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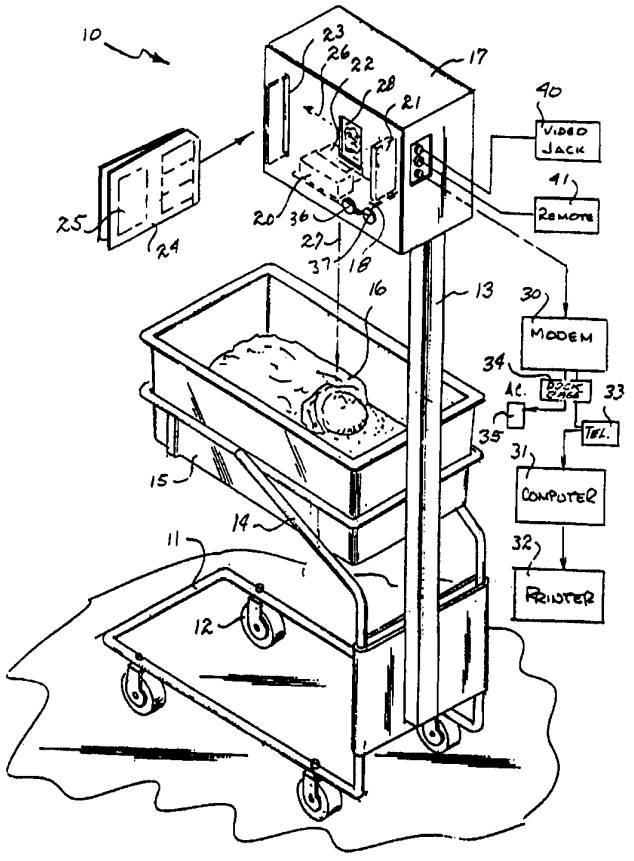
(54) Title: DIGITAL CAMERA SYSTEM FOR PHOTOGRAPHING INFANTS

(57) Abstract

A photographic system is disclosed herein utilizing a color camera (20) for photographing a given subject (16) in digital format and a second gray digital camera (21) for recording pertinent information concerning the subject appearing on a data card (24). The digital data from the color camera (20) is displayed temporarily on a viewing screen (28) and if acceptable, data from both cameras is introduced to a computer (31) and printer (32) via a modem (30) and telephone lines (33). Controls including a timing circuit (46) are provided for accepting the data card into the system and for initiating photographing of the data card (24) and the given subject (16) with temporary display and processing of data to the computer (31) and printer (32).



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DIGITAL CAMERA SYSTEM FOR PHOTOGRAPHING INFANTS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the field of digital photography, and more particularly to a novel digital camera system employing a pair of digital cameras for photographing a live subject and data card information with subsequent temporary review of the data on a display screen followed by transmittal of the data to a remote computer and printer via telephone lines.

2. Brief Description of the Prior Art

In the past, it has been the conventional practice to employ photographic techniques for the baby-photo business employing a variety of mechanical cameras and which extensively use mail services and other entry computer systems. With the consolidation, process of large firms engaging in this business, there came an increasing reliance on centralized processing of the photographic product and the use of the mails for delivering the end product. Since patients, such as mothers' stay in the hospital is continually shrinking to less than 24 hours, the ability to provide bedside service has become impossible except for a few small photo operators.

While the delivery time is increasing for the baby-photo product, averaging between two and four weeks, the rest of the consumer-photo industry has been speeding up the processing times of standard photographic products to the point where today, it is possible to have the standard "snapshot" developed in minutes. Customers readily pay more for this service because they perceive it as value. This has resulted in the loss of some market share in the baby-photo business due to mail and processing delivery delays up to two weeks.

More recently, the baby-photo business intends turning more to the utilization of digital cameras which not only speed up the processing time but permit a variety of options to be taken such as pre-approval of photo shot or image. The present invention uses digital cameras.

However, problems and difficulties have been encountered when employing

prior mechanical cameras in connection with photographing of infants which stem largely from the fact that delays are encounted in the processing of the film and in the event mail systems are employed, further delays may be encounter. When utilizing digital cameras, although processing has increased, systems do not provide pre-approval of photo image or photo image selection and most systems do not provide for remote computer processing and printing. Therefore, hospital personnel cannot be employed and added delay in delivery is encountered.

