(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 776 990 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.04.2007 Bulletin 2007/17

(51) Int Cl.:
A63H 3/36 *(2006.01)*

(21) Application number: **06021643.9**

(22) Date of filing: **16.10.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **21.10.2005 US 255852**
03.03.2006 US 368300
29.09.2006 US 540369

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(54) **Interactive toy system**

(57) Systems and methods for interactive play are provided, including a method of interacting with an action figure. The method includes the steps of providing a base (24) unit having a processor, providing an action figure (22) having a memory which stores data relating to the action figure (22), communicating the data in the form of communication signals to the processor, and presenting an activity instruction based on the communication signals received, with the activity instruction enacting a real-life activity that the action figure can engage in.

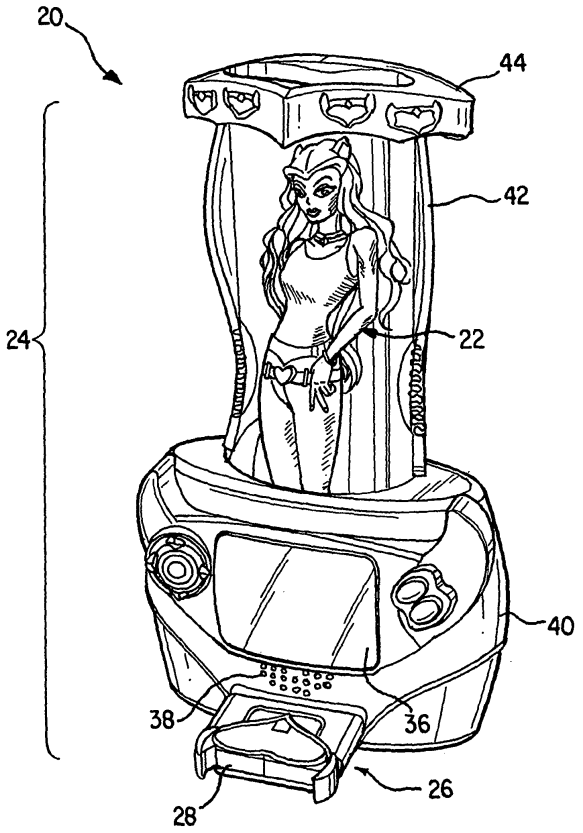

FIG. 1

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Description

[0001] The present invention relates to toys, and in particular, to an interactive toy system.

[0002] Interactive toys have become increasingly popular in recent times. Children enjoy playing with toys that communicate or respond to different selections or prompts from the player. For example, United States Patent Nos. 6,663,393 (Ghaly) 5,607,336 (Lebensfeld et al.), 6,648,719 (Chan) and 6,585,556 (Smirnov) all disclose toys, dolls or action figures who act or respond based on some activation by the user, or by the surrounding events.

[0003] It is an object of the present invention to provide an interactive toy system which allows the user to enact real-life activities of a doll, animal, action-figure or similar creature.

[0004] It is another object of the present invention to provide an interactive toy system which provides a wide variety of responses and play.

[0005] It is yet another object of the present invention to provide an interactive toy system which provides different responses based on different selections made by the user.

[0006] In order to accomplish the objects of the present invention, the present invention provides systems and methods for interactive play, including a method of interacting with an action figure. The method of the present invention includes the steps of (i) providing a base unit having a processor, (ii) providing an action figure having a memory which stores data relating to the action figure, (iii) communicating the data in the form of communication signals to the processor, and (iv) presenting an activity instruction based on the communication signals received, with the activity instruction enacting a real-life activity that the action figure can engage in.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

FIG. 1 is a perspective view of an interactive doll system according to one embodiment of the present invention with the doll shown positioned in the doll station.

FIG. 2 is a front perspective view of the doll station of the system of FIG. 1.

FIG. 3 is a rear perspective view of the doll station of the system of FIG. 1.

FIG. 4 is an exploded perspective view of the base of the doll station of FIG. 1.

FIG. 5 is a block diagram illustrating the electrical components of the system of FIG. 1.

FIG. 6 is a rear perspective view of a doll according to one embodiment that can be used with the system of FIG. 1.

FIG. 7 is a flow chart illustrating one possible flow of operation for the system of the present invention.

FIG. 8A illustrates a chip that can be used in connection with an accessory according to the present invention.

FIGS. 8B-8G illustrate various accessories that can be used with the system of the present invention.

FIG. 9 is a perspective view of a multi-doll system that utilizes the principles of the present invention.

FIG. 10A is a perspective view of an interactive doll system according to another embodiment of the present invention.

FIG. 10B is a block diagram illustrating the electrical components of the system of FIG. 10A.

FIG. 11 is a perspective view of an interactive toy system according to another embodiment of the present invention.

FIGS. 12A-12C illustrate various accessories that can be used with the toy system of FIG. 11.

FIG. 13 illustrates modifications that can be made to the teddy bear in the system of FIG. 11.

FIG. 14 is a block diagram illustrating the electrical components of the system of FIG. 13.

FIG. 15 is an exploded perspective view of a toy system according to yet another embodiment of the present invention.

FIG. 16 is a block diagram illustrating the electrical components of the system of FIG. 15.

FIG. 17 is a flow chart illustrating one possible flow of operation for the system of FIGS. 15-16.

FIG. 18 illustrates an example of a play activity that can involve the incorporation of accessories.

FIG. 19 is a perspective view of the interactive doll system of FIG. 10A with modifications made thereto.

FIG. 20 is a perspective view of an interactive doll system according to another embodiment of the present invention.

FIG. 21 is a block diagram illustrating the electrical components of the system of FIG. 20.

FIG. 22 is a block diagram of the base station in FIG. 21.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0008] The following detailed description is of the best presently contemplated modes of carrying out the invention. This description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating general principles of embodiments of the invention. The scope of the invention is best defined by the appended claims.

[0009] As used herein, the term "doll" is not limited solely to a fashion doll or play doll, but encompasses figurines, action figures, toy animals, plush toys, miniature animals, or any miniaturized or toy version of any living creature.

[0010] The present invention provides an interactive toy system which allows the user to enact real-life activities of a doll, animal, action-figure or similar creature. More specifically, the present invention provides a toy system 20 which provides for interactive play between

the system 20 and the user. The user can select different play programs which will program the doll or toy with certain emotions, responses or characters, and which will allow or direct the user to enact selected real-life activities for the doll or toy.

[0011] According to one embodiment of the present invention, the doll or toy merely functions as an object that is used by the player to enact selected real-life activities, and does not communicate or interact with the player. According to this embodiment, the player communicates solely with a base unit or doll station, which provides instructions or messages to the player regarding how the real-life activities are to be enacted. The player then utilizes the doll or toy to carry out the enactment. In this embodiment, the doll or toy may communicate interactively with the base unit or doll station, but will not communicate directly with the player.

[0012] FIG. 1 illustrates the basic components of an interactive doll system 20 according to one embodiment of the present invention. In its most basic form, the system 20 includes a doll 22, a doll station 24 and a storage device 26. However, as explained hereinbelow, the system 20 can also include a plurality of dolls 22, a plurality of doll stations 24, and a plurality of storage devices 26, all of which can be utilized to create a multi-variety interactive game system.

[0013] The storage device 26 can have a housing 28 that houses any conventional and well-known medium that includes a memory 30 (see FIG. 5) for storing digital data. The memory 30 can be embodied in the form of a memory card or cartridge or any other conventional storage medium, including a RAM, a ROM, or any writeable memory. The housing 28 can be ornamentally configured according to a given theme (e.g., princess theme) for the system, and can also include a communication (e.g., input/output) port 32 which is adapted to be removably coupled to a communication (e.g., input/output) port 34 at the doll station 24. The memory 30 can be adapted to store programs (software) for controlling the operation of the doll station 24, as described below. The memory 30 can also be adapted to store data that can be transferred to the doll station 24. Such data can include verbal or written messages, pre-recorded statements, sounds, music, light shows and other similar responses that can be displayed on the display screen 36 at the doll station 24, or emitted from the speaker 38 at the doll station 24. As used herein, the display screen 36 and the speaker 38 are mechanisms used by the system 20 to present a message. In addition, the system 20 can provide a plurality of different storage devices 26, with each storage device 26 storing software and/or data for different applications. For example, one storage device 26 can contain software and data directed to a princess doll application, another storage device 26 can contain software and data directed to a beach application, another storage device 26 can contain software and data directed to a party application, and another storage device 26 can contain software and data directed to a safari application, among others. The player can vary his/her play variety by selecting the desired storage device 26 for a desired application.

[0014] In addition, the storage device 26 can be coupled to a personal computer PC (see FIG. 5) to download new programs (either from the PC or from the Internet) that can be used to play the system 20. In this regard, the storage device 26 can be embodied in the form of a CD or other diskette.

[0015] The doll station 24 is adapted to hold a doll 22 during use. Referring to FIGS. 2-3, the doll station 24 has a base 40, a rear wall 42, and a roof 44. Referring to FIG. 4, the base 40 has a base housing 46 and a front panel 48. The base housing 46 defines an interior space 50 for holding the doll 22, and has an opening 52 in its front wall 54 for receiving the front panel 48. The front panel 48 houses the electronics (see FIG. 5) of the doll station 24, which includes a processor 56 and a memory 58. The memory 58 can be used to store basic operating instructions for the processor 56, in which case the memory 58 can be embodied in the form of a ROM. Alternatively, the memory 58 can be used to store some or all of the programs, with the memory 30 on the storage device 26 used primarily for storing data that can be utilized to control or change the operation parameters of the programs stored in the memory 58. Referring to FIGS. 4 and 5, the communication port 34, the speaker 38 and the display screen 36 are provided on the front panel 48, and are all coupled to the processor 56. The front panel 48 can also include a control pad 60 and control buttons 62. The port 34 functions to allow data and instructions to be transferred from the memory 30 in the storage device 26 to the processor 56 in the front panel 48. The screen 36 functions to display words, images, colors, and patterns that are in response to instructions or data provided by the storage device 26 or the doll 22. The speaker 38 emits sounds to provide vocal instructions and music. The speaker 38 and the screen 36 are both controlled by the processor 56. The control pad 60 and the buttons 62 are coupled to the processor 56 to provide control signals to the processor 56, so that the player can control the operation of the system 20 by controlling the pad 60 and the buttons 62. For example, the player can press selected buttons 62, or control the pad 60, to select desired play modes or features, or to perform any of the play functions described hereinbelow.

[0016] Referring to FIG. 3, the base 40 can be provided with a battery compartment accessed by a battery cover 64. Conventional batteries 66 (see FIG. 5) can be housed inside the battery compartment, and coupled to the electronics to power the operation of the doll station 24.

[0017] The rear wall 42 extends from the top rear portion of the base 40, and is slightly curved to define a background wall for the doll 22. An optional window 68 can be provided in the rear wall 42 for ornamental or functional (e.g., provide access) purposes. In addition, an antenna 70 can be provided in the rear wall 42 (see FIG. 3), with the antenna 70 coupled to the electronics

shown in FIG. 5 via wiring (not shown) that extends through the base housing 46 and the front panel 48.

[0018] The roof 44 is optional, and can be attached to the top of the rear wall 42 to provide a cover or shade for the doll 22 when the doll 22 is positioned inside the base 22. A handle (not shown) can be provided on top of the roof 44 to provide a means for the user to carry the doll station 24.

[0019] As shown in FIG. 1, the interior space 50 of the base 40 is adapted to hold a doll 22 with the doll 22 in the standing position. The doll 22 would be positioned in front of the rear wall 42, and below the roof 44. The user can insert the doll 22 into this interior space via the open front space defined by the roof 44, the base 40 and the rear wall 42. Even though the present embodiment illustrates the doll 22 as being positioned in a standing position, it is also possible to size and configure the base housing 46, the rear wall 42 and the roof 44 to accomodate the doll 22 in any desired position (sitting, standing, etc.).

[0020] Referring to FIG. 6, the doll 22 is provided with a chip 72 that is secured in a slot 74 that is cut out from the torso 76 of the doll 22. Referring to FIG. 5, the chip 72 includes a memory 78 that is coupled to a controller 82 that is in turn coupled to an antenna 80. The antenna 80 is adapted to communicate with the electronics in the base 40 via the antenna 70 in the rear wall 42. In addition, a small battery 84 can be fitted into part of the slot 74 to power the chip 72. The battery 84 can be embodied in the form of a small watch battery. The memory 80 in the doll 22 contains data which identifies the doll 22 and certain characteristics of the doll 22. These characteristics can include the name, age, height, weight, size, likes, dislikes, mood, requests, type of voice (low-pitch, high-pitch, soft, loud, etc.), and any other characteristic (e.g., shy, outgoing, gregarious, etc.) that can be ascribed to a doll. Data corresponding to desired characteristics can be transferred from the memory 80 to the doll station 24 to activate different responses (e.g., verbal or written messages, pre-recorded statements, sounds, music, light shows, etc.) that can be displayed on the display screen 36 at the doll station 24, or emitted from the speaker 38 at the doll station 24. As a further alternative, the memory 78 in the chip 72 can even contain programs relating to different activities that the specific doll 22 can engage in, and these programs can be transferred to the processor 56 during operation.

[0021] When the doll 22 is placed inside the interior space 50 of the base 40, the antenna 70 and 80 will be positioned adjacent to each other, and be capable of communicating with each other. In one non-limiting embodiment of the present invention, the antenna 70 and 80 can be selected to be short-range antennas that can only communicate wireless signals over a short distance. The use of such short-range antenna would ensure that the doll 22 be positioned in, or in close proximity to, the base 40 before that particular doll 22 can be the subject of the activity. This can be an effective scheme if the manufacturer provides more than one type of doll 22, each having an antenna 80. If longer range antennas 70 and 80 were to be used for a multi-doll system 20, the antenna 70 at the base 40 could be receiving signals from multiple dolls 22, which might confuse the processor 56. Next, the characteristics of the doll 22 are transferred to the processor 56 at the doll station 24 (see step 102 below). In addition, as described below, the user can select a desired application by selecting one of a variety of storage devices 26.

[0022] FIG. 7 is a flowchart that illustrates one one-limiting example of an activity flow for the system 20. In a first step 100, the doll 22 is placed inside the interior space 50 of the base 40. In step 102, the processor 56 identifies the doll 22 in the manner described above, and receives the characteristics of the doll 22. For example, the system 20 can be provided with a plurality of different dolls 22 that can all be used with the same doll station 24. Thus, the identity of the doll 22 is determined in step 102. Next, in step 104, the player selects a storage device 26 and inserts it into the front panel 48. In step 106, the processor 48 identifies the selected storage device 26 (e.g., via signals from the memory 30 to the processor 56 that are communicated via the ports 32 and 34) and determines whether the selected storage device 26 can be used with the selected doll 22. For example, some of the storage devices 26 have applications that cannot be used with some of the dolls 22 in the system 20, and step 106 functions to determine whether the player has selected a compatible storage device 26 (i.e., application). If the selected storage device 26 is not compatible with the selected doll 22, the processor 48 will cause a message to be displayed on the screen 36, or announced through the speaker 38, in step 108, informing the player that an incompatible storage device 26 has been selected. If the selected storage device 26 is compatible with the selected doll 22, in step 110, the processor 48 will download the different software programs from the memory 30 in the storage device 26, and display the various choices in the form of a menu on the screen 36. Then, in step 112, the player can select the desired program for play, which is then executed in step 114. At the end of the execution of the selected program, processing returns to step 112 where the player can again select the next program for play.

[0023] Even though the flow of the present invention is described as including the use of a menu displaying various selections of programs, it is also possible to provide each storage device 26 with only one selection, so that a menu would be unnecessary.

[0024] A variety of different programs can be provided for selection by the player. All of these programs are adapted to allow the player to enact real-life activities for the doll 22, as if the doll 22 were alive and going through the normal daily activities of a living doll. These programs can be based on any of the following: (i) the characteristics of the doll 22 that have been downloaded from the memory 78 on the chip 72, (ii) the nature of the environ-

ment portrayed by the doll station 24, and (iii) the programs and/or theme of the selected storage device 26. These programs can also be independent of any of these parameters, and any of these parameters can be used together or independent of each other. It is the provision and selection of these parameters that allow the player to be able to enact the real-life activities of the doll 22. The following are a few non-limiting examples of programs (enacting activities) that can be stored in the memory 30 and/or 58 and/or 78 for play on the doll station 24.

Example 1

[0025] The processor 56 causes the speaker 38 to emit an instruction, such as "I'm cold, please put a jacket on me". The player then goes to his/her doll accessories, takes a doll jacket and dresses the doll 22 with a jacket.

