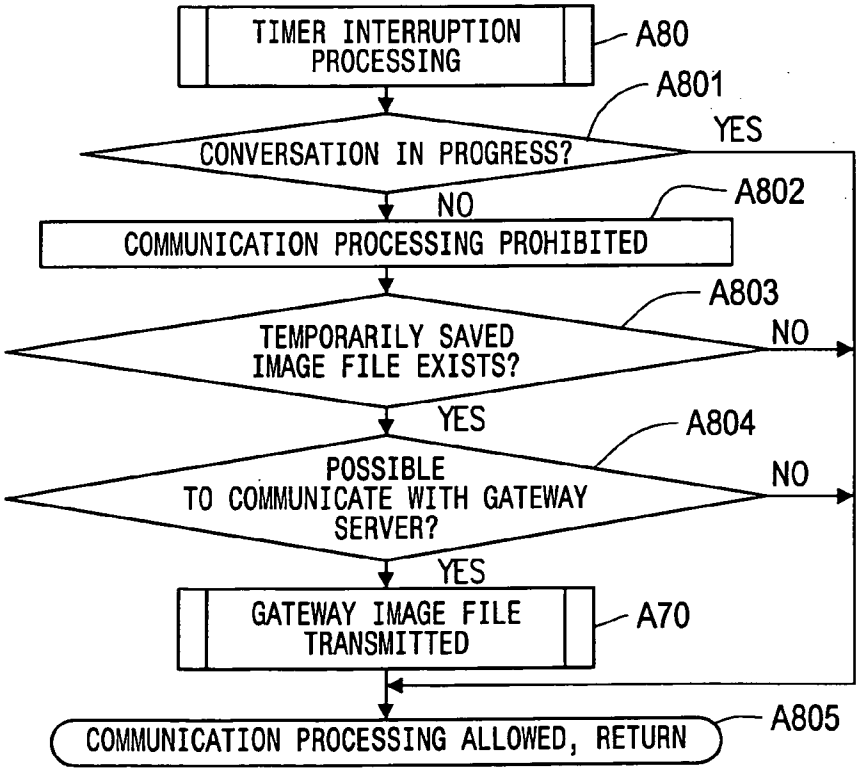


Fig. 107

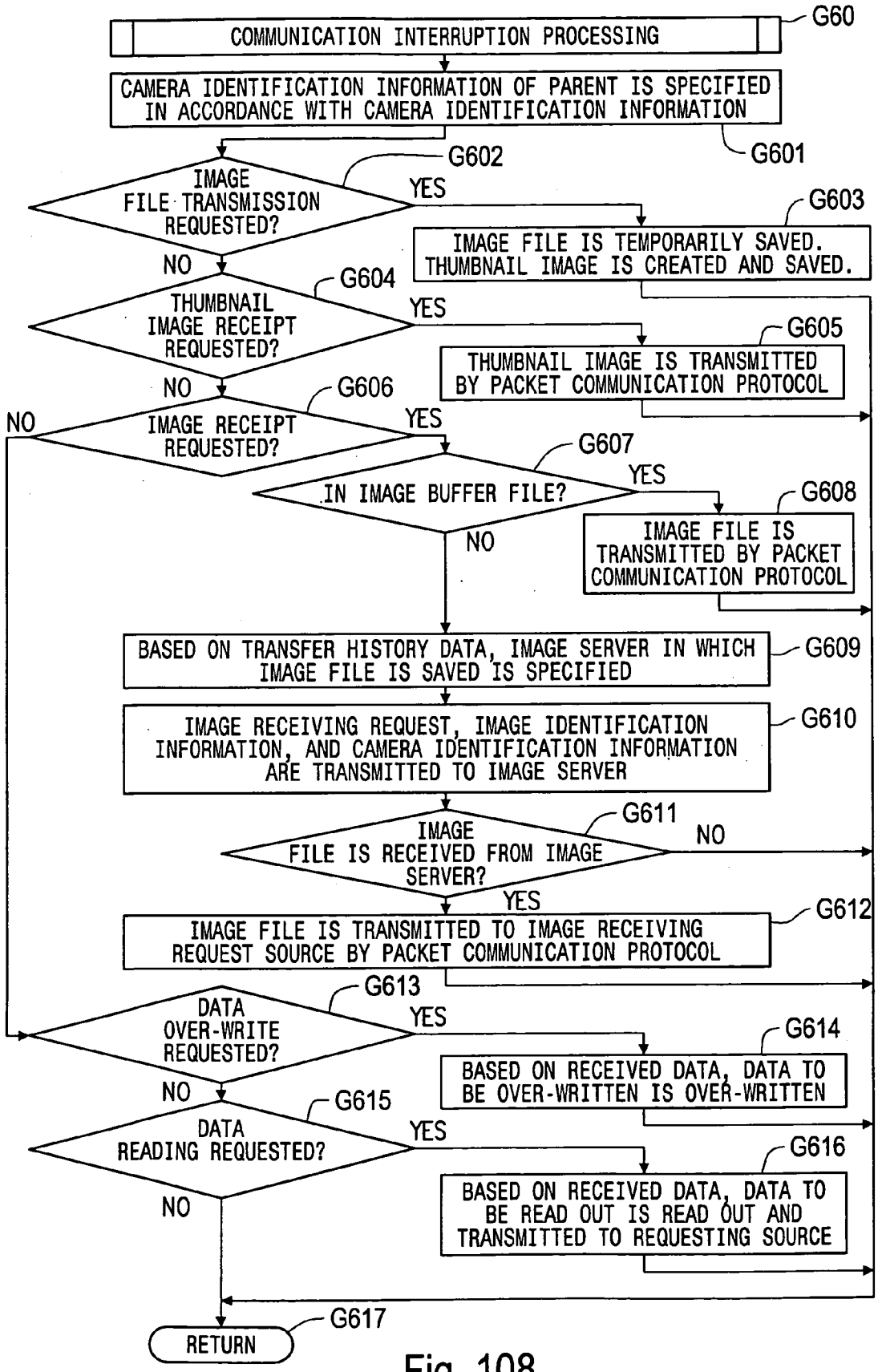

COMMUNICATION INTERRUPTION PROCESSING
G60
CAMERA IDENTIFICATION INFORMATION OF PARENT IS SPECIFIED IN ACCORDANCE WITH CAMERA IDENTIFICATION INFORMATION
G601
IMAGE FILE TRANSMISSION REQUESTED?
G602
YES
NO
IMAGE FILE IS TEMPORARILY SAVED. THUMBNAIL IMAGE IS CREATED AND SAVED.
G603
THUMBNAIL IMAGE RECEIPT REQUESTED?
G604
YES
NO
THUMBNAIL IMAGE IS TRANSMITTED BY PACKET COMMUNICATION PROTOCOL
G605
IMAGE RECEIPT REQUESTED?
G606
NO
YES
IN IMAGE BUFFER FILE?
G607
YES
NO
IMAGE FILE IS TRANSMITTED BY PACKET COMMUNICATION PROTOCOL
G608
BASED ON TRANSFER HISTORY DATA, IMAGE SERVER IN WHICH IMAGE FILE IS SAVED IS SPECIFIED
G609
IMAGE RECEIVING REQUEST, IMAGE IDENTIFICATION INFORMATION, AND CAMERA IDENTIFICATION INFORMATION ARE TRANSMITTED TO IMAGE SERVER
G610
IMAGE FILE IS RECEIVED FROM IMAGE SERVER?
G611
NO
YES
IMAGE FILE IS TRANSMITTED TO IMAGE RECEIVING REQUEST SOURCE BY PACKET COMMUNICATION PROTOCOL
G612
DATA OVER-WRITE REQUESTED?
G613
YES
NO
BASED ON RECEIVED DATA, DATA TO BE OVER-WRITTEN IS OVER-WRITTEN
G614
DATA READING REQUESTED?
G615
YES
NO
BASED ON RECEIVED DATA, DATA TO BE READ OUT IS READ OUT AND TRANSMITTED TO REQUESTING SOURCE
G616
RETURN
G617

Fig. 108

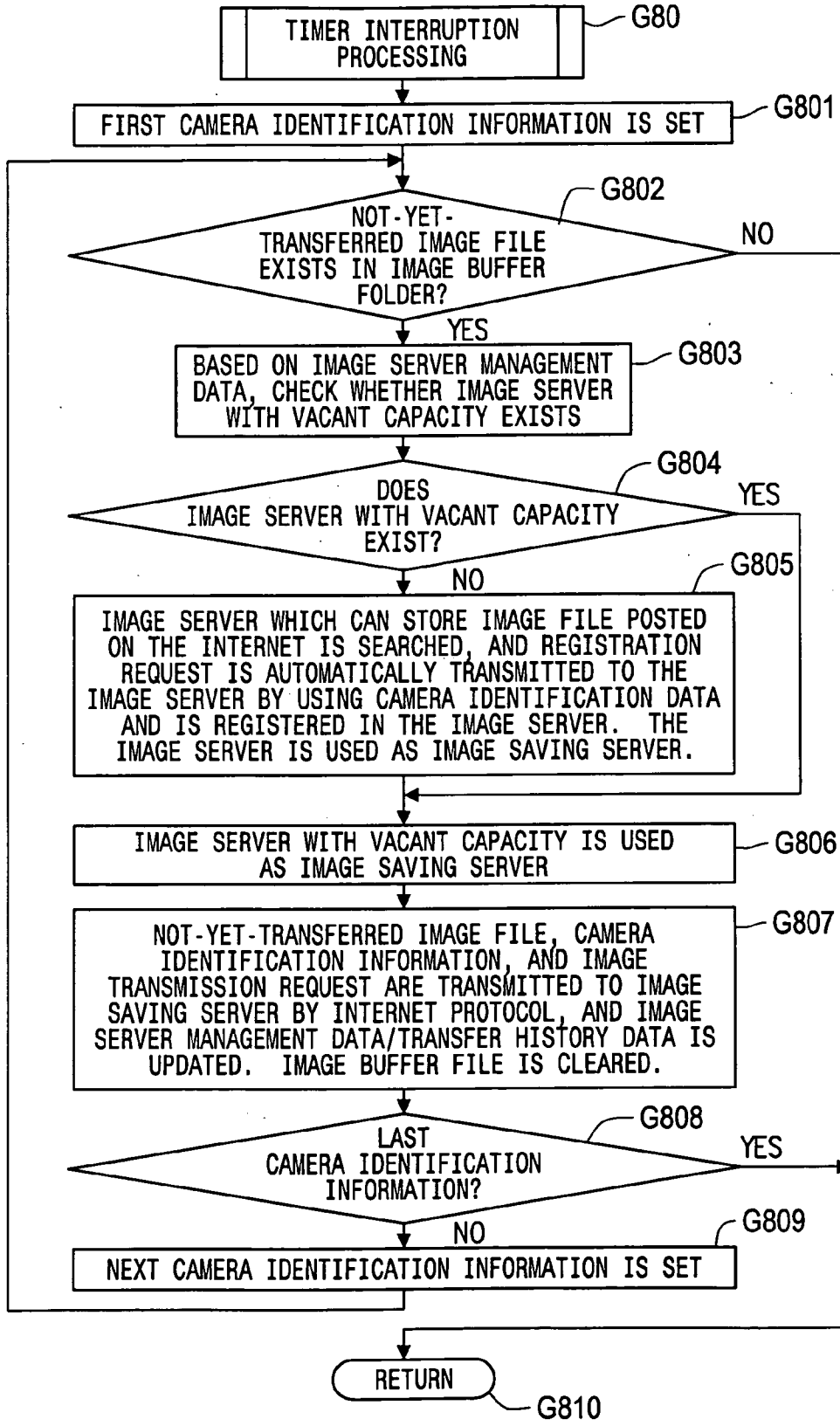

TIMER INTERRUPTION PROCESSING
G80
FIRST CAMERA IDENTIFICATION INFORMATION IS SET
G801
NOT-YET-TRANSFERRED IMAGE FILE EXISTS IN IMAGE BUFFER FOLDER?
G802
NO
YES
BASED ON IMAGE SERVER MANAGEMENT DATA, CHECK WHETHER IMAGE SERVER WITH VACANT CAPACITY EXISTS
G803
DOES IMAGE SERVER WITH VACANT CAPACITY EXIST?
G804
YES
NO
G805
IMAGE SERVER WHICH CAN STORE IMAGE FILE POSTED ON THE INTERNET IS SEARCHED, AND REGISTRATION REQUEST IS AUTOMATICALLY TRANSMITTED TO THE IMAGE SERVER BY USING CAMERA IDENTIFICATION DATA AND IS REGISTERED IN THE IMAGE SERVER. THE IMAGE SERVER IS USED AS IMAGE SAVING SERVER.
IMAGE SERVER WITH VACANT CAPACITY IS USED AS IMAGE SAVING SERVER
G806
NOT-YET-TRANSFERRED IMAGE FILE, CAMERA IDENTIFICATION INFORMATION, AND IMAGE TRANSMISSION REQUEST ARE TRANSMITTED TO IMAGE SAVING SERVER BY INTERNET PROTOCOL, AND IMAGE SERVER MANAGEMENT DATA/TRANSFER HISTORY DATA IS UPDATED. IMAGE BUFFER FILE IS CLEARED.
G807
LAST CAMERA IDENTIFICATION INFORMATION?
G808
YES
NO
G809
NEXT CAMERA IDENTIFICATION INFORMATION IS SET
RETURN
G810

Fig. 109

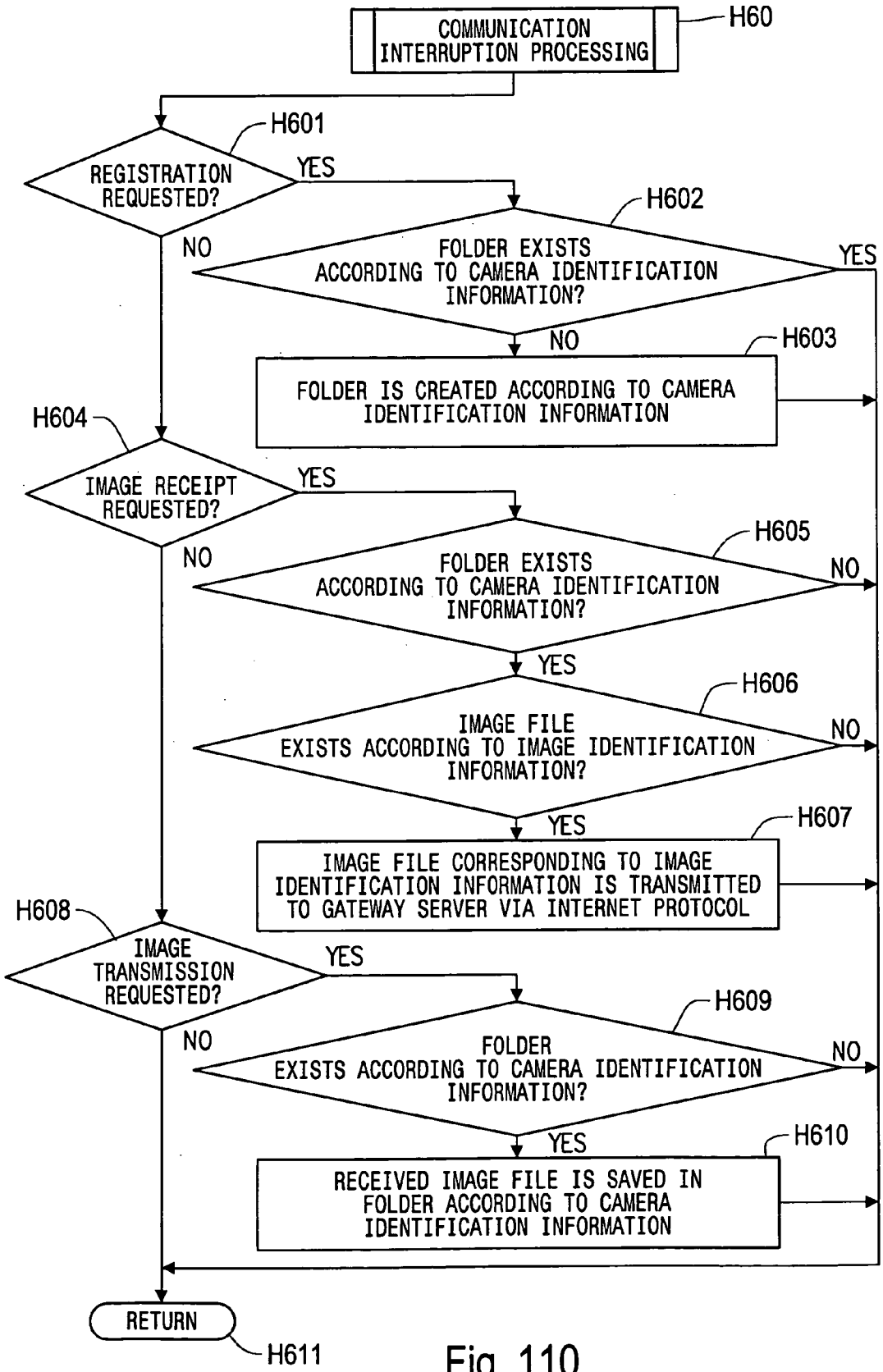

COMMUNICATION INTERRUPTION PROCESSING
H60
H601
REGISTRATION REQUESTED?
YES
NO
H602
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
YES
NO
H603
FOLDER IS CREATED ACCORDING TO CAMERA IDENTIFICATION INFORMATION
H604
IMAGE RECEIPT REQUESTED?
YES
NO
H605
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
NO
YES
H606
IMAGE FILE EXISTS ACCORDING TO IMAGE IDENTIFICATION INFORMATION?
NO
YES
H607
IMAGE FILE CORRESPONDING TO IMAGE IDENTIFICATION INFORMATION IS TRANSMITTED TO GATEWAY SERVER VIA INTERNET PROTOCOL
H608
IMAGE TRANSMISSION REQUESTED?
YES
NO
H609
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
NO
YES
H610
RECEIVED IMAGE FILE IS SAVED IN FOLDER ACCORDING TO CAMERA IDENTIFICATION INFORMATION
RETURN
H611

Fig. 110

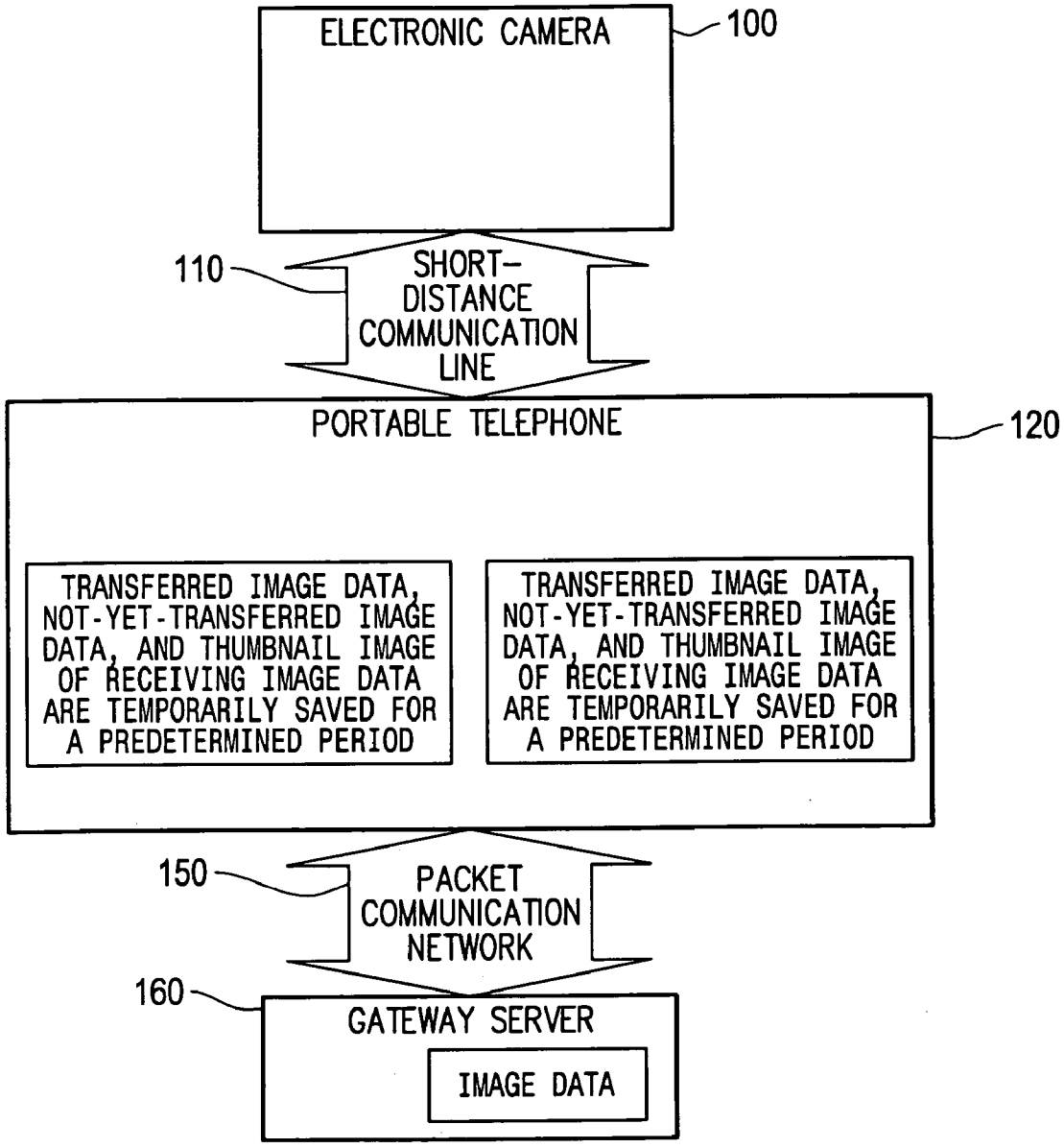

ELECTRONIC CAMERA
100
110
SHORT-DISTANCE COMMUNICATION LINE
PORTABLE TELEPHONE
120
TRANSFERRED IMAGE DATA, NOT-YET-TRANSFERRED IMAGE DATA, AND THUMBNAIL IMAGE OF RECEIVING IMAGE DATA ARE TEMPORARILY SAVED FOR A PREDETERMINED PERIOD
TRANSFERRED IMAGE DATA, NOT-YET-TRANSFERRED IMAGE DATA, AND THUMBNAIL IMAGE OF RECEIVING IMAGE DATA ARE TEMPORARILY SAVED FOR A PREDETERMINED PERIOD
150
PACKET COMMUNICATION NETWORK
160
GATEWAY SERVER
IMAGE DATA

Fig. 111

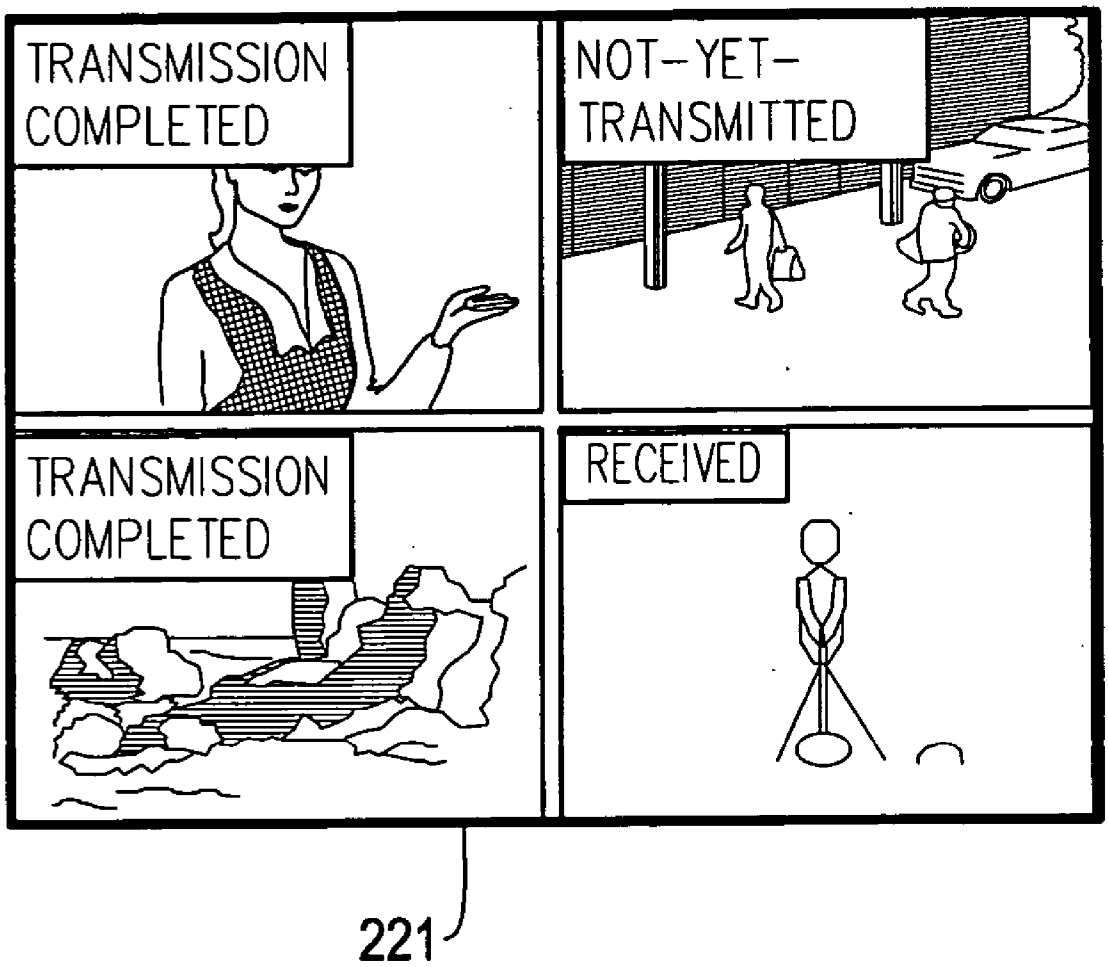

TRANSMISSION COMPLETED
NOT-YET-TRANSMITTED
TRANSMISSION COMPLETED
RECEIVED
221

Fig. 112

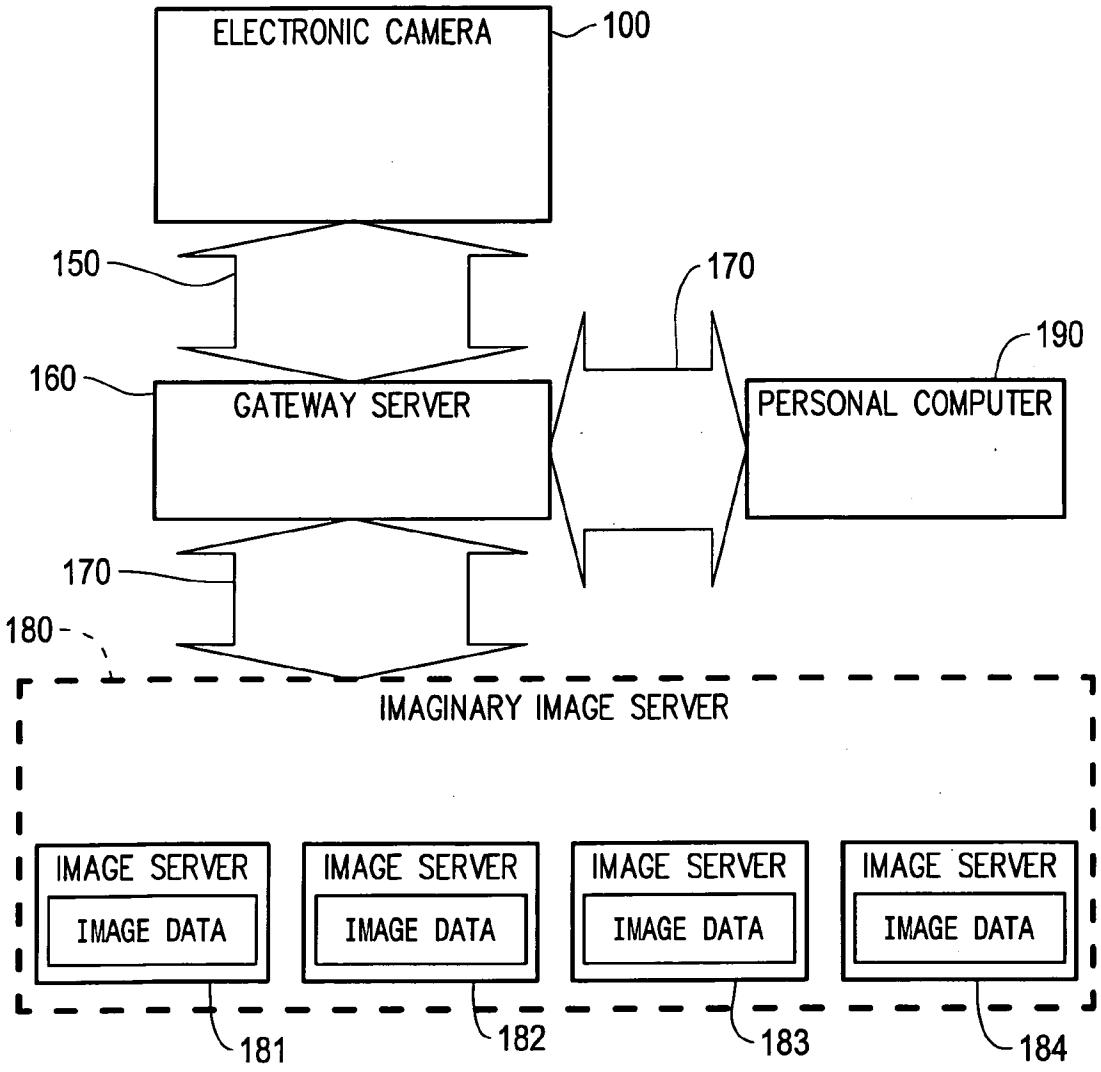

ELECTRONIC CAMERA
100
150
170
190
160
GATEWAY SERVER
PERSONAL COMPUTER
170
180
IMAGINARY IMAGE SERVER
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
181
182
183
184

Fig. 113

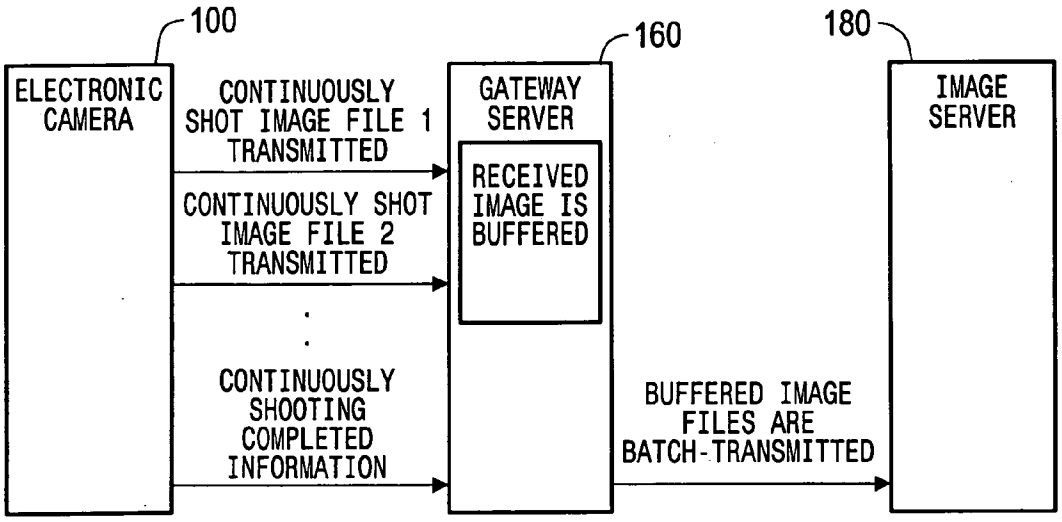


Fig. 114

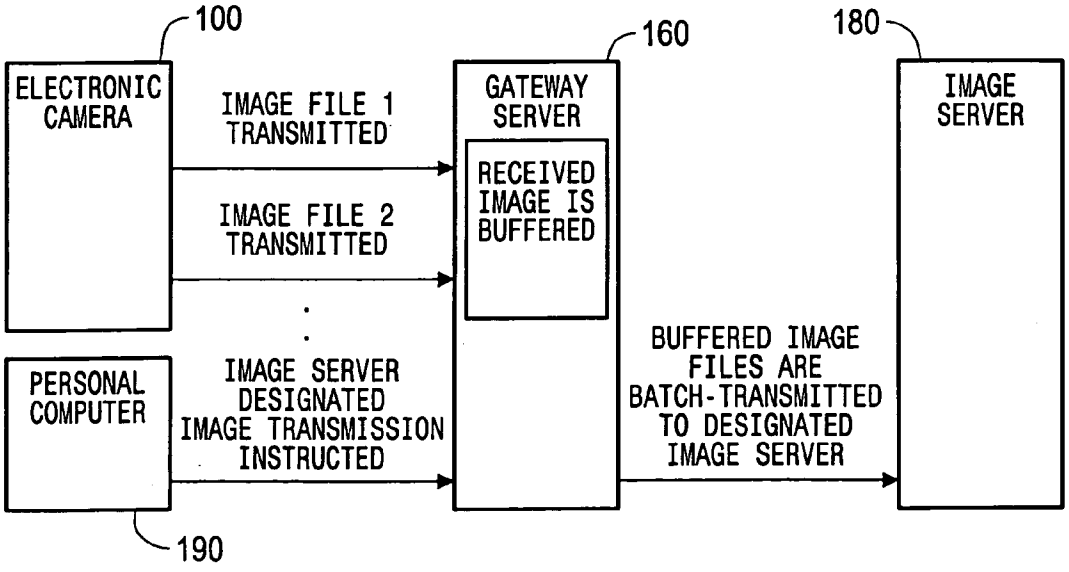


Fig. 115

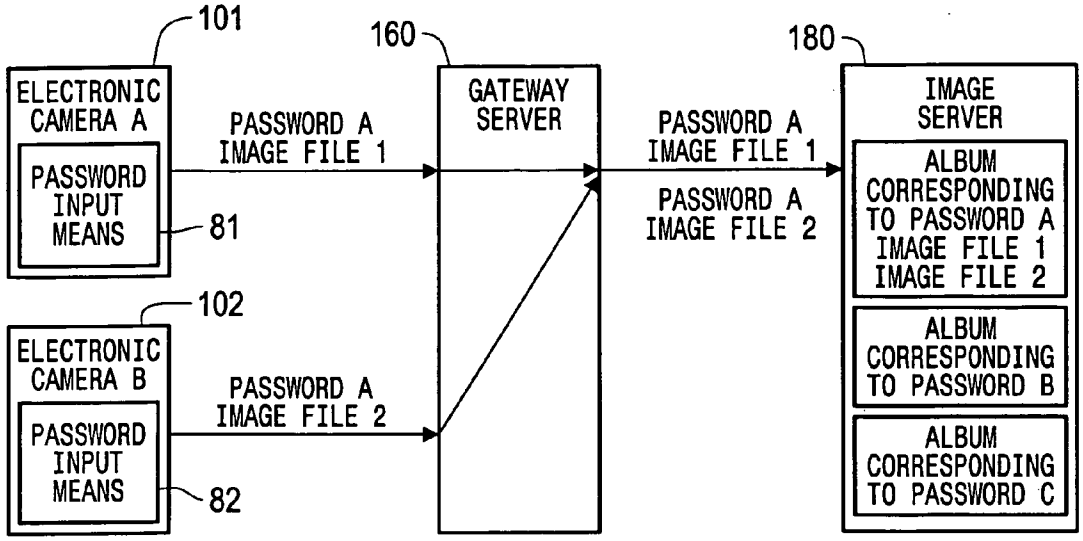


Fig. 116

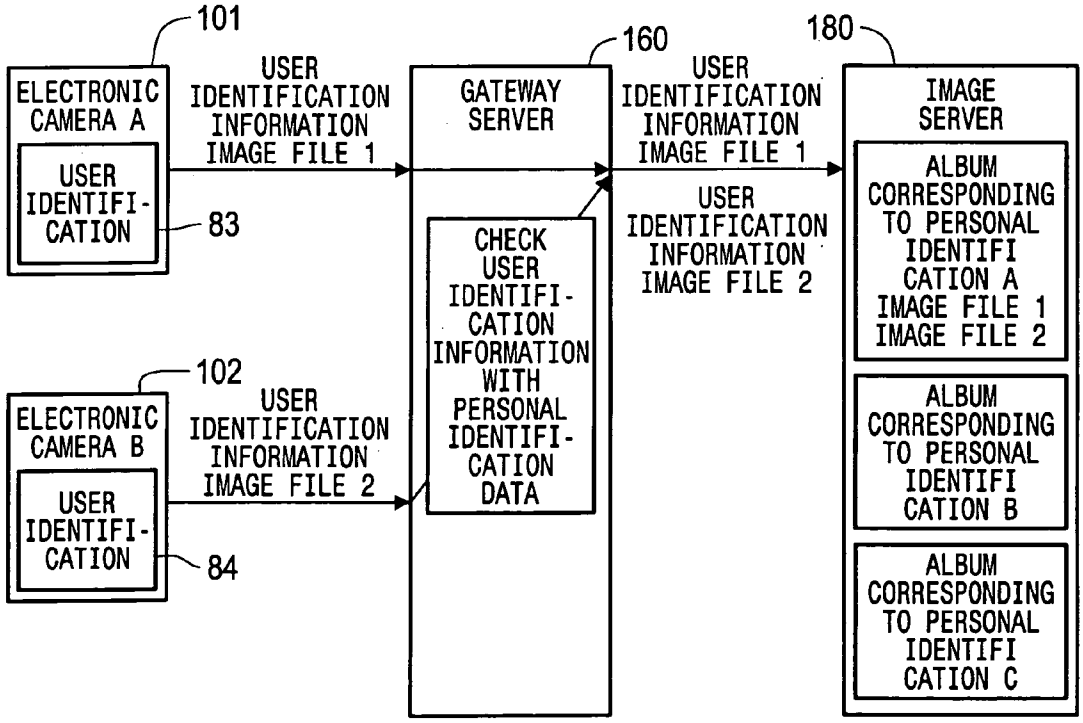


Fig. 117

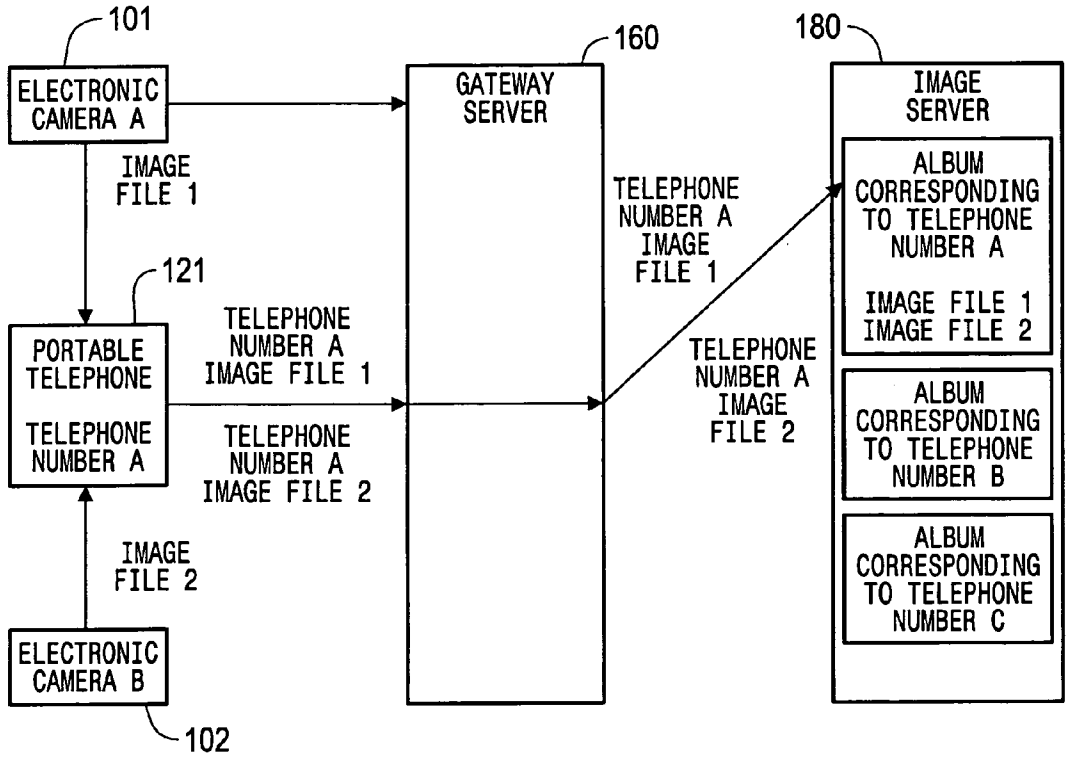

101
ELECTRONIC CAMERA A
IMAGE FILE 1
121
PORTABLE TELEPHONE
TELEPHONE NUMBER A
TELEPHONE NUMBER A IMAGE FILE 1
TELEPHONE NUMBER A IMAGE FILE 2
IMAGE FILE 2
ELECTRONIC CAMERA B
102
160
GATEWAY SERVER
TELEPHONE NUMBER A IMAGE FILE 1
TELEPHONE NUMBER A IMAGE FILE 2
180
IMAGE SERVER
ALBUM CORRESPONDING TO TELEPHONE NUMBER A
IMAGE FILE 1
IMAGE FILE 2
ALBUM CORRESPONDING TO TELEPHONE NUMBER B
ALBUM CORRESPONDING TO TELEPHONE NUMBER C

Fig. 118

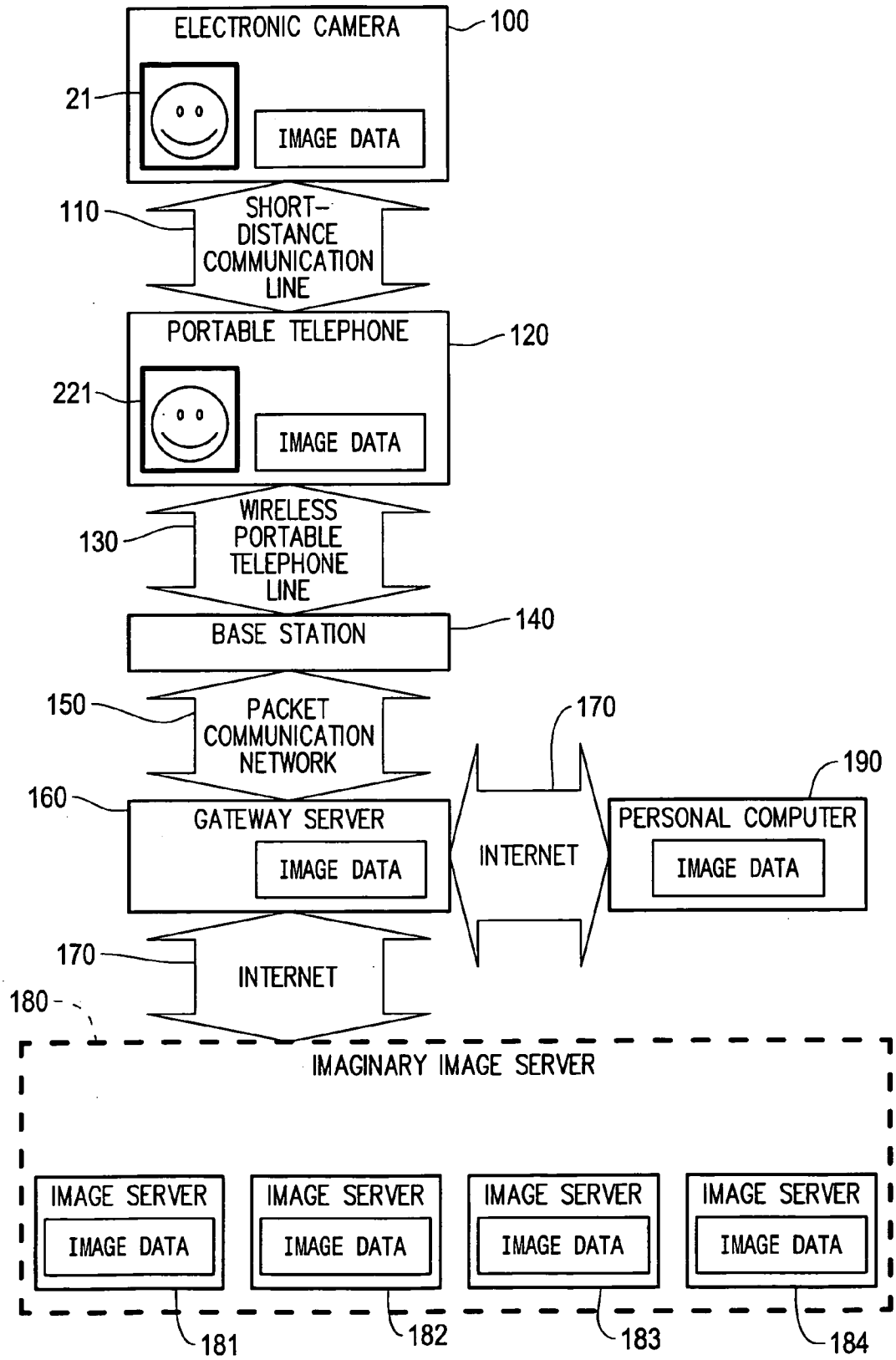

ELECTRONIC CAMERA
100
21
IMAGE DATA
110
SHORT-DISTANCE COMMUNICATION LINE
PORTABLE TELEPHONE
120
221
IMAGE DATA
130
WIRELESS PORTABLE TELEPHONE LINE
BASE STATION
140
150
PACKET COMMUNICATION NETWORK
170
190
160
GATEWAY SERVER
IMAGE DATA
INTERNET
PERSONAL COMPUTER
IMAGE DATA
170
INTERNET
180
IMAGINARY IMAGE SERVER
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
181
182
183
184

Fig. 119

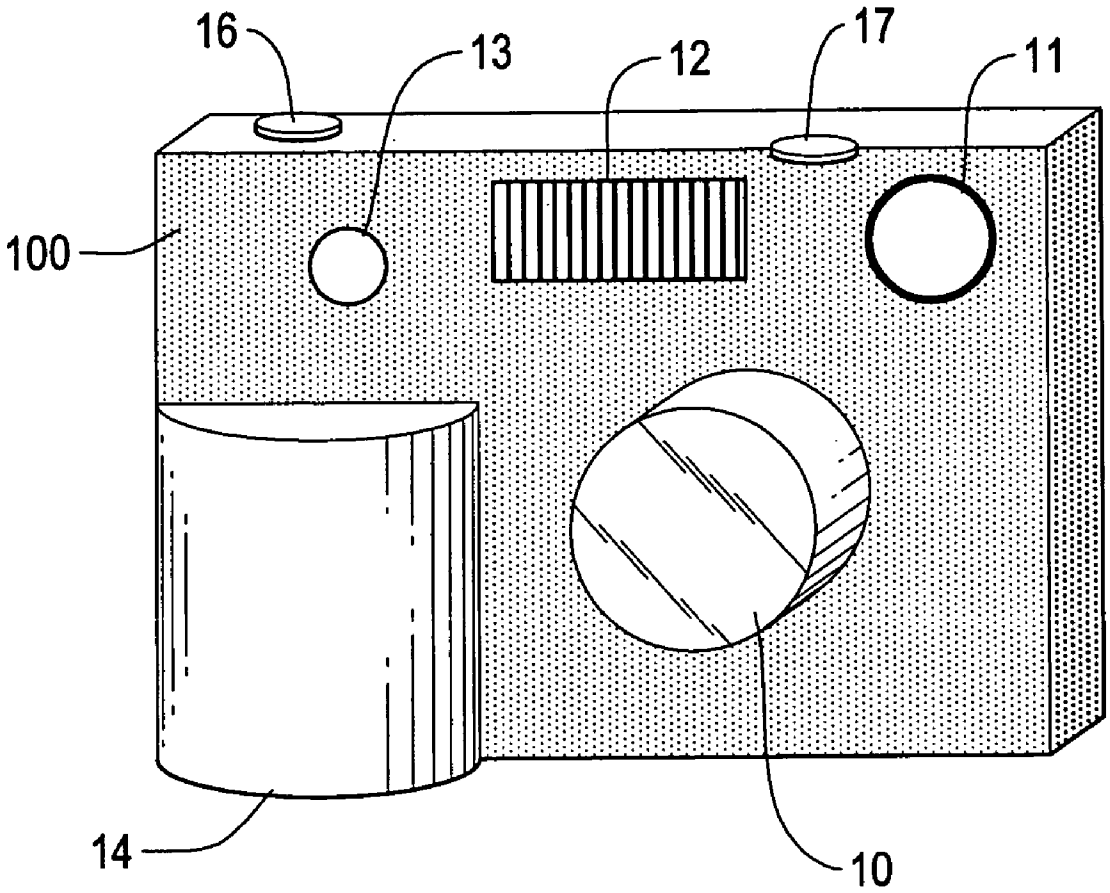


Fig. 120

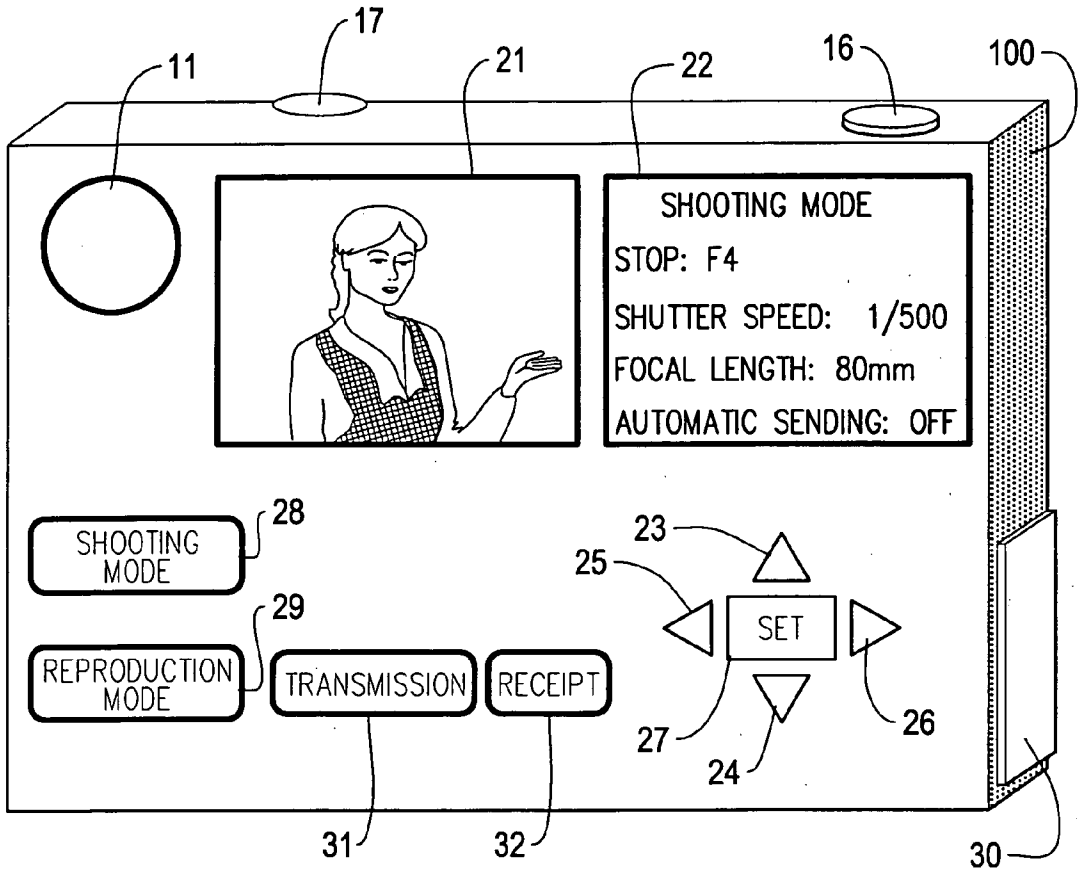

17
11
21
22
16
100
SHOOTING MODE
STOP: F4
SHUTTER SPEED: 1/500
FOCAL LENGTH: 80mm
AUTOMATIC SENDING: OFF
28
SHOOTING MODE
29
REPRODUCTION MODE
TRANSMISSION
RECEIPT
23
25
SET
27
24
26
31
32
30

Fig. 121

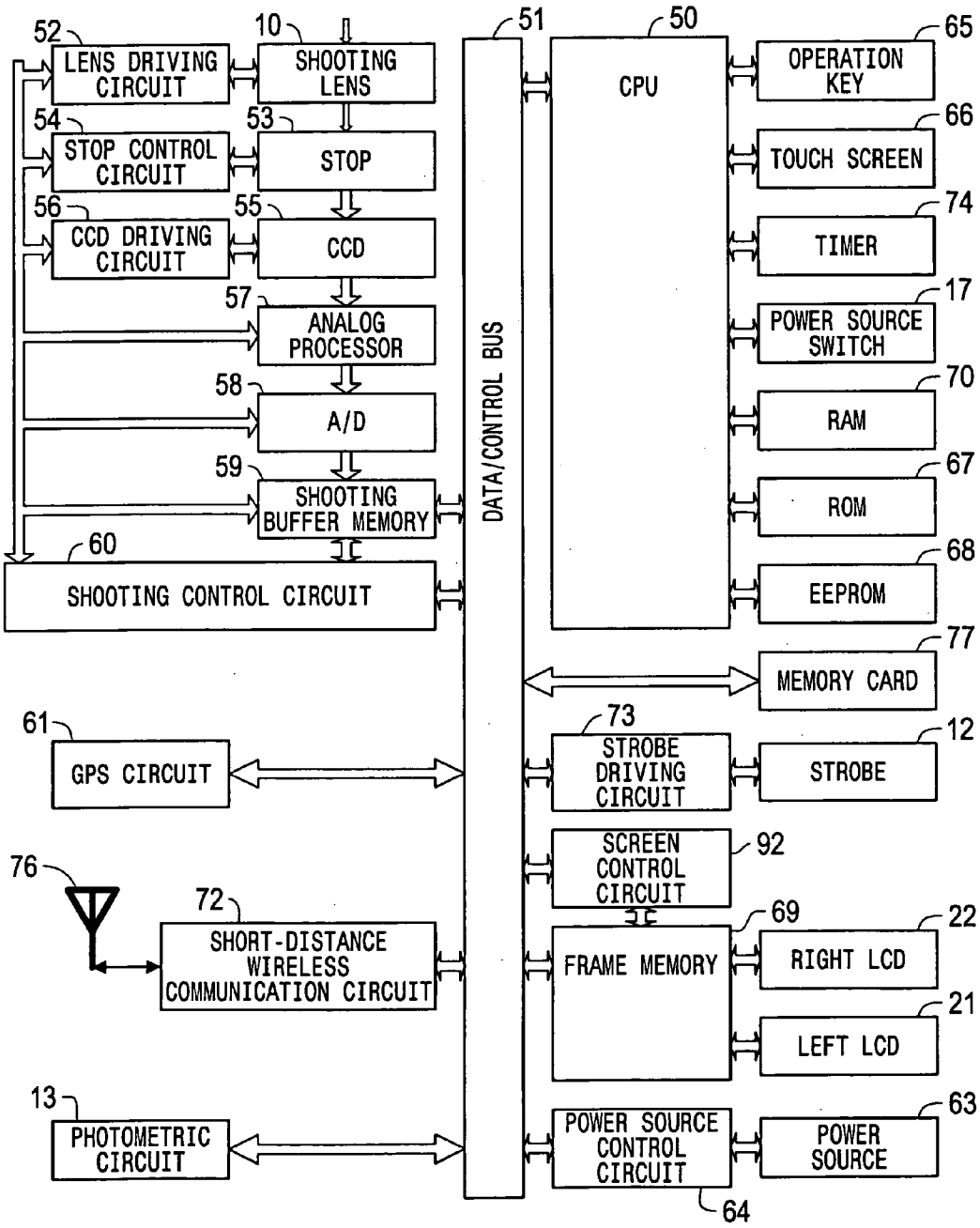
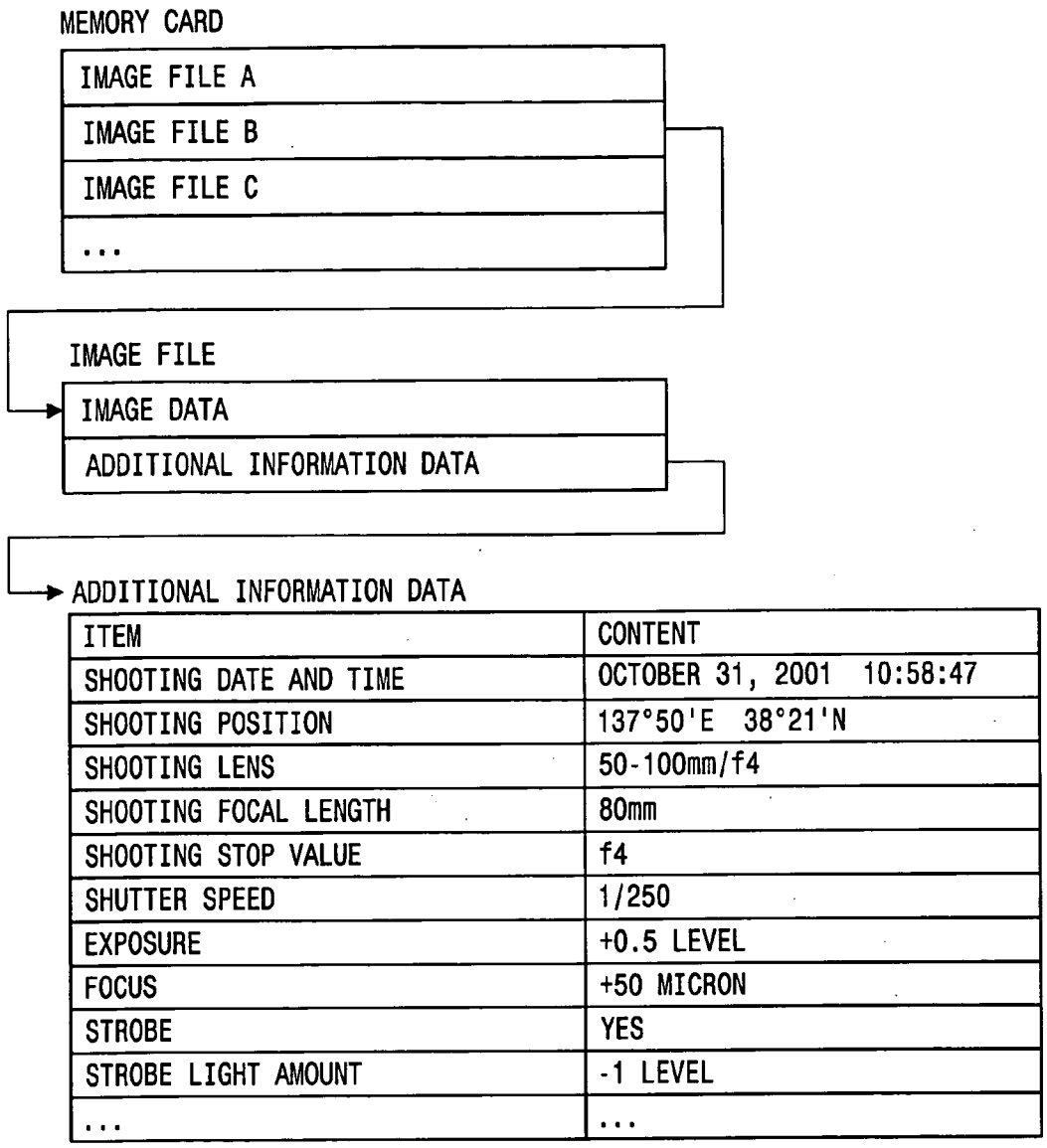

52
LENS DRIVING CIRCUIT
10
SHOOTING LENS
54
STOP CONTROL CIRCUIT
53
STOP
56
CCD DRIVING CIRCUIT
55
CCD
57
ANALOG PROCESSOR
58
A/D
59
SHOOTING BUFFER MEMORY
60
SHOOTING CONTROL CIRCUIT
61
GPS CIRCUIT
76
72
SHORT-DISTANCE WIRELESS COMMUNICATION CIRCUIT
13
PHOTOMETRIC CIRCUIT
51
DATA/CONTROL BUS
50
CPU
65
OPERATION KEY
66
TOUCH SCREEN
74
TIMER
17
POWER SOURCE SWITCH
70
RAM
67
ROM
68
EEPROM
77
MEMORY CARD
73
STROBE DRIVING CIRCUIT
12
STROBE
SCREEN CONTROL CIRCUIT
92
69
FRAME MEMORY
22
RIGHT LCD
21
LEFT LCD
POWER SOURCE CONTROL CIRCUIT
63
POWER SOURCE
64

Fig. 122



ITEM	CONTENT
SHOOTING DATE AND TIME	OCTOBER 31, 2001 10:58:47
SHOOTING POSITION	137°50'E 38°21'N
SHOOTING LENS	50-100mm/f4
SHOOTING FOCAL LENGTH	80mm
SHOOTING STOP VALUE	f4
SHUTTER SPEED	1/250
EXPOSURE	+0.5 LEVEL
FOCUS	+50 MICRON
STROBE	YES
STROBE LIGHT AMOUNT	-1 LEVEL
...	...

Fig.123

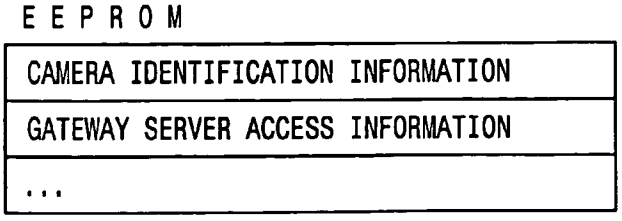


Fig. 124

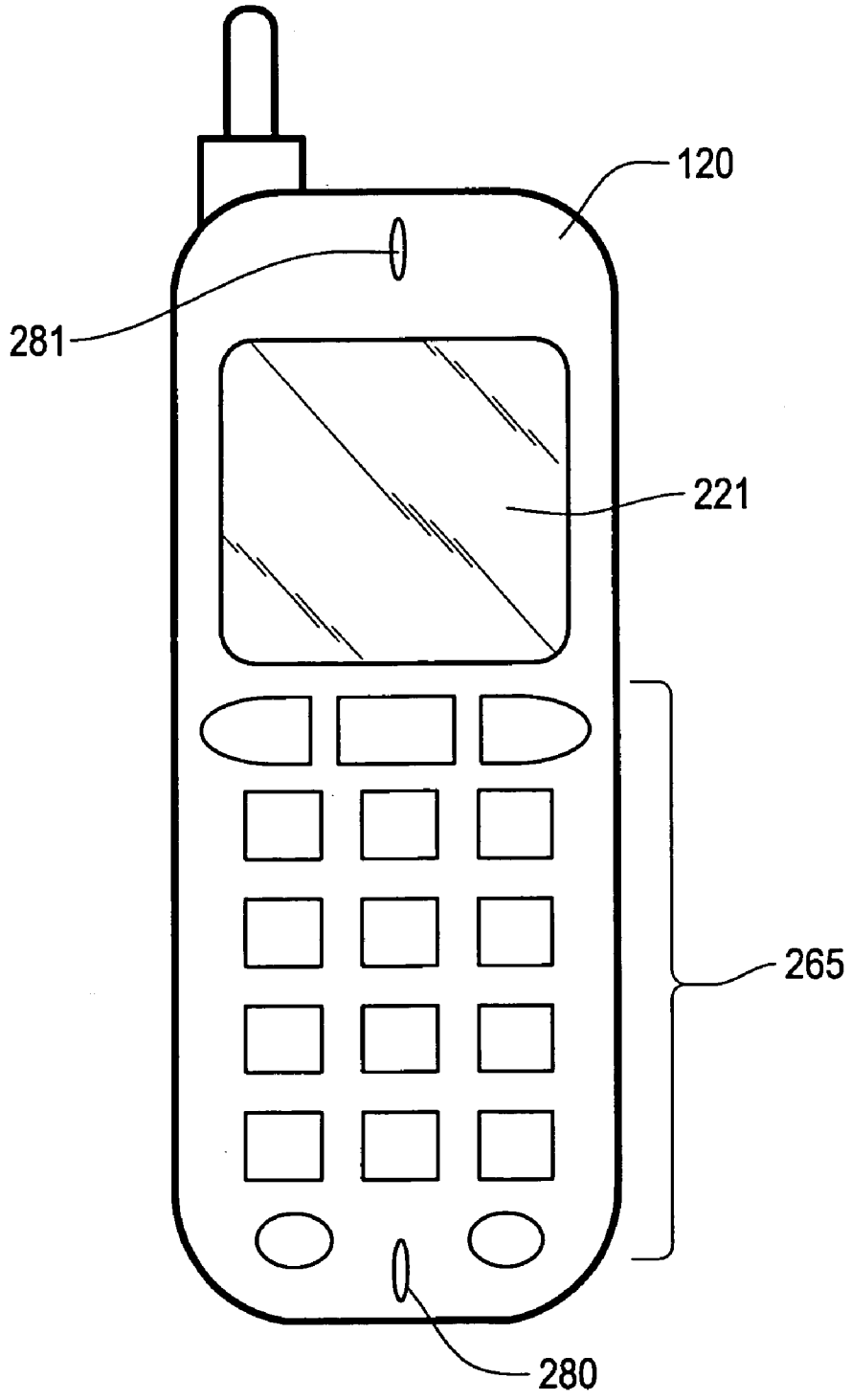


Fig. 125

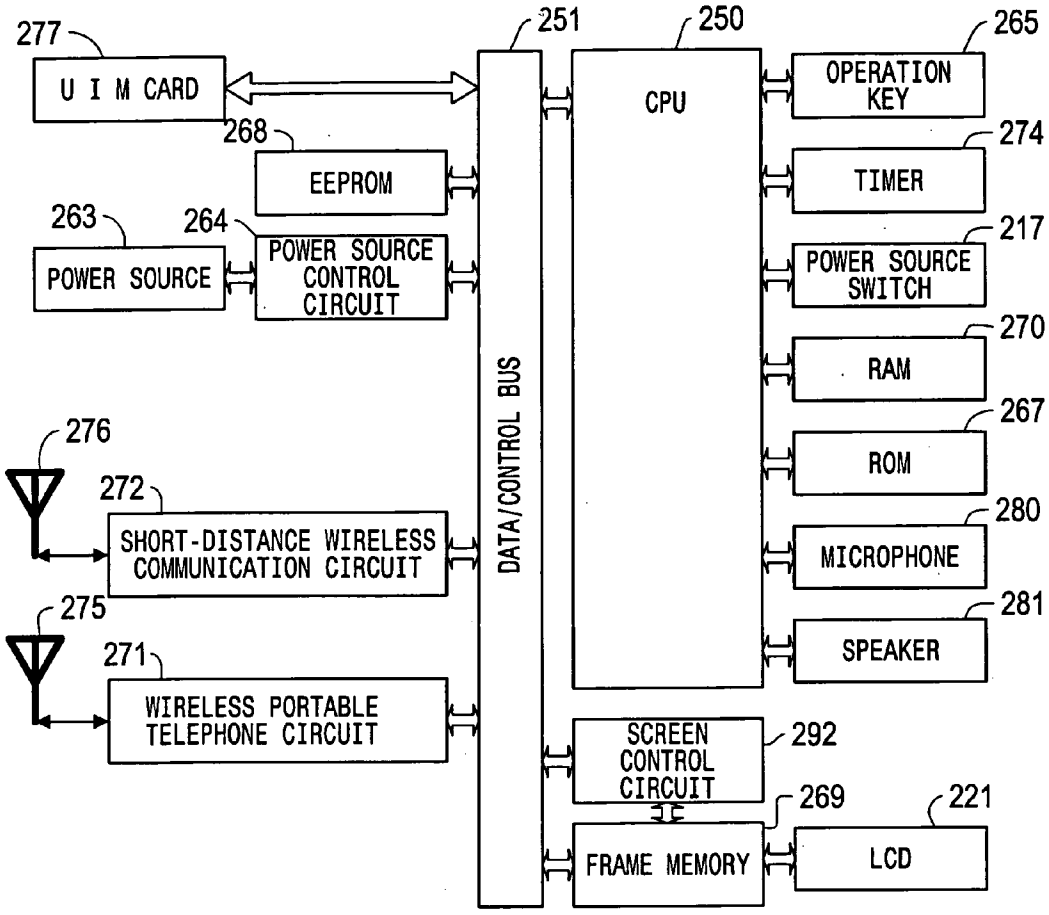


Fig. 126

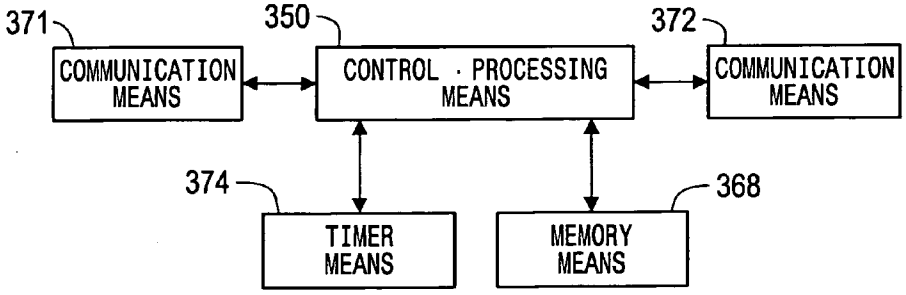


Fig.127

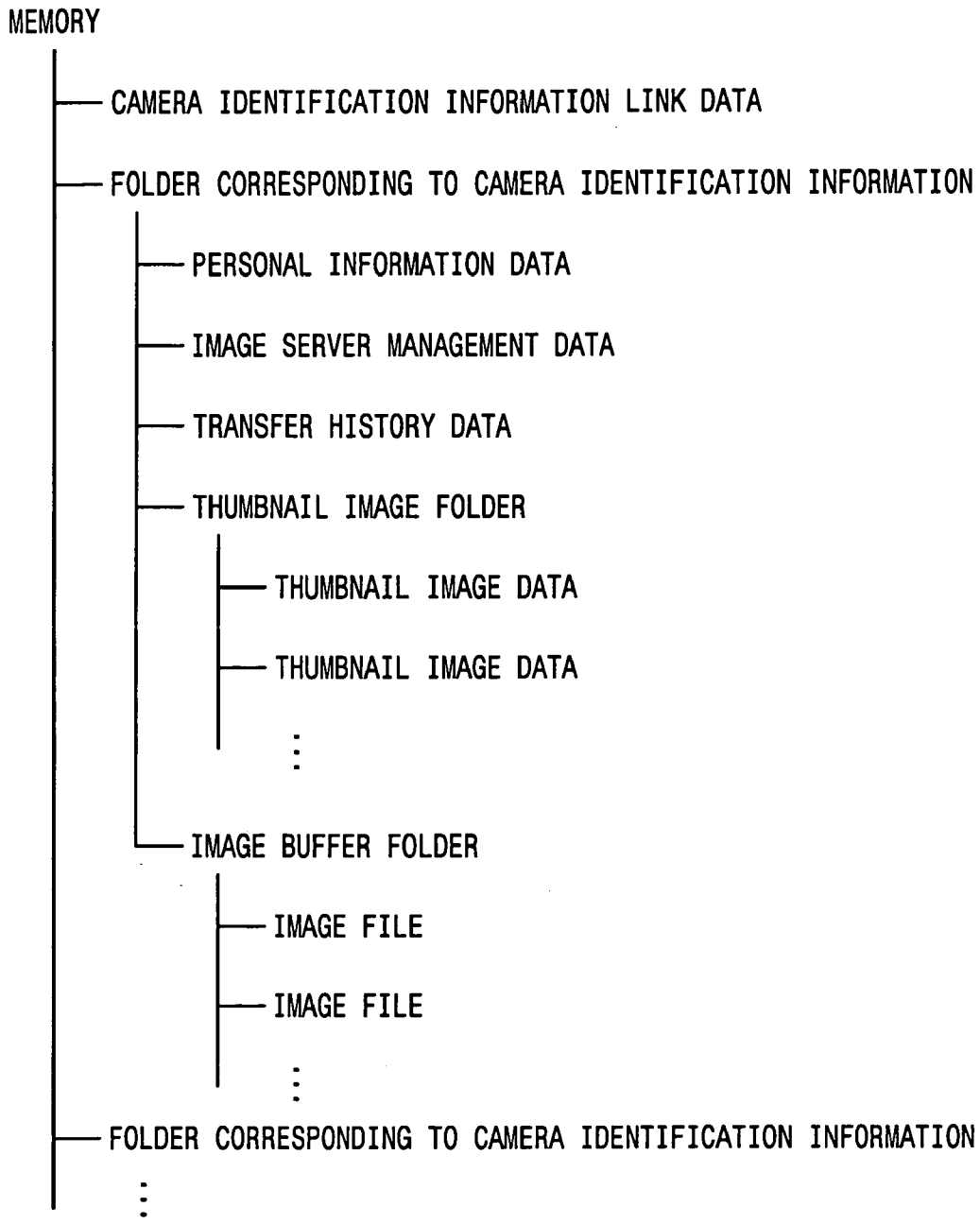

MEMORY
CAMERA IDENTIFICATION INFORMATION LINK DATA
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION
PERSONAL INFORMATION DATA
IMAGE SERVER MANAGEMENT DATA
TRANSFER HISTORY DATA
THUMBNAIL IMAGE FOLDER
THUMBNAIL IMAGE DATA
THUMBNAIL IMAGE DATA
IMAGE BUFFER FOLDER
IMAGE FILE
IMAGE FILE
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION

Fig. 128

CAMERA IDENTIFICATION INFORMATION A : PARENT
CAMERA IDENTIFICATION INFORMATION B → CAMERA IDENTIFICATION INFORMATION A
CAMERA IDENTIFICATION INFORMATION C → CAMERA IDENTIFICATION INFORMATION A
CAMERA IDENTIFICATION INFORMATION D : PARENT
CAMERA IDENTIFICATION INFORMATION E → CAMERA IDENTIFICATION INFORMATION D
CAMERA IDENTIFICATION INFORMATION F : NO LINK
CAMERA IDENTIFICATION INFORMATION H : NOT YET USED
...