Recent practices in digital photography indicate that the preparation of finished prints can be significantly accelerated by sending digitized images to a remote site for processing and printing so as to eliminate mail or courier service. Hard copy prints from a digital representation can be prepared in minutes and picture quality can be controlled using a computer graphics work station. Digital cameras to photograph infants eliminates the need for film, scanners and video recorders and can be controlled directly from modems or by local computers.

Therefore, a long-standing need has existed to provide a novel baby or infant photography system wherein images of the subject can be taken and pre-approved prior to transmission to a remote computer for processing and printing. Also, the image should be accompanied by identifying information and data which would be useful in not only delivering the finished product but in billing and recording purposes.

SUMMARY OF THE INVENTION

Accordingly, the above problems and difficulties are avoided by the present invention which provides a novel digital camera system for photographing babies or infants wherein the infant subject is supported in a portable support stand in spaced arrangement with a color digital camera. The color digital camera is carried in a housing along with a gray camera. The infant lies along the optical axis of the digital color camera while the optical axis of the gray camera projects through a data card insertably received through the housing. Control circuits are interconnected between the two cameras for initially causing the image from the digital color camera to appear on a display for preview by the equipment operator. After approval, the digital

images of the baby from the color camera and the information derived from the data card by the gray camera is processed through a modem to a computer and a printer via telephone lines. A timer is provided in a control circuit for permitting the operator to hold the baby image on the display screen for a preset time period and for organizing the transmission of digital information from both cameras to the computer via the modem.

Therefore, it is among the primary objects of the present invention to provide a photographic system for photographing infant or newborn babies so that delivery of the photographic product or finished product can be delivered to the parents within 48 hours or sooner.

Another object of the present invention is to provide a photographic system utilizing digital cameras whereby the image quality is comparable to conventional photographic prints.

Another object of the present invention is to provide a novel photographic system for photographing newborn infants using remotely operated digital cameras and which may be operated by untrained hospital personnel.

Still another object of the present invention is to provide a novel remotely operated digital camera system for photographing newborn infants, which provides an on-site display and which provides for remote processing and printing.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood with reference to the following description, taken in connection with the accompanying drawings in which:

Figure 1 is a perspective view showing the novel digital camera system incorporating the present invention;

Figure 2 is a perspective diagrammatic view of the housing used in the system shown in Figure 1 illustrating the arrangement of digital cameras and other components;

Figure 3 is an enlarged view of the underside of the color digital camera and its external flash unit;

Figure 4 is a diagrammatic view showing a data card actuating switch disposed in the housing shown in Figure 2; and

Figure 5 is a camera assembly block diagram setting forth the system components within the housing shown in Figure 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figure 1, the novel digital camera photographic system of the present invention is illustrated in the general direction of arrow 10. The system includes a portable stand or frame 11 having a base with a plurality of wheels 12 so that the stand is portable and may be moved about. The stand includes an upright stanchion 13 which extends above a subframe 14 holding a basket 15 in which an infant intended to be photographed is placed. The infant is represented by numeral 16 and is confined within the basket by surrounding sidewalls. A cushion, blanket and other appurtenances may be placed in the basket as desired.

The upper end of stanchion 13 includes a housing 17 which projects over the basket 15 and the infant 16. The housing supports a printed circuit board 18 on which is mounted a color digital camera 20 and a gray or black and white digital camera 21 Adjacent to the camera 20 is an external strobe light 22. The side of housing 17 includes an elongated slot 23 for insertably receiving a data card 24. The data card includes a surface area for recording pertinent information regarding the infant such as date of birth, age, parents names and addresses or the like. Such a surface area is indicated by numeral 25. Upon insertion through slot 23 into the housing 17, the display surface of the card 24 will lie on an optical axis 26 of the gray camera 21 while the infant 16 lies on an optical axis 27 relating to the fixed color digital camera 20. The side of the housing 17 further mounts a display screen 28 which is operably connected to the color digital camera 20 so that the image taken of the infant can be screened for approval. This is a temporary screening and may be cancelled if unsuitable.