Example 2

[0026] The processor 56 causes the speaker 38 to emit an instruction, such as "I would like to go to the beach". The player then takes the doll 22 out of the base 40 and takes the doll 22 to another doll station 24 that represents a beach environment, and inserts the doll 22 into the base 40 of the beach doll station 24. The steps outlined in FIG. 7 are then executed with respect to the beach doll station 24, and the play continues.

Example 3

[0027] The processor 56 causes the speaker 38 to emit an instruction, such as "I would like to play with a friend". The player then takes a different (second) doll 22 and places it adjacent the doll station 24 so that the two dolls 22 can supposedly play with each other. The steps outlined in FIG. 7 are executed with respect to the second doll 22 and the station 24, and the play continues.

Example 4

[0028] The processor 56 causes the screen 36 to display a colorful message, accompanied by music from the speaker 38. This performance can reflect the identity of the doll 22. For example, if the doll 22 is intended to be a happy doll, the screen 36 can be caused to display bright and colorful images, and the speaker 38 can broadcast cheerful music. On the other hand, if the doll 22 is intended to be an evil doll, the screen 36 can be caused to display malicious or dark images, and the speaker 38 can broadcast somber music. These performances can be used to reflect the attitude, character, emotions or mood of the doll 22.

Example 5

[0029] In one non-limiting embodiment of the present invention, the accessories that accompany the doll 22 can be provided with chips similar to chip 72 that allow for the accessory to communicate with the doll station 24. For example, FIGS. 5 and 8A illustrate a chip 172 that can be provided for use with an accessory. The chip 172 has an antenna 180 that is coupled to a memory 178 and a controller 182, which can be the same as the memory 78 and the controller 82, respectively. The antenna 180 allows the chip 172 to communicate with the processor 56 via the antenna 70. The memory 178 in the chip 172 stores data identifying the characteristics of the intended accessory. The antenna 180 can be the same as the antenna 80, and can be a short-range antenna.

[0030] FIGS. 8B-8G illustrate various accessories that incorporate a chip 172, such as a hat 130 (FIG. 8B), a hair brush 132 (FIG. 8C), a pair of boots 134 (FIG. 8D), a skirt 136 (FIG. 8E), a blouse 138 (FIG. 8F), and a pair of trousers 140 (FIG. 8G). Any of these accessories can be used or carried by the doll 22. For example, the doll 22 could be wearing the blouse 138 when it is placed inside the base 40. The chip 172 on the blouse 138 would communicate with the processor 56 (via the antennas 70 and 180) to identify the blouse 138. If the blouse 138 is not the correct blouse 138 for the particular doll 22, the processor 56 can cause a message to be delivered (either via the speaker 38 and/or the screen 36) stating that "the blouse does not belong to this doll". As another example, if the program decides that the doll 22 is supposed to wear another article of clothing, the program can cause the processor 56 to deliver a message (via the speaker 38 and/or the screen 36) stating that "I do not like to wear this blouse; please dress me with another article of clothing". The same play examples can be provided for any accessory.

[0031] Alternatively, a program from any of the memories 30, 58, 78, or 178 can cause the speaker 38 or the screen 36 to emit an instruction, such as "Please give me my hair brush". The player then takes the hair brush 132 and places it in the doll's hand. The chip 172 on the hair brush 132 would communicate with the processor 56 (via the antennas 70 and 180) to identify the hair brush 132. If the player inadvertently places the wrong accessory (e.g., the hat 130) on the doll 22, the processor 56 can cause the speaker 38 and/or the screen 36 to emit a message informing the player that the wrong accessory has been chosen.

[0032] FIG. 18 illustrates one non-limiting example of a play activity that can involve the incorporation of accessories. The image shown in FIG. 18 can be shown on the display screen 36 (or any of the display screens 36c, 36d described below). FIG. 18 is an image on the screen 36 that illustrates the doll 22 inside a fashion store that sells shoes 134 and handbags 133, as well as other accessories 131. These shoes 134 and handbags 133 are virtual representations of actual shoes 134 and handbags 133 that are supplied with the system 20. The player can then take a selected accessory (e.g., a pair of shoes 134) and dress or otherwise associate the actual doll 22 with the actual accessory. When the shoes 134 are worn

by the doll 22, the controller 182 on the chip 172 of the shoes 134 will communicate with the processor 56 to identify the shoes 134 being worn. The processor 56 will then cause the screen 36 to change the image shown in FIG. 18 to show the selected shoes 134 being removed from the shelf 129 (the shelf 129 is a virtual shelf that only appears on the screen 36) and placed on to the feet of the virtual image of the doll 22 on the screen 36. When the player removes the shoes 134 from the feet of the actual doll 22, the image on the screen 36 will replicate that activity. The player can select another pair of shoes 134 to be worn by the actual doll 22, and the image on the screen 36 will again show the newly-selected shoes 134 being removed from the shelf 129 and placed on to the feet of the virtual image of the doll 22 on the screen 36.

[0033] Other play activities involving these accessories can include games and challenges. For example, a program from any of the memories 30, 58, 78, or 178 can cause the speaker 38 and/or the screen 36 to guide the user through a first activity (e.g., a game or challenge) where the user can accumulate points for use in a second or subsequent activity (e.g., a shopping spree). For example, the user can accumulate points by correctly answering certain questions, successfully navigating a maze or other obstacle(s), or designing new fashion outfits. The program then guides the user through a shopping spree where the user can visit any number of shops selling these accessories, and purchase any desired accessories using the points accumulated from the first activity. For example, if a user has accumulated fifty points, the user must allocate these fifty points for use in purchasing different accessories from different shops, with each accessory having a different point requirement for purchase. As the user purchases these accessories, the user can physically dress the doll 22 with the tangible embodiment of the accessory (e.g., the blouse 138) while the system 20 checks to ensure that the blouse 138 being worn by the doll 22 corresponds to the blouse 138 that had been purchased.

Example 6

[0034] The processor 56 causes the speaker 38 to emit an instruction, such as "I want to dance". The player then takes the doll 22 out of the base 40 and plays with the doll 22, pretending that the doll 22 is dancing. During this time, the speaker 38 can be broadcasting dance music, and the screen 36 can be displaying bright lights and other images.

Example 7

[0035] The processor 56 can recognize and store information relating to the programs selected by the player, play patterns of the player, or anything related to the use and play of the system 20. This information can be transferred to the memory 30 in the storage device 26 via ports 34 and 32. The player can select such recognition and storage functions by manipulating the control buttons 62 and/or the control pad 60. The information in the memory 30 can then be transferred by the storage device 26 to a PC where the information can be analyzed, processed and stored for any desired purpose.

Example 8

[0036] FIG. 9 illustrates the provision of a multi-doll system 20a, where a plurality of dolls 22a (each of which can be the same in construction as the doll 22) can be electrically coupled to a plurality of doll sub-stations 24a (each of which can be the same in principle as the base 40). The sub-stations 24a can be part of a larger doll station 24b. Each sub-station 24a can have its own antenna or communication device, but an additional antenna 70a (or communication device) can be provided to facilitate communication between the doll station 24b and any (or all) of the dolls 22a.

Example 9

[0037] The memory 58 can contain programs that include diaries, directories and calendars so that the user can input important dates, addresses, and entries for either the user or the doll 22. The user can access these diaries, directories and calendars via the front panel 48, or the base unit 24c described below.

[0038] FIGS. 10A-10B illustrate another embodiment of a system 20c under the present invention where the doll station 24 is now replaced by a hand-held base unit 24c. In particular, the doll 22c (which can be the same as the doll 22) does not need to be positioned inside or adjacent a doll station 24, but can instead be positioned as a stand-alone doll 22c without a base station 24. The base unit 24c can include all the functions and basic elements of the doll station 24. A separate storage device 26c (which can be the same as the storage device 26) can be inserted through a port 34c (which can be the same as the port 34) in the housing 46c of the base unit 24c. Similar to the doll station 24, the base unit 24c can also include a display screen 36c, speakers 38c, and a control pad 60c that can be the same as the corresponding elements in the doll station 24. An antenna 70c can be provided in the housing 46c of the base unit 24c for communicating with the antenna 80c (see FIGS. 10A and 10B) in the doll 22c.

[0039] The system 20c can operate in the same manner as the system 20, as described above. Specifically, the system 20c allows the player to enact real-life activities of the doll 22c, such as the activities described in Examples 1, 4, 5, 6, 7 and 9 above. The system 20c can also implement the flowchart of FIG. 7.

[0040] Between the systems 20 and 20c, the system 20c may be better suited for use with a single doll 22c, so that the base unit 24c does not need to distinguish between signals received from a plurality of dolls 22c that are positioned in close-enough proximity to the base unit

24c. On the other hand, the system 20 may be better suited to use with a plurality of dolls 22 because the short-range antennas used in the system 20 will allow the doll station 24 to distinguish between the different dolls 22, since the antenna 70 in the doll station 24 will be adapted to communicate with the short-range antenna 80 in the doll 22 that is positioned inside the doll station 24.

[0041] The accessories used with the doll 22c can also include patches of conductive ink. For example, in FIG. 10, the dress 136c can be provided with patches of conductive ink 135c which can incorporate circuitry and even an antenna. Thus, the conductive ink 135c can be used in lieu of the chip 172 that is provided for the accessories in FIGS. 8B-8G.

[0042] FIG. 10B illustrates the electrical components of the system 20c, with the same elements in FIGS. 5 and 10B having the same numeral designations except that a "c" has been added to the designations in FIG. 10B. The systems shown in FIGS. 5 and 10B can be the same except that the system 20c in FIG. 10B can provide electrical contacts 77c and 177c on the doll 22c and the accessory (e.g., dress 136c), respectively. These contacts 77c and 177c can form an electrical coupling between the doll 22c and the accessory (e.g., dress 136c) so that the system 20c can accurately identify the specific accessory that has been used with the doll 22c. In particular, the controller 182c in the chip 172c of the dress 136c can communicate with the controller 82c in the doll 22c, which can in turn communicate to the processor 56c the identity of the dress 136c that has been connected. These contacts 77c, 177c can be embodied using any of the concepts described in U.S. Patent Nos. 6,648,719 and 6,719,604, whose entire disclosures are incorporated by this reference as though set forth fully herein.

[0043] The principles of the present invention are not limited to action figures and fashion dolls only. FIGS. 11 and 12 illustrate another embodiment of a system 20d under the present invention where the doll 22c is now replaced by a teddy bear 22d or other toy animal. The system 20d also includes a base unit 24d that can be identical to the base unit 24c, and a storage device 26d that can be identical to storage devices 26c and 26. The teddy bear 22d can also include a chip (such as 72) and a battery (such as 84) to facilitate operation and use in the same manner as for the dolls 22 and 22c described above. Thus, a player can enact the same activities described above for the teddy bear 22d, including changing accessories and outfits. For example, the teddy bear 22d can be provided with accessories that incorporate a chip 172d, including a fork 132d (see FIG. 12A), a shirt 138d (see FIG. 12B), and a pair of trousers 140d (see FIG. 12C). These accessories are capable of communicating with the base unit 24d in the same way that the accessories in FIGS. 10A-10B are capable of communicating with the base unit 24c.

[0044] In addition, as best shown in FIG. 13, the teddy bear 22d can be provided with pivotable appendages 200 that are pivotably connected to other appendages 200 to create movable limbs and body parts. These appendages 200 can be controlled by gears (e.g., 202) that are operatively connected to a servo motor (not shown) housed in a motor unit 204. The motor unit 204 can include a chip (not shown) that can be the same as the chip 72 in the doll 22, and can also include an antenna 80d. The motor unit 204 has a port 206 that can even receive another storage device 26e. The storage device 26e can contain different software which imparts different characteristics to the teddy bear 22d, and which can be used in addition to the software stored in the base unit 24d and the storage device 26d (i.e., that is used with the base unit 24d). For example, a plurality of different storage devices 26e can be provided, each designed to cause the teddy bear 22d to assume a different mood (e.g., happy, sad, angry, etc.) or character (e.g., quiet, gregarious, etc.) or motion (e.g., cause the appendages to move faster or slower, or to dance, or to walk, etc.). The player can select a specific storage device 26e depending on the mood, character and/or motion desired for the teddy bear 22d. The storage device 26d can then be used to enact a different activity for the teddy bear 22d, with the activity carried out based on the chosen mood, character and/or motion determined by the storage device 26e. Alternatively, the different moods, characters and/or motions can be programmed into the memory (not shown) inside the motor unit 204 (instead of providing a plurality of storage devices 26e), and selected by the player by actuating control buttons 208 on the motor unit 204.

[0045] The teddy bear 22d in FIGS. 11 and 13 can even be modified to function as a base unit or station itself, so that the base unit 24d can be omitted and the elements of the base unit 24d can be provided as part of the teddy bear 22d. For example, a display screen 36d, a speaker 38d, a control pad 60d and control buttons 62d can be provided on the teddy bear 24d. In this embodiment 20e, the motor unit 204 can even house a battery 66d, a processor 56d and a memory 58d that are electrically coupled to the antenna 80d, the display screen 36d, the speaker 38d and the control buttons 62d and control pad 60d in the manner illustrated in FIG. 14. Thus, when FIG. 14 is compared with FIG. 5, these two systems 20 and 20d are essentially the same except that (i) the antenna 80d now functions as the antenna 70, (ii) the port 206 now functions as the port 34, (iii) the storage device(s) 26e now function as the storage device(s) 26 and 26d, and (iv) the chip 72 in FIG. 5 has been omitted. In addition, each chip 172d can include an antenna 180d, controller 182d and memory 178d that correspond to the antenna 180, controller 182 and memory 178 in FIGS. 1-5 and 8A-8G, and each storage device 26e can include a memory 30e and port 32e that correspond to the memory 30 and port 32 in FIGS. 1-5.

[0046] Instead of the wireless connection via the antennas 80d and 180d, as an alternative, electrical contacts 77d and 177d can be provided on the teddy bear 22d and the accessory (e.g., shirt 138d), respectively.

Referring to FIG. 14, these contacts 77d and 177d can form an electrical coupling between the teddy bear 22d and the accessory (e.g., shirt 138d) so that the system 20d can accurately identify the specific accessory that has been used with the teddy bear 22d. In particular, the controller 182d in the chip 172d of the shirt 138d can communicate with the processor 56d in the teddy bear 22d, thereby indicating to the processor 56d the identity of the shirt 138d that has been connected.

[0047] The system 20d can even be modified to include a PC and a PC monitor 210. The antenna 70d on the base unit 24d can communicate signals with the antenna 212 on the PC or other computer, and the images displayed on the screen 38d can be replicated on the monitor 210. The PC can even be used to store programs, and to transfer programs to the base unit 24d for execution thereat.

[0048] The principles in FIGS. 13 and 14 can also be applied for use with the doll systems shown in FIGS. 1-10B. In particular, the dolls 22 and 22c can be provided with appendages (similar to 200 in FIG. 13) so that the user can use the base station 24 or the base unit 24c to move the appendages on the doll 22 or 22c. This is illustrated in FIG. 19 using the system 20c, where the doll 22c is shown as having movable limbs (e.g., 71 c and 73c) that can be controlled by the base unit 24c. The doll 22c can even be provided with a speaker 75c at the mouth, a movable head 81c, and blinking lights 83c (e.g., an LED) at the eyes so that the doll 22c can simulate a real-life human being by speaking through the speaker 75c, blinking through the lights 83c, and moving its limbs 71 c, 73c.

[0049] The doll systems shown and described in connection with FIGS. 1 and 10A can be configured in a variety of different ways, with different components. FIGS. 20 and 21 illustrate yet another way of configuring the doll system. The doll system 20h in FIGS. 20 and 21 has a doll 22h that can be the same as the doll 22c, a base unit 24h that can be the same as the base unit 24c (with the exceptions noted below), a storage device 26h that can be the same as the storage device 26c (with the exceptions noted below), and a doll station that has a base 40h, a rear wall 42h, and a roof 44h that can be the same as the base 40, the rear wall 42, and the roof 44 in FIG. 1 (with the exceptions noted below), respectively. FIG. 21 illustrates the electrical components of the system 20h, with the same elements in FIGS. 5, 10B and 21 having the same numeral designations except that an "h" has been added to the designations in FIG. 21.