Fig.129

PERSONAL
INFORMATION DATA

NAME
GENDER
AGE
ADDRESS
E-MAIL ADDRESS
OCCUPATION
PASSWORD
PHONE NUMBER
...

Fig. 130

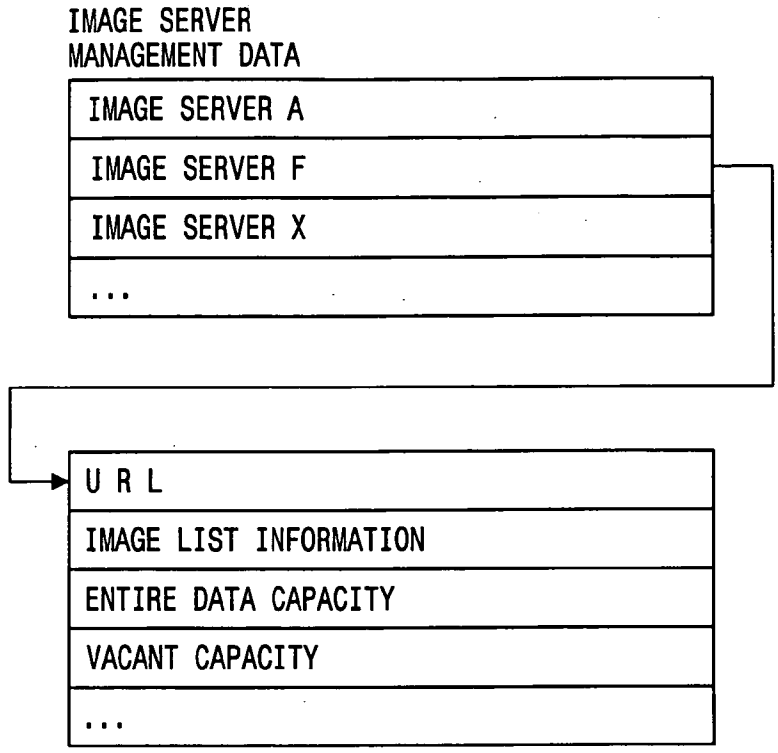


Fig. 131

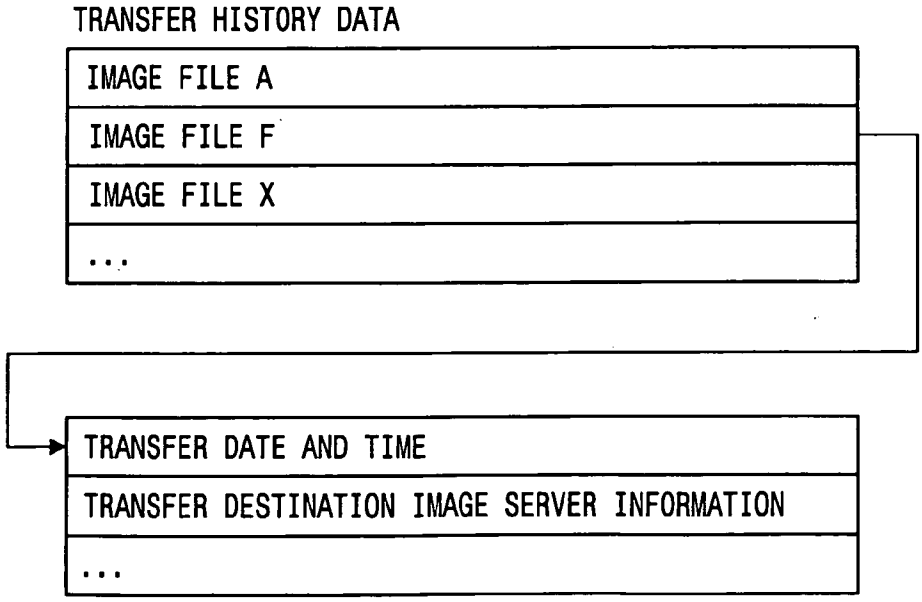


Fig. 132

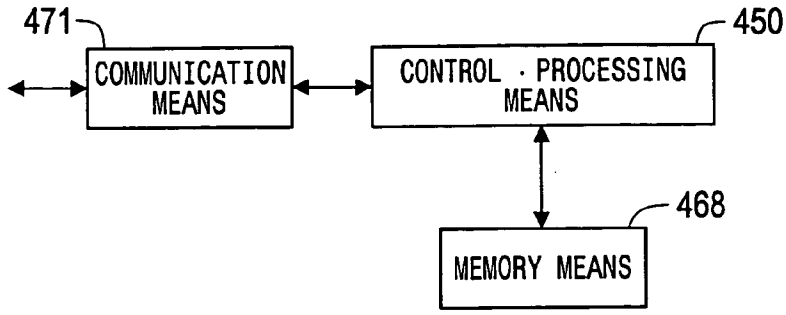


Fig.133

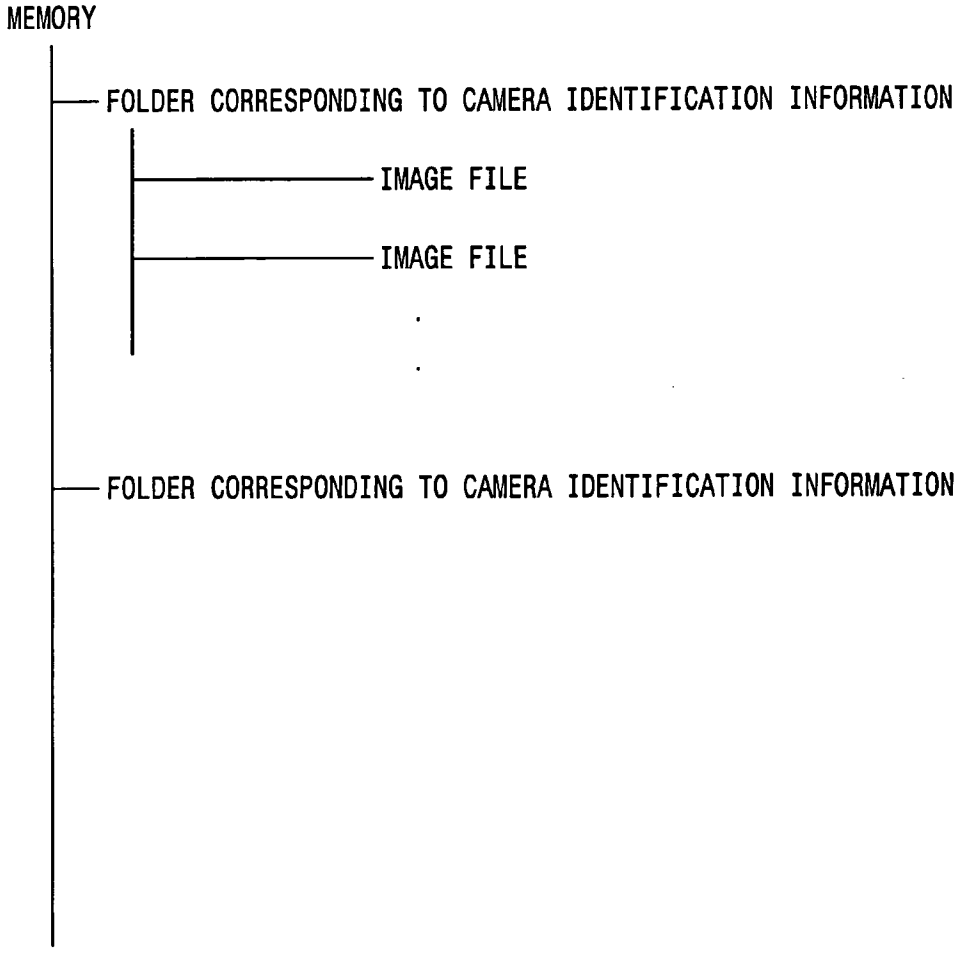


Fig.134

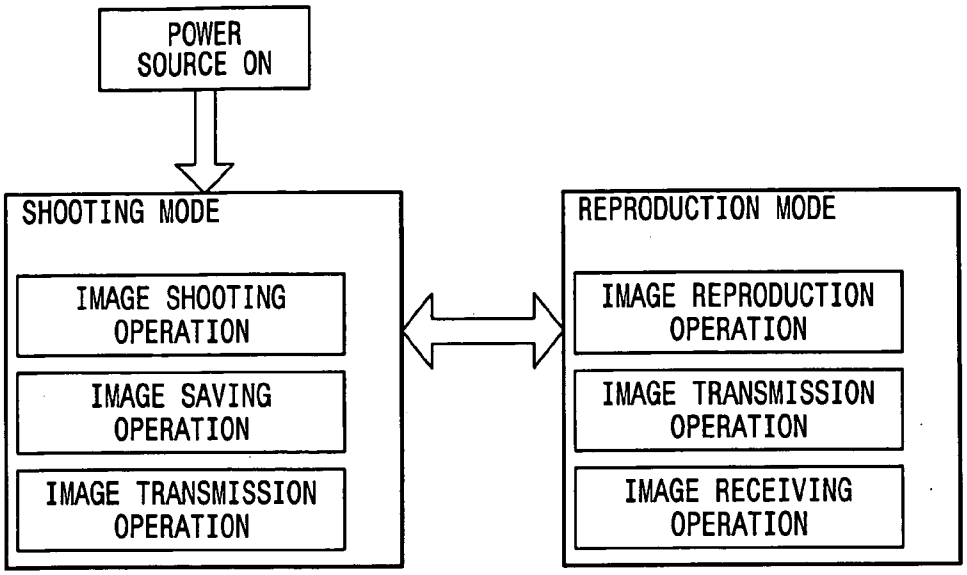


Fig. 135

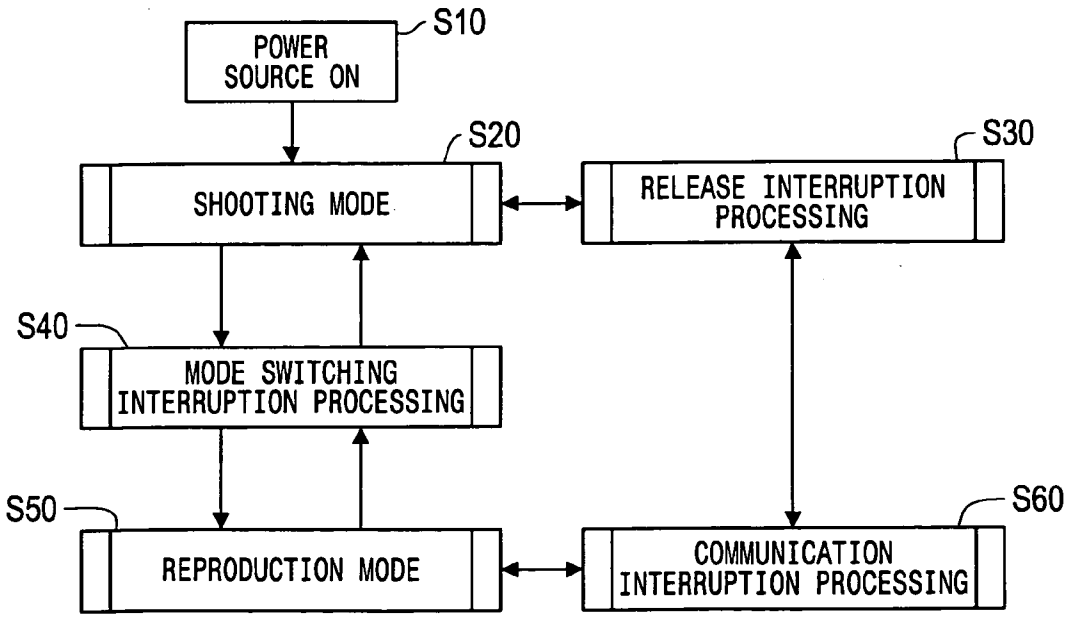


Fig.136

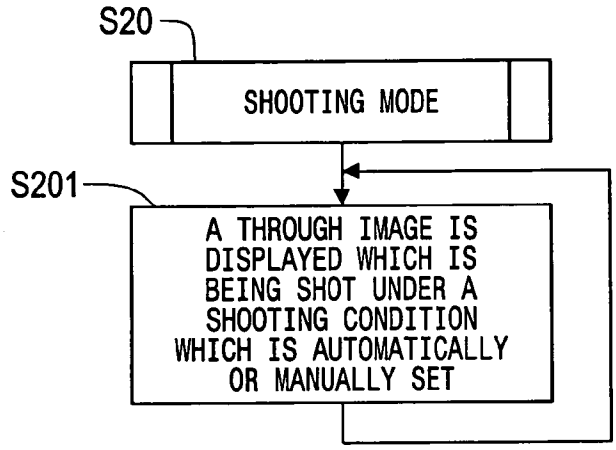


Fig. 137

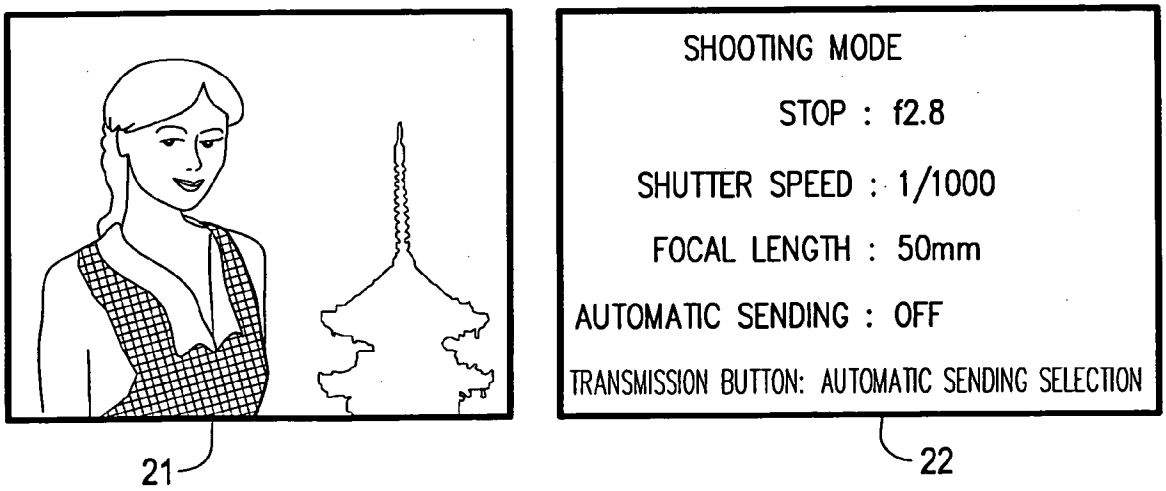


Fig. 138

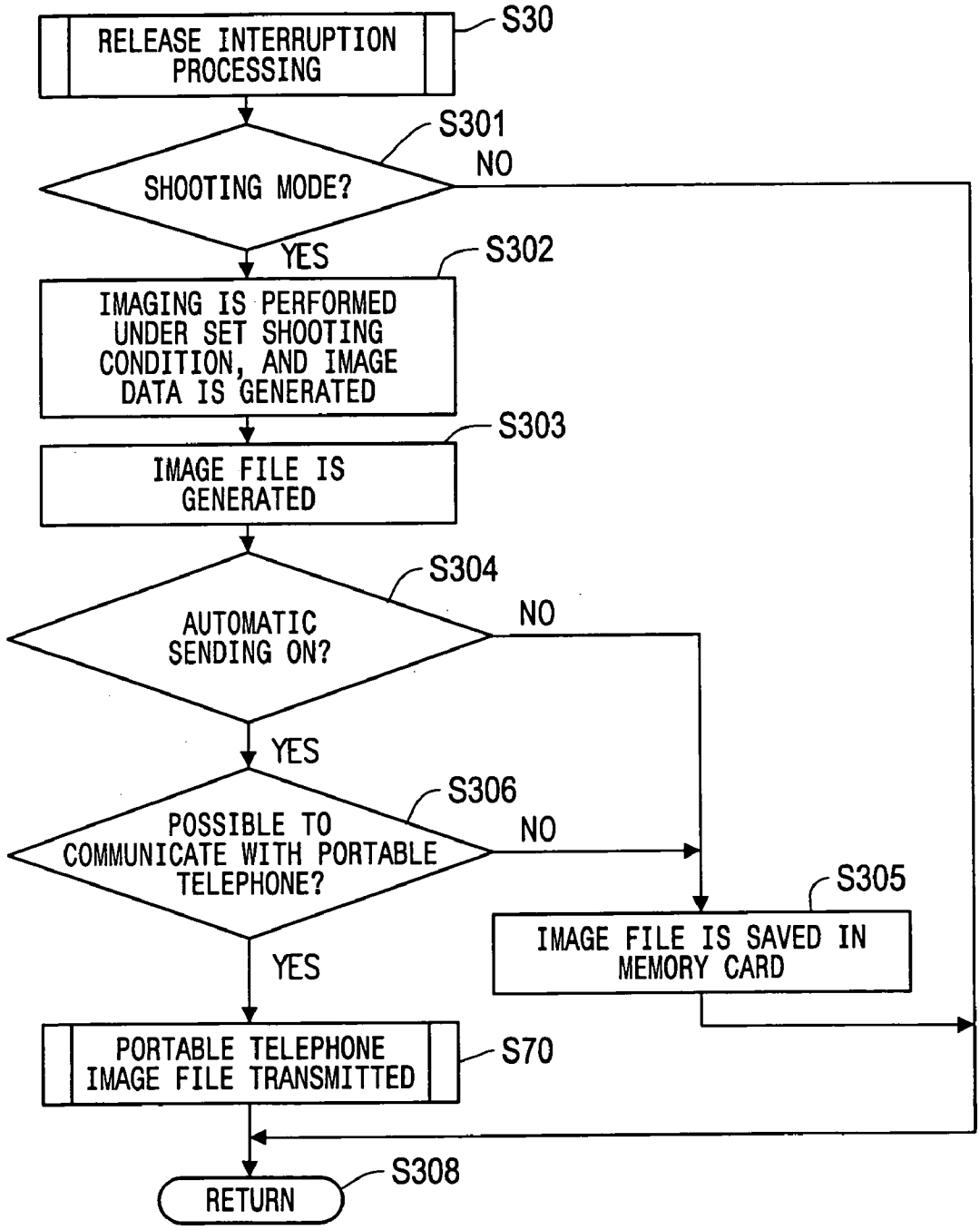

RELEASE INTERRUPTION PROCESSING
S30
SHOOTING MODE?
S301
NO
YES
IMAGING IS PERFORMED UNDER SET SHOOTING CONDITION, AND IMAGE DATA IS GENERATED
S302
IMAGE FILE IS GENERATED
S303
AUTOMATIC SENDING ON?
S304
NO
YES
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S306
NO
IMAGE FILE IS SAVED IN MEMORY CARD
S305
YES
PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
RETURN
S308

Fig. 139

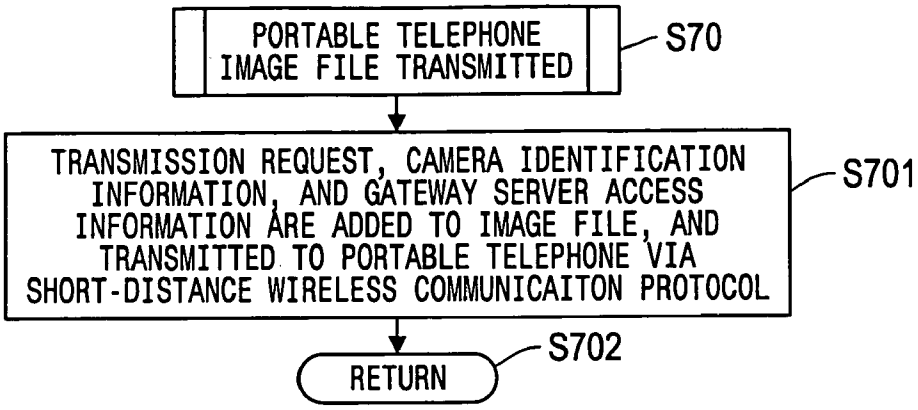


Fig. 140

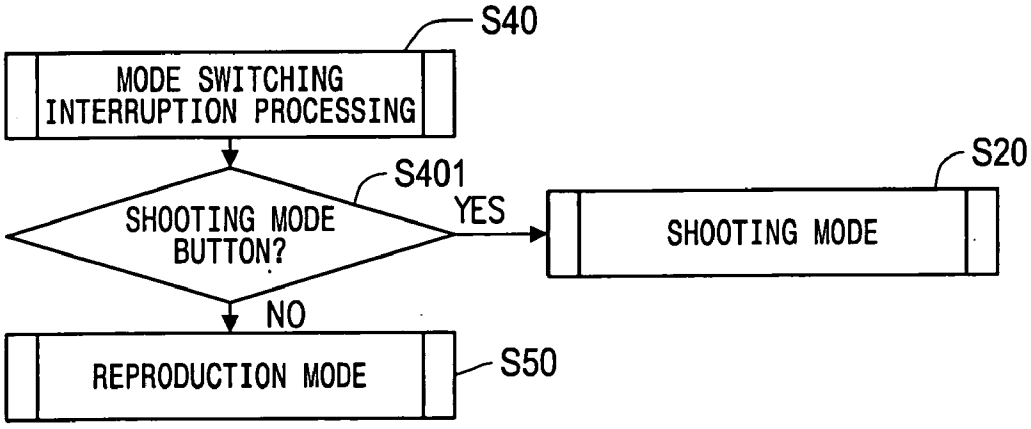


Fig. 141

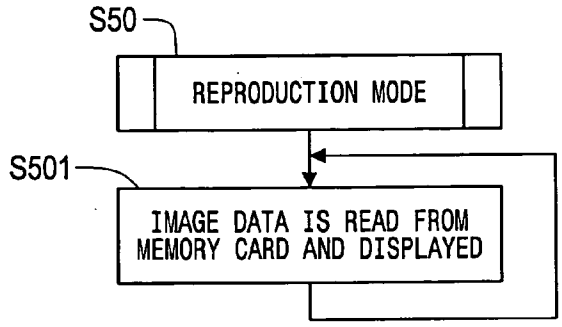


Fig. 142

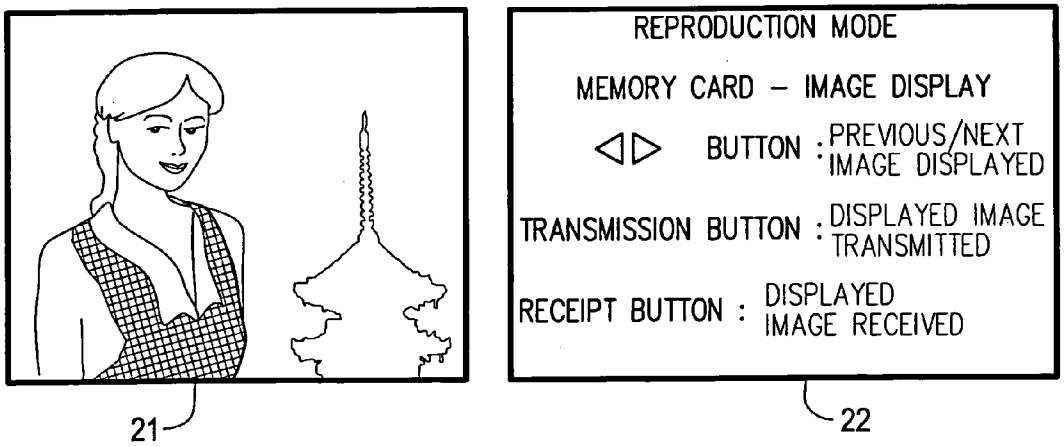


Fig. 143

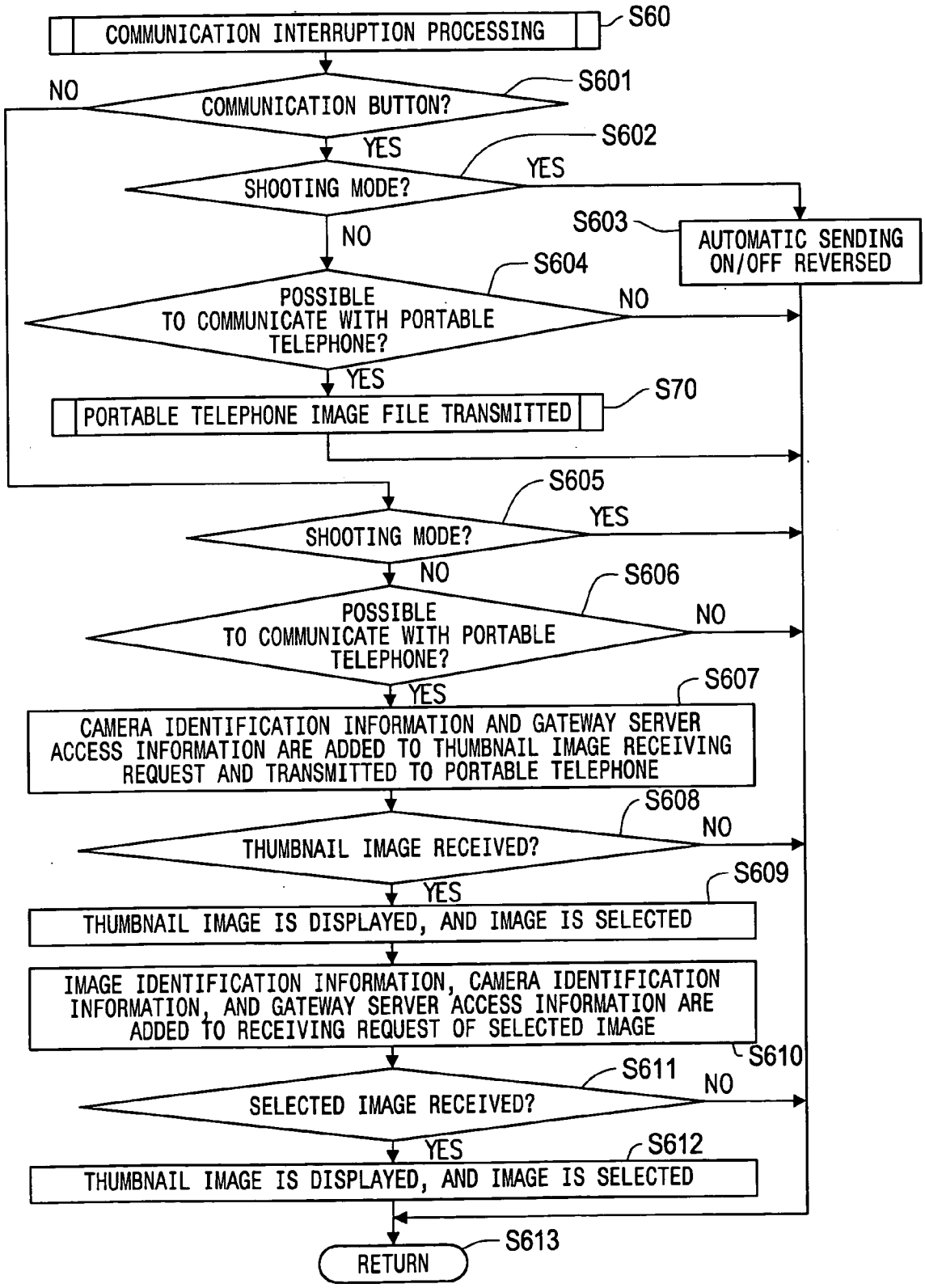

COMMUNICATION INTERRUPTION PROCESSING
S60
COMMUNICATION BUTTON?
S601
NO
YES
SHOOTING MODE?
S602
YES
NO
S603
AUTOMATIC SENDING ON/OFF REVERSED
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S604
NO
YES
PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
SHOOTING MODE?
S605
YES
NO
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S606
NO
YES
CAMERA IDENTIFICATION INFORMATION AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO THUMBNAIL IMAGE RECEIVING REQUEST AND TRANSMITTED TO PORTABLE TELEPHONE
S607
THUMBNAIL IMAGE RECEIVED?
S608
NO
YES
THUMBNAIL IMAGE IS DISPLAYED, AND IMAGE IS SELECTED
S609
IMAGE IDENTIFICATION INFORMATION, CAMERA IDENTIFICATION INFORMATION, AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO RECEIVING REQUEST OF SELECTED IMAGE
S610
SELECTED IMAGE RECEIVED?
S611
NO
YES
THUMBNAIL IMAGE IS DISPLAYED, AND IMAGE IS SELECTED
S612
RETURN
S613

Fig. 144

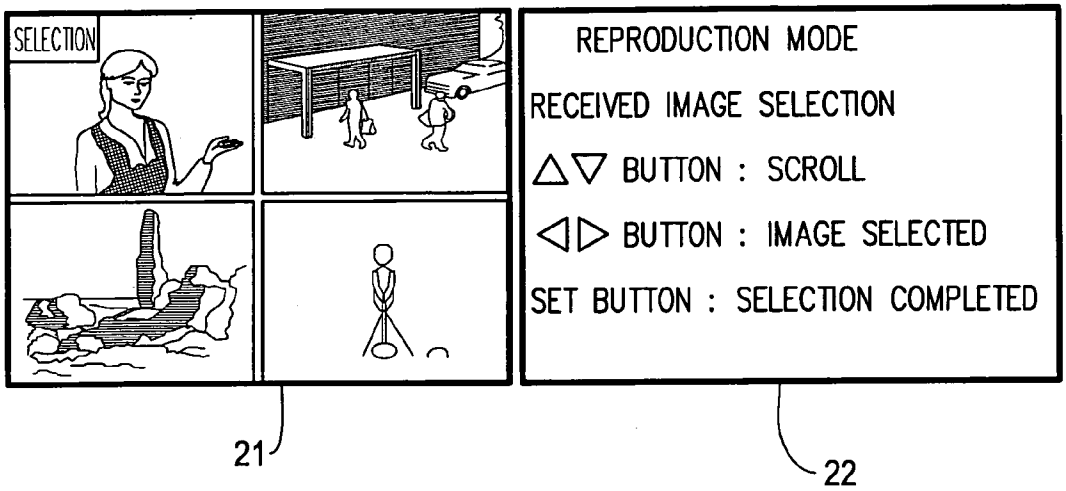


Fig. 145

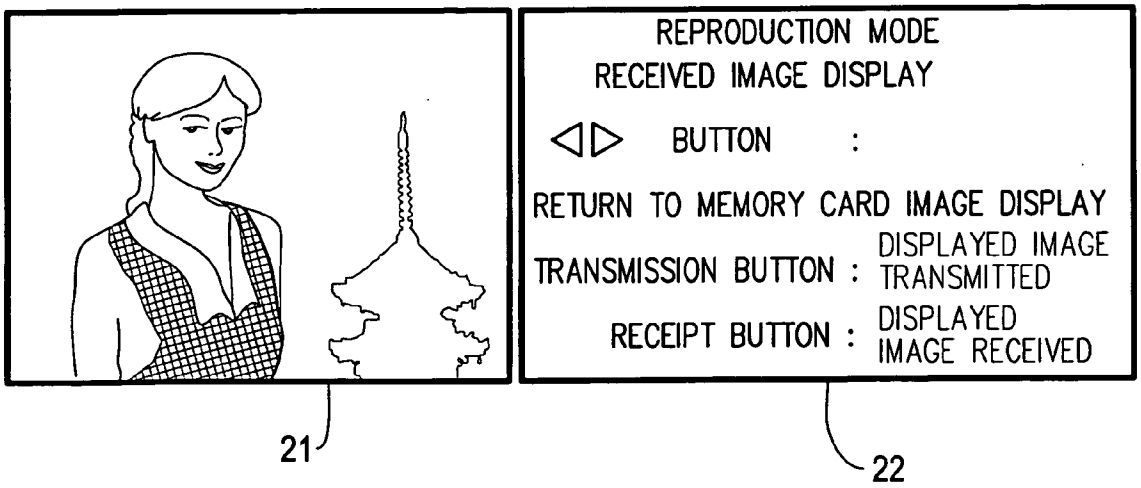


Fig. 146

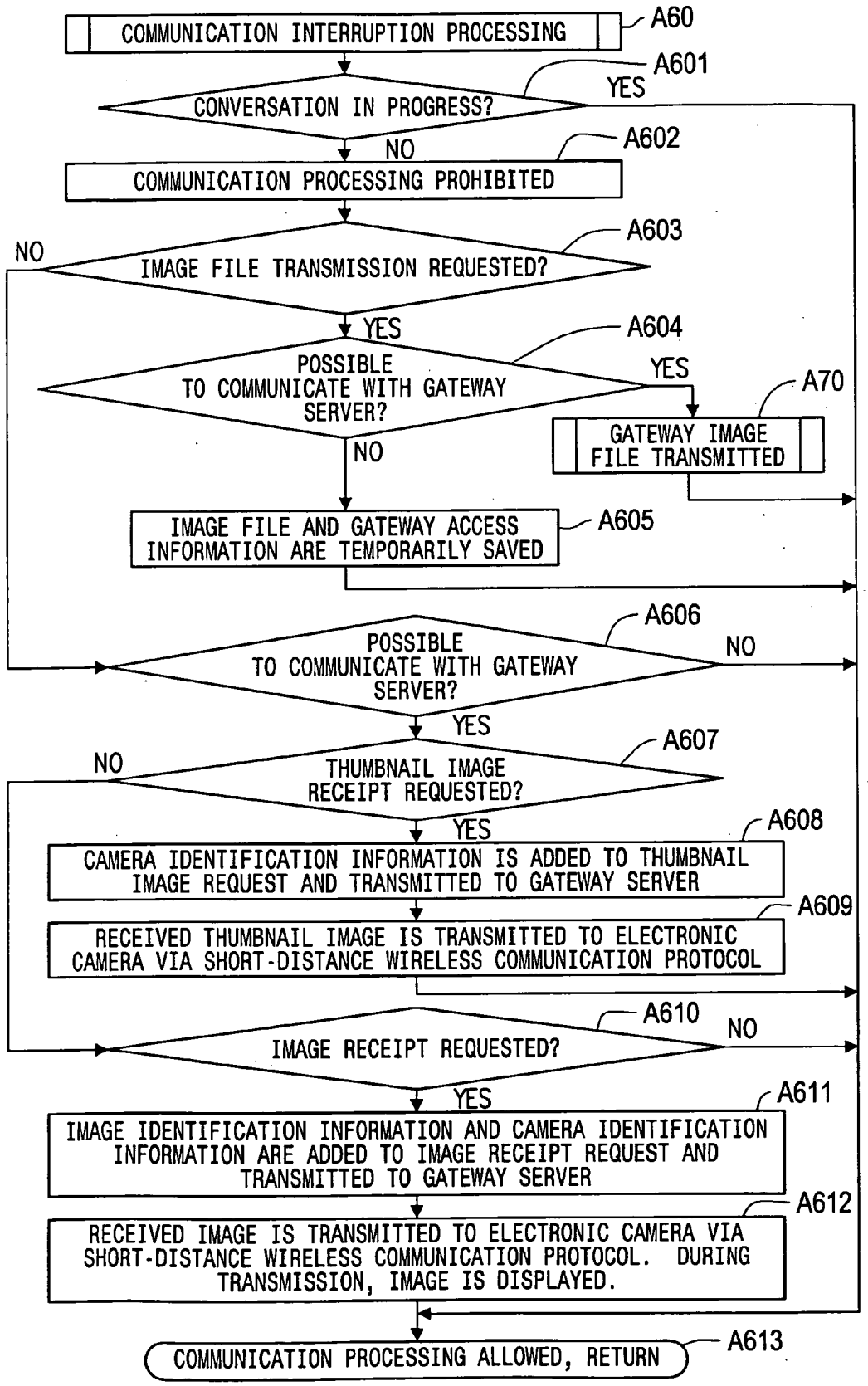

COMMUNICATION INTERRUPTION PROCESSING
A60
CONVERSATION IN PROGRESS?
A601
YES
NO
COMMUNICATION PROCESSING PROHIBITED
A602
IMAGE FILE TRANSMISSION REQUESTED?
A603
NO
YES
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
A604
YES
NO
GATEWAY IMAGE FILE TRANSMITTED
A70
IMAGE FILE AND GATEWAY ACCESS INFORMATION ARE TEMPORARILY SAVED
A605
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
A606
NO
YES
THUMBNAIL IMAGE RECEIPT REQUESTED?
A607
NO
YES
CAMERA IDENTIFICATION INFORMATION IS ADDED TO THUMBNAIL IMAGE REQUEST AND TRANSMITTED TO GATEWAY SERVER
A608
RECEIVED THUMBNAIL IMAGE IS TRANSMITTED TO ELECTRONIC CAMERA VIA SHORT-DISTANCE WIRELESS COMMUNICATION PROTOCOL
A609
IMAGE RECEIPT REQUESTED?
A610
NO
YES
IMAGE IDENTIFICATION INFORMATION AND CAMERA IDENTIFICATION INFORMATION ARE ADDED TO IMAGE RECEIPT REQUEST AND TRANSMITTED TO GATEWAY SERVER
A611
RECEIVED IMAGE IS TRANSMITTED TO ELECTRONIC CAMERA VIA SHORT-DISTANCE WIRELESS COMMUNICATION PROTOCOL. DURING TRANSMISSION, IMAGE IS DISPLAYED.
A612
COMMUNICATION PROCESSING ALLOWED, RETURN
A613

Fig. 147

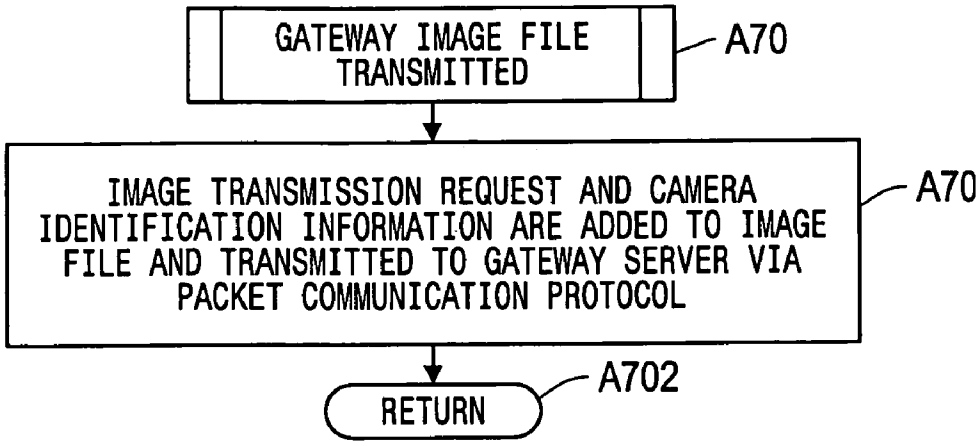


Fig. 148

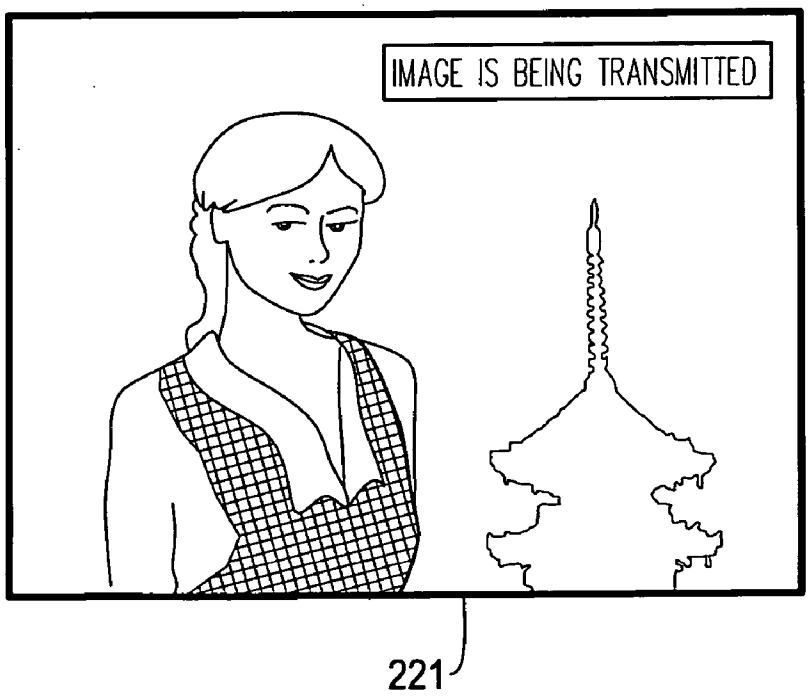


Fig. 149

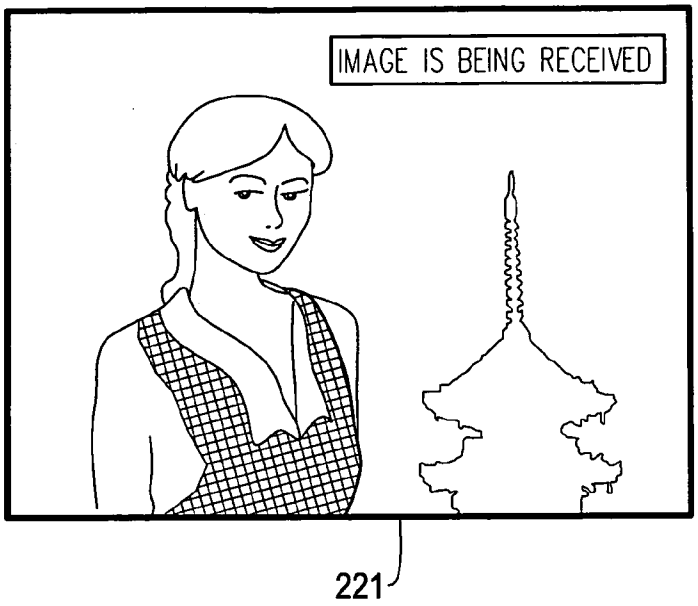


Fig. 150

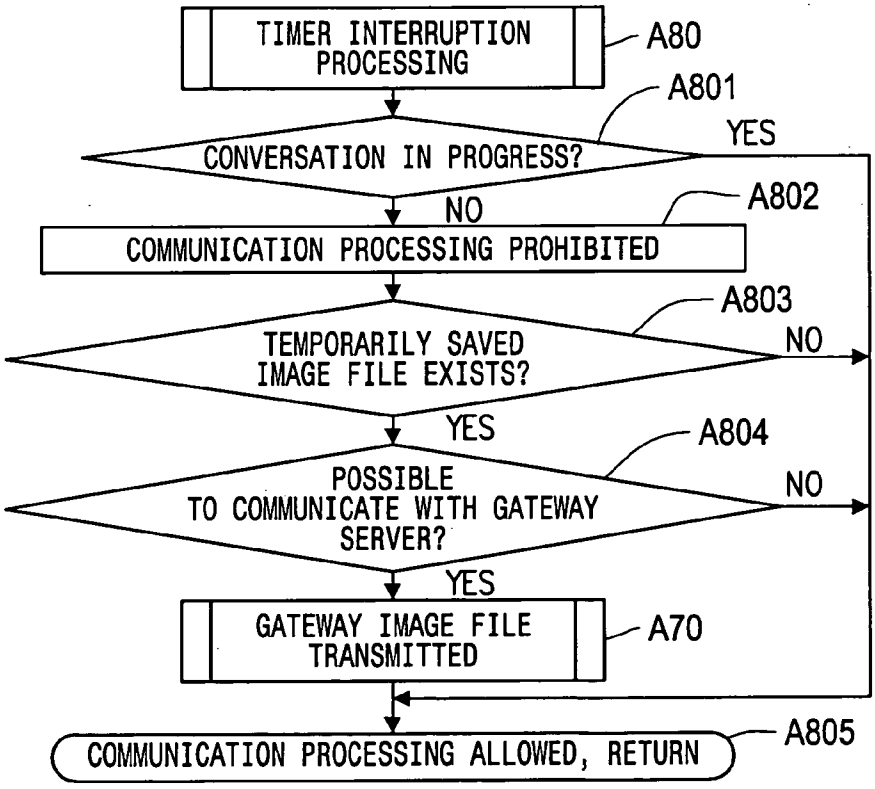


Fig. 151

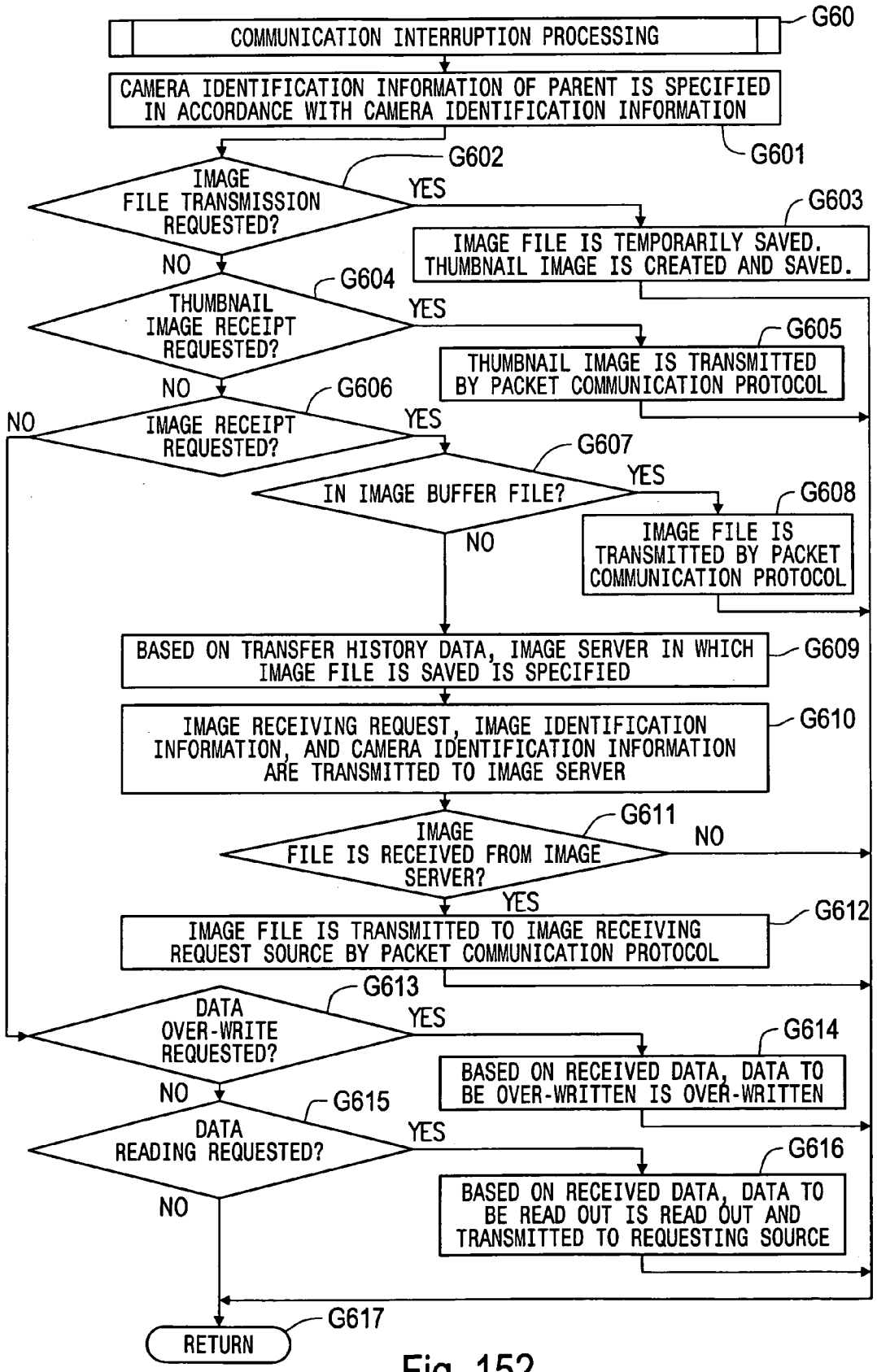

COMMUNICATION INTERRUPTION PROCESSING
G60
CAMERA IDENTIFICATION INFORMATION OF PARENT IS SPECIFIED IN ACCORDANCE WITH CAMERA IDENTIFICATION INFORMATION
G601
IMAGE FILE TRANSMISSION REQUESTED?
G602
YES
NO
IMAGE FILE IS TEMPORARILY SAVED. THUMBNAIL IMAGE IS CREATED AND SAVED.
G603
THUMBNAIL IMAGE RECEIPT REQUESTED?
G604
YES
NO
THUMBNAIL IMAGE IS TRANSMITTED BY PACKET COMMUNICATION PROTOCOL
G605
IMAGE RECEIPT REQUESTED?
G606
YES
NO
IN IMAGE BUFFER FILE?
G607
YES
NO
IMAGE FILE IS TRANSMITTED BY PACKET COMMUNICATION PROTOCOL
G608
BASED ON TRANSFER HISTORY DATA, IMAGE SERVER IN WHICH IMAGE FILE IS SAVED IS SPECIFIED
G609
IMAGE RECEIVING REQUEST, IMAGE IDENTIFICATION INFORMATION, AND CAMERA IDENTIFICATION INFORMATION ARE TRANSMITTED TO IMAGE SERVER
G610
IMAGE FILE IS RECEIVED FROM IMAGE SERVER?
G611
NO
YES
IMAGE FILE IS TRANSMITTED TO IMAGE RECEIVING REQUEST SOURCE BY PACKET COMMUNICATION PROTOCOL
G612
DATA OVER-WRITE REQUESTED?
G613
YES
NO
BASED ON RECEIVED DATA, DATA TO BE OVER-WRITTEN IS OVER-WRITTEN
G614
DATA READING REQUESTED?
G615
YES
NO
BASED ON RECEIVED DATA, DATA TO BE READ OUT IS READ OUT AND TRANSMITTED TO REQUESTING SOURCE
G616
RETURN
G617

Fig. 152

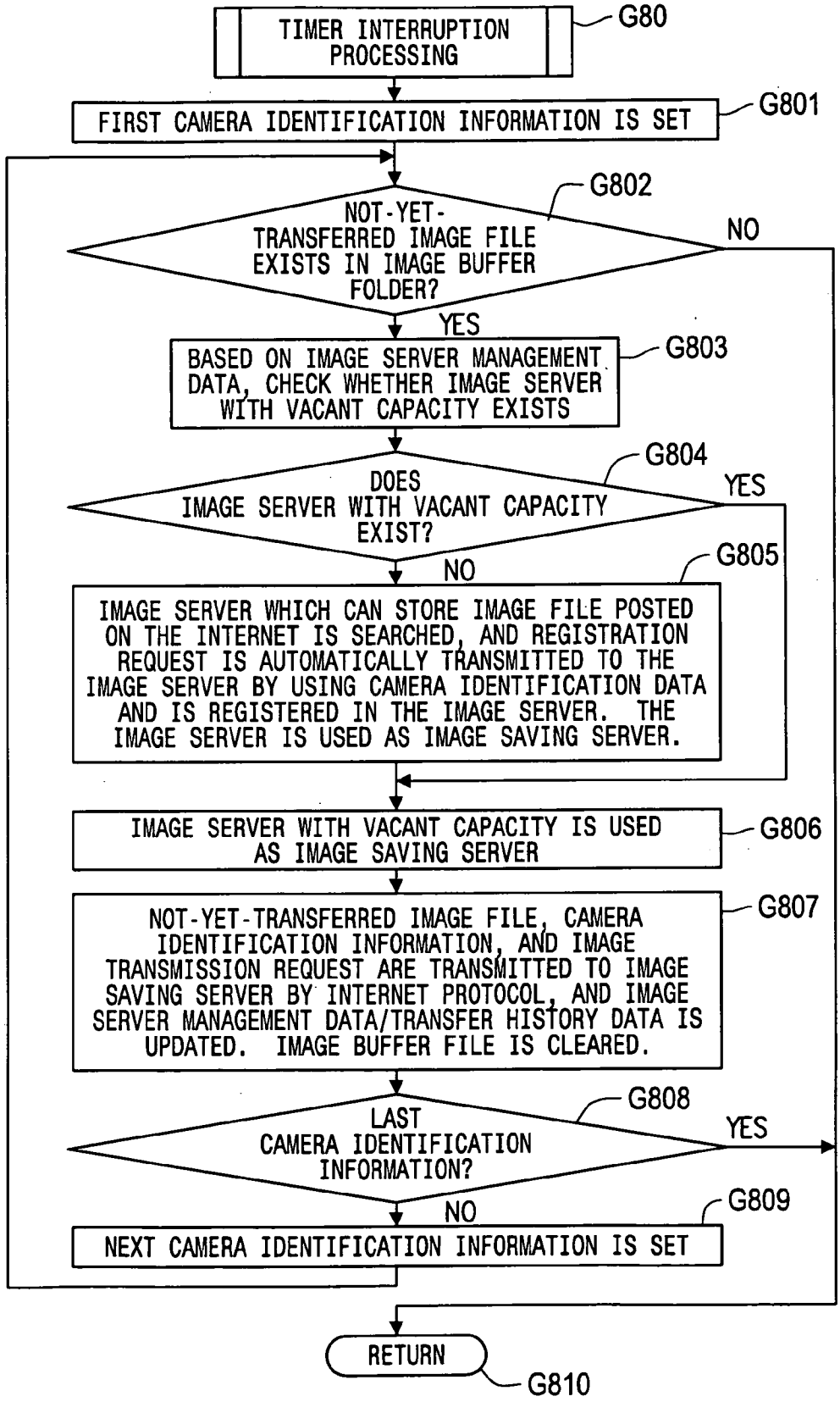

TIMER INTERRUPTION PROCESSING
G80
FIRST CAMERA IDENTIFICATION INFORMATION IS SET
G801
NOT-YET-TRANSFERRED IMAGE FILE EXISTS IN IMAGE BUFFER FOLDER?
G802
NO
YES
BASED ON IMAGE SERVER MANAGEMENT DATA, CHECK WHETHER IMAGE SERVER WITH VACANT CAPACITY EXISTS
G803
DOES IMAGE SERVER WITH VACANT CAPACITY EXIST?
G804
YES
NO
G805
IMAGE SERVER WHICH CAN STORE IMAGE FILE POSTED ON THE INTERNET IS SEARCHED, AND REGISTRATION REQUEST IS AUTOMATICALLY TRANSMITTED TO THE IMAGE SERVER BY USING CAMERA IDENTIFICATION DATA AND IS REGISTERED IN THE IMAGE SERVER. THE IMAGE SERVER IS USED AS IMAGE SAVING SERVER.
IMAGE SERVER WITH VACANT CAPACITY IS USED AS IMAGE SAVING SERVER
G806
NOT-YET-TRANSFERRED IMAGE FILE, CAMERA IDENTIFICATION INFORMATION, AND IMAGE TRANSMISSION REQUEST ARE TRANSMITTED TO IMAGE SAVING SERVER BY INTERNET PROTOCOL, AND IMAGE SERVER MANAGEMENT DATA/TRANSFER HISTORY DATA IS UPDATED. IMAGE BUFFER FILE IS CLEARED.
G807
LAST CAMERA IDENTIFICATION INFORMATION?
G808
YES
NO
G809
NEXT CAMERA IDENTIFICATION INFORMATION IS SET
RETURN
G810

Fig. 153

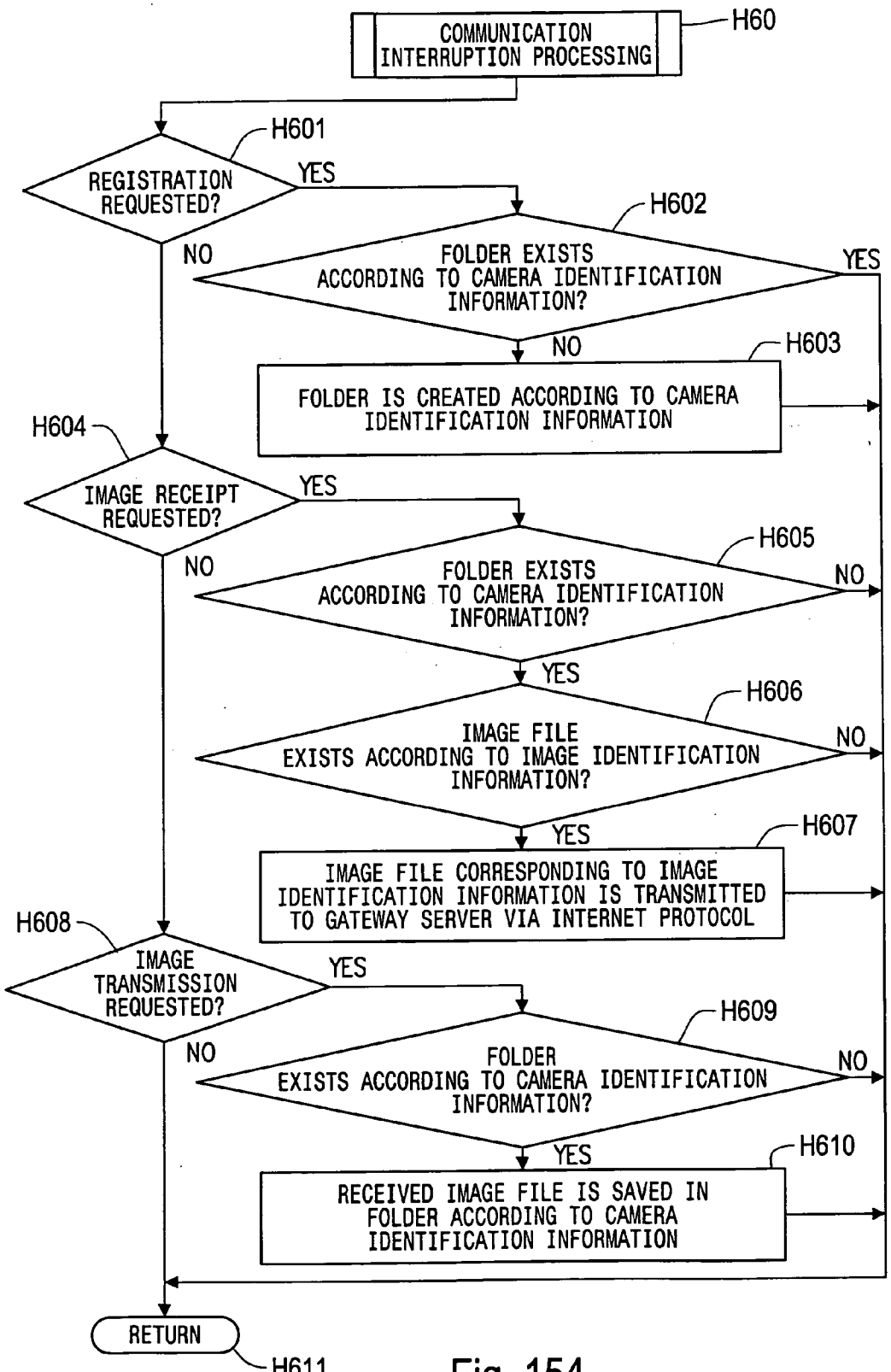

COMMUNICATION INTERRUPTION PROCESSING
H60
REGISTRATION REQUESTED?
H601
YES
NO
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
H602
YES
NO
FOLDER IS CREATED ACCORDING TO CAMERA IDENTIFICATION INFORMATION
H603
IMAGE RECEIPT REQUESTED?
H604
YES
NO
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
H605
NO
YES
IMAGE FILE EXISTS ACCORDING TO IMAGE IDENTIFICATION INFORMATION?
H606
NO
YES
IMAGE FILE CORRESPONDING TO IMAGE IDENTIFICATION INFORMATION IS TRANSMITTED TO GATEWAY SERVER VIA INTERNET PROTOCOL
H607
IMAGE TRANSMISSION REQUESTED?
H608
YES
NO
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
H609
NO
YES
RECEIVED IMAGE FILE IS SAVED IN FOLDER ACCORDING TO CAMERA IDENTIFICATION INFORMATION
H610
RETURN
H611

Fig. 154

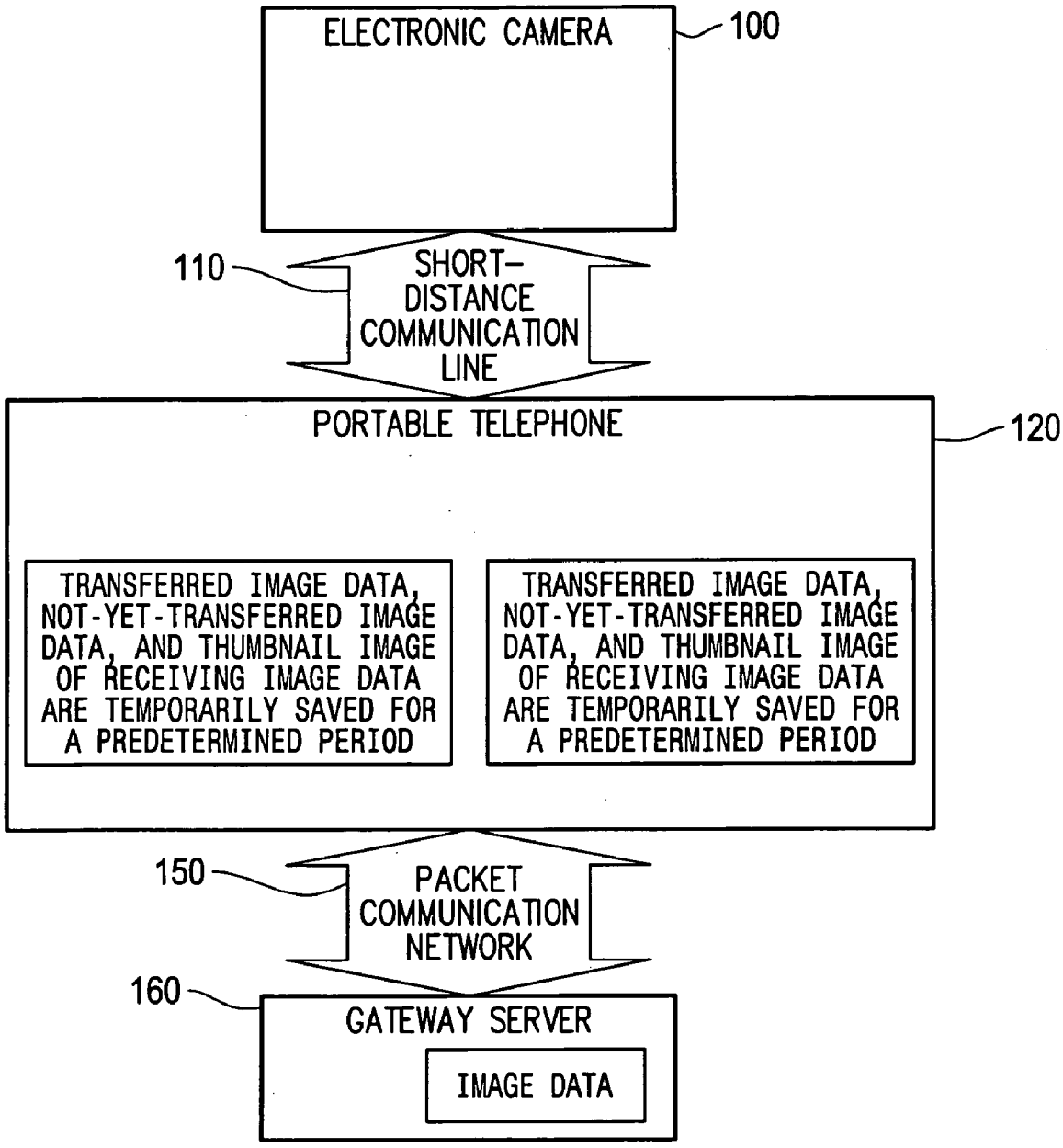

ELECTRONIC CAMERA
100
110
SHORT-DISTANCE COMMUNICATION LINE
PORTABLE TELEPHONE
120
TRANSFERRED IMAGE DATA, NOT-YET-TRANSFERRED IMAGE DATA, AND THUMBNAIL IMAGE OF RECEIVING IMAGE DATA ARE TEMPORARILY SAVED FOR A PREDETERMINED PERIOD
TRANSFERRED IMAGE DATA, NOT-YET-TRANSFERRED IMAGE DATA, AND THUMBNAIL IMAGE OF RECEIVING IMAGE DATA ARE TEMPORARILY SAVED FOR A PREDETERMINED PERIOD
150
PACKET COMMUNICATION NETWORK
160
GATEWAY SERVER
IMAGE DATA

Fig. 155

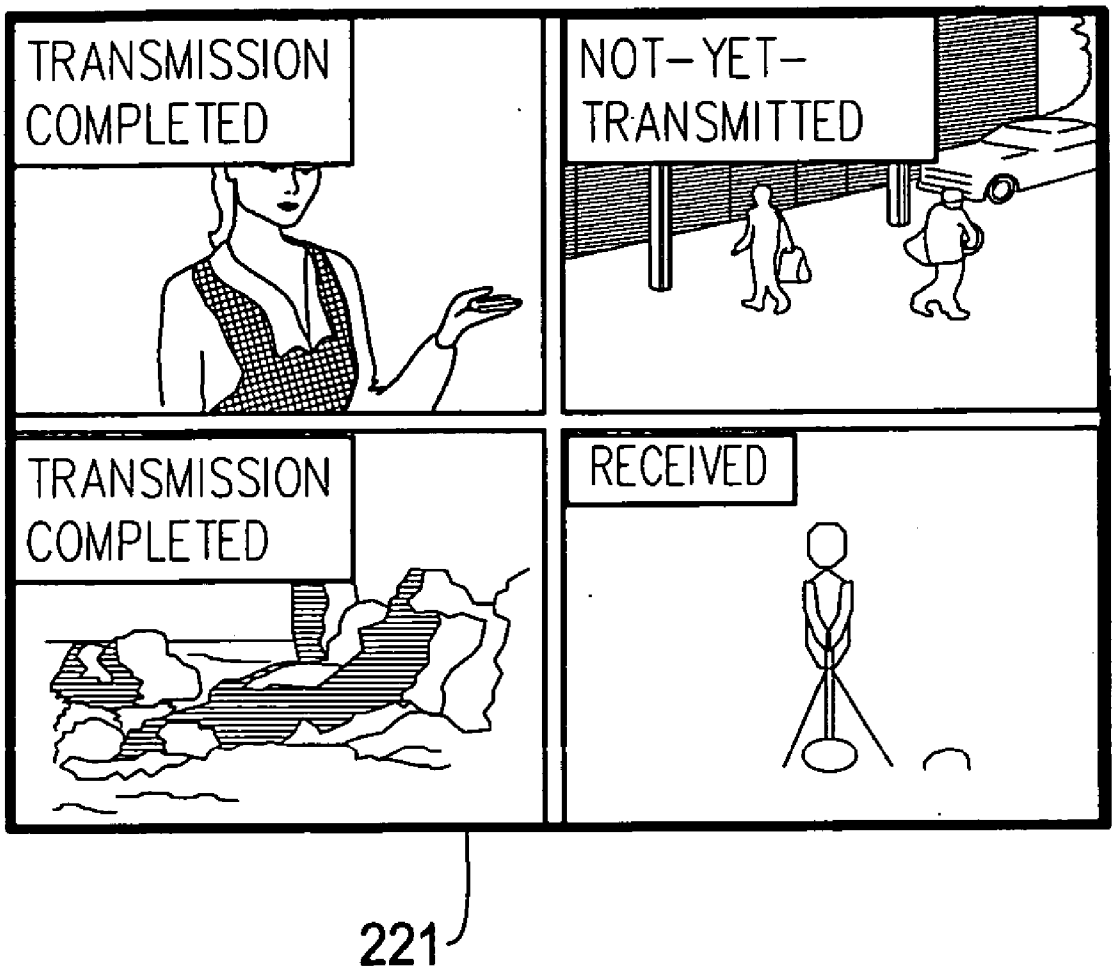

TRANSMISSION COMPLETED
NOT-YET-TRANSMITTED
TRANSMISSION COMPLETED
RECEIVED
221

Fig. 156

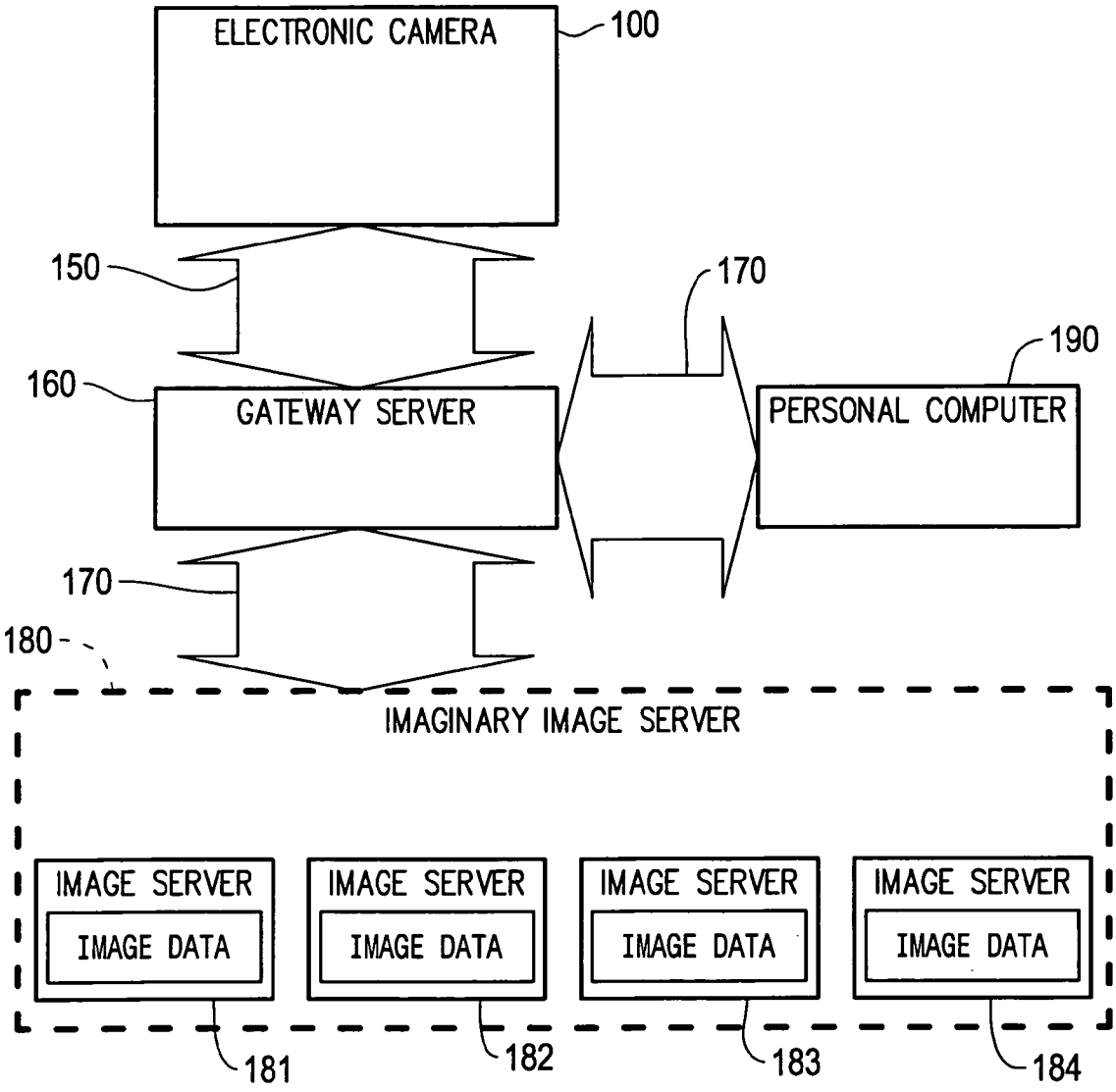

ELECTRONIC CAMERA
100
150
170
190
160
GATEWAY SERVER
PERSONAL COMPUTER
170
180
IMAGINARY IMAGE SERVER
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
181
182
183
184