The system 10 utilizes two fixed digital cameras. The first camera is the color

digital camera 20 which has its own strobe unit 22 and is used for photographing the infant. The other camera 21 is employed for photographing the data on the identification card 24. Both cameras are connected to a modem 30 that is subsequently interrogated periodically by a service or processing group. The service or processing group will retrieve and print the pictures taken by both cameras via the modem and by a remote computer 31 and printer 32. The modem 30 transmits information to the computer via telephone lines 33 and a dock base 34 that couples the telephone lines to the modem. The dock base 34 also connects AC power to the modem and is indicted by numeral 35. In actual construction, the modem 30 is also included within the housing 17 and the dock base 34 is mounted on the end of the housing. This is indicated in the Figure by means of broken lines from the terminal at the end of the housing 17 to the block entitled modem.

The cameras 20 and 21 are wired together so that both are triggered from a single button, green, 36. The button 36 is used to initiate the taking of the picture by activating the cameras. Once activated, the image of the infant taken by camera 20 will appear on the display screen 28 for a temporary review by the operator. If the picture is unacceptable, cancellation may be effected by depressing button number 37 which is separate erase button allowing the last picture to e detected from both cameras so that a picture can be retaken. The color camera 20 is adjustable to compensate for lighting and focusing variations. In some instances, an audible alarm or speaker will be installed to permit the operator to be signalled at the end of picture taking operations. The gray camera 21 has a standard lense and is fixed focus and fixed aperture. An infrared cutting filter may be employed and may be removed to increase sensitivity. An internal low power light source, such as an infrared LED, may be used to illuminate the identification card 24.

The two camera ports are operably connected in parallel for operation with the modem 30 which will then be connected to the telephone line 33 through the docking station or base 34. A single rugged connector attaches the camera assembly to the

docking station or base and provides both AC power and communications such as via a video jack 40 and a remote jack 41. The modem is mounted within the camera assembly housing 17 and is not powered until the assembly is connected to the docking base. The camera assembly includes a battery charge 42, as shown in Figure 5, which runs from the AC input that supplies power to a bank of rechargeable batteries 43. The batteries and battery charger are shown in figure 5 and operate the camera assembly when it is disconnected from its docking base.

The color and gray cameras having different lead-in characters or codes for recognition and operation purposes. When operating over the modem, the camera addressing or coding is controlled by sending the appropriate lead-in code character. Since communications are by blocks, there is avoidance of instances when both cameras try to communicate at the same time.

The management site which includes the computer 31 and the printer 32 requires the ability to retrieve images from the remote cameras transmitter over the telephone line. The computer will store the digital pictures in a data base registered to the ID card information and will modify the pictures to improved quality and paste in pre-composed backgrounds as well as print the results in a form ready to be delivered to the customer. Image retrieval is automatically scheduled and the remote cameras with pictures will respond to the telephone within a three telephone ring sequence in order to have their pictures unloaded and printed. Empty cameras will not respond for six telephone rings.

Referring now in detail to Figures 2, 3 and 4, it can be seen that the information card 24 is inserted through slot 23 which causes a switch 44 to trip and operate with the gray camera 21 for taking a picture of the information on the front of the card. In broken lines in Figure 4, the switch lever 45 is illustrated in its switched position while in solid lines, the latch is shown in its relaxed position. A timer 46 is illustrated on the printed circuit board 18 which is operably connected to the various components in order to effect the sequences described above. In Figure 3, a diffused

glass 47 is paced over the strobe light 22 while a clear glass 48 is placed over the lense 50 of the color digital camera 20.