[0050] The basic difference between the system 20h and the systems 20, 20c is in the communication modes between the respective components. In the system 20h, the base 40h does not have the front panel 48 (which is now incorporated into the base unit 24h), but the base 40h still includes the electrical components illustrated in FIG. 22, including an infrared transmitter 90h, a controller 92h, a battery 94h and a memory 98h that are interconnected in the manner shown in FIG. 22. The memory 98h can be used to store data, software and programs similar to data, software and programs that are stored in the memory 58. The antenna 70h in the rear wall 42h can be electrically connected to the controller 92h. In addition, an infrared receiver 96h can be provided on the housing of the base unit 24h and electrically connected to the processor 56h, so that the base unit 24h no longer has the antenna 70c. The storage device 26h can further include an antenna 97h that is coupled to a processor 99h inside the storage device 26h. The elements 30h, 32h, 58h, 66h, 72h, 80h, 82h, 78h, 172h, 180h, 182h, 178h in FIG. 21 can be identical to the elements 30, 32, 58, 66, 72, 80, 82, 78, 172, 180, 182, 178 in FIG. 5, respectively.

[0051] The system 20h operates in the following manner according to one non-limiting embodiment of the present invention. The doll 22h communicates with the base station via the antenna 80h at the doll 22h and the antenna 70h at the rear wall 42h. The controller 92h in the base 40h receives these communications from the antenna 70h, and then communicates with the base unit 24h via the infrared transmitter 90h and the infrared receiver 96h to the processor 56h.

[0052] The provision of an antenna 97h at the storage device 26h provides another alternative form of communication. If the base station is misplaced, omitted, or not used, the doll 22h can still communicate with the base unit 24h. Specifically, the doll 22h can communicate with the storage device 26h via the antenna 80h at the doll 22h and the antenna 97h at the storage device 26h. The processor 99h in the storage device 26h receives these communications from the antenna 97h, and then communicates with the base unit 24h via the ports 32h and 34h.

[0053] The system 20h can operate in the same manner as the systems 20 and 20c, as described above. Specifically, the system 20h also allows the player to enact real-life activities of the doll 22h, such as the activities described in Examples 1, 4, 5, 6 and 7 above. The system 20h can also implement the flowchart of FIG. 7.

[0054] The principles in FIGS. 11 and 13-14 can be further extended to provide an interactive constructional or building system. FIGS. 15-16 illustrate a constructional system 20f having a base unit 24f that can be similar to the teddy bear 22d in the embodiment 20e of FIG. 14 where the teddy bear 22d is itself a base unit. In this embodiment, the base unit 24f forms a basic building block upon which other pieces 130f, 132f, 134f can be connected or assembled to form different resulting objects.

[0055] The base unit 24f can include all of the elements of the base station 24, including a battery 66f, a processor 56f, a memory 58f, a screen 36f, a speaker 38f, a control pad 60f, a control button 62f and a port 34f that can be the same as the corresponding elements in FIGS. 1-5. The base unit 24f can also include an electrical coupling 70f for receiving a piece 130f, 132f, 134f, etc. The coupling 70f can be similar to the contacts 77c and 77d described above. The storage device 26f can include all of

the elements of the storage device 26, including a memory 30f and a port 32f. In addition, each of the pieces 130f, 132f, 134f can correspond to different accessories 130, 132, 134, etc., in FIGS. 8B-8G, and in this embodiment can represent a head 130f, an arm 132f and a leg 134f. Each of these pieces 130f, 132f, 134f can also include a chip 172f that can be the same as the chip 172, and include the corresponding coupling 177f (which can be the same as the coupling 177c and 177d described above), controller 182f and memory 178f.

[0056] The base unit 24f can include software that is adapted to recognize the various pieces 130f, 132f, 134f, etc. In addition, each different storage device 26f can include software for guiding the player in constructing a particular object. For example, the memory 30f in a specific storage device 26f can contain software for guiding the player in constructing a dinosaur, and the memory 30f in another storage device 26f can contain software for guiding the player in constructing a bird. Alternatively, the storage device 26f can be omitted, and the memory 58f in the base unit 24f can store the different software that can be selected by the player for guiding the player in constructing the different objects.

[0057] One possible use of the toy system 20f is illustrated in the flowchart of FIG. 17, which is educational in nature. In step 220, the player first selects the object to be constructed. This can be accomplished by selecting a software that has been stored in the memory 58f, or by selecting the desired storage device 26f and inserting the selected storage device 26f into the port 34f. Next, in step 222, the selected software will cause instructions or images to appear on the screen 36f and/or through the speaker 38f illustrating the next piece (e.g., arm 132f) that needs to be connected to the base unit 24f. In step 224, the player connects the coupling 177f of the arm 132f to the appropriate coupling 70f. The coupling 70f is an electrical coupling (e.g., an electrical contact) that allows the controller 182f in the chip 172f of the arm 132f to communicate with the processor 56f in the base unit 24f, thereby indicating to the processor 56f the identity of the piece that has been connected. In step 226, the processor 56f checks to see if the correct piece has been connected. If yes, then processing proceeds to step 230 to determine if the object has been completed. If the object has not been completed, processing returns to step 222 to issue the next instructions or images for connecting the next piece. If at step 226 it is determined that the incorrect piece has been connected, processing proceeds to step 228 where an error message is displayed (on the screen 36f) and/or broadcast (over the speaker 38f). Processing then returns to step 222 where the same instruction or image is displayed or broadcast again. This continues until the desired object has been completed at step 230. The flowchart of FIG. 17 can also include an alternative step 232 where the player can use the completed object in the same manner as the teddy bear 22d to enact real-life activities for the completed object, according to the principles described above.

[0058] The toy system 20f can be used to generate a variety of different activities. According to a second activity, the memory 30f in the storage device 26f or the memory 58f in the base unit 24f can store software and a database relating to the construction of different objects. This activity allows the player to initiate the construction and then gives the player choices as to what object(s) the player can assemble based on the start initiated by the player. Thus, this activity is more creative and interactive in nature. For example, in a first step, the player connects a piece (e.g., the arm 132f) to any coupling (e.g., 70f) in the base unit 24f. Then, in the next step, the software will determine the different objects that can be constructed based on the initial first connection, and will display the options to the player on the screen 36f, including instructions for assembling each option. The player can continue to connect additional pieces, and as each additional piece is connected, the software will update its identification of the connected pieces from its database, and cause the screen 36f at the base unit 24f to display new and updated options for the player. This process continues until an object is completely assembled, and even at that point, the player can continue to connect additional pieces, while the software will continue to search its database for possible new objects that can be built. This activity allows the player to engage in either (i) a challenging and creative interactive building game where the player attempts to outwit the system 20f in building an object, or (ii) an instructional interactive game where the system 20f can guide the player in building one of many different objects.

[0059] While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.

[0060] As a non-limiting example, even though the present invention illustrates the use of antennas to facilitate communication between the doll station 24 and the doll 22 and accessories, it s also possible to use wires and other known electrical couplings to facilitate such communication. Also, the wired communication between the ports 32 and 34 can be replaced by wireless communication utilizing separate antennas at the locations of the ports 32 and 34.

Claims

1. A method of interacting with an action figure, comprising:

providing a base unit having a processor;
providing an action figure having a memory which stores data relating to the action figure;
communicating the data in the form of communication signals to the processor; and

presenting an activity instruction from the base unit, the activity instruction being based on the communication signals received, wherein the activity instruction enacts a real-life activity that the action figure can engage in.

2. The method of claim 1, further including:

providing a storage device having a memory which stores instruction data; communicating the instruction data in the form of instruction signals to the processor; and
presenting the activity instruction based on the communication signals and instruction signals received.

3. The method of claim 1, further including:

providing an accessory associated with the doll, the accessory having a memory which stores accessory data relating to the accessory;
communicating the accessory data in the form of communication signals to the processor; and
presenting the activity instruction based on the communication signals, accessory data and instruction signals received.

4. The method of claim 1, further including:

incorporating the base unit and the action figure into a single unit.

5. The method of claim 1, further including:

coupling the base unit to a computer and a monitor; and
displaying the activity instruction on the monitor.

6. The method of claim 1, further including:

transmitting a control signal to the action figure to cause the action figure to experience movement.

7. The method of claim 3, further including:

verifying whether the accessory is the correct accessory designated by the activity instruction.

8. The method of claim 1, further including:

presenting the activity instruction from a screen at the base unit.

9. An interactive play system, comprising:

a base station having:
a holding area;
a processor;
means for receiving communication signals; and
means for presenting a message based on the communication signals received;
a doll retained in the holding area, the doll having:

a memory which stores doll data relating to the doll; and
means for communicating the doll data in the form of communication signals to the processor; and
a storage device having:

a memory which stores instruction data; and
means for communicating the instruction data in the form of communication signals to the processor.

10. The system of claim 9, further including an accessory associated with the doll, the accessory having:

a memory which stores accessory data relating to the accessory;
means for communicating the accessory data in the form of communication signals to the processor.

11. The system of claim 9, wherein the doll is a first doll, and further including a second doll having:

a memory which stores doll data relating to the second doll; and
means for communicating the doll data of the second doll in the form of communication signals to the processor.

12. The system of claim 9, wherein the storage device is a first storage device, and further including a second storage device having:

a memory which stores instruction data; and
means for communicating the instruction data of the second storage device in the form of communication signals to the processor.

13. The system of claim 9, wherein the base station is a first base station, and further including a second base station having:

a holding area;
a processor;
means for receiving communication signals; and
means for presenting a message based on the

communication signals received.

14. The system of claim 9, wherein the presenting means includes a speaker and a screen.

15. The system of claim 9, wherein the base station further includes a control mechanism.

16. The system of claim 9, wherein the receiving means for the base station includes an antenna.

17. The system of claim 9, wherein the receiving means for the base station includes a port.

18. The system of claim 9, wherein the communicating means for the doll comprises an antenna.

19. The system of claim 9, wherein the communicating means for the storage device comprises a port.

20. The system of claim 9, wherein the instruction data includes software.

21. A method of interactive play, comprising:

a. providing a base station having a processor;
b. electrically coupling a doll to the base station, the doll having a memory which stores doll data relating to the doll;
c. transferring the doll data to the processor;
d. determining the identity of the doll;
e. electrically coupling a storage device to the base station, the storage device having a memory which stores instruction data;
f. determining whether an appropriate storage device has been coupled to the base station;
g. transferring the instruction data to the processor if the appropriate storage device has been coupled to the base station; and
h. emitting a response at the base station based on the doll data and the instruction data that has been transferred to the processor.

22. The method of claim 21, wherein the instruction data includes software programs, and further including:

h. executing at least one software program at the processor.

23. A method of interacting with an action figure, comprising:

a. providing a base unit having a processor, a first antenna, and an infrared receiver;
b. providing a base station having a controller, the base station further including an infrared transmitter and a second antenna that are coupled to the controller;
c. providing an action figure having a memory which stores data relating to the action figure, and a third antenna;
d. communicating the data in the form of communication signals from the memory to the third antenna, then from the third antenna to the second antenna, then from the second antenna to the infrared transmitter, then from the infrared transmitter to the infrared receiver, and then to the processor; and
e. presenting an activity instruction from the base unit, the activity instruction being based on the communication signals received, wherein the activity instruction enacts a real-life activity that the action figure can engage in.

24. The method of claim 23, further including:

providing a storage device having a memory which stores instruction data; communicating the instruction data in the form of instruction signals to the processor; and
presenting the activity instruction based on the communication signals and instruction signals received.

25. The method of claim 23, further including:

providing an accessory associated with the doll, the accessory having a memory which stores accessory data relating to the accessory, and a fourth antenna;
communicating the accessory data in the form of accessory communication signals from the memory of the accessory to the fourth antenna, then from the fourth antenna to the second antenna, then from the second antenna to the infrared transmitter, then from the infrared transmitter to the infrared receiver, and then to the processor; and
presenting the activity instruction based on the accessory communication signals, accessory data and instruction signals received.

26. The method of claim 23, further including:

incorporating the base unit and the action figure into a single unit.

27. The method of claim 23, further including:

coupling the base unit to a computer and a monitor; and
displaying the activity instruction on the monitor.

28. The method of claim 23, further including:

e. transmitting a control signal to the action fig-

ure to cause appendages on the action figure to experience movement.

29. The method of claim 25, further including:

verifying whether the accessory is the correct accessory designated by the activity instruction.

30. The method of claim 23, further including:

presenting the activity instruction from a screen at the base unit.

31. A method of interacting with an action figure, comprising:

a. providing a base unit having a first processor and a first port;
b. providing a storage device that is removably coupled to the port of the base unit, the storage device having a second processor, the storage device having a second port and a first antenna that are coupled to the second processor;
c. providing an action figure having a memory which stores data relating to the action figure, and a second antenna;
d. communicating the data in the form of communication signals from the memory to the second antenna, then from the second antenna to the first antenna, then from the first antenna to the second port, then from the second port to the first port, and then to the processor; and
e. presenting an activity instruction from the base unit, the activity instruction being based on the communication signals received, wherein the activity instruction enacts a real-life activity that the action figure can engage in.

32. The method of claim 31, further including:

further providing the storage device having a memory which stores instruction data;
communicating the instruction data in the form of instruction signals to the processor; and
presenting the activity instruction based on the communication signals and instruction signals received.

33. The method of claim 31, further including:

providing an accessory associated with the doll, the accessory having a memory which stores accessory data relating to the accessory, and a third antenna;
communicating the accessory data in the form of accessory communication signals from the memory of the accessory to the third antenna, then from the third antenna to the first antenna, then from the first antenna to the second port, then from the second port to the first port, and then to the processor; and
presenting the activity instruction based on the accessory communication signals, accessory data and instruction signals received.

34. The method of claim 31, further including:

incorporating the base unit and the action figure into a single unit.

35. The method of claim 31, further including:

coupling the base unit to a computer and a monitor; and
displaying the activity instruction on the monitor.

36. The method of claim 31, further including:

e. transmitting a control signal to the action figure to cause appendages on the action figure to experience movement.

37. The method of claim 33, further including:

verifying whether the accessory is the correct accessory designated by the activity instruction.

38. The method of claim 31, further including:

presenting the activity instruction from a screen at the base unit.

39. A method of building an object, comprising:

a. providing a base unit having a processor;
b. selecting a desired object to be built;
c. presenting instructions on how the desired object is to be built;
d. connecting a piece to the base unit in accordance to the instructions, the piece communicating its identity to the processor of the base unit;
e. verifying whether the connected piece is correct; and
f. repeating steps (d) and (e) until the object has been completed.

40. The method of claim 39, further including:

g. presenting an activity instruction from the base unit, the activity instruction enacting a real-life activity that the object can engage in.

41. The method of claim 40, wherein the activity instruction is based on data stored at the base unit representing characteristics of the object.

42. The method of claim 40, further including:

presenting the activity instruction from a screen at the base unit.

43. A method of building an object, comprising:

a. providing a base unit having a processor;
b. connecting a piece to the base unit in accordance to the instructions, the piece communicating its identity to the processor of the base unit;
c. based on the identity of the connected piece, presenting instructions on how to build a plurality of objects that include the connected piece;
d. repeating steps (b) and (c) until a desired object has been completed.

44. The method of claim 43, further including:

e. presenting an activity instruction from the base unit, the activity instruction enacting a real-life activity that the object can engage in.

45. The method of claim 44, wherein the activity instruction is based on data stored at the base unit representing characteristics of the object.

46. The method of claim 44, further including:

presenting the activity instruction from a screen at the base unit.