Fig. 157

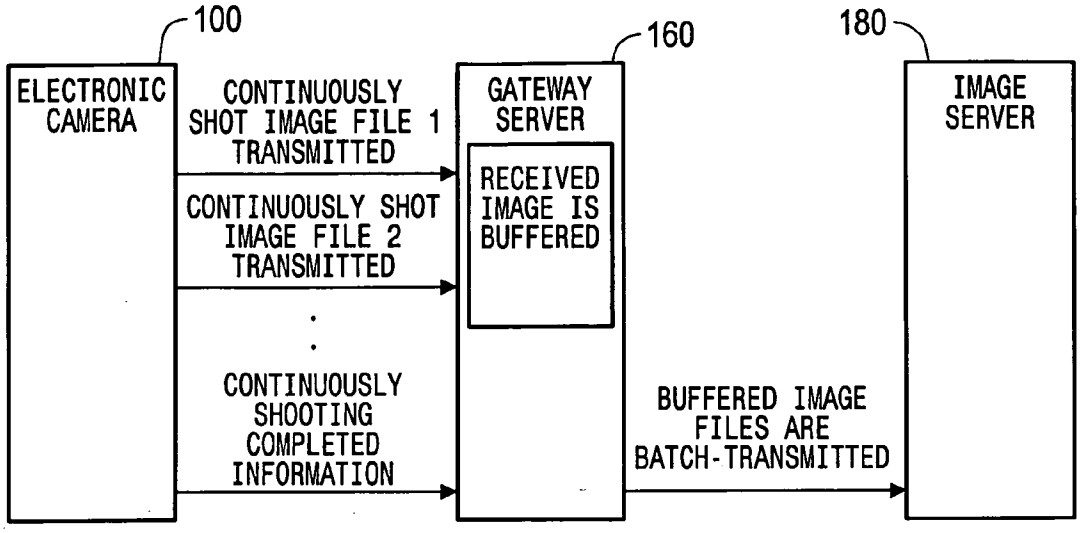


Fig. 158

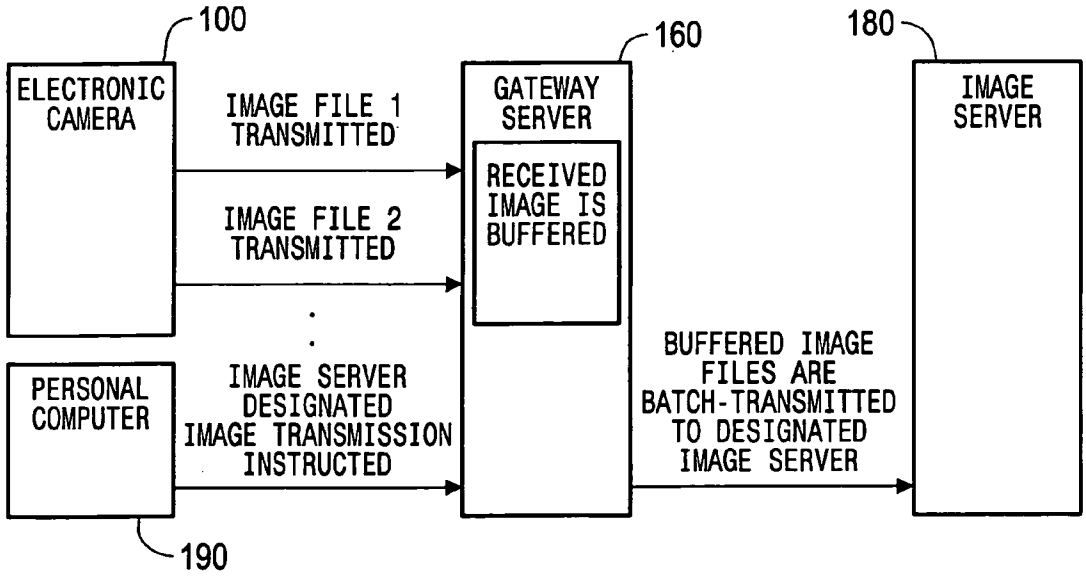


Fig. 159

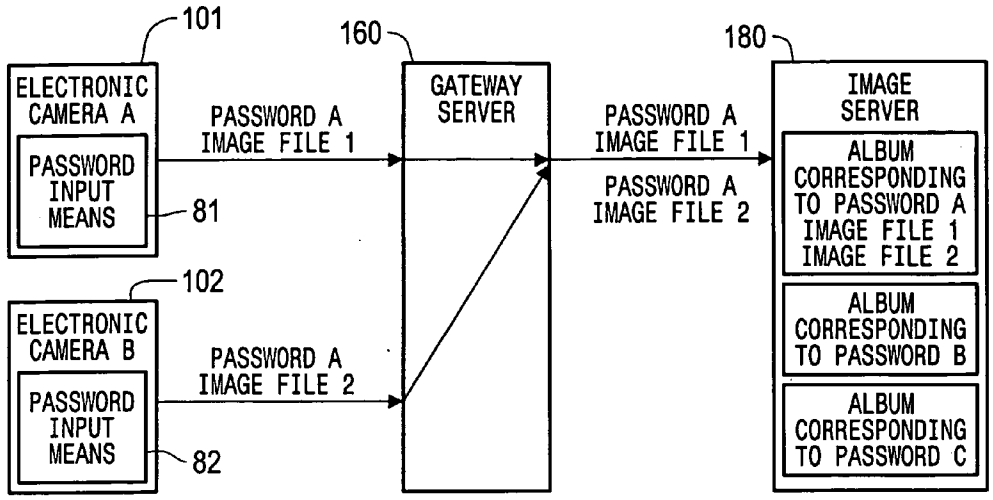


Fig. 160

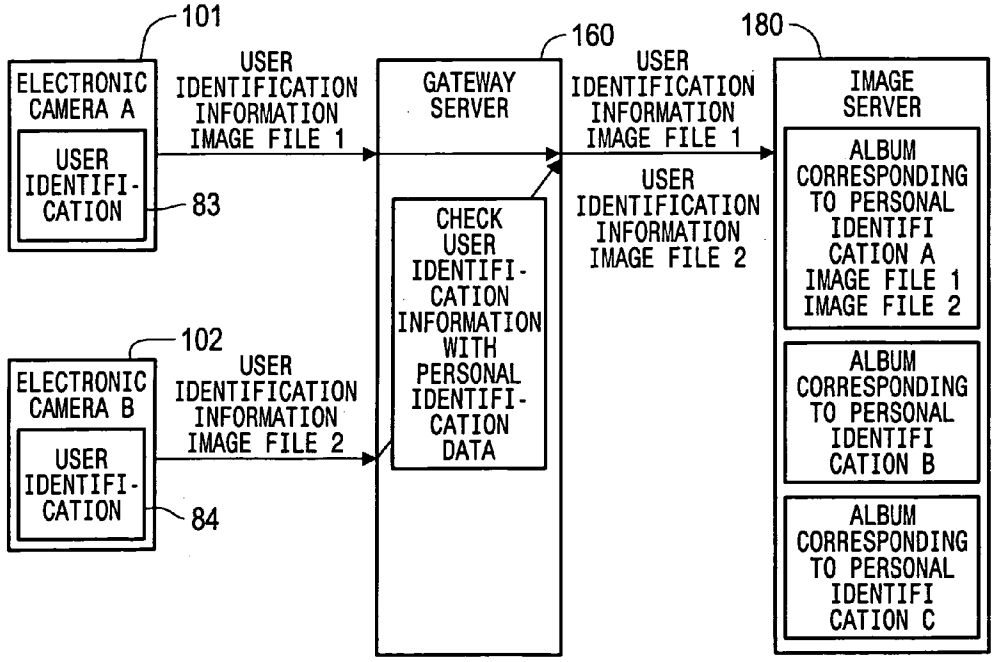


Fig. 161

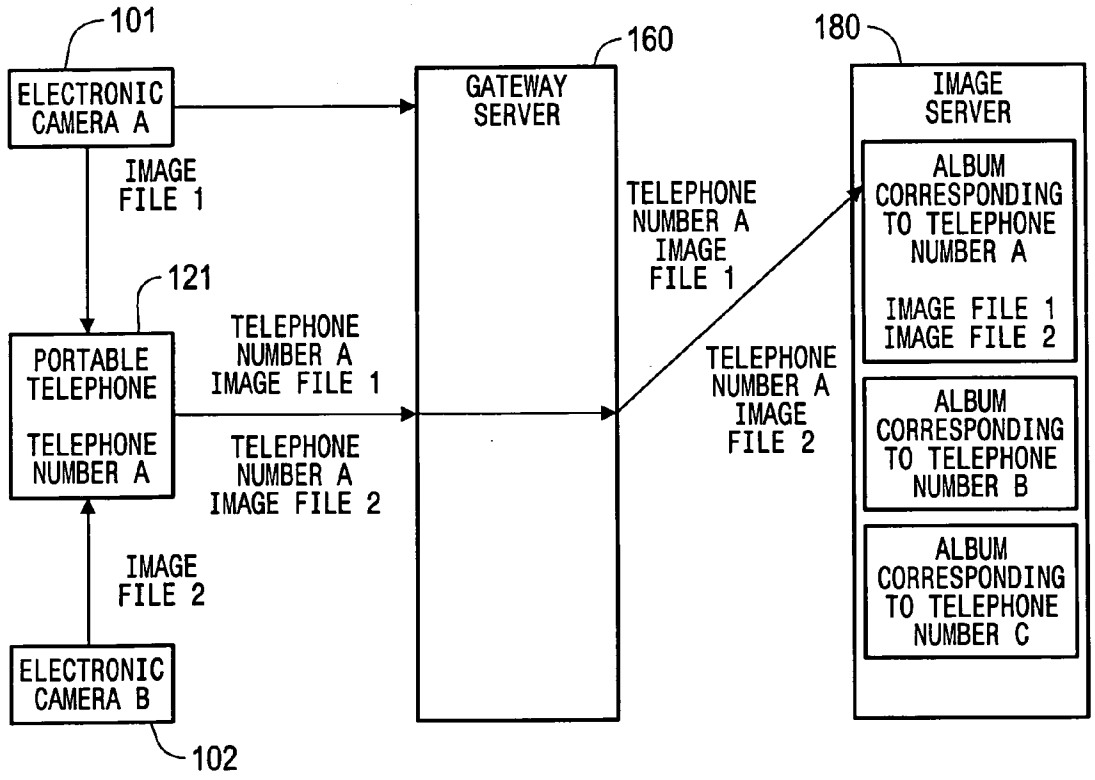

101
ELECTRONIC CAMERA A
IMAGE FILE 1
121
PORTABLE TELEPHONE
TELEPHONE NUMBER A
TELEPHONE NUMBER A IMAGE FILE 1
TELEPHONE NUMBER A IMAGE FILE 2
IMAGE FILE 2
ELECTRONIC CAMERA B
102
160
GATEWAY SERVER
TELEPHONE NUMBER A IMAGE FILE 1
TELEPHONE NUMBER A IMAGE FILE 2
180
IMAGE SERVER
ALBUM CORRESPONDING TO TELEPHONE NUMBER A
IMAGE FILE 1
IMAGE FILE 2
ALBUM CORRESPONDING TO TELEPHONE NUMBER B
ALBUM CORRESPONDING TO TELEPHONE NUMBER C

Fig. 162

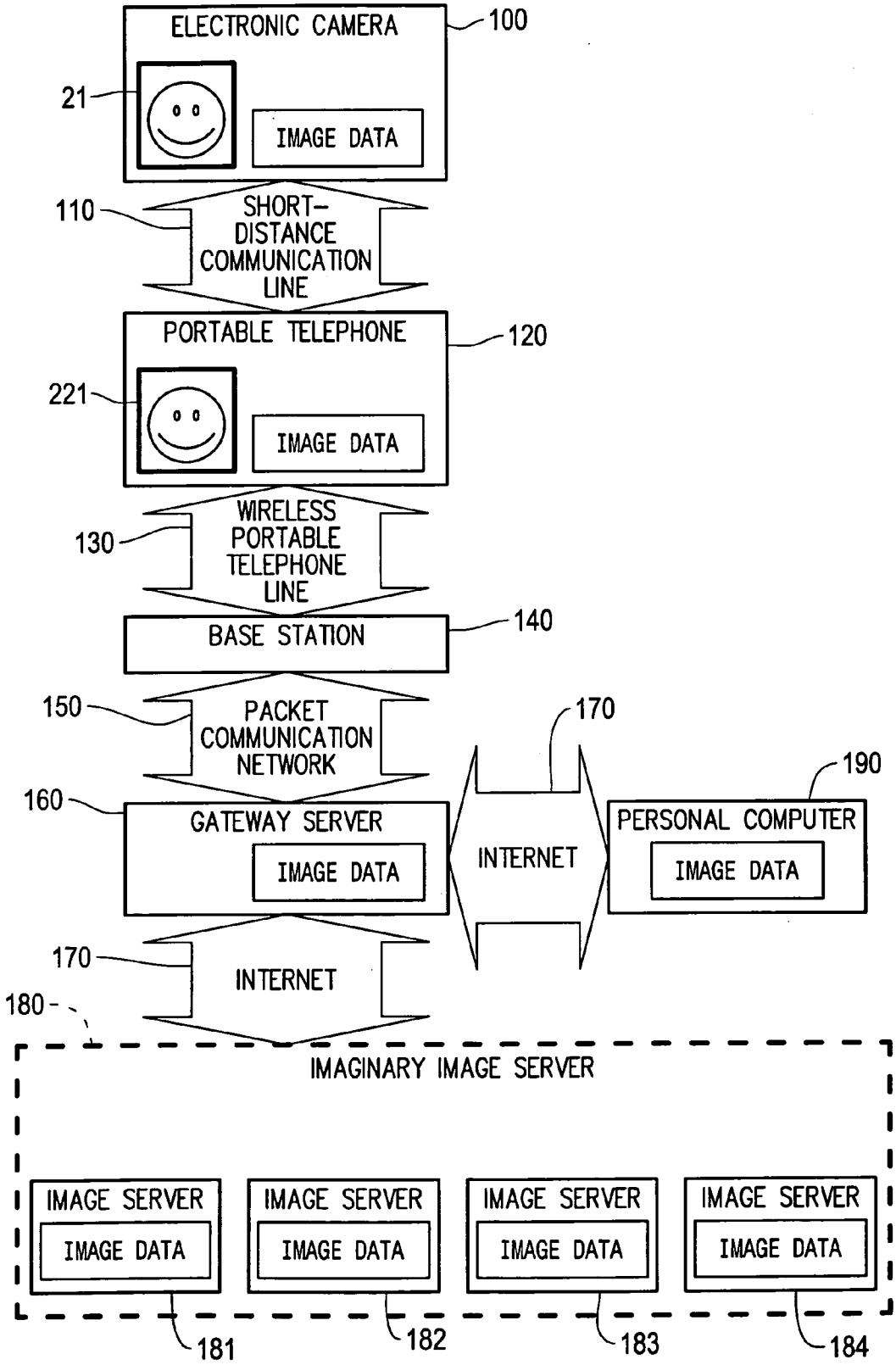

ELECTRONIC CAMERA
100
21
IMAGE DATA
110
SHORT-DISTANCE COMMUNICATION LINE
PORTABLE TELEPHONE
120
221
IMAGE DATA
130
WIRELESS PORTABLE TELEPHONE LINE
BASE STATION
140
150
PACKET COMMUNICATION NETWORK
170
190
160
GATEWAY SERVER
IMAGE DATA
INTERNET
PERSONAL COMPUTER
IMAGE DATA
170
INTERNET
180
IMAGINARY IMAGE SERVER
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
181
182
183
184

Fig. 163

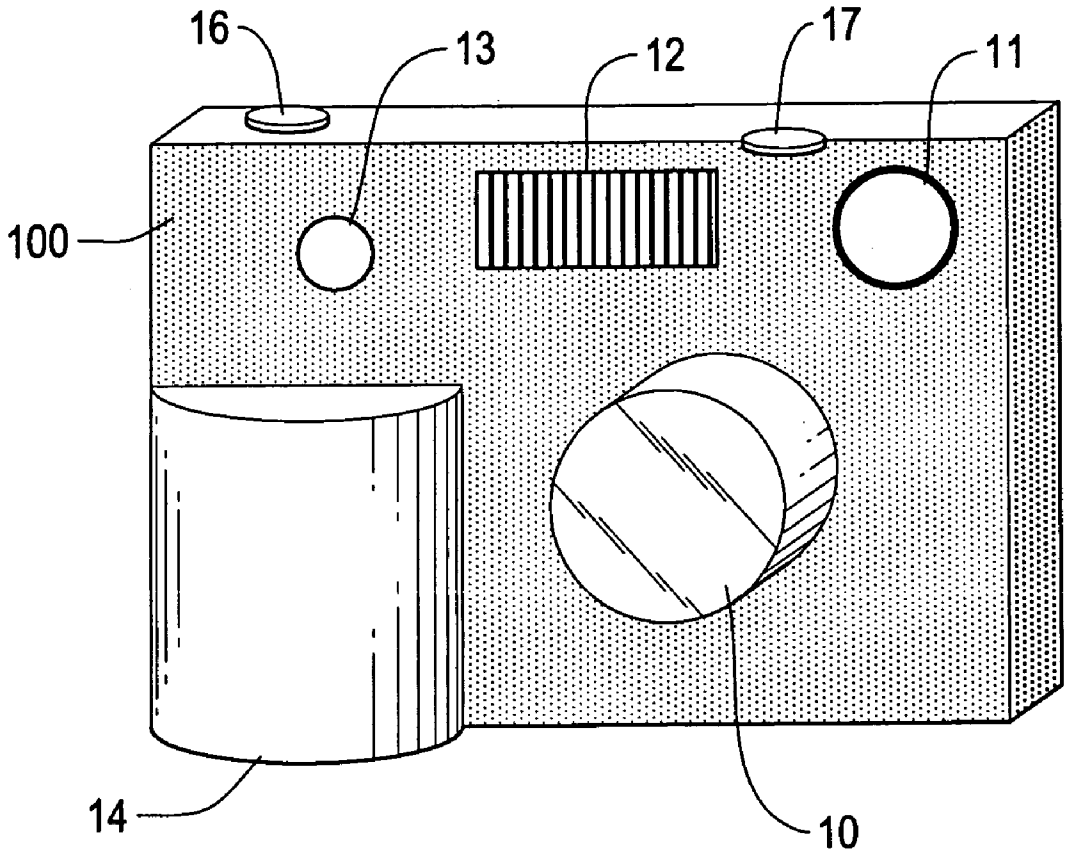


Fig. 164

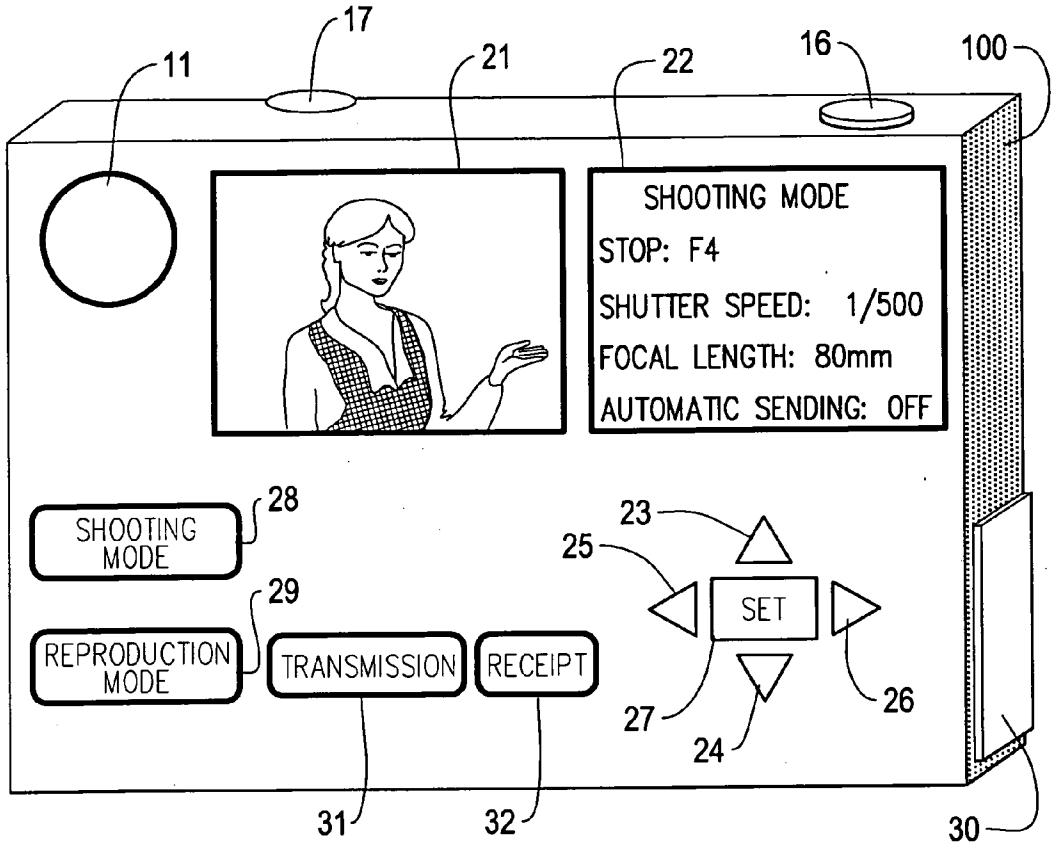

17
11
21
22
16
100
SHOOTING MODE
STOP: F4
SHUTTER SPEED: 1/500
FOCAL LENGTH: 80mm
AUTOMATIC SENDING: OFF
28
SHOOTING MODE
23
25
SET
29
REPRODUCTION MODE
TRANSMISSION
RECEIPT
27
26
24
31
32
30

Fig. 165

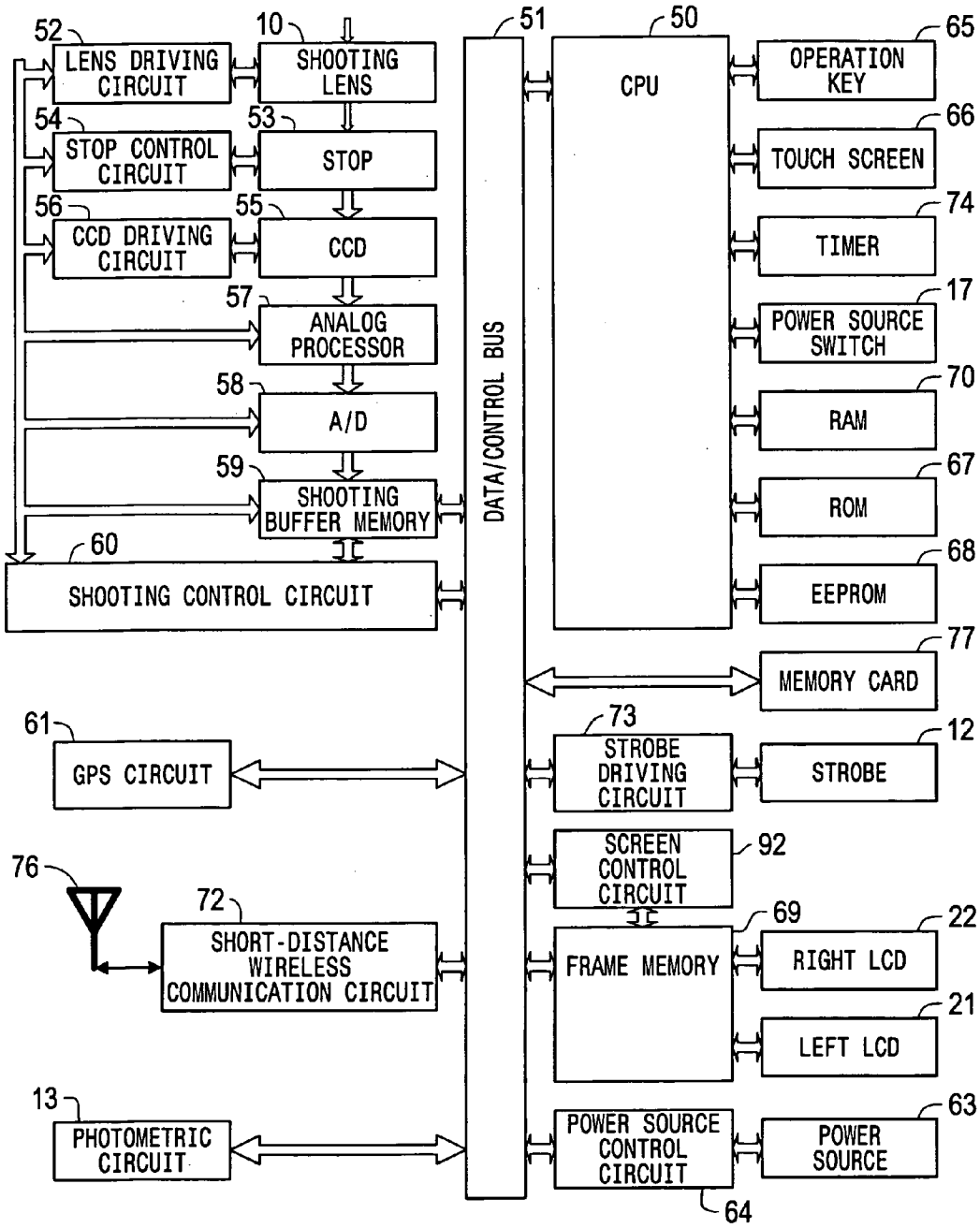

52
LENS DRIVING CIRCUIT
10
SHOOTING LENS
54
STOP CONTROL CIRCUIT
53
STOP
56
CCD DRIVING CIRCUIT
55
CCD
57
ANALOG PROCESSOR
58
A/D
59
SHOOTING BUFFER MEMORY
60
SHOOTING CONTROL CIRCUIT
51
DATA/CONTROL BUS
50
CPU
65
OPERATION KEY
66
TOUCH SCREEN
74
TIMER
17
POWER SOURCE SWITCH
70
RAM
67
ROM
68
EEPROM
77
MEMORY CARD
61
GPS CIRCUIT
73
STROBE DRIVING CIRCUIT
12
STROBE
76
72
SHORT-DISTANCE WIRELESS COMMUNICATION CIRCUIT
SCREEN CONTROL CIRCUIT
92
69
FRAME MEMORY
22
RIGHT LCD
21
LEFT LCD
13
PHOTOMETRIC CIRCUIT
POWER SOURCE CONTROL CIRCUIT
63
POWER SOURCE
64

Fig. 166

MEMORY CARD

IMAGE FILE A
IMAGE FILE B
IMAGE FILE C
...

IMAGE FILE

IMAGE DATA
ADDITIONAL INFORMATION DATA

ADDITIONAL INFORMATION DATA

ITEM	CONTENT
SHOOTING DATE AND TIME	OCTOBER 31, 2001 10:58:47
SHOOTING POSITION	137°50'E 38°21'N
SHOOTING LENS	50-100mm/f4
SHOOTING FOCAL LENGTH	80mm
SHOOTING STOP VALUE	f4
SHUTTER SPEED	1/250
EXPOSURE	+0.5 LEVEL
FOCUS	+50 MICRON
STROBE	YES
STROBE LIGHT AMOUNT	-1 LEVEL
...	...

Fig.167

EEPROM

CAMERA IDENTIFICATION INFORMATION
GATEWAY SERVER ACCESS INFORMATION
...

Fig. 168

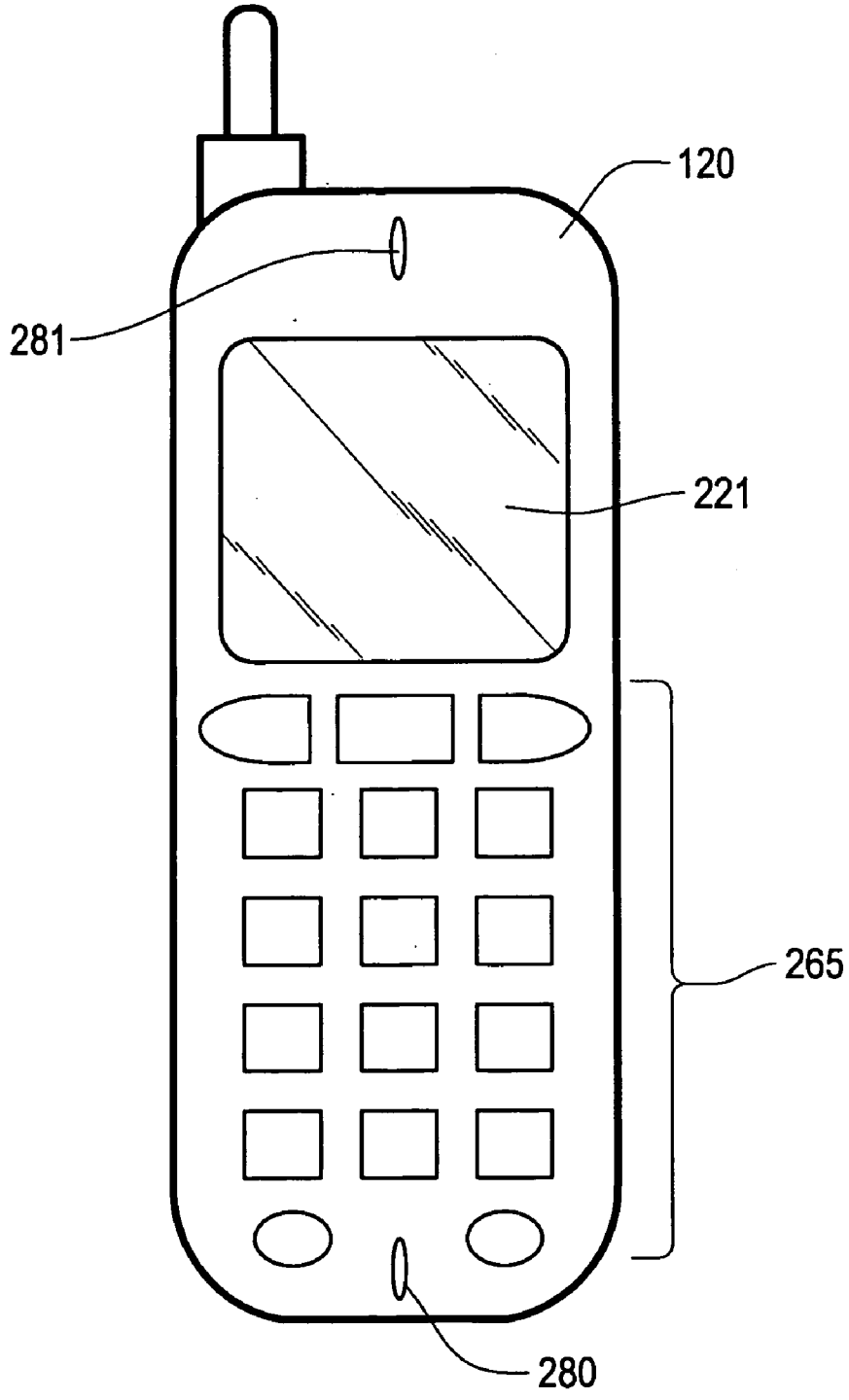


Fig. 169

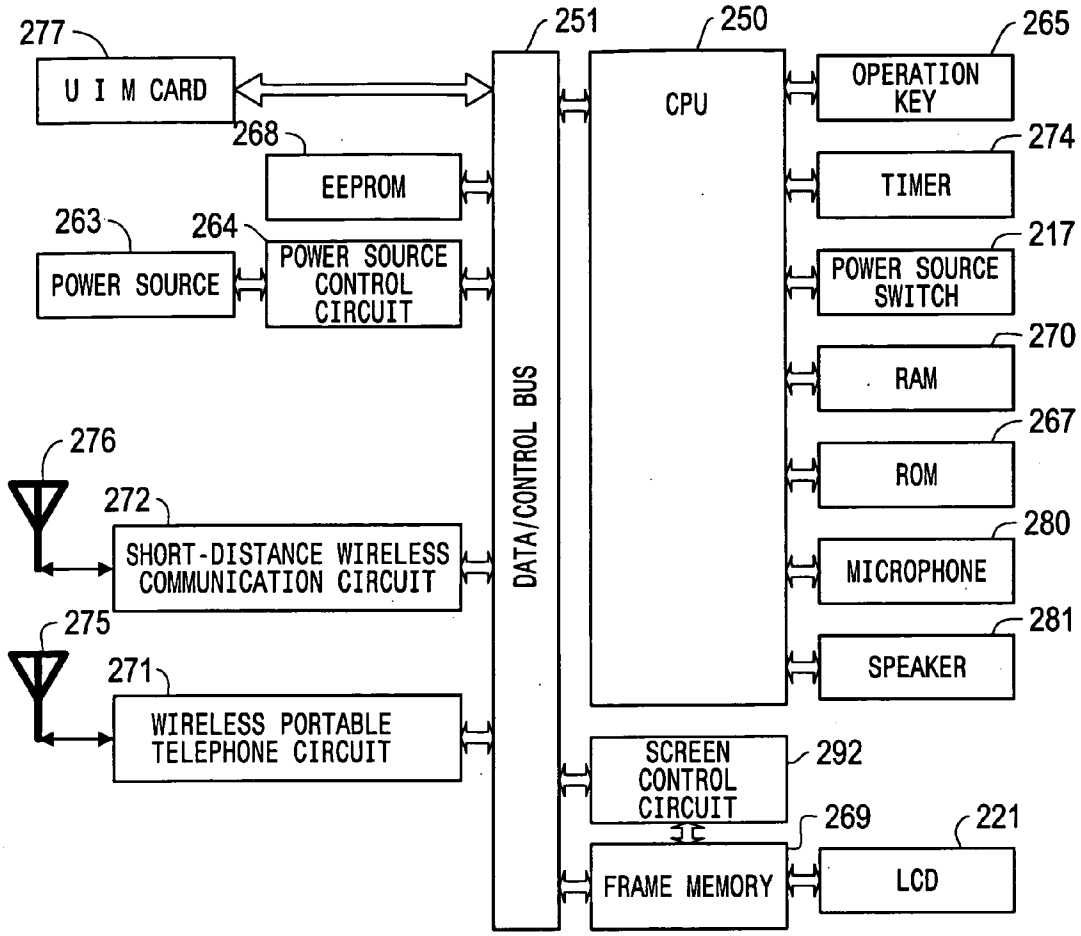


Fig. 170

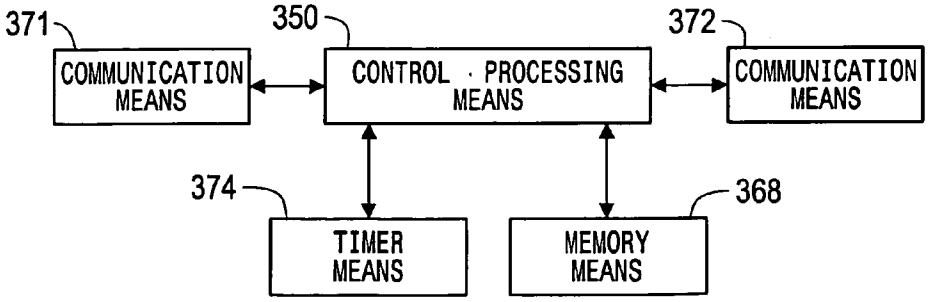


Fig.171

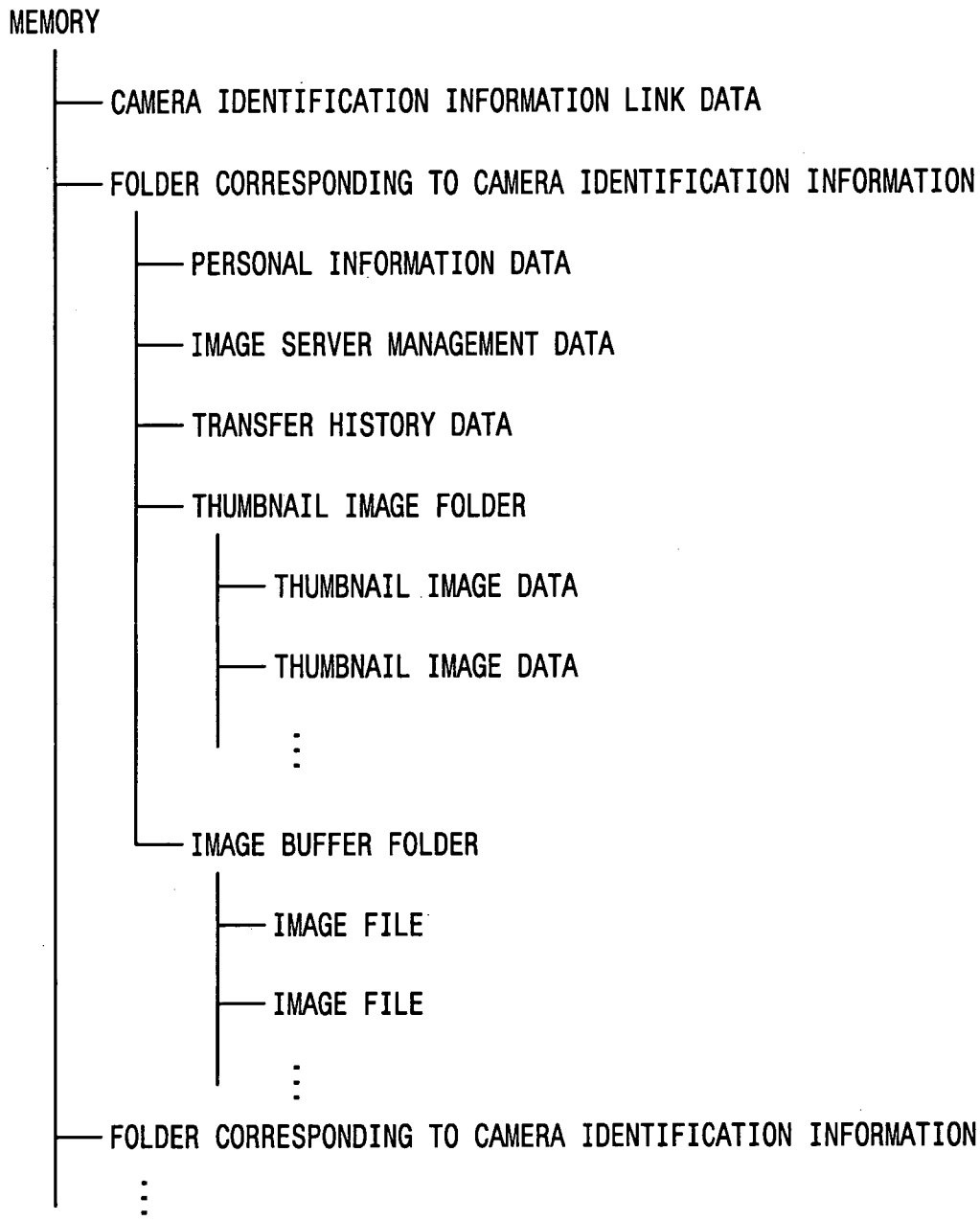

MEMORY
CAMERA IDENTIFICATION INFORMATION LINK DATA
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION
PERSONAL INFORMATION DATA
IMAGE SERVER MANAGEMENT DATA
TRANSFER HISTORY DATA
THUMBNAIL IMAGE FOLDER
THUMBNAIL IMAGE DATA
THUMBNAIL IMAGE DATA
IMAGE BUFFER FOLDER
IMAGE FILE
IMAGE FILE
FOLDER CORRESPONDING TO CAMERA IDENTIFICATION INFORMATION

Fig. 172

CAMERA IDENTIFICATION INFORMATION A : PARENT
CAMERA IDENTIFICATION INFORMATION B → CAMERA IDENTIFICATION INFORMATION A
CAMERA IDENTIFICATION INFORMATION C → CAMERA IDENTIFICATION INFORMATION A
CAMERA IDENTIFICATION INFORMATION D : PARENT
CAMERA IDENTIFICATION INFORMATION E → CAMERA IDENTIFICATION INFORMATION D
CAMERA IDENTIFICATION INFORMATION F : NO LINK
CAMERA IDENTIFICATION INFORMATION H : NOT YET USED
...

Fig.173

PERSONAL
INFORMATION DATA

NAME
GENDER
AGE
ADDRESS
E-MAIL ADDRESS
OCCUPATION
PASSWORD
PHONE NUMBER
...

Fig. 174

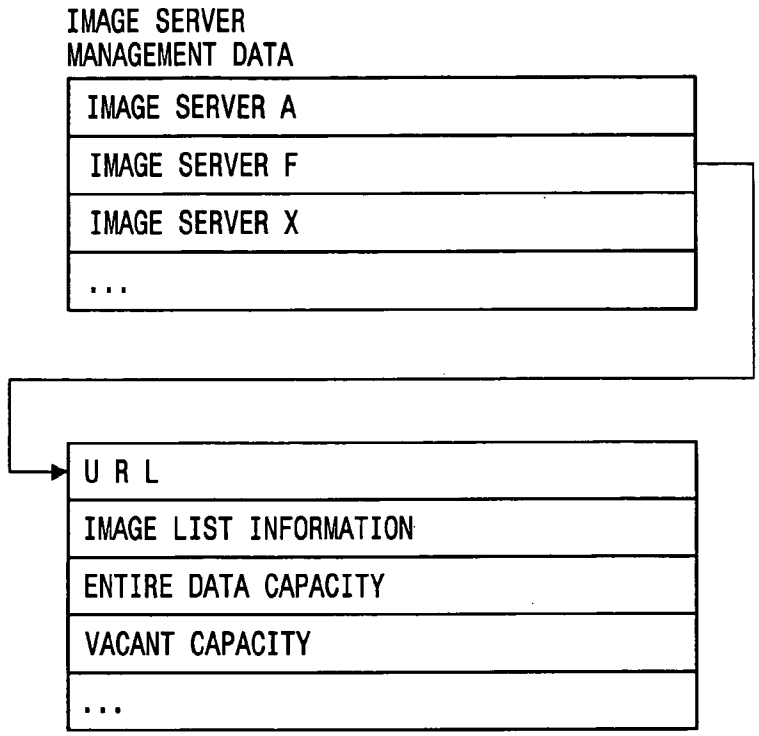


Fig. 175

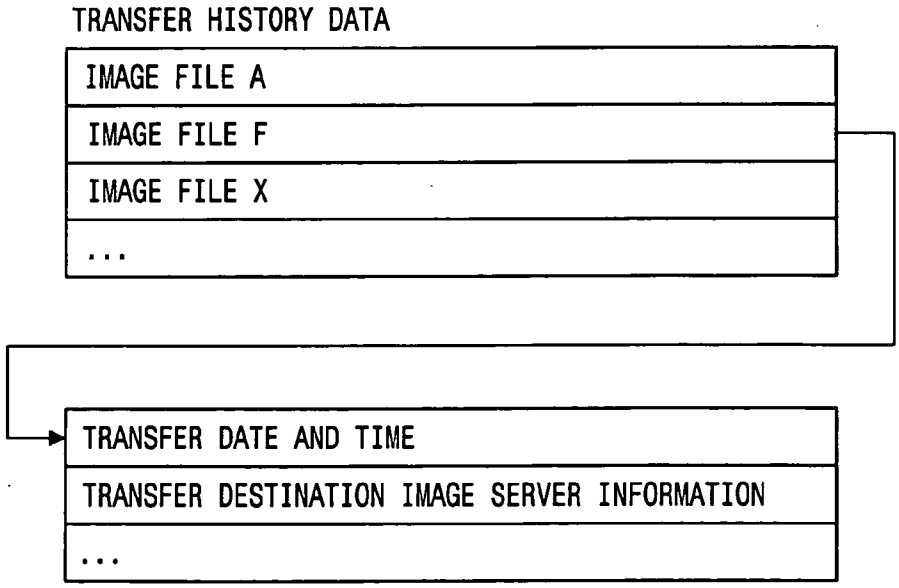


Fig. 176

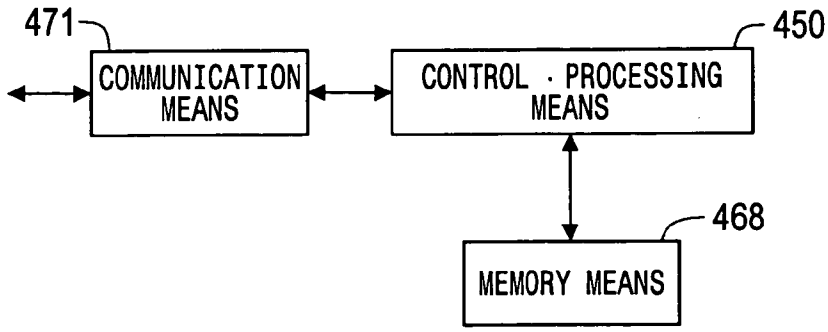


Fig.177

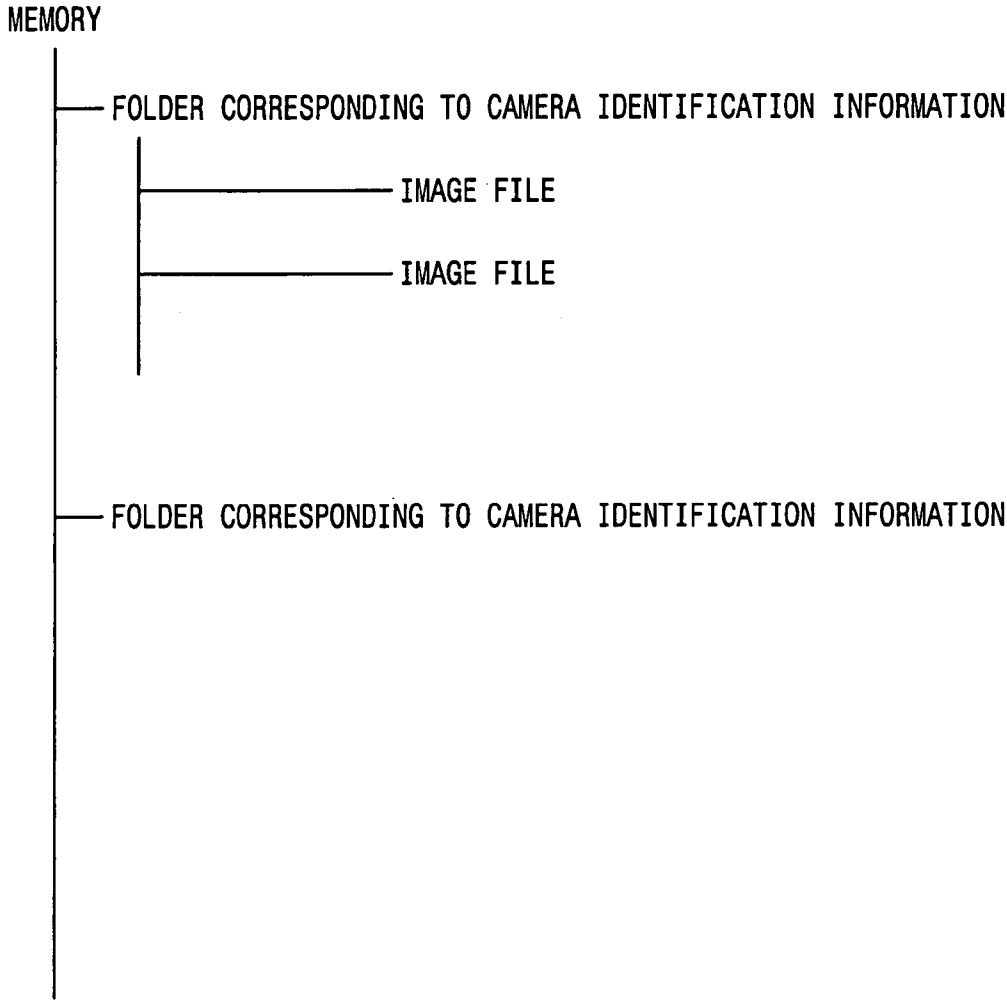


Fig.178

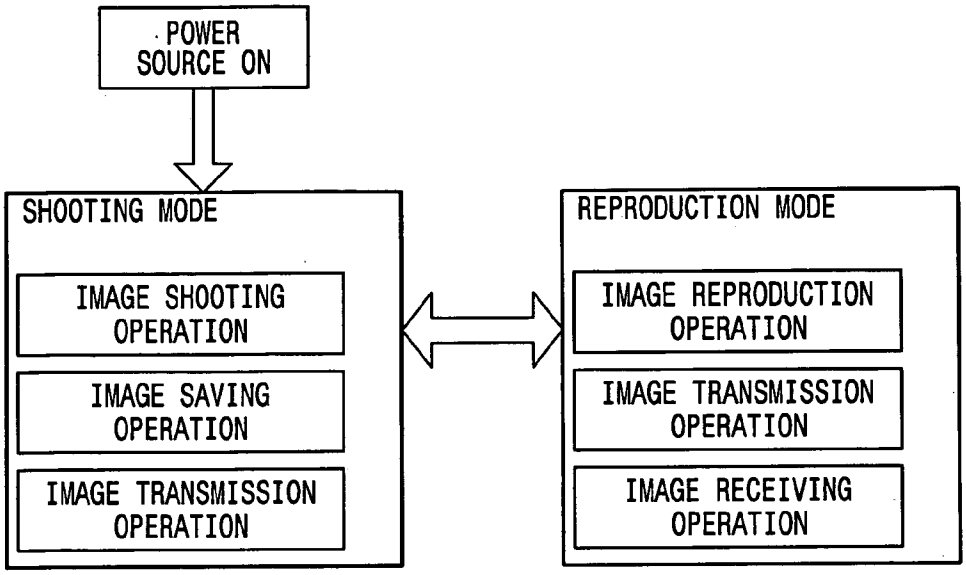


Fig. 179

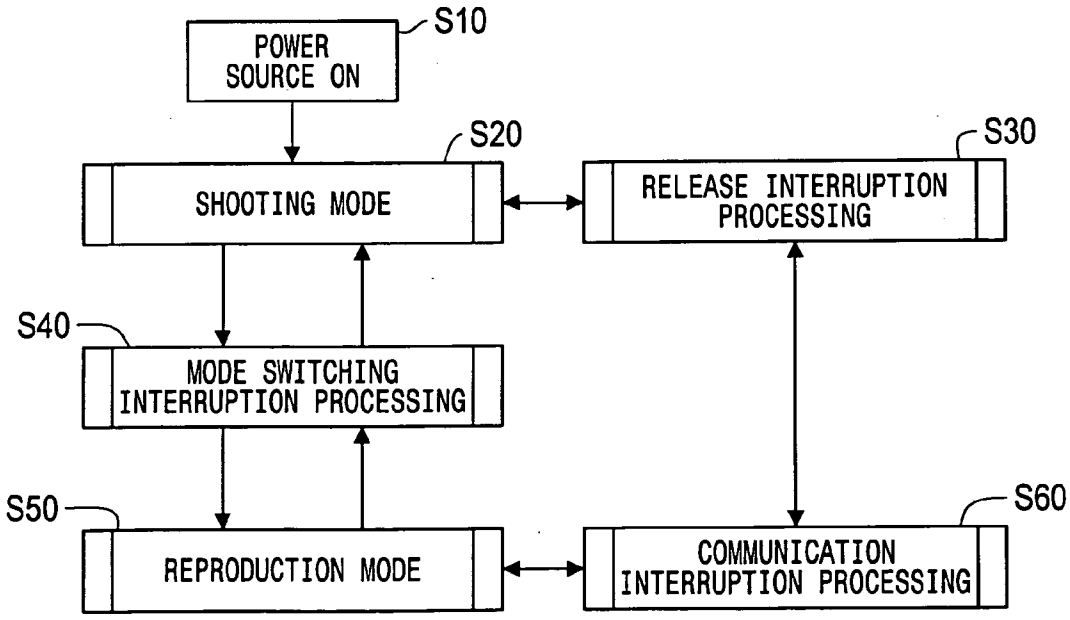


Fig.180

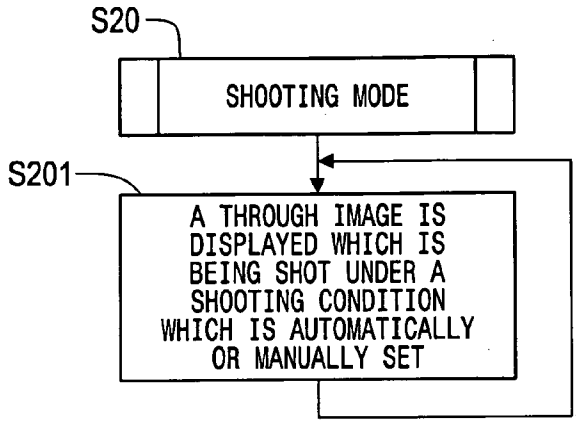


Fig. 181

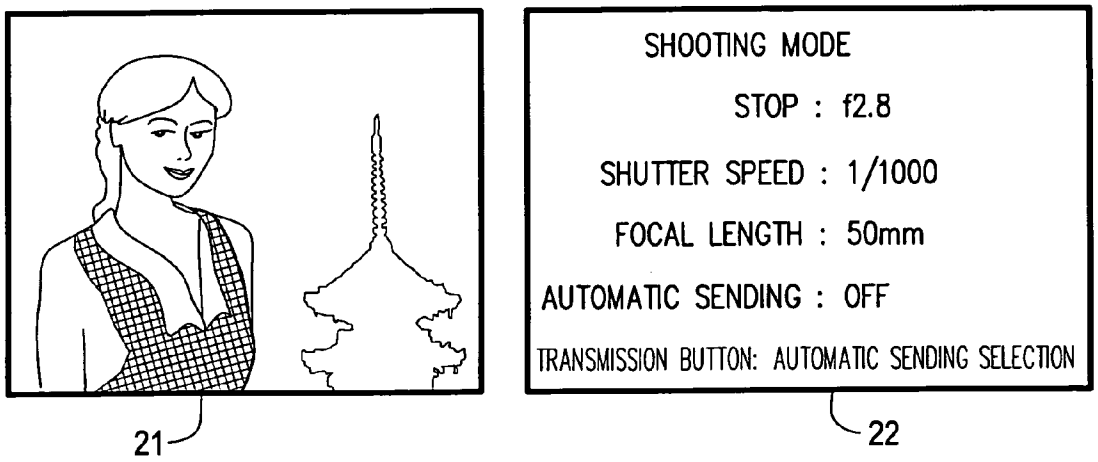


Fig. 182

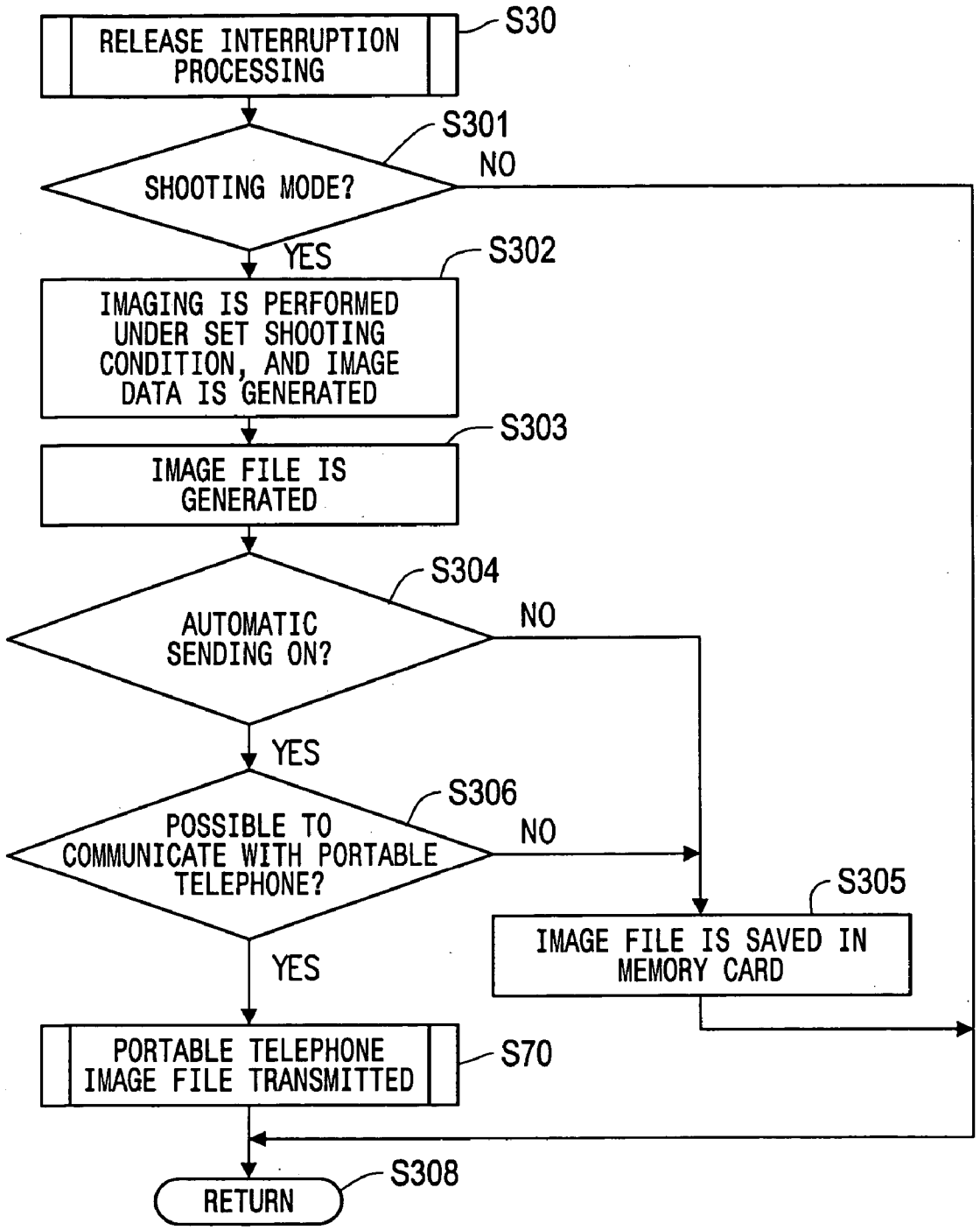

RELEASE INTERRUPTION PROCESSING
S30
SHOOTING MODE?
S301
NO
YES
IMAGING IS PERFORMED UNDER SET SHOOTING CONDITION, AND IMAGE DATA IS GENERATED
S302
IMAGE FILE IS GENERATED
S303
AUTOMATIC SENDING ON?
S304
NO
YES
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S306
NO
IMAGE FILE IS SAVED IN MEMORY CARD
S305
YES
PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
RETURN
S308

Fig. 183

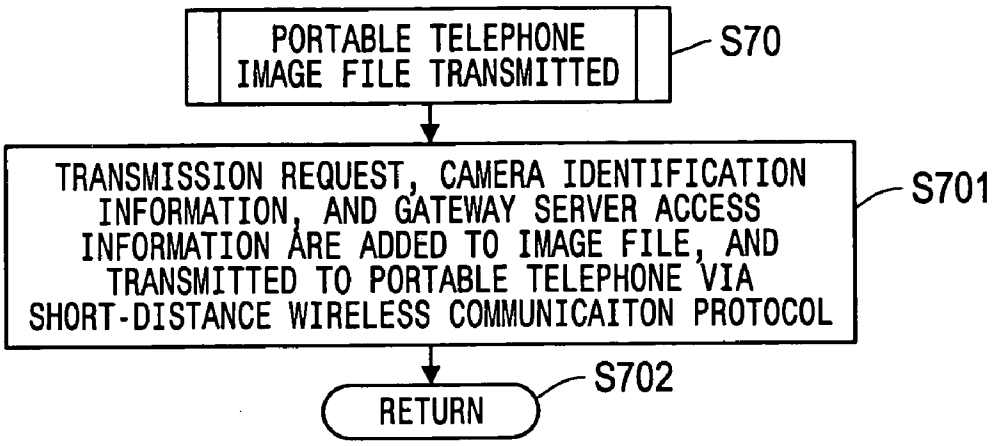


Fig. 184

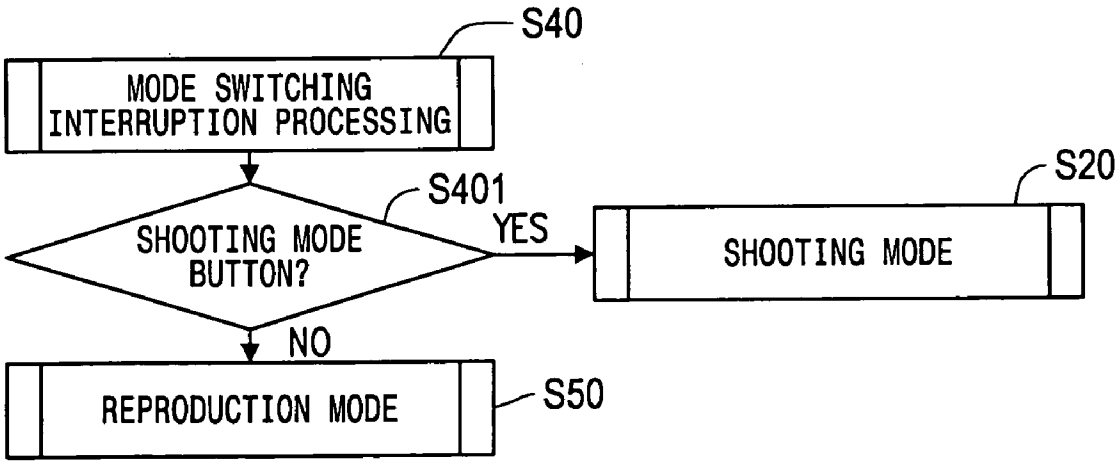


Fig. 185

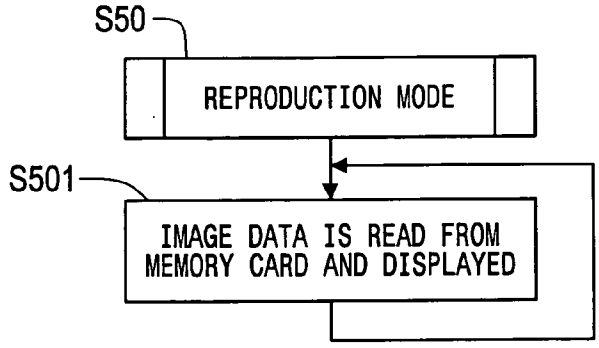


Fig. 186

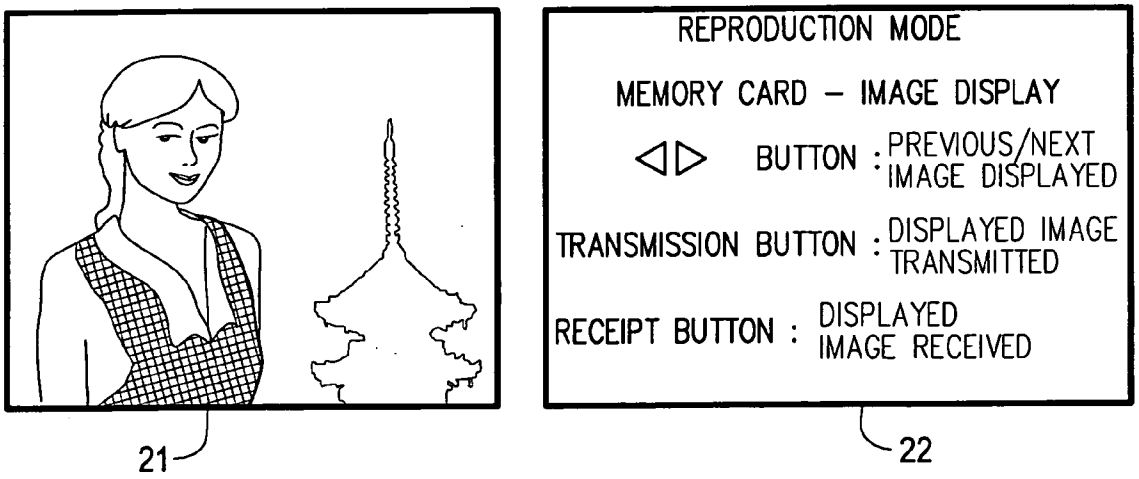


Fig. 187

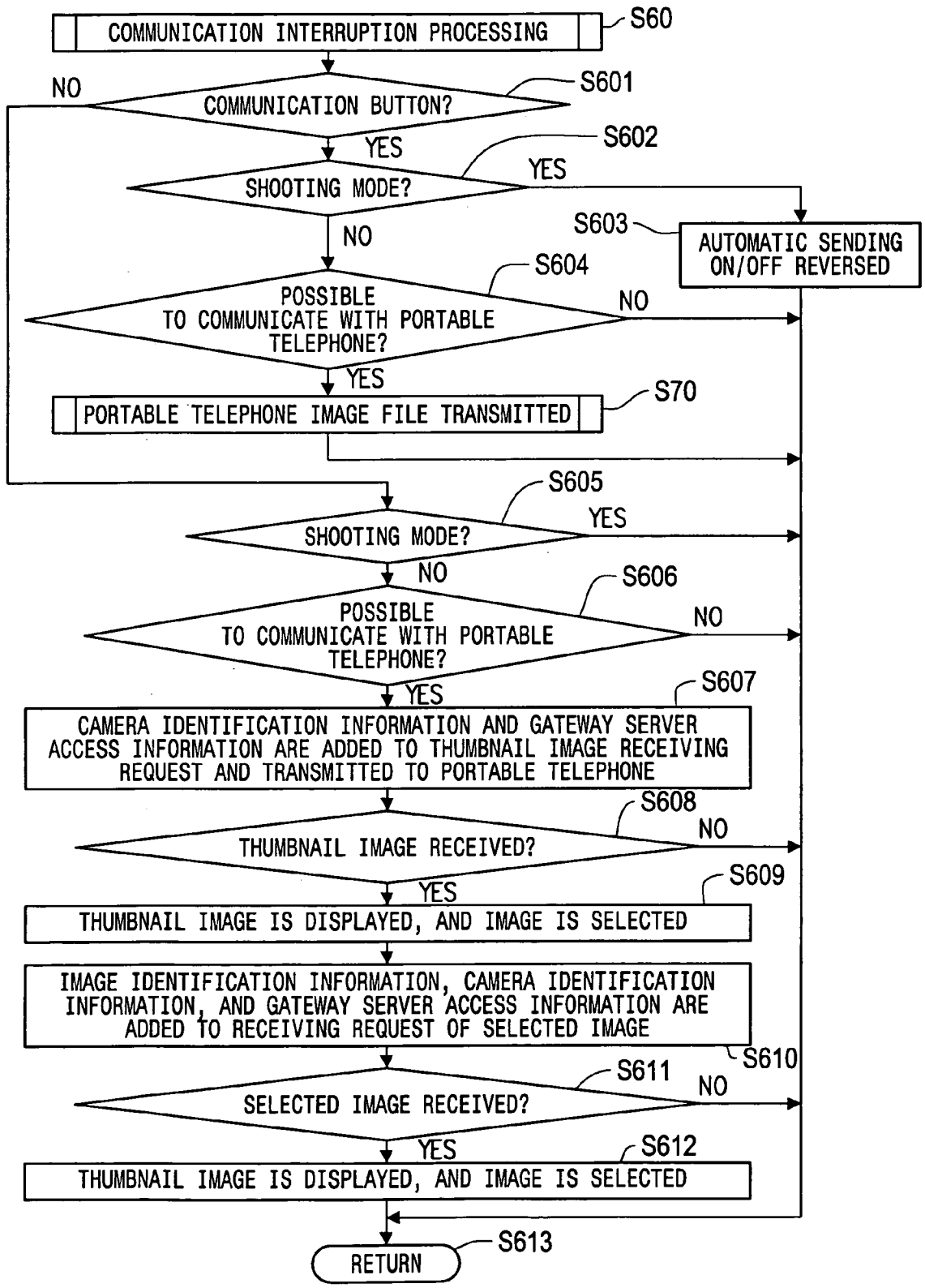

COMMUNICATION INTERRUPTION PROCESSING
S60
COMMUNICATION BUTTON?
S601
NO
YES
SHOOTING MODE?
S602
YES
NO
S603
AUTOMATIC SENDING ON/OFF REVERSED
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S604
NO
YES
PORTABLE TELEPHONE IMAGE FILE TRANSMITTED
S70
SHOOTING MODE?
S605
YES
NO
POSSIBLE TO COMMUNICATE WITH PORTABLE TELEPHONE?
S606
NO
YES
CAMERA IDENTIFICATION INFORMATION AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO THUMBNAIL IMAGE RECEIVING REQUEST AND TRANSMITTED TO PORTABLE TELEPHONE
S607
THUMBNAIL IMAGE RECEIVED?
S608
NO
YES
THUMBNAIL IMAGE IS DISPLAYED, AND IMAGE IS SELECTED
S609
IMAGE IDENTIFICATION INFORMATION, CAMERA IDENTIFICATION INFORMATION, AND GATEWAY SERVER ACCESS INFORMATION ARE ADDED TO RECEIVING REQUEST OF SELECTED IMAGE
S610
SELECTED IMAGE RECEIVED?
S611
NO
YES
THUMBNAIL IMAGE IS DISPLAYED, AND IMAGE IS SELECTED
S612
RETURN
S613

Fig. 188

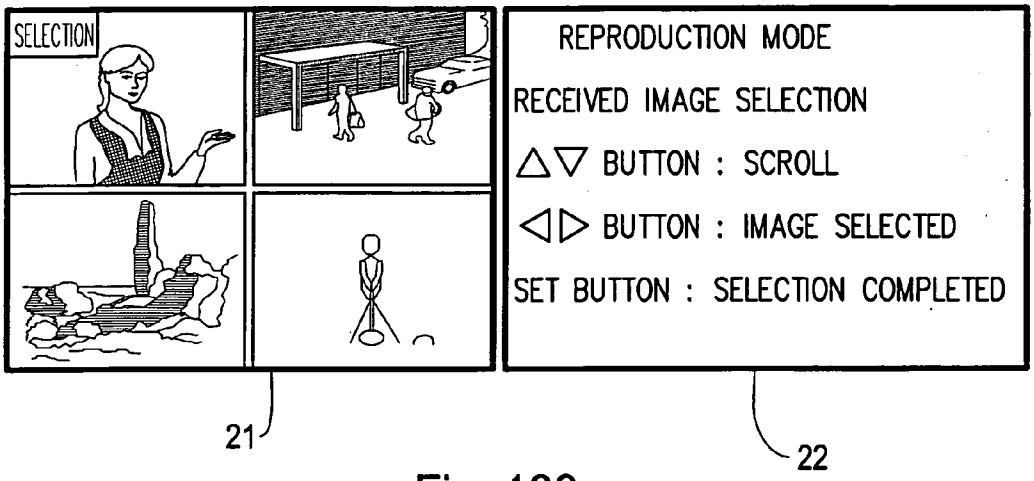


Fig. 189

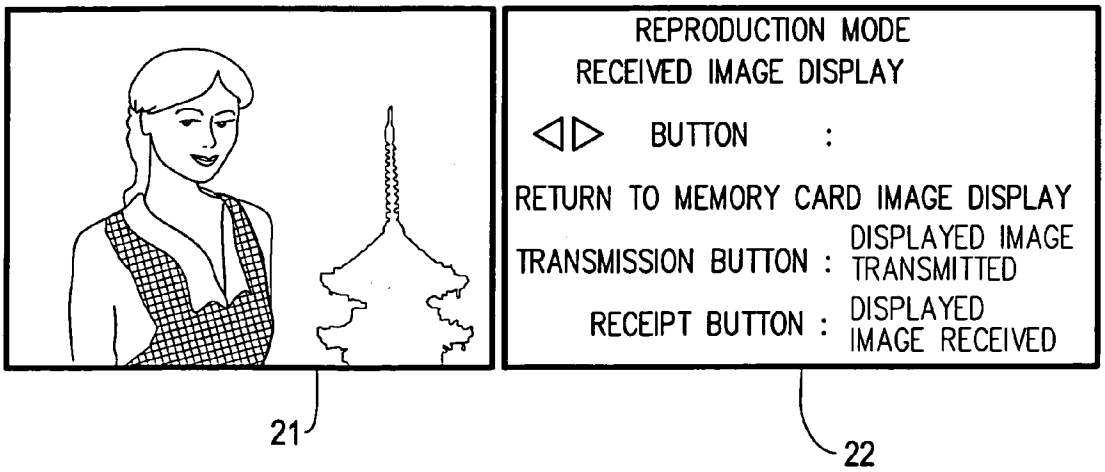


Fig. 190

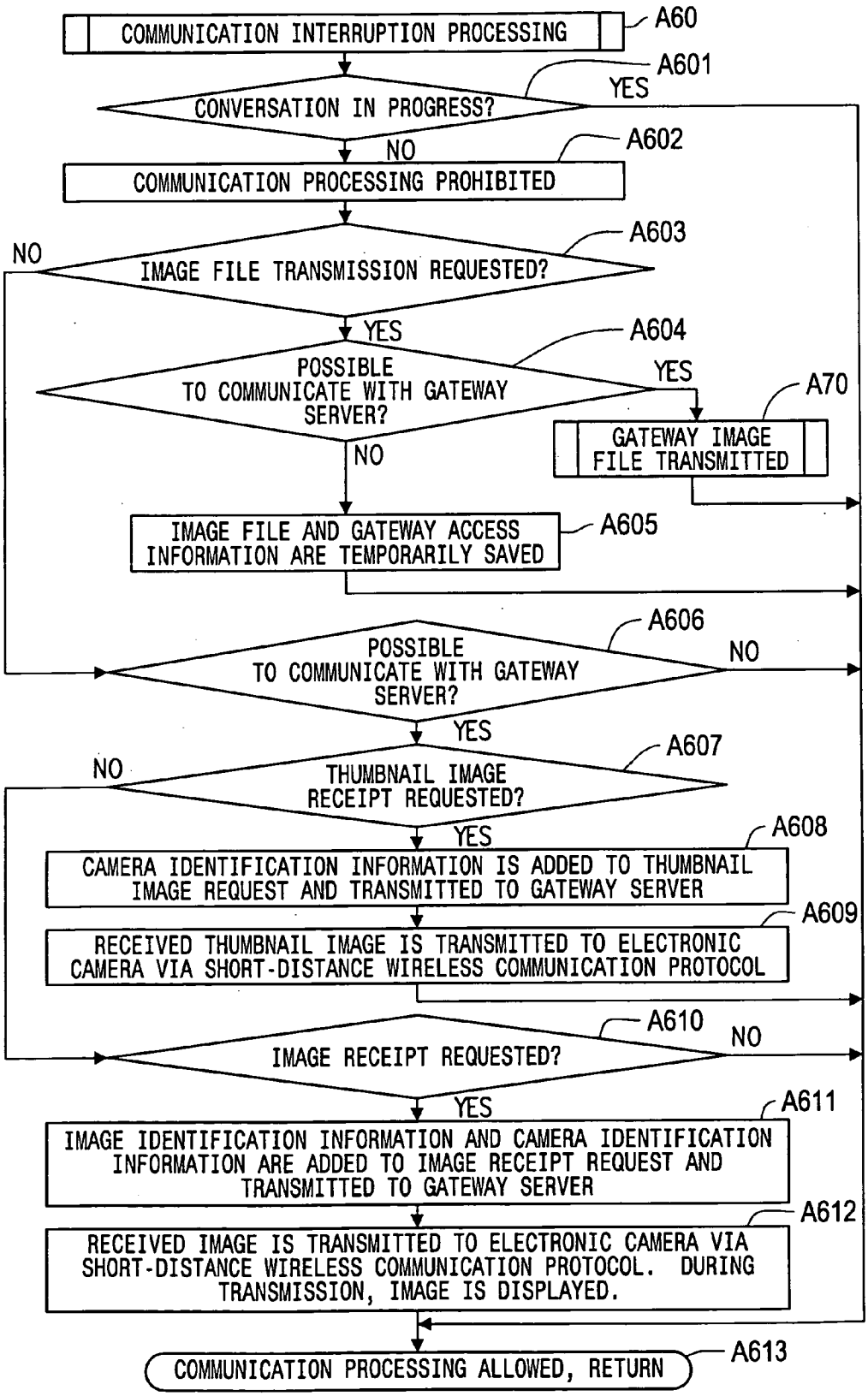

COMMUNICATION INTERRUPTION PROCESSING
A60
CONVERSATION IN PROGRESS?
A601
YES
NO
COMMUNICATION PROCESSING PROHIBITED
A602
IMAGE FILE TRANSMISSION REQUESTED?
A603
NO
YES
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
A604
YES
NO
GATEWAY IMAGE FILE TRANSMITTED
A70
IMAGE FILE AND GATEWAY ACCESS INFORMATION ARE TEMPORARILY SAVED
A605
POSSIBLE TO COMMUNICATE WITH GATEWAY SERVER?
A606
NO
YES
THUMBNAIL IMAGE RECEIPT REQUESTED?
A607
NO
YES
CAMERA IDENTIFICATION INFORMATION IS ADDED TO THUMBNAIL IMAGE REQUEST AND TRANSMITTED TO GATEWAY SERVER
A608
RECEIVED THUMBNAIL IMAGE IS TRANSMITTED TO ELECTRONIC CAMERA VIA SHORT-DISTANCE WIRELESS COMMUNICATION PROTOCOL
A609
IMAGE RECEIPT REQUESTED?
A610
NO
YES
IMAGE IDENTIFICATION INFORMATION AND CAMERA IDENTIFICATION INFORMATION ARE ADDED TO IMAGE RECEIPT REQUEST AND TRANSMITTED TO GATEWAY SERVER
A611
RECEIVED IMAGE IS TRANSMITTED TO ELECTRONIC CAMERA VIA SHORT-DISTANCE WIRELESS COMMUNICATION PROTOCOL. DURING TRANSMISSION, IMAGE IS DISPLAYED.
A612
COMMUNICATION PROCESSING ALLOWED, RETURN
A613