In figure 5, a block diagram of the components within the housing 17 is illustrated wherein the internal lighted gray camera 21 takes a picture of the information on the front side of card 24 after it has been inserted within the housing 17. Simultaneously, the camera 20 takes a picture of the baby in the basket or bassinet. The simultaneous action is initiated by depressing of the button 36 which not only actuates the cameras but causes the image taken by camera 20 to appear on the display 28. In the event that the image is unsatisfactory, button 37 is depressed for erasing or cancelling the image so another picture can be displayed. Once a suitable picture has been accepted, the acceptable image from camera 20 and the image of the data information taken by camera 21 is processed through the data modem 30 and via docking base 34 to telephone lines leading to the management site which houses the computer 31 and printer 32. Once the information has been received by the computer, processing takes place to operate the printer and the resultant pictures can be delivered.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

What is claimed is:

1. A digital camera system for producing digitally finished prints comprising:

at least two objects intended to be simultaneously photographed;

a pair of digital cameras for generating digital images of said objects;

a display means coupled to a selected one of said cameras for displaying a selected one of said objects;

a computer printer means remotely located with respect to said cameras; and

a telephone interface means connected between said cameras and said computer printer means for conducting said digital images to said computer printer means for production o digitally finished prints.

2. The invention as defined in Claim 1 wherein:

said non-selected object is a data card carrying indicia identifying said selected object.

3. The invention as defined in claim 2 wherein;

each of said cameras has an optical axis and said optical axes are normal with respect to each other with each of said objects lying on a respective one of said axes.

4. The invention as defined in claim 3 wherein;

said telephone interface means includes a modem and telephone lines with said modem operably coupled to said cameras and said telephone lines operably coupled to said computer printer means.

5. The invention as defined in claim 4 including:

a movable stand;

a housing mounted on said stand; and

said cameras, said display means and said modem disposed in said housing.

6. The invention as defined in claim 5 including:

switch control means operably connected to said cameras for manually actuating said cameras and for erasing said digital object image from said display; and

said switch control means incudes circuit means connected to said modem for

conducting said digital images from said cameras to said modem.

7. The invention as defined in claim 6 including:

a support for said selected one of said objects secured to said stanchion under said housing in alignment with said axis of said selected camera.

8. The invention as defined in claim 7 including:

a battery and a charger disposed in said housing for providing operating power to said cameras and said modem.

9. Apparatus for use in producing digitally finished prints comprising:

a. means at a first location for generating a digital representation of an image;

b. means at said first location for generating a digital representation of data, said data associated with identifying said image;

c. means at said first location for transmitting said digital representation of said image and of said digital representation of said data to a second location;

d. means at said second location for receiving said digital representations;

e. means at said second location for converting said digital representation of said image to an image; and

f. means for producing a print of said image.

10. The apparatus of claim 9 in which said means at said first location for generating a digital representation of an image is a digital camera.

11. The apparatus of claim 9 in which said means for transmitting said data is a modem.

12. The method of creating a picture of an image and associated data comprising the steps:

a. creating a digital representation of an image at a first location;

b. creating a digital representation of data associated with said image at said first location;

c. transmitting said digital representation of said image and said data to a second location;

