

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
17 April 2008 (17.04.2008)

(10) International Publication Number
WO 2008/043202 A1

(51) International Patent Classification:
H04M 11/04 (2006.01)

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(21) International Application Number:
PCT/CN2006/002635

(22) International Filing Date: 9 October 2006 (09.10.2006)

(25) Filing Language: English

(26) Publication Language: English

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

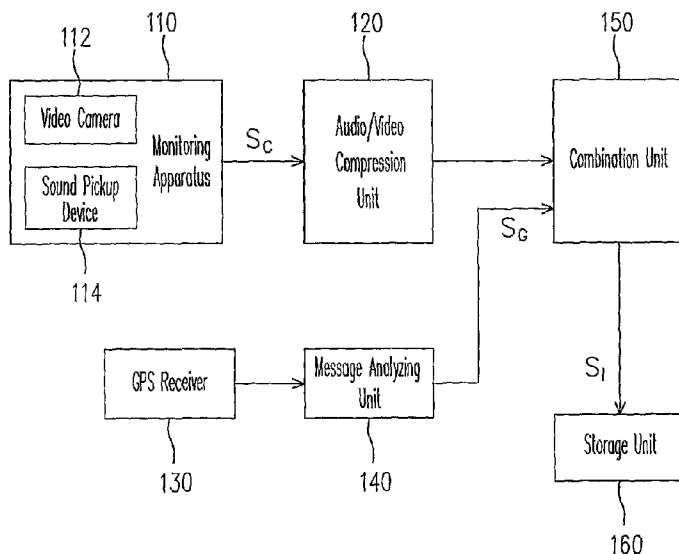
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(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: AUTOMOTIVE/HANDHELD MODULE OF INTEGRATED MONITORING RECORDING APPARATUS AND GLOBE POSITIONING SYSTEMS AND TRANSMITTING APPARATUS AND SEPARATING APPARATUS THEREOF



(57) Abstract: A module of integrated monitoring apparatus and global positioning system (GPS), a transmitting apparatus thereof, and a separating apparatus thereof are provided. The module includes a monitoring apparatus (110), a GP receiver (130), a message analyzing unit (140), and a combination unit (150). The monitoring apparatus (110) out a monitoring information. The GPS receiver (130) receives a satellite signal. The message analyzing unit (140) generates a GPS message based on the satellite signal. And the combination unit (150) combines the monitoring information and the GPS message into an integrated information.

WO 2008/043202 A1



Published:

— *with international search report*

AUTOMOTIVE/HANDHELD MODULE OF INTEGRATED MONITORING
RECORDING APPARATUS AND GLOBE POSITIONING SYSTEM, AND
TRANSMITTING APPARATUS AND SEPARATING APPARATUS THEREOF

BACKGROUND OF THE INVENTION

Field of Invention

[0001] The present invention relates to a module of integrated monitoring apparatus and global positioning system (GPS), a transmitting apparatus thereof, and a separating apparatus thereof. More particularly, the present invention relates to an automotive/handheld module of integrated monitoring apparatus and global positioning system (GPS), a transmitting apparatus thereof, and a separating apparatus thereof.

Description of Related Art

[0002] Digital monitoring recording apparatuses have been used extensively in various fields. For example, after the occurrence of a car accident, a forensic investigator is able to clarify the responsibility through playing the audio/video data recorded by a digital monitoring recording apparatus installed in the car.

[0003] On the other hand, most vehicles are equipped with global positioning systems (GPS) nowadays. To read a GPS message, a geographic information system (GIS) is required. However, said equipments can merely track routes of vehicles. Without associating said equipments with image data obtained by a monitoring apparatus, it is unlikely to know what actually happens during a travel of a specific vehicle.

[0004] Furthermore, an image monitoring apparatus installed in a vehicle can neither

provide real-time surveillance nor establish a two-way communication with a remote vehicle monitoring station for an immediate response.