Fig. 191

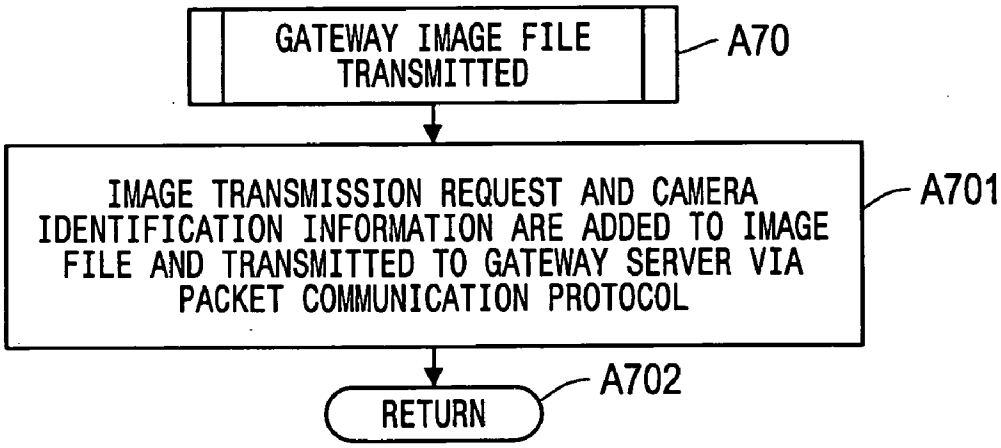


Fig. 192

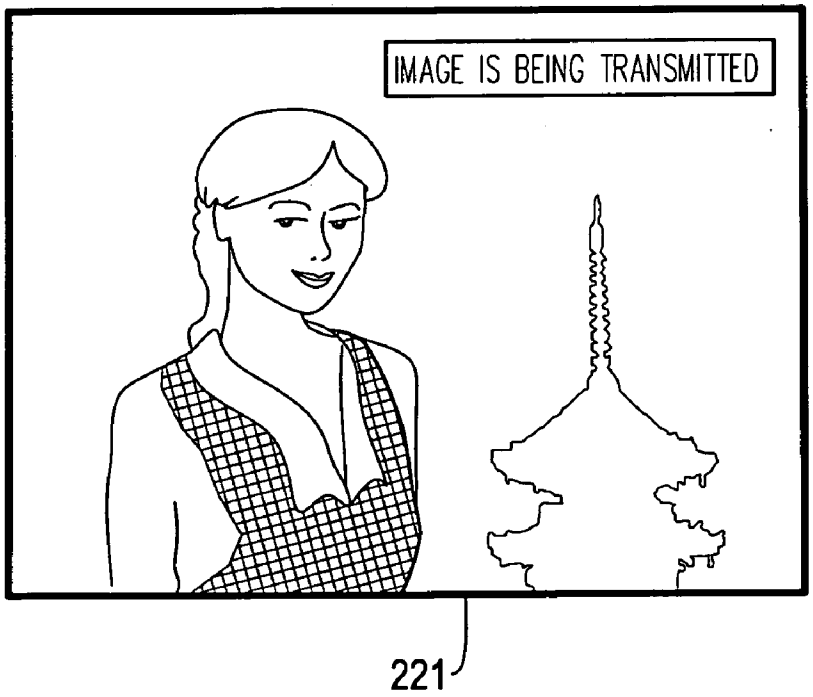


Fig. 193

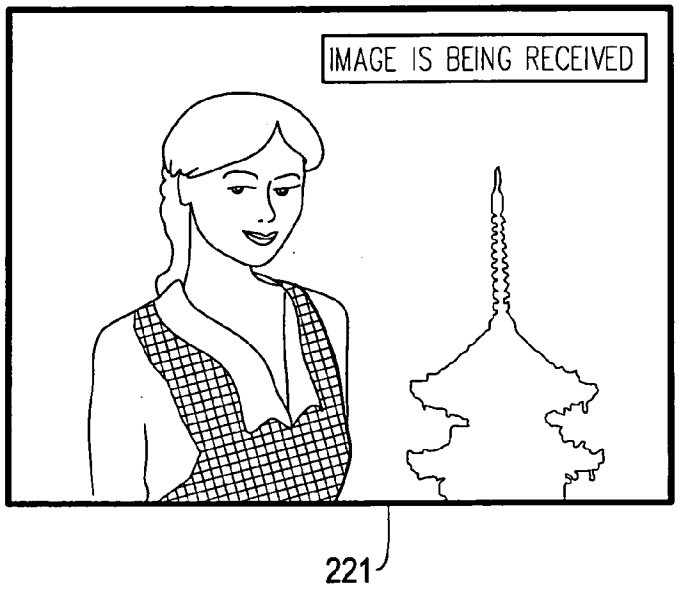


Fig. 194

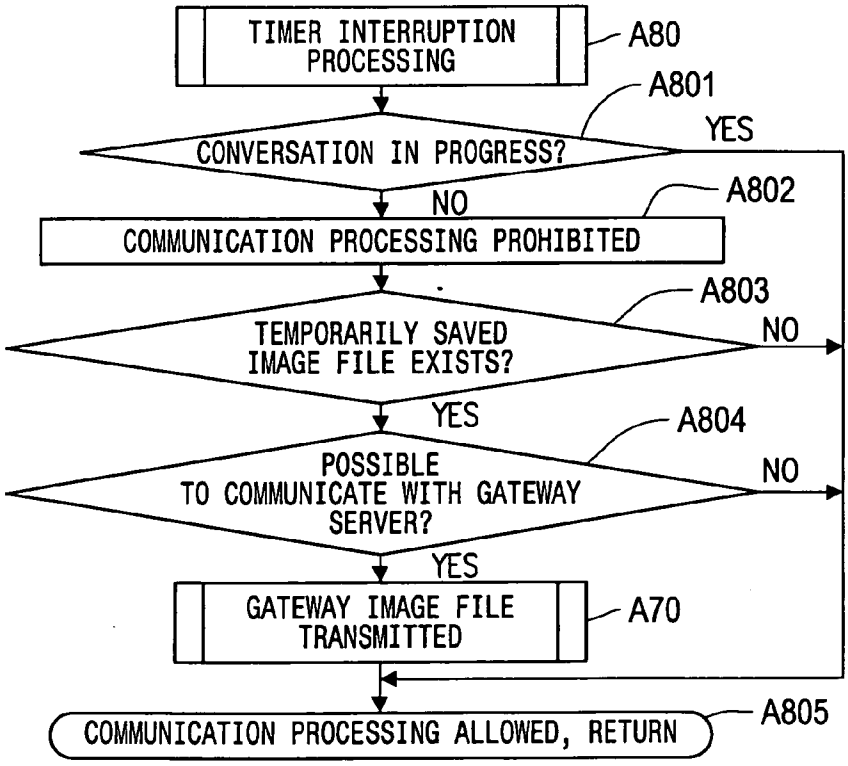


Fig. 195

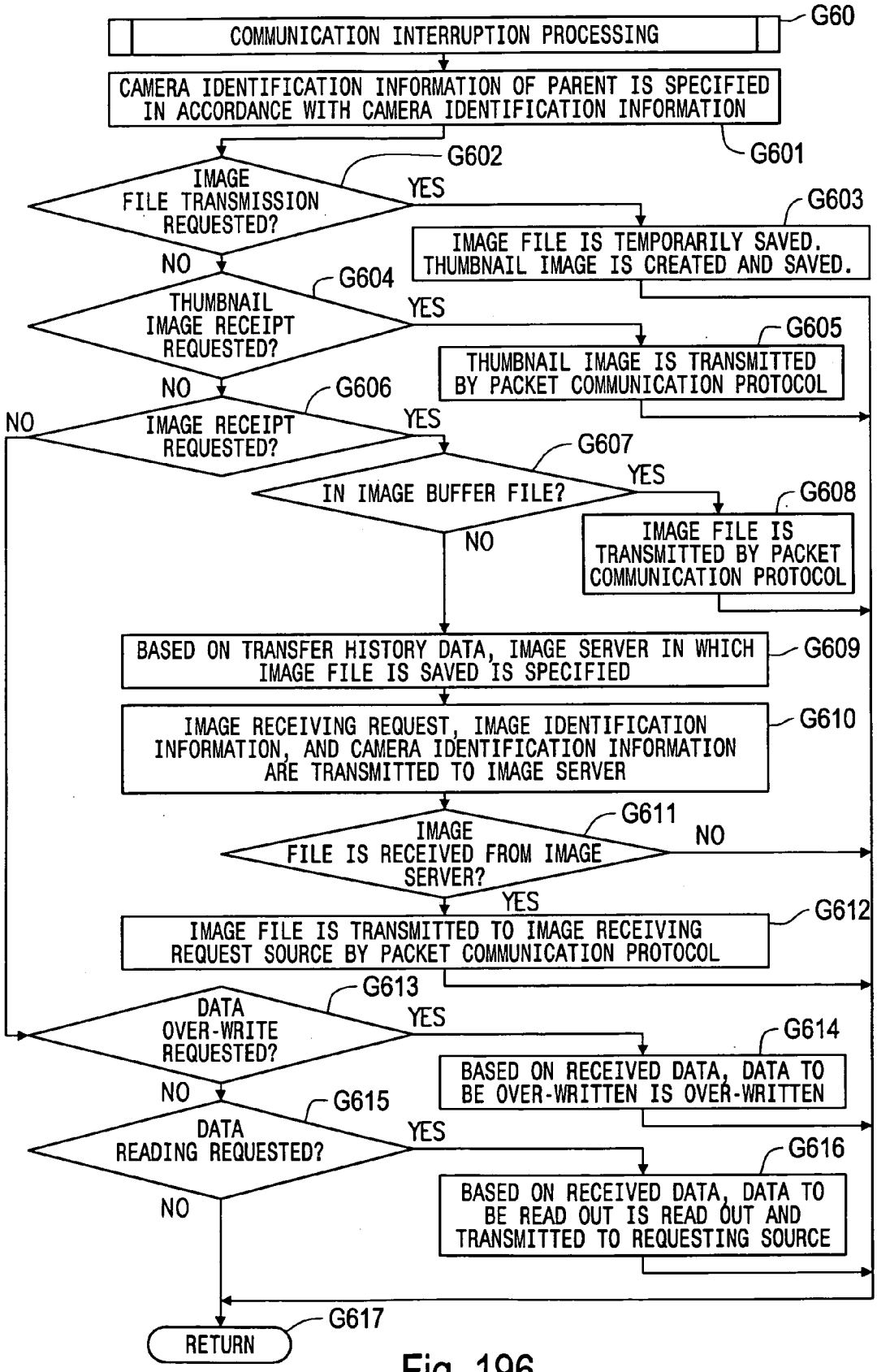

COMMUNICATION INTERRUPTION PROCESSING
G60
CAMERA IDENTIFICATION INFORMATION OF PARENT IS SPECIFIED IN ACCORDANCE WITH CAMERA IDENTIFICATION INFORMATION
G601
IMAGE FILE TRANSMISSION REQUESTED?
G602
YES
NO
IMAGE FILE IS TEMPORARILY SAVED. THUMBNAIL IMAGE IS CREATED AND SAVED.
G603
THUMBNAIL IMAGE RECEIPT REQUESTED?
G604
YES
NO
THUMBNAIL IMAGE IS TRANSMITTED BY PACKET COMMUNICATION PROTOCOL
G605
IMAGE RECEIPT REQUESTED?
G606
YES
NO
IN IMAGE BUFFER FILE?
G607
YES
NO
IMAGE FILE IS TRANSMITTED BY PACKET COMMUNICATION PROTOCOL
G608
BASED ON TRANSFER HISTORY DATA, IMAGE SERVER IN WHICH IMAGE FILE IS SAVED IS SPECIFIED
G609
IMAGE RECEIVING REQUEST, IMAGE IDENTIFICATION INFORMATION, AND CAMERA IDENTIFICATION INFORMATION ARE TRANSMITTED TO IMAGE SERVER
G610
IMAGE FILE IS RECEIVED FROM IMAGE SERVER?
G611
NO
YES
IMAGE FILE IS TRANSMITTED TO IMAGE RECEIVING REQUEST SOURCE BY PACKET COMMUNICATION PROTOCOL
G612
DATA OVER-WRITE REQUESTED?
G613
YES
NO
BASED ON RECEIVED DATA, DATA TO BE OVER-WRITTEN IS OVER-WRITTEN
G614
DATA READING REQUESTED?
G615
YES
NO
BASED ON RECEIVED DATA, DATA TO BE READ OUT IS READ OUT AND TRANSMITTED TO REQUESTING SOURCE
G616
RETURN
G617

Fig. 196

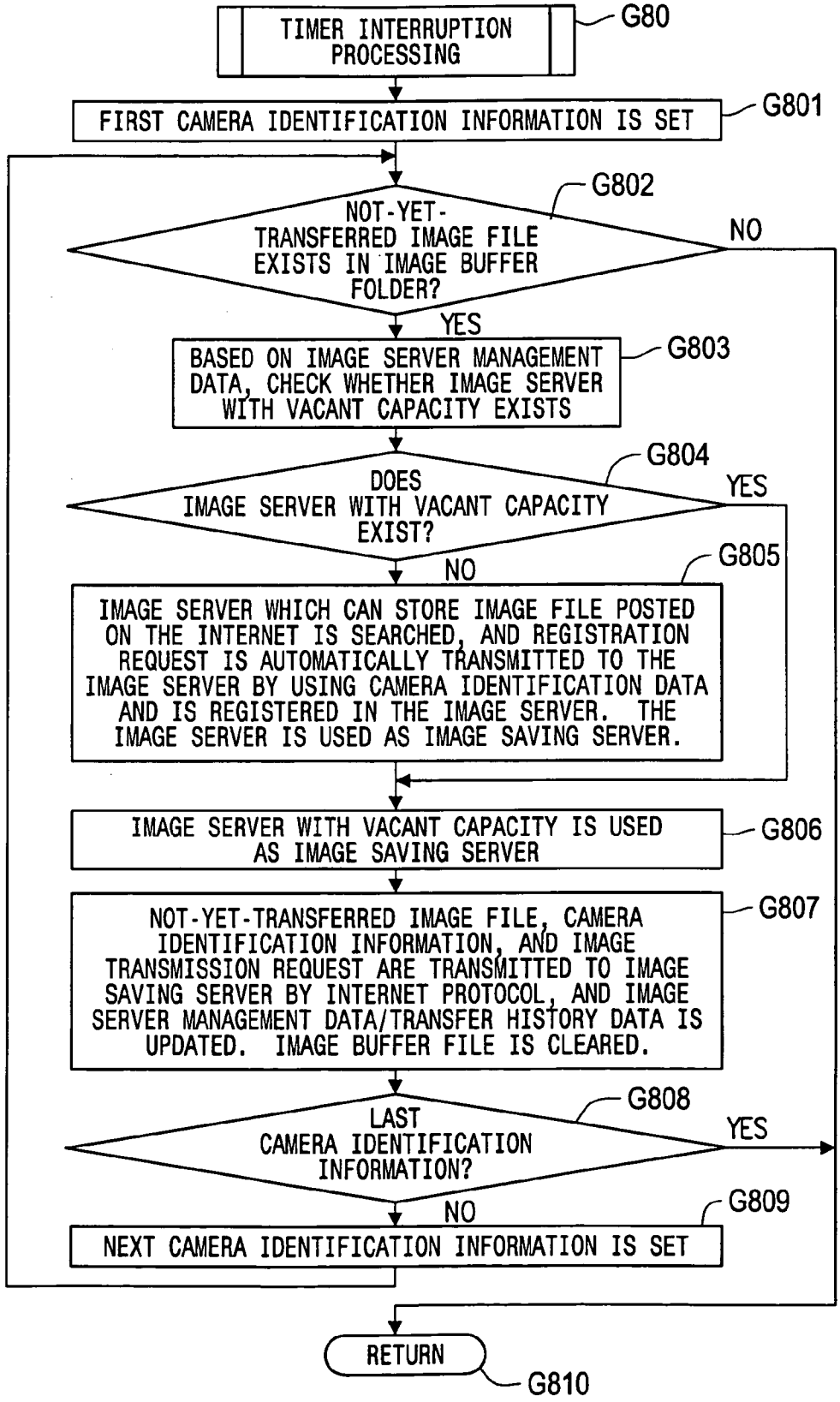

TIMER INTERRUPTION PROCESSING
G80
FIRST CAMERA IDENTIFICATION INFORMATION IS SET
G801
NOT-YET-TRANSFERRED IMAGE FILE EXISTS IN IMAGE BUFFER FOLDER?
G802
NO
YES
BASED ON IMAGE SERVER MANAGEMENT DATA, CHECK WHETHER IMAGE SERVER WITH VACANT CAPACITY EXISTS
G803
DOES IMAGE SERVER WITH VACANT CAPACITY EXIST?
G804
YES
NO
G805
IMAGE SERVER WHICH CAN STORE IMAGE FILE POSTED ON THE INTERNET IS SEARCHED, AND REGISTRATION REQUEST IS AUTOMATICALLY TRANSMITTED TO THE IMAGE SERVER BY USING CAMERA IDENTIFICATION DATA AND IS REGISTERED IN THE IMAGE SERVER. THE IMAGE SERVER IS USED AS IMAGE SAVING SERVER.
IMAGE SERVER WITH VACANT CAPACITY IS USED AS IMAGE SAVING SERVER
G806
NOT-YET-TRANSFERRED IMAGE FILE, CAMERA IDENTIFICATION INFORMATION, AND IMAGE TRANSMISSION REQUEST ARE TRANSMITTED TO IMAGE SAVING SERVER BY INTERNET PROTOCOL, AND IMAGE SERVER MANAGEMENT DATA/TRANSFER HISTORY DATA IS UPDATED. IMAGE BUFFER FILE IS CLEARED.
G807
LAST CAMERA IDENTIFICATION INFORMATION?
G808
YES
NO
G809
NEXT CAMERA IDENTIFICATION INFORMATION IS SET
RETURN
G810

Fig. 197

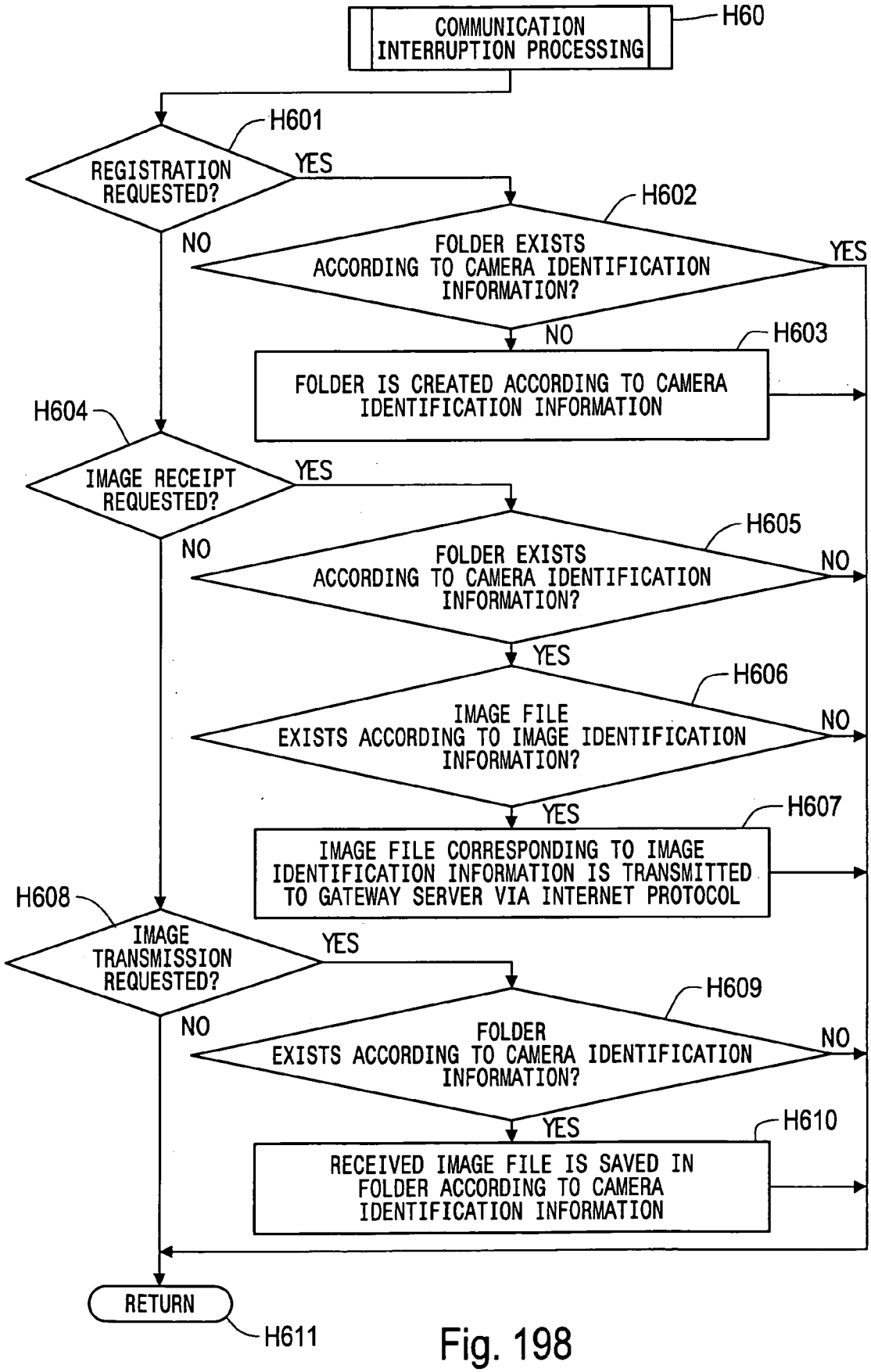

COMMUNICATION INTERRUPTION PROCESSING
H60
H601
REGISTRATION REQUESTED?
YES
NO
H602
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
YES
NO
H603
FOLDER IS CREATED ACCORDING TO CAMERA IDENTIFICATION INFORMATION
H604
IMAGE RECEIPT REQUESTED?
YES
NO
H605
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
NO
YES
H606
IMAGE FILE EXISTS ACCORDING TO IMAGE IDENTIFICATION INFORMATION?
NO
YES
H607
IMAGE FILE CORRESPONDING TO IMAGE IDENTIFICATION INFORMATION IS TRANSMITTED TO GATEWAY SERVER VIA INTERNET PROTOCOL
H608
IMAGE TRANSMISSION REQUESTED?
YES
NO
H609
FOLDER EXISTS ACCORDING TO CAMERA IDENTIFICATION INFORMATION?
NO
YES
H610
RECEIVED IMAGE FILE IS SAVED IN FOLDER ACCORDING TO CAMERA IDENTIFICATION INFORMATION
RETURN
H611

Fig. 198

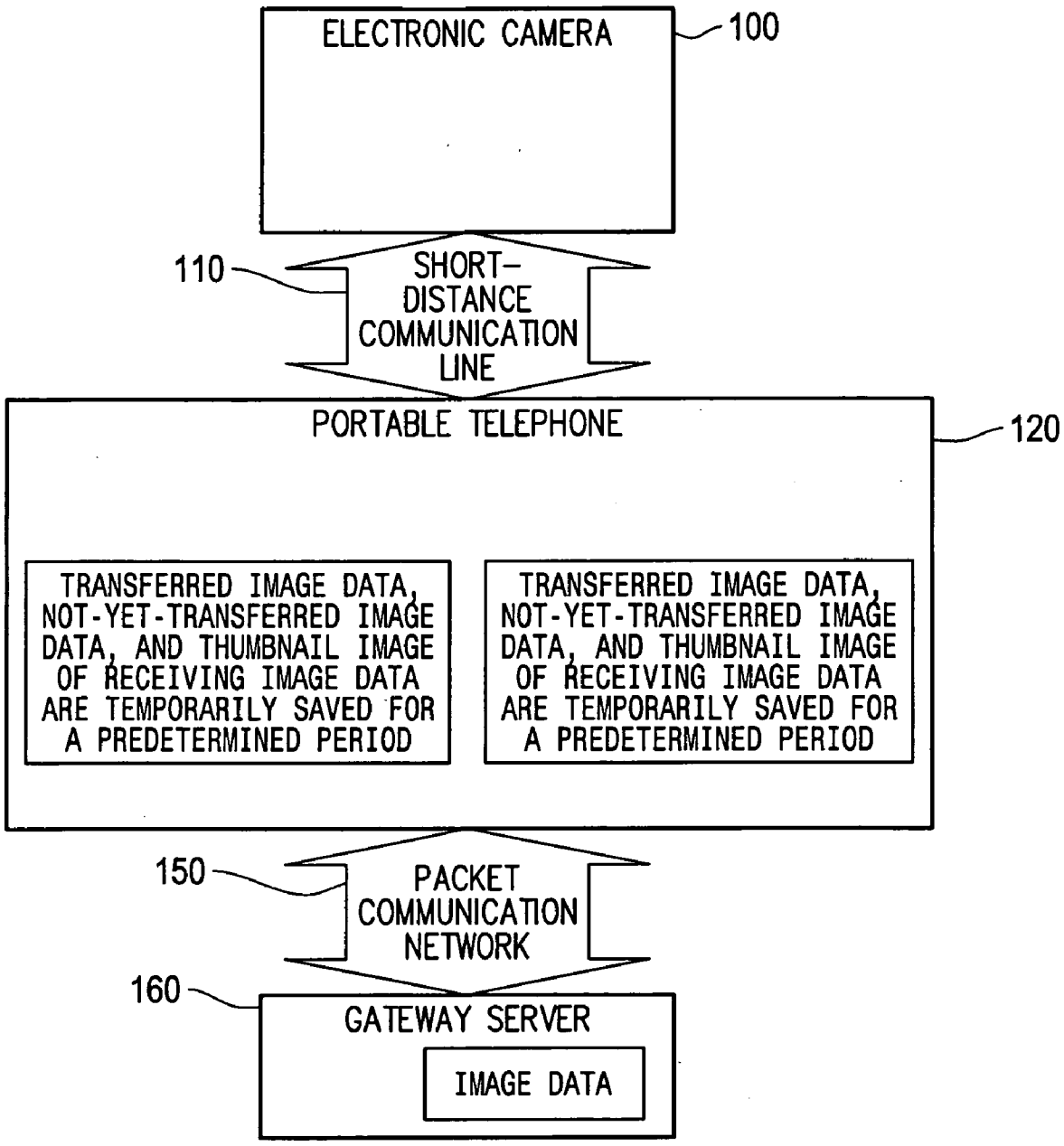

ELECTRONIC CAMERA
100
110
SHORT-DISTANCE COMMUNICATION LINE
PORTABLE TELEPHONE
120
TRANSFERRED IMAGE DATA, NOT-YET-TRANSFERRED IMAGE DATA, AND THUMBNAIL IMAGE OF RECEIVING IMAGE DATA ARE TEMPORARILY SAVED FOR A PREDETERMINED PERIOD
TRANSFERRED IMAGE DATA, NOT-YET-TRANSFERRED IMAGE DATA, AND THUMBNAIL IMAGE OF RECEIVING IMAGE DATA ARE TEMPORARILY SAVED FOR A PREDETERMINED PERIOD
150
PACKET COMMUNICATION NETWORK
160
GATEWAY SERVER
IMAGE DATA

Fig. 199

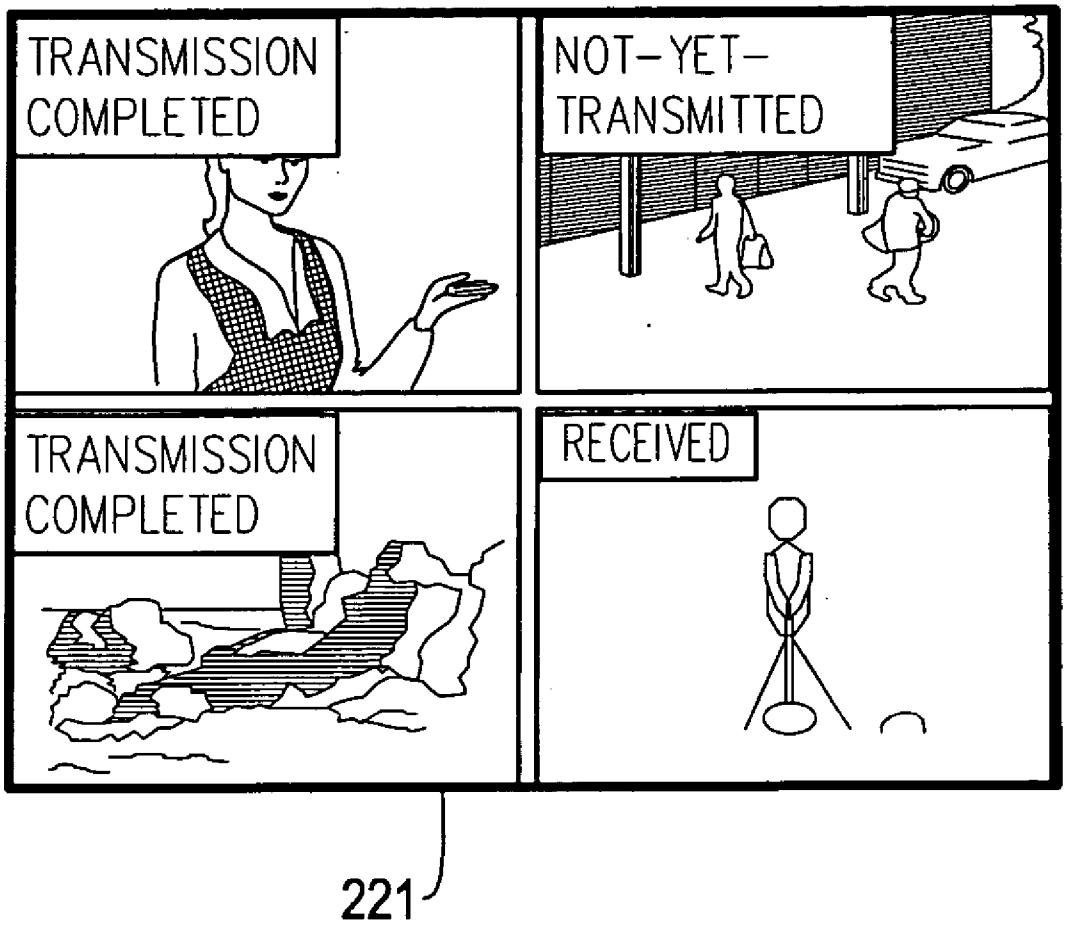

TRANSMISSION COMPLETED
NOT-YET-TRANSMITTED
TRANSMISSION COMPLETED
RECEIVED
221

Fig. 200

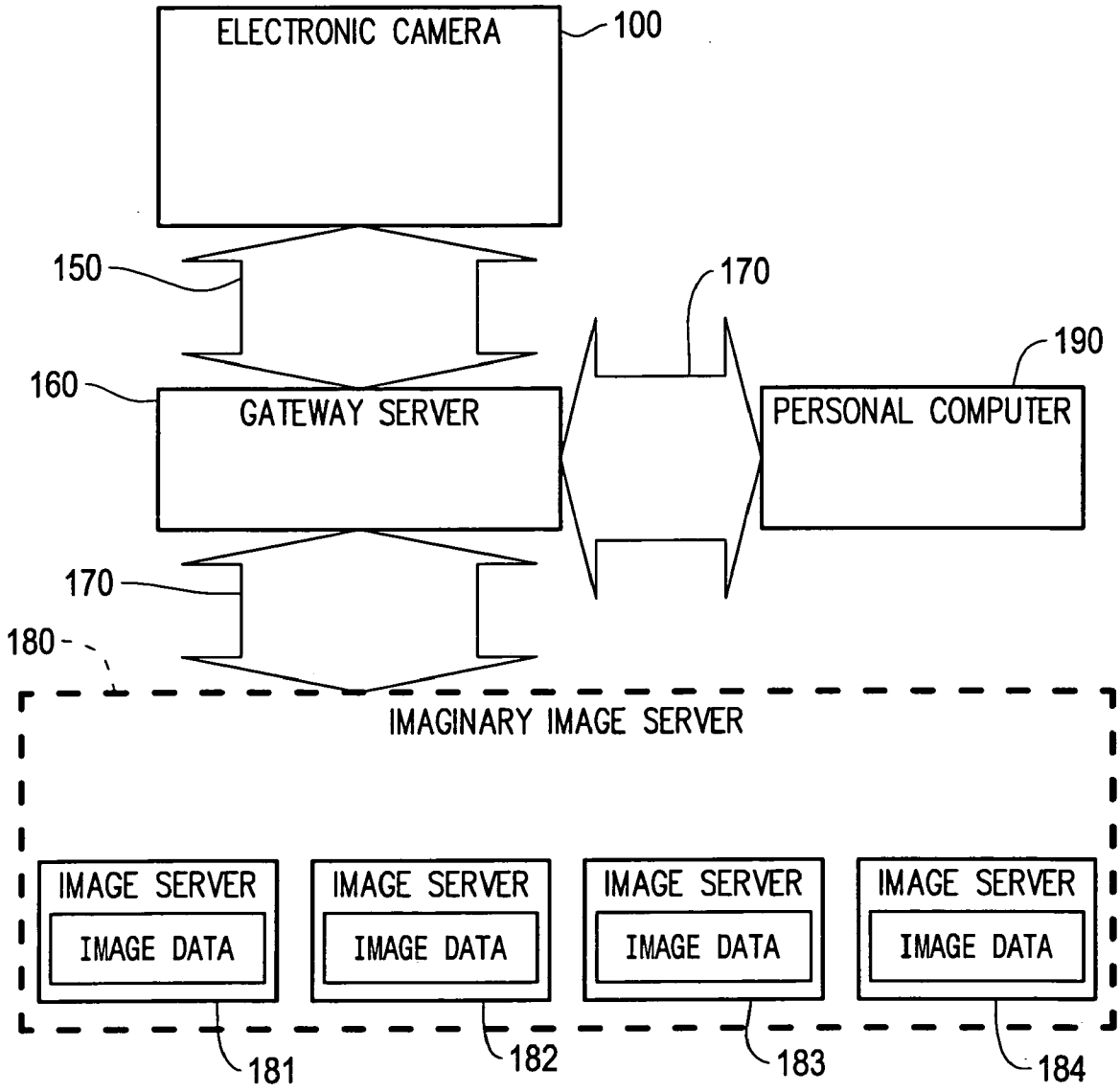

ELECTRONIC CAMERA
100
150
170
190
160
GATEWAY SERVER
PERSONAL COMPUTER
170
180
IMAGINARY IMAGE SERVER
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
IMAGE SERVER
IMAGE DATA
181
182
183
184

Fig. 201

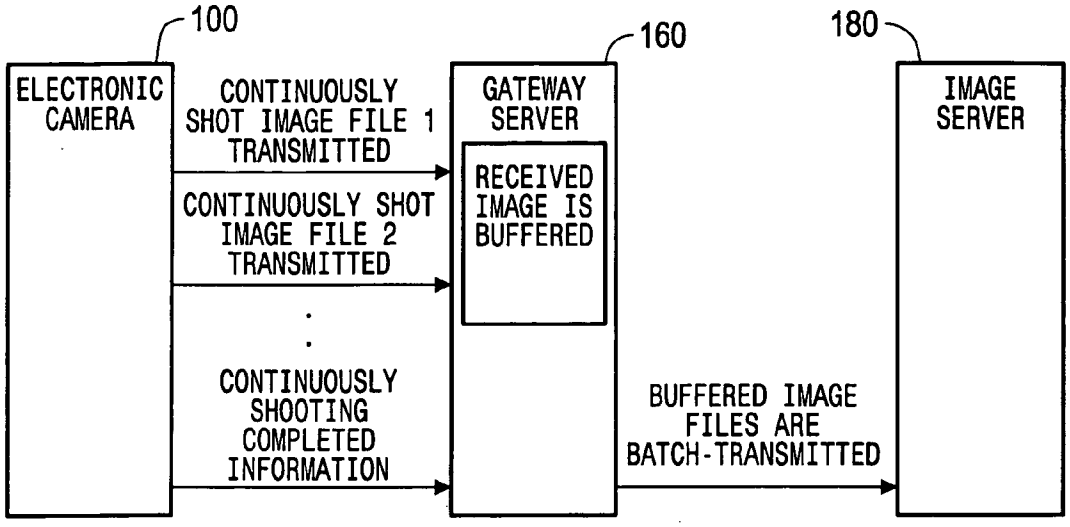


Fig. 202

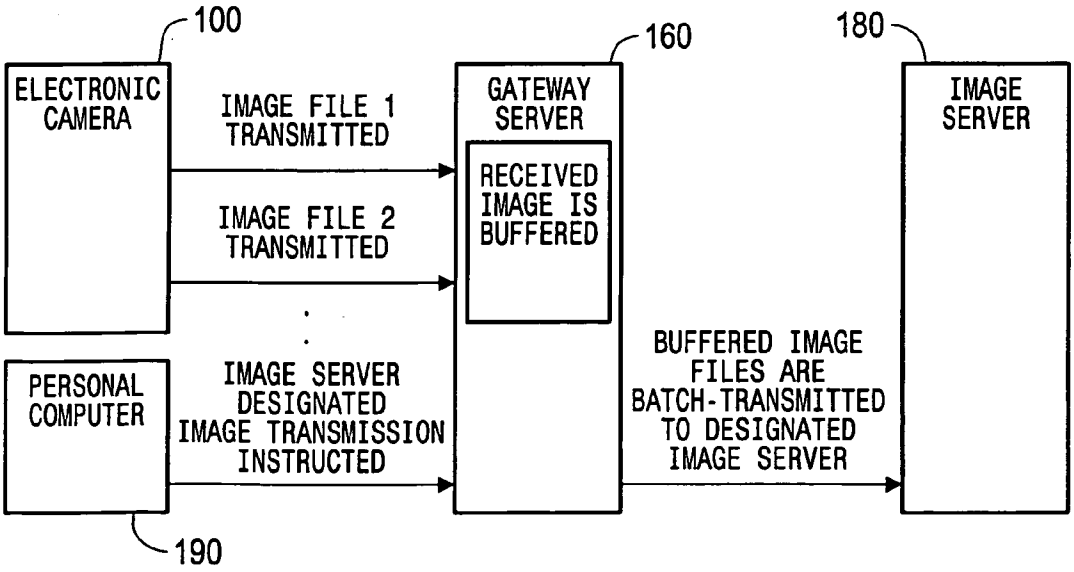


Fig. 203

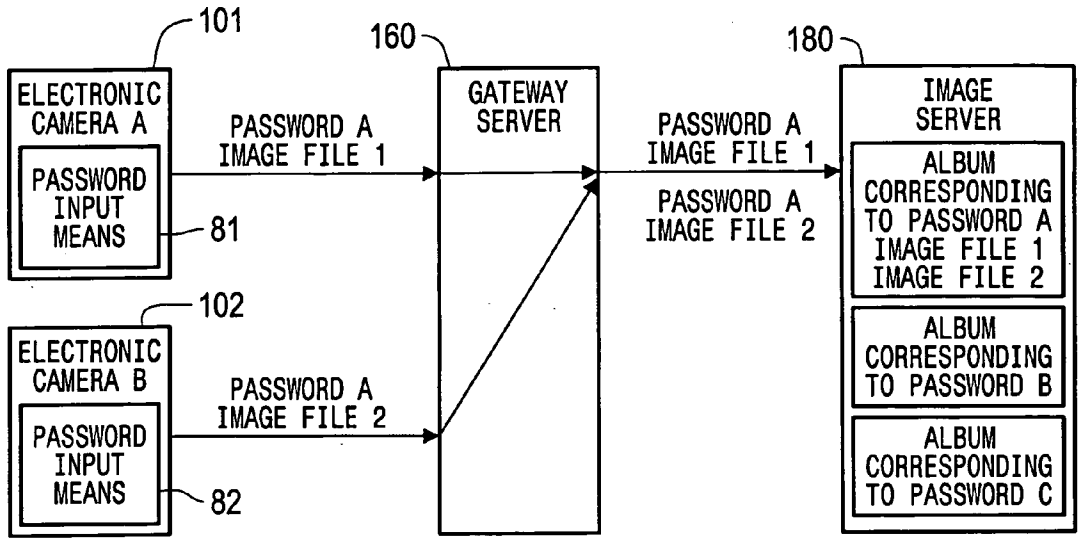


Fig. 204

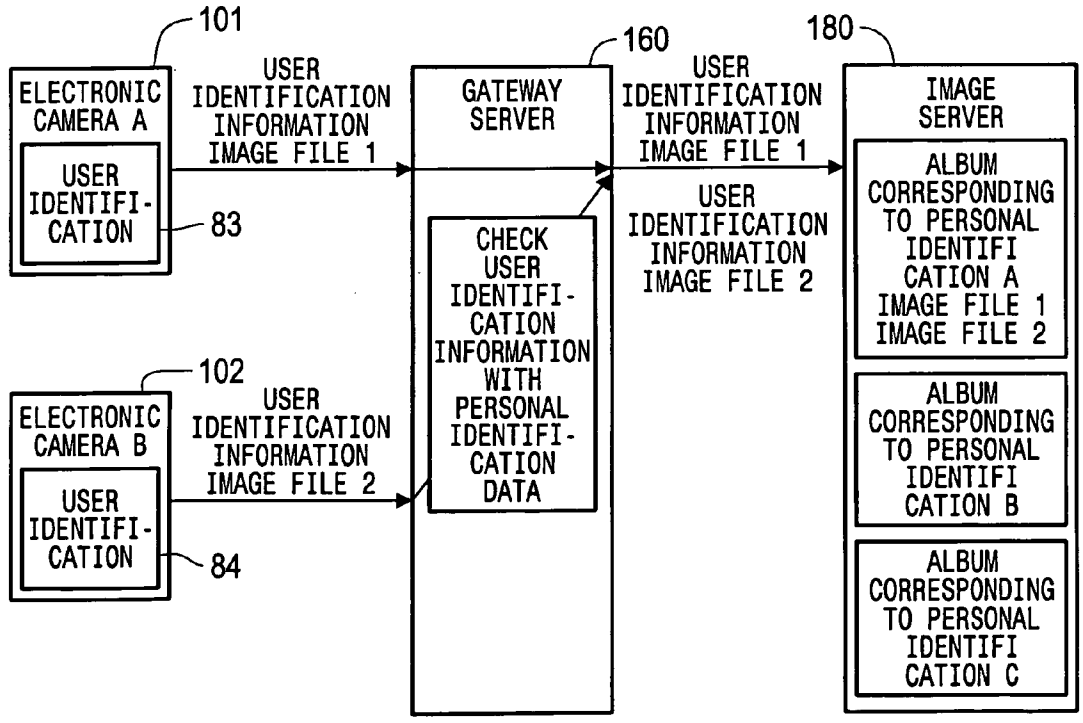


Fig. 205

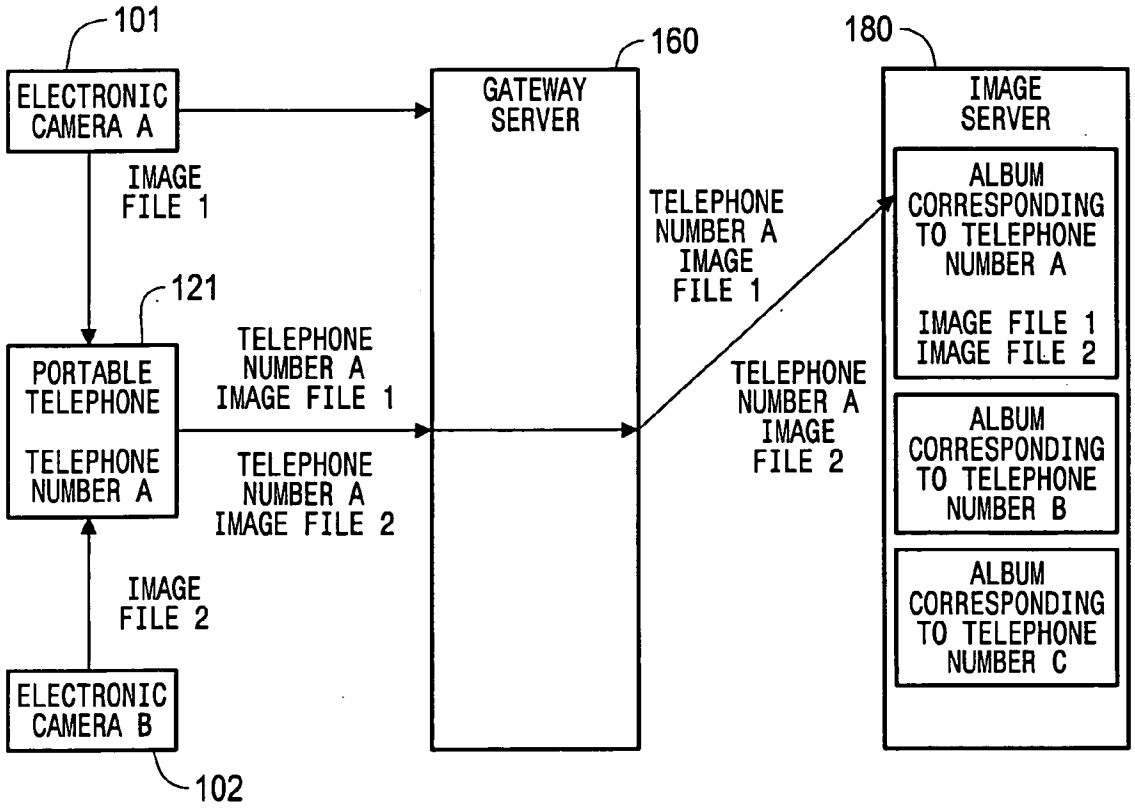

101
ELECTRONIC CAMERA A
IMAGE FILE 1
121
PORTABLE TELEPHONE
TELEPHONE NUMBER A
TELEPHONE NUMBER A IMAGE FILE 1
TELEPHONE NUMBER A IMAGE FILE 2
IMAGE FILE 2
ELECTRONIC CAMERA B
102
160
GATEWAY SERVER
TELEPHONE NUMBER A IMAGE FILE 1
TELEPHONE NUMBER A IMAGE FILE 2
180
IMAGE SERVER
ALBUM CORRESPONDING TO TELEPHONE NUMBER A
IMAGE FILE 1
IMAGE FILE 2
ALBUM CORRESPONDING TO TELEPHONE NUMBER B
ALBUM CORRESPONDING TO TELEPHONE NUMBER C

Fig. 206

IMAGE TRANSMISSION SYSTEM, IMAGE RELAY APPARATUS AND ELECTRONIC IMAGE DEVICE

INCORPORATION BY REFERENCE

[0001] The present application is based on Japanese Patent Applications 2002-151749, 2002-154284, 2002-154285, 2002-199498 and 2002-199499, which are incorporated herein by reference in their entireties.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to an image transmission system that transmits image data through telecommunication means; in particular, it relates to an image transmission system wherein image data captured with an electronic image device such as an electronic camera is transmitted via an image relay apparatus such as a gateway server to an image storage device such as an image server on the Internet and stored there, and image data stored in an image storage device such as an image server on the Internet is downloaded to and browsed in an electronic image device such as an electronic camera via an image relay apparatus such as a gateway server; the invention furthermore relates to the image relay apparatus and electronic image device used in the image transmission system.

[0004] 2. Related Art

[0005] There has been active development of image transmission systems wherein all the image data captured with an electronic camera is transmitted via telecommunication lines to an externally located high capacity storage device (image server) and stored there, and the image data stored in the image server is used (browsed, printed, distributed, etc.) by making use of the various image services offered by the image server.

[0006] For example, image data transmission systems are known, wherein image data captured with an electronic camera is transmitted to and stored on a personal computer or image server on the Internet or the like using a digital data transmission function built into the electronic camera or a digital data transmission function of a portable telephone connected to the digital camera; image data stored on a personal computer or image server on the Internet or the like is received by the electronic camera using the digital data transmission function built into the electronic camera or the digital data transmission function of a portable telephone connected to the electronic camera; and received image data is displayed on the liquid crystal display of the electronic camera and viewed.

[0007] Such image transmission systems have the following advantages.

[0008] Large capacity built-in memory or removable memory for storing image data becomes unnecessary, so the cost of the electronic camera can be reduced.

[0009] All the image data is stored on a specific image server, so the benefits of post-processing services (printing, etc.) can be expected.

[0010] The user of the electronic camera only has to depress the shutter button to have the image data stored on an image server, so in cases such as where image print orders are placed over the Internet, the effort of having to transmit image data to the image server that performs the printing service from one's electronic camera or memory card can be done away with.

[0011] In such an image data transmission system, there are limits to the storage capacity of the storage area (album) allocated to a single user of the image server, and if the data size of the image data that one wishes to newly store exceeds the available capacity of the aforementioned album, it would be necessary to delete some of the image data stored in the album to increase the available capacity of the aforementioned album, or to register with a different image server and open a new album. Or else, whenever storing image data, one would have to designate an album with available capacity from among several albums to store the image data in that album. Such operations are very bothersome and a source of anguish for users with little knowledge of image transmission systems, especially children and the elderly, and such a situation arising while taking pictures would end the enjoyment of taking pictures, and as a result has been a cause that has impeded the general adoption of such image transmission systems. Moreover, even for users with extensive knowledge of image transmission systems, such operations are time consuming, and there have been situation where photo opportunities have been lost as a result.

[0012] In this connection, an object of the present invention is to provide an image transmission system that allows image data transmission operations to be carried out in a reliable, efficient and simple manner, as well as providing an image relay apparatus and electronic image device used in the image transmission system.

SUMMARY OF THE INVENTION

[0013] To achieve the aforementioned object, in the image transmission system according to the present invention, a gateway is set up between the electronic camera (electronic image device) and the image storage device that stores the image data (image server), which gateway automatically performs the various image server related procedures on behalf of the user. For example, the operation of selecting an image server holding an album with available capacity, the registration procedure for setting up a new album on an image server, the procedure for writing and reading image data to and from an image server, operations for avoiding conflict of image identification information (image file names) of image data when image data captured with multiple electronic cameras is stored on the same image server, and the like, are performed automatically.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] **FIG. 1** is a conceptual drawing of an image transmission system.

[0015] **FIG. 2** is an external view (front view) of an electronic camera.

[0016] **FIG. 3** is an external view (rear view) of an electronic camera.

[0017] **FIG. 4** is a block diagram showing the electrical configuration of an electronic camera.

[0018] **FIG. 5** is a diagram of the data of a memory card.

[0019] **FIG. 6** is a diagram of the data of an image file.

[0020] **FIG. 7** is a diagram of the data of an EEPROM.

[0021] **FIG. 8** is a block diagram showing the configuration of a gateway server.

[0022] **FIG. 9** is a diagram of the memory of a gateway server.

[0023] **FIG. 10** is an explanatory drawing of personal identification data.

[0024] **FIG. 11** is an explanatory drawing of server management data.

[0025] **FIG. 12** is a block diagram showing the configuration of an image server.

[0026] **FIG. 13** is a diagram of the memory of an image server.

[0027] **FIG. 14** is a state transition diagram for an electronic camera.

[0028] **FIG. 15** is a main flow chart.

[0029] **FIG. 16** is a subroutine flow chart.

[0030] **FIG. 17** is a screen display example.

[0031] **FIG. 18** is a subroutine flow chart.

[0032] **FIG. 19** is a subroutine flow chart.

[0033] **FIG. 20** is a subroutine flow chart.

[0034] **FIG. 21** is a screen display example.

[0035] **FIG. 22** is a screen display example.

[0036] **FIG. 23** is a subroutine flow chart.

[0037] **FIG. 24** is a subroutine flow chart.

[0038] **FIG. 25** is a subroutine flow chart.

[0039] **FIG. 26** is a subroutine flow chart.

[0040] **FIG. 27** is a subroutine flow chart.

[0041] **FIG. 28** is an explanatory drawing of the operation of image transmission.

[0042] **FIG. 29** is an explanatory drawing of the operation of image transmission.

[0043] **FIG. 30** is a conceptual drawing of an image transmission system.

[0044] **FIG. 31** is an external view (front view) of an electronic camera.

[0045] **FIG. 32** is an external view (rear view) of an electronic camera.

[0046] **FIG. 33** is a block diagram showing the electrical configuration of an electronic camera.

[0047] **FIG. 34** is a diagram of the data of a memory card.

[0048] **FIG. 35** is a diagram of the data of an EEPROM.

[0049] **FIG. 36** is an external view of a portable telephone.

[0050] **FIG. 37** is a block diagram showing the electrical configuration of a portable telephone.

[0051] **FIG. 38** is a block diagram showing the configuration of a gateway server.

[0052] **FIG. 39** is a diagram of the memory of a gateway server.

[0053] **FIG. 40** is an explanatory drawing of camera identification information link data.

[0054] **FIG. 41** is an explanatory drawing of personal identification data.

[0055] **FIG. 42** is an explanatory drawing of server management data.

[0056] **FIG. 43** is an explanatory drawing of transfer history data.

[0057] **FIG. 44** is a block diagram showing the configuration of an image server.

[0058] **FIG. 45** is a diagram of the memory of an image server.

[0059] **FIG. 46** is a state transition diagram for an electronic camera.

[0060] **FIG. 47** is a main flow chart of a CPU.

[0061] **FIG. 48** is a subroutine flow chart.

[0062] **FIG. 49** is a screen display example.

[0063] **FIG. 50** is a subroutine flow chart.

[0064] **FIG. 51** is a subroutine flow chart.

[0065] **FIG. 52** is a subroutine flow chart.

[0066] **FIG. 53** is a subroutine flow chart.

[0067] **FIG. 54** is a screen display example.

[0068] **FIG. 55** is a subroutine flow chart.

[0069] **FIG. 56** is a screen display example.

[0070] **FIG. 57** is a screen display example.

[0071] **FIG. 58** is a subroutine flow chart.

[0072] **FIG. 59** is a subroutine flow chart.

[0073] **FIG. 61** is a screen display example.

[0074] **FIG. 62** is a screen display example.

[0075] **FIG. 63** is a subroutine flow chart.

[0076] **FIG. 64** is a subroutine flow chart.

[0077] **FIG. 65** is a subroutine flow chart.

[0078] **FIG. 67** is a conceptual drawing of an image transmission system.

[0079] **FIG. 68** is a screen display example.

[0080] **FIG. 69** is a conceptual drawing of an image transmission system.

[0081] **FIG. 70** is an explanatory drawing of the operation of image transmission.

[0082] **FIG. 71** is an explanatory drawing of the operation of image transmission.

[0083] **FIG. 72** is an explanatory drawing of the operation of image transmission.

[0084] **FIG. 73** is an explanatory drawing of the operation of image transmission.

[0085] **FIG. 74** is an explanatory drawing of the operation of image transmission.

[0086] **FIG. 75** is a conceptual drawing of an image transmission system.

[0087] **FIG. 76** is an external view (front view) of an electronic camera.

[0088] **FIG. 77** is an external view (rear view) of an electronic camera.

[0089] **FIG. 78** is a block diagram showing the electrical configuration of an electronic camera.

[0090] **FIG. 79** is a diagram of the data of a memory card.

[0091] **FIG. 80** is a diagram of the data of an EEPROM.

[0092] **FIG. 81** is an external view of a portable telephone.

[0093] **FIG. 82** is a block diagram showing the electrical configuration of a portable telephone.

[0094] **FIG. 83** is a block diagram showing the configuration of a gateway server.

[0095] **FIG. 84** is a diagram of the memory of a gateway server.

[0096] **FIG. 85** is an explanatory drawing of camera identification information link data.

[0097] **FIG. 86** is an explanatory drawing of personal identification data.

[0098] **FIG. 87** is an explanatory drawing of server management data.

[0099] **FIG. 88** is an explanatory drawing of transfer history data.

[0100] **FIG. 89** is a block diagram showing the configuration of an image server.

[0101] **FIG. 90** is diagram of the memory of an image server.

[0102] **FIG. 91** is a state transition diagram for an electronic camera.

[0103] **FIG. 92** is a main flow chart of a CPU.

[0104] **FIG. 93** is subroutine flow chart.

[0105] **FIG. 94** is a screen display example.

[0106] **FIG. 95** is subroutine flow chart.

[0107] **FIG. 96** is subroutine flow chart.

[0108] **FIG. 97** is subroutine flow chart.

[0109] **FIG. 98** is subroutine flow chart.

[0110] **FIG. 99** is a screen display example.

[0111] **FIG. 100** is subroutine flow chart.

[0112] **FIG. 101** is a screen display example.

[0113] **FIG. 102** is a screen display example.

[0114] **FIG. 103** is subroutine flow chart.

[0115] **FIG. 104** is subroutine flow chart.

[0116] **FIG. 105** is a screen display example.

[0117] **FIG. 106** is a screen display example.

[0118] **FIG. 107** is subroutine flow chart.

[0119] **FIG. 108** is subroutine flow chart.

[0120] **FIG. 109** is subroutine flow chart.

[0121] **FIG. 110** is subroutine flow chart.

[0122] **FIG. 111** is a conceptual drawing of an image transmission system.

[0123] **FIG. 112** is a screen display example.

[0124] **FIG. 113** is a conceptual drawing of an image transmission system.

[0125] **FIG. 114** is an explanatory drawing of the operation of image transmission.

[0126] **FIG. 115** is an explanatory drawing of the operation of image transmission.

[0127] **FIG. 116** is an explanatory drawing of the operation of image transmission.

[0128] **FIG. 117** is an explanatory drawing of the operation of image transmission.

[0129] **FIG. 118** is an explanatory drawing of the operation of image transmission.

[0130] **FIG. 119** is a conceptual drawing of an image transmission system.

[0131] **FIG. 120** is an external view (front view) of an electronic camera.

[0132] **FIG. 121** is an external view (rear view) of an electronic camera.

[0133] **FIG. 122** is a block diagram showing the electrical configuration of an electronic camera.

[0134] **FIG. 123** is a diagram of the data of a memory card.

[0135] **FIG. 124** is a diagram of the data of an EEPROM.

[0136] **FIG. 125** is an external view of a portable telephone.

[0137] **FIG. 126** is a block diagram showing the electrical configuration of a portable telephone.

[0138] **FIG. 127** is block diagram showing the configuration of a gateway server.

[0139] **FIG. 128** is a diagram of the memory of a gateway server.

[0140] **FIG. 129** is an explanatory drawing of camera identification information link data.

[0141] **FIG. 130** is an explanatory drawing of personal identification data.

[0142] **FIG. 131** is an explanatory drawing of server management data.

[0143] **FIG. 132** is an explanatory drawing of transfer history data.

[0144] **FIG. 133** is a block diagram showing the configuration of an image server.

[0145] **FIG. 134** is a diagram of the memory of an image server.

[0146] **FIG. 135** is a state transition diagram for an electronic camera.

[0147] **FIG. 136** is a main flow chart of a CPU.

[0148] **FIG. 137** is subroutine flow chart.

[0149] **FIG. 138** is a screen display example.

[0150] **FIG. 139** is subroutine flow chart.

[0151] **FIG. 140** is subroutine flow chart.

[0152] **FIG. 141** is subroutine flow chart.

[0153] **FIG. 142** is subroutine flow chart.

[0154] **FIG. 143** is a screen display example.

[0155] **FIG. 144** is subroutine flow chart.

[0156] **FIG. 145** is a screen display example.

[0157] **FIG. 146** is a screen display example.

[0158] **FIG. 147** is subroutine flow chart.

[0159] **FIG. 148** is subroutine flow chart.

[0160] **FIG. 149** is a screen display example.

[0161] **FIG. 150** is a screen display example.

[0162] **FIG. 151** is subroutine flow chart.

[0163] **FIG. 152** is subroutine flow chart.

[0164] **FIG. 153** is subroutine flow chart.

[0165] **FIG. 154** is subroutine flow chart.

[0166] **FIG. 155** is a conceptual drawing of an image transmission system.

[0167] **FIG. 156** is a screen display example.

[0168] **FIG. 157** is a conceptual drawing of an image transmission system.

[0169] **FIG. 158** is an explanatory drawing of the operation of image transmission.

[0170] **FIG. 159** is an explanatory drawing of the operation of image transmission.

[0171] **FIG. 160** is an explanatory drawing of the operation of image transmission.

[0172] **FIG. 161** is an explanatory drawing of the operation of image transmission.

[0173] **FIG. 162** is an explanatory drawing of the operation of image transmission.

[0174] **FIG. 163** is a conceptual drawing of an image transmission system.

[0175] **FIG. 164** is an external view (front view) of an electronic camera.

[0176] **FIG. 165** is an external view (rear view) of an electronic camera.

[0177] **FIG. 166** is a block diagram showing the electrical configuration of an electronic camera.

[0178] **FIG. 167** is a diagram of the data of a memory card.

[0179] **FIG. 168** is a diagram of the data of an EEPROM.

[0180] **FIG. 169** is an external view of a portable telephone.

[0181] **FIG. 170** is a block diagram showing the electrical configuration of a portable telephone.

[0182] **FIG. 171** is block diagram showing the configuration of a gateway server.

[0183] **FIG. 172** is a diagram of the memory of a gateway server.

[0184] **FIG. 173** is an explanatory drawing of camera identification information link data.

[0185] **FIG. 174** is an explanatory drawing of personal identification data.

[0186] **FIG. 175** is an explanatory drawing of server management data.

[0187] **FIG. 176** is an explanatory drawing of transfer history data.

[0188] **FIG. 177** is a block diagram showing the configuration of an image server.

[0189] **FIG. 178** is a diagram of the memory of an image server.

[0190] **FIG. 179** is a state transition diagram for an electronic camera.

[0191] **FIG. 180** is a main flow chart of a CPU.

[0192] **FIG. 181** is subroutine flow chart.

[0193] **FIG. 182** is a screen display example.

[0194] **FIG. 183** is subroutine flow chart.

[0195] **FIG. 184** is subroutine flow chart.

[0196] **FIG. 185** is subroutine flow chart.

[0197] **FIG. 186** is subroutine flow chart.

[0198] **FIG. 187** is a screen display example.

[0199] **FIG. 188** is subroutine flow chart.

[0200] **FIG. 189** is a screen display example.

[0201] **FIG. 190** is a screen display example.

[0202] **FIG. 191** is subroutine flow chart.

[0203] **FIG. 192** is subroutine flow chart.

[0204] **FIG. 193** is a screen display example.

[0205] **FIG. 194** is a screen display example.

[0206] **FIG. 195** is subroutine flow chart.

[0207] **FIG. 196** is subroutine flow chart.

[0208] **FIG. 197** is subroutine flow chart.

[0209] **FIG. 198** is subroutine flow chart.

[0210] **FIG. 199** is a conceptual drawing of an image transmission system.

[0211] **FIG. 200** is a screen display example.

[0212] **FIG. 201** is a conceptual drawing of an image transmission system.

[0213] **FIG. 202** is an explanatory drawing of the operation of image transmission.

[0214] **FIG. 203** is an explanatory drawing of the operation of image transmission.

[0215] **FIG. 204** is an explanatory drawing of the operation of image transmission.

[0216] **FIG. 205** is an explanatory drawing of the operation of image transmission.

[0217] **FIG. 206** is an explanatory drawing of the operation of image transmission.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0218] 1:

[0219] Below, modes of embodiment of the present invention are described with reference to the drawings. **FIG. 1** is a conceptual drawing of an image data transmission system applying the present invention. First, the case of transmitting image data from an electronic camera **100** to image servers **181** through **184** on the Internet **170** will be described. The electronic camera **100** has a built-in wireless portable telephone function. Using the wireless portable telephone function, the electronic camera **100** transmits image data (an image file) generated by a capture operation to a gateway server **160** via a wireless portable telephone link **130** immediately after the image is captured. Here, the electronic camera **100** sends the image file, camera identification information for identifying the individual electronic camera **100**, and user identification information for identifying the user using the electronic camera **100** to the gateway server **160**, and does not send the image identification information for identifying the image file or image server identification information for designating the image server **181** through **184** that will store the image file.

[0220] The gateway server **160** has a built-in wireless portable telephone function, and upon receiving the image file, camera identification information and user identification information from the electronic camera **100** by means of the wireless portable telephone function, it appends image identification information (an image file name) to the image file, selects an image server having a album with available capacity corresponding to the user identification information from among image servers **181** through **184**, connects to the image server via the Internet **170**, and transmits the image file received from the electronic camera **100**, the user identification information and image identification information using Internet protocol. The image server selected from among image servers **181** through **184** by the gateway server **160** has an album (image file storage memory region) corresponding to the user identification information, receives the image file, user identification information and image identification information from the gateway server **160** using Internet protocol, and associates and stores the received image file and image identification information in an album corresponding to the received user identification information.

[0221] If there is no image server that has an album with available capacity corresponding to the user identification information among the image servers **181** through **184**, the gateway server **160** sets up an album corresponding to the user identification information on a new image server using the personal identification data stored in association with the user identification information, and causes the received image file to be stored in that album. Furthermore, the gateway server **160** transmits the image identification information assigned to the image file and the image server identification information of the image server where the image file was stored to the electronic camera **100** using the portable wireless telephone function, and the electronic camera **100** stores the image identification information and image server identification information. Moreover, the gateway server **160** stores the image server identification information of the server where the image file was stored in association with the image identification information.

[0222] Next, the case where the electronic camera **100** receives image data (an image file) from one of the image servers **181** through **184** will be described. First, the electronic camera **100** transmits the image identification information of the image file it wishes to read, the camera identification information and the user identification information by means of the wireless portable telephone function via a wireless portable telephone link **130** to the gateway server **160**. Here, image server identification information for designating an image server **181** through **184** where the image file is stored is not sent.

[0223] Upon receiving the image identification information, camera identification information and user identification information from the electronic camera **100** by means of the wireless portable telephone function, the gateway server **160** specifies the image server where the image file corresponding to the image identification information is stored based on memorized data, connects to that image server via the Internet **170**, and transmits, using Internet protocol, the image identification information and user identification information received from the electronic camera **100**. The image server from among image servers **181** through **184** with that the gateway server **160** established a connection identifies the image file corresponding to the received image identification information from the album corresponding to the user identification information and transmits the image file to the gateway server **160** using Internet protocol. The gateway server **160** transmits the image file received from the image server to the electronic camera **100** using the wireless telephone function, and the electronic camera **100** displays the received image file.

[0224] **FIG. 2** and **FIG. 3** are external views (front view and rear view) of a mode of embodiment of the electronic camera **100** used in an image data transmission system applying the present invention. As shown in **FIG. 2, a** photographic lens **10** for forming a subject image, a finder **11** for confirming the frame, a strobe **12** for illuminating the subject when a photograph is taken, a photometric circuit **13** for detecting the brightness of the subject, and a grip **14** extending from the camera housing for making it easier for the user hold the electronic camera **100** in his or her hands are provided at the front of the electronic camera **100**, and a release button **16** and a power switch **17** for turning the power supply to the electronic camera **100** on and off are provided at the top.

[0225] As shown in **FIG. 3**, the eyepiece of the finder **11**, a left LCD (left screen) **21** comprising a substantially rectangular screen for text and image display, and a right

LCD (right screen) **22** comprising a substantially rectangular screen for text and image display are arranged at the rear of the electronic camera **100**; an UP button **23**, a DOWN button **24**, LEFT button **25**, RIGHT button **26** and SELECT button **27**, used for image switching and the like, are arranged below the right LCD **22**, and a capture mode button **28** for putting the electronic camera **100** into capture mode and a playback mode button **29** for putting the electronic camera **100** into playback mode are arranged below the left LCD **21**. A memory card slot **30** for installing memory cards **77** (removable storage media) used for storing user identification information and thumbnail images is provided at the side.

[**0226**] The release button **16**, UP button **23**, DOWN button **24**, LEFT button **25**, RIGHT button **26**, SELECT button **27**, capture mode button **28** and playback mode button **29** are all control keys operated by the user.

[**0227**] A so-called touch screen **66**, equipped with a function of outputting contact position information corresponding to the position indicated by a finger touch operation is arranged over the left LCD **21** and the right LCD **22**, which can be used for selection of image data and options displayed on the screen. This touch screen **66** is made of a transparent material such as glass or resin, allowing the user to view the image or text formed on the inside of the touch screen **66** through the touch screen **66**.

[**0228**] **FIG. 4** is a block diagram showing an example of the internal electrical configuration of the electronic camera **100** shown in **FIGS. 2 and 3**, whereby the constitutive elements are connected to each other via a data/control bus **51** for transmitting various types of informational data and control data. The various constitutive elements can be roughly divided into a block centered on the capture control circuit **60** that executes image data capture operations, a block of the memory card **77** that stores image files, a block centered on the screen control circuit **92** that executes the display of image data and associated information, and a block centered on the CPU **50**, which performs overall control of the user interface such as the control keys **65** and of the various control circuits.

[**0229**] The CPU **50** (central processing unit) is the means that controls the entire electronic camera **100**, issuing various instructions to the capture control circuit **60**, screen control circuit **92** and power control circuit **64** in accordance with input information from the control keys **65**, touch screen **66**, power switch **17**, timer **74** and photometric circuit **13**. The photometric circuit **13** measures the brightness of the subject and outputs the photometric data that is the result of this measurement to the CPU **50**. The CPU **50** sets the exposure time and sensitivity of the CCD **55** according to the photometric data by means of the CCD drive circuit **56**, and controls the value of the diaphragm **53** by means of the diaphragm control circuit **54** via the capture control circuit **60** in accordance with the data of those settings.