d. converting said digital representation to an image; and

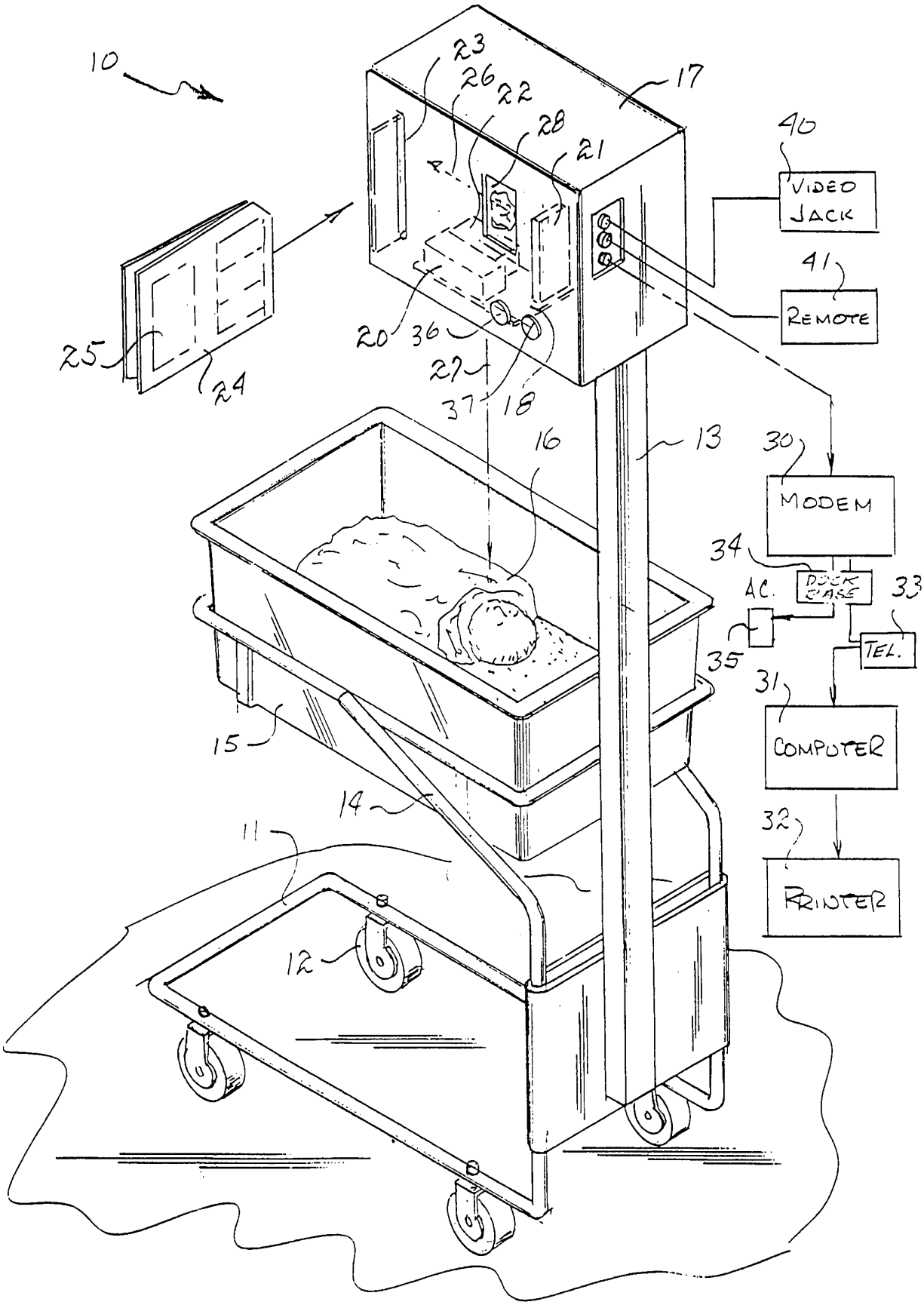
e. creating a print of said image.

13. The method of claim 12 in which said means for converting said digital representation to an image is a digital camera.

14. The method of claim 12 in which said means for transmitting said digital representations to said second location is a modem.

15. The method of claim 14 in which said means for converting said image to a digital representation is a digital camera.