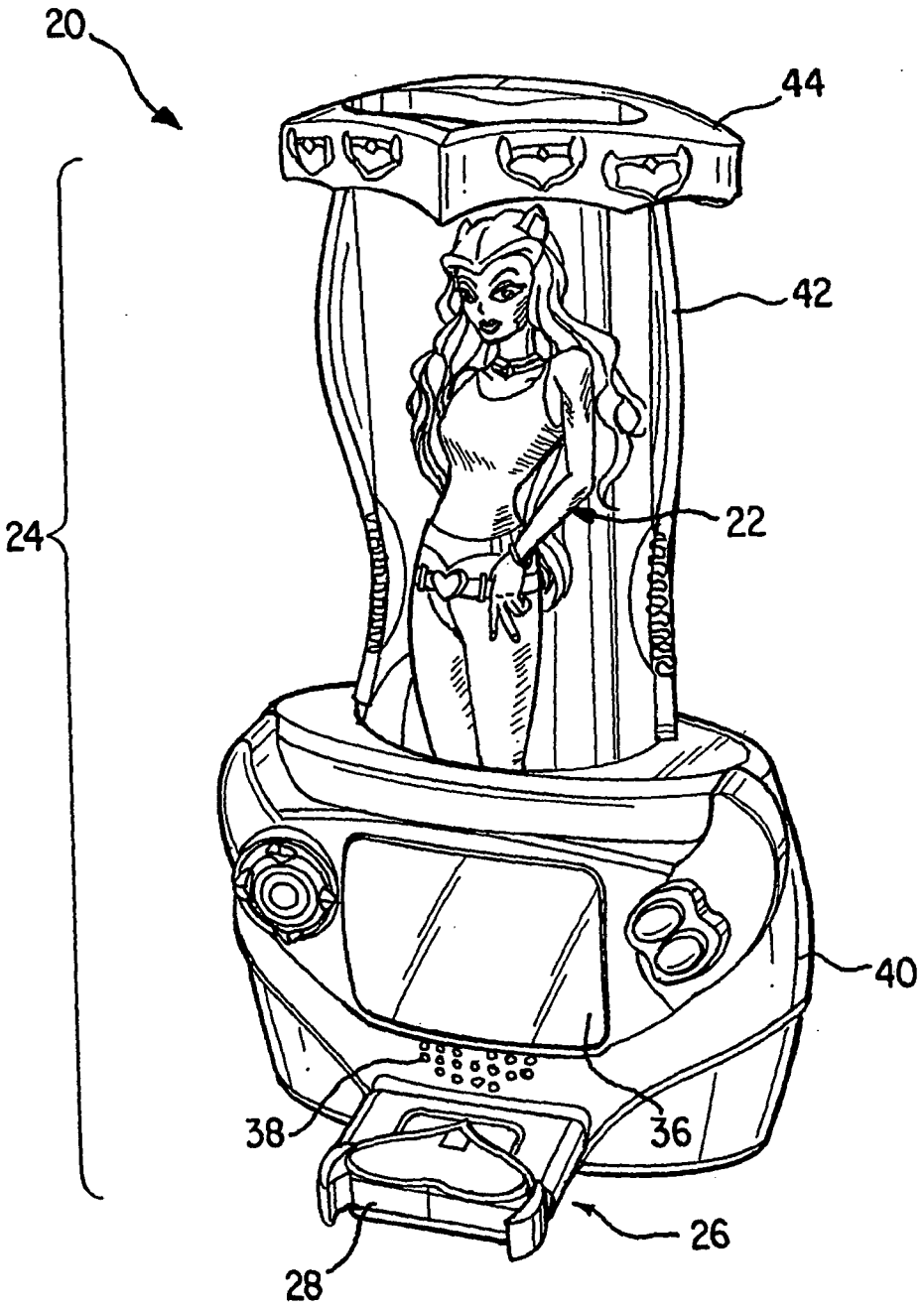


FIG. 1

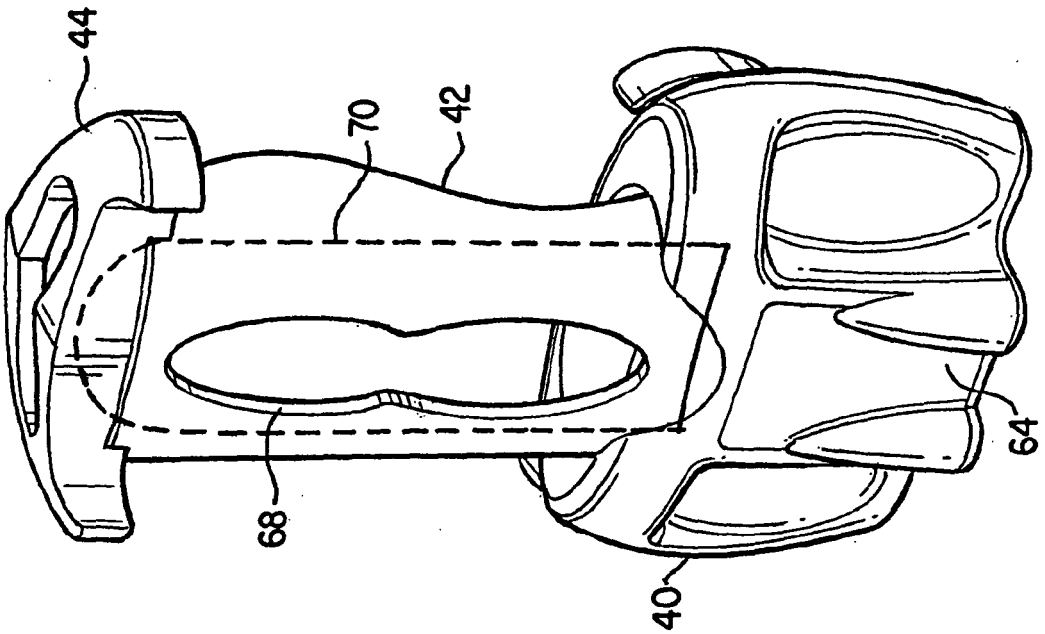


FIG. 3

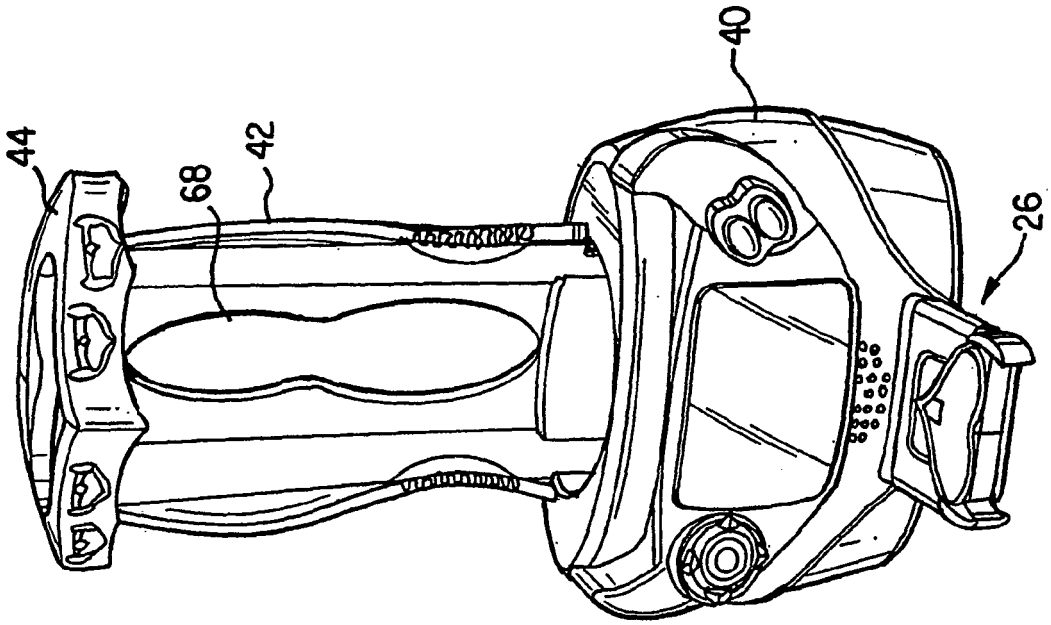


FIG. 2

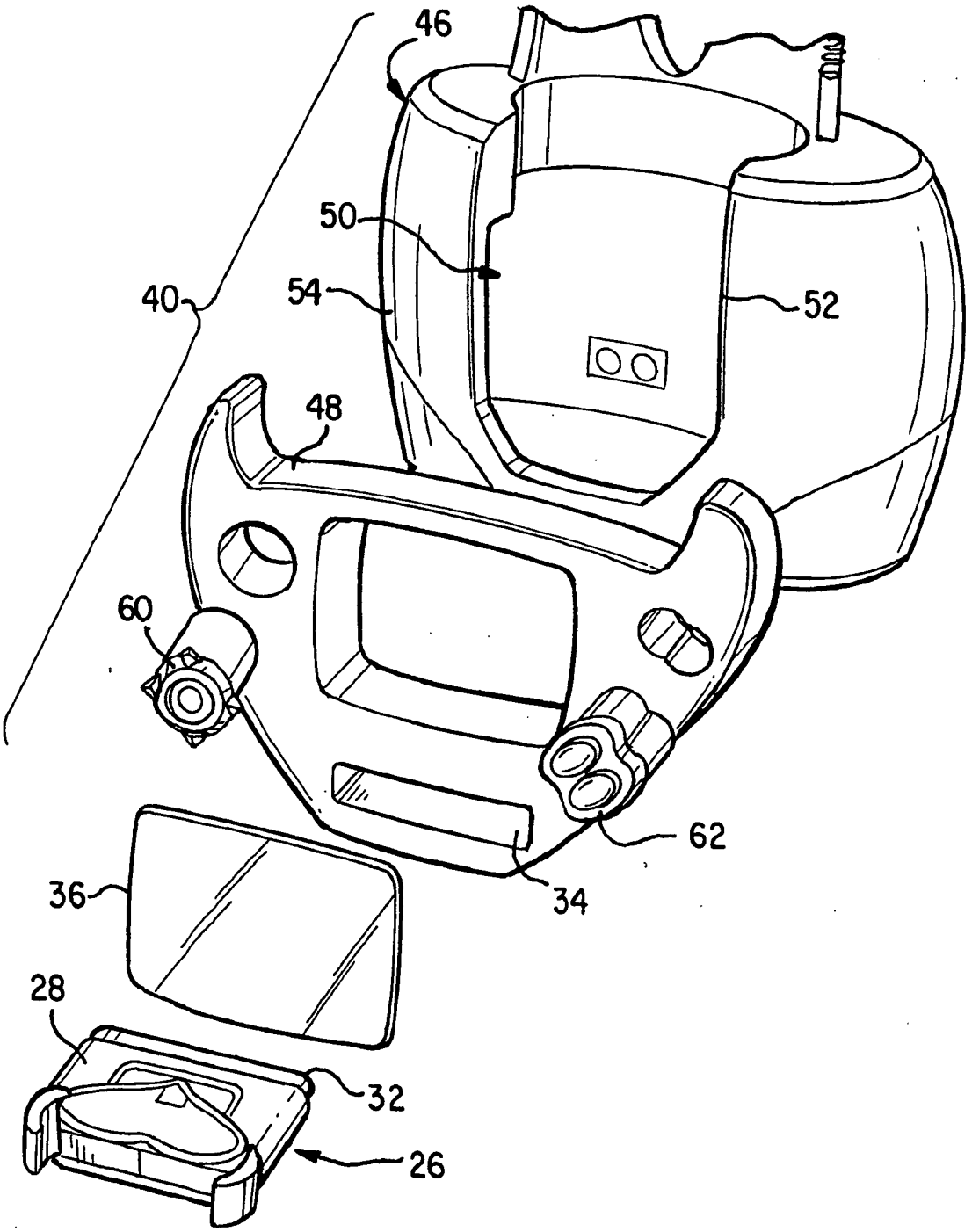


FIG. 4

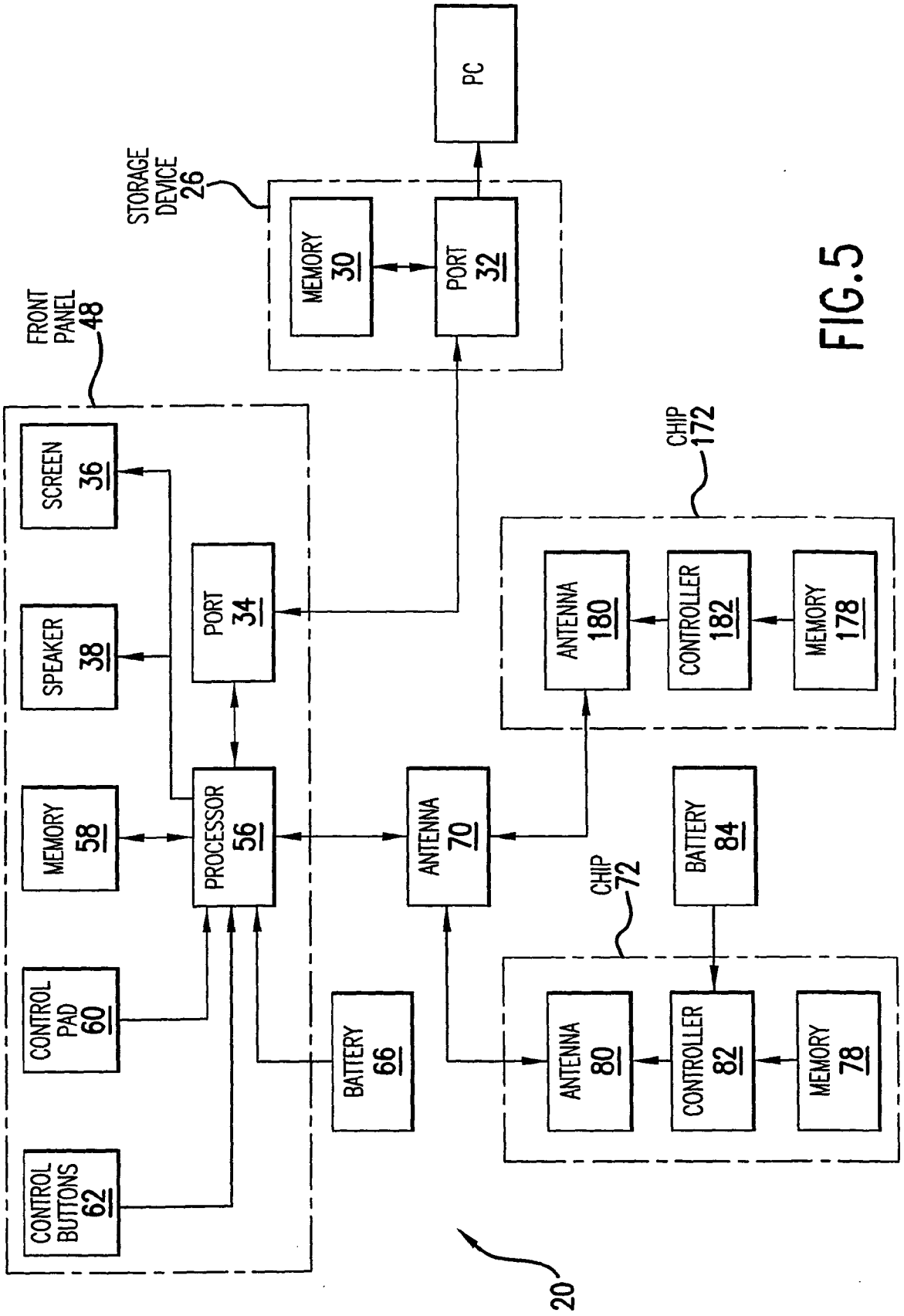

PC
STORAGE DEVICE 26
MEMORY 30
PORT 32
FRONT PANEL 48
SCREEN 36
SPEAKER 38
PORT 34
CHIP 172
ANTENNA 180
CONTROLLER 182
MEMORY 178
MEMORY 58
PROCESSOR 56
ANTENNA 70
BATTERY 84
CHIP 72
CONTROL PAD 60
BATTERY 66
ANTENNA 80
CONTROLLER 82
MEMORY 78
CONTROL BUTTONS 62
20