[**0230**] In capture mode, the CPU **50** controls the capture operation via the capture control circuit **60** in accordance with the manipulation of the release button **16**. Furthermore, if the subject is dark based on the photometric data, the CPU **50** causes the strobe **12** to emit light via the strobe drive circuit **73** when taking a picture. The timer **74** has a built-in clock circuit and finds the date and time information corresponding to the current date and time and provides the capture date and time information to the CPU **50** when a picture is taken or makes interrupt processing requests to the CPU **50** at preset intervals. The CPU **50** controls the various units according to a control program stored in ROM **67** (read-only memory). The EEPROM **68** (electrically erasable programmable ROM) is a non-volatile memory that stores settings information, etc. required for the operation of the electronic camera **100**. The RAM **70** is a volatile memory that is used as a temporary working area of the CPU **50**. The CPU **50** detects the state of manipulation of the power switch **17** and controls the power supply **63** via a power supply control circuit **64**.

[**0231**] The capture control circuit **60** performs focusing and zooming of the photographic lens **10** by means of a lens drive circuit **52**, controls the exposure of the CCD **55** by controlling the diaphragm **53** by means of the diaphragm control circuit **54**, and controls the operation of the CCD **55** by means of a CCD control circuit **56**. Light beams from the subject are formed by the photographic lens **10** into a subject image over the CCD **55** after passing through the diaphragm **53** to adjust the amount of light, and this subject image is picked up by the CCD **55**. The CCD **55** (charge coupled device), which comprises a plurality of pixels, is a charge accumulation type image sensor used for picking up a subject image, and outputs electrical image signals corresponding to the strength of the subject image formed on the CCD **55** to an analog processing unit **57** in accordance with drive pulses provided by the CCD drive circuit **56**.

[**0232**] The analog processing unit **57** samples the image signal, which has undergone photoelectric conversion by the CCD **55**, with a specific timing, and amplifies the sampled signal to a specific level. An A/D conversion circuit **58** (analog/digital conversion circuit) digitizes the image signal sampled by the analog processing unit **57**, thereby converting it to digital data, which is temporarily stored in capture buffer memory **59**.

[**0233**] In capture mode, the capture control circuit **60** repeats the operation described above, while the screen control circuit **92** repeats the through-image display operation of reading out the digital data stored successively in the capture buffer memory **59** via the data/control bus **51**, storing it temporarily in the frame memory **69**, converting the digital data into image data for display, storing it again in frame memory **69**, and displaying the image data for display on the left screen **21**. Furthermore, the screen control circuit **92** obtains text display information from the CPU **50** as required, converts it to text data for display and stores it in the frame memory **69**, and displays the text data for display on the left screen **21** and right screen **22**. In this way, in capture mode, the image picked up by the CCD **50** is displayed in real time on the left screen **21**, making it possible to use this through-image as a monitor screen to make the composition settings for taking a picture. The capture control circuit **60** analyzes the extent of the high frequency component of the digital data stored in the capture buffer memory **59** and detects the state of focus adjustment of the photographic lens **10**, and performs focus adjustment of the photographic lens **10** by means of the lens drive circuit **52** in accordance with the detection results.

[**0234**] At the time of release, upon receiving a capture instruction from the CPU **50**, the capture control circuit **60** causes the subject image to be picked up by the CCD **55** via

the CCD drive circuit **56**, passes the image signal generated by the image pickup through analog processor **57** and the AID conversion circuit **58** and temporarily stores it as digital data (raw data) in the capture buffer memory **59**. The capture control circuit **60** converts or compresses the digital data stored temporarily in the capture buffer memory **59** into a specific recording format (JPEG, etc.) to form the image data. The CPU **50** generates thumbnail image data (image data with compressed data volume or scaled-down image information) corresponding to the aforementioned image data and stores it the memory card **77**, as well as generating an image file by appending specific appended informational data to the aforementioned image data. Next, the CPU **50** connects to the gateway server **160** by means of the wireless portable telephone circuit **72** based on gateway server access information stored in the EEPROM **68**, and transmits the aforementioned image file, the camera identification information stored in the EEPROM **68** and the user identification information stored in the memory card **77** to the gateway server **160** by means of the wireless portable telephone circuit **72** through the antenna **76**. Subsequently the CPU **50** receives the image identification information of the image file assigned by the gateway server **160**, and the image server identification information of the image server where the image file was stored, from the gateway **160** by means of the wireless portable telephone circuit **72**, and stores that information in the memory card **77**.

[**0235**] A GPS circuit **61** (global positioning system circuit) detects the location information (longitude data and latitude data) for the electronic camera **100** using information from multiple satellites orbiting around the earth, and provides the capture location information to the CPU **50** at the time of image capture. The CPU **50** appends the capture location information to the image data and stores it in the memory card **77**.

[**0236**] In playback mode, the CPU **50** first reads the thumbnail image data stored in the memory card **77** and stores it temporarily in the frame memory **69**, and displays the thumbnail image data on the left screen **21** by means of the screen control circuit **92**. The CPU **50** next transmits the image identification information corresponding to the thumbnail image data selected by the user, the camera identification information and the user identification information by means of the wireless portable telephone circuit **72** through antenna **76** to the gateway server **160**. Subsequently, the CPU **50** receives the image file corresponding to the image identification information transmitted to the gateway server **160** from the gateway server **160** by means of the wireless portable telephone circuit **72**, temporarily stores the image data contained in the image file in the frame memory **69**, and displays the image data on the left screen **21** by means of the screen control circuit **92**.

[**0237**] **FIG. 5** shows the configuration of the data stored in the memory card **77**. By installing a memory card **77** customized on a per-user basis into the electronic camera **100**, even if the user uses different electronic cameras, it is possible to obtain a usage environment that is no different than if the same electronic camera was used. As shown in **FIG. 5**, the memory card **77** stores the user identification information (ID number or other information for individually identifying users), transmitted image information (information on image files transferred to an image server), and image files stored temporarily due to an impossibility of transfer to an image server. The transmitted image information, as shown in **FIG. 5**, consists of image identification information for transmitted image files (image file names assigned by the gateway server **160**, etc.), thumbnail image data (image data obtained by compressing the volume of the original image data for small screen display) corresponding to the image data, image capture date and time data, image server identification information for identifying the image server where an image file is stored, camera identification information for identifying the electronic camera that captured an image, etc.

[**0238**] **FIG. 6** shows the configuration of data of image files stored on an image server or held temporarily in the memory card **77**. As shown in **FIG. 6**, each image file is made up of image data and appended informational data. The appended informational data consists of image identification information, camera identification information, user identification information, capture data that indicates the various settings at the time of image capture, capture date and time data, and capture location data. **FIG. 7** is a drawing that shows the configuration of information stored in the EEPROM **68**, which consists of camera identification information for identifying the individual electronic camera **100** and gateway server access information used by the electronic camera **100** to access a predetermined gateway server **160** (phone number, etc.).

[**0239**] **FIG. 8** is a block diagram showing the internal configuration of the gateway server **160**, wherein a communication means **371** comprising a wireless portable telephone function, a communication means **372** connected to the Internet, and a memory means **368** that stores various management data information are connected to a control/processing means **350** that performs overall control of the various elements of the gateway server **160**. The gateway server **160** exchanges information such as image files with the electronic camera **100** using a wireless telephone link via the communication means **371**, and exchanges information such as image files with the image server using Internet protocol via the communication means **372**.

[**0240**] Various types of information are held in the memory means **368**, as shown in **FIG. 9**. The camera identification information database contains the camera identification information for all electronic cameras capable of accessing the gateway server **160**. The image server information database contains information relating to image servers to that the gateway server **160** can connect (URLs, conditions of use, etc.) The user identification information database contains user identification information for all users that can use the gateway server **160**. User identification information is registered with the gateway server **160** from a vendor terminal or the like when the electronic camera is purchased.

[**0241**] Furthermore, in the memory means **368**, a folder corresponding to the user identification information is prepared for each user. Each folder contains the personal information data, image server management data and an image identification information list (a list of image identification information for all image files captured by a user). Furthermore, a folder corresponding to user identification information contains separate folders for each item of image identification information corresponding to each of the image files captured by the user, and folders corresponding

to an item of image identification information contain the thumbnail image data that corresponds to the image data corresponding to the item of image identification information, the image server identification information of the image server where the image file corresponding to the item of image identification information is stored, the appended informational data of the image file corresponding to the item of image identification information, etc.

[0242] **FIG. 10** is a diagram showing the configuration of personal information data, which consists of data needed for registering with an image server (name, sex, age, address, email address, profession, password, telephone number, etc.). It may also contain a credit card number or the like for billing for various services offered by the image server. This personal identification data can be modified as necessary from an external personal computer **190** connected to the gateway server **160**. **FIG. 11** is a drawing showing the configuration of image server management data, which consists of a list of image server identification information and information on individual image servers (URL: Uniform Resource Locator, a list of image identification information for image files stored in the album corresponding to the user identification information on the image server in question, total storage capacity of album corresponding to the user identification information on the image server in question, available capacity of album corresponding to the user identification information on the image server in question, and the like).

[0243] **FIG. 12** is a block diagram showing the internal configuration of image servers **181** through **184**, wherein a communication means **471** connected to the Internet and a memory means **468** that stores information such as image data are connected to the control/processing means **450** that performs overall control of the individual elements of image servers **181** through **184**. Image servers **181** through **184** exchange information such as image data with the gateway server **160** via the communication means **471** using Internet protocol. In the memory means **468**, a folder corresponding to each item of user identification information is prepared, as shown in **FIG. 13**, and image files are stored in the folders corresponding to each item of user identification information.

[0244] **FIG. 14** is a state transition diagram for an embodiment of the electronic camera **100** according to the present invention. When power is turned on, the camera enters capture mode, and manipulating the release button **16** causes the camera to perform a capture operation and a post-capture image file creation and image transmission operation, which automatically transfers the image file via the gateway server **160** to an image server **181** through **184**. In playback mode, it performs an image reception operation that downloads image files stored on image servers **181** through **184** via the gateway server **160**, and an image playback operation that plays back and displays those image files. Furthermore, manipulating the capture mode button **28** causes transition from playback mode to capture mode, while manipulating the playback mode button **29** causes transition from capture mode to playback mode.

[0245] **FIG. 15** is a main flow chart of the operation of the electronic camera **100** (CPU **50**) in the mode of embodiment described above. First, in S**10**, the power supply is turned on by manipulating the power switch **17**, and in S**20**, the capture mode subroutine is executed, leading to a capture enabled state. If the release button **16** is manipulated while in capture mode, the release interrupt handling subroutine is executed in S**30**, and the capture operation and image transmission operation are carried out. If the playback mode button **29** is manipulated while in capture mode, the mode switch interrupt handling subroutine is executed in S**40**, the playback mode subroutine is executed in S**50**, and an image file stored on image servers **181** through **184** is read out and played back and displayed on the left screen **21**. Conversely, if the capture mode button **28** is manipulated while in playback mode, a mode switch interrupt handling subroutine is executed in S**40**, and the system moves to the capture mode subroutine of S**20**. The timer interrupt handling subroutine in S**60** is executed based on interrupt requests from the timer **74**, and image transmission operations are performed on the image files stored temporarily in the memory card **77**.

[0246] **FIG. 16** is a detailed flow chart of the capture mode subroutine. Starting in S**30**, S**201** processing is repeated. The image data to be produced is, as shown in **FIG. 17**, displayed on left screen **21**, as per the camera option conditions set by the user, by sequential CCD **55** in S**201**, and the photograph option conditions of that time are displayed in text on right display **22**.

[0247] **FIG. 18** is a detailed flow chart of the release interrupt handling mode subroutine. Starting in S**30**, it is checked whether the system is in capture mode in S**310**, and if it is not in capture mode, the system returns in S**309**. If it is in capture mode, the capture operation is executed in S**302** under the capture conditions set by the user or the camera to generate image data, and appended informational data (camera identification information, user identification information, capture data, time data, location data, etc.) is appended to the image data in S**303** to generate an image file. In S**304**, transmitted image information (thumbnail image data, etc.) is generated and stored in the memory card **77**. In S**305**, a connection to the gateway server **160** is attempted using the wireless portable telephone circuit **72** and a check is made as to whether communication is possible. If communication with the gateway server **160** is not possible, the image file is temporarily stored in the memory card **77** and the subroutine returns in S**309**. If communication with the gateway server **160** is possible, the image file, camera identification information, user identification information and a transmission request are transmitted to the gateway server **160** using the wireless portable telephone circuit **72** in S**307**. In S**308**, the image identification information corresponding to the image file and the image identification information of the image server where the image file was stored, transmitted from the gateway server **160**, are received, the transmitted image information stored in the memory card **77** is updated based on this received information, and the subroutine returns in S**309**.

[0248] **FIG. 19** is a detailed flow chart of the mode switch interrupt handling subroutine. Starting in S**40** upon manipulation of the capture mode button **28** or playback mode button **29**, it is checked in S**401** whether the manipulated button was the capture mode button **28**, and if it was the capture mode button **28**, playback mode is terminated and the system moves to the capture mode subroutine of S**20**. If the manipulated button was not the capture mode button **28**,

the capture mode is terminated and the system moves to the playback mode subroutine of S**50**.

[**0249**] **FIG. 20** is detailed flow chart of the playback mode subroutine. Starting in S**50**, the thumbnail images stored in the memory card **77** are displayed on the left screen **21** as shown in **FIG. 21**, and operating instructions are displayed on the right screen **22**. The user scrolls the thumbnail images displayed on the left screen **21** using the UP button **23** and DOWN button **24**, selects the thumbnail image he wishes to playback and display using the touch panel **66**, and confirms the selection with the SELECT button **27**. In S**502**, it is checked whether the image file corresponding to the thumbnail image selected by the user is temporarily stored in the memory card **77**, and if it is being temporarily stored there, the image file is read from the memory card **77** in S**503** and is played back and displayed on the left screen **21**, and the subroutine proceeds to S**509**. If the image file corresponding to the thumbnail image selected by the user is not being temporarily stored in the memory card **77**, a connection to the gateway server **160** is attempted using the wireless portable telephone circuit **72** in S**504**, checking if communication is possible, and if communication with the gateway server **160** is not possible, a warning to the effect that communication is not possible is displayed on the left screen **21**, and the subroutine proceeds to S**509**. If communication with the gateway server **160** is possible, the image identification information corresponding to the thumbnail image selected by the user, the camera identification information, user identification information and a reception request are transmitted to the gateway server **160** using the wireless portable telephone circuit **72**. In S**507**, the image file selected by the user is received from the gateway server **160**. In S**508**, the received image data is displayed on the left screen **21** as shown in **FIG. 22** and the appended informational data for the image data is displayed on the right screen **22**, and the subroutine proceeds to S**509**. In S**509**, the subroutine waits for the user to manipulate the UP button **23** or DOWN button **24**, and returns to the thumbnail image display of S**501** when a button is manipulated.

[**0250**] **FIG. 23** is a detailed flow chart of the timer interrupt handling subroutine. Starting in S**60**, it is checked in S**601** whether there are image files temporarily stored in the memory card **77**, and if there are none, the subroutine returns in S**605**. If there are image files being temporarily stored, in S**602**, connection to the gateway server **160** is attempted using the wireless portable telephone circuit **72**, checking if communication is possible, and if communication with the gateway server **160** is not possible, the subroutine returns in S**605**. If communication with the gateway server **160** is possible, the image files stored temporarily in the memory card **77**, the camera identification information, user identification information and a transmission request are transmitted to the gateway server **160** using the wireless portable telephone circuit **72** in S**603**. In S**604**, the image identification information corresponding to the image files and the image identification information of the image server where the image files were stored, transmitted from the gateway server **160**, are received, the transmitted image information stored in the memory card **77** is updated based on this received information, and the subroutine returns in S**309**.

[**0251**] Next, the operation of the gateway server **160** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the gateway server **160** other than the image relaying operation will be omitted as they have little bearing on the present invention. **FIG. 24** is a detailed flow chart of the communication interrupt handling started when the gateway server **160** performs image relaying. Starting in G**10** with a communication request from the electronic camera **100**, in G**101**, it is checked whether the received camera identification information is present in the camera identification information database, and if it is not present, the subroutine returns in G**105**. If it is present, it is checked in G**102** whether the received user identification information is present in the user identification information database, and if it is not present, the subroutine returns in G**105**. If it is present, it is checked in G**103** whether the received request is an image file transmission request, and if it was an image file transmission request, the image write handling subroutine of G**20** is executed and the system returns in G**105**. If it was not an image file transmission request, it is checked in G**104** whether the received request is an image file reception request, and if it was an image file reception request, the image read handling subroutine is executed and the system returns in G**105**. If it was not an image file reception request, the system returns in G**105**.

[**0252**] **FIG. 25** is a detailed flow chart of the image write handling of the gateway server **160**. Starting in G**20**, image identification information is assigned to the received image file in G**201**. Here, image identification information conflicts can be avoided by having the gateway server **160** assign image identification information that is different from any image identification information stored in the image identification information list corresponding to the received user identification information. In G**202**, it is checked whether there is an image server with available capacity based on the image server management data corresponding to the received user identification information, and if there is an image server with available capacity, the system proceeds to G**204**, while if there is no image server with available capacity, a new image server with available capacity is searched for in G**203**. In G**203**, a search is conducted for open image servers on the Internet that allow image file storage, registration with the image server that is found is performed automatically using the user identification information and personal information data stored in association with the user identification information, and information on the image server in question (storage capacity, etc.) is entered into the image server management data. In G**204**, an image server with available capacity is designated as the image server to be used for image storage. In G**205**, the image file received from the electronic camera **100**, the user identification information and an image write request are transmitted using Internet protocol to the image server designated as the image server to be used for image storage, and in G**206**, the image server management data and image identification information list in the folder corresponding to the user identification information is updated, and data (thumbnail image, etc.) is generated in the folder corresponding to the image identification information. In G**207**, the image file that was transmitted to the image server is deleted, the image identification information assigned to the image file and the image server identification information of the image server where the image file was stored are transmitted to the electronic camera **100**, and the subroutine returns in G**208**.

[0253] **FIG. 26** is a detailed flow chart of the image read handling of the gateway server **160**. Starting in G**30**, it is checked in G**301** whether the received image identification information is present in the image identification information list in the folder corresponding to the received user identification information, and if it is not present, the system returns in G**306**. If it is present, in G**302**, the image server where the image file corresponding to the received image identification information is stored is identified based on the image server identification information in the folder corresponding to the received image identification information. In G**303**, the image identification information, user identification information and an image read request are transmitted to the image server in question using Internet protocol, and in G**304**, the image file corresponding to the image identification information transmitted by the image server is received. In G**305**, the image file received from the image server is transmitted to the electronic camera **100**, and the systems returns in G**306**.

[0254] Next, the operation of the image servers **181** through **184** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the image servers **181** through **184** other than the image transmission and storage operation will be omitted as it has little bearing on the present invention. **FIG. 27** is a detailed flow chart of the communication interrupt handling started when a communication request is received by the image servers **181** through **184** from the gateway server **160**. Starting in H**60** upon receiving a communication request from the gateway server **160**, it is checked in H**601** whether the received request is an image server registration request, and if it was a registration request, it is checked in H**602** whether a folder corresponding to the received user identification information exists, and if it already exists, the system returns in H**611**. If no folder corresponding to the received user identification information exists, in H**603**, the registration procedure is carried out based on the received user identification information and personal information data, a folder (album) corresponding to the user identification information is created, and the system returns in H**611**.

[0255] If the request received in H**601** is not an image server registration request, it is checked in H**604** whether the received request is an image read request, and if it was an image read request, it is checked in H**605** whether a folder (album) corresponding to the received user identification information exists, and if it does not exist, the system returns in H**611**. If a folder corresponding to the received user identification information exists, it is checked in H**606** whether an image file corresponding to the received image identification information exists in the folder, and if it does not exist, the system returns in H**611**. If an image file corresponding to the received image identification information exists, the image file in question is transmitted to the gateway server **160** using Internet protocol in H**607**, and the system returns in H**611**. If the received request in H**604** is not an image read request to the image server, it is checked in H**608** whether the received request is an image write request, and if it was not an image write request, the system returns in H**611**. If it was an image write request, it is checked in H**609** whether a folder corresponding to the received user identification information exists, and if it does not exists, the system returns in H**611**. If a folder corresponding to the received user identification information exists, the received image file is stored in the folder in H**610**, and the system returns in H**611**.

[0256] In the mode of embodiment described above (**FIG. 1** through **FIG. 27**), the selection of an image server that has an album with available capacity corresponding to the user identification information for storing an image file, the registration with an image server for setting up an album corresponding to the user identification information and the image file read and write operations in relation to the image server using Internet protocol are performed automatically, without human intervention, by the gateway server **160** positioned between the electronic camera **100** and the image servers **181** through **184** that store the image files, which makes it possible to transmit image files captured by the electronic camera **100** to the image server in a reliable and rapid manner, as well as allowing users with no knowledge of such image transmission systems to simply use this image transmission system and letting the user focus on taking pictures with the electronic camera **100**.

[0257] In the above mode of embodiment (**FIG. 1** through **FIG. 27**), the gateway server **160** positioned between the electronic camera **100** and the image servers **181** through **184** that store the image data assigns image identification information to identify individual image files transmitted from the electronic camera **100** and returns the image identification information to the electronic camera, so even if image files captured by the same user using different electronic cameras are transmitted to the gateway server **160**, no duplication of image identification information will occur, and confusion of the image transmission system due to duplication of image identification information can be avoided.

[0258] In the above mode of embodiment (**FIG. 1** through **FIG. 27**), the user identification information for identifying individual users is stored in the memory card **77**, and the user is identified to the electronic camera **100** by installing the memory card **77**, so even if the user uses multiple electronic cameras, the user can be reliably identified to the electronic camera **100** without any bothersome effort, and no confusion is caused by multiple users sharing the same electronic camera. Furthermore, since information on transmitted image files (thumbnail image data, identification information of the image server where the images are stored, image identification information, etc.) is stored in the memory card **77**, when downloading and browsing image files that have been stored on an image server, the desired image files can be quickly specified from the electronic camera by displaying and selecting thumbnail images.

[0259] In the above mode of embodiment (**FIG. 1** through **FIG. 27**), the electronic camera **100** transmits all the captured image files to the gateway server **160** immediately after they are captured and deletes them after transmission is completed, so there is no need to provide high capacity built-in memory for storing many image files, making it possible to build the electronic camera **100** inexpensively. Furthermore, the electronic camera **100** temporarily stores image files that could not be transmitted to the gateway server **160** for reasons such as being out of communication range, and such temporarily stored image files are automatically transmitted to the gateway server **160** under specific startup conditions (e.g., specific time intervals or a specific clock time or the wireless portable telephone link congestion

status), making it possible to prevent cases of forgetting to transmit, and by appropriately setting the startup conditions (for instance, startup in an early time period or startup upon detecting that the data transmission rate of the wireless portable telephone link is at or above a specific value), the transmission of image files between the electronic camera **100** and gateway server **160** can be carried out quickly, making it possible to reduce communication charges.

[**0260**] (Description of modified embodiments) The present invention is not limited to the mode of embodiment described above, and various modifications and changes are possible.

[**0261**] While in the above mode of embodiment (**FIG. 1** through **FIG. 27**), the electronic camera **100** and gateway server **160** perform image transfer directly, it is likewise permissible to connect the electronic camera **100** to a portable telephone terminal and perform transmission of image data between the electronic camera **100** and gateway server **160** via the portable telephone terminal. Doing this makes it unnecessary to provide a wireless portable telephone function in the electronic camera **100**, allowing the electronic camera **100** to be made smaller and cheaper. Furthermore, one may provide a memory card slot in the portable telephone terminal and store the user identification information, transmitted image information and temporarily stored image files on a card installed in that slot. Doing this makes it unnecessary to provide a memory card installation mechanism or memory card read and write software in the electronic camera **100**, allowing the electronic camera **100** to be made smaller and less expensive. Furthermore, by using the telephone number of the portable telephone terminal employed by the user instead of the user identification information, it is possible to do without the effort of registering user identification information and avoid duplication of user identification information. Furthermore, it is possible to talk using the wireless portable telephone function of the electronic camera **100**, in that case the electronic camera **100** can be configured as a portable telephone with a camera.

[**0262**] While in the above mode of embodiment (**FIG. 1** through **FIG. 27**), the gateway server **160** stored image files on an image server whenever it received an image file from the electronic camera **100**, it is also possible to have the gateway server **160** temporarily accumulate image files received from the electronic camera **100**, and transmit and store the accumulated image files on an image server with a specific timing (specific frequency, specific times, when accumulated data volume reaches a specific value, upon receiving an external transmission instruction, etc.).

[**0263**] For example, when transmitting image files captured with a series of capture operations (continuous capture or continuous shutter, bracket capture, panorama capture, etc.) by the electronic camera **100** from the electronic camera **100** to an image server, the image transfer may be performed by the scheme shown in **FIG. 28**. Here, continuous capture refers to continuously photographing the same subject at specific time intervals while tracking its movement; bracket capture refers to taking multiple photographs of the same subject while varying the capture conditions, such as exposure; and panorama capture refers to photographing a landscape or the like while shifting the capture direction by a certain amount each time. Namely, for each capture operation, the electronic camera **100** appends identification information to image files captured in series to the effect that this image is part of a series, and transmits it to the gateway server **160**. The gateway server **160** temporarily stores image files with appended identification information indicating that it is part of a series of images in an image buffer folder in memory **268**. Once the series of image captures is completed, the electronic camera **100** transmits information to the gateway server **160** indicating that the series of image captures has been completed, and upon receiving that information, the gateway server **160** does a batch transmission of the series of image files stored temporarily in the image buffer folder to the same image server over the Internet and stores them there. Doing this makes it possible to transmit multiple image files between the gateway server **160** and image server with a single transmission procedure, allowing the transmission time to be shortened and allowing the image transmission processing load of the gateway server **160** and image servers **181** through **184** to be reduced. Furthermore, storing image files captured in a series on the same image server makes it highly convenient when the user later connects directly to the image server **181** through **184**, with a personal computer or the like, to use the series of image data. Furthermore, during the serial image capture, the electronic camera **100** just transmits image files to the gateway server **160** one-sidedly, without waiting to receive information from the gateway server **160**, allowing the electronic camera **100** to perform the series of capture operations freely with a timing appropriate for the series of captures.

[**0264**] Instead of transmitting information indicating that a series of captures has been completed from the electronic camera **100** to the gateway server **160**, is also permissible to transmit to the gateway server **160**, from a personal computer or portable telephone terminal connected to the gateway server **160**, an instruction to transmit a series of image files accumulated on the gateway server **160** together to an image server, in response to that instruction, the gateway server **160** will transmit the series of image files accumulated on the gateway server **160** together to an image server.

[**0265**] Furthermore, when transmitting image files captured in a series from the electronic camera **100** to the gateway server **160**, if an image file is transmitted from the electronic camera **100** to the gateway server **160** after every capture, the communication time will become longer due to the overhead for establishing communication and the additional information, and there are cases where, during this time, the picture-taking conditions will change or where the pictures cannot be taken at the planned time intervals. In such cases, one can optionally have the electronic camera **100** store the series of captured image files in RAM **70**, and once the series of captures is completed, transmit the series of image files with added identification information indicating that it is as series of images, together with information indicating that the series of captures has been completed, in a batch to the gateway server **160**. Furthermore, when image files are transmitted from the electronic camera **100** to the gateway server **160** via a portable telephone terminal, one can optionally have the image files captures in a series be transmitted from the electronic camera **100** to the portable telephone terminal each time an image is captured and store them temporarily in the portable telephone terminal's built-in memory, and once the electronic camera **100** has completed the series of captures, transmit information indicating that the series of captures has been completed to the portable

telephone terminal, in response to that the portable telephone terminal will transmit the series of image files, with added identification information indicating that this is a series of images, in a batch to the gateway server **160**. Doing this makes it possible for the electronic camera **100** to perform a series of captures under the desired capture conditions and timing without affecting the image file transmission speed or the like.

[**0266**] Furthermore, one can for instance have the gateway server **160** buffer image files received from the electronic camera **100** in an image buffer folder in the memory means **168**, and deliver the image files buffered in the image buffer folder to the image server based on an external instruction. **FIG. 29** is a drawing that shows the image transmission processing for such a scheme. Multiple image files are transmitted from the electronic camera **100** to the gateway server **160**, and are stored temporarily in an image buffer folder on the gateway server **160** corresponding to the user identification information. Thereafter, a personal computer **160** connects to the gateway server **160** and transmits the user identification information, the identification information of the image server to that the images are to be transferred, and an image transfer request to the gateway server **160**. In response to the received user identification information, the gateway server **160** transmits the image files stored temporarily in the image buffer folder in a batch to the image server corresponding to the received image server identification information. Doing this makes it possible for the user to transmit and store image data captured with the electronic camera **100** from the gateway server **160** at a convenient time to a suitable image server.

[**0267**] In the above mode of embodiment (**FIG. 29**), the gateway server **160** buffered image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmitted the image files buffered in the image buffer folder together to the image server based on an external instruction; however, the gateway server **160** may also transmit accumulated image files to the image server by the following method. For example, the image files may be transmitted to the image server when the total data volume of the image files stored temporarily on the gateway server **160** exceeds a certain volume. Alternatively, the gateway server **160** may transmit image files to the image server once they have been accumulated for a set period or time, based on the date and time data of the start of storage of the image files in the image buffer folder. Alternatively, the gateway server **160** can transmit accumulated image files to the image server at specific clock times.

[**0268**] While in the above mode of embodiment (**FIG. 1** through **FIG. 27**), the gateway server **160** performed management of the electronic camera based on camera identification information received form the electronic camera **100**, it is also possible to use general identification information instead of camera identification information for individually identifying multiple electronic cameras **100**. For example, using the next generation version of the IP protocol, IPV6 (Internet Protocol Version 6), the use of that on the Internet is planned, as the identification information, would make it possible for all electronic devices that handle images, besides electronic cameras, to make use of the image transmission system according to the present invention. Namely, IPV6 provides a 32-bit address space (on order of 10 to the 9th power), so there is no concern of running out of addresses, which makes it possible for one device to have multiple addresses depending on the application, as well as eliminating the risk of duplication of camera identification information and further increasing the utility of the image transmission system according to the present invention.

[**0269**] While in the above mode of embodiment (**FIG. 1** through **FIG. 27**), the user identified himself to the image transmission system by installing a memory card **77** with user identification information written therein into the electronic camera **100**, it is possible to identify the user to the image transmission system by other methods as well.

[**0270**] For example, one can provide a password input means on the electronic camera side and identify the user to the image transmission system based on the password inputted by the user. Furthermore, instead of password input, one can provide user identification means (fingerprint detection means, iris pattern detection means, facial image detection means, etc.) on the electronic camera side and have the electronic camera automatically perform user identification without manual intervention by the user and identify the user to the image transmission system. Doing this makes it possible to automatically identify the user of the electronic camera, which eliminates the effort of inputting passwords or the operation of installing a memory card storing personal information data, and makes it possible to resolve the problem of forgotten passwords and memory card theft.

[**0271**] As described above, in the image transmission system according to the present invention, the image relay apparatus (gateway server), which is positioned between the electronic image device (electronic camera) and the image storage device (image server) that stores image data, automatically performs bothersome procedures and operations, such as selection of image storage device, registration with an image storage device, operations for writing and reading image data to and from the image storage device, etc., on behalf of the user, which makes it possible for the electronic image device and the user of the electronic image device to efficiently, reliably, quickly and easily process image data without being aware of the image storage device or of the bothersome procedures and operation relating to the image storage device. As a result, the application of such an image transmission system to image services aimed at general users unaccustomed to handling image data can be expected to have a substantial affect of promoting adoption.

[**0272**] 2:

[**0273**] **FIG. 31** is a conceptual drawing of an image data transmission system applying the present invention. First, the case of transmitting image data from the electronic camera **100** to the image servers **181** through **184** will be described. The electronic camera **100** generates image data through capture operations. When transmitting the image data to external image servers **181** through **184**, the electronic camera **100** connects to a portable telephone **120**. The connection between the electronic camera **100** and the portable telephone **120** is made by means of a short-range communication link **110** (e.g., Bluetooth protocol based short-range wireless communication, short-range wired communication based on a cable connection-specific protocol, IEEE 802.11 protocol based wireless LAN communication, short-range infrared communication using the IrDA protocol, etc.). The electronic camera **100** selects the image data to transmit, displays the image data on the screen **21** and

transmits it to the portable telephone **120**. Since the electronic camera **100** and the portable telephone **120** are used by the user simultaneously, it suffices for the local wireless communication range to be on the order of several meters, which allows the power load on the electronic camera **100** and portable telephone **120** due to short-range wireless communication to be reduced.

[**0274**] The portable telephone **120** is provided with a short-range communication function for communicating with the aforementioned electronic camera **100** and a long-range communication function using a wireless portable telephone link **130**, whereby the long-range communication function using the wireless portable telephone link **130** allows both conventional talk functions and packet communication protocol based digital data communication functions to be executed. The portable telephone **120** temporarily stores image data received from the electronic camera **100** via the short-range communication link **110** in an internal memory. Next, the portable telephone **120** sends the stored image data using a packet communication protocol via the wireless portable telephone link **130** to a base station **140**. While transmitting image data to the base station **140**, the portable telephone **120** displays the image data being transmitted on a screen **221**.

[**0275**] The base station **140** transmits the image data, received from the portable telephone **120** using a packet communication protocol via the wireless portable telephone link **130**, to a gateway server **160** via a packet communication network **150** using a packet communication protocol. The gateway server **160** stores the image data received using a packet communication protocol via the packet communication network **150** for a time in an internal memory, and transmits the stored image data at specific intervals using Internet protocol via the Internet **170** to image servers **181** through **184**. The gateway server **160** keeps thumbnail image data (scaled-down image data obtained by compressing and reducing the data volume of the original image data) corresponding to the image data transmitted to the image servers in an internal memory. Image servers **181** through **184** store the image data received using Internet protocol via the Internet **170** in a high capacity memory.

[**0276**] When transmitting image data from the electronic camera **100** to an image server, there is no need to perform the transmission with awareness of the complicated connection and communication procedures for accessing the image server on the electronic camera **100** side; rather, on the electronic camera **100** side, it suffices to append fixed address information for specifying the gateway server **160** and camera identification information for identifying the electronic camera **100** to the image data to be transmitted, and pass it on to the portable telephone **120**. The portable telephone **120** transmits the image data and camera identification information by packet communication to the designated gateway server **160** based on the received gateway server address information. The gateway server **160** manages the image data according to the camera identification information received via packet communication, and transmits the image data to a suitable image server among multiple image servers **181** through **184** on the Internet using Internet protocol. The multiple image servers **181** through **184** are treated as a single virtual image server **180** from the viewpoint of the electronic camera, and the complicated procedures for accessing each image server on the Internet are all performed by the gateway server **150**.

[**0277**] Next, the case where the electronic camera **100** receives image data from the virtual image server **180** will be described. First, the electronic camera **100** is connected to the portable telephone **120** using the short-range communication link **110**. The electronic camera **100** transmits a browse data request, camera identification information and gateway server **160** address information to the portable telephone **120**. Next, the portable telephone **120** transmits the browse data request and camera identification information via the base station **140** using packet communication protocol to the designated gateway server **160** based on the received gateway server **160** address information. Upon receiving the browse data request and camera identification information, the gateway server **160**, based on the camera identification information, transmits the thumbnail image data (browse data) for the image data stored on the virtual server **180** via the base station **140** using packet communication protocol to the portable telephone **120** that transmitted the browse data request. The portable telephone **120** transmits the received browse data over the short-range communication link **110** to the electronic camera **100**.

[**0278**] The electronic camera **100** displays the received browse data (thumbnail image data) on the screen **21**, from that the desired image is selected. The electronic camera **100** transmits a request for the selected image data along with image identification information (image file name, etc.) for the image data, camera identification information and gateway server **160** address information over the short-range communication link **110** to the portable telephone **120**. Next, the portable telephone **120**, based on the received gateway server **160** address information, transmits the image data request, image identification information and camera identification information via the base station **140** using packet communication protocol to the designated gateway server **160**. Upon receiving the image data request, image identification information and camera identification information, the gateway server **160** specifies the image data stored on the virtual server **180** according to the camera identification information and image identification information, and transmits the image data request and image identification information using Internet protocol to the image server **181** through **184** on the Internet **170** that is storing the image data in question.

[**0279**] The image server that receives the image data request and image identification information transmits the image data corresponding to the image identification information using Internet protocol to the gateway server **160**. Upon receiving the image data, the gateway server **160** transmits that image data via the base station **140** using packet communication protocol to the portable telephone **120** that transmitted the image data request. The gateway server **160** temporarily stores the image data received from the image server in an internal memory. The portable telephone **120** transmits the received image data over the short-range communication link **110** to the electronic camera **100**. The electronic camera **100** displays the received image data on the screen **21**.

[**0280**] The gateway server **160** can also be connected from a user's personal computer **190** via the Internet **170**, and the user can read and use image data from the virtual

server **180** via the gateway server **160** on a personal computer **190**, and can modify the settings of the gateway server **160**.

[**0281**] **FIG. 32** and **FIG. 33** are an external view (front view and rear view) of an embodiment of the electronic camera **100** used in an image data transmission system applying the present invention. As shown in **FIG. 32, a** photographic lens **10** for forming a subject image, a finder **11** for confirming the frame, a strobe **12** for illuminating the subject when a photograph is taken, a photometric circuit for detecting the brightness of the subject, and a grip **14** extending from the camera housing for making it easier for the user hold the electronic camera **100** in his or her hands are provided at the front of the electronic camera **100**, and a release button **16** and a power switch **17** for turning the power supply to the electronic camera **100** on and off are provided at the top.

[**0282**] As shown in **FIG. 33**, the eyepiece of the finder **11**, a left LCD (left screen) **21** comprising a substantially rectangular screen for text and image display, and a right LCD (right screen) **22** comprising a substantially rectangular screen for text and image display are arranged at the rear of the electronic camera **100**; an UP button **23**, a DOWN button **24**, LEFT button **25**, RIGHT button **26** and SELECT button **27**, used for image searching, are arranged below the right LCD **22**, and a capture mode button **28** for putting the electronic camera **100** into capture mode and a playback mode button **29** for putting the electronic camera **100** into playback mode, a transmit button **31** for controlling image data transmission, and a receive button **32** for controlling image data reception are arranged below the left LCD **21**. A memory card slot **30** for installing a memory card **77** used for image data is provided at the side.

[**0283**] The release button **16**, UP button **23**, DOWN button **24**, LEFT button **25**, RIGHT button **26**, SELECT button **27**, capture mode button **28**, playback mode button **29**, transmit button **31** and receive button **32** are all control keys operated by the user.

[**0284**] A so-called touch screen **66**, equipped with a function of outputting contact position data corresponding to the position indicated by a finger touch operation is arranged over the left LCD **21** and the right LCD **22**, which can be used for selection of image data and options displayed on the screen. This touch screen **66** is made of a transparent material such as glass or resin, allowing the user to view the image or text formed on the inside of the touch screen **66** through the touch screen **66**.

[**0285**] **FIG. 34** is a block diagram showing an example of the electric configuration of the internal part of the electronic camera **100** shown in **FIGS. 32 and 33**, whereby the constitutive elements are connected to each other via a data/control bus **51** for transmitting various types of informational data and control data. The various constitutive elements can be roughly divided into a block centered on the capture control circuit **60** that executes image data capture operations, a block of the memory card **77** that stores image files, a block centered on the screen control circuit **92** that executes the display of image data and associated information, and a block centered on the CPU **50**, which performs overall control of the user interface such as the control keys **65** and of the various control circuits.

[**0286**] The CPU **50** (central processing unit) is the means that controls the entire electronic camera **100**, issuing various instructions to the capture control circuit **60**, screen control circuit **92** and power control circuit **64** in accordance with input information from the control keys **65**, touch screen **66**, power switch **17**, timer **74** and photometric circuit **13**. The photometric circuit **13** measures the brightness of the subject and outputs the photometric data that is the result of this measurement to the CPU **50**. The CPU **50** sets the exposure time and sensitivity of the CCD **55** according to the photometric data by means of the CCD drive circuit **56**, and controls the value of the diaphragm **53** by means of the diaphragm control circuit **54** via the capture control circuit **60** in accordance with the data of those settings.

[**0287**] In capture mode, the CPU **50** controls the capture operation via the capture control circuit **60** in accordance the manipulation of the release button **16**. Furthermore, if the subject is dark based on the photometric data, the CPU **50** causes the strobe **12** to emit light via the strobe drive circuit **73** when taking a picture. The timer **74** has a built-in clock circuit and finds the date and time information corresponding to the current date and time and provides the capture date and time information to the CPU **50** when a picture is taken. The CPU **50** appends the capture date and time information to the image data and stores it in the memory card **77**. The CPU **50** controls the various units according to a control program stored in ROM **67** (read-only memory). The EEPROM **68** (electrically erasable programmable ROM) is a non-volatile memory that stores settings information, etc. required for the operation of the electronic camera **100**. The RAM **70** is a volatile memory that is used as a temporary working area of the CPU **50**. The CPU **50** detects the manipulation state of the power switch **17** and controls the power supply **63** via a power supply control circuit **64**.

[**0288**] The capture control circuit **60** performs focusing and zooming of the photographic lens **10** by means of a lens drive circuit **52**, controls the exposure of the CCD **55** by controlling the diaphragm **53** by means of the diaphragm control circuit **54**, and controls the operation of the CCD **55** by means of a CCD control circuit **56**. Light beams from the subject are formed by the photographic lens **10** into a subject image over the CCD **55** after passing through the diaphragm **53** to adjust the amount of light, and this subject image is picked up by the CCD **55**. The CCD **55** (charge coupled device), which comprises a plurality of pixels, is a charge accumulation type image sensor used for picking up a subject image, and outputs electrical image signals corresponding to the strength of the subject image formed on the CCD **55** to an analog processing unit **57** in accordance with drive pulses provided by the CCD drive circuit **56**.

[**0289**] The analog processing unit **57** samples the image signal, which has undergone photoelectric conversion by the CCD **55**, with a specific timing, and amplifies the sampled signal to a specific level. An A/D conversion circuit **58** (analog/digital conversion circuit) digitizes the image signal sampled by the analog processing unit **57**, thereby converting it to digital data, which is temporarily stored in capture buffer memory **59**.

[**0290**] In capture mode, the capture control circuit **60** repeats the operation described above, while the screen control circuit **92** repeats the through-image display operation of reading out the digital data stored successively in the capture buffer memory **59** via the data/control bus **51**, storing it temporarily in the frame memory **69**, converting

the digital data into image data for display, storing it again in frame memory **69**, and displaying the image data for display on the left screen **21**. Furthermore, the screen control circuit **92** obtains text display information from the CPU **50** as required, converts it to text data for display and stores it in the frame memory **69**, and displays the text data for display on the left screen **21** and right screen **22**. In this way, in capture mode, the image picked up by the CCD **50** is displayed in real time on the left screen **21**, making it possible to use this through-image as a monitor screen to make the composition settings for taking a picture. The capture control circuit **60** analyzes the extent of the high frequency component of the digital data stored in the capture buffer memory **59** and detects the state of focus adjustment of the photographic lens **10**, and performs focus adjustment of the photographic lens **10** by means of the lens drive circuit **52** in accordance with the detection results.

[**0291**] At the time of release, upon receiving a capture instruction from the CPU **50**, the capture control circuit **60** causes the subject image to be picked up by the CCD **55** via the CCD drive circuit **56**, passes the image signal generated by the image pickup through the A/D conversion circuit **58** and temporarily stores it as digital data (raw data) in the capture buffer memory **59**. The capture control circuit **60** converts or compresses the digital data stored temporarily in the capture buffer memory **59** into a specific recording format (JPEG, etc.) to form the image data, and stores the image data on the memory card **77**.

[**0292**] A GPS circuit **61** (global positioning system circuit) detects the location information (longitude data and latitude data) for the electronic camera **100** using information from multiple satellites orbiting around the earth, and provides the capture location information to the CPU **50** at the time of image capture. The CPU **50** appends the capture location information to the image data and stores it in the memory card **77**.

[**0293**] The CPU **50** can transmit the image data stored in the memory card **77** to the outside via the short-range wireless communication circuit **72** and the antenna **76**, or conversely store image data received from the outside via the short-range wireless communication circuit **72** and the antenna **76** in the memory card **77** and display it on the left screen **21**, as required.

[**0294**] In playback mode, the screen control circuit **92** reads out the image data indicated by the CPU **50** from the memory card **77** and places it temporarily into the frame memory **69**, displays the image data on the left screen **21**, and, following the instructions of the CPU **50**, places text data such as playback mode instructions into the frame memory **69** and displays the text data on the right screen **22**.

[**0295**] Moreover, if transmit button **31** is used in the playback mode, the data displayed on left screen **21** is transmitted to the outside via short-range wireless communication circuit **72** and antenna **76**, while if receive button **32** is pressed, data is received from the outside via short-range wireless communication circuit **72** and antenna **76** and the image data is played on left screen **21**.

[**0296**] **FIG. 35** shows the data configuration of image files stored in the memory card **77**. As shown in **FIG. 35**, multiple image files are stored in the memory card **77**. Each image file is made up of image data and appended informational data. The appended informational data consists of capture data that indicates the various settings at the time of image capture, capture date and time data, and capture location data. **FIG. 36** is a drawing that shows the configuration of information stored in the EEPROM **68**, which consists of camera identification information for identifying the individual electronic camera **100** and gateway server access information used by the portable telephone **120** to access the gateway server **160**.

[**0297**] **FIG. 37** is an external view of the portable telephone **120**, which is provided with a display screen **221** for displaying image data, various control keys **265**, a microphone **280** and a speaker **281**. **FIG. 38** is a block diagram showing an example of the internal electrical configuration of the portable telephone **120**, wherein the various elements are connected to each other via a data/control bus **251** for transmitting various types of informational data and control data. The CPU **250** (central processing unit) is the means that performs overall control of the entire portable telephone **120**, issuing various instructions to the screen control circuit **292** and power supply control circuit **264** in accordance with input information from the control keys **265**, power switch **217** and timer **274**.

[**0298**] The CPU **250** controls the various units in accordance with a control program stored in ROM **267** (read-only memory). The EEPROM **268** (electrically erasable programmable ROM) is a non-volatile memory that is used for storing of settings information necessary for the operation of the portable telephone **120** and for temporary storage of image data. The RAM **270** is a volatile memory that is used as a temporary working area of the CPU **250**. The UIM (User Identity Module) is a portable storage medium that can be installed in and removed from the portable telephone **120** and that stores personal information of the user of the portable telephone **120** and the like, which personal information can be used by the CPU **250** as required. The CPU **250** detects the state of manipulation of the power switch **217**, and controls the power supply **263** via the power supply control circuit **264**.

[**0299**] The CPU **250** performs processing of outgoing and incoming telephone calls using the wireless portable telephone circuit **271** and antenna **275**, and performs telephone conversion processing using the microphone **280** and speaker **281**. Furthermore, the CPU **250** performs exchange of digital data with the outside by means of packet communication protocol using the wireless portable telephone circuit **271** and antenna **275**. Moreover, the CPU **250** performs exchange of messages with electronic devices having a short-range wireless communication capability that are in the vicinity of the portable telephone **120** via the short-range wireless communication circuit **272** and the antenna **276**, and is able to exchange image information and the like. The CPU **250** reads and loads image data stored temporarily in EEPROM **268** into frame memory **269**, and displays the image data on the display screen **221** using the screen control circuit **92**.

[**0300**] **FIG. 39** is a block diagram showing the internal configuration of the gateway server **160**, wherein a communication means **371** connected to a packet communication network, a communication means **372** connected to the Internet, a memory means **368** that stores various information such as image data, and a timer means **374** are con-

nected to a control/processing means **350** that performs overall control of the various elements of the gateway server **160**. The gateway server **160** exchanges information such as image data with the portable telephone **120** using a packet communication protocol via the communication means **371**, and exchanges information such as image data with image servers using Internet protocol via the communication means **372**.

[**0301**] Various types of information are held in the memory means **368**, as shown in **FIG. 40**. The camera identification information link data, as shown in **FIG. 41**, is data that indicates the correspondence relations of individual items of camera identification information, whereby the arrow indicates that the camera identification information on the right is the parent of the camera identification information on the left. It also represents whether a given item of camera identification information is parent camera identification information, or is single (no link) or is unused, etc. Namely, the gateway server **160** refers to this camera identification information link data, searches for parent camera identification information based on the received camera identification information, and if parent camera identification information exists, performs processing, which is described below, in accordance with the parent camera identification information. Performing such processing makes it possible to treat image data captured with different electronic cameras as image data captured with a single electronic camera. This camera identification information link data can be modified if necessary from an external personal computer **190** or the like, connected to the gateway server **160**.

[**0302**] In the memory means **368**, as shown in **FIG. 40, a** folder corresponding to each item of camera identification information is prepared, and each folder corresponding to an item of camera identification information holds personal identification data, image server management data, transfer history data, thumbnail image data and image file data. **FIG. 42** is a drawing that shows the configuration of personal identification data, which comprises data relating to the user of the electronic camera **100** corresponding to the camera identification information; the personal identification data can be used by the gateway server **160** to register with image servers on the Internet to secure a new storage area for storing image data or when reading/writing image data to and from image servers. This personal identification data can be modified as necessary from an external personal computer **190** connected to the gateway server **160**, and may optionally be made modifiable by transmission of information stored on the UIM card installed in the portable telephone **120** from the portable telephone **120** to the gateway server **160**.

[**0303**] **FIG. 43** is a drawing showing the configuration of server management data, which consists of identifying names of image servers on that the gateway server **160** stores image data according to the camera identification information, the URL (Uniform Resource Locator) of each image server, the total data capacity provided on each image server according to the camera identification information, the available capacity out total data capacity prepared provided on each image server according to the camera identification information, and list information on the image data stored on each image server based on the camera identification information (image file identification information or image file names), etc.

[**0304**] **FIG. 44** is a drawing that shows the configuration of the transfer history data, which consists of list information on image data stored on the virtual image server **180** according to the camera identification information (image file identification information or image file names), information on the date and time of transfer of each item of image data to the image server, information relating to the image server to that image data is transferred, etc.

[**0305**] **FIG. 45** is a block diagram showing the internal configuration of image servers **181** through **184**, wherein a communication means **471** connected to the Internet and a memory means **468** that stores information such as image data are connected to the control/processing means **450** that performs overall control of the individual elements of image servers **181** through **184**. Image servers **181** through **184** exchange information such as image data with the gateway server **160** via the communication means **471** using Internet protocol. In the memory means **468**, a folder corresponding to each item of camera identification information is prepared, as shown in **FIG. 46**, and image file data is stored in the folders corresponding to each item of camera identification information.

[**0306**] **FIG. 47** is a state transition diagram for an embodiment of the electronic camera **100** according to the present invention. When power is turned on, the camera enters capture mode, and manipulating the release button **16** causes the camera to perform a capture operation and a post-capture image file creation and loading of the image file into the memory card **77**. In playback mode, it performs playback and display operations on the image data stored in the memory card **77**. In capture mode, if the automatic transmission function is turned on, an image transfer operation is performed, whereby captured image data is automatically transmitted and stored on an image server. Furthermore, in playback mode, manipulating the transmit button **31** causes an image transmission operation to be performed, whereby the image data displayed on the left screen **21** is transmitted and stored on an image server. Moreover, in manipulating the receive button **32** in playback mode causes an image reception operation to be performed, whereby the desired image data is received from the image server and displayed on the left screen **21**. Furthermore, manipulating the capture mode button **28** causes a transition from playback mode to capture mode, and manipulating the playback mode button **29** causes a transition from capture mode to playback mode.

[**0307**] **FIG. 48** is a main flow chart of the operation of the electronic camera **100** (CPU **50**) in the mode of embodiment described above. First, in S**10**, the power supply is turned on by manipulating the power switch **17**, and in S**20**, the capture mode subroutine is executed, leading to a capture possible state. If the release button **16** is manipulated while in capture mode, the release interrupt handling subroutine is executed in S**30**, and the capture operation is carried out. If the playback mode button **29** is manipulated while in capture mode, a mode switch interrupt handling subroutine is executed in S**40**, the playback mode subroutine is executed in S**50**, and image data stored in the memory card **77** is played back and displayed on the left screen **21**. Conversely, if the capture mode button **28** is manipulated while in

playback mode, a mode switch interrupt handling subroutine is executed in S**40**, and the system moves to the capture mode subroutine of S**20**. If the automatic transmission function is turned on, manipulating the release button **16** causes the communication interrupt processing of S**60** to be executed following the capture operation, and transmission of image data to the image server is carried out. Furthermore, manipulating the transmit button **31** or the receive button **32** while in playback mode causes the communication interrupt processing of S**60** to be executed, and transmission of image data to the image server or reception of image data from the image server is carried out.

[**0308**] **FIG. 49** is a detailed flow chart of the capture mode subroutine. Starting in S**20**, the processing of S**201** is repeated. In S**201**, image data successively generated by the CCD **55** under the camera settings made by the user is displayed on the left screen **21** as shown in **FIG. 50**, at that time the capture settings are displayed as text on the right screen **22**.

[**0309**] **FIG. 51** is a detailed flow chart of the release interrupt handling subroutine. Starting in S**30**, it is checked in S**301** whether the system is in capture mode, and if it is not in capture mode, the system returns in S**308**. If it is in capture mode, the capture operation is carried out under the capture conditions set by the user or the camera to generate image data, and appended informational data (capture data, time data, location data) is appended to the image data in S**303** to general an image file. In S**304**, it is checked whether the automatic transmit function is turned on, and if it is not turned on, the image file is loaded into the memory card **77** in S**305** and the system returns in S**308**. If the automatic transmit function is turned on, communication with the portable telephone **120** is attempted using the short-range wireless communication circuit **72** in S**306**, checking whether communication is possible, and if communication with the portable telephone **120** is possible, the portable telephone image file transmission subroutine of S**70** is executed, transmitting the image file to the portable telephone **120**, and the system returns in S**308**. If communication with the portable telephone **120** is not possible, the system goes back to S**305**, stores the image file on the memory card **77**, and returns in S**308**.

[**0310**] **FIG. 52** is detailed flow chart of the portable telephone image file transmission subroutine. Starting in S**70**, the image file, camera identification information, gateway server access information and an image transmit request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.), and the system returns in S**702**.

[**0311**] **FIG. 53** is a detailed flow chart of the mode switch interrupt handling subroutine. Starting in S**40** upon manipulation of the capture mode button **28** or playback mode button **29**, it is checked in S**401** whether the manipulated button was the capture mode button **28**, and if it was the capture mode button **28**, playback mode is terminated and the system moves to the capture mode subroutine of S**20**. If the manipulated button was not the capture mode button **28**, the capture mode is terminated and the system moves to the playback mode subroutine of S**50**.

[**0312**] **FIG. 54** is detailed flow chart of the playback mode subroutine. Starting in S**50**, the processing of S**501** is repeated. In S**501**, in response to the manipulation of the LEFT button **25** and RIGHT button **26**, image data stored in the memory card **77** is selected and read, and is played back and displayed on the left screen **21** as shown in **FIG. 55**, while operating instructions are displayed on the right screen **22**. After power is turned on, the most recent image data is displayed; subsequently, image data with older time data are displayed successively in response to manipulation of the LEFT button **25**, and image data with newer time data are displayed successively in response to manipulation of the RIGHT button.

[**0313**] **FIG. 56** is a detailed flow chart of the communication interrupt handling subroutine started by manipulating the transmit button **31** or receive button **32**. Starting in S**60**, it is checked in S**601** whether the manipulated button was the transmit button **31**, and if was the transmit button **31**, it is checked in S**602** whether the system is in capture mode, and if it is in capture mode, the current setting of the automatic transmit function is inverted in S**603**, and the system returns in S**613**. If the system was in playback mode in S**602**, communication with the portable telephone **120** using the short-range wireless communication circuit **72** is attempted in S**604**, checking whether communication is possible, and if communication with portable telephone **120** is possible, the portable telephone image file transmission subroutine of S**70** is executed, transmitting the image file of the image data currently displayed on the left screen **21** to the portable telephone **120**, and the system returns in S**613**. If communication with the portable telephone **120** is not possible, the system returns in S**613**.

[**0314**] If the button manipulated in S**601** was the receive button **32**, it is checked in S**605** whether the system is in capture mode, and if it is in capture mode, the system returns in S**613**. If it is in playback mode, communication with the portable telephone **120** using the short-range wireless communication circuit **72** is attempted in S**606**, checking whether communication is possible, and if communication with the portable telephone **120** is not possible, the system returns in S**613**. If communication with portable telephone **120** is possible, in S**607**, the camera identification information, gateway server access information and a thumbnail image reception request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.). In S**608**, the system waits to receive thumbnail images form the portable telephone **120** and returns in S**613** if reception was not possible. If thumbnail images were received, in S**609**, as shown in **FIG. 57**, the received thumbnail images are displayed on the left screen **21**, while operating instructions are displayed on the right screen **22**. The thumbnail images are scrolled by manipulating the UP button **23** and DOWN button **24**, and either the left or right thumbnail image is selected by manipulating the LEFT button **25** or RIGHT button **26**. Manipulating the SELECT button **27** confirms the selected thumbnail image. In S**610**, the identification information appended to the selected thumbnail image, the camera identification information, gateway server access information and an image reception request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.). In S**611**, the system waits to receive image data from the portable telephone **120** and returns in S**612** if reception was not possible. If image data was

received, in S612, as shown in **FIG. 58**, the received image data is displayed on the left screen **21** while operating instructions are displayed on the right screen **22**, and the system returns in S613.

[**0315**] Next, operation of the portable telephone **120** (CPU **250**) in the above mode of embodiment will be described. Description of the operation of the portable telephone **120** relating to talk functions will be omitted as it has little bearing on the present invention. **FIG. 59** is a detailed flow chart of the communication interrupt handling started when the portable telephone **120** performs image transmission. Communication interrupt handling is started in A**60** when a communication request is received via short-range wireless communication from the electronic camera **100**, it is checked in A**601** whether the system is currently processing a voice call, and if it is processing a voice call, the system returns in A**613** without responding to the communication request from the electronic camera **100**. If a voice call is not being processed, voice call processing is blocked in A**602**, it is checked in A**603** whether the request from the electronic camera **100** is an image file transmission request, and if it was an image file transmission request, in A**604**, communication is attempted with the gateway server **160** using the wireless portable telephone circuit **271** based on the gateway server access information, checking whether communication is possible, and if communication with the gateway server **160** is possible, the gateway image file transmission subroutine of A**70** is executed, the image file received from the electronic camera **100** is transmitted to the gateway server **160**, voice call processing is unblocked in A**613**, and the system returns. If communication with the gateway server **160** is not possible, in A**605**, the image file, camera identification information, gateway server access information, etc. received from the electronic camera **100**, are stored temporarily in EEPROM **268**, and the system unlocks voice call processing and returns in A**613**.

[**0316**] If the request from the electronic camera **100** in A**603** was not an image file transfer request, in A**606**, communication with the gateway server **160** is attempted using the wireless portable telephone circuit **271** based on the gateway server access information, checking if communication is possible, and if communication with the gateway server **160** is not possible, the system unblocks voice call processing in A**613** and returns. If communication with the gateway server **160** is possible, it is checked in A**607** whether the request from the electronic camera **100** is a thumbnail image reception request, and if it was a thumbnail image reception request, in A**608**, a thumbnail image reception request and camera identification information are transmitted to the gateway server **160** by means of the wireless portable telephone circuit **271** using a packet communication protocol. In A**609**, the thumbnail images are received from the gateway server **160** and are transmitted to the electronic camera **100** by means of the short-range wireless communication circuit **272** using a short-range wireless communication protocol. While transmitting thumbnail images to the electronic camera **100**, the thumbnail images are displayed on the screen **221**. Once transmission of thumbnail images to the electronic camera **100** is completed, the system unblocks voice call processing and returns in A**613**.

[**0317**] If the request from the electronic camera **100** in A**607** was not a thumbnail image reception request, in A**610** it is checked whether the request from the electronic camera **100** is a selected image reception request, and if it was not an image reception request, the system unblocks voice call processing and returns in A**613**. If it was an image reception request, in A**611**, an image reception request, image identification information and camera identification information are transmitted to the gateway server **160** by means of the wireless portable telephone circuit **271** using a packet communication protocol. In A**612**, image data corresponding to the image identification information is received from the web server **160**, and is transmitted to the electronic camera **100** by means of the short-range wireless communication circuit **272** using a short-range wireless communication protocol. During transmission of images to the electronic camera **100**, the image data is displayed on the screen **221**, as shown in **FIG. 62**. Once transmission of image data to the electronic camera **100** is completed, display of image data on the screen **221** is terminated, and the system unblocks voice call processing and returns in A**613**. To more effectively alert the user of the fact that image data is being transmitted, a different display mode from normal image data display may be used, for instance periodic flashing (repeated display and non-display) of the image data displayed on the screen **221**. Here, normal display mode refers to the display mode whereby image data is statically displayed.

[**0318**] **FIG. 60** is a detailed flow chart of the gateway image file transmission subroutine. Starting in A**70**, in A**701** the image file, camera identification information and an image transmission request are transmitted by packet communication protocol using the wireless portable telephone circuit **271** to the gateway server **160** designated based on the gateway access information, and the system returns in A**702**. While an image file is being transmitted to the gateway server **160**, the image data being transmitted is displayed on the screen **221**, as shown in **FIG. 61**, and the display is terminated once transmission is completed. Furthermore, to more effectively alert the user of the fact that image data is being transmitted, a different display mode from normal image data display may be used, for instance periodic flashing (repeated display and non-display) of the image data displayed on the screen **221**. Here, normal display mode refers to the display mode whereby image data is statically displayed.

[**0319**] **FIG. 63** is a detailed flow chart of the timer interrupt handling subroutine launched at regular intervals by the timer **274** of the portable telephone **120**. Starting in A**80**, it is checked in A**801** whether the system is currently processing a voice call, and if it is currently processing a voice call, the system returns in A**805**. If it is not processing a voice call, voice call processing is blocked in A**802**, it is checked in A**803** whether there are image files being temporarily stored in EEPROM **268**, and if there are no image files being temporarily stored, the system unblocks voice call processing and returns in A**805**. If there are temporarily stored image files, communication with the gateway server **160** by means of the wireless portable telephone circuit **271** based on the gateway server access information is attempted in A**804**, checking whether communication is possible, and if communication with the gateway server **160** is not possible, the system unblocks voice call processing and returns in A**805**. If communication with the gateway server **160** is possible, the gateway image file transmission subroutine of A**70** is executed, image files received from the electronic

camera **100** are transmitted to the gateway server **160**, and in A**805**, the system unblocks voice call processing and returns.

[**0320**] As indicated above, when communication with the gateway server **160** is not possible, the portable telephone **120** temporarily stores the image files received from the electronic camera **100**, and when communication with the gateway server **160** becomes possible, it automatically transmits the temporarily stored image files to the gateway server **160**. To notify the user of the fact that image files transmitted from the electronic camera **100** to the gateway server **160** are being temporarily stored by the portable telephone **120**, one may optionally display a specific mark, icon or text on the screen **221** while image files are being temporarily stored by the portable telephone **120**. By doing this, in a situation where the user is in a hurry to transmit the image files, the user will be able to see this display and perform image file transmission by a different method.

[**0321**] Furthermore, while the communication interrupt handling of **FIG. 59** assumes that the connection between the electronic camera **100** and portable telephone **120** is maintained until communication is completed once the connection between the electronic camera **100** and portable telephone **120** has been established, in case the connection between the electronic camera **100** and the portable telephone **120** should be cut off (for example, if the portable telephone **120** becomes unable to transmit thumbnail images or image files received from the gateway server **160** to the electronic camera **100**), one can have the thumbnail images and image files be stored temporarily in the EEPROM **268** of the portable telephone **120**, have the portable telephone **120** detect when communication between the portable telephone **120** and electronic camera **100** becomes possible, and automatically transmit the thumbnail images or image files stored temporarily in EEPROM **268** to the electronic camera **100**. The portable telephone **120** may optionally display the fact that that thumbnail images or image files transmitted to the electronic camera **100** from the gateway server **160** are being stored temporarily by the portable telephone **120** by displaying a special mark, icon or text on the screen **221** while the image files are being temporarily stored by the portable telephone **120**. By doing this, in a situation where the user is in a hurry to transmit the image files, the user will be able to see this display, and take countermeasures such as rechecking the connection between the portable telephone **120** and electronic camera.

[**0322**] Next, the operation of the gateway server **160** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the gateway server **160** other than the image transmission operation will be omitted as they have little bearing on the present invention. **FIG. 64** is a detailed flow chart of the communication interrupt handling started when the gateway server **160** performs image transmission. Starting in G**60** with a communication request from the portable telephone **120** or personal computer **190**, in G**601**, the parent camera identification information is identified by referring to the camera identification information link data based on the received camera identification information. Subsequent image data handling is performed on the folder corresponding to the parent camera identification information. In G**602**, it is checked whether the received request is an image file transmission request, and if it was an image file transmission request, in G**603**, the received image file is stored temporarily in an image buffer folder in the folder corresponding to the camera identification information, thumbnail image data corresponding to the image data is generated and stored in a thumbnail image folder, likewise in the folder corresponding to the camera identification information, and the system returns in G**617**.

[**0323**] If the request received in G**602** was not an image file transmission request, it is checked in G**604** whether the received request is a thumbnail image reception request, and if it was a thumbnail image reception request, in G**605** the thumbnail images stored in the thumbnail image folder inside the folder corresponding to the camera identification information are transmitted by packet communication protocol to the originator of the thumbnail image reception request (portable telephone **120**), and the system returns in G**617**. If the request received in G**604** was not a thumbnail image reception request, it is checked in G**606** whether the received request is an image reception request, and if it was an image reception request, it is checked in G**607** whether image data corresponding to the image identification information exists in the image buffer folder inside the folder corresponding to the camera identification information, and if image data corresponding to the image identification information exists in the image buffer folder, the image file containing the image data is transmitted to the originator of the image reception request (portable telephone **120**) using a packet communication protocol in G**608**, and the system returns in G**617**.

[**0324**] If there is no image data corresponding to the image identification information in the image buffer folder, the image server where the image file corresponding to the image identification information is stored is determined based on the transfer history data in G**609**, and an image reception request and the image identification information is transmitted to that image server using Internet protocol in G**610**. In G**611**, the system waits to receive the specified image file from the image server, returning in G**617** if the image file could not be received from the image server; if the image file was received from the image server, the image file is transmitted to the originator of the image reception request (portable telephone **120**) in G**612** using a packet communication protocol, the image file is stored temporarily in the image buffer folder in the folder corresponding to the camera identification information, and the system returns in G**617**.

[**0325**] If the received request in G**606** was not an image reception request, it is checked in G**613** whether the received request is a data overwrite request, and if it was a data overwrite request, personal identification data, camera identification information link data or the like in the folder corresponding to the camera identification information is overwritten according to the received data, and the system returns in G**617**. If the received request in G**613** was not a data overwrite request, it is checked in G**615** whether the received request was a data read request, and it was a data read request, the personal identification data, camera identification information link data and the like in the folder corresponding to the camera identification information is read and transmitted to the requestor in accordance with the received data, and the system returns in G**617**. If the received request in G**615** was not a data read request, the system returns in G**617**.

[0326] **FIG. 65** is a detailed flow chart of the timer interrupt handling started at specific intervals by the timer **374** of the gateway server **160**. Starting at G**80**, the first item of camera identification information from the camera identification information list maintained by the gateway server **160** is selected in G**801**. In G**802**, it is checked based on the transfer history data whether there are image files that have not been transferred yet to the image server in the image buffer folder inside the folder corresponding to the selected camera identification information, and if there are no image files that have not been transferred yet, the system returns in G**810**. If there are image files that have not been transferred yet, it is checked in G**803**, based on image server management data, whether there is an image server with available capacity. In S**804**, if there is an image server with available capacity, the system proceeds to G**806**, and if there are no image servers with available capacity, a new image server with available capacity is searched for in G**805**. In G**805**, a search is carried out for open image servers on the Internet that are able to store image files, registration with the found image server is carried out automatically using camera identification information, and information on the image server (storage capacity, etc.) is recorded in the image server management data. In G**806**, an image server with available capacity is designated as the image server for storing images. In G**807**, image files that have not been transferred yet are transmitted using Internet protocol to the image server designated as the image server for storing images, the image server management data and transfer history data are updated, and all the image files stored temporarily in the image buffer folder are deleted. In G**807**, it is checked whether the currently selected camera identification information is the last item of camera identification information in the camera identification information list; if it is not the last item of camera identification information, in G**809**, the camera identification information is updated to the next item of camera identification information, the system goes back to G**802** and repeats the processing described above, and if it is the last item of camera identification information, the system returns in G**810**.

[0327] Next, the operation of the image servers **181** through **184** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the image servers **181** through **184** other than the image transmission and storage operation will be omitted as it has little bearing on the present invention. **FIG. 66** is a detailed flow chart of the communication interrupt handling started when a communication request is received by the image servers **181** through **184** from the gateway server **160**. Starting in H**60** upon receiving a communication request from the gateway server **160**, it is checked in H**601** whether the received request is an image server registration request, and if it was a registration request, it is checked in H**602** whether a folder corresponding to the received camera identification information exists, and if it already exists, the system returns in H**611**. If no folder corresponding to the received camera identification information exists, in H**603**, a folder corresponding to the received camera identification information is created, and the system returns in H**611**.

[0328] If the request received in H**601** is not an image server registration request, it is checked in H**604** whether the received request is an image reception request (image read request), and if it was an image reception request, it is checked in H**605** whether a folder corresponding to the received camera identification information exists, and if it does not exist, the system returns in H**611**. If a folder corresponding to the received camera identification information exists, it is checked in H**606** whether an image file corresponding to the received image identification information exists in the folder, and if it does not exist, the system returns in H**611**. If an image file corresponding to the received image identification information exists, the image file in question is transmitted to the gateway server **160** using Internet protocol in H**607**, and the system returns in H**611**. If the received request in H**604** is not an image reception request to the image server, it is checked in H**608** whether the received request is an image transmission request (image write request), and if it was not an image transmission request, the system returns in H**611**. If it was an image transmission request, it is checked in H**609** whether a folder corresponding to the received camera identification information exists, and if it does not exists, the system returns in H**611**. If a folder corresponding to the received camera identification information exists, the received image file is stored in the folder in H**610**, and the system returns in H**611**.

[0329] In the mode of embodiment described above (**FIG. 31** through **FIG. 66**), while relaying image files received from the electronic camera **100** though the gateway server **160**, the portable telephone **120** displays the image data being transmitted on the screen **221**, as shown in **FIG. 61**, that allows the user to confirm based on the display of screen **221** that the image data he selected and transmitted is in fact being transmitted from the portable telephone **120** to the gateway server **160**, and allows the user to confirm that transmission of image data from the portable telephone **120** to the gateway server **160** has been completed based on the fact that display of image data on the screen **221** has terminated. Furthermore, the fact that display of image data has started on the screen **221** of the portable telephone **120** allows one to confirm that transmission of image data from the electronic camera **100** to the portable telephone **120** has been completed, and that one can accordingly start taking picture with electronic camera **100**.

[0330] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), while image files received from the gateway server **160** are being relayed to the electronic camera **100**, the image data being transmitted is displayed on the screen **221**, as shown in **FIG. 62**, which allows the user to get an overview of the received image data based on the display of screen **221** before displaying and browsing the image data after transmission of image data to the electronic camera **100** is completed, and allows the user to confirm that transmission of image data from the portable telephone **120** to the electronic camera **100** has been completed based on the fact that display of image data on the screen **221** has terminated.

[0331] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), if the portable telephone **120** was not able to relay image files received from the electronic camera **100** to the gateway server **160** (for example, when the portable telephone **120** is out of range of the wireless portable telephone link), those image files are stored temporarily in the EEPROM **268** of the portable telephone **120**, and when transmission of image files to the gateway server **160** becomes possible, the image files stored temporarily in EEPROM **268** are automatically transmitted to the gateway

server **160**, so even if communication between the portable telephone **120** and the gateway server **160** is not possible, the user does not need to redo the image file transmission operation on the electronic camera **100** side, which makes it possible to avoid the risk of a user forgetting to retransmit, and allows the user to focus on taking pictures with the electronic camera **120** once image files have been transmitted from the electronic camera **100** to the portable telephone **120**.

[**0332**] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** temporarily stores image data received from the electronic camera **100** or image servers **181** through **184** in the memory means **368** of the gateway server **160**, and transmits the stored image data as necessary to the electronic camera **100** or image servers **181** through **184**, thereby making it possible to reduce the communication traffic between the image servers **181** through **184** and gateway server **160** or between the electronic camera **100** and the gateway server **160**.

[**0333**] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** stores the user's personal information in the memory means **368**, and if there is no available capacity to store image data in the image server's album corresponding to the camera identification information, the gateway server connects to another image server on the Internet, automatically sets up an album (folder) corresponding to the camera identification information using the aforementioned personal information, transmits the image data received from the electronic camera **100** to the image server and causes it to be stored in the new album, thereby freeing the user from having to perform the complicated procedure of connecting to an image server and the bothersome procedure of setting up an album, which would otherwise have to be carried out directly on the electronic camera **100** side.

[**0334**] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** keeps, in the memory means **368**, server management information for unified management of albums (folders) set up corresponding to camera identification information on each of the image servers **181** through **184**, and based on the server management information, performs generalized storage and management of image data stored in distributed fashion across multiple image servers **181** through **184** based by combining it into one virtual album, thereby making it possible to exchange large volumes of image data between the virtual album and the electronic camera **100** by means of simple operations, without the user being aware of the multiple image servers **181** through **184** that actually the store the image data on the Internet.