FIG. 1.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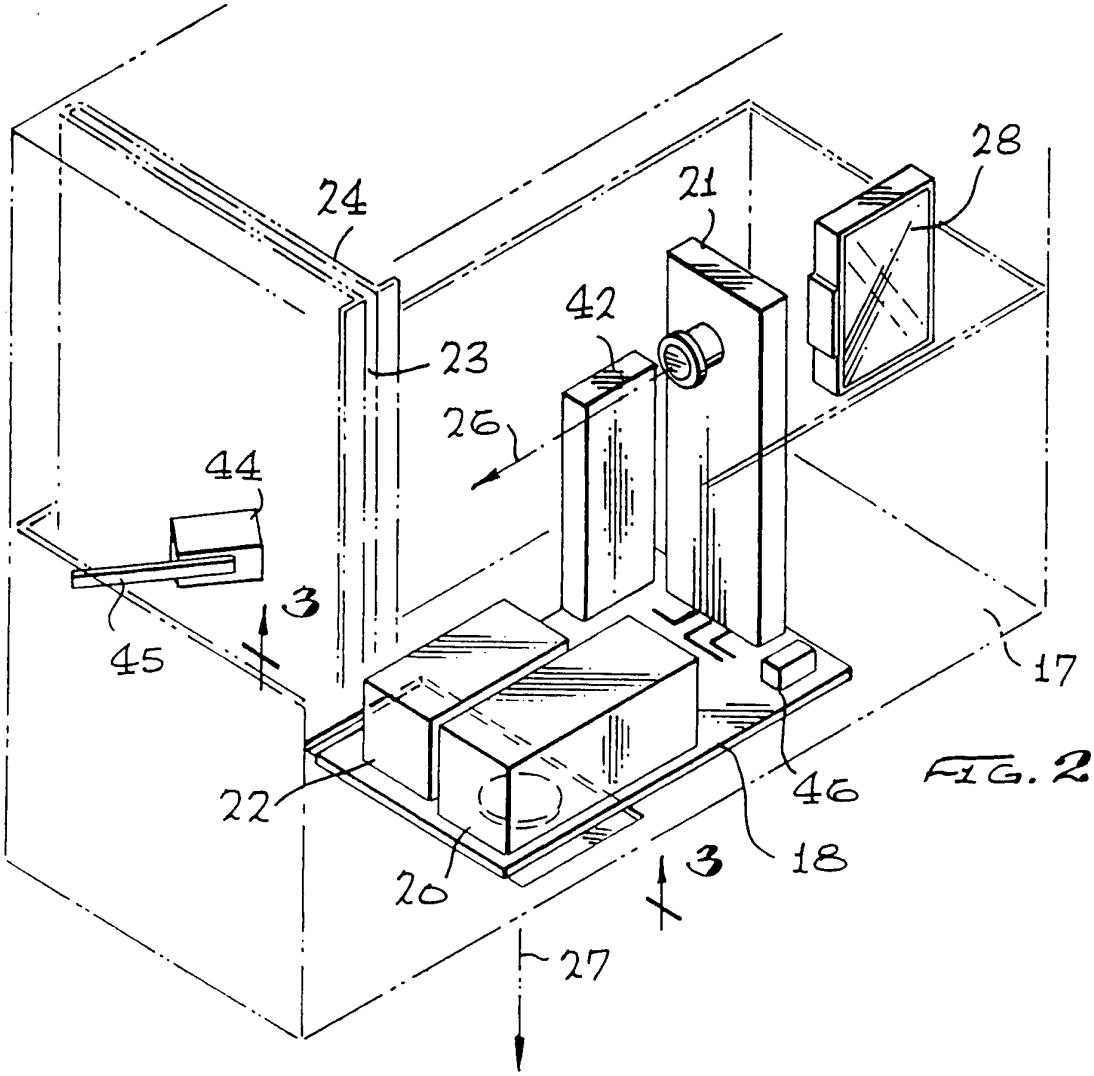