FIG.5

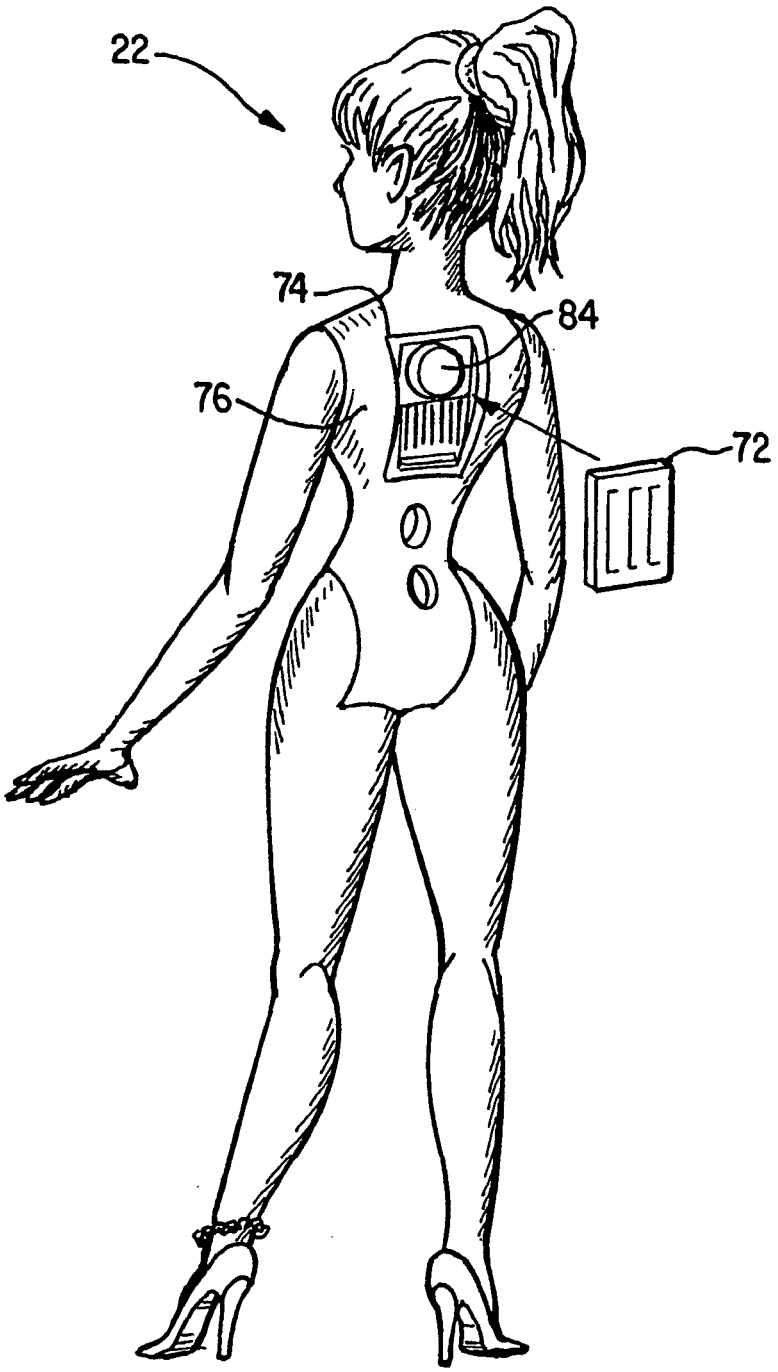


FIG. 6

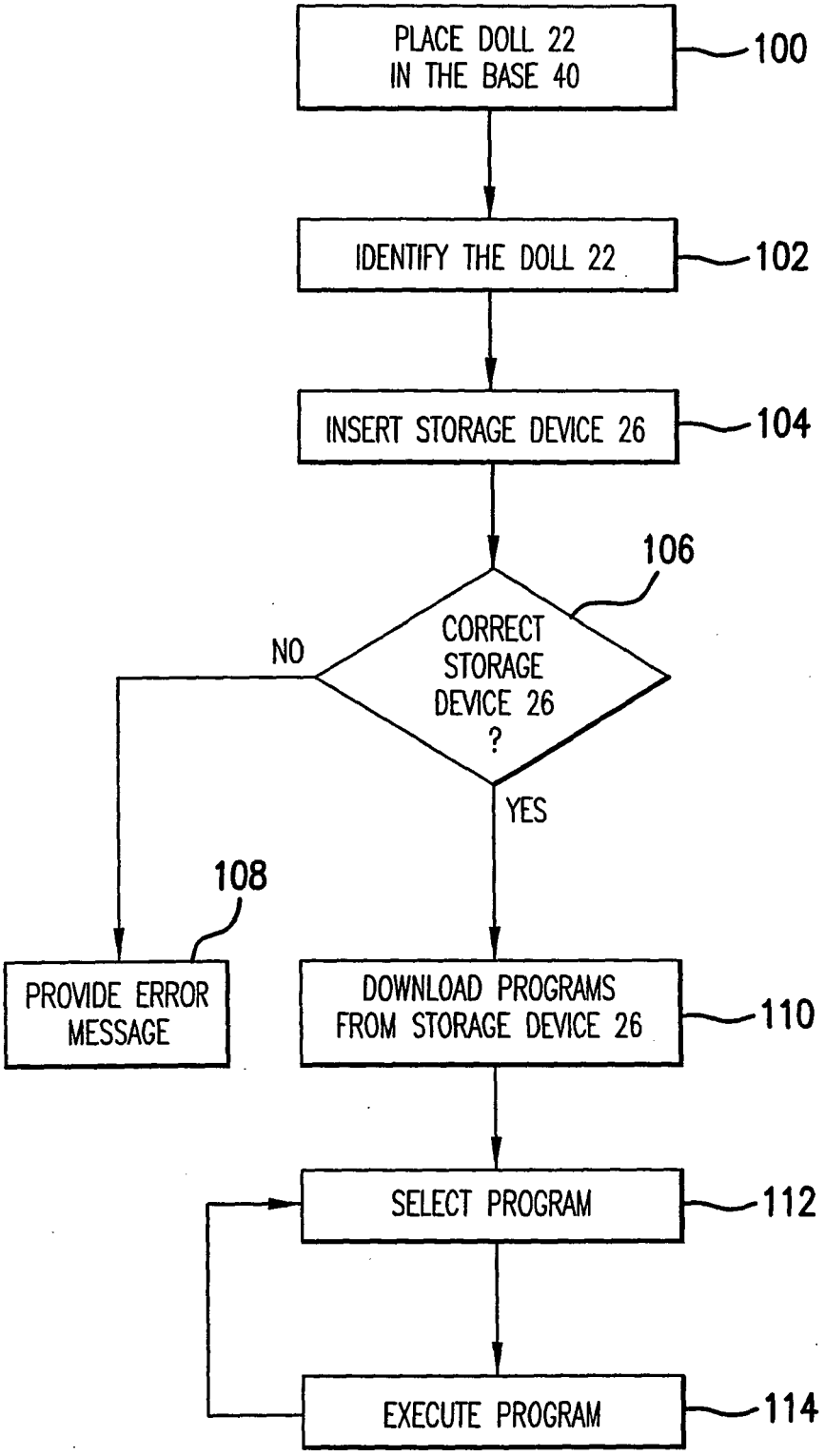

PLACE DOLL 22 IN THE BASE 40
100
IDENTIFY THE DOLL 22
102
INSERT STORAGE DEVICE 26
104
106
CORRECT STORAGE DEVICE 26 ?
NO
YES
108
PROVIDE ERROR MESSAGE
DOWNLOAD PROGRAMS FROM STORAGE DEVICE 26
110
SELECT PROGRAM
112
EXECUTE PROGRAM
114