[**0335**] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** keeps, in the memory means **368**, link information that represents the associations of camera identification information for individually identifying electronic cameras, views multiple electronic cameras as a single group based on the link information, and transmits and stores image data received from the electronic cameras in an album on an image server corresponding to the group to that those electronic cameras belong, thereby making it possible to store image data captured with multiple electronic cameras in a single album on the image server. (Description of modified embodiments) The present invention is not limited to the mode of embodiment described above, and various modifications and changes are possible.

[**0336**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), transmission was carried out for reach image file relayed from the electronic camera **100** via the portable telephone **120** to the gateway server **160**, it is also permissible to transmit multiple image files as a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160**. In such cases as well, during transmission of image data from the portable telephone **120** to the gateway server **160**, the portable telephone **120** displays the image data being transmitted on the screen **221**. Doing this allows the user to check the progress of the processing of image file transmission from the portable telephone **120** to the gateway server **160** based on the image data being displayed. Furthermore, when multiple image files are transmitted in a batch from electronic camera **100** via the portable telephone **120** to the gateway server **160** in this manner, first all the image files to be transmitted are transmitted from the electronic camera **100** to the portable telephone **120** and are temporarily buffered in the EEPROM **268** of the portable telephone **120**, and once transmission of image files from the electronic camera **100** to the portable telephone **120** is completed, the portable telephone **120** transmits the image files stored temporarily in EEPROM **268** to the gateway server **160**. Doing so makes it unnecessary to transmit appended informational data (camera identification information, gateway server access information, image transmission requests etc.) for each individual image file from the electronic camera **100** to the portable telephone **120**, making it possible to shorten the transmission time for image files between the electronic camera **100** and portable telephone **120**. When transmitting image files from the portable telephone **120** to the gateway server **160**, this also makes it unnecessary to transmit appended informational data (camera identification information, image transmission requests, etc.) for each individual image file from the portable telephone **120** to the gateway server **160**, making it possible to reduce the transmitted data volume passing through the wireless portable telephone link **130** and packet communication network **150** and shorten the image file transmission time, as well as to reduce communication fees.

[**0337**] Furthermore, when transmitting multiple image files in a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160**, if all the image files to be transmitted are first transmitted from the electronic camera **100** to the portable telephone **120** and are temporarily buffered in the EEPROM **268** of the portable telephone **120**, and once transmission of image files from the electronic camera **100** to the portable telephone **120** is completed, the portable telephone **120** transmits the image files stored temporarily in EEPROM **268** to the gateway server **160**, then if problems occur with the wireless portable telephone link **130** or packet communication network **150** during transmission of image files from the portable telephone **120** to the gateway server **160**, the portable telephone **120** will leave the image files that have not been completely transmitted in the EEPROM **268**, and will automatically

transmit the image files remaining in EEPROM **268** to the gateway server **160** once transmission of image files to the gateway server **160** becomes possible. Doing so makes it unnecessary for the user to redo the image file transmission operation on the electronic camera **100** side from the beginning even if communication between the portable telephone **120** and gateway server **160** becomes impossible midway during image transmission, allowing the user to focus on taking pictures with the electronic camera **120** once image files have been transmitted from the electronic camera **100** to the portable telephone **120**, as well as making it possible to reduce the transmitted data volume passing through the wireless portable telephone link **130** and the packet communication network **150** compared to if file transfer from the electronic camera **100** to the gateway server **160** were redone from the beginning, and allowing one to shorten the image file transmission time and to reduce communication charges.

[**0338**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), greater data communication efficiency of the image transmission system was achieved by having the gateway server **160** temporarily store image files transmitted between the electronic camera **100** and the image server in an image buffer folder and make use of the image files stored temporarily in the image buffer folder as necessary, and by storing thumbnail image data corresponding to the image files in a thumbnail image folder and making use of that thumbnail image data as necessary, it is also possible, as shown in **FIG. 67**, to provide the same sort of image buffer folder and thumbnail image folder in the EEPROM **268** of the portable telephone **120** and temporarily store thumbnail image data and image files transmitted between the electronic camera **100** and the image server in the image buffer folder or thumbnail image folder, and, when the image file or thumbnail image data requested by the electronic camera **100** is present in the image buffer folder or thumbnail image folder, to have the portable telephone **120** transmit those image files and thumbnail image data to the electronic camera **100**. In such cases, the image files or thumbnail image data stored temporarily in the image buffer folder and thumbnail image folder in the EEPROM **268** may be cleared periodically in their entirety, or the image files and thumbnail image data may be deleted in the order of their age according to the storage start date and time data of the image file or thumbnail image data, so as to keep the total data volume of the temporarily stored image files and thumbnail image data at or below a specific volume. Alternatively, image files kept for more than a specific period of time may be deleted based on the storage start date and time data of the image files or thumbnail image data, or else stored image files or thumbnail image data may be deleted at specific clock times.

[**0339**] If this is done, then when the user wishes to reconfirm the image data most recently transmitted or received via the portable telephone **120**, it will be possible to display a summary of the status of temporarily stored images on the screen **221** of the portable telephone **120**, as shown in **FIG. 68**, to transmit the image files or corresponding thumbnail image data temporarily stored in the portable telephone **120** from the portable telephone **120** to the electronic camera **100** and make use of them, thereby making it unnecessary to make inquiries via the portable telephone **120** to the gateway server **160** regarding the image files or thumbnail image data and making it possible to quickly read image files or thumbnail image data into the electronic camera **100**, as well as allowing the communication data volume between the portable telephone **120** and gateway server **160** to be reduced and correspondingly reduce the communication line usage fees.

[**0340**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), the electronic camera **100** transmits image data via a single portable telephone **120** to a single gateway server **160**, it is also permissible to have the electronic camera **100** transmit image data via a single portable telephone **120** to multiple gateway servers. In such an image transmission system, the portable telephone **120** can store image files transmitted from the electronic camera **100** in EEPROM **268** under predetermined conditions (for a specific period of time from the start of storage, etc.) and transmit the stored image files to multiple gateway servers based on instructions from the electronic camera **100**. Doing this makes it unnecessary to transmit image files from the electronic camera **100** to the portable telephone **120** every time the electronic camera **100** transmits image files to multiple servers, allowing the transmission of image files to the gateway servers to be carried out more quickly. For example, if an image file was transmitted from the electronic camera **100** to one gateway server and the user then wants to transfer the same image file to a different gateway server, the image identification information of the image file and the destination gateway server access information are sent from the electronic camera **100** to the portable telephone **120**, whereupon, if an image file corresponding to the received image identification information is present in the EEPROM **268**, the portable telephone **120** reads that image file from the EEPROM **268** and transmits it to the gateway server corresponding to the received gateway server access information. If the image file corresponding to the image identification information is not present in the EEPROM **268**, the portable telephone **120** informs the electronic camera **100** that no image file corresponding to the received image identification information is present in the portable telephone **120**, in response to that the electronic camera transmits the image file to the portable telephone **120**.

[**0341**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), the portable telephone **120** performs relaying of image data in the transmission of image data between the electronic camera **100** and the gateway server **160**, if the electronic camera **100** itself has a built-in wireless portable telephone function, it is also permissible to omit the portable telephone **120**, as shown in **FIG. 69**, and to have the electronic camera **100** communicate directly with the gateway server **160** using a packet communication protocol. In **FIG. 69**, the base station **140** has been left out of the illustration.

[**0342**] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** provides the electronic camera **100** with a single virtual album that combines the albums secured according to the camera identification information on multiple image servers **181** through **184**, and increases the available capacity of the virtual album by automatically setting up a new album corresponding to the camera identification information by registering with a new image server when the available capacity of the virtual album becomes insufficient; however, instead of setting up a new album on a new image server, a new album may also be set up on an existing server on that

an album has already been set up. For example, if the gateway server **160** has unused camera identification information and the available capacity of the virtual album has become insufficient, the gateway server **160** can register with an image server, on that an album forming part of the virtual album has already been established, using one item of the unused camera identification information, and set up a new album corresponding to the unused item of camera identification information. Furthermore, the gateway server **160** can link the camera identification information used for setting up albums to the camera identification information corresponding to the virtual album, so as to incorporate the newly created album in the virtual album. Doing this makes it possible to deal with insufficient available capacity of the virtual album when the number of image servers is limited.

[**0343**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** buffers image files received from the electronic camera **100** in an image buffer folder and delivers the image files buffered in the image buffer folder at specific intervals, when transmitting image files captured with a series of capture operations (continuous capture or continuous shutter, bracket capture, panorama capture, etc.) from the electronic camera **100** in automatic transfer mode to the gateway server **160**, the image transfer may be performed by the scheme shown in **FIG. 70**. Here, continuous capture refers to continuously photographic the same subject at specific time intervals while tracking its movement; bracket capture refers to taking multiple photographs of the same subject while varying the capture conditions, such as exposure; and panorama capture refers to photographing a landscape or the like while shifting the capture direction by a certain amount each time. Namely, for each capture operation, the electronic camera **100** appends identification information to image files captured in series to the effect that this image is part of a series, and transmits it to the gateway server **160**. The gateway server **160** temporarily stores image files with appended identification information indicating that it is part of a series of images in an image buffer folder. Once the series of image captures is completed, the electronic camera **100** transmits information to the gateway server **160** indicating that the series of image captures has been completed, and upon receiving that information, the gateway server **160** does a batch transmission of the series of image files stored temporarily in the image buffer folder to the same image server over the Internet and stores them there. Doing this makes it possible to transmit multiple image files between the gateway server **160** and image server with a single transmission procedure, allowing the transmission time to be shortened and allowing the image transmission processing load of the gateway server **160** and image servers **181** through **184** to be reduced. Furthermore, storing image files captured in a series on the same image server makes it highly convenient when the user later connects directly to the image server **181** through **184**, with a personal computer or the like, to use the series of image data.

[**0344**] Instead of transmitting information indicating that a series of captures has been completed from the electronic camera **100** to the gateway server **160**, is also permissible to transmit to the gateway server **160**, from a terminal such as a personal computer **190** connected to the gateway server **160**, an instruction to transmit a series of image files accumulated on the gateway server **160** together to an image server, in response to that instruction, the gateway server **160** will transmit the series of image files accumulated on the gateway server **160** together to an image server.

[**0345**] Furthermore, when transmitting image files captured in a series from the electronic camera **100** to the gateway server **160** in automatic transmission mode, if an image file is transmitted from the electronic camera **100** to the gateway server **160** after every capture, the communication time will become longer due to the overhead for establishing communication and the additional information, and there are cases where, during this time, the picture-taking conditions will change or where the pictures cannot be taken at the planned time intervals. In such cases, one can optionally have the electronic camera **100** temporarily store the series of captured image files in RAM **70**, and once the series of captures is completed, transmit the series of image files with added identification information indicating that it is as series of images, together with information indicating that the series of captures has been completed, in a batch to the gateway server **160**. Furthermore, when the data transfer rate of short-range wireless communication between the electronic camera **100** and portable telephone **120** is fast, one may optionally have the image files captured in a series be transmitted from the electronic camera **100** to the portable telephone **120** each time an image is captured, storing them temporarily in the EEPROM **268** of the portable telephone **120**, and have the electronic camera **100** transmit information indicating that the series of captures has been completed to the portable telephone **120** once the series of captures has been completed, and in response to that information, have the portable telephone **120** transmit a series of image files with appended identification information indicating that this is a series of images to the gateway server **160**. Doing this makes it possible for the electronic camera **100** to perform a series of captures under the desired capture conditions and timing without affecting the image file transmission speed or the like, even in automatic transmission mode (a mode where captured image files are automatically transmitted to and stored on an image server).

[**0346**] Furthermore, when the electronic camera **100** selects image files captured in series, which have been saved on the memory card **77**, and transmits those selected image files to an image server, by transmitting those image files with appended identification information indicating that they are a series of images, the gateway server **160** will be able recognize that these are image files captured in series and perform processing such as storing them on the same image server.

[**0347**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** buffers image files received from the electronic camera **100** in an image buffer folder and delivers the image files buffered in the image buffer folder to the image server at specific intervals, one can also have the image files buffered in the image buffer folder be delivered to the image server based on an external instruction. **FIG. 71** is a drawing that shows the image transmission processing for such a scheme. Multiple image files are transmitted from the electronic camera **100** to the gateway server **160**, and are stored temporarily in an image buffer folder in a folder corresponding to the camera identification information on the gateway server **160**. Thereafter, a personal computer **190** connects to the gateway server **160** and transmits the camera identification information, the identification information of the image server to that the

images are to be transferred, and an image transfer instruction to the gateway server **160**. In response to the received camera identification information, the gateway server **160** transmits the image files, which are stored temporarily in the image buffer folder in the folder corresponding to the received camera identification information, in a batch to the image server corresponding to the received image server identification information. Doing this makes it possible for the user to transmit and store image data captured with the electronic camera **100** from the gateway server **160** at a convenient time to a suitable image server.

[**0348**] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** buffered image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmitted the image files buffered in the image buffer folder together to the image server at specific intervals; however, the gateway server **160** may also transmit accumulated image files to the image server by the following method. For example, the image files may be transmitted to the image server when the total data volume of the image files stored temporarily on the gateway server **160** exceeds a certain volume. Alternatively, the gateway server **160** may transmit image files to the image server once they have been accumulated for a set period or time, based on the date and time data of the start of storage of the image files in the image buffer folder. Alternatively, the gateway server **160** can transmit accumulated image files to the image server at specific clock times.

[**0349**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** buffers image files transmitted between the electronic camera **100** and the image server in an image buffer folder and clears the entirety of the image files buffered in the image buffer folder at specific intervals, the gateway server **160** may also delete image files by the following method. For example, the gateway server **160** may delete image files in the order of oldest to newest based on date and time information on the start of storage of the image files in the image buffer folder, so as to keep the total data volume of the image files stored temporarily in the image buffer folder at or below a specific volume. Alternatively, the gateway server **160** may delete image files stored for more than a specific period of time based on date and time information on the start of storage of the image files in the image buffer folder. Or the gateway server **160** may delete stored image files at specific clock times.

[**0350**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** buffers image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmits them as necessary to the electronic camera **100**, the gateway server **160** may also transmit image files accumulated in the image buffer folder (image files transmitted by the electronic camera **100** to an image server or image files read by the electronic camera **100** from an image server) to another image server or electronic camera based on instructions from the electronic camera **100**. Doing this makes it unnecessary to transmit every single image files from the electronic camera **100** to the gateway server **160**, thereby making it possible to shorten the image file transmission time and reduce transmission charges.

[**0351**] While in the above mode of embodiment (**FIG. 31** through **FIG. 66**), the gateway server **160** performed management of individual albums on image servers according to the camera identification information received from the electronic camera **100**, it is also possible to use general identification information instead of camera identification information for individually identifying multiple electronic cameras **100**. For example, using the next generation version of the IP protocol, IPV6 (Internet Protocol Version 6), the use of that on the Internet is planned, as the identification information, would make it possible for all electronic devices that handle images, besides electronic cameras, to make use of the image transmission system according to the present invention. Namely, IPV6 provides a 32-bit address space (on order of 10 to the 9th power), so there is practically no concern of running out of addresses, which makes it possible for one device to have multiple addresses depending on the application and further increases the utility of the image transmission system according to the present invention.

[**0352**] In the above mode of embodiment (**FIG. 31** through **FIG. 66**), the image servers **181** through **184** had individual albums (folders) corresponding to the camera identification information set individually for each electronic camera **100**, the electronic camera **100** would transmit the camera identification information set in the camera in question to the gateway server **160**, and the gateway server **160**, based on the received camera identification information, would create a new album corresponding to the received camera identification information on the image server **181** through **184** or perform reading and writing of image data to and from an album corresponding to the received camera identification information present on the image server **181** through **184**; however, it is also permissible to manage image data transmission and storage between the electronic camera **100** and image servers **181** through **184** using identification information other than camera identification information.

[**0353**] For example, in **FIG. 72, a** password input means is provided on the electronic camera side and image data transmission and storage is managed according to the password inputted by the user. In **FIG. 72**, electronic camera A**101** and electronic camera B**102** are each equipped with a password input means **81** and **82**, and when transmitting a captured image file, electronic camera A**101** and electronic camera B**102** transmit the password inputted by the user and the image file as a pair to the gateway server **160**. Meanwhile, the image server **181** has a folder prepared that corresponds to the password, and the gateway server **160** transmits the received image file and stores it in an album on the image server **181** corresponding to the received password. The gateway server **160** can also create a new album on the image server corresponding to the received password. Furthermore, when downloading image files from the image server **181**, the electronic camera A**101** and electronic camera B**102** transmit image identification information and a password to the gateway server **160**, and the gateway server **160** transmits the received image identification information and password to the image server **181**. The image server **181** reads the image file corresponding to the received image identification information from the album corresponding to the received password, and transmits that image file to via the gateway server **160** to the electronic camera A**101** and B**102**. Instead of password input, the electronic camera can obtain user identification information by installing a UIM

card on that personal identification data has been stored in advance into the electronic camera.

[0354] If this is done, then when the same user uses multiple electronic cameras or when multiple users use the same camera, the image files captured by the electronic camera will be stored in an album on an image server corresponding to the password inputted by the user, so there is no inconvenience of having to later separate image files stored in the same album on an image server for different users, or collect image files stored in different albums on an image server for each user, allowing image files to be stored efficiently on a per-user basis and making it possible to protect the privacy of the stored image data.

[0355] While in **FIG. 72**, control and management of image data transmission and storage operations between the electronic camera **100** and image servers **181** through **184** is carried out based on the password inputted by the user into the electronic camera, in **FIG. 73**, instead of a password, a user identification means is provided on the electronic camera side, the electronic camera performs user identification automatically without manual intervention by the user, and image data transmission and storage is management based on that user identification information. In **FIG. 73**, electronic cameras A**101** and B**102** are equipped with user identification means **83** and **84** (fingerprint detection means, iris pattern detection means, facial image detection means, etc.), and when transmitting a captured image file, the electronic cameras A**101** and B**102** transmit the image file paired with the user identification information detected by the user identification means **83** and **84** (fingerprint pattern characteristics information, iris pattern characteristics information, facial image pattern characteristics information, etc.) to the gateway server **160**. The gateway server **160** compares the received user identification information with user identification information contained in the personal identification data that is stored in advance to identify the user. Meanwhile, the image server **181** has an album prepared that corresponds to the personal identification data, and the gateway server **160** transmits and stores received image files in the album on the image server corresponding to the personal identification data of the identified user. The gateway server **160** can also create a new album on the image server corresponding to the personal identification data of the identified user. Furthermore, when downloading image files from the image server **181**, electronic cameras A**101** and B**102** transmit image identification information and user identification information to the gateway server **160**, the gateway server **160** identifies the users based on the received user identification information, and transmits the personal identification data corresponding to the user along with the image identification information to the image server **181**. The image server **181** reads image files corresponding to the received image identification information from the album corresponding to the received personal identification data, and transmits those image files via the gateway server **160** to the electronic cameras A**101** and B**102**.

[0356] Doing this makes it possible to automatically perform user identification at the electronic camera, which eliminates the effort or inputting passwords for individual identification and resolves the problems of forgotten passwords and password theft.

[0357] The means of personal identification described above in **FIG. 72** and **FIG. 73** (password input means, UIM card, fingerprint detection or other user identification means) can also be provided on the portable telephone side, if the gateway server is connected to from the electronic camera via the portable telephone. In **FIG. 74**, when connecting from the electronic camera to the gateway server via the portable telephone, image data transmission and storage are managed based on the telephone number of the portable telephone. In **FIG. 74**, when transmitting a captured image file, the electronic cameras A**101** and B**102** connect to the portable telephone **121** (telephone number A) and transmit the image file to the portable telephone **121**. The portable telephone **121** transmits the received image file paired with the telephone number to the gateway server **160**. Meanwhile, the image server **181** has an album prepared corresponding to the telephone number of the portable telephone, and the gateway server **160** transmits and stores the received image file in an album on the image server **181** corresponding to the telephone number. The gateway server **160** can also create a new album on an image server corresponding to the telephone number. Furthermore, when downloading image files from the image server **181**, the electronic cameras A**101** and B**102** send image identification information to the portable telephone **121**, the portable telephone **121** transmits the telephone number and image identification information to the gateway server **160**, and the gateway server **160** transmits the telephone number and image identification information to the image server **181**. The image server **181** reads the image file corresponding to the received image identification information from the album corresponding to the received telephone number, and transmits that image file to the electronic cameras A**101** and B**102** via the gateway server **160** and the portable telephone **121**.

[0358] Doing this allows the user to store image files separated on a per individual basis in a per-individual album on an image server or read image files from one's own exclusive album on an image server by performing image transmission and reception using his portable telephone, even when using multiple electronic cameras or when multiple persons use the same electronic camera.

[0359] Furthermore, by combining the electronic camera's camera identification information with multiple personal identification means, the user identification precision can be increased and a higher level of image information security can be attained.

[0360] As described above, in the image transmission system and image relay device according to the present invention, while image data is being transmitted from the portable telephone (image relay device) to external devices, which image data is displayed on the display means provided on the portable telephone, allowing the user to confirm the operating state of the portable telephone (is image data that was transmitted from the electronic camera to the portable telephone being transmitted from the portable telephone to an image server or not), so upon confirming that transmission of image data that one has instructed to be transmitted has been initiated from the portable telephone, the user can disconnect the portable telephone from the electronic camera and take pictures with the electronic camera. Furthermore, when transmitting multiple items of image data in a batch from the electronic camera via the portable telephone, one can find out that item of image data is currently being transmitted from the portable telephone to the external device, allowing one to also confirm the

progress of transmission of image data from the portable telephone to the external device.

[0361] Moreover, in the image transmission system and image relay device according to the present invention, when transmission of data from the portable telephone (image relay device) to the external device is not possible, the image data is stored temporarily in the portable telephone, and is automatically transmitted to the external device once transmission of image data to the external device becomes possible, thereby making it unnecessary for the user to redo the image data transmission operation from the beginning, allowing the user to focus on taking picture with the electronic camera once image data has been transmitted form the electronic camera to the portable telephone.

[0362] Moreover, in the image transmission system and image relay device according to the present invention, the image data relayed through the portable telephone (image relay device) or the corresponding thumbnail image data is stored temporarily in the portable telephone, so when the user wishes to check the image data most recently transmitted or received via the portable telephone, the user can display the image data stored temporarily in the portable telephone or the corresponding thumbnail image data on the display means provided on the portable telephone, or read it into the electronic camera for use, making it possible to quickly check the image data, which is used by relaying it through the portable telephone, without making inquiries to the originator of the image data transmission (the image server), and allowing communication line usage fees to be reduced.

[0363] 3:

[0364] **FIG. 75** is a conceptual drawing of an image data transmission system applying the present invention. First, the case of transmitting image data from the electronic camera **100** to the image servers **181** through **184** will be described. The electronic camera **100** generates image data through capture operations. When transmitting the image data to external image servers **181** through **184**, the electronic camera **100** connects to a portable telephone **120**. The connection between the electronic camera **100** and the portable telephone **120** is made by means of a short-range communication link **110** (e.g., Bluetooth protocol based short-range wireless communication, short-range wired communication based on a cable connection-specific protocol, IEEE 802.11 protocol based wireless LAN communication, short-range infrared communication using the IrDA protocol, etc.). The electronic camera **100** selects the image data to transmit, displays the image data on the screen **21** and transmits it to the portable telephone **120**. Since the electronic camera **100** and the portable telephone **120** are used by the user simultaneously, it suffices for the local wireless communication range to be on the order of several meters, which allows the power load on the electronic camera **100** and portable telephone **120** due to short-range wireless communication to be reduced.

[0365] The portable telephone **120** is provided with a short-range communication function for communicating with the aforementioned electronic camera **100** and a long-range communication function using a wireless portable telephone link **130**, whereby the long-range communication function using the wireless portable telephone link **130** allows both conventional talk functions and packet communication protocol based digital data communication functions to be executed. The portable telephone **120** temporarily stores image data received from the electronic camera **100** via the short-range communication link **110** in an internal memory. Next, the portable telephone **120** sends the stored image data using a packet communication protocol via the wireless portable telephone link **130** to a base station **140**. While transmitting image data to the base station **140**, the portable telephone **120** displays the image data being transmitted on a screen **221**.

[0366] The base station **140** transmits the image data, received from the portable telephone **120** using a packet communication protocol via the wireless portable telephone link **130**, to a gateway server **160** via a packet communication network **150** using a packet communication protocol. The gateway server **160** stores the image data received from the base station **140** using a packet communication protocol via the packet communication network **150** for a time in an internal memory, and transmits the stored image data at specific intervals using Internet protocol via the Internet **170** to image servers **181** through **184**. The gateway server **160** keeps thumbnail image data (scaled-down image data obtained by compressing and reducing the data volume of the original image data) corresponding to the image data transmitted to the image servers in an internal memory. Image servers **181** through **184** store the image data received using Internet protocol via the Internet **170** in a high capacity memory.

[0367] When transmitting image data from the electronic camera **100** to an image server, there is no need to perform the transmission with awareness of the complicated connection and communication procedures for accessing the image server on the electronic camera **100** side; rather, on the electronic camera **100** side, it suffices to append fixed address information for specifying the gateway server **160** and camera identification information for identifying the electronic camera **100** to the image data to be transmitted, and pass it on to the portable telephone **120**. The portable telephone **120** transmits the image data and camera identification information by packet communication to the designated gateway server **160** based on the received gateway server address information. The gateway server **160** manages the image data according to the camera identification information received via packet communication, and transmits the image data to a suitable image server among multiple image servers **181** through **184** on the Internet **170** using Internet protocol. The multiple image servers **181** through **184** are treated as a single virtual image server **180** from the viewpoint of the electronic camera, and the complicated procedures for accessing each image server on the Internet **170** are all performed by the gateway server **150**.

[0368] Next, the case where the electronic camera **100** receives image data from the virtual image server **180** will be described. First, the electronic camera **100** is connected to the portable telephone **120** by means of the short-range communication link **110**. The electronic camera **100** transmits a browse data request, camera identification information and gateway server **160** address information to the portable telephone **120**. Next, the portable telephone **120** transmits the browse data request and camera identification information via the base station **140** using packet communication protocol to the designated gateway server **160** based on the received gateway server **160** address information.

Upon receiving the browse data request and camera identification information, the gateway server **160** transmits the thumbnail image data (browse data) for the image data corresponding to the camera identification information stored on the virtual server **180** via the base station **140** using packet communication protocol to the portable telephone **120** that transmitted the browse data request. The portable telephone **120** transmits the received browse data over the short-range communication link **110** to the electronic camera **100**.

[**0369**] The electronic camera **100** displays the received browse data (thumbnail image data) on the screen **21**, from that the desired image is selected. The electronic camera **100** transmits a request for the selected image data along with image identification information (image file name, etc.) for the image data, camera identification information and gateway server **160** address information over the short-range communication link **110** to the portable telephone **120**. Next, the portable telephone **120**, based on the received gateway server **160** address information, transmits the image data request, image identification information and camera identification information via the base station **140** using packet communication protocol to the designated gateway server **160**. Upon receiving the image data request, image identification information and camera identification information, the gateway server **160** specifies the image data stored on the virtual server **180** according to the camera identification information and image identification information, and transmits the image data request and image identification information using Internet protocol to the image server **181** through **184** on the Internet **170** that is storing the image data in question.

[**0370**] The image server, which receives the image data request and image identification information, transmits the image data corresponding to the image identification information using Internet protocol to the gateway server **160**. Upon receiving the image data, the gateway server **160** transmits that image data via the base station **140** using packet communication protocol to the portable telephone **120** that transmitted the image data request. The gateway server **160** temporarily stores the image data received from the image server in an internal memory. The portable telephone **120** transmits the received image data over the short-range communication link **110** to the electronic camera **100**. The electronic camera **100** displays the received image data on the screen **21**.

[**0371**] The gateway server **160** can also be connected to from a user's personal computer **190** via the Internet **170**, and the user can read and use image data from the virtual server **180** via the gateway server **160** on a personal computer **190**, and can modify the settings of the gateway server **160**.

[**0372**] **FIG. 76** and **FIG. 77** are an external view (front view and rear view) of an embodiment of the electronic camera **100** used in an image data transmission system applying the present invention. As shown in **FIG. 76, a** photographic lens **10** for forming a subject image, a finder **11** for confirming the frame, a strobe **12** for illuminating the subject when a photograph is taken, a photometric circuit **13** for detecting the brightness of the subject, and a grip **14** extending from the camera housing for making it easier for the user hold the electronic camera **100** in his or her hands are provided at the front of the electronic camera **100**, and a release button **16** and a power switch **17** for turning the power supply to the electronic camera **100** on and off are provided at the top.

[**0373**] As shown in **FIG. 77**, the eyepiece of the finder **11**, a left LCD (left screen) **21** comprising a substantially rectangular screen for text and image display, and a right LCD (right screen) **22** comprising a substantially rectangular screen for text and image display are arranged at the rear of the electronic camera **100**; an UP button **23**, a DOWN button **24**, LEFT button **25**, RIGHT button **26** and SELECT button **27**, used for image searching, are arranged below the right LCD **22**, and a capture mode button **28** for putting the electronic camera **100** into capture mode, a playback mode button **29** for putting the electronic camera **100** into playback mode, a transmit button **31** for controlling image data transmission, and a receive button **32** for controlling image data reception are arranged below the left LCD **21**. A memory card slot **30** for installing a memory card **77** used for storing image data is provided at the side.

[**0374**] The release button **16**, UP button **23**, DOWN button **24**, LEFT button **25**, RIGHT button **26**, SELECT button **27**, capture mode button **28**, playback mode button **29**, transmit button **31** and receive button **32** are all control keys operated by the user.

[**0375**] A so-called touch screen **66**, equipped with a function of outputting contact position data corresponding to the position indicated by a finger touch operation is arranged over the left LCD **21** and the right LCD **22**, which touch screen can be used for selection of image data and options displayed on the screen. This touch screen **66** is made of a transparent material such as glass or resin, allowing the user to view the image or text formed on the inside of the touch screen **66** through the touch screen **66**.

[**0376**] **FIG. 78** is a block diagram showing an example of the internal electrical configuration of the electronic camera **100** shown in **FIGS. 76 and 77**, whereby the constitutive elements are connected to each other via a data/control bus **51** for transmitting various types of informational data and control data. The various constitutive elements can be roughly divided into a block centered on the capture control circuit **60** that executes image data capture operations, a block of the memory card **77** that stores and saves image files, a block centered on the screen control circuit **92** that executes the display of image data and associated information, and a block centered on the CPU **50**, which performs overall control of the user interface such as the control keys **65** and of the various control circuits.

[**0377**] The CPU **50** (central processing unit) is the means that controls the entire electronic camera **100**, issuing various instructions to the capture control circuit **60**, screen control circuit **92** and power control circuit **64** in accordance with input information from the control keys **65**, touch screen **66**, power switch **17**, timer **74** and photometric circuit **13**. The photometric circuit **13** measures the brightness of the subject and outputs the photometric data that is the result of this measurement to the CPU **50**. The CPU **50** sets the exposure time and sensitivity of the CCD **55** according to the photometric data by means of a CCD drive circuit **56**, and controls the value of the diaphragm **53** by means of a diaphragm control circuit **54** via the capture control circuit **60** in accordance with the data of those settings.

[0378] In capture mode, the CPU **50** controls the capture operation via the capture control circuit **60** in accordance the manipulation of the release button **16**. Furthermore, if the subject is dark based on the photometric data, the CPU **50** causes the strobe **12** to emit light via the strobe drive circuit **73** when taking a picture. The timer **74** has a built-in clock circuit and finds the date and time information corresponding to the current date and time and provides the capture date and time information to the CPU **50** when a picture is taken. The CPU **50** appends the capture date and time information to the image data and stores it in the memory card **77**. The CPU **50** controls the various units according to a control program stored in ROM **67** (read-only memory). The EEPROM **68** (electrically erasable programmable ROM) is a non-volatile memory that stores settings information, etc. required for the operation of the electronic camera **100**. The RAM **70** is a volatile memory that is used as a temporary working area of the CPU **50**. The CPU **50** detects the manipulation state of the power switch **17** and controls the power supply **63** via a power supply control circuit **64**.

[0379] The capture control circuit **60** performs focusing and zooming of the photographic lens **10** by means of a lens drive circuit **52**, controls the exposure of the CCD **55** by controlling the diaphragm **53** by means of the diaphragm control circuit **54**, and controls the operation of the CCD **55** by means of a CCD drive circuit **56**. Light beams from the subject are formed by the photographic lens **10** into a subject image over the CCD **55** after passing through the diaphragm **53** to adjust the amount of light, and this subject image is picked up by the CCD **55**. The CCD **55** (charge coupled device), which comprises a plurality of pixels, is a charge accumulation type image sensor used for picking up a subject image, and outputs electrical image signals corresponding to the strength of the subject image formed on the CCD **55** to an analog processing unit **57** in accordance with drive pulses provided by the CCD drive circuit **56**.

[0380] The analog processing unit **57** samples the image signal, which has undergone photoelectric conversion by the CCD **55**, with a specific timing, and amplifies the sampled signal to a specific level. An A/D conversion circuit **58** (analog/digital conversion circuit) digitizes the image signal sampled by the analog processing unit **57**, thereby converting it to digital data, which is temporarily stored in capture buffer memory **59**.

[0381] In capture mode, the capture control circuit **60** repeats the operation described above, while the screen control circuit **92** repeats the through-image display operation of reading out the digital data stored successively in the capture buffer memory **59** via the data/control bus **51**, loading it once into the frame memory **69**, converting the digital data into image data for display, loading it again into the frame memory **69**, and displaying the image data for display on the left screen **21**. Furthermore, the screen control circuit **92** obtains text display information from the CPU **50** as required, converts it to text data for display and stores it in the frame memory **69**, and displays the text data for display on the left screen **21** and right screen **22**. In this way, in capture mode, the image picked up by the CCD **50** is displayed in real time on the left screen **21**, making it possible to use this through-image as a monitor screen to make the composition settings for taking a picture. The capture control circuit **60** analyzes the extent of the high frequency component of the digital data stored in the capture buffer memory **59** and detects the state of focus adjustment of the photographic lens **10**, and performs focus adjustment of the photographic lens **10** by means of the lens drive circuit **52** in accordance with the detection results.

[0382] At the time of release, upon receiving a capture instruction from the CPU **50**, the capture control circuit **60** causes the subject image to be picked up by the CCD **55** via the CCD drive circuit **56**, passes the image signal generated by the image pickup through the analog processing unit **57** and A/D conversion circuit **58** and temporarily stores it as digital data (raw data) in the capture buffer memory **59**. The capture control circuit **60** converts or compresses the digital data stored temporarily in the capture buffer memory **59** into a specific recording format (JPEG, etc.) to form the image data, and stores the image data on the memory card **77**.

[0383] A GPS circuit **61** (global positioning system circuit) detects the location information (longitude data and latitude data) for the electronic camera **100** using information from multiple satellites orbiting around the earth, and provides the capture location information to the CPU **50** at the time of image capture. The CPU **50** appends the capture location information to the image data and stores it in the memory card **77**.

[0384] The CPU **50** can transmit the image data stored in the memory card **77** to the outside via the short-range wireless communication circuit **72** and the antenna **76**, or conversely store image data received from the outside via the short-range wireless communication circuit **72** and the antenna **76** in the memory card **77** and display it on the left screen **21**, as required.

[0385] In playback mode, the screen control circuit **92** reads out the image data indicated by the CPU **50** from the memory card **77** and places it temporarily into the frame memory **69**, displays the image data on the left screen **21**, and, following the instructions of the CPU **50**, places text data such as playback mode instructions into the frame memory **69** and displays the text data on the right screen **22**.

[0386] Moreover, in playback mode, manipulating the transmit button **31** causes the image data being played back and displayed on the left screen **21** to be transmitted to the outside via the short-range wireless communication circuit **72** and antenna **76**, and manipulating the receive button **32** causes image data to be received from the outside via the short-range wireless communication circuit **72** and antenna **76** and played back and displayed on the left screen **21**.

[0387] **FIG. 79** shows the data configuration of image files stored in the memory card **77**. As shown in **FIG. 79**, multiple image files are stored in the memory card **77**. Each image file is made up of image data and appended informational data. The appended informational data consists of capture data that indicates the various settings at the time of image capture, capture date and time data, and capture location data. **FIG. 80** is a drawing that shows the configuration of information stored in the EEPROM **68**, which consists of camera identification information for identifying the individual electronic camera **100** and gateway server access information used by the portable telephone **120** to access the gateway server **160**.

[0388] **FIG. 81** is an external view of the portable telephone **120**, which is provided with a display screen **221** for displaying image data, various control keys **265**, a micro-

phone **280** and a speaker **281**. **FIG. 82** is a block diagram showing an example of the internal electrical configuration of the portable telephone **120** shown in **FIG. 81**, wherein the various elements are connected to each other via a data/control bus **251** for transmitting various types of informational data and control data. The CPU **250** (central processing unit) is the means that performs overall control of the entire portable telephone **120**, issuing various instructions to the screen control circuit **292** and power supply control circuit **264** in accordance with input information from the control keys **265**, power switch **217** and timer **274**.

[**0389**] The CPU **250** controls the various units in accordance with a control program stored in ROM **267** (read-only memory). The EEPROM **268** (electrically erasable programmable ROM) is a non-volatile memory that is used for storage of settings information necessary for the operation of the portable telephone **120** and for temporary storage of image data. The RAM **270** is a volatile memory that is used as a temporary working area of the CPU **250**. The UIM card (User Identity Module) is a portable storage medium that can be installed in and removed from the portable telephone **120** and that stores personal information of the user of the portable telephone **120** and the like, which personal information can be used by the CPU **250** as required. The CPU **250** detects the state of manipulation of the power switch **217**, and controls the power supply **263** via the power supply control circuit **264**.

[**0390**] The CPU **250** performs processing of outgoing and incoming telephone calls using the wireless portable telephone circuit **271** and antenna **275**, and performs voice call processing using the microphone **280** and speaker **281**. Furthermore, the CPU **250** performs exchange of digital data with the outside by means of packet communication protocol using the wireless portable telephone circuit **271** and antenna **275**. Moreover, the CPU **250** performs exchange of messages with electronic devices having a short-range wireless communication capability that are in the vicinity of the portable telephone **120** via the short-range wireless communication circuit **272** and the antenna **276**, and is able to exchange image information and the like. The CPU **250** reads and loads image data stored temporarily in EEPROM **268** into frame memory **269**, and displays the image data on the display screen **221** using the screen control circuit **92**.

[**0391**] **FIG. 83** is a block diagram showing the internal configuration of the gateway server **160**, wherein a communication means **371** connected to a packet communication network, a communication means **372** connected to the Internet, a memory means **368** that stores information such as image data, and a timer means **374** are connected to a control/processing means **350** that performs overall control of the various elements of the gateway server **160**. The gateway server **160** exchanges information such as image data with the portable telephone **120** using a packet communication protocol via the communication means **371**, and exchanges information such as image data with image servers using Internet protocol via the communication means **372**.

[**0392**] Various types of information are held in the memory means **368**, as shown in **FIG. 84**. The camera identification information link data, as shown in **FIG. 85**, is data that indicates the correspondence relations of individual items of camera identification information, whereby the arrow indicates that the camera identification information on the right is the parent of the camera identification information on the left. It also represents whether a given item of camera identification information is parent camera identification information, or is single (no link) or is unused, etc. Namely, the gateway server **160** refers to this camera identification information link data, searches for parent camera identification information based on the received camera identification information, and if parent camera identification information exists, performs processing, which is described below, in accordance with the parent camera identification information. Performing such processing makes it possible to treat image data captured with different electronic cameras as image data captured with a single electronic camera. This camera identification information link data can be modified if necessary from an external personal computer **190** or the like, connected to the gateway server **160**.

[**0393**] In the memory means **368**, as shown in **FIG. 84, a** folder corresponding to each item of camera identification information is prepared, and each folder corresponding to an item of camera identification information holds personal identification data, image server management data, transfer history data, thumbnail image data and image file data. **FIG. 86** is a drawing that shows the configuration of personal identification data, which comprises data relating to the user of the electronic camera **100** corresponding to the camera identification information; the personal identification data can be used by the gateway server **160** to register with image servers on the Internet to secure a new storage area for storing image data or when reading/writing image data to and from image servers. This personal identification data can be modified as necessary from an external personal computer **190**, etc., connected to the gateway server **160**, and may optionally be made modifiable by transmission of information stored on the UIM card installed in the portable telephone **120** from the portable telephone **120** to the gateway server **160**.

[**0394**] **FIG. 87** is a drawing showing the configuration of server management data, which consists of identifying names of image servers on that the gateway server **160** stores image data according to the camera identification information, the URL (Uniform Resource Locator) of each image server, the total data capacity provided on each image server according to the camera identification information, the available capacity out of the total data capacity provided on each image server according to the camera identification information, and list information on the image data stored on each image server based on the camera identification information (image file identification information or image file names), etc.

[**0395**] **FIG. 88** is a drawing that shows the configuration of the transfer history data, which consists of list information on image data stored on the virtual image server **180** according to the camera identification information (image file identification information or image file names), information on the date and time of transfer of each item of image data to the image server, information relating to the image server to that image data is transferred, etc.

[**0396**] **FIG. 89** is a block diagram showing the internal configuration of image servers **181** through **184**, wherein a communication means **471** connected to the Internet and a

memory means **468** that stores information such as image data are connected to the control/processing means **450** that performs overall control of the individual elements of image servers **181** through **184**. Image servers **181** through **184** exchange information such as image data with the gateway server **160** via the communication means **471** using Internet protocol. In the memory means **468**, a folder corresponding to each item of camera identification information is prepared, as shown in **FIG. 90**, and image file data is stored in the folders corresponding to each item of camera identification information.

[**0397**] **FIG. 91** is a state transition diagram for an embodiment of the electronic camera **100** according to the present invention. When power is turned on, the camera enters capture mode, and manipulating the release button **16** causes the camera to perform a capture operation and a post-capture image file creation and loading of the image file into the memory card **77**. In playback mode, it performs playback and display operations on the image data stored in the memory card **77**. In capture mode, if the automatic transmission function is turned on, an image transfer operation is performed, whereby captured image data is automatically transmitted and stored on an image server. Furthermore, in playback mode, manipulating the transmit button **31** causes an image transmission operation to be performed, whereby the image data displayed on the left screen **21** is transmitted and stored on an image server. Moreover, manipulating the receive button **32** in playback mode causes an image reception operation to be performed, whereby the desired image data is received from the image server and displayed on the left screen **21**. Furthermore, manipulating the capture mode button **28** causes a transition from playback mode to capture mode, and manipulating the playback mode button **29** causes a transition from capture mode to playback mode.

[**0398**] **FIG. 92** is a main flow chart of the operation of the electronic camera **100** (CPU **50**) in the mode of embodiment described above. First, in S**10**, the power supply is turned on by manipulating the power switch **17**, and in S**20**, the capture mode subroutine is executed, leading to a capture enabled state. If the release button **16** is manipulated while in capture mode, the release interrupt handling subroutine is executed in S**30**, and the capture operation is carried out. If the playback mode button **29** is manipulated while in capture mode, a mode switch interrupt handling subroutine is executed in S**40**, the playback mode subroutine is executed in S**50**, and image data stored in the memory card **77** is played back and displayed on the left screen **21**. Conversely, if the capture mode button **28** is manipulated while in playback mode, a mode switch interrupt handling subroutine is executed in S**40**, and the system moves to the capture mode subroutine of S**20**. If the automatic transmission function is turned on, manipulating the release button **16** causes the communication interrupt processing of S**60** to be executed following the capture operation, and transmission of image data to the image server is carried out. Furthermore, manipulating the transmit button **31** or the receive button **32** while in playback mode causes the communication interrupt processing of S**60** to be executed, and transmission of image data to the image server or reception of image data from the image server is carried out.

[**0399**] **FIG. 93** is a detailed flow chart of the capture mode subroutine. Starting in S**20**, the processing of S**201** is repeated. In S**201**, image data successively generated by the CCD **55** under the camera settings made by the user is displayed on the left screen **21** as shown in **FIG. 94**, at that time the capture settings are displayed as text on the right screen **22**.

[**0400**] **FIG. 95** is a detailed flow chart of the release interrupt handling subroutine. Starting in S**30**, it is checked in S**301** whether the system is in capture mode, and if it is not in capture mode, the system returns in S**308**. If it is in capture mode, the capture operation is carried out under the capture conditions set by the user or the camera to generate image data, and appended informational data (capture data, time data, location data) is appended to the image data in S**303** to generate an image file. In S**304**, it is checked whether the automatic transmit function is turned on, and if it is not turned on, the image file is loaded into the memory card **77** in S**305** and the system returns in S**308**. If the automatic transmit function is turned on, communication with the portable telephone **120** is attempted using the short-range wireless communication circuit **72** in S**306**, checking whether communication is possible, and if communication with the portable telephone **120** is possible, the portable telephone image file transmission subroutine of S**70** is executed, transmitting the image file to the portable telephone **120**, and the system returns in S**308**. If communication with the portable telephone **120** is not possible, the system goes back to S**305**, stores the image file on the memory card **77**, and returns in S**308**.

[**0401**] **FIG. 96** is a detailed flow chart of the portable telephone image file transmission subroutine. Starting in S**70**, the image file, camera identification information, gateway server access information and an image transmission request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.) in S**701**, and the system returns in S**702**.

[**0402**] **FIG. 97** is a detailed flow chart of the mode switch interrupt handling subroutine. Starting in S**40** upon manipulation of the capture mode button **28** or playback mode button **29**, it is checked in S**401** whether the manipulated button was the capture mode button **28**, and if it was the capture mode button **28**, playback mode is terminated and the system moves to the capture mode subroutine of S**20**. If the manipulated button was not the capture mode button **28**, the capture mode is terminated and the system moves to the playback mode subroutine of S**50**.

[**0403**] **FIG. 98** is detailed flow chart of the playback mode subroutine. Starting in S**50**, the processing of S**501** is repeated. In S**501**, in response to the manipulation of the LEFT button **25** and RIGHT button **26**, image data stored in the memory card **77** is selected and read, and is played back and displayed on the left screen **21** as shown in **FIG. 99**, while operating instructions are displayed on the right screen **22**. Immediately after power is turned on, the most recent image data is displayed; subsequently, image data with older time data are displayed successively in response to manipulation of the LEFT button **25**, and image data with newer time data are displayed successively in response to manipulation of the RIGHT button **26**.

[**0404**] **FIG. 100** is a detailed flow chart of the communication interrupt handling subroutine started by manipulating the transmit button **31** or receive button **32**. Starting in S**60**, it is checked in S**601** whether the manipulated button

was the transmit button **31**, and if was the transmit button **31**, it is checked in S**602** whether the system is in capture mode, and if it is in capture mode, the current setting of the automatic transmit function is inverted in S**603**, and the system returns in S**613**. If the system was in playback mode in S**602**, communication with the portable telephone **120** using the short-range wireless communication circuit **72** is attempted in S**604**, checking whether communication is possible, and if communication with portable telephone **120** is possible, the portable telephone image file transmission subroutine of S**70** is executed, transmitting the image file of the image data currently displayed on the left screen **21** to the portable telephone **120**, and the system returns in S**613**. If communication with the portable telephone **120** is not possible, the system returns in S**613**.

[**0405**] If the button manipulated in S**601** was the receive button **32**, it is checked in S**605** whether the system is in capture mode, and if it is in capture mode, the system returns in S**613**. If it is in playback mode, communication with the portable telephone **120** using the short-range wireless communication circuit **72** is attempted in S**606**, checking whether communication is possible, and if communication with the portable telephone **120** is not possible, the system returns in S**613**. If communication with portable telephone **120** is possible, in S**607**, the camera identification information, gateway server access information and a thumbnail image reception request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.). In S**608**, the system waits to receive thumbnail images form the portable telephone **120** and returns in S**613** if reception was not possible. If thumbnail images were received, in S**609**, as shown in **FIG. 101**, the received thumbnail images are displayed on the left screen **21**, while operating instructions are displayed on the right screen **22**. The thumbnail images are scrolled by manipulating the UP button **23** and DOWN button **24**, and either the left or right thumbnail image is selected by manipulating the LEFT button **25** or RIGHT button **26**. Manipulating the SELECT button **27** confirms the selected thumbnail image. In S**610**, the image identification information appended to the selected thumbnail image, the camera identification information, gateway server access information and an image reception request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.). In S**611**, the system waits to receive image data from the portable telephone **120** and returns in S**613** if reception was not possible. If image data was received, in S**612**, as shown in **FIG. 102**, the received image data is displayed on the left screen **21** while operating instructions are displayed on the right screen **22**, and the system returns in S**613**.

[**0406**] Next, operation of the portable telephone **120** (CPU **250**) in the above mode of embodiment will be described. Description of the operation of the portable telephone **120** relating to talk functions will be omitted as it has little bearing on the present invention. **FIG. 103** is a detailed flow chart of the communication interrupt handling started when the portable telephone **120** performs image transmission.

[**0407**] Communication interrupt handling is started in A**60** when a communication request is received via short-range wireless communication from the electronic camera **100**, it is checked in A**601** whether the system is currently processing a voice call, and if it is processing a voice call, the system returns in A**613** without responding to the communication request from the electronic camera **100**. If a voice call is not being processed, voice call processing is blocked in A**602**, it is checked in A**603** whether the request from the electronic camera **100** is an image file transmission request, and if it was an image file transmission request, in A**604**, communication is attempted with the gateway server **160** using the wireless portable telephone circuit **271** based on the gateway server access information, checking whether communication is possible, and if communication with the gateway server **160** is possible, the gateway image file transmission subroutine of A**70** is executed, the image file received from the electronic camera **100** is transmitted to the gateway server **160**, voice call processing is unblocked in A**613**, and the system returns. If communication with the gateway server **160** is not possible, in A**605**, the image file, camera identification information, gateway server access information, etc. received from the electronic camera **100**, are stored temporarily in EEPROM **268**, and the system unlocks voice call processing and returns in A**613**.

[**0408**] If the request from the electronic camera **100** in A**603** was not an image file transfer request, in A**606**, communication with the gateway server **160** is attempted using the wireless portable telephone circuit **271** based on the gateway server access information, checking if communication is possible, and if communication with the gateway server **160** is not possible, the system unblocks voice call processing in A**613** and returns. If communication with the gateway server **160** is possible, it is checked in A**607** whether the request from the electronic camera **100** is a thumbnail image reception request, and if it was a thumbnail image reception request, in A**608**, a thumbnail image reception request and camera identification information are transmitted to the gateway server **160** by means of the wireless portable telephone circuit **271** using a packet communication protocol. In A**609**, the thumbnail images are received from the gateway server **160** and are transmitted to the electronic camera **100** by means of the short-range wireless communication circuit **272** using a short-range wireless communication protocol. While transmitting thumbnail images to the electronic camera **100**, the thumbnail images are displayed on the screen **221**. Once transmission of thumbnail images to the electronic camera **100** is completed, the system unblocks voice call processing and returns in A**613**.

[**0409**] If the request from the electronic camera **100** in A**607** was not a thumbnail image reception request, in A**610** it is checked whether the request from the electronic camera **100** is a selected image reception request, and if it was not an image reception request, the system unblocks voice call processing and returns in A**613**. If it was an image reception request, in A**611**, an image reception request, image identification information and camera identification information are transmitted to the gateway server **160** by means of the wireless portable telephone circuit **271** using a packet communication protocol. In A**612**, image data corresponding to the image identification information is received from the gateway server **160**, and is transmitted to the electronic camera **100** by means of the short-range wireless communication circuit **272** using a short-range wireless communication protocol. During transmission of images to the elec-

tronic camera **100**, the image data is displayed on the screen **221**, as shown in **FIG. 106**. Once transmission of image data to the electronic camera **100** is completed, display of image data on the screen **221** is terminated, and the system unblocks voice call processing and returns in A**613**. To more effectively alert the user of the fact that image data is being transmitted, a different display mode from normal image data display may be used, for instance periodic flashing (repeated display and non-display) of the image data displayed on the screen **221**. Here, normal display mode refers to the display mode whereby image data is statically displayed.

[**0410**] **FIG. 104** is a detailed flow chart of the gateway image file transmission subroutine. Starting in A**70**, in A**701** the image file, camera identification information and an image transmission request are transmitted by packet communication protocol using the wireless portable telephone circuit **271** to the gateway server **160** designated based on the gateway access information, and the system returns in A**702**. While an image file is being transmitted to the gateway server **160**, the image data being transmitted is displayed on the screen **221**, as shown in **FIG. 105**, and the display is terminated once transmission is completed. Furthermore, to more effectively alert the user of the fact that image data is being transmitted, a different display mode from normal image data display may be used, for instance periodic flashing (repeated display and non-display) of the image data displayed on the screen **221**. Here, normal display mode refers to the display mode whereby image data is statically displayed.

[**0411**] **FIG. 107** is a detailed flow chart of the timer interrupt handling started at regular intervals by the timer **274** of the portable telephone **120**. Starting in A**80**, it is checked in A**801** whether the system is currently processing a voice call, and if it is currently processing a voice call, the system returns in A**805**. If it is not processing a voice call, voice call processing is blocked in A**802**, it is checked in A**803** whether there are image files being temporarily stored in EEPROM **268**, and if there are no image files being temporarily stored, the system unblocks voice call processing and returns in A**805**. If there are temporarily stored image files, communication with the gateway server **160** by means of the wireless portable telephone circuit **271** based on the gateway server access information is attempted in A**804**, checking whether communication is possible, and if communication with the gateway server **160** is not possible, the system unblocks voice call processing and returns in A**805**. If communication with the gateway server **160** is possible, the gateway image file transmission subroutine of A**70** is executed, image files received from the electronic camera **100** are transmitted to the gateway server **160**, and in A**805**, the system unblocks voice call processing and returns.

[**0412**] As indicated above, when communication with the gateway server **160** is not possible, the portable telephone **120** temporarily stores the image files received from the electronic camera **100**, and when communication with the gateway server **160** becomes possible, it automatically transmits the temporarily stored image files to the gateway server **160**. To notify the user of the fact that image files transmitted from the electronic camera **100** to the gateway server **160** are being temporarily stored by the portable telephone **120**, one may optionally display a specific mark, icon or text on the screen **221** while image files are being temporarily stored by the portable telephone **120**. By doing this, in a situation where the user is in a hurry to transmit the image files, the user will be able to see this display and perform image file transmission by a different method.

[**0413**] Furthermore, while the communication interrupt handling of **FIG. 103** assumes that the connection between the electronic camera **100** and portable telephone **120** is maintained until communication is completed once the connection between the electronic camera **100** and portable telephone **120** has been established, in case the connection between the electronic camera **100** and the portable telephone **120** should be cut off (for example, if the portable telephone **120** becomes unable to transmit thumbnail images or image files received from the gateway server **160** to the electronic camera **100**), one can have the thumbnail images and image files be stored temporarily in the EEPROM **268** of the portable telephone **120**, have the portable telephone **120** detect when communication between the portable telephone **120** and electronic camera **100** becomes possible, and automatically transmit the thumbnail images or image files stored temporarily in EEPROM **268** to the electronic camera **100**. The portable telephone **120** may optionally display the fact that that thumbnail images or image files transmitted to the electronic camera **100** from the gateway server **160** are being stored temporarily by the portable telephone **120** by displaying a special mark, icon or text on the screen **221** while the image files are being temporarily stored by the portable telephone **120**. By doing this, in a situation where the user is in a hurry to transmit the image files, the user will be able to see this display, and take countermeasures such as rechecking the connection between the portable telephone **120** and electronic camera.

[**0414**] Next, the operation of the gateway server **160** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the gateway server **160** other than the image transmission operation will be omitted as they have little bearing on the present invention. **FIG. 108** is a detailed flow chart of the communication interrupt handling started when the gateway server **160** performs image transmission. Starting in G**60** with a communication request from the portable telephone **120** or personal computer **190**, in G**601**, the parent camera identification information is identified by referring to the camera identification information link data based on the received camera identification information. Subsequent image data handling is performed on the folder corresponding to the parent camera identification information. In G**602**, it is checked whether the received request is an image file transmission request, and if it was an image file transmission request, in G**603**, the received image file is stored temporarily in an image buffer folder in the folder corresponding to the camera identification information, thumbnail image data corresponding to the image data is generated and stored in a thumbnail image folder, likewise in the folder corresponding to the camera identification information, and the system returns in G**617**.

[**0415**] If the request received in G**602** was not an image file transmission request, it is checked in G**604** whether the received request is a thumbnail image reception request, and if it was a thumbnail image reception request, in G**605** the thumbnail images stored in the thumbnail image folder inside the folder corresponding to the camera identification

information are transmitted by packet communication protocol to the originator of the thumbnail image reception request (portable telephone **120**), and the system returns in G**617**. If the request received in G**604** was not a thumbnail image reception request, it is checked in G**606** whether the received request is an image reception request, and if it was an image reception request, it is checked in G**607** whether image data corresponding to the image identification information exists in the image buffer folder inside the folder corresponding to the camera identification information, and if image data corresponding to the image identification information exists in the image buffer folder, the image file containing the image data is transmitted to the originator of the image reception request (portable telephone **120**) using a packet communication protocol in G**608**, and the system returns in G**617**.

[**0416**] If there is no image data corresponding to the image identification information in the image buffer folder, the image server where the image file corresponding to the image identification information is stored is determined based on the transfer history data in G**609**, and an image reception request and the image identification information are transmitted to that image server using Internet protocol in G**610**. In G**611**, the system waits to receive the specified image file from the image server, returning in G**617** if the image file could not be received from the image server; if the image file was received from the image server, the image file is transmitted to the originator of the image reception request (portable telephone **120**) in G**612** using a packet communication protocol, the image file is stored temporarily in the image buffer folder in the folder corresponding to the camera identification information, and the system returns in G**617**.

[**0417**] If the received request in G**606** was not an image reception request, it is checked in G**613** whether the received request is a data overwrite request, and if it was a data overwrite request, personal identification data in the folder corresponding to the camera identification information, camera identification information link data, etc., is overwritten according to the received data, and the system returns in G**617**. If the received request in G**613** was not a data overwrite request, it is checked in G**615** whether the received request was a data read request, and if it was a data read request, the personal identification data in the folder corresponding to the camera identification information, camera identification information link data, etc., is read and transmitted to the requestor in accordance with the received data, and the system returns in G**617**. If the received request in G**615** was not a data read request, the system returns in G**617**.

[**0418**] **FIG. 109** is a detailed flow chart of the timer interrupt handling started at specific intervals by the timer means **374** of the gateway server **160**. Starting in G**80**, the first item of camera identification information from the camera identification information list maintained by the gateway server **160** is selected in G**801**. In G**802**, it is checked based on the transfer history data whether there are image files that have not been transferred yet to the image server in the image buffer folder inside the folder corresponding to the selected camera identification information, and if there are no image files that have not been transferred yet, the system returns in G**810**. If there are image files that have not been transferred yet, it is checked in G**803**, based on image server management data, whether there is an image server with available capacity. In S**804**, if there is an image server with available capacity, the system proceeds to G**806**, and if there are no image servers with available capacity, a new image server with available capacity is searched for in G**805**. In G**805**, a search is carried out for open image servers on the Internet that are able to store image files, registration with the found image server is carried out automatically using camera identification information, and information on the image server (storage capacity, etc.) is recorded in the image server management data. In G**806**, an image server with available capacity is designated as the image server for storing images. In G**807**, image files that have not been transferred yet are transmitted using Internet protocol to the image server designated as the image server for storing images, the image server management data and transfer history data are updated, and all the image files stored temporarily in the image buffer folder are deleted. In G**808**, it is checked whether the currently selected camera identification information is the last item of camera identification information in the camera identification information list; if it is not the last item of camera identification information, in G**809**, the camera identification information is changed to the next item of camera identification information, the system goes back to G**802** and repeats the processing described above, and if it is the last item of camera identification information, the system returns in G**810**.

[**0419**] Next, the operation of the image servers **181** through **184** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the image servers **181** through **184** other than the image transmission and storage operation will be omitted as they have little bearing on the present invention. **FIG. 100** is a detailed flow chart of the communication interrupt handling started when a communication request is received by the image servers **181** through **184** from the gateway server **160**. Starting in H**60** upon receiving a communication request from the gateway server **160**, it is checked in H**601** whether the received request is an image server registration request, and if it was a registration request, it is checked in H**602** whether a folder corresponding to the received camera identification information exists, and if it already exists, the system returns in H**611**. If no folder corresponding to the received camera identification information exists, in H**603**, a folder corresponding to the received camera identification information is created, and the system returns in H**611**.

[**0420**] If the request received in H**601** is not an image server registration request, it is checked in H**604** whether the received request is an image reception request (image read request), and if it was an image reception request, it is checked in H**605** whether a folder corresponding to the received camera identification information exists, and if it does not exist, the system returns in H**611**. If a folder corresponding to the received camera identification information exists, it is checked in H**606** whether an image file corresponding to the received image identification information exists in the folder, and if it does not exist, the system returns in H**611**. If an image file corresponding to the received image identification information exists, the image file in question is transmitted to the gateway server **160** using Internet protocol in H**607**, and the system returns in H**611**. If the received request in H**604** is not an image reception request to the image server, it is checked in H**608** whether the received request is an image transmission

request (image write request), and if it was not an image transmission request, the system returns in H611. If it was an image transmission request, it is checked in H609 whether a folder corresponding to the received camera identification information exists, and if it does not exists, the system returns in H611. If a folder corresponding to the received camera identification information exists, the received image file is stored in the folder in H610, and the system returns in H611.

[0421] In the mode of embodiment described above (**FIG. 75** through **FIG. 110**), while relaying image files received from the electronic camera **100** though the gateway server **160**, the portable telephone **120** displays the image data being transmitted on the screen **221**, as shown in **FIG. 105**, which allows the user to confirm based on the display of screen **221** that the image data he selected and transmitted is in fact being transmitted from the portable telephone **120** to the gateway server **160**, and allows the user to confirm that transmission of image data from the portable telephone **120** to the gateway server **160** has been completed based on the fact that display of image data on the screen **221** has terminated. Furthermore, the fact that display of image data has started on the screen **221** of the portable telephone **120** allows one to confirm that transmission of image data from the electronic camera **100** to the portable telephone **120** has been completed, and one can accordingly start taking picture with the electronic camera **100**.

[0422] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), while image files received from the gateway server **160** are being relayed to the electronic camera **100**, the portable telephone **120** displays the image data being transmitted on the screen **221**, as shown in **FIG. 106**, which allows the user to get an overview of the received image data based on the display of screen **221** before displaying and browsing the image data on the screen after transmission of the image data to the electronic camera **100** is completed, and allows the user to confirm that transmission of image data from the portable telephone **120** to the electronic camera **100** has been completed based on the fact that display of image data on the screen **221** has terminated.

[0423] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), if the portable telephone **120** was not able to relay image files received from the electronic camera **100** to the gateway server **160** (for example, when the portable telephone **120** is out of range of the wireless portable telephone link), those image files are stored temporarily in the EEPROM **268** of the portable telephone **120**, and when transmission of image files to the gateway server **160** becomes possible, the image files stored temporarily in EEPROM **268** are automatically transmitted to the gateway server **160**, so even if communication between the portable telephone **120** and the gateway server **160** is not possible, the user does not need to redo the image file transmission operation on the electronic camera **100** side, which makes it possible to avoid the risk of the user forgetting to retransmit, and allows the user to focus on taking pictures with the electronic camera **120** once image files have been transmitted from the electronic camera **100** to the portable telephone **120**.

[0424] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** temporarily stores image data received from the electronic camera **100** or image servers **181** through **184** in the memory means **368** of the gateway server **160**, and transmits the stored image data as necessary to the electronic camera **100** or image servers **181** through **184**, thereby making it possible to reduce the communication traffic between the image servers **181** through **184** and gateway server **160** or between the electronic camera **100** and the gateway server **160**.

[0425] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** stores the user's personal information in the memory means **368**, and if there is no available capacity to store image data in the image server's album corresponding to the camera identification information, the gateway server connects to another image server on the Internet, automatically sets up an album (folder) corresponding to the camera identification information using the aforementioned personal information, transmits the image data received from the electronic camera **100** to the image server and causes it to be stored in the new album, thereby freeing the user from having to perform the complicated procedure of connecting to an image server and the bothersome procedure of setting up an album, which the user would otherwise have to carry out directly on the electronic camera **100** side.

[0426] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** keeps, in the memory means **368**, server management information for unified management of albums (folders) set up corresponding to camera identification information on each of the image servers **181** through **184**, and based on the server management information, performs generalized storage and management of image data stored in distributed fashion across multiple image servers **181** through **184** by combining it into one virtual album, thereby making it possible to exchange large volumes of image data between the virtual album and the electronic camera **100** by means of simple operations, without the user being aware of the multiple image servers **181** through **184** that actually store the image data on the Internet.

[0427] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** keeps, in the memory means **368**, link information that represents the associations of camera identification information for individually identifying electronic cameras, views multiple electronic cameras as a single group based on the link information, and transmits and stores image data received from the electronic cameras in an album on an image server corresponding to the group to that those electronic cameras belong, thereby making it possible to store image data captured with multiple electronic cameras in a single album on the image server.

[0428] (Description of modified embodiments) The present invention is not limited to the mode of embodiment described above, and various modifications and changes are possible.

[0429] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), transmission was carried out individually for reach image file relayed from the electronic camera

100 via the portable telephone **120** to the gateway server **160**, it is also permissible to transmit multiple image files as a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160**. In such cases as well, during transmission of image data from the portable telephone **120** to the gateway server **160**, the portable telephone **120** displays the image data being transmitted on the screen **221**. Doing this allows the user to check the progress of the processing of image file transmission from the portable telephone **120** to the gateway server **160** based on the image data being displayed. Furthermore, when multiple image files are transmitted in a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160** in this manner, first all the image files to be transmitted are transmitted from the electronic camera **100** to the portable telephone **120** and are temporarily buffered in the EEPROM **268** of the portable telephone **120**, and once transmission of image files from the electronic camera **100** to the portable telephone **120** is completed, the portable telephone **120** transmits the image files stored temporarily in EEPROM **268** to the gateway server **160**. Doing so makes it unnecessary to transmit appended informational data (camera identification information, gateway server access information, image transmission requests etc.) for each individual image file from the electronic camera **100** to the portable telephone **120**, making it possible to shorten the transmission time for image files between the electronic camera **100** and portable telephone **120**. When transmitting image files from the portable telephone **120** to the gateway server **160**, this also makes it unnecessary to transmit appended informational data (camera identification information, image transmission requests, etc.) for each individual image file from the portable telephone **120** to the gateway server **160**, making it possible to reduce the transmitted data volume passing through the wireless portable telephone link **130** and packet communication network **150** and to shorten the image file transmission time, as well as to reduce communication fees.

[**0430**] Furthermore, when transmitting multiple image files in a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160**, if all the image files to be transmitted are first transmitted from the electronic camera **100** to the portable telephone **120** and are temporarily buffered in the EEPROM **268** of the portable telephone **120**, and once transmission of image files from the electronic camera **100** to the portable telephone **120** is completed, the portable telephone **120** transmits the image files stored temporarily in EEPROM **268** to the gateway server **160**, then if problems occur with the wireless portable telephone link **130** or packet communication network **150** during transmission of image files from the portable telephone **120** to the gateway server **160** and transmission of image files becomes impossible, the portable telephone **120** will leave the image files that it has not finished transmitting in the EEPROM **268**, and will automatically transmit the image files remaining in EEPROM **268** to the gateway server **160** once transmission of image files to the gateway server **160** becomes possible. Doing so makes it unnecessary for the user to redo the image file transmission operation on the electronic camera **100** side from the beginning even if communication between the portable telephone **120** and gateway server **160** becomes impossible midway during image transmission, allowing the user to focus on taking pictures with the electronic camera **120** once image files have been transmitted from the electronic camera **100** to the portable telephone **120**, as well as making it possible to reduce the transmitted data volume passing through the wireless portable telephone link **130** and the packet communication network **150** compared to if file transfer from the electronic camera **100** to the gateway server **160** were redone from the beginning, and allowing one to shorten the image file transmission time and to reduce communication charges.

[**0431**] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), greater data communication efficiency of the image transmission system was achieved by having the gateway server **160** temporarily store image files transmitted between the electronic camera **100** and the image server in an image buffer folder and make use of the image files stored temporarily in the image buffer folder as necessary, and by storing thumbnail image data corresponding to the image files in a thumbnail image folder and making use of that thumbnail image data as necessary, it is also possible, as shown in **FIG. 111**, to provide the same sort of image buffer folder and thumbnail image folder in the EEPROM **268** of the portable telephone **120** and temporarily store thumbnail image data and image files transmitted between the electronic camera **100** and the image server in the image buffer folder and thumbnail image folder, and, when the image file or thumbnail image data requested by the electronic camera **100** is present in the image buffer folder or thumbnail image folder, to have the portable telephone **120** transmit those image files and thumbnail image data to the electronic camera **100**. In such cases, the image files or thumbnail image data stored temporarily in the image buffer folder and thumbnail image folder in the EEPROM **268** may be cleared periodically in their entirety, or the image files and thumbnail image data may be deleted in the order of their age according to the storage start date and time data of the image file or thumbnail image data, so as to keep the total data volume of the temporarily stored image files and thumbnail image data at or below a specific volume. Alternatively, image files kept for more than a specific period of time may be deleted based on the storage start date and time data of the image files or thumbnail image data, or else stored image files or thumbnail image data may be deleted at specific clock times.

[**0432**] If this is done, then when the user wishes to reconfirm the image data most recently transmitted or received via the portable telephone **120**, it will be possible to display a summary of the status of temporarily stored images on the screen **221** of the portable telephone **120**, as shown in **FIG. 112**, and to transmit the image files or corresponding thumbnail image data temporarily stored in the portable telephone **120** from the portable telephone **120** to the electronic camera **100** and make use of them, thereby making it unnecessary to make inquiries via the portable telephone **120** to the gateway server **160** regarding the image files or thumbnail image data and making it possible to quickly read image files or thumbnail image data into the electronic camera **100**, as well as allowing the communication data volume between the portable telephone **120** and gateway server **160** to be reduced and correspondingly reduce the communication line usage fees.

[**0433**] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), the electronic camera **100** transmits image data via a single portable telephone **120** to a single

gateway server **160**, it is also permissible to have the electronic camera **100** transmit image data via a single portable telephone **120** to multiple gateway servers. In such an image transmission system, the portable telephone **120** can store image files transmitted from the electronic camera **100** in EEPROM **268** under predetermined conditions (for a specific period of time from the start of storage, etc.) and transmit the stored image files to multiple gateway servers based on instructions from the electronic camera **100**. When the electronic camera **100** transmits image files to multiple gateway servers, doing this will make it unnecessary to transmit image files from the electronic camera **100** to the portable telephone **120** every time an image file is to be transmitted, allowing the transmission of image files to the gateway servers to be carried out more quickly. For example, if an image file was transmitted from the electronic camera **100** to one gateway server and the user then wants to transmit the same image file to a different gateway server, the image identification information of the image file and the destination gateway server access information are sent from the electronic camera **100** to the portable telephone **120**, whereupon, if an image file corresponding to the received image identification information is present in the EEPROM **268**, the portable telephone **120** reads that image file from the EEPROM **268** and transmits it to the gateway server corresponding to the received gateway server access information. If no image file corresponding to the received image identification information is present in the EEPROM **268**, the portable telephone **120** informs the electronic camera **100** that no image file corresponding to the received image identification information is present in the portable telephone **120**, in response to that the electronic camera transmits the image file to the portable telephone **120**.

[**0434**] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), the portable telephone **120** performs relaying of image data in the transmission of image data between the electronic camera **100** and the gateway server **160**, if the electronic camera **100** itself has a built-in wireless portable telephone function, it is also permissible to omit the portable telephone **120**, as shown in **FIG. 113**, and to have the electronic camera **100** communicate directly with the gateway server **160** using a packet communication protocol. In **FIG. 113**, the base station **140** has been left out of the illustration.

[**0435**] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** provides the electronic camera **100** with a single virtual album that combines the albums secured according to the camera identification information on multiple image servers **181** through **184**, and increases the available capacity of the virtual album by automatically setting up a new album corresponding to the camera identification information by registering with a new image server when the available capacity of the virtual album becomes insufficient; however, instead of setting up a new album on a new image server, a new album may also be set up on an existing server on that an album has already been set up. For example, if the gateway server **160** has unused camera identification information and the available capacity of the virtual album has become insufficient, the gateway server **160** can register with an image server, on that an album forming part of the virtual album has already been established, using one item of the unused camera identification information, and set up a new album corresponding to the unused item of camera identification information. Furthermore, the gateway server **160** can link the camera identification information used for setting up new albums to the camera identification information corresponding to the virtual album, so as to incorporate the newly created album into the virtual album. Doing this makes it possible to deal with insufficient available capacity of the virtual album when the number of image servers is limited.