FIG. 2

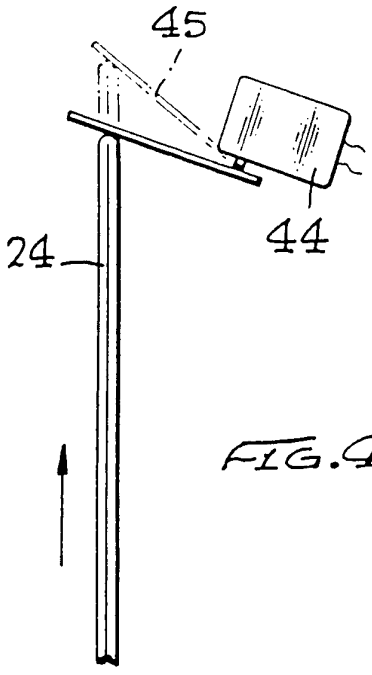
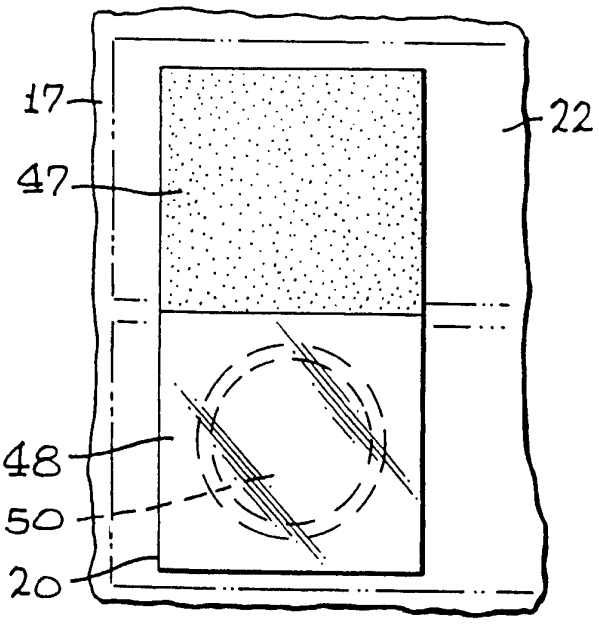
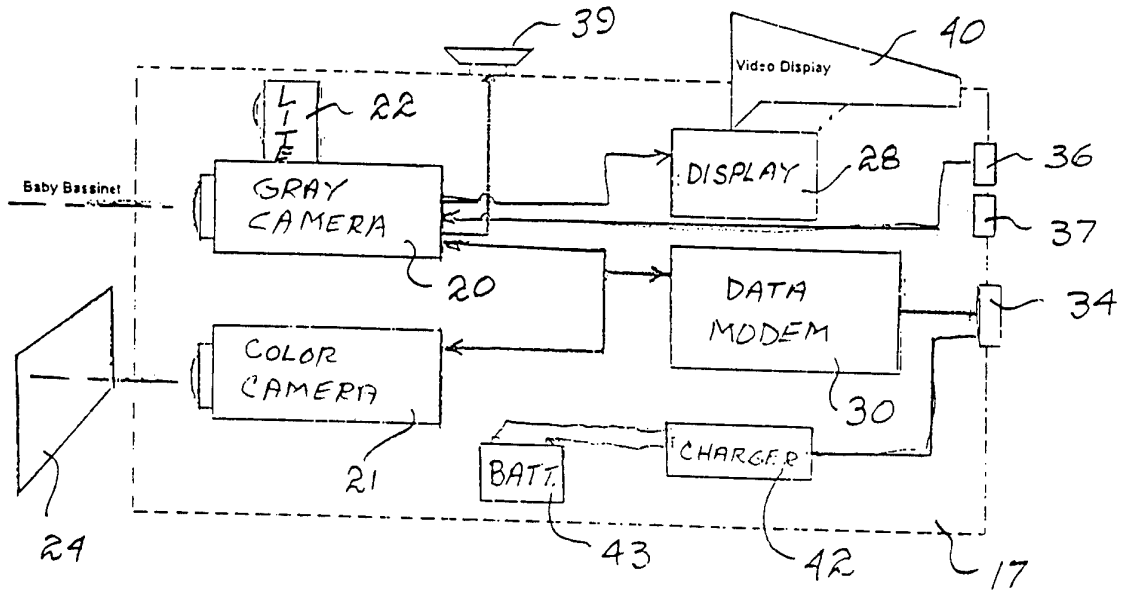


FIG. 4

FIG. 3




39
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Video Display
22
Baby Bassinet
GRAY CAMERA
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DISPLAY
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36
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DATA MODEM
34
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COLOR CAMERA
21
CHARGER
BATT.
43
42
24
17

FIGURE 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/11835

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04N 1/46; H04N 7/18
US CL :348/ 584, 589; 358/ 524, 527
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 348/ 14, 17, 18, 584, 589; 358/ 500, 524, 527

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ---- Y	US, A, 5,075,769 (ALLEN ET AL.) 24 DECEMBER 1991 Figure 1; col.3, lines 11-23; col 4, lines 16-41; col 12, lines 13-57	9, 10, 12, 13 ---------- 1-3, 5, 7, 15
Y	US, A, 4,714,962 (LEVINE) 22 DECEMBER 1987 col 3, lines 13-30, 48-58	1, 4, 6, 11, 14
Y	US, A, 4,488,794 (DOLGOW ET AL.) 18 DECEMBER 1984 col. 7, lines 57-65	8
Y	US, A, 4,845,636 (WALKER) 04 JULY 1989 col. 3, lines 5-12	1, 4, 6, 11, 14

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Date of the actual completion of the international search
05 SEPTEMBER 1996

Date of mailing of the international search report
30 SEP 1996

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