SUMMARY OF THE INVENTION

[0005] An object of the present invention is to provide an automotive/handheld module of integrated monitoring recording apparatus and global positioning system (GPS), so as to combine a monitoring information and a GPS message into an integrated information for further investigations or analyses.

[0006] Another object of the present invention is to provide an automotive/handheld transmitting apparatus of integrated monitoring recording information and global positioning system (GPS) message, so as to transmit an integrated information from a monitored terminal to a monitoring terminal and do the other way around, establishing a two-way communication.

[0007] Still another object of the present invention is to provide an automotive/handheld separating apparatus of integrated monitoring recording information and global positioning system (GPS) message, so as to separate an integrated information to a monitoring information and a GPS message for further investigations or analyses.

[0008] In view of the aforementioned and other objects, the present invention provides an automotive/handheld module of integrated monitoring recording apparatus and global positioning system (GPS), comprising a monitoring apparatus, a GPS receiver, a message analyzing unit, and a combination unit. The monitoring apparatus outputs a monitoring information. The GPS receiver receives a satellite signal. The message analyzing unit generates a GPS message based on the satellite signal. And

the combination unit combines the monitoring information and the GPS message into an integrated information.

[0009] The automotive/handheld module of the integrated monitoring recording apparatus and GPS according to one preferred embodiment of the present invention further comprises an audio/video compression unit, wherein the audio/video compression unit is coupled between the monitoring apparatus and the combination unit for compressing the monitoring information, and the compressed monitoring information and the GPS message are combined into the integrated information.

[0010] According to the automotive/handheld module of the integrated monitoring recording apparatus and GPS disclosed in one preferred embodiment of the present invention, the combination unit is coupled to a storage unit for storing the integrated information.

[0011] From another perspective, the present invention provides an automotive/handheld transmitting apparatus of integrated monitoring recording information and global positioning system (GPS) message, comprising a host control unit and a communication unit. The host control unit receives an integrated information. The communication unit is coupled to the host control unit for transmitting the integrated information to a receiving terminal, and the integrated information comprises a monitoring information and a GPS message.

[0012] According to the automotive/handheld transmitting apparatus of the integrated monitoring recording information and GPS message disclosed in one preferred embodiment of the present invention, the communication unit is a mobile communication unit transmitting the integrated information to another mobile

communication unit of the receiving terminal through a wireless telecommunication interface.

[0013] According to the automotive/handheld transmitting apparatus of the integrated monitoring recording information and GPS message disclosed in one preferred embodiment of the present invention, the communication unit is a network unit transmitting the integrated information to another network unit of the receiving terminal.

[0014] According to the automotive/handheld transmitting apparatus of the integrated monitoring recording information and GPS message disclosed in one preferred embodiment of the present invention, the GPS message comprises at least one of the global positioning coordinates and a moving speed, and the monitoring information comprises at least one of the image signal and the sound signal.

[0015] From still another perspective, the present invention provides an automotive/handheld separating apparatus of integrated monitoring recording information and global positioning system (GPS) message, comprising a separating unit, a geographic information system (GIS), and an image browsing system. The separating unit receives an integrated information and separates the same to a monitoring information and a GPS message. The GIS associates the GPS message with an electronic map. And the image browsing system displays the monitoring information.

[0016] According to the automotive/handheld separating apparatus of the integrated monitoring recording information and GPS message disclosed in one preferred embodiment of the present invention, the monitoring information comprises audio/video data revealing a detected environment change.

[0017] According to the automotive/handheld separating apparatus of the integrated monitoring recording information and GPS message disclosed in one preferred embodiment of the present invention, the GPS message comprises at least one of the global positioning coordinates and a moving speed.