[**0436**] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** buffers image files received from the electronic camera **100** in an image buffer folder and delivers the image files buffered in the image buffer folder to image servers at specific intervals, when transmitting image files captured with a series of capture operations (continuous capture or continuous shutter, bracket capture, panorama capture, etc.) from the electronic camera in automatic transfer mode to the gateway server **160**, the image transfer may also be performed by the scheme shown in **FIG. 114**. Here, continuous capture refers to continuously photographic the same subject at specific time intervals while tracking its movement; bracket capture refers to taking multiple photographs of the same subject while varying the capture conditions, such as exposure; and panorama capture refers to photographing a landscape or the like while shifting the capture direction by a certain amount each time. Namely, for each capture operation, the electronic camera **100** appends identification information to image files captured in series to the effect that this image is part of a series, and transmits it to the gateway server **160**. The gateway server **160** temporarily stores image files with appended identification information indicating that it is part of a series of images in an image buffer folder. Once the series of image captures is completed, the electronic camera **100** transmits information to the gateway server **160** indicating that the series of image captures has been completed, and upon receiving that information, the gateway server **160** does a batch transmission of the series of image files stored temporarily in the image buffer folder to the same image server over the Internet and stores them there. Doing this makes it possible to transmit multiple image files between the gateway server **160** and image server with a single transmission procedure, allowing the transmission time to be shortened and allowing the image transmission processing load on the gateway server **160** and image servers **181** through **184** to be reduced. Furthermore, storing image files captured in a series on the same image server makes it highly convenient when the user later connects directly to the image server **181** through **184**, with a personal computer or the like, to use the series of image data.

[**0437**] Instead of transmitting information indicating that a series of captures has been completed from the electronic camera **100** to the gateway server **160**, it is also permissible to transmit to the gateway server **160**, from a terminal such as a personal computer **190** connected to the gateway server **160**, an instruction to transmit a series of image files accumulated on the gateway server **160** together to an image server, in response to that instruction, the gateway server **160** will transmit the series of image files accumulated on the gateway server **160** together to an image server.

[**0438**] Furthermore, when transmitting image files captured in a series from the electronic camera **100** to the gateway server **160** in automatic transmission mode, if an image file is transmitted from the electronic camera **100** to

the gateway server **160** after every capture, the communication time will become longer due to the overhead for establishing communication and the appended information, and there are cases where, during this time, the picture-taking conditions will change or where the pictures cannot be taken at the planned time intervals. In such cases, one can optionally have the electronic camera **100** temporarily store the series of captured image files in RAM **70**, and once the series of captures is completed, transmit the series of image files with appended identification information indicating that it is a series of images, together with information indicating that the series of captures has been completed, in a batch to the gateway server **160**. Furthermore, when the data transfer rate of short-range wireless communication between the electronic camera **100** and portable telephone **120** is fast, one may optionally have the image files captured in a series be transmitted from the electronic camera **100** to the portable telephone **120** each time an image is captured, storing them temporarily in the EEPROM **268** of the portable telephone **120**, and have the electronic camera **100** transmit information indicating that the series of captures has been completed to the portable telephone **120** once the series of captures has been completed, and in response to that information, have the portable telephone **120** transmit a series of image files with appended identification information indicating that this is a series of images in a batch to the gateway server **160**. Doing this makes it possible for the electronic camera **100** to perform a series of captures under the desired capture conditions without affecting the image file transmission speed or the like, even in automatic transmission mode (a mode where captured image files are automatically transmitted to and stored on an image server).

[**0439**] Furthermore, when the electronic camera **100** selects image files captured in series, which have been saved on the memory card **77**, and transmits those selected image files to an image server, by transmitting those image files with appended identification information indicating that they are a series of images, the gateway server **160** will be able recognize that these are image files captured in series and perform processing such as storing them on the same image server.

[**0440**] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** buffers image files received from the electronic camera **100** in an image buffer folder and delivers the image files buffered in the image buffer folder to the image server at specific intervals, one can also have the image files buffered in the image buffer folder be delivered to the image server based on an external instruction. **FIG. 115** is a drawing that shows the image transmission processing for such a scheme. Multiple image files are transmitted from the electronic camera **100** to the gateway server **160**, and are stored temporarily in an image buffer folder in a folder corresponding to the camera identification information on the gateway server **160**. Thereafter, a personal computer **190** connects to the gateway server **160** and transmits the camera identification information, the identification information of the image server to that the images are to be transferred, and an image transmission instruction to the gateway server **160**. In response to the received camera identification information, the gateway server **160** transmits the image files, which are stored temporarily in the image buffer folder in the folder corresponding to the received camera identification information, in a batch to the image server corresponding to the received image server identification information. Doing this makes it possible for the user to transmit and store image data captured with the electronic camera **100** from the gateway server **160** at a convenient time to a suitable image server.

[**0441**] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** buffered image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmitted the image files buffered in the image buffer folder together to the image server at specific intervals; however, the gateway server **160** may also transmit accumulated image files to the image server by the following method. For example, the image files may be transmitted to the image server when the total data volume of the image files stored temporarily on the gateway server **160** exceeds a certain volume. Alternatively, the gateway server **160** may transmit image files to the image server once they have been accumulated for a set period or time, based on the date and time data of the start of storage of the image files in the image buffer folder. Alternatively, the gateway server **160** can transmit accumulated image files to the image server at specific clock times.

[**0442**] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** buffers image files transmitted between the electronic camera **100** and the image server in an image buffer folder and clears the entirety of the image files buffered in the image buffer folder at specific intervals, the gateway server **160** may also delete image files by the following method. For example, the gateway server **160** may delete image files in the order of oldest to newest based on date and time information on the start of storage of the image files in the image buffer folder, so as to keep the total data volume of the image files stored temporarily in the image buffer folder at or below a specific volume. Alternatively, the gateway server **160** may delete image files stored for more than a specific period of time based on date and time information on the start of storage of the image files in the image buffer folder. Or the gateway server **160** may delete stored image files at specific clock times.

[**0443**] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** buffers image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmits them as necessary to the electronic camera **100**, the gateway server **160** may also transmit image files accumulated in the image buffer folder (image files transmitted by the electronic camera **100** to an image server or image files read by the electronic camera **100** from an image server) to another image server or electronic camera based on instructions from the electronic camera **100**. Doing this makes it unnecessary to transmit each image file one by one from the electronic camera **100** to the gateway server **160**, thereby making it possible to shorten the image file transmission time and reduce transmission charges.

[**0444**] While in the above mode of embodiment (**FIG. 75** through **FIG. 110**), the gateway server **160** performed management of individual albums on image servers according to the camera identification information received from the electronic camera **100**, it is also possible to use general identification information instead of camera identification information for individually identifying multiple electronic cameras **100**. For example, using the next generation version

of the IP protocol, IPV6 (Internet Protocol Version 6), the use of that on the Internet is planned, as the identification information, would make it possible for all electronic devices that handle images, besides electronic cameras, to make use of the image transmission system according to the present invention. Namely, IPV6 provides a 32-bit address space (on order of 10 to the 9th power), so there is practically no concern of running out of addresses, which makes it possible for one device to have multiple addresses depending on the application, and can further increase the utility of the image transmission system according to the present invention.

[**0445**] In the above mode of embodiment (**FIG. 75** through **FIG. 110**), the image servers **181** through **184** had individual albums (folders) corresponding to the camera identification information set individually for each electronic camera **100**, the electronic camera **100** would transmit the camera identification information set in the camera in question to the gateway server **160**, and the gateway server **160**, based on the received camera identification information, would create new albums corresponding to the received camera identification information on the image servers **181** through **184** or perform reading and writing of image data to and from an album corresponding to the received camera identification information present on the image servers **181** through **184**; however, it is also permissible to manage image data transmission and storage between the electronic camera **100** and image servers **181** through **184** using identification information other than camera identification information.

[**0446**] For example, in **FIG. 116, a** password input means is provided on the electronic camera side and image data transmission and storage is managed according to the password inputted by the user. In **FIG. 116**, electronic cameras A**101** and B**102** are equipped with password input means **81** and **82**, and when transmitting a captured image file, electronic cameras A**101** and B**102** transmit the password inputted by the user and the image file as a pair to the gateway server **160**. Meanwhile, the image server **181** has an album prepared that corresponds to the password, and the gateway server **160** transmits the received image file and stores it in the album on the image server **181** corresponding to the received password. The gateway server **160** can also create a new album on the image server corresponding to the received password. Furthermore, when downloading image files from the image server **181**, the electronic cameras A**101** and B**102** transmit image identification information and a password to the gateway server **160**, and the gateway server **160** transmits the received image identification information and password to the image server **181**. The image server **181** reads the image file corresponding to the received image identification information from the album corresponding to the received password, and transmits that image file to via the gateway server **160** to the electronic cameras A**101** and B**102**. Instead of password input, the electronic camera can obtain user identification information by installing a UIM card on that personal identification data has been stored in advance into the electronic camera.

[**0447**] If this is done, then when the same user uses multiple electronic cameras or when multiple users use the same camera, the image files captured by the electronic camera will be stored in an album on an image server corresponding to the password inputted by the user, so there is no inconvenience of having to later separate image files stored in the same album on an image server for different users, or collect image files stored in different albums on an image server for each user, allowing image files to be stored efficiently on a per-user basis and making it possible to protect the privacy of the stored image data.

[**0448**] While in **FIG. 116**, control and management of image data transmission and storage operations between the electronic camera **100** and image servers **181** through **184** is carried out based on the password inputted by the user into the electronic camera, in **FIG. 117**, instead of a password, a user identification means is provided on the electronic camera side, the electronic camera performs user identification automatically without manual intervention by the user, and image data transmission and storage is managed based on that user identification information. In **FIG. 117**, electronic cameras A**101** and B**102** are equipped with user identification means **83** and **84** (fingerprint detection means, iris pattern detection means, facial image detection means, etc.), and when transmitting a captured image file, the electronic cameras A**101** and B**102** transmit the image file paired with the user identification information detected by the user identification means **83** and **84** (fingerprint pattern characteristics information, iris pattern characteristics information, facial image pattern characteristics information, etc.) to the gateway server **160**. The gateway server **160** compares the received user identification information with user identification information contained in the personal identification data that is stored in advance to identify the user. Meanwhile, the image server **181** has an album prepared that corresponds to the personal identification data, and the gateway server **160** transmits and stores received image files in the album on the image server corresponding to the personal identification data of the identified user. The gateway server **160** can also create a new album on the image server corresponding to the personal identification data of the identified user. Furthermore, when downloading image files from the image server **181**, electronic cameras A**101** and B**102** transmit image identification information and user identification information to the gateway server **160**, the gateway server **160** identifies the users based on the received user identification information, and transmits the personal identification data corresponding to the user along with the image identification information to the image server **181**. The image server **181** reads image files corresponding to the received image identification information from the album corresponding to the received personal identification data, and transmits those image files via the gateway server **160** to the electronic cameras A**101** and B**102**.

[**0449**] Doing this makes it possible to automatically perform user identification at the electronic camera, which eliminates the effort of inputting passwords for individual identification and resolves the problems of forgotten passwords and password theft.

[**0450**] The means of personal identification described above in **FIG. 116** and **FIG. 117** (password input means, UIM card, fingerprint detection or other user identification means) can also be provided on the portable telephone side, if the gateway server is connected to from the electronic camera via the portable telephone. In **FIG. 118**, when connecting from the electronic camera to the gateway server via the portable telephone, image data transmission and storage are managed based on the telephone number of the

portable telephone. In **FIG. 118**, when transmitting a captured image file, the electronic cameras A**101** and B**102** connect to the portable telephone **121** (telephone number A) and transmit the image file to the portable telephone **121**. The portable telephone **121** transmits the received image file paired with the telephone number to the gateway server **160**. Meanwhile, the image server **181** has an album prepared corresponding to the telephone number of the portable telephone, and the gateway server **160** transmits and stores the received image file in an album on the image server **181** corresponding to the telephone number. The gateway server **160** can also create a new album on an image server corresponding to the telephone number. Furthermore, when downloading image files from the image server **181**, the electronic cameras A**101** and B**102** send image identification information to the portable telephone **121**, the portable telephone **121** transmits the telephone number and image identification information to the gateway server **160**, and the gateway server **160** transmits the telephone number and image identification information to the image server **181**. The image server **181** reads the image file corresponding to the received image identification information from the album corresponding to the received telephone number, and transmits that image file to the electronic cameras A**101** and B**102** via the gateway server **160** and the portable telephone **121**.

[**0451**] Doing this allows the user to store image files separated on a per individual basis in a per-individual album on an image server or read image files from one's own exclusive album on an image server by performing image transmission and reception using his portable telephone, even when using multiple electronic cameras or when multiple persons use the same electronic camera.

[**0452**] Furthermore, by combining the electronic camera's camera identification information with multiple personal identification means, the user identification precision can be increased and a higher level of image information security can be attained.

[**0453**] As described above, in the image transmission system and image relay apparatus according to the present invention, the image relay apparatus temporarily stores image data transmitted from the electronic image device to the image storage device, or image data transmitted from the image storage device to the electronic image device, and transmits the stored image data individually or together to the electronic image device or image storage device as required, thereby making it possible to reduce the communication traffic between the image relay apparatus and electronic image device or between the image relay apparatus and the image storage device, and thus allowing the image data communication time to be shortened and allowing the communication charges to be reduced.

[**0454**] Moreover, in the image transmission system and image relay apparatus according to the present invention, when transmitting a series of image data from the electronic image device to the image storage device and storing them there, the series of image data is first stored in the image relay apparatus, and is transmitted together from the image relay apparatus to the image storage device and stored there, thereby making it possible to transmit and store image data on an image server while maintaining the serial nature of the image data.

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[**0456**] **FIG. 119** is a conceptual drawing of an image data transmission system applying the present invention. First, the case of transmitting image data from the electronic camera **100** to the image servers **181** through **184** will be described. The electronic camera **100** generates image data through capture operations. When transmitting the image data to external image servers **181** through **184**, the electronic camera **100** connects to a portable telephone **120**. The connection between the electronic camera **100** and the portable telephone **120** is made by means of a short-range communication link **110** (e.g., Bluetooth protocol based short-range wireless communication, short-range wired communication based on a cable connection-specific protocol, IEEE 802.11 protocol based wireless LAN communication, short-range infrared communication using the IrDA protocol, etc.). The electronic camera **100** selects the image data to transmit, displays the image data on the screen **21** and transmits it to the portable telephone **120**. Since the electronic camera **100** and the portable telephone **120** are used by the user simultaneously, it suffices for the local wireless communication range to be on the order of several meters, which allows the power load on the electronic camera **100** and portable telephone **120** due to short-range wireless communication to be reduced.

[**0457**] The portable telephone **120** is provided with a short-range communication function for communicating with the aforementioned electronic camera **100** and a long-range communication function using a wireless portable telephone link **130**, whereby the long-range communication function using the wireless portable telephone link **130** allows both conventional talk functions and packet communication protocol based digital data communication functions to be executed. The portable telephone **120** temporarily stores image data received from the electronic camera **100** via the short-range communication link **110** in an internal memory. Next, the portable telephone **120** sends the stored image data using a packet communication protocol via the wireless portable telephone link **130** to a base station **140**. While transmitting image data to the base station **140**, the portable telephone **120** displays the image data being transmitted on a screen **221**.

[**0458**] The base station **140** transmits the image data, received from the portable telephone **120** using a packet communication protocol via the wireless portable telephone link **130**, to a gateway server **160** via a packet communication network **150** using a packet communication protocol. The gateway server **160** stores the image data received from the base station **140** using a packet communication protocol via the packet communication network **150** for a time in an internal memory, and transmits the stored image data at specific intervals using Internet protocol via the Internet **170** to image servers **181** through **184**. The gateway server **160** keeps thumbnail image data (scaled-down image data obtained by compressing and reducing the data volume of the original image data) corresponding to the image data transmitted to the image servers in an internal memory. Image servers **181** through **184** store the image data received using Internet protocol via the Internet **170** in a high capacity memory.

[**0459**] When transmitting image data from the electronic camera **100** to an image server, there is no need to perform

the transmission with awareness of the complicated connection and communication procedures for accessing the image server on the electronic camera **100** side; rather, on the electronic camera **100** side, it suffices to append fixed address information for specifying the gateway server **160** and camera identification information for identifying the electronic camera **100** to the image data to be transmitted, and pass it on to the portable telephone **120**. The portable telephone **120** transmits the image data and camera identification information by packet communication to the designated gateway server **160** based on the received gateway server address information. The gateway server **160** manages the image data according to the camera identification information received via packet communication, and transmits the image data to a suitable image server among multiple image servers **181** through **184** on the Internet **170** using Internet protocol. The multiple image servers **181** through **184** are treated as a single virtual image server **180** from the viewpoint of the electronic camera, and the complicated procedures for accessing each image server on the Internet **170** are all performed by the gateway server **150**.

[**0460**] Next, the case where the electronic camera **100** receives image data from the virtual image server **180** will be described. First, the electronic camera **100** is connected to the portable telephone **120** by means of the short-range communication link **110**. The electronic camera **100** transmits a browse data request, camera identification information and gateway server **160** address information to the portable telephone **120**. Next, the portable telephone **120** transmits the browse data request and camera identification information via the base station **140** using packet communication protocol to the designated gateway server **160** based on the received gateway server **160** address information. Upon receiving the browse data request and camera identification information, the gateway server **160** transmits the thumbnail image data (browse data) for the image data corresponding to the camera identification information stored on the virtual server **180** via the base station **140** using packet communication protocol to the portable telephone **120** that transmitted the browse data request. The portable telephone **120** transmits the received browse data over the short-range communication link **110** to the electronic camera **100**.

[**0461**] The electronic camera **100** displays the received browse data (thumbnail image data) on the screen **21**, from that the desired image is selected. The electronic camera **100** transmits a request for the selected image data along with image identification information (image file name, etc.) for the image data, camera identification information and gateway server **160** address information over the short-range communication link **110** to the portable telephone **120**. Next, the portable telephone **120**, based on the received gateway server **160** address information, transmits the image data request, image identification information and camera identification information via the base station **140** using packet communication protocol to the designated gateway server **160**. Upon receiving the image data request, image identification information and camera identification information, the gateway server **160** specifies the image data stored on the virtual server **180** according to the camera identification information and image identification information, and transmits the image data request and image identification information using Internet protocol to the image server **181** through **184** on the Internet **170** that is storing the image data in question.

[**0462**] The image server, which receives the image data request and image identification information, transmits the image data corresponding to the image identification information using Internet protocol to the gateway server **160**. Upon receiving the image data, the gateway server **160** transmits that image data via the base station **140** using packet communication protocol to the portable telephone **120** that transmitted the image data request. The gateway server **160** temporarily stores the image data received from the image server in an internal memory. The portable telephone **120** transmits the received image data over the short-range communication link **110** to the electronic camera **100**. The electronic camera **100** displays the received image data on the screen **21**.

[**0463**] The gateway server **160** can also be connected to from a user's personal computer **190** via the Internet **170**, and the user can read and use image data from the virtual server **180** via the gateway server **160** on a personal computer **190**, and can modify the settings of the gateway server **160**.

[**0464**] **FIG. 120** and **FIG. 121** are an external view (front view and rear view) of an embodiment of the electronic camera **100** used in an image data transmission system applying the present invention. As shown in **FIG. 120, a** photographic lens **10** for forming a subject image, a finder **11** for confirming the frame, a strobe **12** for illuminating the subject when a photograph is taken, a photometric circuit **13** for detecting the brightness of the subject, and a grip **14** extending from the camera housing for making it easier for the user hold the electronic camera **100** in his or her hands are provided at the front of the electronic camera **100**, and a release button **16** and a power switch **17** for turning the power supply to the electronic camera **100** on and off are provided at the top.

[**0465**] As shown in **FIG. 121**, the eyepiece of the finder **11**, a left LCD (left screen) **21** comprising a substantially rectangular screen for text and image display, and a right LCD (right screen) **22** comprising a substantially rectangular screen for text and image display are arranged at the rear of the electronic camera **100**; an UP button **23**, a DOWN button **24**, LEFT button **25**, RIGHT button **26** and SELECT button **27**, used for image manipulation and the like, are arranged below the right LCD **22**, and a capture mode button **28** for putting the electronic camera **100** into capture mode, a playback mode button **29** for putting the electronic camera **100** into playback mode, a transmit button **31** for controlling image data transmission, and a receive button **32** for controlling image data reception are arranged below the left LCD **21**. A memory card slot **30** for installing a memory card **77** used for storing image data is provided at the side.

[**0466**] The release button **16**, UP button **23**, DOWN button **24**, LEFT button **25**, RIGHT button **26**, SELECT button **27**, capture mode button **28**, playback mode button **29**, transmit button **31** and receive button **32** are all control keys operated by the user.

[**0467**] A so-called touch screen **66**, equipped with a function of outputting contact position data corresponding to the position indicated by a finger touch operation is arranged

over the left LCD **21** and the right LCD **22**, which touch screen can be used for selection of image data and options displayed on the screen. This touch screen **66** is made of a transparent material such as glass or resin, allowing the user to view the image or text formed on the inside of the touch screen **66** through the touch screen **66**.

[**0468**] **FIG. 124** is a block diagram showing an example of the internal electrical configuration of the electronic camera **100** shown in **FIGS. 120 and 121**, whereby the constitutive elements are connected to each other via a data/control bus **51** for transmitting various types of informational data and control data. The various constitutive elements can be roughly divided into a block centered on the capture control circuit **60** that executes image data capture operations, a block of the memory card **77** that stores and saves image files, a block centered on the screen control circuit **92** that executes the display of image data and associated information, and a block centered on the CPU **50**, which performs overall control of the user interface such as the control keys **65** and of the various control circuits.

[**0469**] The CPU **50** (central processing unit) is the means that controls the entire electronic camera **100**, issuing various instructions to the capture control circuit **60**, screen control circuit **92** and power control circuit **64** in accordance with input information from the control keys **65**, touch screen **66**, power switch **17**, timer **74** and photometric circuit **13**. The photometric circuit **13** measures the brightness of the subject and outputs the photometric data that is the result of this measurement to the CPU **50**. The CPU **50** sets the exposure time and sensitivity of the CCD **55** according to the photometric data by means of a CCD drive circuit **56**, and controls the value of the diaphragm **53** by means of a diaphragm control circuit **54** via the capture control circuit **60** in accordance with the data of those settings.

[**0470**] In capture mode, the CPU **50** controls the capture operation via the capture control circuit **60** in accordance the manipulation of the release button **16**. Furthermore, if the subject is dark based on the photometric data, the CPU **50** causes the strobe **12** to emit light via the strobe drive circuit **73** when taking a picture. The timer **74** has a built-in clock circuit and finds the date and time information corresponding to the current date and time and provides the capture date and time information to the CPU **50** when a picture is taken. The CPU **50** appends the capture date and time information to the image data and stores it in the memory card **77**. The CPU **50** controls the various units according to a control program stored in ROM **67** (read-only memory). The EEPROM **68** (electrically erasable programmable ROM) is a non-volatile memory that stores settings information, etc. required for the operation of the electronic camera **100**. The RAM **70** is a volatile memory that is used as a temporary working area of the CPU **50**. The CPU **50** detects the manipulation state of the power switch **17** and controls the power supply **63** via a power supply control circuit **64**.

[**0471**] The capture control circuit **60** performs focusing and zooming of the photographic lens **10** by means of a lens drive circuit **52**, controls the exposure of the CCD **55** by controlling the diaphragm **53** by means of the diaphragm control circuit **54**, and controls the operation of the CCD **55** by means of a CCD drive circuit **56**. Light beams from the subject are formed by the photographic lens **10** into a subject image over the CCD **55** after passing through the diaphragm **53** to adjust the amount of light, and this subject image is picked up by the CCD **55**. The CCD **55** (charge coupled device), which comprises a plurality of pixels, is a charge accumulation type image sensor used for picking up a subject image, and outputs electrical image signals corresponding to the strength of the subject image formed on the CCD **55** to an analog processing unit **57** in accordance with drive pulses provided by the CCD drive circuit **56**.

[**0472**] The analog processing unit **57** samples the image signal, which has undergone photoelectric conversion by the CCD **55**, with a specific timing, and amplifies the sampled signal to a specific level. An A/D conversion circuit **58** (analog/digital conversion circuit) digitizes the image signal sampled by the analog processing unit **57**, thereby converting it to digital data, which is temporarily stored in capture buffer memory **59**.

[**0473**] In capture mode, the capture control circuit **60** repeats-the operation described above, while the screen control circuit **92** repeats the through-image display operation of reading out the digital data stored successively in the capture buffer memory **59** via the data/control bus **51**, loading it once into the frame memory **69**, converting the digital data into image data for display, loading it again into the frame memory **69**, and displaying the image data for display on the left screen **21**. Furthermore, the screen control circuit **92** obtains text display information from the CPU **50** as required, converts it to text data for display and stores it in the frame memory **69**, and displays the text data for display on the left screen **21** and right screen **22**. In this way, in capture mode, the image picked up by the CCD **50** is displayed in real time on the left screen **21**, making it possible to use this through-image as a monitor screen to make the composition settings for taking a picture. The capture control circuit **60** analyzes the extent of the high frequency component of the digital data stored in the capture buffer memory **59** and detects the state of focus adjustment of the photographic lens **10**, and performs focus adjustment of the photographic lens **10** by means of the lens drive circuit **52** in accordance with the detection results.

[**0474**] At the time of release, upon receiving a capture instruction from the CPU **50**, the capture control circuit **60** causes the subject image to be picked up by the CCD **55** via the CCD drive circuit **56**, passes the image signal generated by the image pickup through the analog processing unit **57** and A/D conversion circuit **58** and temporarily stores it as digital data (raw data) in the capture buffer memory **59**. The capture control circuit **60** converts or compresses the digital data stored temporarily in the capture buffer memory **59** into a specific recording format (JPEG, etc.) to form the image data, and stores the image data on the memory card **77**.

[**0475**] A GPS circuit **61** (global positioning system circuit) detects the location information (longitude data and latitude data) for the electronic camera **100** using information from multiple satellites orbiting around the earth, and provides the capture location information to the CPU **50** at the time of image capture. The CPU **50** appends the capture location information to the image data and stores it in the memory card **77**.

[**0476**] The CPU **50** can transmit the image data stored in the memory card **77** to the outside via the short-range wireless communication circuit **72** and the antenna **76**, or conversely store image data received from the outside via

the short-range wireless communication circuit **72** and the antenna **76** in the memory card **77** and display it on the left screen **21**, as required.

[**0477**] In playback mode, the screen control circuit **92** reads out the image data indicated by the CPU **50** from the memory card **77** and places it temporarily into the frame memory **69**, displays the image data on the left screen **21**, and, following the instructions of the CPU **50**, places text data such as playback mode instructions into the frame memory **69** and displays the text data on the right screen **22**.

[**0478**] Moreover, in playback mode, manipulating the transmit button **31** causes the image data being played back and displayed on the left screen **21** to be transmitted to the outside via the short-range wireless communication circuit **72** and antenna **76**, and manipulating the receive button **32** causes image data to be received from the outside via the short-range wireless communication circuit **72** and antenna **76** and played back and displayed on the left screen **21**.

[**0479**] **FIG. 123** shows the data configuration of image files stored in the memory card **77**. As shown in **FIG. 123**, multiple image files are stored in the memory card **77**. Each image file is made up of image data and appended informational data. The appended informational data consists of capture data that indicates the various settings at the time of image capture, capture date and time data, and capture location data. **FIG. 124** is a drawing that shows the configuration of information stored in the EEPROM **68**, which consists of camera identification information for identifying the individual electronic camera **100** and gateway server access information used by the portable telephone **120** to access the gateway server **160**.

[**0480**] **FIG. 125** is an external view of the portable telephone **120**, which is provided with a display screen **221** for displaying image data, various control keys **265**, a microphone **280** and a speaker **281**. **FIG. 126** is a block diagram showing an example of the internal electrical configuration of the portable telephone **120** shown in **FIG. 125**, wherein the various elements are connected to each other via a data/control bus **251** for transmitting various types of informational data and control data. The CPU **250** (central processing unit) is the means that performs overall control of the entire portable telephone **120**, issuing various instructions to the screen control circuit **292** and power supply control circuit **264** in accordance with input information from the control keys **265**, power switch **217** and timer **274**.

[**0481**] The CPU **250** controls the various units in accordance with a control program stored in ROM **267** (read-only memory). The EEPROM **268** (electrically erasable programmable ROM) is a non-volatile memory that is used for storage of settings information necessary for the operation of the portable telephone **120** and for temporary storage of image data. The RAM **270** is a volatile memory that is used as a temporary working area of the CPU **250**. The UIM card (User Identity Module) **277** is a portable storage medium that can be installed in and removed from the portable telephone **120** and that stores personal information of the user of the portable telephone **120** and the like, which personal information can be used by the CPU **250** as required. The CPU **250** detects the state of manipulation of the power switch **217**, and controls the power supply **263** via the power supply control circuit **264**.

[**0482**] The CPU **250** performs processing of outgoing and incoming telephone calls using the wireless portable telephone circuit **271** and antenna **275**, and performs voice call processing using the microphone **280** and speaker **281**. Furthermore, the CPU **250** performs exchange of digital data with the outside by means of packet communication protocol using the wireless portable telephone circuit **271** and antenna **275**. Moreover, the CPU **250** performs exchange of messages with electronic devices having a short-range wireless communication capability that are in the vicinity of the portable telephone **120** via the short-range wireless communication circuit **272** and the antenna **276**, and is able to exchange image information and the like. The CPU **250** reads and loads image data stored temporarily in EEPROM **268** into frame memory **269**, and displays the image data on the display screen **221** using the screen control circuit **92**.

[**0483**] **FIG. 127** is a block diagram showing the internal configuration of the gateway server **160**, wherein a communication means **371** connected to a packet communication network, a communication means **372** connected to the Internet, a memory means **368** that stores information such as image data, and a timer means **374** are connected to a control/processing means **350** that performs overall control of the various elements of the gateway server **160**. The gateway server **160** exchanges information such as image data with the portable telephone **120** using a packet communication protocol via the communication means **371**, and exchanges information such as image data with image servers using Internet protocol via the communication means **372**.

[**0484**] Various types of information are held in the memory means **368**, as shown in **FIG. 128**. The camera identification information link data, as shown in **FIG. 129**, is data that indicates the correspondence relations of individual items of camera identification information, whereby the arrow indicates that the camera identification information on the right is the parent of the camera identification information on the left. It also represents whether a given item of camera identification information is parent camera identification information, or is single (no link) or is unused, etc. Namely, the gateway server **160** refers to this camera identification information link data, searches for parent camera identification information based on the received camera identification information, and if parent camera identification information exists, performs processing, which is described below, in accordance with the parent camera identification information. Performing such processing makes it possible to treat image data captured with different electronic cameras as image data captured with a single electronic camera. This camera identification information link data can be modified if necessary from an external personal computer **190** or the like, connected to the gateway server **160**.

[**0485**] In the memory means **368**, as shown in **FIG. 128, a** folder corresponding to each item of camera identification information is prepared, and each folder corresponding to an item of camera identification information holds personal identification data, image server management data, transfer history data, thumbnail image data and image file data. **FIG. 130** is a drawing that shows the configuration of personal identification data, which comprises data relating to the user of the electronic camera **100** corresponding to the camera identification information; the personal identification data can be used by the gateway server **160** to register with image servers on the Internet to secure a new storage area for

storing image data or when reading/writing image data to and from image servers. This personal identification data can be modified as necessary from an external personal computer **190**, etc., connected to the gateway server **160**, and may optionally be made modifiable by transmission of information stored on the UIM card **277** installed in the portable telephone **120** from the portable telephone **120** to the gateway server **160**.

[**0486**] **FIG. 131** is a drawing showing the configuration of server management data, which consists of identifying names of image servers on that the gateway server **160** stores image data according to the camera identification information, the URL (Uniform Resource Locator) of each image server, the total data capacity provided on each image server according to the camera identification information, the available capacity out of the total data capacity provided on each image server according to the camera identification information, and list information on the image data stored on each image server based on the camera identification information (image file identification information or image file names), etc.

[**0487**] **FIG. 132** is a drawing that shows the configuration of the transfer history data, which consists of list information on image data stored on the virtual image server **180** according to the camera identification information (image file identification information or image file names), information on the date and time of transfer of each item of image data to the image server, information relating to the image server to that image data is transferred, etc.

[**0488**] **FIG. 133** is a block diagram showing the internal configuration of image servers **181** through **184**, wherein a communication means **471** connected to the Internet and a memory means **468** that stores information such as image data are connected to the control/processing means **450** that performs overall control of the individual elements of image servers **181** through **184**. Image servers **181** through **184** exchange information such as image data with the gateway server **160** via the communication means **471** using Internet protocol. In the memory means **468**, a folder corresponding to each item of camera identification information is prepared, as shown in **FIG. 134**, and image file data is stored in the folders corresponding to each item of camera identification information.

[**0489**] **FIG. 135** is a state transition diagram for an embodiment of the electronic camera **100** according to the present invention. When power is turned on, the camera enters capture mode, and manipulating the release button **16** causes the camera to perform a capture operation and a post-capture image file creation and loading of the image file into the memory card **77**. In playback mode, it performs playback and display operations on the image data stored in the memory card **77**. In capture mode, if the automatic transmission function is turned on, an image transfer operation is performed, whereby captured image data is automatically transmitted and stored on an image server. Furthermore, in playback mode, manipulating the transmit button **31** causes an image transmission operation to be performed, whereby the image data displayed on the left screen **21** is transmitted and stored on an image server. Moreover, manipulating the receive button **32** in playback mode causes an image reception operation to be performed, whereby the desired image data is received from the image server and displayed on the left screen **21**. Furthermore, manipulating the capture mode button **28** causes a transition from playback mode to capture mode, and manipulating the playback mode button **29** causes a transition from capture mode to playback mode.

[**0490**] **FIG. 136** is a main flow chart of the operation of the electronic camera **100** (CPU **50**) in the mode of embodiment described above. First, in S**10**, the power supply is turned on by manipulating the power switch **17**, and in S**20**, the capture mode subroutine is executed, leading to a capture enabled state. If the release button **16** is manipulated while in capture mode, the release interrupt handling subroutine is executed in S**30**, and the capture operation is carried out. If the playback mode button **29** is manipulated while in capture mode, a mode switch interrupt handling subroutine is executed in S**40**, the playback mode subroutine is executed in S**50**, and image data stored in the memory card **77** is played back and displayed on the left screen **21**. Conversely, if the capture mode button **28** is manipulated while in playback mode, a mode switch interrupt handling subroutine is executed in S**40**, and the system moves to the capture mode subroutine of S**20**. If the automatic transmission function is turned on, manipulating the release button **16** causes the communication interrupt processing of S**60** to be executed following the capture operation, and transmission of image data to the image server is carried out. Furthermore, manipulating the transmit button **31** or the receive button **32** while in playback mode causes the communication interrupt processing of S**60** to be executed, and transmission of image data to the image server or reception of image data from the image server is carried out.

[**0491**] **FIG. 137** is a detailed flow chart of the capture mode subroutine. Starting in S**20**, the processing of S**201** is repeated. In S**201**, image data successively generated by the CCD **55** under the camera settings made by the user is displayed on the left screen **21** as shown in **FIG. 138**, at that time the capture settings are displayed as text on the right screen **22**.

[**0492**] **FIG. 139** is a detailed flow chart of the release interrupt handling subroutine. Starting in S**30**, it is checked in S**301** whether the system is in capture mode, and if it is not in capture mode, the system returns in S**308**. If it is in capture mode, the capture operation is carried out under the capture conditions set by the user or the camera to generate image data, and appended informational data (capture data, time data, location data) is appended to the image data in S**303** to generate an image file. In S**304**, it is checked whether the automatic transmit function is turned on, and if it is not turned on, the image file is loaded into the memory card **77** in S**305** and the system returns in S**308**. If the automatic transmit function is turned on, communication with the portable telephone **120** is attempted using the short-range wireless communication circuit **72** in S**306**, checking whether communication is possible, and if communication with the portable telephone **120** is possible, the portable telephone image file transmission subroutine of S**70** is executed, transmitting the image file to the portable telephone **120**, and the system returns in S**308**. If communication with the portable telephone **120** is not possible, the system goes back to S**305**, stores the image file on the memory card **77**, and returns in S**308**.

[**0493**] **FIG. 140** is a detailed flow chart of the portable telephone image file transmission subroutine. Starting in

S70, the image file, camera identification information, gateway server access information and an image transmission request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.) in S701, and the system returns in S702.

[0494] **FIG. 141** is a detailed flow chart of the mode switch interrupt handling subroutine. Starting in S40 upon manipulation of the capture mode button **28** or playback mode button **29**, it is checked in S401 whether the manipulated button was the capture mode button **28**, and if it was the capture mode button **28**, playback mode is terminated and the system moves to the capture mode subroutine of S20. If the manipulated button was not the capture mode button **28**, the capture mode is terminated and the system moves to the playback mode subroutine of S50.

[0495] **FIG. 142** is detailed flow chart of the playback mode subroutine. Starting in S50, the processing of S501 is repeated. In S501, in response to the manipulation of the LEFT button **25** and RIGHT button **26**, image data stored in the memory card **77** is selected and read, and is played back and displayed on the left screen **21** as shown in **FIG. 143**, while operating instructions are displayed on the right screen **22**. Immediately after power is turned on, the most recent image data is displayed; subsequently, image data with older time data are displayed successively in response to manipulation of the LEFT button **25**, and image data with newer time data are displayed successively in response to manipulation of the RIGHT button **26**.

[0496] **FIG. 144** is a detailed flow chart of the communication interrupt handling subroutine started by manipulating the transmit button **31** or receive button **32**. Starting in S60, it is checked in S601 whether the manipulated button was the transmit button **31**, and if was the transmit button **31**, it is checked in S602 whether the system is in capture mode, and if it is in capture mode, the current setting of the automatic transmit function is inverted in S603, and the system returns in S613. If the system was in playback mode in S602, communication with the portable telephone **120** using the short-range wireless communication circuit **72** is attempted in S604, checking whether communication is possible, and if communication with portable telephone **120** is possible, the portable telephone image file transmission subroutine of S70 is executed, transmitting the image file of the image data currently displayed on the left screen **21** to the portable telephone **120**, and the system returns in S613. If communication with the portable telephone **120** is not possible, the system returns in S613.

[0497] If the button manipulated in S601 was the receive button **32**, it is checked in S605 whether the system is in capture mode, and if it is in capture mode, the system returns in S613. If it is in playback mode, communication with the portable telephone **120** using the short-range wireless communication circuit **72** is attempted in S606, checking whether communication is possible, and if communication with the portable telephone **120** is not possible, the system returns in S613. If communication with portable telephone **120** is possible, in S607, the camera identification information, gateway server access information and a thumbnail image reception request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.). In S608, the system waits to receive thumbnail images form the portable telephone **120** and returns in S613 if reception was not possible. If thumbnail images were received, in S609, as shown in **FIG. 145**, the received thumbnail images are displayed on the left screen **21**, while operating instructions are displayed on the right screen **22**. The thumbnail images are scrolled by manipulating the UP button **23** and DOWN button **24**, and either the left or right thumbnail image is selected by manipulating the LEFT button **25** or RIGHT button **26**. Manipulating the SELECT button **27** confirms the selected thumbnail image. In S610, the image identification information appended to the selected thumbnail image, the camera identification information, gateway server access information and an image reception request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.). In S611, the system waits to receive image data from the portable telephone **120** and returns in S613 if reception was not possible. If image data was received, in S612, as shown in **FIG. 146**, the received image data is displayed on the left screen **21** while operating instructions are displayed on the right screen **22**, and the system returns in S613.

[0498] Next, operation of the portable telephone **120** (CPU **250**) in the above mode of embodiment will be described. Description of the operation of the portable telephone **120** relating to talk functions will be omitted as it has little bearing on the present invention. **FIG. 147** is a detailed flow chart of the communication interrupt handling started when the portable telephone **120** performs image transmission. Communication interrupt handling is started in A60 when a communication request is received via short-range wireless communication from the electronic camera **100**, it is checked in A601 whether the system is currently processing a voice call, and if it is processing a voice call, the system returns in A613 without responding to the communication request from the electronic camera **100**. If a voice call is not being processed, voice call processing is blocked in A602, it is checked in A603 whether the request from the electronic camera **100** is an image file transmission request, and if it was an image file transmission request, in A604, communication is attempted with the gateway server **160** using the wireless portable telephone circuit **271** based on the gateway server access information, checking whether communication is possible, and if communication with the gateway server **160** is possible, the gateway image file transmission subroutine of A70 is executed, the image file received from the electronic camera **100** is transmitted to the gateway server **160**, voice call processing is unblocked in A613, and the system returns. If communication with the gateway server **160** is not possible, in A605, the image file, camera identification information, gateway server access information, etc. received from the electronic camera **100**, are stored temporarily in EEPROM **268**, and the system unlocks voice call processing and returns in A613.

[0499] If the request from the electronic camera **100** in A603 was not an image file transfer request, in A606, communication with the gateway server **160** is attempted using the wireless portable telephone circuit **271** based on the gateway server access information, checking if communication is possible, and if communication with the gateway server **160** is not possible, the system unblocks voice call processing in A613 and returns. If communication with the

gateway server **160** is possible, it is checked in A**607** whether the request from the electronic camera **100** is a thumbnail image reception request, and if it was a thumbnail image reception request, in A**608**, a thumbnail image reception request and camera identification information are transmitted to the gateway server **160** by means of the wireless portable telephone circuit **271** using a packet communication protocol. In A**609**, the thumbnail images are received from the gateway server **160** and are transmitted to the electronic camera **100** by means of the short-range wireless communication circuit **272** using a short-range wireless communication protocol. While transmitting thumbnail images to the electronic camera **100**, the thumbnail images are displayed on the screen **221**. Once transmission of thumbnail images to the electronic camera **100** is completed, the system unblocks voice call processing and returns in A**613**.

[**0500**] If the request from the electronic camera **100** in A**607** was not a thumbnail image reception request, in A**610** it is checked whether the request from the electronic camera **100** is a selected image reception request, and if it was not an image reception request, the system unblocks voice call processing and returns in A**613**. If it was an image reception request, in A**611**, an image reception request, image identification information and camera identification information are transmitted to the gateway server **160** by means of the wireless portable telephone circuit **271** using a packet communication protocol. In A**612**, image data corresponding to the image identification information is received from the gateway server **160**, and is transmitted to the electronic camera **100** by means of the short-range wireless communication circuit **272** using a short-range wireless communication protocol. During transmission of images to the electronic camera **100**, the image data is displayed on the screen **221**, as shown in **FIG. 150**. Once transmission of image data to the electronic camera **100** is completed, display of image data on the screen **221** is terminated, and the system unblocks voice call processing and returns in A**613**. To more effectively alert the user of the fact that image data is being transmitted, a different display mode from normal image data display may be used, for instance periodic flashing (repeated display and non-display) of the image data displayed on the screen **221**. Here, normal display mode refers to the display mode whereby image data is statically displayed.

[**0501**] **FIG. 148** is a detailed flow chart of the gateway image file transmission subroutine. Starting in A**70**, in A**701** the image file, camera identification information and an image transmission request are transmitted by packet communication protocol using the wireless portable telephone circuit **271** to the gateway server **160** designated based on the gateway access information, and the system returns in A**702**. While an image file is being transmitted to the gateway server **160**, the image data being transmitted is displayed on the screen **221**, as shown in **FIG. 149**, and the display is terminated once transmission is completed. Furthermore, to more effectively alert the user of the fact that image data is being transmitted, a different display mode from normal image data display may be used, for instance periodic flashing (repeated display and non-display) of the image data displayed on the screen **221**. Here, normal display mode refers to the display mode whereby image data is statically displayed.

[**0502**] **FIG. 151** is a detailed flow chart of the timer interrupt handling started at regular intervals by the timer **274** of the portable telephone **120**. Starting in A**80**, it is checked in A**801** whether the system is currently processing a voice call, and if it is currently processing a voice call, the system returns in A**805**. If it is not processing a voice call, voice call processing is blocked in A**802**, it is checked in A**803** whether there are image files being temporarily stored in EEPROM **268**, and if there are no image files being temporarily stored, the system unblocks voice call processing and returns in A**805**. If there are temporarily stored image files, communication with the gateway server **160** by means of the wireless portable telephone circuit **271** based on the gateway server access information is attempted in A**804**, checking whether communication is possible, and if communication with the gateway server **160** is not possible, the system unblocks voice call processing and returns in A**805**. If communication with the gateway server **160** is possible, the gateway image file transmission subroutine of A**70** is executed, image files received from the electronic camera **100** are transmitted to the gateway server **160**, and in A**805**, the system unblocks voice call processing and returns.

[**0503**] As indicated above, when communication with the gateway server **160** is not possible, the portable telephone **120** temporarily stores the image files received from the electronic camera **100**, and when communication with the gateway server **160** becomes possible, it automatically transmits the temporarily stored image files to the gateway server **160**. To notify the user of the fact that image files transmitted from the electronic camera **100** to the gateway server **160** are being temporarily stored by the portable telephone **120**, one may optionally display a specific mark, icon or text on the screen **221** while image files are being temporarily stored by the portable telephone **120**. By doing this, in a situation where the user is in a hurry to transmit the image files, the user will be able to see this display and perform image file transmission by a different method.

[**0504**] Furthermore, while the communication interrupt handling of **FIG. 147** assumes that the connection between the electronic camera **100** and portable telephone **120** is maintained until communication is completed once the connection between the electronic camera **100** and portable telephone **120** has been established, in case the connection between the electronic camera **100** and the portable telephone **120** should be cut off (for example, if the portable telephone **120** becomes unable to transmit thumbnail images or image files received from the gateway server **160** to the electronic camera **100**), one can have the thumbnail images and image files be stored temporarily in the EEPROM **268** of the portable telephone **120**, have the portable telephone **120** detect when communication between the portable telephone **120** and electronic camera **100** becomes possible, and automatically transmit the thumbnail images or image files stored temporarily in EEPROM **268** to the electronic camera **100**. The portable telephone **120** may optionally display the fact that that thumbnail images or image files transmitted to the electronic camera **100** from the gateway server **160** are being stored temporarily by the portable telephone **120** by displaying a special mark, icon or text on the screen **221** while the image files are being temporarily stored by the portable telephone **120**. By doing this, in a situation where the user is in a hurry to transmit the image files, the user will

be able to see this display, and take countermeasures such as rechecking the connection between the portable telephone **120** and electronic camera.

[**0505**] Next, the operation of the gateway server **160** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the gateway server **160** other than the image transmission operation will be omitted as they have little bearing on the present invention. **FIG. 152** is a detailed flow chart of the communication interrupt handling started when the gateway server **160** performs image transmission. Starting in G**60** with a communication request from the portable telephone **120** or personal computer **190**, in G**601**, the parent camera identification information is identified by referring to the camera identification information link data based on the received camera identification information. Subsequent image data handling is performed on the folder corresponding to the parent camera identification information. In G**602**, it is checked whether the received request is an image file transmission request, and if it was an image file transmission request, in G**603**, the received image file is stored temporarily in an image buffer folder in the folder corresponding to the camera identification information, thumbnail image data corresponding to the image data is generated and stored in a thumbnail image folder, likewise in the folder corresponding to the camera identification information, and the system returns in G**617**.

[**0506**] If the request received in G**602** was not an image file transmission request, it is checked in G**604** whether the received request is a thumbnail image reception request, and if it was a thumbnail image reception request, in G**605** the thumbnail images stored in the thumbnail image folder inside the folder corresponding to the camera identification information are transmitted by packet communication protocol to the originator of the thumbnail image reception request (portable telephone **120**), and the system returns in G**617**. If the request received in G**604** was not a thumbnail image reception request, it is checked in G**606** whether the received request is an image reception request, and if it was an image reception request, it is checked in G**607** whether image data corresponding to the image identification information exists in the image buffer folder inside the folder corresponding to the camera identification information, and if image data corresponding to the image identification information exists in the image buffer folder, the image file containing the image data is transmitted to the originator of the image reception request (portable telephone **120**) using a packet communication protocol in G**608**, and the system returns in G**617**.

[**0507**] If there is no image data corresponding to the image identification information in the image buffer folder, the image server where the image file corresponding to the image identification information is stored is determined based on the transfer history data in G**609**, and an image reception request and the image identification information are transmitted to that image server using Internet protocol in G**610**. In G**611**, the system waits to receive the specified image file from the image server, returning in G**617** if the image file could not be received from the image server; if the image file was received from the image server, the image file is transmitted to the originator of the image reception request (portable telephone **120**) in G**612** using a packet communication protocol, the image file is stored temporarily in the image buffer folder in the folder corresponding to the camera identification information, and the system returns in G**617**.

[**0508**] If the received request in G**606** was not an image reception request, it is checked in G**613** whether the received request is a data overwrite request, and if it was a data overwrite request, in G**14** personal identification data in the folder corresponding to the camera identification information, camera identification information link data, etc., is overwritten according to the received data, and the system returns in G**617**. If the received request in G**613** was not a data overwrite request, it is checked in G**615** whether the received request was a data read request, and if it was a data read request, the personal identification data in the folder corresponding to the camera identification information, camera identification information link data, etc., is read and transmitted to the requester in accordance with the received data, and the system returns in G**617**. If the received request in G**615** was not a data read request, the system returns in G**617**.

[**0509**] **FIG. 153** is a detailed flow chart of the timer interrupt handling started at specific intervals by the timer means **374** of the gateway server **160**. Starting in G**80**, the first item of camera identification information from the camera identification information list maintained by the gateway server **160** is selected in G**801**. In G**802**, it is checked based on the transfer history data whether there are image files that have not been transferred yet to the image server in the image buffer folder inside the folder corresponding to the selected camera identification information, and if there are no image files that have not been transferred yet, the system proceeds to G**810**. If there are image files that have not been transferred yet, it is checked in G**803**, based on image server management data, whether there is an image server with available capacity. In S**804**, if there is an image server with available capacity, the system proceeds to G**806**, and if there are no image servers with available capacity, a new image server with available capacity is searched for in G**805**. In G**805**, a search is carried out for open image servers on the Internet that are able to store image files, registration with the found image server is carried out automatically using camera identification information, and information on the image server (storage capacity, etc.) is recorded in the image server management data. In G**806**, an image server with available capacity is designated as the image server for storing images. In G**807**, image files that have not been transferred yet are transmitted using Internet protocol to the image server designated as the image server for storing images, the image server management data and transfer history data are updated, and all the image files stored temporarily in the image buffer folder are deleted. In G**808**, it is checked whether the currently selected camera identification information is the last item of camera identification information in the camera identification information list; if it is not the last item of camera identification information, in G**809**, the camera identification information is changed to the next item of camera identification information, the system goes back to G**802** and repeats the processing described above, and if it is the last item of camera identification information, the system returns in G**810**.

[**0510**] Next, the operation of the image servers **181** through **184** (control/processing means **350**) in the above mode of embodiment will be described. Description of

operations of the image servers **181** through **184** other than the image transmission and storage operation will be omitted as they have little bearing on the present invention. **FIG. 154** is a detailed flow chart of the communication interrupt handling started when a communication request is received by the image servers **181** through **184** from the gateway server **160**. Starting in H**60** upon receiving a communication request from the gateway server **160**, it is checked in H**601** whether the received request is an image server registration request, and if it was a registration request, it is checked in H**602** whether a folder corresponding to the received camera identification information exists, and if it already exists, the system returns in H**611**. If no folder corresponding to the received camera identification information exists, in H**603**, a folder corresponding to the received camera identification information is created, and the system returns in H**611**.

[**0511**] If the request received in H**601** is not an image server registration request, it is checked in H**604** whether the received request is an image reception request (image read request), and if it was an image reception request, it is checked in H**605** whether a folder corresponding to the received camera identification information exists, and if it does not exist, the system returns in H**611**. If a folder corresponding to the received camera identification information exists, it is checked in H**606** whether an image file corresponding to the received image identification information exists in the folder, and if it does not exist, the system returns in H**611**. If an image file corresponding to the received image identification information exists, the image file in question is transmitted to the gateway server **160** using Internet protocol in H**607**, and the system returns in H**611**. If the received request in H**604** is not an image reception request to the image server, it is checked in H**608** whether the received request is an image transmission request (image write request), and if it was not an image transmission request, the system returns in H**611**. If it was an image transmission request, it is checked in H**609** whether a folder corresponding to the received camera identification information exists, and if it does not exists, the system returns in H**611**. If a folder corresponding to the received camera identification information exists, the received image file is stored in the folder in H**610**, and the system returns in H**611**.

[**0512**] In the mode of embodiment described above (**FIG. 119** through **FIG. 154**), while relaying image files received from the electronic camera **100** though the gateway server **160**, the portable telephone **120** displays the image data being transmitted on the screen **221**, as shown in **FIG. 149**, which allows the user to confirm based on the display of screen **221** that the image data he selected and transmitted is in fact being transmitted from the portable telephone **120** to the gateway server **160**, and allows the user to confirm that transmission of image data from the portable telephone **120** to the gateway server **160** has been completed based on the fact that display of image data on the screen **221** has terminated. Furthermore, the fact that display of image data has started on the screen **221** of the portable telephone **120** allows one to confirm that transmission of image data from the electronic camera **100** to the portable telephone **120** has been completed, and one can accordingly start taking picture with the electronic camera **100**.

[**0513**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), while image files received from the gateway server **160** are being relayed to the electronic camera **100**, the portable telephone **120** displays the image data being transmitted on the screen **221**, as shown in **FIG. 150**, which allows the user to get an overview of the received image data based on the display of screen **221** before displaying and browsing the image data on the screen after transmission of the image data to the electronic camera **100** is completed, and allows the user to confirm that transmission of image data from the portable telephone **120** to the electronic camera **100** has been completed based on the fact that display of image data on the screen **221** has terminated.

[**0514**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), if the portable telephone **120** was not able to relay image files received from the electronic camera **100** to the gateway server **160** (for example, when the portable telephone **120** is out of range of the wireless portable telephone link), those image files are stored temporarily in the EEPROM **268** of the portable telephone **120**, and when transmission of image files to the gateway server **160** becomes possible, the image files stored temporarily in EEPROM **268** are automatically transmitted to the gateway server **160**, so even if communication between the portable telephone **120** and the gateway server **160** is not possible, the user does not need to redo the image file transmission operation on the electronic camera **100** side, which makes it possible to avoid the risk of the user forgetting to retransmit, and allows the user to focus on taking pictures with the electronic camera **120** once image files have been transmitted from the electronic camera **100** to the portable telephone **120**.

[**0515**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** temporarily stores image data received from the electronic camera **100** or image servers **181** through **184** in the memory means **368** of the gateway server **160**, and transmits the stored image data as necessary to the electronic camera **100** or image servers **181** through **184**, thereby making it possible to reduce the communication traffic between the image servers **181** through **184** and gateway server **160** or between the electronic camera **100** and the gateway server **160**.

[**0516**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** stores the user's personal information in the memory means **368**, and if there is no available capacity to store image data in the image server's album corresponding to the camera identification information, the gateway server connects to another image server on the Internet, automatically sets up an album (folder) corresponding to the camera identification information using the aforementioned personal information, transmits the image data received from the electronic camera **100** to the image server and causes it to be stored in the new album, thereby freeing the user from having to perform the complicated procedure of connecting to an image server and the bothersome procedure of setting up an album, which the user would otherwise have to carry out directly on the electronic camera **100** side.

[**0517**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** that relays image data between the electronic camera **100** and image servers

181 through **184** keeps, in the memory means **368**, server management information for unified management of albums (folders) set up corresponding to camera identification information on each of the image servers **181** through **184**, and based on the server management information, performs generalized storage and management of image data stored in distributed fashion across multiple image servers **181** through **184** by combining it into one virtual album, thereby making it possible to exchange large volumes of image data between the virtual album and the electronic camera **100** by means of simple operations, without the user being aware of the multiple image servers **181** through **184** that actually store the image data on the Internet.

[**0518**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** keeps, in the memory means **368**, link information that represents the associations of camera identification information for individually identifying electronic cameras, views multiple electronic cameras as a single group based on the link information, and transmits and stores image data received from the electronic cameras in an album on an image server corresponding to the group to that those electronic cameras belong, thereby making it possible to store image data captured with multiple electronic cameras in a single album on the image server. (Description of modified embodiments) The present invention is not limited to the mode of embodiment described above, and various modifications and changes are possible.

[**0519**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), transmission was carried out individually for reach image file relayed from the electronic camera **100** via the portable telephone **120** to the gateway server **160**, it is also permissible to transmit multiple image files as a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160**. In such cases as well, during transmission of image data from the portable telephone **120** to the gateway server **160**, the portable telephone **120** displays the image data being transmitted on the screen **221**. Doing this allows the user to check the progress of the processing of image file transmission from the portable telephone **120** to the gateway server **160** based on the image data being displayed. Furthermore, when multiple image files are transmitted in a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160** in this manner, first all the image files to be transmitted are transmitted from the electronic camera **100** to the portable telephone **120** and are temporarily buffered in the EEPROM **268** of the portable telephone **120**, and once transmission of image files from the electronic camera **100** to the portable telephone **120** is completed, the portable telephone **120** transmits the image files stored temporarily in EEPROM **268** to the gateway server **160**. Doing so makes it unnecessary to transmit appended informational data (camera identification information, gateway server access information, image transmission requests etc.) for each individual image file from the electronic camera **100** to the portable telephone **120**, making it possible to shorten the transmission time for image files between the electronic camera **100** and portable telephone **120**. When transmitting image files from the portable telephone **120** to the gateway server **160**, this also makes it unnecessary to transmit appended informational data (camera identification information, image transmission requests, etc.) for each individual image file from the portable telephone **120** to the gateway server **160**, making it possible to reduce the transmitted data volume passing through the wireless portable telephone link **130** and packet communication network **150** and to shorten the image file transmission time, as well as to reduce communication fees.

[**0520**] Furthermore, when transmitting multiple image files in a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160**, if all the image files to be transmitted are first transmitted from the electronic camera **100** to the portable telephone **120** and are temporarily buffered in the EEPROM **268** of the portable telephone **120**, and once transmission of image files from the electronic camera **100** to the portable telephone **120** is completed, the portable telephone **120** transmits the image files stored temporarily in EEPROM **268** to the gateway server **160**, then if problems occur with the wireless portable telephone link **130** or packet communication network **150** during transmission of image files from the portable telephone **120** to the gateway server **160** and transmission of image files becomes impossible, the portable telephone **120** will leave the image files that it has not finished transmitting in the EEPROM **268**, and will automatically transmit the image files remaining in EEPROM **268** to the gateway server **160** once transmission of image files to the gateway server **160** becomes possible. Doing so makes it unnecessary for the user to redo the image file transmission operation on the electronic camera **100** side from the beginning even if communication between the portable telephone **120** and gateway server **160** becomes impossible midway during image transmission, allowing the user to focus on taking pictures with the electronic camera **120** once image files have been transmitted from the electronic camera **100** to the portable telephone **120**, as well as making it possible to reduce the transmitted data volume passing through the wireless portable telephone link **130** and the packet communication network **150** compared to if file transfer from the electronic camera **100** to the gateway server **160** were redone from the beginning, and allowing one to shorten the image file transmission time and to reduce communication charges.

[**0521**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), greater data communication efficiency of the image transmission system was achieved by having the gateway server **160** temporarily store image files transmitted between the electronic camera **100** and the image server in an image buffer folder and make use of the image files stored temporarily in the image buffer folder as necessary, and by storing thumbnail image data corresponding to the image files in a thumbnail image folder and making use of that thumbnail image data as necessary, it is also possible, as shown in **FIG. 155**, to provide the same sort of image buffer folder and thumbnail image folder in the EEPROM **268** of the portable telephone **120** and temporarily store thumbnail image data and image files transmitted between the electronic camera **100** and the image server in the image buffer folder and thumbnail image folder, and, when the image file or thumbnail image data requested by the electronic camera **100** is present in the image buffer folder or thumbnail image folder, to have the portable telephone **120** transmit those image files and thumbnail image data to the electronic camera **100**. In such cases, the image files or thumbnail image data stored temporarily in the image buffer folder and thumbnail image folder in the EEPROM **268** may be cleared

periodically in their entirety, or the image files and thumbnail image data may be deleted in the order of their age according to the storage start date and time data of the image file or thumbnail image data, so as to keep the total data volume of the temporarily stored image files and thumbnail image data at or below a specific volume. Alternatively, image files kept for more than a specific period of time may be deleted based on the storage start date and time data of the image files or thumbnail image data, or else stored image files or thumbnail image data may be deleted at specific clock times.

[**0522**] If this is done, then when the user wishes to reconfirm the image data most recently transmitted or received via the portable telephone **120**, it will be possible to display a summary of the status of temporarily stored images on the screen **221** of the portable telephone **120**, as shown in **FIG. 156**, and to transmit the image files or corresponding thumbnail image data temporarily stored in the portable telephone **120** from the portable telephone **120** to the electronic camera **100** and make use of them, thereby making it unnecessary to make inquiries via the portable telephone **120** to the gateway server **160** regarding the image files or thumbnail image data and making it possible to quickly read image files or thumbnail image data into the electronic camera **100**, as well as allowing the communication data volume between the portable telephone **120** and gateway server **160** to be reduced and correspondingly reduce the communication line usage fees.

[**0523**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), the electronic camera **100** transmits image data via a single portable telephone **120** to a single gateway server **160**, it is also permissible to have the electronic camera **100** transmit image data via a single portable telephone **120** to multiple gateway servers. In such an image transmission system, the portable telephone **120** can store image files transmitted from the electronic camera **100** in EEPROM **268** under predetermined conditions (for a specific period of time from the start of storage, etc.) and transmit the stored image files to multiple gateway servers based on instructions from the electronic camera **100**. When the electronic camera **100** transmits image files to multiple gateway servers, doing this will make it unnecessary to transmit image files from the electronic camera **100** to the portable telephone **120** every time an image file is to be transmitted, allowing the transmission of image files to the gateway servers to be carried out more quickly. For example, if an image file was transmitted from the electronic camera **100** to one gateway server and the user then wants to transmit the same image file to a different gateway server, the image identification information of the image file and the destination gateway server access information are sent from the electronic camera **100** to the portable telephone **120**, whereupon, if an image file corresponding to the received image identification information is present in the EEPROM **268**, the portable telephone **120** reads that image file from the EEPROM **268** and transmits it to the gateway server corresponding to the received gateway server access information. If no image file corresponding to the received image identification information is present in the EEPROM **268**, the portable telephone **120** informs the electronic camera **100** that no image file corresponding to the received image identification information is present in the portable telephone **120**, in response to that the electronic camera transmits the image file to the portable telephone **120**.

[**0524**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), the portable telephone **120** performs relaying of image data in the transmission of image data between the electronic camera **100** and the gateway server **160**, if the electronic camera **100** itself has a built-in wireless portable telephone function, it is also permissible to omit the portable telephone **120**, as shown in **FIG. 157**, and to have the electronic camera **100** communicate directly with the gateway server **160** using a packet communication protocol. In **FIG. 157**, the base station **140** has been left out of the illustration.

[**0525**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** provides the electronic camera **100** with a single virtual album that combines the albums secured according to the camera identification information on multiple image servers **181** through **184**, and increases the available capacity of the virtual album by automatically setting up a new album corresponding to the camera identification information by registering with a new image server when the available capacity of the virtual album becomes insufficient; however, instead of setting up a new album on a new image server, a new album may also be set up on an existing server on that an album has already been set up. For example, if the gateway server **160** has unused camera identification information and the available capacity of the virtual album has become insufficient, the gateway server **160** can register with an image server, on that an album forming part of the virtual album has already been established, using one item of the unused camera identification information, and set up a new album corresponding to the unused item of camera identification information. Furthermore, the gateway server **160** can link the camera identification information used for setting up new albums to the camera identification information corresponding to the virtual album, so as to incorporate the newly created album into the virtual album. Doing this makes it possible to deal with insufficient available capacity of the virtual album when the number of image servers is limited.

[**0526**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** buffers image files received from the electronic camera **100** in an image buffer folder and delivers the image files buffered in the image buffer folder to image servers at specific intervals, when transmitting image files captured with a series of capture operations (continuous capture or continuous shutter, bracket capture, panorama capture, etc.) from the electronic camera in automatic transfer mode to the gateway server **160**, the image transfer may also be performed by the scheme shown in **FIG. 158**. Here, continuous capture refers to continuously photographic the same subject at specific time intervals while tracking its movement; bracket capture refers to taking multiple photographs of the same subject while varying the capture conditions, such as exposure; and panorama capture refers to photographing a landscape or the like while shifting the capture direction by a certain amount each time. Namely, for each capture operation, the electronic camera **100** appends identification information to image files captured in series to the effect that this image is part of a series, and transmits it to the gateway server **160**. The gateway server **160** temporarily stores image files with appended identification information indicating that it is part of a series of images in an image buffer folder. Once the series of image captures is completed, the electronic camera

100 transmits information to the gateway server **160** indicating that the series of image captures has been completed, and upon receiving that information, the gateway server **160** does a batch transmission of the series of image files stored temporarily in the image buffer folder to the same image server over the Internet and stores them there. Doing this makes it possible to transmit multiple image files between the gateway server **160** and image server with a single transmission procedure, allowing the transmission time to be shortened and allowing the image transmission processing load on the gateway server **160** and image servers **181** through **184** to be reduced. Furthermore, storing image files captured in a series on the same image server makes it highly convenient when the user later connects directly to the image server **181** through **184**, with a personal computer or the like, to use the series of image data.

[**0527**] Instead of transmitting information indicating that a series of captures has been completed from the electronic camera **100** to the gateway server **160**, it is also permissible to transmit to the gateway server **160**, from a terminal such as a personal computer **190** connected to the gateway server **160**, an instruction to transmit a series of image files accumulated on the gateway server **160** together to an image server, in response to that instruction, the gateway server **160** will transmit the series of image files accumulated on the gateway server **160** together to an image server.

[**0528**] Furthermore, when transmitting image files captured in a series from the electronic camera **100** to the gateway server **160** in automatic transmission mode, if an image file is transmitted from the electronic camera **100** to the gateway server **160** after every capture, the communication time will become longer due to the overhead for establishing communication and the appended information, and there are cases where, during this time, the picture-taking conditions will change or where the pictures cannot be taken at the planned time intervals. In such cases, one can optionally have the electronic camera **100** temporarily store the series of captured image files in RAM **70**, and once the series of captures is completed, transmit the series of image files with appended identification information indicating that it is a series of images, together with information indicating that the series of captures has been completed, in a batch to the gateway server **160**. Furthermore, when the data transfer rate of short-range wireless communication between the electronic camera **100** and portable telephone **120** is fast, one may optionally have the image files captured in a series be transmitted from the electronic camera **100** to the portable telephone **120** each time an image is captured, storing them temporarily in the EEPROM **268** of the portable telephone **120**, and have the electronic camera **100** transmit information indicating that the series of captures has been completed to the portable telephone **120** once the series of captures has been completed, and in response to that information, have the portable telephone **120** transmit a series of image files with appended identification information indicating that this is a series of images in a batch to the gateway server **160**. Doing this makes it possible for the electronic camera **100** to perform a series of captures under the desired capture conditions without affecting the image file transmission speed or the like, even in automatic transmission mode (a mode where captured image files are automatically transmitted to and stored on an image server).

[**0529**] Furthermore, when the electronic camera **100** selects image files captured in series, which have been saved on the memory card **77**, and transmits those selected image files to an image server, by transmitting those image files with appended identification information indicating that they are a series of images, the gateway server **160** will be able recognize that these are image files captured in series and perform processing such as storing them on the same image server.

[**0530**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** buffers image files received from the electronic camera **100** in an image buffer folder and delivers the image files buffered in the image buffer folder to the image server at specific intervals, one can also have the image files buffered in the image buffer folder be delivered to the image server based on an external instruction. **FIG. 159** is a drawing that shows the image transmission processing for such a scheme. Multiple image files are transmitted from the electronic camera **100** to the gateway server **160**, and are stored temporarily in an image buffer folder in a folder corresponding to the camera identification information on the gateway server **160**. Thereafter, a personal computer **190** connects to the gateway server **160** and transmits the camera identification information, the identification information of the image server to that the images are to be transferred, and an image transmission instruction to the gateway server **160**. In response to the received camera identification information, the gateway server **160** transmits the image files, which are stored temporarily in the image buffer folder in the folder corresponding to the received camera identification information, in a batch to the image server corresponding to the received image server identification information. Doing this makes it possible for the user to transmit and store image data captured with the electronic camera **100** from the gateway server **160** at a convenient time to a suitable image server.

[**0531**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** buffered image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmitted the image files buffered in the image buffer folder together to the image server at specific intervals; however, the gateway server **160** may also transmit accumulated image files to the image server by the following method. For example, the image files may be transmitted to the image server when the total data volume of the image files stored temporarily on the gateway server **160** exceeds a certain volume. Alternatively, the gateway server **160** may transmit image files to the image server once they have been accumulated for a set period or time, based on the date and time data of the start of storage of the image files in the image buffer folder. Alternatively, the gateway server **160** can transmit accumulated image files to the image server at specific clock times.

[**0532**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** buffers image files transmitted between the electronic camera **100** and the image server in an image buffer folder and clears the entirety of the image files buffered in the image buffer folder at specific intervals, the gateway server **160** may also delete image files by the following method. For example, the gateway server **160** may delete image files in the order of oldest to newest based on date and time information on the start of storage of the image files in the image buffer folder,

so as to keep the total data volume of the image files stored temporarily in the image buffer folder at or below a specific volume. Alternatively, the gateway server **160** may delete image files stored for more than a specific period of time based on date and time information on the start of storage of the image files in the image buffer folder. Or the gateway server **160** may delete stored image files at specific clock times.

[**0533**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** buffers image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmits them as necessary to the electronic camera **100**, the gateway server **160** may also transmit image files accumulated in the image buffer folder (image files transmitted by the electronic camera **100** to an image server or image files read by the electronic camera **100** from an image server) to another image server or electronic camera based on instructions from the electronic camera **100**. Doing this makes it unnecessary to transmit each image file one by one from the electronic camera **100** to the gateway server **160**, thereby making it possible to shorten the image file transmission time and reduce transmission charges.

[**0534**] While in the above mode of embodiment (**FIG. 119** through **FIG. 154**), the gateway server **160** performed management of individual albums on image servers according to the camera identification information received from the electronic camera **100**, it is also possible to use general identification information instead of camera identification information for individually identifying multiple electronic cameras **100**. For example, using the next generation version of the IP protocol, IPV6 (Internet Protocol Version 6), the use of that on the Internet is planned, as the identification information, would make it possible for all electronic devices that handle images, besides electronic cameras, to make use of the image transmission system according to the present invention. Namely, IPV6 provides a 32-bit address space (on order of 10 to the 9th power), so there is practically no concern of running out of addresses, which makes it possible for one device to have multiple addresses depending on the application, and can further increase the utility of the image transmission system according to the present invention. Furthermore, for instance in a network environment wherein electronic devices such as electronic cameras connect to the gateway server by means of a wireless LAN (Ethernet™) or the like, it is possible to use the MAC (Media Access Control) address or Ethernet™ address assigned to each individual electronic device as the identification information. A MAC address is assigned to each electronic device without duplication, which makes it suitable for individually identifying electronic devices and makes it possible to omit the effort to newly setting the identification information for applications of the present invention.

[**0535**] While the above mode of embodiment (**FIG. 119** through **FIG. 154** and **FIG. 157**) were described assuming that information such as image data was transmitted between the electronic camera **100**, portable telephone **120** and gateway server **160** using packet communication, it is of course also permissible to transmit information such as image data using circuit-switched data communication.

[**0536**] In the above mode of embodiment (**FIG. 119** through **FIG. 154**), the image servers **181** through **184** had individual albums (folders) corresponding to the camera identification information set individually for each electronic camera **100**, the electronic camera **100** would transmit the camera identification information set in the camera in question to the gateway server **160**, and the gateway server **160**, based on the received camera identification information, would create new albums corresponding to the received camera identification information on the image servers **181** through **184** or perform reading and writing of image data to and from an album corresponding to the received camera identification information present on the image servers **181** through **184**; however, it is also permissible to manage image data transmission and storage between the electronic camera **100** and image servers **181** through **184** using identification information other than camera identification information.

[**0537**] For example, in **FIG. 160, a** password input means is provided on the electronic camera side and image data transmission and storage is managed according to the password inputted by the user. In **FIG. 160**, electronic cameras A**101** and B**102** are equipped with password input means **81** and **82**, and when transmitting a captured image file, electronic cameras A**101** and B**102** transmit the password inputted by the user and the image file as a pair to the gateway server **160**. Meanwhile, the image server **181** has an album prepared that corresponds to the password, and the gateway server **160** transmits the received image file and stores it in the album on the image server **181** corresponding to the received password. The gateway server **160** can also create a new album on the image server corresponding to the received password. Furthermore, when downloading image files from the image server **181**, the electronic cameras A**101** and B**102** transmit image identification information and a password to the gateway server **160**, and the gateway server **160** transmits the received image identification information and password to the image server **181**. The image server **181** reads the image file corresponding to the received image identification information from the album corresponding to the received password, and transmits that image file to via the gateway server **160** to the electronic cameras A**101** and B**102**. Instead of password input, the electronic camera can obtain user identification information by installing a UIM card on that personal identification data has been stored in advance into the electronic camera.

[**0538**] If this is done, then when the same user uses multiple electronic cameras or when multiple users use the same camera, the image files captured by the electronic camera will be stored in an album on an image server corresponding to the password inputted by the user, so there is no inconvenience of having to later separate image files stored in the same album on an image server for different users, or collect image files stored in different albums on an image server for each user, allowing image files to be stored efficiently on a per-user basis and making it possible to protect the privacy of the stored image data.