FIG.7

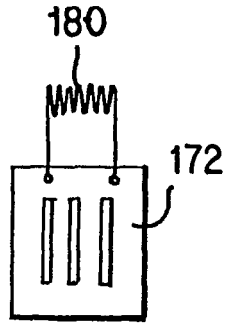


FIG. 8A

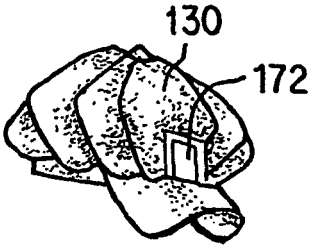


FIG. 8B

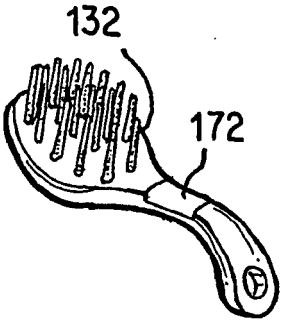


FIG. 8C

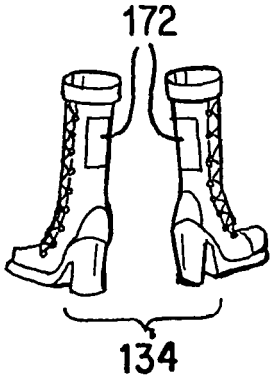


FIG. 8D

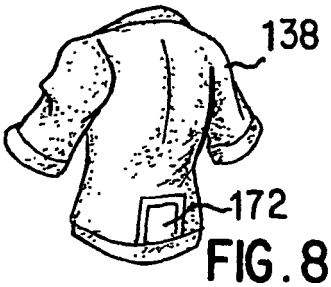


FIG. 8F

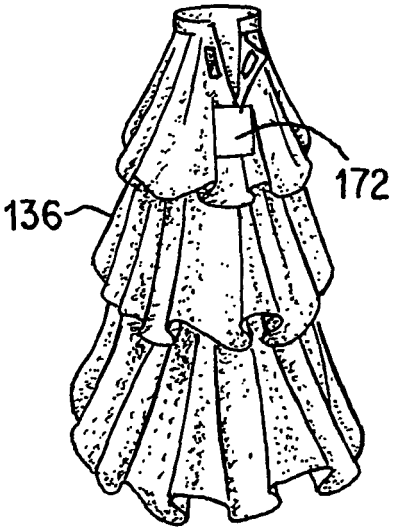


FIG. 8E

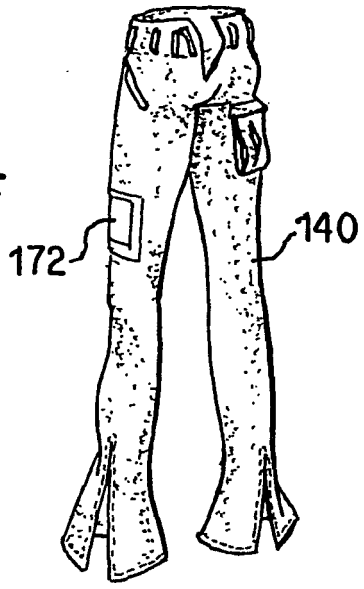


FIG. 8G

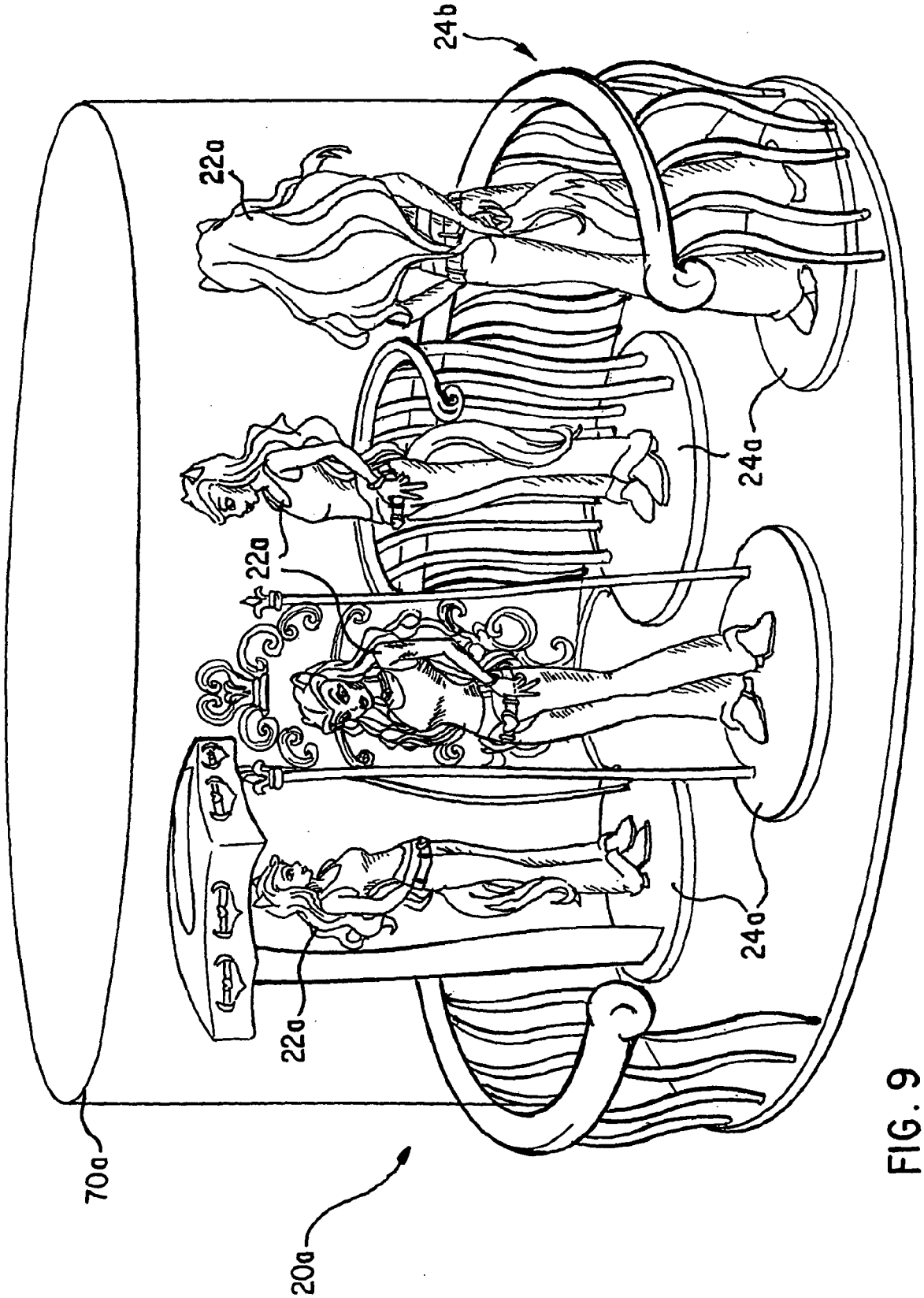


FIG. 9

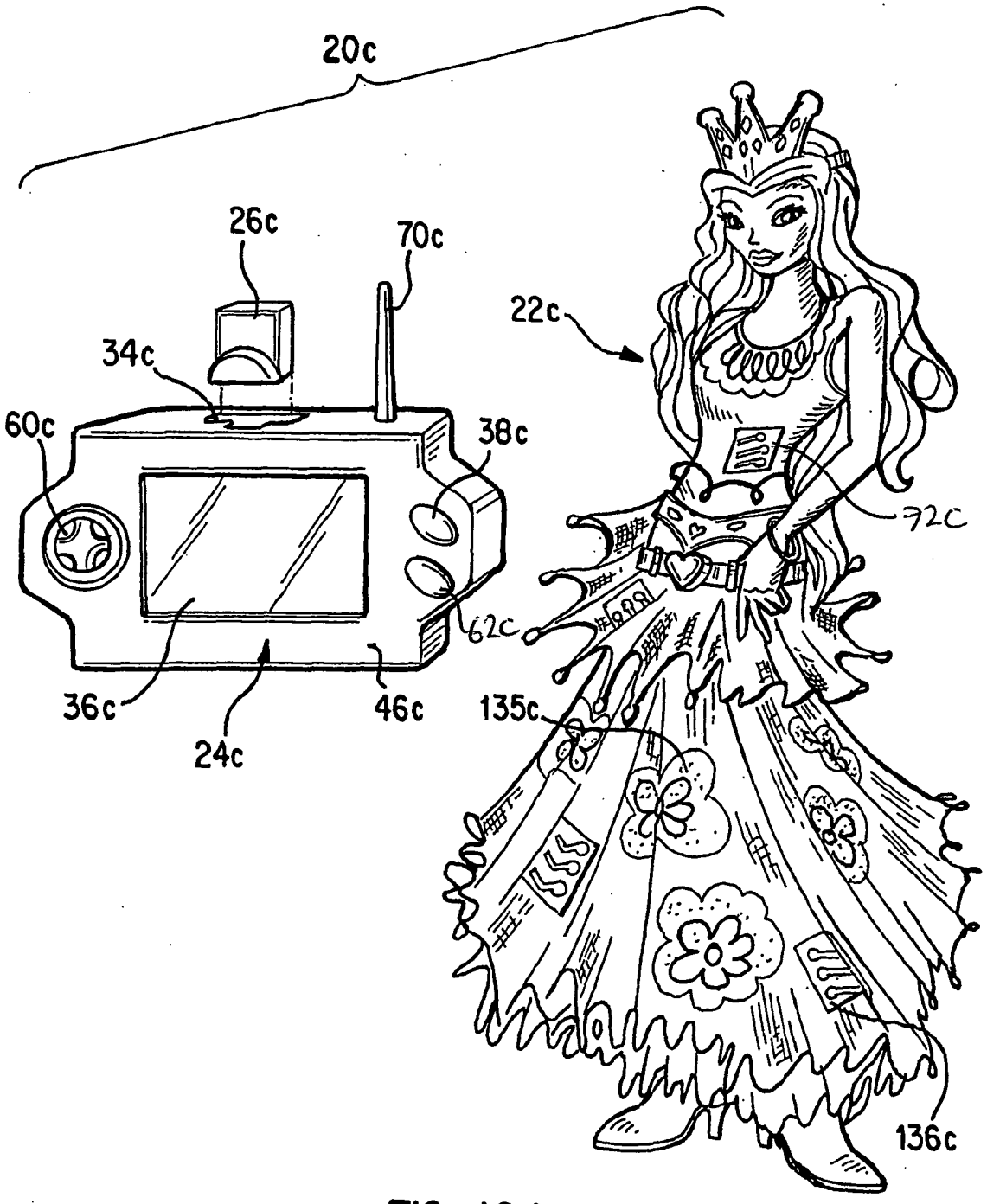


FIG. 10A

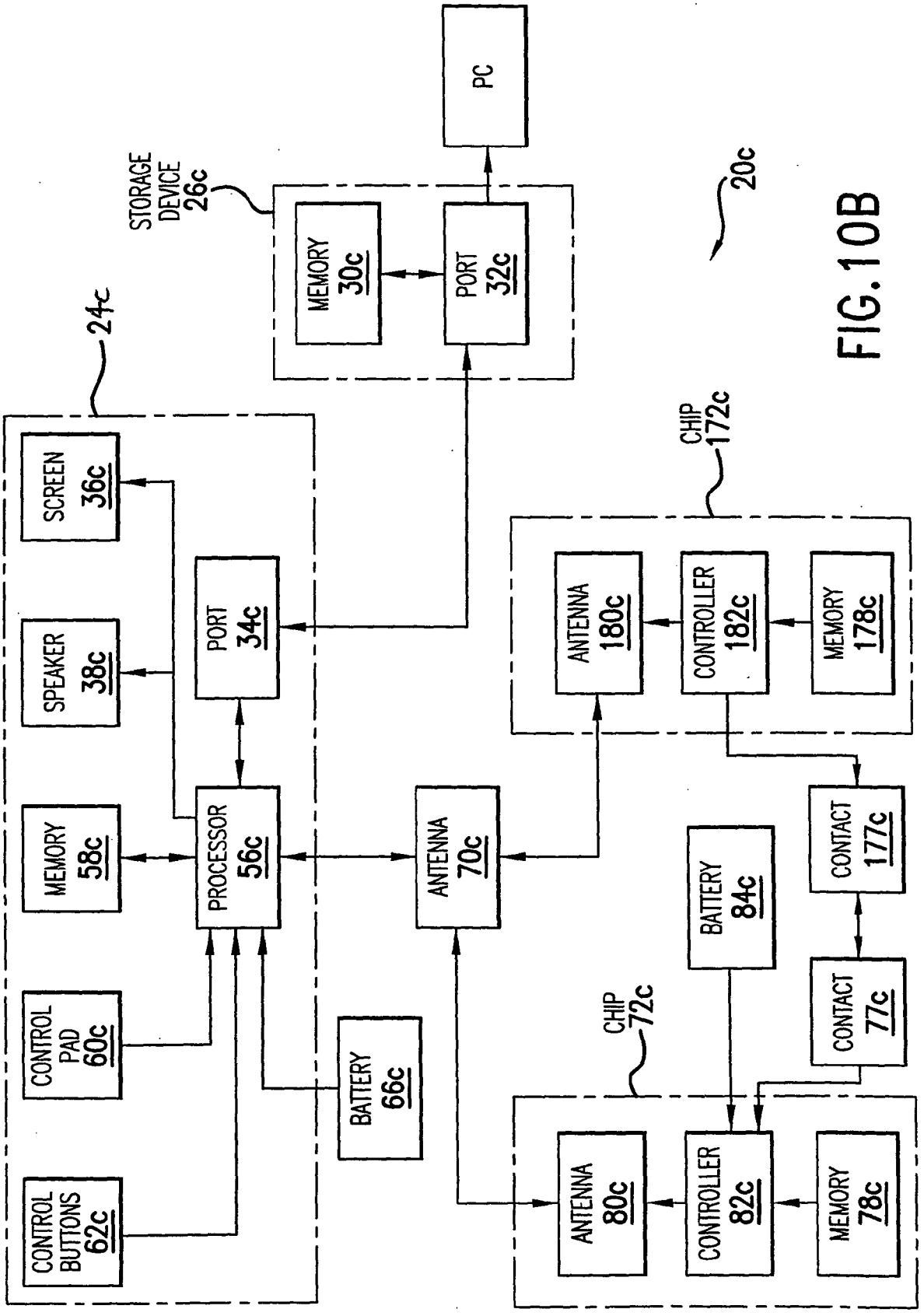

PC
STORAGE DEVICE 26c
MEMORY 30c
PORT 32c
20c
24c
SCREEN 36c
SPEAKER 38c
PORT 34c
MEMORY 58c
PROCESSOR 56c
CONTROL PAD 60c
CONTROL BUTTONS 62c
BATTERY 66c
ANTENNA 70c
CHIP 172c
ANTENNA 180c
CONTROLLER 182c
MEMORY 178c
BATTERY 84c
CONTACT 177c
CONTACT 77c
CHIP 72c
ANTENNA 80c
CONTROLLER 82c
MEMORY 78c

FIG. 10B

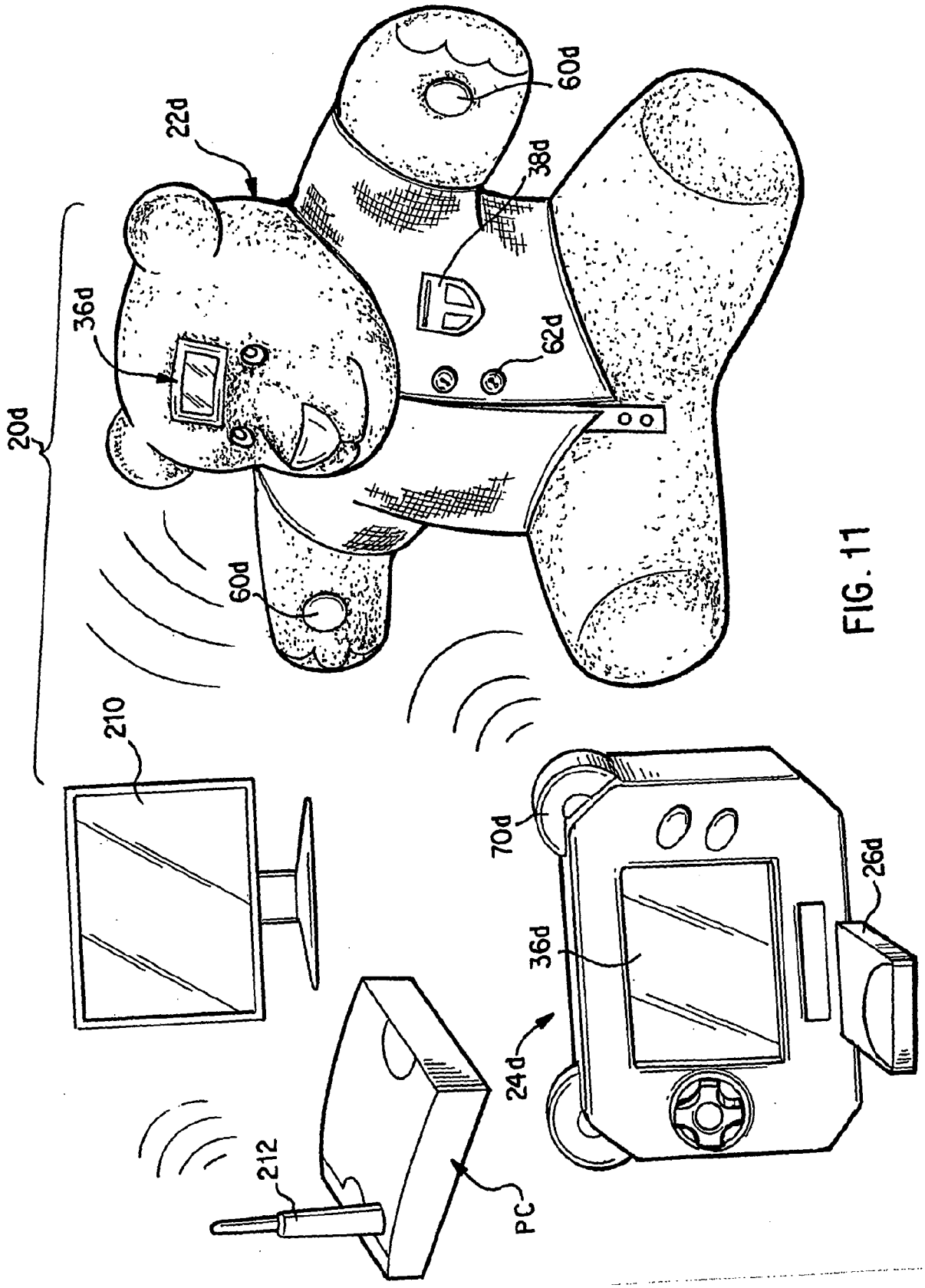


FIG. 11

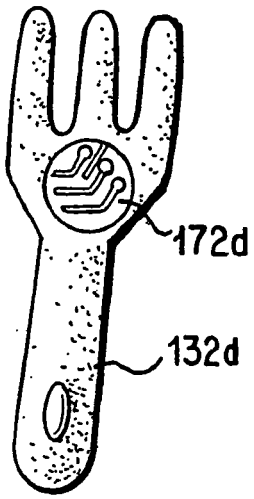


FIG. 12 A

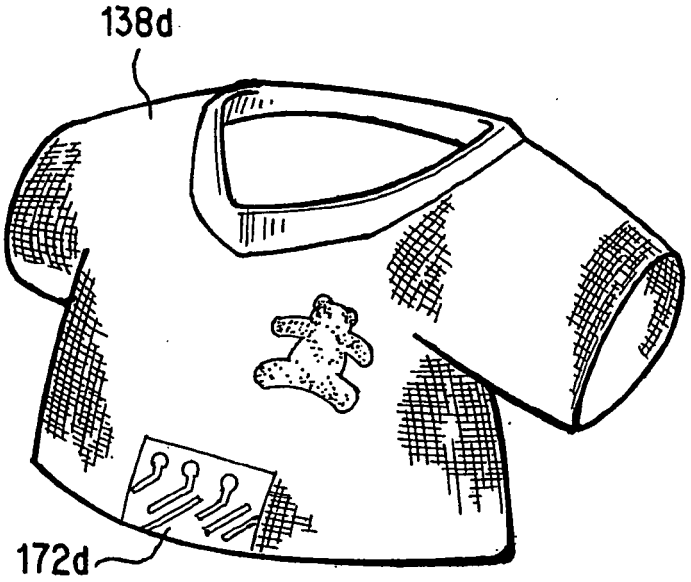


FIG. 12B

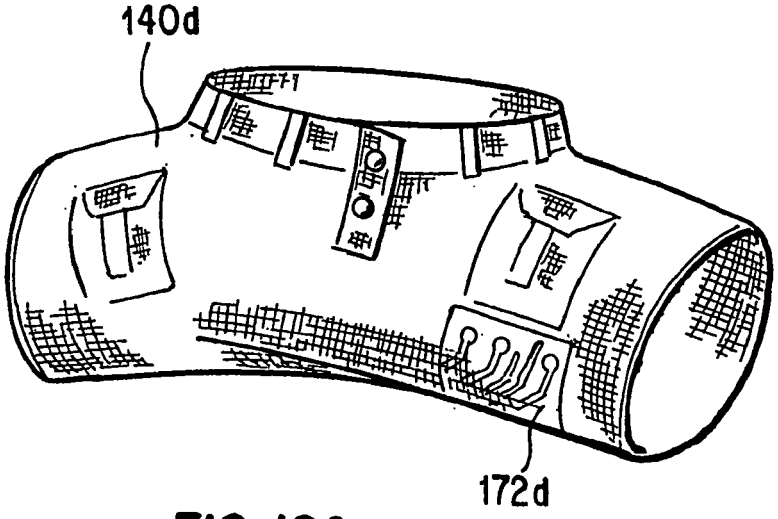


FIG. 12C

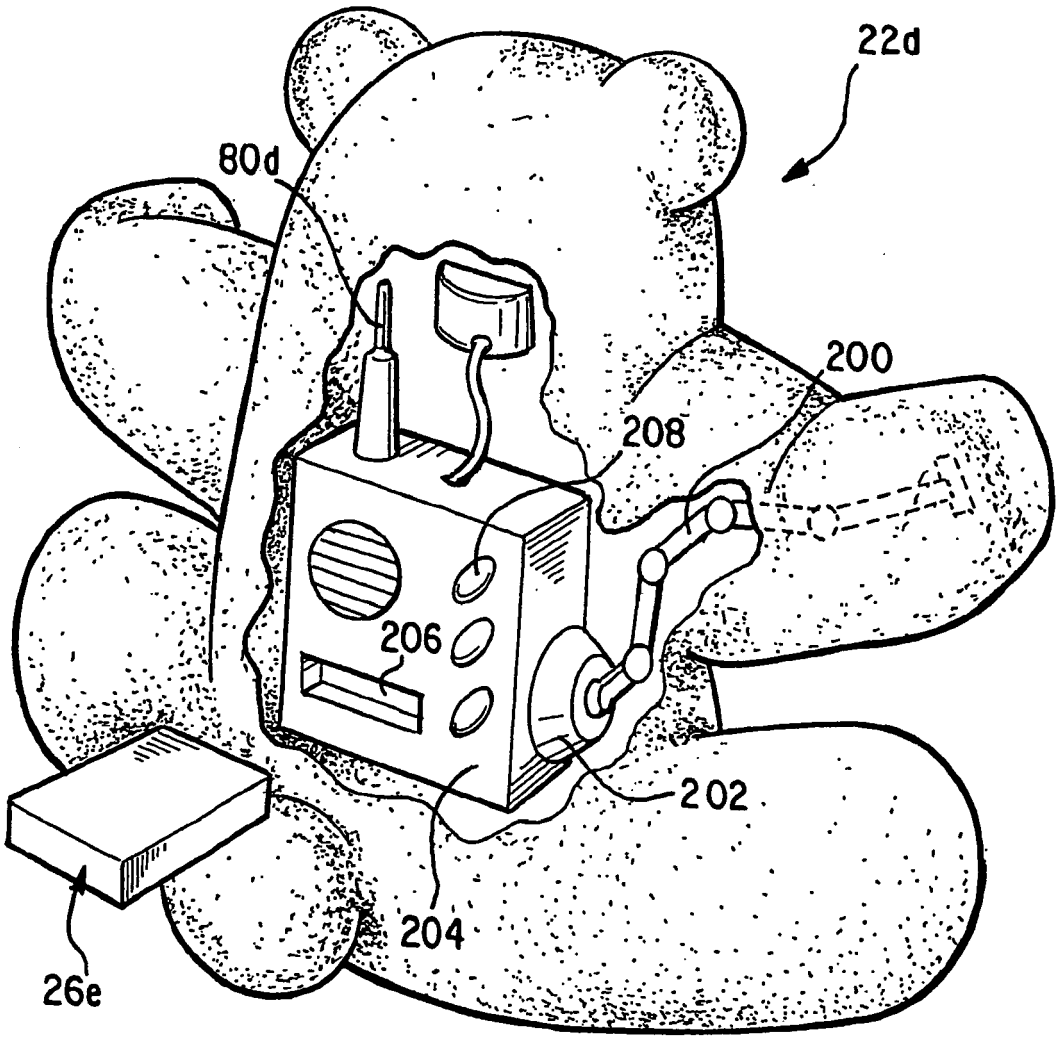


FIG. 13

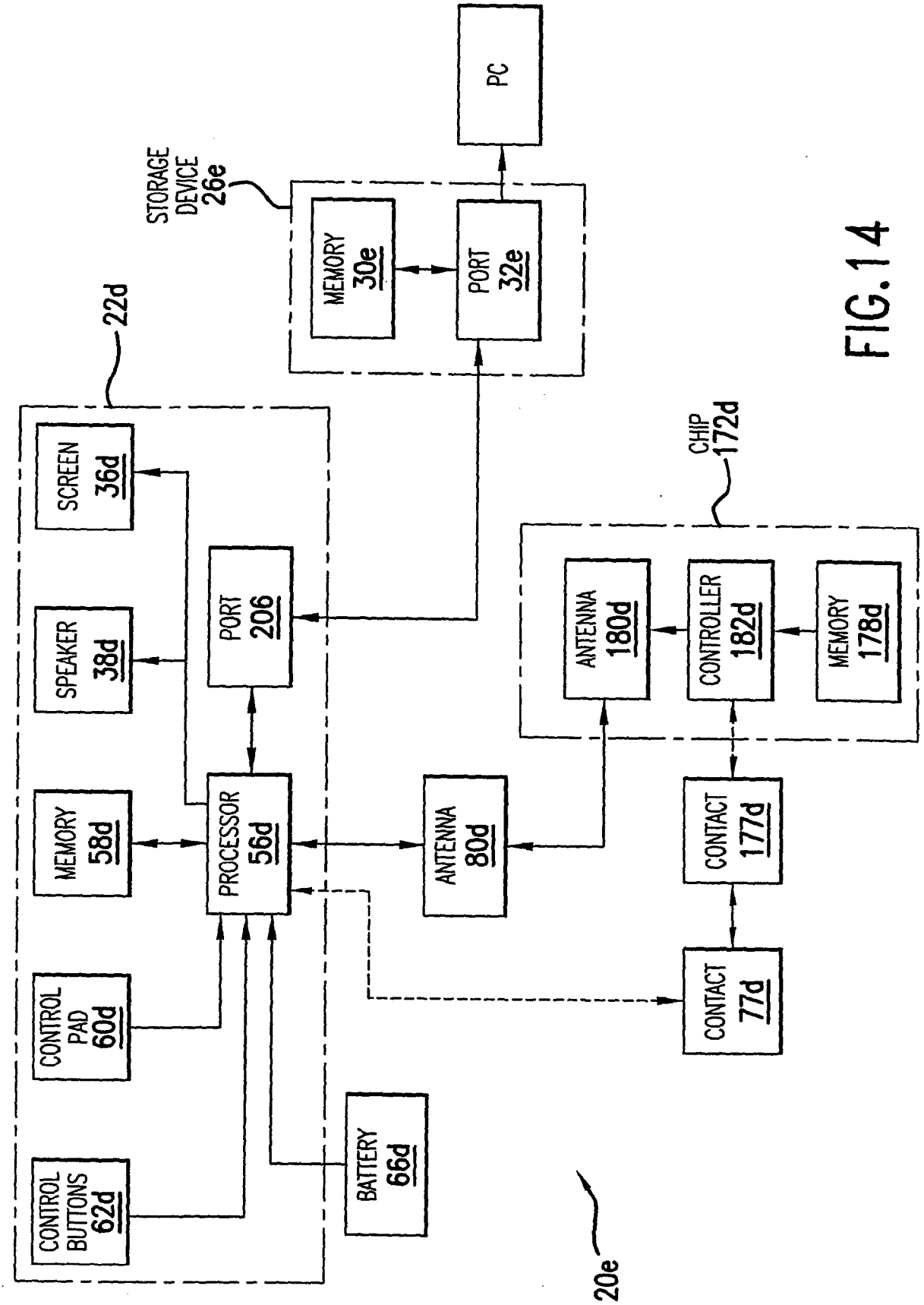

PC
STORAGE DEVICE 26e
MEMORY 30e
PORT 32e
22d
SCREEN 36d
SPEAKER 38d
MEMORY 58d
CONTROL PAD 60d
CONTROL BUTTONS 62d
PORT 206
PROCESSOR 56d
BATTERY 66d
ANTENNA 80d
CHIP 172d
ANTENNA 180d
CONTROLLER 182d
MEMORY 178d
CONTACT 177d
CONTACT 77d
20e