[0018] The present invention integrates the monitoring recording apparatus into the GPS, so that the monitoring information obtained by the monitoring recording apparatus is combined with the GPS message into the integrated information, ensuring an accurate and effective investigation result. Furthermore, through the transmitting apparatus of the integrated monitoring recording information and GPS message, the integrated information is immediately transmitted to the remote vehicle monitoring station. Similarly, through the separating apparatus of the integrated monitoring recording information and GPS message, the monitoring station is capable of separating the integrated information to the monitoring information and the GPS message for further references and analyses. The analyzed results are then immediately transmitted back to the monitored terminal, and thereby a two-way communication can be efficiently established and managed. In order to the make aforementioned and other objects, features and advantages of the present invention comprehensible, preferred embodiments accompanied with figures are described in detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The accompanying drawings are included to provide a further understanding of the invention, and are incorporated in and constitute a part of this specification. The drawings illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention.

[0020] FIG. 1 is a block view depicting an automotive/handheld module of integrated monitoring recording apparatus and global positioning system (GPS) according to one preferred embodiment of the present invention.

[0021] FIG. 2 is a block view depicting an automotive/handheld transmitting apparatus of integrated monitoring recording information and global positioning system (GPS) message according to one preferred embodiment of the present invention.

[0022] FIG. 3 is a block view of an automotive/handheld separating apparatus of integrated monitoring recording apparatus and global positioning system (GPS) message according to one preferred embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

[0023] Reference will now be made in detail to the present preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

[0024] The so-called automotive safety monitoring recording system preserves evidence for a vehicle through a video recording process. The system mainly involves installations of video recording apparatuses in the vehicle to record various dynamic images inside or outside the vehicle at any time, and to compress the recorded images to a digital signal, so that the signal can be further deciphered and simultaneously archived as an image file for further references and analyses.

[0025] FIG. 1 is a block view depicting an automotive/handheld module of integrated monitoring recording apparatus and global positioning system (GPS) according to one preferred embodiment of the present invention. Referring to FIG. 1, the present

embodiment directs to a monitoring apparatus 110, an audio/video compression unit 120, a global positioning system (GPS) receiver 130, a message analyzing unit 140, a combination unit 150, and a storage unit 160. Wherein, the monitoring apparatus 110 outputs a monitoring information S_c , and the audio/video compression unit 120 compresses the monitoring information S_c and transmits the same to the combination unit 150.

[0026] The monitoring apparatus 110 includes a video camera 112 and a sound pickup device 114. The video camera 112 converts an external image to an image signal, and the monitoring information S_c includes the image signal. The video camera 112 may be a charge coupled device camera (CCD camera) or a complementary metal-oxide semiconductor (CMOS) camera, which can be assembled in the front or rear of a vehicle to dynamically capture real-time images. Said images are then transferred to the monitoring apparatus 110 for outputting the monitoring information so as to be saved and recorded. On the other hand, the sound pickup device 114 (e.g. a microphone) converts the external sound into a sound signal, and the monitoring information S_c includes the sound signal. Thereby, the monitoring apparatus 110 captures and archives the environment changes in the form of sound or images through the video camera 112 and the sound pickup device 114 for future references or analyses. Moreover, the monitoring apparatus 110 can record both the internal and the external conditions of the moving vehicle, including the engine speed and the fuel system of the car, and moisture, temperature outside the car. All the information can be incorporated into the monitoring information S_c .

[0027] The GPS receiver 130 receives a satellite signal. The message analyzing unit 140 then generates the GPS message S_G based on the satellite signal. The

combination unit 150 further combines the monitoring information S_c and the GPS message S_G into the integrated information S_I . Wherein, the GPS message S_G includes a moving speed e.g. a car's velocity and global positioning coordinates obtained by conducting a calculation based on the satellite signal. The moving speed is calculated in light of the global positioning coordinates, for example, by using the global positioning coordinates and their corresponding time. To determine the moving speed of an object, simply divide the distance traveled by the time.

[0028] Furthermore, the storage unit 160 can store the integrated information S_I . For example, the storage unit 160 is a hard disk, which can store a large amount of data due to the large capacity of the hard disk. The storage unit 160 can also be a card reader capable of storing data in storage media such as memory cards. Being light and thin, the memory cards are more convenient to carry.