[**0539**] While in **FIG. 160**, control and management of image data transmission and storage operations between the electronic camera **100** and image servers **181** through **184** is carried out based on the password inputted by the user into the electronic camera, in **FIG. 161**, instead of a password, a user identification means is provided on the electronic camera side, the electronic camera performs user identification automatically without manual intervention by the

user, and image data transmission and storage is managed based on that user identification information. In **FIG. 161**, electronic cameras A**101** and B**102** are equipped with user identification means **83** and **84** (fingerprint detection means, iris pattern detection means, facial image detection means, etc.), and when transmitting a captured image file, the electronic cameras A**101** and B**102** transmit the image file paired with the user identification information detected by the user identification means **83** and **84** (fingerprint pattern characteristics information, iris pattern characteristics information, facial image pattern characteristics information, etc.) to the gateway server **160**. The gateway server **160** compares the received user identification information with user identification information contained in the personal identification data that is stored in advance to identify the user. Meanwhile, the image server **181** has an album prepared that corresponds to the personal identification data, and the gateway server **160** transmits and stores received image files in the album on the image server corresponding to the personal identification data of the identified user. The gateway server **160** can also create a new album on the image server corresponding to the personal identification data of the identified user. Furthermore, when downloading image files from the image server **181**, electronic cameras A**101** and B**102** transmit image identification information and user identification information to the gateway server **160**, the gateway server **160** identifies the users based on the received user identification information, and transmits the personal identification data corresponding to the user along with the image identification information to the image server **181**. The image server **181** reads image files corresponding to the received image identification information from the album corresponding to the received personal identification data, and transmits those image files via the gateway server **160** to the electronic cameras A**101** and B**102**.

[**0540**] Doing this makes it possible to automatically perform user identification at the electronic camera, which eliminates the effort of inputting passwords for individual identification and resolves the problems of forgotten passwords and password theft.

[**0541**] The means of personal identification described above in **FIG. 160** and **FIG. 161** (password input means, UIM card, fingerprint detection or other user identification means) can also be provided on the portable telephone side, if the gateway server is connected to from the electronic camera via the portable telephone. In **FIG. 162**, when connecting from the electronic camera to the gateway server via the portable telephone, image data transmission and storage are managed based on the telephone number of the portable telephone. In **FIG. 162**, when transmitting a captured image file, the electronic cameras A**101** and B**102** connect to the portable telephone **121** (telephone number A) and transmit the image file to the portable telephone **121**. The portable telephone **121** transmits the received image file paired with the telephone number to the gateway server **160**. Meanwhile, the image server **181** has an album prepared corresponding to the telephone number of the portable telephone, and the gateway server **160** transmits and stores the received image file in an album on the image server **181** corresponding to the telephone number. The gateway server **160** can also create a new album on an image server corresponding to the telephone number. Furthermore, when downloading image files from the image server **181**, the electronic cameras A**101** and B**102** send image identification information to the portable telephone **121**, the portable telephone **121** transmits the telephone number and image identification information to the gateway server **160**, and the gateway server **160** transmits the telephone number and image identification information to the image server **181**. The image server **181** reads the image file corresponding to the received image identification information from the album corresponding to the received telephone number, and transmits that image file to the electronic cameras A**101** and B**102** via the gateway server **160** and the portable telephone **121**.

[**0542**] Doing this allows the user to store image files separated on a per individual basis in a per-individual album on an image server or read image files from one's own exclusive album on an image server by performing image transmission and reception using his portable telephone, even when using multiple electronic cameras or when multiple persons use the same electronic camera.

[**0543**] Furthermore, by combining the electronic camera's camera identification information with multiple personal identification means, the user identification precision can be increased and a higher level of image information security can be attained.

[**0544**] As described above, in the image transmission system, image relay apparatus and electronic image device according to the present invention, the image relay apparatus views multiple electronic image devices as one electronic image device based on the individual identification information of the electronic image devices, and stores image data transmitted from the electronic image devices in a single album on an image server, which makes it possible to store image data transmitted by a single user using multiple electronic image devices in a single album on an image server, without the user having to perform bothersome procedures, as well as allowing the user to browse the image data stored in the album using multiple electronic image devices, without the user having to perform bothersome procedures.

[**0545**] Moreover, in the image transmission system, image relay apparatus and electronic image device according to the present invention, the image relay apparatus automatically establishes the identity of the user of the electronic camera based on a password or the user's personal information or the like and allows access (storage, browsing) from the electronic image device to the album on the image server corresponding to the identification results, so even if multiple users share a single electronic image device, it is possible to store captured image data in separate albums for each user without bothersome procedures, and to prohibit browsing of image data captured by other users without bothersome procedures.

[**0546**] 5:

[**0547**] **FIG. 163** is a conceptual drawing of an image data transmission system applying the present invention. First, the case of transmitting image data from the electronic camera **100** to the image servers **181** through **184** will be described. The electronic camera **100** generates image data through capture operations. When transmitting the image data to external image servers **181** through **184**, the electronic camera **100** connects to a portable telephone **120**. The connection between the electronic camera **100** and the

portable telephone **120** is made by means of a short-range communication link **110** (e.g., Bluetooth protocol based short-range wireless communication, short-range wired communication based on a cable connection-specific protocol, IEEE 802.11 protocol based wireless LAN communication, short-range infrared communication using the IrDA protocol, etc.). The electronic camera **100** selects the image data to transmit, displays the image data on the screen **21** and transmits it to the portable telephone **120**. Since the electronic camera **100** and the portable telephone **120** are used by the user simultaneously, it suffices for the local wireless communication range to be on the order of several meters, which allows the power load on the electronic camera **100** and portable telephone **120** due to short-range wireless communication to be reduced.

[**0548**] The portable telephone **120** is provided with a short-range communication function for communicating with the aforementioned electronic camera **100** and a long-range communication function using a wireless portable telephone link **130**, whereby the long-range communication function using the wireless portable telephone link **130** allows both conventional talk functions and packet communication protocol based digital data communication functions to be executed. The portable telephone **120** temporarily stores image data received from the electronic camera **100** via the short-range communication link **10** in an internal memory. Next, the portable telephone **120** sends the stored image data using a packet communication protocol via the wireless portable telephone link **130** to a base station **140**. While transmitting image data to the base station **140**, the portable telephone **120** displays the image data being transmitted on a screen **221**.

[**0549**] The base station **140** transmits the image data, received from the portable telephone **120** using a packet communication protocol via the wireless portable telephone link **130**, to a gateway server **160** via a packet communication network **150** using a packet communication protocol. The gateway server **160** stores the image data received from the base station **140** using a packet communication protocol via the packet communication network **150** for a time in an internal memory, and transmits the stored image data at specific intervals using Internet protocol via the Internet **170** to image servers **181** through **184**. The gateway server **160** keeps thumbnail image data (scaled-down image data obtained by compressing and reducing the data volume of the original image data) corresponding to the image data transmitted to the image servers in an internal memory. Image servers **181** through **184** store the image data received using Internet protocol via the Internet **170** in a high capacity memory.

[**0550**] When transmitting image data from the electronic camera **100** to an image server, there is no need to perform the transmission with awareness of the complicated connection and communication procedures for accessing the image server on the electronic camera **100** side; rather, on the electronic camera **100** side, it suffices to append fixed address information for specifying the gateway server **160** and camera identification information for identifying the electronic camera **100** to the image data to be transmitted, and pass it on to the portable telephone **120**. The portable telephone **120** transmits the image data and camera identification information by packet communication to the designated gateway server **160** based on the received gateway server address information. The gateway server **160** manages the image data according to the camera identification information received via packet communication, and transmits the image data to a suitable image server among multiple image servers **181** through **184** on the Internet **170** using Internet protocol. The multiple image servers **181** through **184** are treated as a single virtual image server **180** from the viewpoint of the electronic camera, and the complicated procedures for accessing each image server on the Internet **170** are all performed by the gateway server **150**.

[**0551**] Next, the case where the electronic camera **100** receives image data from the virtual image server **180** will be described. First, the electronic camera **100** is connected to the portable telephone **120** by means of the short-range communication link **110**. The electronic camera **100** transmits a browse data request, camera identification information and gateway server **160** address information to the portable telephone **120**. Next, the portable telephone **120** transmits the browse data request and camera identification information via the base station **140** using packet communication protocol to the designated gateway server **160** based on the received gateway server **160** address information. Upon receiving the browse data request and camera identification information, the gateway server **160** transmits the thumbnail image data (browse data) for the image data corresponding to the camera identification information stored on the virtual server **180** via the base station **140** using packet communication protocol to the portable telephone **120** that transmitted the browse data request. The portable telephone **120** transmits the received browse data over the short-range communication link **110** to the electronic camera **100**.

[**0552**] The electronic camera **100** displays the received browse data (thumbnail image data) on the screen **21**, from that the desired image is selected. The electronic camera **100** transmits a request for the selected image data along with image identification information (image file name, etc.) for the image data, camera identification information and gateway server **160** address information over the short-range communication link **110** to the portable telephone **120**. Next, the portable telephone **120**, based on the received gateway server **160** address information, transmits the image data request, image identification information and camera identification information via the base station **140** using packet communication protocol to the designated gateway server **160**. Upon receiving the image data request, image identification information and camera identification information, the gateway server **160** specifies the image data stored on the virtual server **180** according to the camera identification information and image identification information, and transmits the image data request and image identification information using Internet protocol to the image server **181** through **184** on the Internet **170** that is storing the image data in question.

[**0553**] The image server, which receives the image data request and image identification information, transmits the image data corresponding to the image identification information using Internet protocol to the gateway server **160**. Upon receiving the image data, the gateway server **160** transmits that image data via the base station **140** using packet communication protocol to the portable telephone **120** that transmitted the image data request. The gateway server **160** temporarily stores the image data received from

the image server in an internal memory. The portable telephone **120** transmits the received image data over the short-range communication link **110** to the electronic camera **100**. The electronic camera **100** displays the received image data on the screen **21**.

[**0554**] The gateway server **160** can also be connected to from a user's personal computer **190** via the Internet **170**, and the user can read and use image data from the virtual server **180** via the gateway server **160** on a personal computer **190**, and can modify the settings of the gateway server **160**.

[**0555**] **FIG. 164** and **FIG. 165** are an external view (front view and rear view) of an embodiment of the electronic camera **100** used in an image data transmission system applying the present invention. As shown in **FIG. 164, a** photographic lens **10** for forming a subject image, a finder **11** for confirming the frame, a strobe **12** for illuminating the subject when a photograph is taken, a photometric circuit **13** for detecting the brightness of the subject, and a grip **14** extending from the camera housing for making it easier for the user hold the electronic camera **100** in his or her hands are provided at the front of the electronic camera **100**, and a release button **16** and a power switch **17** for turning the power supply to the electronic camera **100** on and off are provided at the top.

[**0556**] As shown in **FIG. 165**, the eyepiece of the finder **11**, a left LCD (left screen) **21** comprising a substantially rectangular screen for text and image display, and a right LCD (right screen) **22** comprising a substantially rectangular screen for text and image display are arranged at the rear of the electronic camera **100**; an UP button **23**, a DOWN button **24**, LEFT button **25**, RIGHT button **26** and SELECT button **27**, used for image manipulation and the like, are arranged below the right LCD **22**, and a capture mode button **28** for putting the electronic camera **100** into capture mode, a playback mode button **29** for putting the electronic camera **100** into playback mode, a transmit button **31** for controlling image data transmission, and a receive button **32** for controlling image data reception are arranged below the left LCD **21**. A memory card slot **30** for installing a memory card **77** used for storing image data is provided at the side.

[**0557**] The release button **16**, UP button **23**, DOWN button **24**, LEFT button **25**, RIGHT button **26**, SELECT button **27**, capture mode button **28**, playback mode button **29**, transmit button **31** and receive button **32** are all control keys operated by the user.

[**0558**] A so-called touch screen **66**, equipped with a function of outputting contact position data corresponding to the position indicated by a finger touch operation is arranged over the left LCD **21** and the right LCD **22**, which touch screen can be used for selection of image data and options displayed on the screen. This touch screen **66** is made of a transparent material such as glass or resin, allowing the user to view the image or text formed on the inside of the touch screen **66** through the touch screen **66**.

[**0559**] **FIG. 166** is a block diagram showing an example of the internal electrical configuration of the electronic camera **100** shown in **FIGS. 164 and 165**, whereby the constitutive elements are connected to each other via a data/control bus **51** for transmitting various types of informational data and control data. The various constitutive elements can be roughly divided into a block centered on the capture control circuit **60** that executes image data capture operations, a block of the memory card **77** that stores and saves image files, a block centered on the screen control circuit **92** that executes the display of image data and associated information, and a block centered on the CPU **50**, which performs overall control of the user interface such as the control keys **65** and of the various control circuits.

[**0560**] The CPU **50** (central processing unit) is the means that controls the entire electronic camera **100**, issuing various instructions to the capture control circuit **60**, screen control circuit **92** and power control circuit **64** in accordance with input information from the control keys **65**, touch screen **66**, power switch **17**, timer **74** and photometric circuit **13**. The photometric circuit **13** measures the brightness of the subject and outputs the photometric data that is the result of this measurement to the CPU **50**. The CPU **50** sets the exposure time and sensitivity of the CCD **55** according to the photometric data by means of a CCD drive circuit **56**, and controls the value of the diaphragm **53** by means of a diaphragm control circuit **54** via the capture control circuit **60** in accordance with the data of those settings.

[**0561**] In capture mode, the CPU **50** controls the capture operation via the capture control circuit **60** in accordance the manipulation of the release button **16**. Furthermore, if the subject is dark based on the photometric data, the CPU **50** causes the strobe **12** to emit light via the strobe drive circuit **73** when taking a picture. The timer **74** has a built-in clock circuit and finds the date and time information corresponding to the current date and time and provides the capture date and time information to the CPU **50** when a picture is taken. The CPU **50** appends the capture date and time information to the image data and stores it in the memory card **77**. The CPU **50** controls the various units according to a control program stored in ROM **67** (read-only memory). The EEPROM **68** (electrically erasable programmable ROM) is a non-volatile memory that stores settings information, etc. required for the operation of the electronic camera **100**. The RAM **70** is a volatile memory that is used as a temporary working area of the CPU **50**. The CPU **50** detects the manipulation state of the power switch **17** and controls the power supply **63** via a power supply control circuit **64**.

[**0562**] The capture control circuit **60** performs focusing and zooming of the photographic lens **10** by means of a lens drive circuit **52**, controls the exposure of the CCD **55** by controlling the diaphragm **53** by means of the diaphragm control circuit **54**, and controls the operation of the CCD **55** by means of a CCD drive circuit **56**. Light beams from the subject are formed by the photographic lens **10** into a subject image over the CCD **55** after passing through the diaphragm **53** to adjust the amount of light, and this subject image is picked up by the CCD **55**. The CCD **55** (charge coupled device), which comprises a plurality of pixels, is a charge accumulation type image sensor used for picking up a subject image, and outputs electrical image signals corresponding to the strength of the subject image formed on the CCD **55** to an analog processing unit **57** in accordance with drive pulses provided by the CCD drive circuit **56**.

[**0563**] The analog processing unit **57** samples the image signal, which has undergone photoelectric conversion by the CCD **55**, with a specific timing, and amplifies the sampled signal to a specific level. An A/D conversion circuit **58**

(analog/digital conversion circuit) digitizes the image signal sampled by the analog processing unit **57**, thereby converting it to digital data, which is temporarily stored in capture buffer memory **59**.

[**0564**] In capture mode, the capture control circuit **60** repeats the operation described above, while the screen control circuit **92** repeats the through-image display operation of reading out the digital data stored successively in the capture buffer memory **59** via the data/control bus **51**, loading it once into the frame memory **69**, converting the digital data into image data for display, loading it again into the frame memory **69**, and displaying the image data for display on the left screen **21**. Furthermore, the screen control circuit **92** obtains text display information from the CPU **50** as required, converts it to text data for display and stores it in the frame memory **69**, and displays the text data for display on the left screen **21** and right screen **22**. In this way, in capture mode, the image picked up by the CCD **50** is displayed in real time on the left screen **21**, making it possible to use this through-image as a monitor screen to make the composition settings for taking a picture. The capture control circuit **60** analyzes the extent of the high frequency component of the digital data stored in the capture buffer memory **59** and detects the state of focus adjustment of the photographic lens **10**, and performs focus adjustment of the photographic lens **10** by means of the lens drive circuit **52** in accordance with the detection results.

[**0565**] At the time of release, upon receiving a capture instruction from the CPU **50**, the capture control circuit **60** causes the subject image to be picked up by the CCD **55** via the CCD drive circuit **56**, passes the image signal generated by the image pickup through the analog processing unit **57** and A/D conversion circuit **58** and temporarily stores it as digital data (raw data) in the capture buffer memory **59**. The capture control circuit **60** converts or compresses the digital data stored temporarily in the capture buffer memory **59** into a specific recording format (JPEG, etc.) to form the image data, and stores the image data on the memory card **77**.

[**0566**] A GPS circuit **61** (global positioning system circuit) detects the location information (longitude data and latitude data) for the electronic camera **100** using information from multiple satellites orbiting around the earth, and provides the capture location information to the CPU **50** at the time of image capture. The CPU **50** appends the capture location information to the image data and stores it in the memory card **77**.

[**0567**] The CPU **50** can transmit the image data stored in the memory card **77** to the outside via the short-range wireless communication circuit **72** and the antenna **76**, or conversely store image data received from the outside via the short-range wireless communication circuit **72** and the antenna **76** in the memory card **77** and display it on the left screen **21**, as required.

[**0568**] In playback mode, the screen control circuit **92** reads out the image data indicated by the CPU **50** from the memory card **77** and places it temporarily into the frame memory **69**, displays the image data on the left screen **21**, and, following the instructions of the CPU **50**, places text data such as playback mode instructions into the frame memory **69** and displays the text data on the right screen **22**.

[**0569**] Moreover, in playback mode, manipulating the transmit button **31** causes the image data being played back and displayed on the left screen **21** to be transmitted to the outside via the short-range wireless communication circuit **72** and antenna **76**, and manipulating the receive button **32** causes image data to be received from the outside via the short-range wireless communication circuit **72** and antenna **76** and played back and displayed on the left screen **21**.

[**0570**] **FIG. 167** shows the data configuration of image files stored in the memory card **77**. As shown in **FIG. 167**, multiple image files are stored in the memory card **77**. Each image file is made up of image data and appended informational data. The appended informational data consists of capture data that indicates the various settings at the time of image capture, capture date and time data, and capture location data. **FIG. 168** is a drawing that shows the configuration of information stored in the EEPROM **68**, which consists of camera identification information for identifying the individual electronic camera **100** and gateway server access information used by the portable telephone **120** to access the gateway server **160**.

[**0571**] **FIG. 169** is an external view of the portable telephone **120**, which is provided with a display screen **221** for displaying image data, various control keys **265**, a microphone **280** and a speaker **281**. **FIG. 170** is a block diagram showing an example of the internal electrical configuration of the portable telephone **120** shown in **FIG. 169**, wherein the various elements are connected to each other via a data/control bus **251** for transmitting various types of informational data and control data. The CPU **250** (central processing unit) is the means that performs overall control of the entire portable telephone **120**, issuing various instructions to the screen control circuit **292** and power supply control circuit **264** in accordance with input information from the control keys **265**, power switch **217** and timer **274**.

[**0572**] The CPU **250** controls the various units in accordance with a control program stored in ROM **267** (read-only memory). The EEPROM **268** (electrically erasable programmable ROM) is a non-volatile memory that is used for storage of settings information necessary for the operation of the portable telephone **120** and for temporary storage of image data. The RAM **270** is a volatile memory that is used as a temporary working area of the CPU **250**. The UIM card (User Identity Module) **277** is a portable storage medium that can be installed in and removed from the portable telephone **120** and that stores personal information of the user of the portable telephone **120** and the like, which personal information can be used by the CPU **250** as required. The CPU **250** detects the state of manipulation of the power switch **217**, and controls the power supply **263** via the power supply control circuit **264**.

[**0573**] The CPU **250** performs processing of outgoing and incoming telephone calls using the wireless portable telephone circuit **271** and antenna **275**, and performs voice call processing using the microphone **280** and speaker **281**. Furthermore, the CPU **250** performs exchange of digital data with the outside by means of packet communication protocol using the wireless portable telephone circuit **271** and antenna **275**. Moreover, the CPU **250** performs exchange of messages with electronic devices having a short-range wireless communication capability that are in the vicinity of the portable telephone **120** via the short-range wireless communication circuit **272** and the antenna **276**, and is able to exchange image information and the like. The CPU **250**

reads and loads image data stored temporarily in EEPROM **268** into frame memory **269**, and displays the image data on the display screen **221** using the screen control circuit **92**.

[**0574**] **FIG. 171** is a block diagram showing the internal configuration of the gateway server **160**, wherein a communication means **371** connected to a packet communication network, a communication means **372** connected to the Internet, a memory means **368** that stores information such as image data, and a timer means **374** are connected to a control/processing means **350** that performs overall control of the various elements of the gateway server **160**. The gateway server **160** exchanges information such as image data with the portable telephone **120** using a packet communication protocol via the communication means **371**, and exchanges information such as image data with image servers using Internet protocol via the communication means **372**.

[**0575**] Various types of information are held in the memory means **368**, as shown in **FIG. 172**. The camera identification information link data, as shown in **FIG. 173**, is data that indicates the correspondence relations of individual items of camera identification information, whereby the arrow indicates that the camera identification information on the right is the parent of the camera identification information on the left. It also represents whether a given item of camera identification information is parent camera identification information, or is single (no link) or is unused, etc. Namely, the gateway server **160** refers to this camera identification information link data, searches for parent camera identification information based on the received camera identification information, and if parent camera identification information exists, performs processing, which is described below, in accordance with the parent camera identification information. Performing such processing makes it possible to treat image data captured with different electronic cameras as image data captured with a single electronic camera. This camera identification information link data can be modified if necessary from an external personal computer **190** or the like, connected to the gateway server **160**.

[**0576**] In the memory means **368**, as shown in **FIG. 172, a** folder corresponding to each item of camera identification information is prepared, and each folder corresponding to an item of camera identification information holds personal identification data, image server management data, transfer history data, thumbnail image data and image file data. **FIG. 174** is a drawing that shows the configuration of personal identification data, which comprises data relating to the user of the electronic camera **100** corresponding to the camera identification information; the personal identification data can be used by the gateway server **160** to register with image servers on the Internet to secure a new storage area for storing image data or when reading/writing image data to and from image servers. This personal identification data can be modified as necessary from an external personal computer **190**, etc., connected to the gateway server **160**, and may optionally be made modifiable by transmission of information stored on the UIM card **277** installed in the portable telephone **120** from the portable telephone **120** to the gateway server **160**.

[**0577**] **FIG. 175** is a drawing showing the configuration of server management data, which consists of identifying names of image servers on that the gateway server **160** stores image data according to the camera identification information, the URL (Uniform Resource Locator) of each image server, the total data capacity provided on each image server according to the camera identification information, the available capacity out of the total data capacity provided on each image server according to the camera identification information, and list information on the image data stored on each image server based on the camera identification information (image file identification information or image file names), etc.

[**0578**] **FIG. 176** is a drawing that shows the configuration of the transfer history data, which consists of list information on image data stored on the virtual image server **180** according to the camera identification information (image file identification information or image file names), information on the date and time of transfer of each item of image data to the image server, information relating to the image server to that image data is transferred, etc.

[**0579**] **FIG. 177** is a block diagram showing the internal configuration of image servers **181** through **184**, wherein a communication means **471** connected to the Internet and a memory means **468** that stores information such as image data are connected to the control/processing means **450** that performs overall control of the individual elements of image servers **181** through **184**. Image servers **181** through **184** exchange information such as image data with the gateway server **160** via the communication means **471** using Internet protocol. In the memory means **468**, a folder corresponding to each item of camera identification information is prepared, as shown in **FIG. 178**, and image file data is stored in the folders corresponding to each item of camera identification information.

[**0580**] **FIG. 179** is a state transition diagram for an embodiment of the electronic camera **100** according to the present invention. When power is turned on, the camera enters capture mode, and manipulating the release button **16** causes the camera to perform a capture operation and a post-capture image file creation and loading of the image file into the memory card **77**. In playback mode, it performs playback and display operations on the image data stored in the memory card **77**. In capture mode, if the automatic transmission function is turned on, an image transfer operation is performed, whereby captured image data is automatically transmitted and stored on an image server. Furthermore, in playback mode, manipulating the transmit button **31** causes an image transmission operation to be performed, whereby the image data displayed on the left screen **21** is transmitted and stored on an image server. Moreover, manipulating the receive button **32** in playback mode causes an image reception operation to be performed, whereby the desired image data is received from the image server and displayed on the left screen **21**. Furthermore, manipulating the capture mode button **28** causes a transition from playback mode to capture mode, and manipulating the playback mode button **29** causes a transition from capture mode to playback mode.

[**0581**] **FIG. 180** is a main flow chart of the operation of the electronic camera **100** (CPU **50**) in the mode of embodiment described above. First, in S**10**, the power supply is turned on by manipulating the power switch **17**, and in S**20**, the capture mode subroutine is executed, leading to a capture

enabled state. If the release button **16** is manipulated while in capture mode, the release interrupt handling subroutine is executed in S**30**, and the capture operation is carried out. If the playback mode button **29** is manipulated while in capture mode, a mode switch interrupt handling subroutine is executed in S**40**, the playback mode subroutine is executed in S**50**, and image data stored in the memory card **77** is played back and displayed on the left screen **21**. Conversely, if the capture mode button **28** is manipulated while in playback mode, a mode switch interrupt handling subroutine is executed in S**40**, and the system moves to the capture mode subroutine of S**20**. If the automatic transmission function is turned on, manipulating the release button **16** causes the communication interrupt processing of S**60** to be executed following the capture operation, and transmission of image data to the image server is carried out. Furthermore, manipulating the transmit button **31** or the receive button **32** while in playback mode causes the communication interrupt processing of S**60** to be executed, and transmission of image data to the image server or reception of image data from the image server is carried out.

[**0582**] **FIG. 181** is a detailed flow chart of the capture mode subroutine. Starting in S**20**, the processing of S**201** is repeated. In S**201**, image data successively generated by the CCD **55** under the camera settings made by the user is displayed on the left screen **21** as shown in **FIG. 182**, at that time the capture settings are displayed as text on the right screen **22**.

[**0583**] **FIG. 183** is a detailed flow chart of the release interrupt handling subroutine. Starting in S**30**, it is checked in S**301** whether the system is in capture mode, and if it is not in capture mode, the system returns in S**308**. If it is in capture mode, the capture operation is carried out under the capture conditions set by the user or the camera to generate image data, and appended informational data (capture data, time data, location data) is appended to the image data in S**303** to generate an image file. In S**304**, it is checked whether the automatic transmit function is turned on, and if it is not turned on, the image file is loaded into the memory card **77** in S**305** and the system returns in S**308**. If the automatic transmit function is turned on, communication with the portable telephone **120** is attempted using the short-range wireless communication circuit **72** in S**306**, checking whether communication is possible, and if communication with the portable telephone **120** is possible, the portable telephone image file transmission subroutine of S**70** is executed, transmitting the image file to the portable telephone **120**, and the system returns in S**308**. If communication with the portable telephone **120** is not possible, the system goes back to S**305**, stores the image file on the memory card **77**, and returns in S**308**.

[**0584**] **FIG. 184** is a detailed flow chart of the portable telephone image file transmission subroutine. Starting in S**70**, the image file, camera identification information, gateway server access information and an image transmission request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.) in S**701**, and the system returns in S**702**.

[**0585**] **FIG. 185** is a detailed flow chart of the mode switch interrupt handling subroutine. Starting in S**40** upon manipulation of the capture mode button **28** or playback mode button **29**, it is checked in S**401** whether the manipulated button was the capture mode button **28**, and if it was the capture mode button **28**, playback mode is terminated and the system moves to the capture mode subroutine of S**20**. If the manipulated button was not the capture mode button **28**, the capture mode is terminated and the system moves to the playback mode subroutine of S**50**.

[**0586**] **FIG. 186** is detailed flow chart of the playback mode subroutine. Starting in S**50**, the processing of S**501** is repeated. In S**501**, in response to the manipulation of the LEFT button **25** and RIGHT button **26**, image data stored in the memory card **77** is selected and read, and is played back and displayed on the left screen **21** as shown in **FIG. 187**, while operating instructions are displayed on the right screen **22**. Immediately after power is turned on, the most recent image data is displayed; subsequently, image data with older time data are displayed successively in response to manipulation of the LEFT button **25**, and image data with newer time data are displayed successively in response to manipulation of the RIGHT button **26**.

[**0587**] **FIG. 188** is a detailed flow chart of the communication interrupt handling subroutine started by manipulating the transmit button **31** or receive button **32**. Starting in S**60**, it is checked in S**601** whether the manipulated button was the transmit button **31**, and if was the transmit button **31**, it is checked in S**602** whether the system is in capture mode, and if it is in capture mode, the current setting of the automatic transmit function is inverted in S**603**, and the system returns in S**613**. If the system was in playback mode in S**602**, communication with the portable telephone **120** using the short-range wireless communication circuit **72** is attempted in S**604**, checking whether communication is possible, and if communication with portable telephone **120** is possible, the portable telephone image file transmission subroutine of S**70** is executed, transmitting the image file of the image data currently displayed on the left screen **21** to the portable telephone **120**, and the system returns in S**613**. If communication with the portable telephone **120** is not possible, the system returns in S**613**.

[**0588**] If the button manipulated in S**601** was the receive button **32**, it is checked in S**605** whether the system is in capture mode, and if it is in capture mode, the system returns in S**613**. If it is in playback mode, communication with the portable telephone **120** using the short-range wireless communication circuit **72** is attempted in S**606**, checking whether communication is possible, and if communication with the portable telephone **120** is not possible, the system returns in S**613**. If communication with portable telephone **120** is possible, in S**607**, the camera identification information, gateway server access information and a thumbnail image reception request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.). In S**608**, the system waits to receive thumbnail images form the portable telephone **120** and returns in S**613** if reception was not possible. If thumbnail images were received, in S**609**, as shown in **FIG. 189**, the received thumbnail images are displayed on the left screen **21**, while operating instructions are displayed on the right screen **22**. The thumbnail images are scrolled by manipulating the UP button **23** and DOWN button **24**, and either the left or,right thumbnail image is selected by manipulating the LEFT button **25** or RIGHT button **26**.

Manipulating the SELECT button **27** confirms the selected thumbnail image. In **S610**, the image identification information appended to the selected thumbnail image, the camera identification information, gateway server access information and an image reception request are transmitted to the portable telephone **120** by means of the short-range wireless communication circuit **72** using a short-range wireless communication protocol (Bluetooth, etc.). In **S611**, the system waits to receive image data from the portable telephone **120** and returns in **S613** if reception was not possible. If image data was received, in **S612**, as shown in **FIG. 146**, the received image data is displayed on the left screen **21** while operating instructions are displayed on the right screen **22**, and the system returns in **S613**.

[**0589**] Next, operation of the portable telephone **120** (CPU **250**) in the above mode of embodiment will be described. Description of the operation of the portable telephone **120** relating to talk functions will be omitted as it has little bearing on the present invention. **FIG. 191** is a detailed flow chart of the communication interrupt handling started when the portable telephone **120** performs image transmission.

[**0590**] Communication interrupt handling is started in **A60** when a communication request is received via short-range wireless communication from the electronic camera **100**, it is checked in **A601** whether the system is currently processing a voice call, and if it is processing a voice call, the system returns in **A613** without responding to the communication request from the electronic camera **100**. If a voice call is not being processed, voice call processing is blocked in **A602**, it is checked in **A603** whether the request from the electronic camera **100** is an image file transmission request, and if it was an image file transmission request, in **A604**, communication is attempted with the gateway server **160** using the wireless portable telephone circuit **271** based on the gateway server access information, checking whether communication is possible, and if communication with the gateway server **160** is possible, the gateway image file transmission subroutine of **A70** is executed, the image file received from the electronic camera **100** is transmitted to the gateway server **160**, voice call processing is unblocked in **A613**, and the system returns. If communication with the gateway server **160** is not possible, in **A605**, the image file, camera identification information, gateway server access information, etc. received from the electronic camera **100**, are stored temporarily in EEPROM **268**, and the system unlocks voice call processing and returns in **A613**.

[**0591**] If the request from the electronic camera **100** in **A603** was not an image file transfer request, in **A606**, communication with the gateway server **160** is attempted using the wireless portable telephone circuit **271** based on the gateway server access information, checking if communication is possible, and if communication with the gateway server **160** is not possible, the system unblocks voice call processing in **A613** and returns. If communication with the gateway server **160** is possible, it is checked in **A607** whether the request from the electronic camera **100** is a thumbnail image reception request, and if it was a thumbnail image reception request, in **A608**, a thumbnail image reception request and camera identification information are transmitted to the gateway server **160** by means of the wireless portable telephone circuit **271** using a packet communication protocol. In **A609**, the thumbnail images are received from the gateway server **160** and are transmitted to the electronic camera **100** by means of the short-range wireless communication circuit **272** using a short-range wireless communication protocol. While transmitting thumbnail images to the electronic camera **100**, the thumbnail images are displayed on the screen **221**. Once transmission of thumbnail images to the electronic camera **100** is completed, the system unblocks voice call processing and returns in **A613**.

[**0592**] If the request from the electronic camera **100** in **A607** was not a thumbnail image reception request, in **A610** it is checked whether the request from the electronic camera **100** is a selected image reception request, and if it was not an image reception request, the system unblocks voice call processing and returns in **A613**. If it was an image reception request, in **A611**, an image reception request, image identification information and camera identification information are transmitted to the gateway server **160** by means of the wireless portable telephone circuit **271** using a packet communication protocol. In **A612**, image data corresponding to the image identification information is received from the gateway server **160**, and is transmitted to the electronic camera **100** by means of the short-range wireless communication circuit **272** using a short-range wireless communication protocol. During transmission of images to the electronic camera **100**, the image data is displayed on the screen **221**, as shown in **FIG. 194**. Once transmission of image data to the electronic camera **100** is completed, display of image data on the screen **221** is terminated, and the system unblocks voice call processing and returns in **A613**. To more effectively alert the user of the fact that image data is being transmitted, a different display mode from normal image data display may be used, for instance periodic flashing (repeated display and non-display) of the image data displayed on the screen **221**. Here, normal display mode refers to the display mode whereby image data is statically displayed.

[**0593**] **FIG. 192** is a detailed flow chart of the gateway image file transmission subroutine. Starting in **A70**, in **A701** the image file, camera identification information and an image transmission request are transmitted by packet communication protocol using the wireless portable telephone circuit **271** to the gateway server **160** designated based on the gateway access information, and the system returns in **A702**. While an image file is being transmitted to the gateway server **160**, the image data being transmitted is displayed on the screen **221**, as shown in **FIG. 193**, and the display is terminated once transmission is completed. Furthermore, to more effectively alert the user of the fact that image data is being transmitted, a different display mode from normal image data display may be used, for instance periodic flashing (repeated display and non-display) of the image data displayed on the screen **221**. Here, normal display mode refers to the display mode whereby image data is statically displayed.

[**0594**] **FIG. 195** is a detailed flow chart of the timer interrupt handling started at regular intervals by the timer **274** of the portable telephone **120**. Starting in **A80**, it is checked in **A801** whether the system is currently processing a voice call, and if it is currently processing a voice call, the system returns in **A805**. If it is not processing a voice call, voice call processing is blocked in **A802**, it is checked in **A803** whether there are image files being temporarily stored

in EEPROM **268**, and if there are no image files being temporarily stored, the system unblocks voice call processing and returns in A**805**. If there are temporarily stored image files, communication with the gateway server **160** by means of the wireless portable telephone circuit **271** based on the gateway server access information is attempted in A**804**, checking whether communication is possible, and if communication with the gateway server **160** is not possible, the system unblocks voice call processing and returns in A**805**. If communication with the gateway server **160** is possible, the gateway image file transmission subroutine of A**70** is executed, image files received from the electronic camera **100** are transmitted to the gateway server **160**, and in A**805**, the system unblocks voice call processing and returns.

[**0595**] As indicated above, when communication with the gateway server **160** is not possible, the portable telephone **120** temporarily stores the image files received from the electronic camera **100**, and when communication with the gateway server **160** becomes possible, it automatically transmits the temporarily stored image files to the gateway server **160**. To notify the user of the fact that image files transmitted from the electronic camera **100** to the gateway server **160** are being temporarily stored by the portable telephone **120**, one may optionally display a specific mark, icon or text on the screen **221** while image files are being temporarily stored by the portable telephone **120**. By doing this, in a situation where the user is in a hurry to transmit the image files, the user will be able to see this display and perform image file transmission by a different method.

[**0596**] Furthermore, while the communication interrupt handling of **FIG. 191** assumes that the connection between the electronic camera **100** and portable telephone **120** is maintained until communication is completed once the connection between the electronic camera **100** and portable telephone **120** has been established, in case the connection between the electronic camera **100** and the portable telephone **120** should be cut off (for example, if the portable telephone **120** becomes unable to transmit thumbnail images or image files received from the gateway server **160** to the electronic camera **100**), one can have the thumbnail images and image files be stored temporarily in the EEPROM **268** of the portable telephone **120**, have the portable telephone **120** detect when communication between the portable telephone **120** and electronic camera **100** becomes possible, and automatically transmit the thumbnail images or image files stored temporarily in EEPROM **268** to the electronic camera **100**. The portable telephone **120** may optionally display the fact that that thumbnail images or image files transmitted to the electronic camera **100** from the gateway server **160** are being stored temporarily by the portable telephone **120** by displaying a special mark, icon or text on the screen **221** while the image files are being temporarily stored by the portable telephone **120**. By doing this, in a situation where the user is in a hurry to transmit the image files, the user will be able to see this display, and take countermeasures such as rechecking the connection between the portable telephone **120** and electronic camera.

[**0597**] Next, the operation of the gateway server **160** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the gateway server **160** other than the image transmission operation will be omitted as they have little bearing on the present invention. **FIG. 196** is a detailed flow chart of the communication interrupt handling started when the gateway server **160** performs image transmission. Starting in G**60** with a communication request from the portable telephone **120** or personal computer **190**, in G**601**, the parent camera identification information is identified by referring to the camera identification information link data based on the received camera identification information. Subsequent image data handling is performed on the folder corresponding to the parent camera identification information. In G**602**, it is checked whether the received request is an image file transmission request, and if it was an image file transmission request, in G**603**, the received image file is stored temporarily in an image buffer folder in the folder corresponding to the camera identification information, thumbnail image data corresponding to the image data is generated and stored in a thumbnail image folder, likewise in the folder corresponding to the camera identification information, and the system returns in G**617**.

[**0598**] If the request received in G**602** was not an image file transmission request, it is checked in G**604** whether the received request is a thumbnail image reception request, and if it was a thumbnail image reception request, in G**605** the thumbnail images stored in the thumbnail image folder inside the folder corresponding to the camera identification information are transmitted by packet communication protocol to the originator of the thumbnail image reception request (portable telephone **120**), and the system returns in G**617**. If the request received in G**604** was not a thumbnail image reception request, it is checked in G**606** whether the received request is an image reception request, and if it was an image reception request, it is checked in G**607** whether image data corresponding to the image identification information exists in the image buffer folder inside the folder corresponding to the camera identification information, and if image data corresponding to the image identification information exists in the image buffer folder, the image file containing the image data is transmitted to the originator of the image reception request (portable telephone **120**) using a packet communication protocol in G**608**, and the system returns in G**617**.

[**0599**] If there is no image data corresponding to the image identification information in the image buffer folder, the image server where the image file corresponding to the image identification information is stored is determined based on the transfer history data in G**609**, and an image reception request and the image identification information are transmitted to that image server using Internet protocol in G**610**. In G**611**, the system waits to receive the specified image file from the image server, returning in G**617** if the image file could not be received from the image server; if the image file was received from the image server, the image file is transmitted to the originator of the image reception request (portable telephone **120**) in G**612** using a packet communication protocol, the image file is stored temporarily in the image buffer folder in the folder corresponding to the camera identification information, and the system returns in G**617**.

[**0600**] If the received request in G**606** was not an image reception request, it is checked in G**613** whether the received request is a data overwrite request, and if it was a data overwrite request, personal identification data in the folder corresponding to the camera identification information,

camera identification information link data, etc., is overwritten according to the received data, and the system returns in G**617**. If the received request in **0613** was not a data overwrite request, it is checked in G**615** whether the received request was a data read request, and if it was a data read request, the personal identification data in the folder corresponding to the camera identification information, camera identification information link data, etc., is read and transmitted to the requestor in accordance with the received data, and the system returns in G**617**. If the received request in G**615** was not a data read request, the system returns in G**617**.

[**0601**] **FIG. 197** is a detailed flow chart of the timer interrupt handling started at specific intervals by the timer means **374** of the gateway server **160**. Starting in G**80**, the first item of camera identification information from the camera identification information list maintained by the gateway server **160** is selected in G**801**. In G**802**, it is checked based on the transfer history data whether there are image files that have not been transferred yet to the image server in the image buffer folder inside the folder corresponding to the selected camera identification information, and if there are no image files that have not been transferred yet, the system proceeds to G**810**. If there are image files that have not been transferred yet, it is checked in G**803**, based on image server management data, whether there is an image server with available capacity. In S**804**, if there is an image server with available capacity, the system proceeds to G**806**, and if there are no image servers with available capacity, a new image server with available capacity is searched for in G**805**. In G**805**, a search is carried out for open image servers on the Internet that are able to store image files, registration with the found image server is carried out automatically using camera identification information, and information on the image server (storage capacity, etc.) is recorded in the image server management data. In G**806**, an image server with available capacity is designated as the image server for storing images. In G**807**, image files that have not been transferred yet are transmitted using Internet protocol to the image server designated as the image server for storing images, the image server management data and transfer history data are updated, and all the image files stored temporarily in the image buffer folder are deleted. In G**808**, it is checked whether the currently selected camera identification information is the last item of camera identification information in the camera identification information list; if it is not the last item of camera identification information, in G**809**, the camera identification information is changed to the next item of camera identification information, the system goes back to G**802** and repeats the processing described above, and if it is the last item of camera identification information, the system returns in G**810**.

[**0602**] Next, the operation of the image servers **181** through **184** (control/processing means **350**) in the above mode of embodiment will be described. Description of operations of the image servers **181** through **184** other than the image transmission and storage operation will be omitted as they have little bearing on the present invention. **FIG. 198** is a detailed flow chart of the communication interrupt handling started when a communication request is received by the image servers **181** through **184** from the gateway server **160**. Starting in H**60** upon receiving a communication request from the gateway server **160**, it is checked in H**601** whether the received request is an image server registration request, and if it was a registration request, it is checked in H**602** whether a folder corresponding to the received camera identification information exists, and if it already exists, the system returns in H**611**. If no folder corresponding to the received camera identification information exists, in H**603**, a folder corresponding to the received camera identification information is created, and the system returns in H**611**.

[**0603**] If the request received in H**601** is not an image server registration request, it is checked in H**604** whether the received request is an image reception request (image read request), and if it was an image reception request, it is checked in H**605** whether a folder corresponding to the received camera identification information exists, and if it does not exist, the system returns in H**611**. If a folder corresponding to the received camera identification information exists, it is checked in H**606** whether an image file corresponding to the received image identification information exists in the folder, and if it does not exist, the system returns in H**611**. If an image file corresponding to the received image identification information exists, the image file in question is transmitted to the gateway server **160** using Internet protocol in H**607**, and the system returns in H**611**. If the received request in H**604** is not an image reception request to the image server, it is checked in H**608** whether the received request is an image transmission request (image write request), and if it was not an image transmission request, the system returns in H**611**. If it was an image transmission request, it is checked in H**609** whether a folder corresponding to the received camera identification information exists, and if it does not exists, the system returns in H**611**. If a folder corresponding to the received camera identification information exists, the received image file is stored in the folder in H**610**, and the system returns in H**611**.

[**0604**] In the mode of embodiment described above (**FIG. 163** through **FIG. 198**), while relaying image files received from the electronic camera **100** though the gateway server **160**, the portable telephone **120** displays the image data being transmitted on the screen **221**, as shown in **FIG. 193**, which allows the user to confirm based on the display of screen **221** that the image data he selected and transmitted is in fact being transmitted from the portable telephone **120** to the gateway server **160**, and allows the user to confirm that transmission of image data from the portable telephone **120** to the gateway server **160** has been completed based on the fact that display of image data on the screen **221** has terminated. Furthermore, the fact that display of image data has started on the screen **221** of the portable telephone **120** allows one to confirm that transmission of image data from the electronic camera **100** to the portable telephone **120** has been completed, and one can accordingly start taking picture with the electronic camera **100**.

[**0605**] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), while image files received from the gateway server **160** are being relayed to the electronic camera **100**, the portable telephone **120** displays the image data being transmitted on the screen **221**, as shown in **FIG. 194**, which allows the user to get an overview of the received image data based on the display of screen **221** before displaying and browsing the image data on the screen after transmission of the image data to the electronic camera **100** is completed, and allows the user to confirm that transmission of image data from the portable telephone **120** to the

electronic camera **100** has been completed based on the fact that display of image data on the screen **221** has terminated.

[**0606**] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), if the portable telephone **120** was not able to relay image files received from the electronic camera **100** to the gateway server **160** (for example, when the portable telephone **120** is out of range of the wireless portable telephone link), those image files are stored temporarily in the EEPROM **268** of the portable telephone **120**, and when transmission of image files to the gateway server **160** becomes possible, the image files stored temporarily in EEPROM **268** are automatically transmitted to the gateway server **160**, so even if communication between the portable telephone **120** and the gateway server **160** is not possible, the user does not need to redo the image file transmission operation on the electronic camera **100** side, which makes it possible to avoid the risk of the user forgetting to retransmit, and allows the user to focus on taking pictures with the electronic camera **120** once image files have been transmitted from the electronic camera **100** to the portable telephone **120**.

[**0607**] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** temporarily stores image data received from the electronic camera **100** or image servers **181** through **184** in the memory means **368** of the gateway server **160**, and transmits the stored image data as necessary to the electronic camera **100** or image servers **181** through **184**, thereby making it possible to reduce the communication traffic between the image servers **181** through **184** and gateway server **160** or between the electronic camera **100** and the gateway server **160**.

[**0608**] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** stores the user's personal information in the memory means **368**, and if there is no available capacity to store image data in the image server's album corresponding to the camera identification information, the gateway server connects to another image server on the Internet, automatically sets up an album (folder) corresponding to the camera identification information using the aforementioned personal information, transmits the image data received from the electronic camera **100** to the image server and causes it to be stored in the new album, thereby freeing the user from having to perform the complicated procedure of connecting to an image server and the bothersome procedure of setting up an album, which the user would otherwise have to carry out directly on the electronic camera **100** side.

[**0609**] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** keeps, in the memory means **368**, server management information for unified management of albums (folders) set up corresponding to camera identification information on each of the image servers **181** through **184**, and based on the server management information, performs generalized storage and management of image data stored in distributed fashion across multiple image servers **181** through **184** by combining it into one virtual album, thereby making it possible to exchange large volumes of image data between the virtual album and the electronic camera **100** by means of simple operations, without the user being aware of the multiple image servers **181** through **184** that actually store the image data on the Internet.

[**0610**] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** that relays image data between the electronic camera **100** and image servers **181** through **184** keeps, in the memory means **368**, link information that represents the associations of camera identification information for individually identifying electronic cameras, views multiple electronic cameras as a single group based on the link information, and transmits and stores image data received from the electronic cameras in an album on an image server corresponding to the group to that those electronic cameras belong, thereby making it possible to store image data captured with multiple electronic cameras in a single album on the image server. (Description of modified embodiments) The present invention is not limited to the mode of embodiment described above, and various modifications and changes are possible.

[**0611**] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), transmission was carried out individually for reach image file relayed from the electronic camera **100** via the portable telephone **120** to the gateway server **160**, it is also permissible to transmit multiple image files as a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160**. In such cases as well, during transmission of image data from the portable telephone **120** to the gateway server **160**, the portable telephone **120** displays the image data being transmitted on the screen **221**. Doing this allows the user to check the progress of the processing of image file transmission from the portable telephone **120** to the gateway server **160** based on the image data being displayed. Furthermore, when multiple image files are transmitted in a batch from the electronic camera **100** via the portable telephone **120** to the gateway server **160** in this manner, first all the image files to be transmitted are transmitted from the electronic camera **100** to the portable telephone **120** and are temporarily buffered in the EEPROM **268** of the portable telephone **120**, and once transmission of image files from the electronic camera **100** to the portable telephone **120** is completed, the portable telephone **120** transmits the image files stored temporarily in EEPROM **268** to the gateway server **160**. Doing so makes it unnecessary to transmit appended informational data (camera identification information, gateway server access information, image transmission requests etc.) for each individual image file from the electronic camera **100** to the portable telephone **120**, making it possible to shorten the transmission time for image files between the electronic camera **100** and portable telephone **120**. When transmitting image files from the portable telephone **120** to the gateway server **160**, this also makes it unnecessary to transmit appended informational data (camera identification information, image transmission requests, etc.) for each individual image file from the portable telephone **120** to the gateway server **160**, making it possible to reduce the transmitted data volume passing through the wireless portable telephone link **130** and packet communication network **150** and to shorten the image file transmission time, as well as to reduce communication fees.

[**0612**] Furthermore, when transmitting multiple image files in a batch from the electronic camera **100** via the

portable telephone **120** to the gateway server **160**, if all the image files to be transmitted are first transmitted from the electronic camera **100** to the portable telephone **120** and are temporarily buffered in the EEPROM **268** of the portable telephone **120**, and once transmission of image files from the electronic camera **100** to the portable telephone **120** is completed, the portable telephone **120** transmits the image files stored temporarily in EEPROM **268** to the gateway server **160**, then if problems occur with the wireless portable telephone link **130** or packet communication network **150** during transmission of image files from the portable telephone **120** to the gateway server **160** and transmission of image files becomes impossible, the portable telephone **120** will leave the image files that it has not finished transmitting in the EEPROM **268**, and will automatically transmit the image files remaining in EEPROM **268** to the gateway server **160** once transmission of image files to the gateway server **160** becomes possible. Doing so makes it unnecessary for the user to redo the image file transmission operation on the electronic camera **100** side from the beginning even if communication between the portable telephone **120** and gateway server **160** becomes impossible midway during image transmission, allowing the user to focus on taking pictures with the electronic camera **120** once image files have been transmitted from the electronic camera **100** to the portable telephone **120**, as well as making it possible to reduce the transmitted data volume passing through the wireless portable telephone link **130** and the packet communication network **150** compared to if file transfer from the electronic camera **100** to the gateway server **160** were redone from the beginning, and allowing one to shorten the image file transmission time and to reduce communication charges.

[**0613**] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), greater data communication efficiency of the image transmission system was achieved by having the gateway server **160** temporarily store image files transmitted between the electronic camera **100** and the image server in an image buffer folder and make use of the image files stored temporarily in the image buffer folder as necessary, and by storing thumbnail image data corresponding to the image files in a thumbnail image folder and making use of that thumbnail image data as necessary, it is also possible, as shown in **FIG. 199**, to provide the same sort of image buffer folder and thumbnail image folder in the EEPROM **268** of the portable telephone **120** and temporarily store thumbnail image data and image files transmitted between the electronic camera **100** and the image server in the image buffer folder and thumbnail image folder, and, when the image file or thumbnail image data requested by the electronic camera **100** is present in the image buffer folder or thumbnail image folder, to have the portable telephone **120** transmit those image files and thumbnail image data to the electronic camera **100**. In such cases, the image files or thumbnail image data stored temporarily in the image buffer folder and thumbnail image folder in the EEPROM **268** may be cleared periodically in their entirety, or the image files and thumbnail image data may be deleted in the order of their age according to the storage start date and time data of the image file or thumbnail image data, so as to keep the total data volume of the temporarily stored image files and thumbnail image data at or below a specific volume. Alternatively, image files kept for more than a specific period of time may be deleted based on the storage start date and time data of the image files or thumbnail image data, or else stored image files or thumbnail image data may be deleted at specific clock times.

[**0614**] If this is done, then when the user wishes to reconfirm the image data most recently transmitted or received via the portable telephone **120**, it will be possible to display a summary of the status of temporarily stored images on the screen **221** of the portable telephone **120**, as shown in **FIG. 200**, and to transmit the image files or corresponding thumbnail image data temporarily stored in the portable telephone **120** from the portable telephone **120** to the electronic camera **100** and make use of them, thereby making it unnecessary to make inquiries via the portable telephone **120** to the gateway server **160** regarding the image files or thumbnail image data and making it possible to quickly read image files or thumbnail image data into the electronic camera **100**, as well as allowing the communication data volume between the portable telephone **120** and gateway server **160** to be reduced and correspondingly reduce the communication line usage fees.

[**0615**] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), the electronic camera **100** transmits image data via a single portable telephone **120** to a single gateway server **160**, it is also permissible to have the electronic camera **100** transmit image data via a single portable telephone **120** to multiple gateway servers. In such an image transmission system, the portable telephone **120** can store image files transmitted from the electronic camera **100** in EEPROM **268** under predetermined conditions (for a specific period of time from the start of storage, etc.) and transmit the stored image files to multiple gateway servers based on instructions from the electronic camera **100**. When the electronic camera **100** transmits image files to multiple gateway servers, doing this will make it unnecessary to transmit image files from the electronic camera **100** to the portable telephone **120** every time an image file is to be transmitted, allowing the transmission of image files to the gateway servers to be carried out more quickly. For example, if an image file was transmitted from the electronic camera **100** to one gateway server and the user then wants to transmit the same image file to a different gateway server, the image identification information of the image file and the destination gateway server access information are sent from the electronic camera **100** to the portable telephone **120**, whereupon, if an image file corresponding to the received image identification information is present in the EEPROM **268**, the portable telephone **120** reads that image file from the EEPROM **268** and transmits it to the gateway server corresponding to the received gateway server access information. If no image file corresponding to the received image identification information is present in the EEPROM **268**, the portable telephone **120** informs the electronic camera **100** that no image file corresponding to the received image identification information is present in the portable telephone **120**, in response to that the electronic camera transmits the image file to the portable telephone **120**.

[**0616**] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), the portable telephone **120** performs relaying of image data in the transmission of image data between the electronic camera **100** and the gateway server **160**, if the electronic camera **100** itself has a built-in wireless portable telephone function, it is also permissible to omit the portable telephone **120**, as shown in **FIG. 201**, and to have

the electronic camera **100** communicate directly with the gateway server **160** using a packet communication protocol. In **FIG. 201**, the base station **140** has been left out of the illustration.

[**0617**] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** provides the electronic camera **100** with a single virtual album that combines the albums secured according to the camera identification information on multiple image servers **181** through **184**, and increases the available capacity of the virtual album by automatically setting up a new album corresponding to the camera identification information by registering with a new image server when the available capacity of the virtual album becomes insufficient; however, instead of setting up a new album on a new image server, a new album may also be set up on an existing server on that an album has already been set up. For example, if the gateway server **160** has unused camera identification information and the available capacity of the virtual album has become insufficient, the gateway server **160** can register with an image server, on that an album forming part of the virtual album has already been established, using one item of the unused camera identification information, and set up a new album corresponding to the unused item of camera identification information. Furthermore, the gateway server **160** can link the camera identification information used for setting up new albums to the camera identification information corresponding to the virtual album, so as to incorporate the newly created album into the virtual album. Doing this makes it possible to deal with insufficient available capacity of the virtual album when the number of image servers is limited.

[**0618**] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** buffers image files received from the electronic camera **100** in an image buffer folder and delivers the image files buffered in the image buffer folder to image servers at specific intervals, when transmitting image files captured with a series of capture operations (continuous capture or continuous shutter, bracket capture, panorama capture, etc.) from the electronic camera in automatic transfer mode to the gateway server **160**, the image transfer may also be performed by the scheme shown in **FIG. 202**. Here, continuous capture refers to continuously photographic the same subject at specific time intervals while tracking its movement; bracket capture refers to taking multiple photographs of the same subject while varying the capture conditions, such as exposure; and panorama capture refers to photographing a landscape or the like while shifting the capture direction by a certain amount each time. Namely, for each capture operation, the electronic camera **100** appends identification information to image files captured in series to the effect that this image is part of a series, and transmits it to the gateway server **160**. The gateway server **160** temporarily stores image files with appended identification information indicating that it is part of a series of images in an image buffer folder. Once the series of image captures is completed, the electronic camera **100** transmits information to the gateway server **160** indicating that the series of image captures has been completed, and upon receiving that information, the gateway server **160** does a batch transmission of the series of image files stored temporarily in the image buffer folder to the same image server over the Internet and stores them there. Doing this makes it possible to transmit multiple image files between the gateway server **160** and image server with a single transmission procedure, allowing the transmission time to be shortened and allowing the image transmission processing load on the gateway server **160** and image servers **181** through **184** to be reduced. Furthermore, storing image files captured in a series on the same image server makes it highly convenient when the user later connects directly to the image server **181** through **184**, with a personal computer or the like, to use the series of image data.

[**0619**] Instead of transmitting information indicating that a series of captures has been completed from the electronic camera **100** to the gateway server **160**, it is also permissible to transmit to the gateway server **160**, from a terminal such as a personal computer **190** connected to the gateway server **160**, an instruction to transmit a series of image files accumulated on the gateway server **160** together to an image server; in response to that instruction, the gateway server **160** will transmit the series of image files accumulated on the gateway server **160** together to an image server.

[**0620**] Furthermore, when transmitting image files captured in a series from the electronic camera **100** to the gateway server **160** in automatic transmission mode, if an image file is transmitted from the electronic camera **100** to the gateway server **160** after every capture, the communication time will become longer due to the overhead for establishing communication and the appended information, and there are cases where, during this time, the picture-taking conditions will change or where the pictures cannot be taken at the planned time intervals. In such cases, one can optionally have the electronic camera **100** temporarily store the series of captured image files in RAM **70**, and once the series of captures is completed, transmit the series of image files with appended identification information indicating that it is a series of images, together with information indicating that the series of captures has been completed, in a batch to the gateway server **160**. Furthermore, when the data transfer rate of short-range wireless communication between the electronic camera **100** and portable telephone **120** is fast, one may optionally have the image files captured in a series be transmitted from the electronic camera **100** to the portable telephone **120** each time an image is captured, storing them temporarily in the EEPROM **268** of the portable telephone **120**, and have the electronic camera **100** transmit information indicating that the series of captures has been completed to the portable telephone **120** once the series of captures has been completed, and in response to that information, have the portable telephone **120** transmit a series of image files with appended identification information indicating that this is a series of images in a batch to the gateway server **160**. Doing this makes it possible for the electronic camera **100** to perform a series of captures under the desired capture conditions without affecting the image file transmission speed or the like even in automatic transmission mode (a mode where captured image files are automatically transmitted to and stored on an image server).

[**0621**] Furthermore, when the electronic camera **100** selects image files captured in series, which have been saved on the memory card **77**, and transmits those selected image files to an image server, by transmitting those image files with appended identification information indicating that they are a series of images, the gateway server **160** will be

able recognize that these are image files captured in series and perform processing such as storing them on the same image server.

[0622] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** buffers image files received from the electronic camera **100** in an image buffer folder and delivers the image files buffered in the image buffer folder to the image server at specific intervals, one can also have the image files buffered in the image buffer folder be delivered to the image server based on an external instruction. **FIG. 203** is a drawing that shows the image transmission processing for such a scheme. Multiple image files are transmitted from the electronic camera **100** to the gateway server **160**, and are stored temporarily in an image buffer folder in a folder corresponding to the camera identification information on the gateway server **160**. Thereafter, a personal computer **190** connects to the gateway server **160** and transmits the camera identification information, the identification information of the image server to that the images are to be transferred, and an image transmission instruction to the gateway server **160**. In response to the received camera identification information, the gateway server **160** transmits the image files, which are stored temporarily in the image buffer folder in the folder corresponding to the received camera identification information, in a batch to the image server corresponding to the received image server identification information. Doing this makes it possible for the user to transmit and store image data captured with the electronic camera **100** from the gateway server **160** at a convenient time to a suitable image server.

[0623] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** buffered image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmitted the image files buffered in the image buffer folder together to the image server at specific intervals; however, the gateway server **160** may also transmit accumulated image files to the image server by the following method. For example, the image files may be transmitted to the image server when the total data volume of the image files stored temporarily on the gateway server **160** exceeds a certain volume. Alternatively, the gateway server **160** may transmit image files to the image server once they have been accumulated for a set period or time, based on the date and time data of the start of storage of the image files in the image buffer folder. Alternatively, the gateway server **160** can transmit accumulated image files to the image server at specific clock times.

[0624] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** buffers image files transmitted between the electronic camera **100** and the image server in an image buffer folder and clears the entirety of the image files buffered in the image buffer folder at specific intervals, the gateway server **160** may also delete image files by the following method. For example, the gateway server **160** may delete image files in the order of oldest to newest based on date and time information on the start of storage of the image files in the image buffer folder, so as to keep the total data volume of the image files stored temporarily in the image buffer folder at or below a specific volume. Alternatively, the gateway server **160** may delete image files stored for more than a specific period of time based on date and time information on the start of storage of the image files in the image buffer folder. Or the gateway server **160** may delete stored image files at specific clock times.

[0625] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** buffers image files transmitted between the electronic camera **100** and the image server in an image buffer folder and transmits them as necessary to the electronic camera **100**, the gateway server **160** may also transmit image files accumulated in the image buffer folder (image files transmitted by the electronic camera **100** to an image server or image files read by the electronic camera **100** from an image server) to another image server or electronic camera based on instructions from the electronic camera **100**. Doing this makes it unnecessary to transmit each image file one by one from the electronic camera **100** to the gateway server **160**, thereby making it possible to shorten the image file transmission time and reduce transmission charges.

[0626] While in the above mode of embodiment (**FIG. 163** through **FIG. 198**), the gateway server **160** performed management of individual albums on image servers according to the camera identification information received from the electronic camera **100**, it is also possible to use general identification information instead of camera identification information for individually identifying multiple electronic cameras **100**. For example, using the next generation version of the IP protocol, IPV6 (Internet Protocol Version 6), the use of that on the Internet is planned, as the identification information, would make it possible for all electronic devices that handle images, besides electronic cameras, to make use of the image transmission system according to the present invention. Namely, IPV6 provides a 32-bit address space (on order of 10 to the 9th power), so there is practically no concern of running out of addresses, which makes it possible for one device to have multiple addresses depending on the application, and can further increase the utility of the image transmission system according to the present invention. Furthermore, for instance in a network environment wherein electronic devices such as electronic cameras connect to the gateway server by means of a wireless LAN (Ethernet™) or the like, it is possible to use the MAC (Media Access Control) address or Ethernet™ address assigned to each individual electronic device as the identification information. A MAC address is assigned to each electronic device without duplication, which makes it suitable for individually identifying electronic devices and makes it possible to omit the effort to newly setting the identification information for applications of the present invention.

[0627] While the above mode of embodiment (**FIG. 163** through **FIG. 198** and **FIG. 201**) were described assuming that information such as image data was transmitted between the electronic camera **100**, portable telephone **120** and gateway server **160** using packet communication, it is of course also permissible to transmit information such as image data using circuit-switched data communication.

[0628] In the above mode of embodiment (**FIG. 163** through **FIG. 198**), the image servers **181** through **184** had individual albums (folders) corresponding to the camera identification information set individually for each electronic camera **100**, the electronic camera **100** would transmit the camera identification information set in the camera in

question to the gateway server **160**, and the gateway server **160**, based on the received camera identification information, would create new albums corresponding to the received camera identification information on the image servers **181** through **184** or perform reading and writing of image data to and from an album corresponding to the received camera identification information present on the image servers **181** through **184**; however, it is also permissible to manage image data transmission and storage between the electronic camera **100** and image servers **181** through **184** using identification information other than camera identification information.

[**0629**] For example, in **FIG. 204, a** password input means is provided on the electronic camera side and image data transmission and storage is managed according to the password inputted by the user. In **FIG. 204**, electronic cameras A**101** and B**102** are equipped with password input means **81** and **82**, and when transmitting a captured image file, electronic cameras A**101** and B**102** transmit the password inputted by the user and the image file as a pair to the gateway server **160**. Meanwhile, the image server **181** has an album prepared that corresponds to the password, and the gateway server **160** transmits the received image file and stores it in the album on the image server **181** corresponding to the received password. The gateway server **160** can also create a new album on the image server corresponding to the received password. Furthermore, when downloading image files from the image server **181**, the electronic cameras A**101** and B**102** transmit image identification information and a password to the gateway server **160**, and the gateway server **160** transmits the received image identification information and password to the image server **181**. The image server **181** reads the image file corresponding to the received image identification information from the album corresponding to the received password, and transmits that image file to via the gateway server **160** to the electronic cameras A**101** and B**102**. Instead of password input, the electronic camera can obtain user identification information by installing a UIM card on that personal identification data has been stored in advance into the electronic camera.

[**0630**] If this is done, then when the same user uses multiple electronic cameras or when multiple users use the same camera, the image files captured by the electronic camera will be stored in an album on an image server corresponding to the password inputted by the user, so there is no inconvenience of having to later separate image files stored in the same album on an image server for different users, or collect image files stored in different albums on an image server for each user, allowing image files to be stored efficiently on a per-user basis and making it possible to protect the privacy of the stored image data.

[**0631**] While in **FIG. 204**, control and management of image data transmission and storage operations between the electronic camera **100** and image servers **181** through **184** is carried out based on the password inputted by the user into the electronic camera, in **FIG. 205**, instead of a password a user identification means is provided on the electronic camera side, the electronic camera performs user identification automatically without manual intervention by the user, and image data transmission and storage is managed based on that user identification information. In **FIG. 205**, electronic cameras A**101** and B**102** are equipped with user identification means **83** and **84** (fingerprint detection means, iris pattern detection means, facial image detection means, etc.), and when transmitting a captured image file, the electronic cameras A**101** and B**102** transmit the image file paired with the user identification information detected by the user identification means **83** and **84** (fingerprint pattern characteristics information, iris pattern characteristics information, facial image pattern characteristics information, etc.) to the gateway server **160**. The gateway server **160** compares the received user identification information with user identification information contained in the personal identification data that is stored in advance to identify the user. Meanwhile, the image server **181** has an album prepared that corresponds to the personal identification data, and the gateway server **160** transmits and stores received image files in the album on the image server corresponding to the personal identification data of the identified user. The gateway server **160** can also create a new album on the image server corresponding to the personal identification data of the identified user. Furthermore, when downloading image files from the image server **181**, electronic cameras A**101** and B**102** transmit image identification information and user identification information to the gateway server **160**, the gateway server **160** identifies the users based on the received user identification information, and transmits the personal identification data corresponding to the user along with the image identification information to the image server **181**. The image server **181** reads image files corresponding to the received image identification information from the album corresponding to the received personal identification data, and transmits those image files via the gateway server **160** to the electronic cameras A**101** and B**102**.

[**0632**] Doing this makes it possible to automatically perform user identification at the electronic camera, which eliminates the effort of inputting passwords for individual identification and resolves the problems of forgotten passwords and password theft.

[**0633**] The means of personal identification described above in **FIG. 204** and **FIG. 205** (password input means, UIM card, fingerprint detection or other user identification means) can also be provided on the portable telephone side if the gateway server is connected to from the electronic camera via the portable telephone. In **FIG. 206**, when connecting from the electronic camera to the gateway server via the portable telephone, image data transmission and storage are managed based on the telephone number of the portable telephone. In **FIG. 206**, when transmitting a captured image file, the electronic cameras A**101** and B**102** connect to the portable telephone **121** (telephone number A) and transmit the image file to the portable telephone **121**. The portable telephone **121** transmits the received image file paired with the telephone number to the gateway server **160**. Meanwhile, the image server **181** has an album prepared corresponding to the telephone number of the portable telephone, and the gateway server **160** transmits and stores the received image file in an album on the image server **181** corresponding to the telephone number. The gateway server **160** can also create a new album on an image server corresponding to the telephone number. Furthermore, when downloading image files from the image server **181**, the electronic cameras A**101** and B**102** send image identification information to the portable telephone **121**, the portable telephone **121** transmits the telephone number and image identification information to the gateway server **160**, and the gateway server **160** transmits the telephone number and

image identification information to the image server **181**. The image server **181** reads the image file corresponding to the received image identification information from the album corresponding to the received telephone number, and transmits that image file to the electronic cameras A**101** and B**102** via the gateway server **160** and the portable telephone **121**.

[**0634**] Doing this allows the user to store image files separated on a per individual basis in a per-individual album on an image server or read image files from one's own exclusive album on an image server by performing image transmission and reception using his portable telephone, even when using multiple electronic cameras or when multiple persons use the same electronic camera.

[**0635**] Furthermore, by combining the electronic camera's camera identification information with multiple personal identification means, the user identification precision can be increased and a higher level of image information security can be attained.

[**0636**] As described above, in the image transmission system and image relay apparatus according to the present invention, when the storage capacity of an album on an image server on the Internet for storing a user's image data is insufficient, the image relay apparatus uses the user's stored personal information to register with a new image server and automatically set up a new album for storing image data for the user, which allows the user to make use of large volumes of image data without having to worry about the storage capacity of the album used for storing image data, and makes it possible to further promote image services that employ such image servers on the Internet.

[**0637**] Moreover, in the image transmission system and image relay apparatus according to the present invention, the image relay apparatus, based on server management information for unified management of albums (folders), which are set up corresponding to user identification information (camera identification information) on individual image servers, performs generalized storage and management of image data stored in distributed fashion across multiple image servers by combining it into one virtual album, thereby making it possible to manipulate large volumes of image data by means of simple operations on a virtual album managed by the image relay apparatus, without the user being aware of the multiple image servers that actually store the image data on the Internet, as well as making it possible to further promote image services that employ such image servers on the Internet.

What is claimed is:

1. An image transmission system comprising:

an electronic image device that generates image information;

multiple image storage devices that store the image information; and

an image relay apparatus that relays the image information between the electronic image device and the multiple image storage devices,

wherein:

the electronic image device transmits the generated image information and user identification information for identifying the user of the electronic image device to the image relay apparatus;

the multiple image storage devices have individual albums prepared corresponding to each item of the user identification information for storing the image information;

the image relay apparatus, based on the user identification information received from the electronic image device, automatically selects an image storage device from the multiple image storage devices and transmits the image information and the user identification information received from the electronic image device to the image storage device; and

the image storage device, which receives the image information and the user identification information from the image relay apparatus stores the received image information in an album corresponding to the received user identification information.

2. An image transmission system as set forth in claim 1, wherein the electronic image device transmits all the generated image information to the image relay apparatus immediately after the image information is generated and deletes the image information that it has finished transmitting.

3. An image transmission system as set forth in claim 2, wherein the electronic image device comprises storage means for storing information, temporarily stores generated image information in the storage means when the image information cannot be transmitted to the image relay apparatus, and automatically transmits the image information temporarily stored in the storage means to the image relay apparatus under specific startup conditions.

4. An image transmission system as set forth in claim 3, wherein the startup conditions are a predetermined time.

5. An image transmission system as set forth in claim 3, wherein the startup conditions are a state of communication between the electronic image device and the image relay apparatus.

6. An image transmission system as set forth in any of claims **1** through **5**, wherein the image relay apparatus generates image identification information for identifying the image information received from the electronic image device and transmits the image identification information to the image server that stores the image information corresponding to the image identification information and to the electronic image device that transmitted the image information corresponding to the image identification information.

7. An image transmission system as set forth in any of claims **1** through **6**, wherein a removable storage medium that stores the user identification information can be installed in the electronic image device, and the electronic image device transmits the user identification information stored in the installed removable storage medium to the image relay apparatus.

8. An image transmission system as set forth in any of claims **1** through **7**, wherein the electronic image device comprises a storage means for storing information, and stores scaled-down image information obtained by compressing the data volume of image information received from the image relay apparatus in the storage means.

9. An image transmission system as set forth in any of claims **1** through **8**, wherein the electronic image device comprises an identification means that identifies the user of the electronic image device, and transmits the user identification information according to the results of identification by the identification means to the image relay apparatus.

10. An image transmission system comprising:

multiple electronic image devices that generate image information;

an image storage device that stores the image information; and

an image relay apparatus that relays the image information between the electronic image devices and the image storage device,

wherein:

the multiple electronic image devices transmit the generated image information to the image relay apparatus;

the image relay apparatus transmits the image information received from the multiple electronic image devices to the image storage device;

the image storage device stores the image information received from the image relay apparatus; and

the image relay apparatus generates image identification information for identifying the image information received from the multiple electronic image devices and transmits the image identification information to the image server that stores the image information corresponding to the image identification information and to the electronic image device that transmitted the image information corresponding to the image identification information.

11. An image transmission system as set forth in any of claims **1** through **10**, wherein the electronic image device comprises a display means that displays the image information.

12. An image transmission system as set forth in any of claims **1** through **11**, wherein the electronic image device comprises an image pickup means that generates image information through an image pickup operation.

13. An image transmission system as set forth in any of claims **1** through **12**, wherein a protocol of information transmission between the electronic image device and the image relay apparatus is different from a protocol of information transmission between the image storage device and the image relay apparatus.

14. An image relay apparatus used in the image transmission system as set forth in any of claims **1** through **13**.

15. An electronic image device used in the image transmission system as set forth in any of claims **1** through **13**.

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