FIG. 14

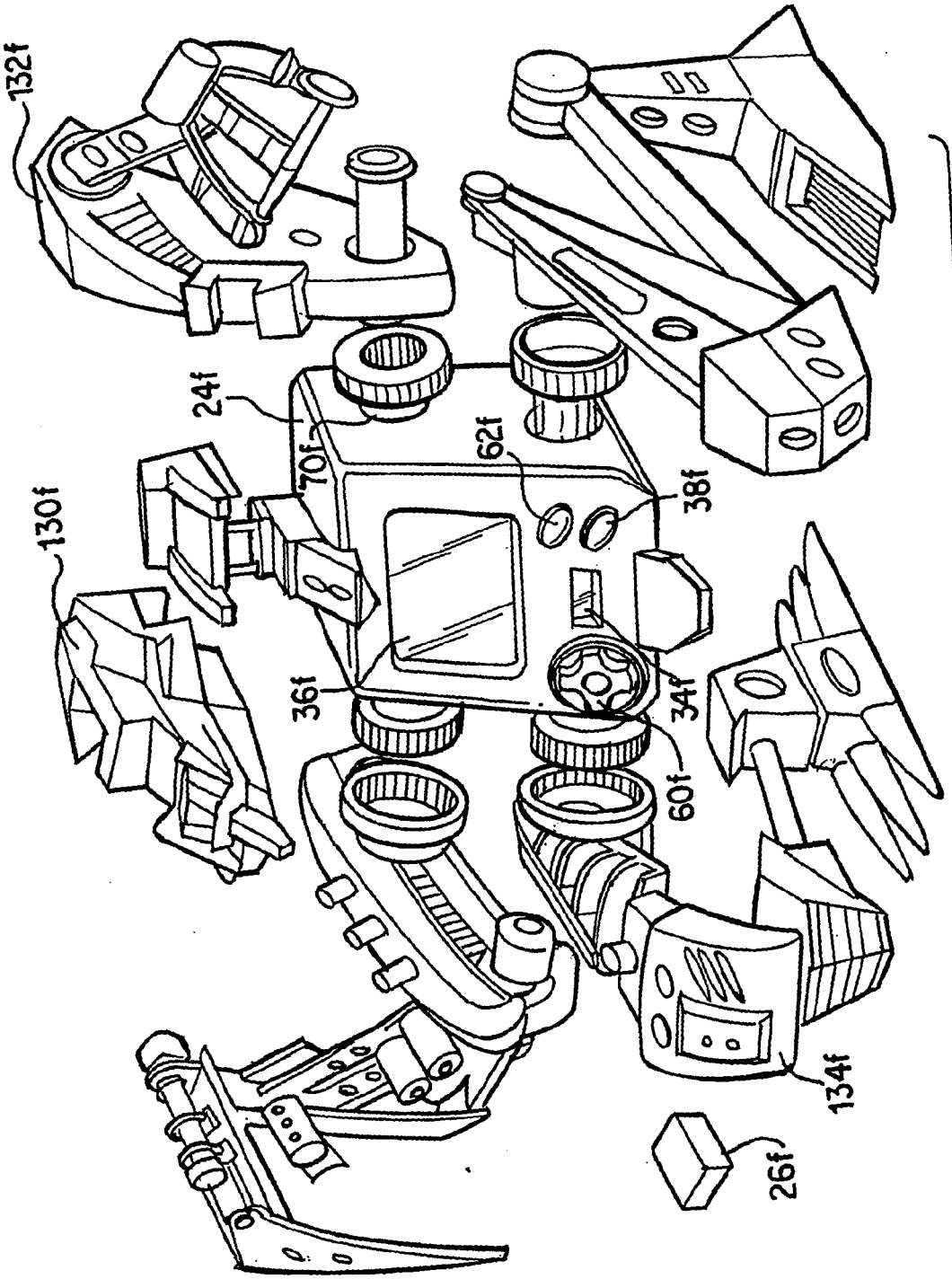
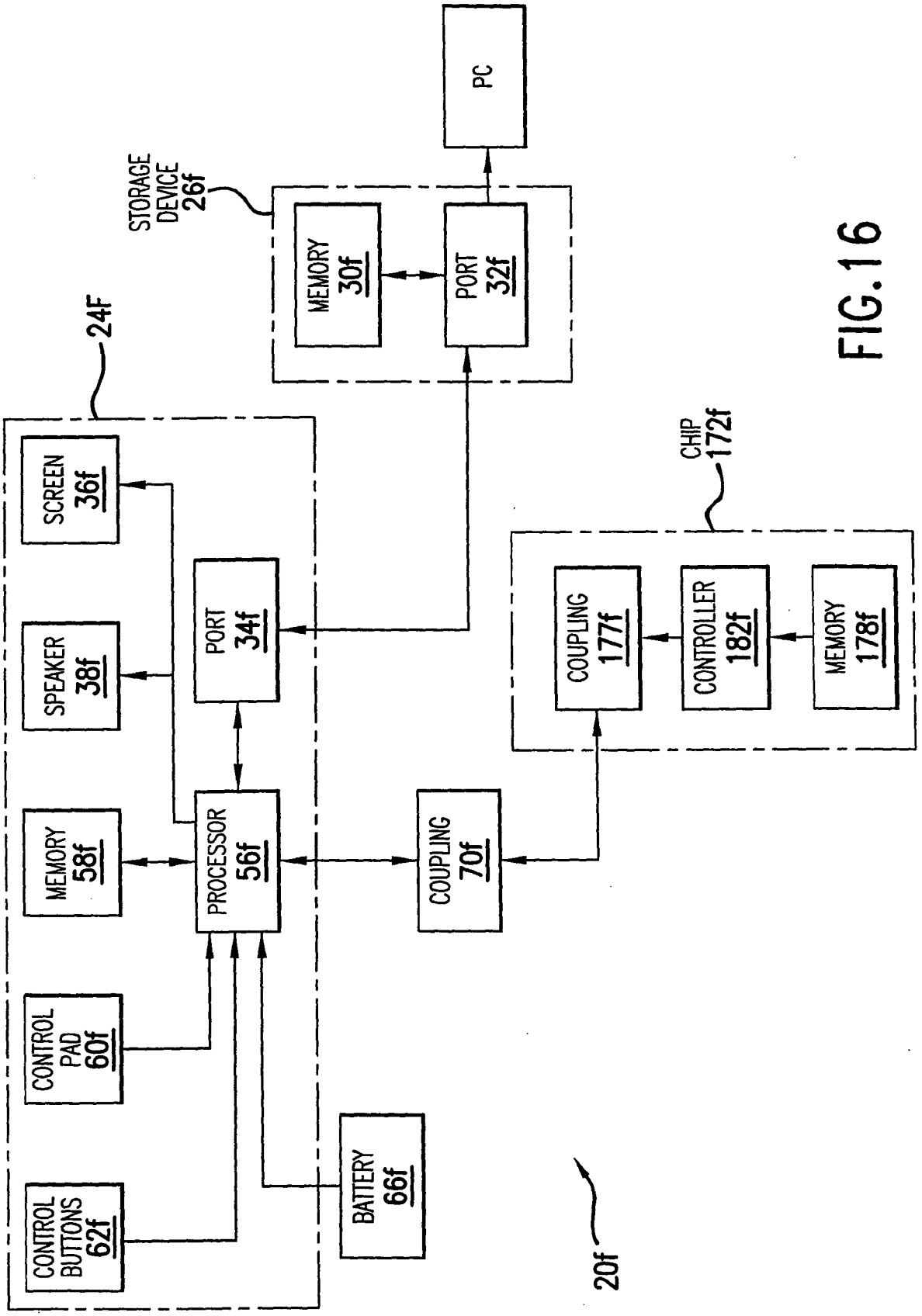


FIG. 15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MEMORY 30f
PORT 32f
24F
SCREEN 36f
SPEAKER 38f
PORT 34f
CHIP 172f
COUPLING 177f
CONTROLLER 182f
MEMORY 178f
MEMORY 58f
PROCESSOR 56f
COUPLING 70f
CONTROL PAD 60f
CONTROL BUTTONS 62f
BATTERY 66f
20f

FIG.16

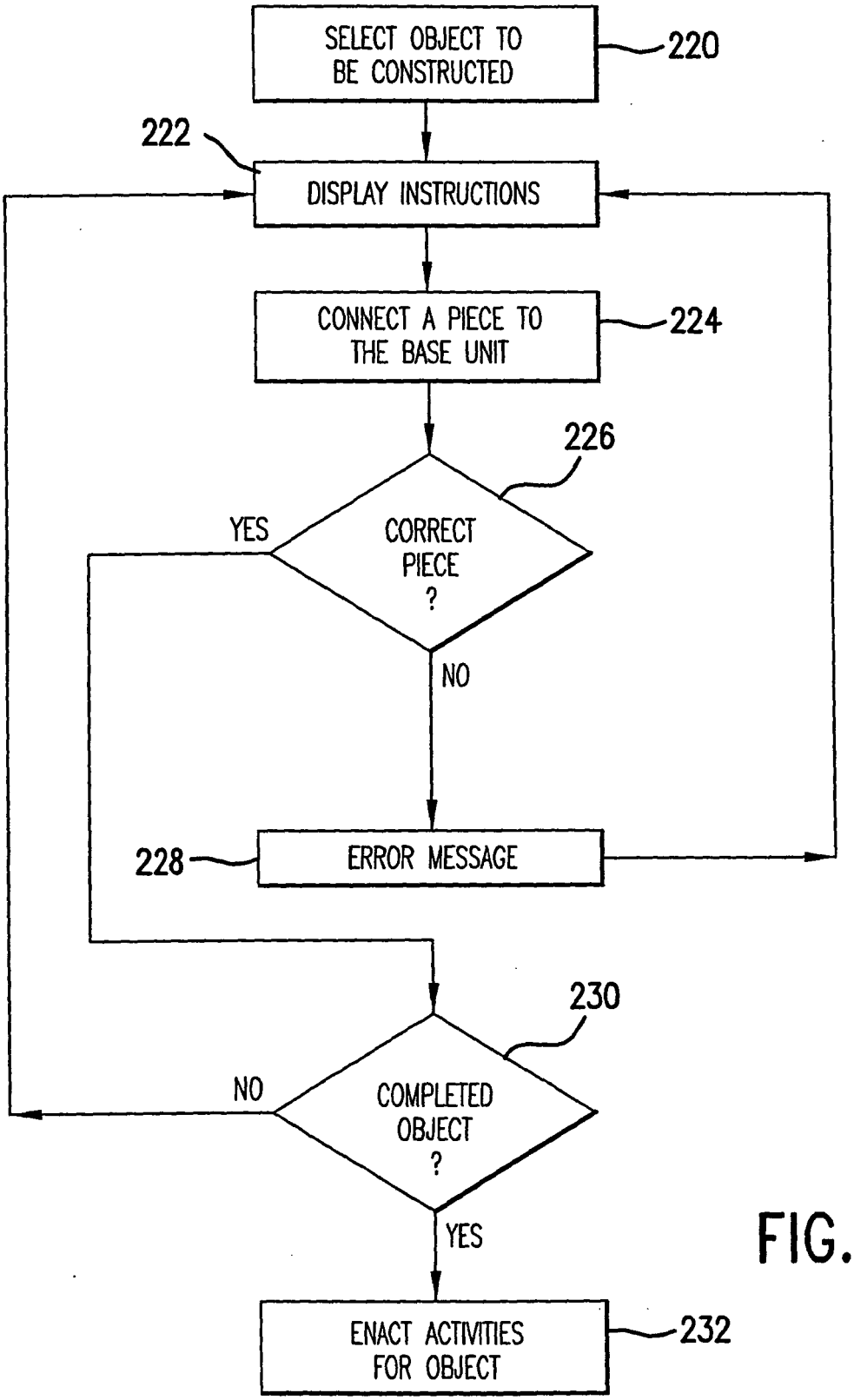
SELECT OBJECT TO BE CONSTRUCTED
220
222
DISPLAY INSTRUCTIONS
CONNECT A PIECE TO THE BASE UNIT
224
226
YES
CORRECT PIECE ?
NO
228
ERROR MESSAGE
230
NO
COMPLETED OBJECT ?
YES
ENACT ACTIVITIES FOR OBJECT
232