[0029] It should be noted that the module of the integrated monitoring recording apparatus and GPS is applied to a vehicle in the present embodiment, but not limited to this. The module of the integrated monitoring recording apparatus and GPS disclosed in the present embodiment of the present invention can also be fulfilled in the handheld mode. For example, the module can be a part of a portable electronic apparatus in a mobile phone. When the module is applied in the handheld mode, users are able to detect a environment change through the monitoring apparatus. Further, the monitoring apparatus can be integrated with the GPS, so that one system with multiple functions can save spaces and costs, advancing the synergy of the monitoring apparatus and the GPS.

[0030] FIG. 2 is a block view depicting an automotive/handheld transmitting apparatus of integrated monitoring recording information and global positioning system

(GPS) message according to one preferred embodiment of the present invention. Referring to FIGs. 1 and 2 together, the transmitting apparatus comprises a host unit 210, a communication unit 220, and a display apparatus 240. The host unit 210 receives an integrated information, and the communication unit 220 transmits the integrated information to a receiving terminal 230 e.g. a remote vehicle monitoring station, wherein the integrated information comprises a monitoring information and a GPS message. The GPS message comprises at least one of the global positioning coordinates and a moving speed, while the monitoring information comprises at least one of the image signal and the sound signal.

[0031] The communication unit 220 is, for example, a mobile communication unit, which transmits the integrated information to another mobile communication unit of the receiving terminal 230 through a wireless communication interface. The mobile communication unit applies to at least one of the following: global system for mobile communication (GSM), general packet radio service (GPRS), 3rd generation (3G), short message service (SMS), and multimedia messaging service (MMS). The communication unit 220 can transmit the GPS message to the receiving terminal 230 by adopting SMS. On the other hand, the communication unit 220 can transmit both the GPS message and an audio/video signal to the receiving terminal 230 by adopting MMS. Or, the communication unit 220 is, for example, a network unit, which transmits the integrated information to another network unit of the receiving terminal 230.

[0032] The transmitting apparatus of the present embodiment further comprises the display apparatus 240, which displays a message received by the host unit 210 from the receiving terminal 230 through the communication unit 220. The receiving terminal 230 is, for example, a remote vehicle monitoring station. After receiving the

integrated information transmitted by the host unit 210, the remote vehicle monitoring station can analyze the monitoring information and the GPS message for tracking routes and providing real-time surveillance effectively. Through the communication unit 220, the analyzed results can be sent back to the host unit 210 in the form of a message. Accordingly, the vehicle monitoring station is capable of archiving the integrated information for further references, or of providing real-time surveillance in association with a geographical information system (GIS). Similarly, through said process, the vehicle monitoring station can actively transmit messages to vehicles for an immediate response, and thereby a two-way communication can be established.

[0033] It should be noted that the transmitting apparatus of the integrated monitoring recording information and GPS message is applied to a vehicle in the present embodiment, but not limited to this. The transmitting apparatus of the integrated monitoring recording information and GPS message disclosed in the present embodiment of the present invention can also be fulfilled in the handheld mode. For example, the transmitting apparatus can be a part of a portable electronic apparatus in a mobile phone. When the transmitting apparatus is applied in the handheld mode, users are able to detect a environment change. Further, the GPS message helps locate the user or track the route of the user's vehicle. Under any unusual circumstances, a warning message can be transmitted to the user in time, so as to prevent the occurrence of a car accident.

[0034] FIG. 3 is a block view of an automotive/handheld separating apparatus of integrated monitoring recording information and global positioning system (GPS) message according to one preferred embodiment of the present invention. In the present embodiment, the separating apparatus comprises a separating unit 310, a

geographic information system (GIS) 320, an image browsing system 330, and a display apparatus 340. Referring to FIG. 3, the separating unit 310 receives an integrated information and separates the same to a monitoring information and a global positioning system (GPS) message. The GIS 320 associates the GPS message with an electronic map. And the image browsing system 330 displays the monitoring information separated from the separating unit 310.