FIG.17

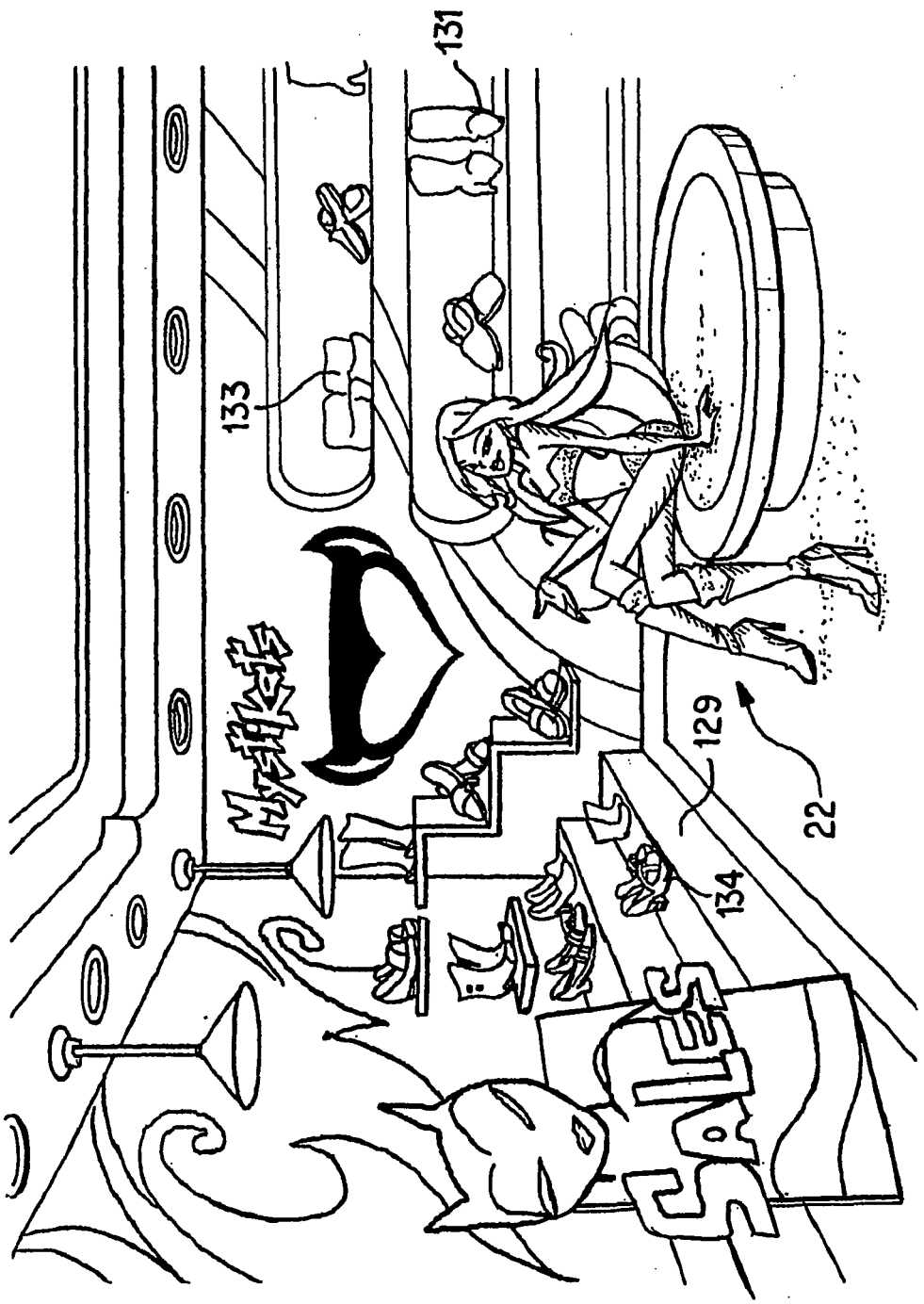

FIG.18

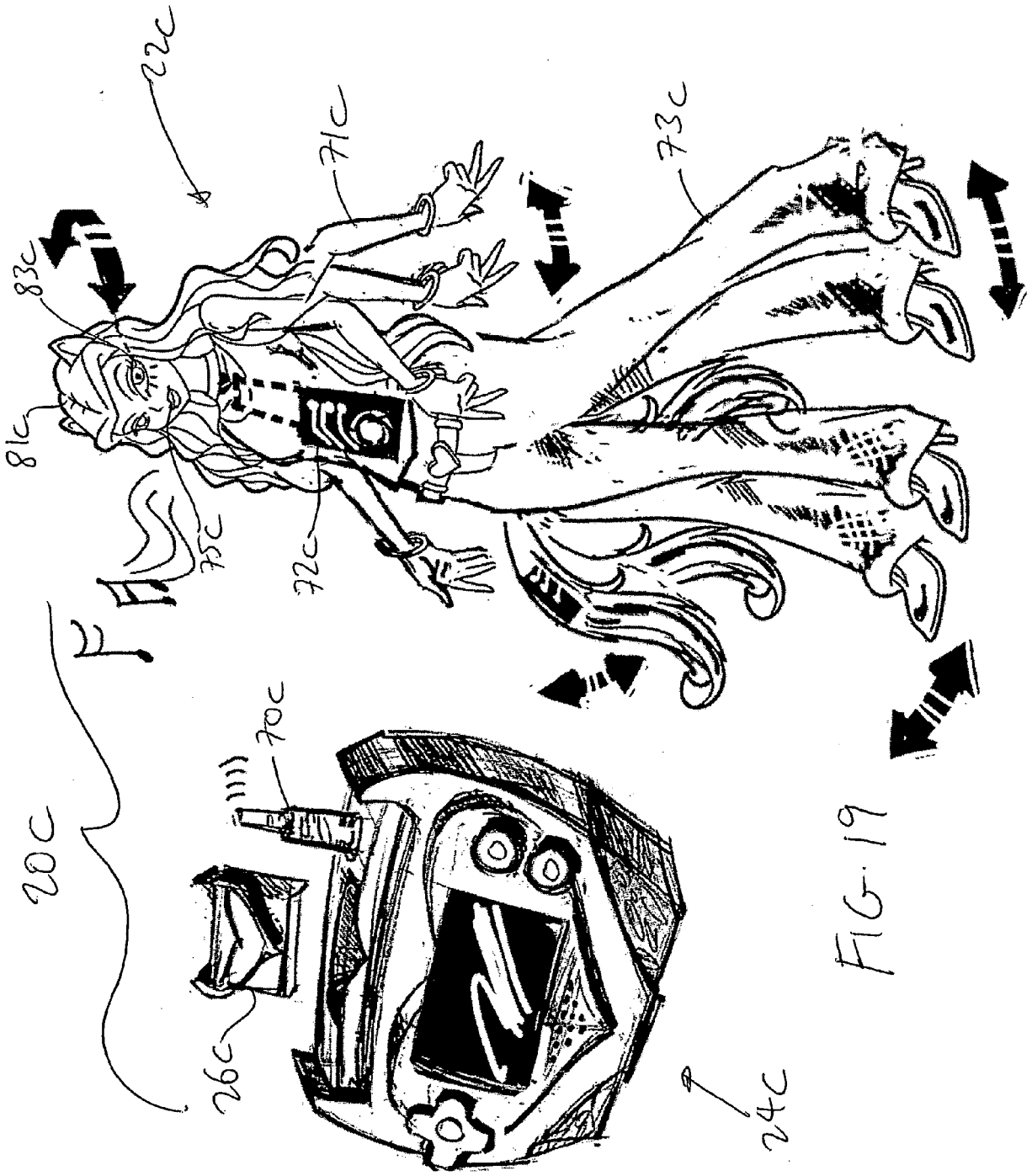

FIG. 19

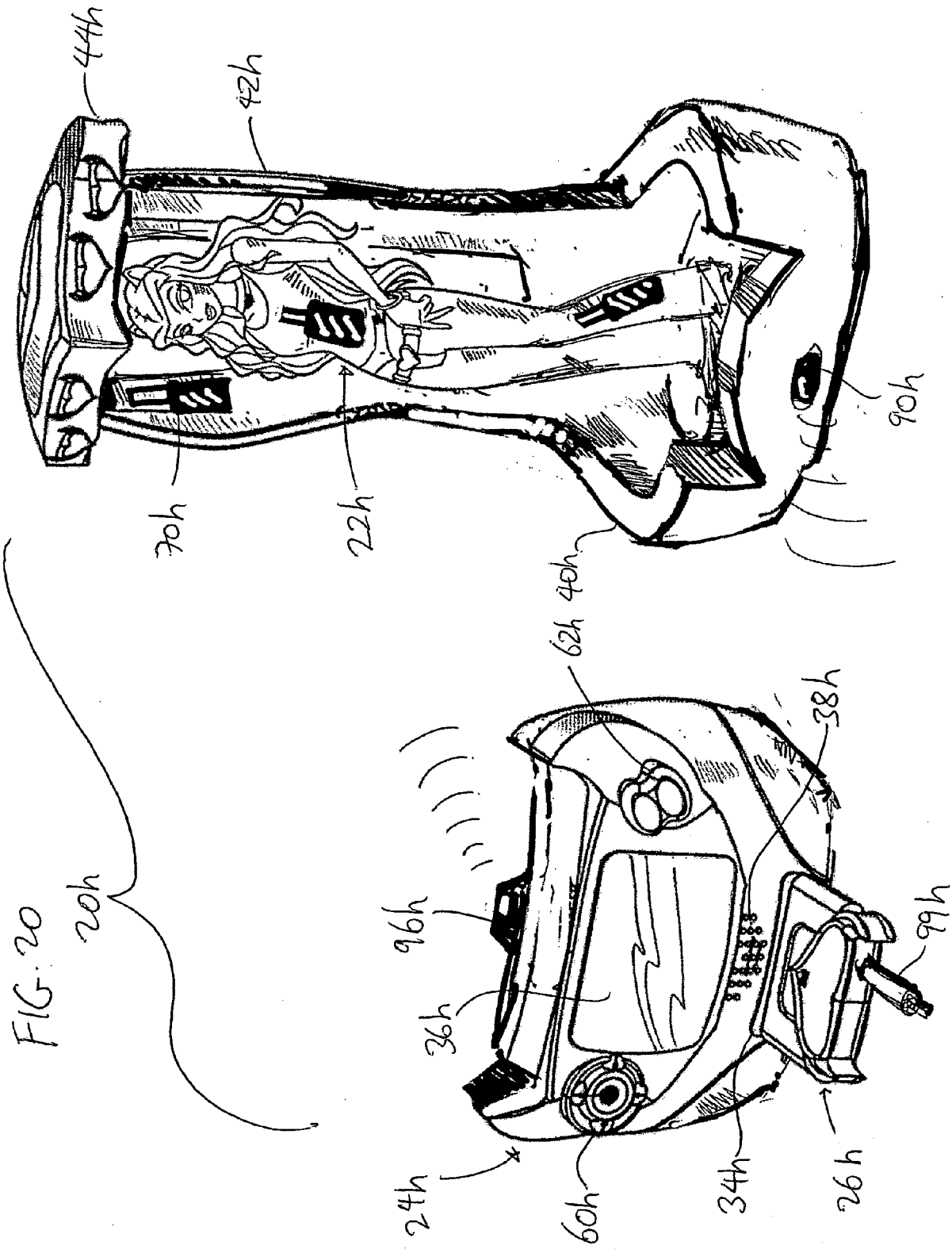

FIG. 20

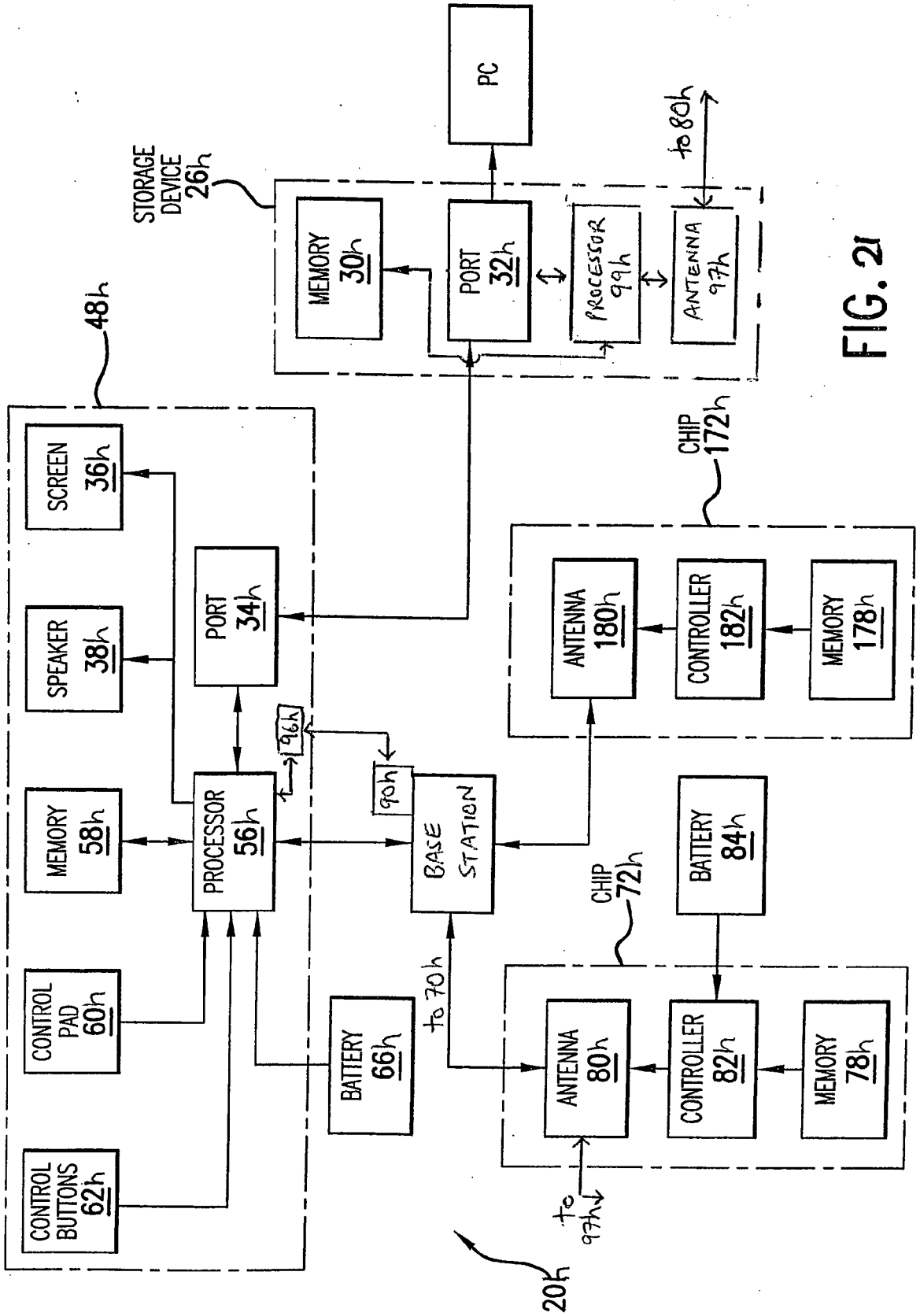
PC
STORAGE DEVICE 26h
MEMORY 30h
PORT 32h
PROCESSOR 99h
ANTENNA 97h
to 80h
48h
SCREEN 36h
SPEAKER 38h
MEMORY 58h
CONTROL PAD 60h
CONTROL BUTTONS 62h
PROCESSOR 56h
PORT 34h
96h
90h
BASE STATION
BATTERY 66h
to 70h
CHIP 172h
ANTENNA 180h
CONTROLLER 182h
MEMORY 178h
CHIP 72h
BATTERY 84h
ANTENNA 80h
CONTROLLER 82h
MEMORY 78h
to 97h
20h

FIG. 21

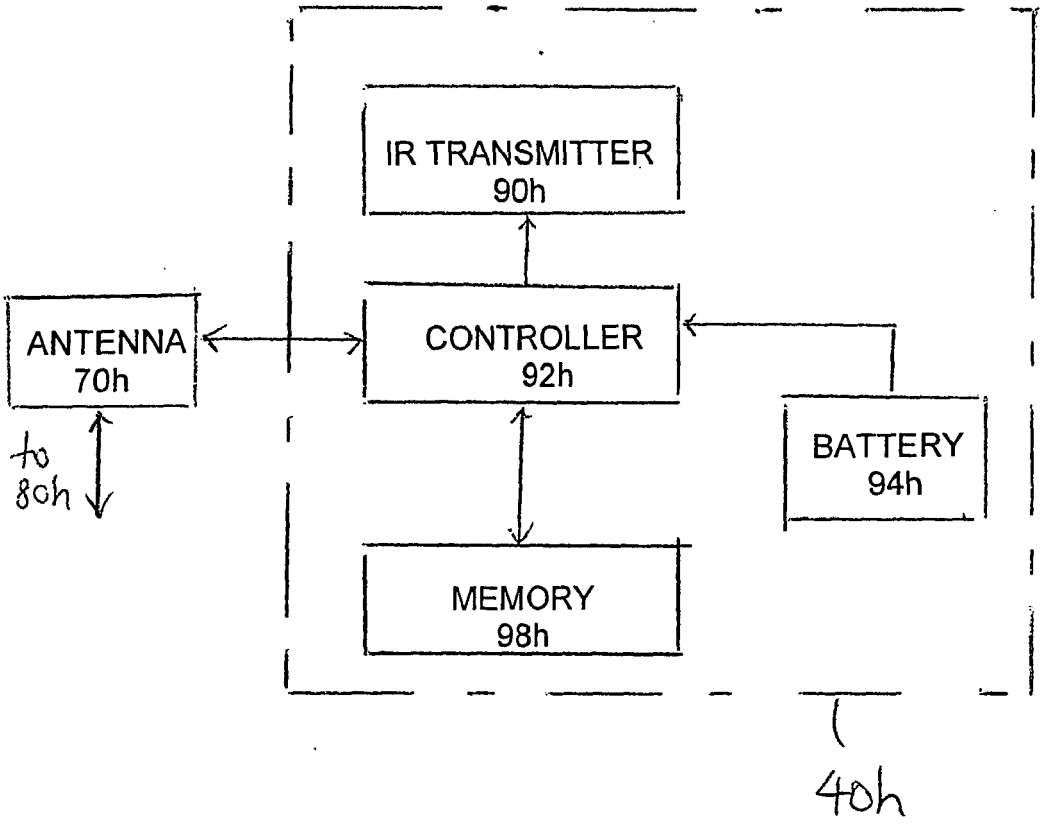
IR TRANSMITTER
90h
ANTENNA
70h
CONTROLLER
92h
BATTERY
94h
to
80h
MEMORY
98h
40h

FIG. 22

REFERENCES CITED IN THE DESCRIPTION

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- US 5607336 A, Lebensfeld **[0002]**
- US 6648719 B, Chan **[0002] [0042]**
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