[0035] The monitoring information includes audio/video data revealing a detected environment change. The GPS message comprises at least one of a global positioning coordinates and a moving speed. Moreover, the separating apparatus of the present embodiment further comprises the display apparatus 340 which synchronically displays at least one of the audio/video data, the electronic maps, and the moving speed. The integrated information received by the separating unit 310 can be provided by a mobile communication unit 350, a network unit 360, or a storage unit 370.

[0036] Accordingly, through the separating apparatus of the integrated monitoring recording information and GPS message, the integrated information can be separated to the monitoring information and the GPS message. The GPS message can be associated with the GIS 320, and thereby actual locations of vehicles can be shown in the electronic map, and the moving speed of vehicles can be learned. On the other hand, the monitoring information can be viewed through the image browsing system 330 and the display system 340, so as to detect a environment change and to learn the condition of the vehicle during a monitoring process.

[0037] In view of the foregoing, the present invention integrates the monitoring recording apparatus into the GPS, so that the monitoring information obtained by the monitoring recording apparatus is combined with the GPS message into the integrated

information, ensuring an accurate and effective investigation result. For instance, the present invention can be applied to observe a environment change, a moving speed, and an actual location of a monitored terminal at the same time. Furthermore, through the transmitting apparatus of the integrated monitoring recording information and GPS message, the integrated information is immediately transmitted to the remote monitoring station. Similarly, through the separating apparatus of the integrated monitoring recording information and GPS message, the monitoring station is capable of separating the integrated information to the monitoring information and the GPS message for further references and analyses. The analyzed results are then transmitted back to the monitored terminal immediately, and thereby a two-way communication can be efficiently established and managed.

[0038] It will be apparent to persons of ordinary art in the art that various modifications and variations can be made to the structure of the present invention without departing from the scope or spirit of the invention. In view of the foregoing, it is intended that the present invention cover modifications and variations of this invention provided they fall within the scope of the following claims and their equivalents.

WHAT IS CLAIMED IS:

1. An automotive/handheld module of integrated monitoring recording apparatus and global positioning system (GPS), comprising :

a monitoring apparatus, for outputting a monitoring information;

a GPS receiver, for receiving a satellite signal;

a message analyzing unit coupled to the GPS receiver for generating a GPS message according to the satellite signal; and

a combination unit coupled to the monitoring apparatus and the message analyzing unit for combining the monitoring information and the GPS message into an integrated information.

2. The automotive/handheld module of the integrated monitoring recording apparatus and GPS as claimed in claim 1, wherein the monitoring apparatus comprises at least a video camera for converting an external image into an image signal, and the monitoring information comprises the image signal.

3. The automotive/handheld module of the integrated monitoring recording apparatus and GPS as claimed in claim 1, wherein the monitoring apparatus comprises at least a sound pickup device for converting an external sound into a sound signal, and the monitoring information comprises the sound signal.

4. The automotive/handheld module of the integrated monitoring recording apparatus and GPS as claimed in claim 3, wherein the sound pickup device is a microphone.

5. The automotive/handheld module of the integrated monitoring recording apparatus and GPS as claimed in claim 1, further comprising an audio/video compression unit, wherein the audio/video compression unit is coupled between the

monitoring apparatus and the combination unit for compressing the monitoring information, and the compressed monitoring information and the GPS message are combined into the integrated information.

6. The automotive/handheld module of the integrated monitoring recording apparatus and GPS as claimed in claim 1, wherein the message analyzing unit generates a plurality of global positioning coordinates according to the satellite signal and calculates a moving speed with the global positioning coordinates and their corresponding time, and the GPS message comprises at least one of the global positioning coordinates and the moving speed.

7. The automotive/handheld module of the integrated monitoring recording apparatus and GPS as claimed in claim 1, wherein the combination unit is coupled to a storage unit for storing the integrated information.

8. An automotive/handheld transmitting apparatus of integrated monitoring recording information and global positioning system (GPS) message, comprising :

a host control unit, for receiving an integrated information; and

a communication unit, coupled to the host control unit for transmitting the integrated information to a receiving terminal, wherein the integrated information comprises a monitoring information and a GPS message.

9. The automotive/handheld transmitting apparatus of the integrated monitoring recording information and GPS message as claimed in claim 8, wherein the communication unit is a mobile communication unit transmitting the integrated information to another mobile communication unit of the receiving terminal through a wireless telecommunication interface.

10. The automotive/handheld transmitting apparatus of the integrated monitoring recording information and GPS message as claimed in claim 9, wherein the mobile communication unit applies to at least one of the following: global system for mobile communication (GSM), general packet radio service (GPRS), 3rd generation (3G), short message service (SMS), and multimedia messaging service (MMS).

11. The automotive/handheld transmitting apparatus of the integrated monitoring recording information and GPS message as claimed in claim 8, wherein the communication unit is a network unit transmitting the integrated information to another network unit of the receiving terminal through a network interface.

12. The automotive/handheld transmitting apparatus of the integrated monitoring recording information and GPS message as claimed in claim 8, further comprising a display apparatus, wherein the host control unit receives a message through the communication unit, and the message is displayed on the display apparatus.

13. The automotive/handheld transmitting apparatus of the integrated monitoring recording information and GPS message as claimed in claim 8, wherein the GPS message comprises at least one of the global positioning coordinates and a moving speed, and the monitoring information comprises at least one of an image signal and a sound signal.

14. An automotive/handheld separating apparatus of integrated monitoring recording information and global positioning system (GPS) message, comprising :

a separating unit, for receiving an integrated information and separating the integrated information to a monitoring information and a GPS message;

a geographic information system (GIS), for associating the GPS message with an electronic map; and

an image browsing system, for displaying the monitoring information.

15. The automotive/handheld separating apparatus of the integrated monitoring recording information and GPS message as claimed in claim 14, wherein the monitoring information comprises an audio/video data revealing a detected environment change.

16. The automotive/handheld separating apparatus of the integrated monitoring recording information and GPS message as claimed in claim 15, wherein the GPS message comprises at least one of a global positioning coordinate and a moving speed.

17. The automotive/handheld separating apparatus of the integrated monitoring recording information and GPS message as claimed in claim 16, further comprising a display apparatus for synchronously displaying at least one of the audio/video data, the electronic map, and the moving speed.

18. The automotive/handheld separating apparatus of the integrated monitoring recording information and GPS message as claimed in claim 14, wherein the integrated information is provided by a mobile communication unit.

19. The automotive/handheld separating apparatus of the integrated monitoring recording information and GPS message as claimed in claim 14, wherein the integrated information is provided by a network unit.

20. The automotive/handheld separating apparatus of the integrated monitoring recording information and GPS message as claimed in claim 14, wherein the integrated information is provided by a storage unit.

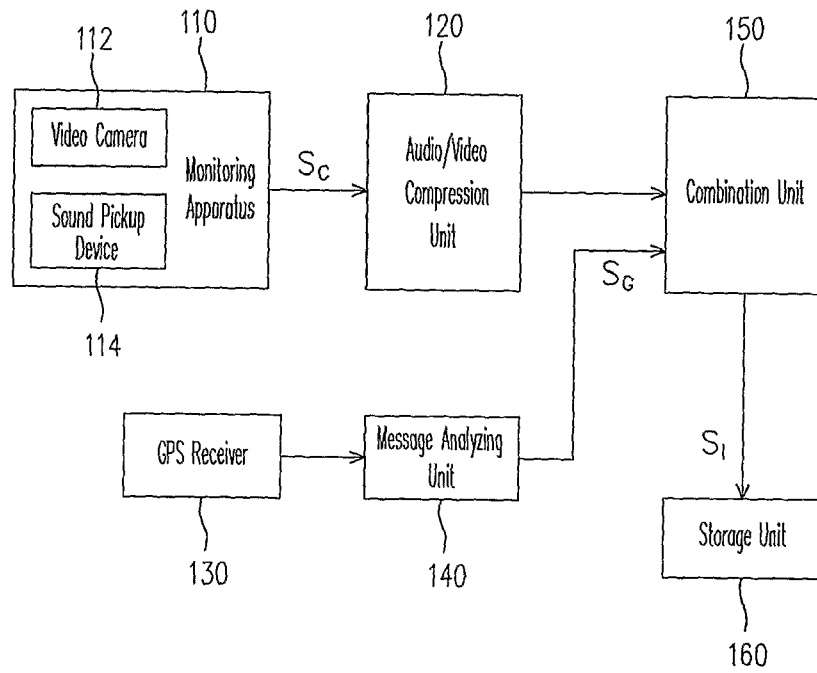


FIG. 1

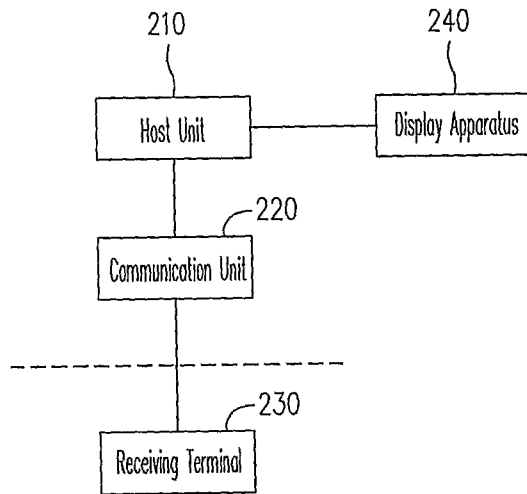


FIG. 2

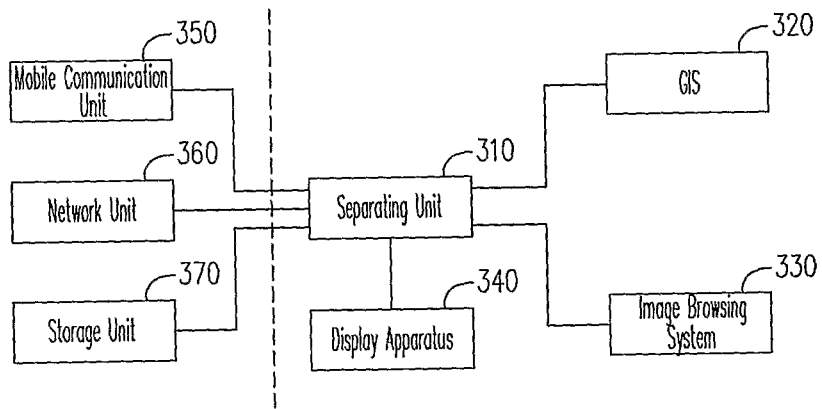



FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2006/002635

A. CLASSIFICATION OF SUBJECT MATTER <p style="text-align: center;">H04M11/04(2006.01)i</p> <p>According to International Patent Classification (IPC) or to both national classification and IPC</p>		
B. FIELDS SEARCHED <p>Minimum documentation searched (classification system followed by classification symbols)</p> <p style="text-align: center;">IPC: H04M, G07C, G08G</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)</p> <p>WPI, EPODOC, PAJ, CPRS, CNKI: GPS/Global Position System, image/video/camera/ccd, audio/sound/microphone/ Mike, monitor+/surveillance</p>		
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
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"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 07. Jul. 2007 (07.07.2007)	Date of mailing of the international search report 19 JUL 2007 (19-07-2007)	
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer CUI Lei Telephone No. (86-10)62084625	

INTERNATIONAL SEARCH REPORT

International application No.

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