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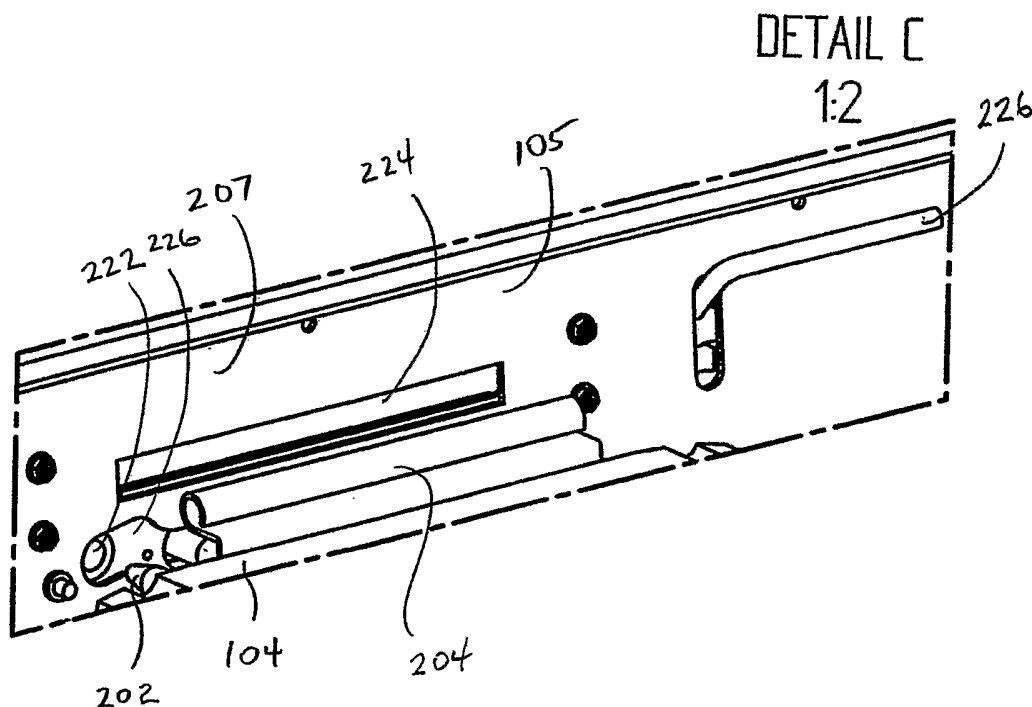
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[Continued on next page]

(54) Title: CHAIR INTERCONNECTION FOR A GAMING MACHINE



(57) Abstract: A gaming system a chair having a base and a mechanical connector mounted to the base, and a gaming machine having a rotary locking mechanism to mate with the mechanical connector of the chair to latch the base to the gaming machine. The gaming machine and base can include an electrical connection.



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CHAIR INTERCONNECTION FOR A GAMING MACHINE

Cross-Reference to Related Application

5 This application claims the benefit under 35 U.S.C. 119 (e) of U.S. Provisional Application No. 60/640,350 filed on December, 30 2004, which is hereby incorporated by reference in its entirety. This application is related to United States Provisional Patent Application Serial No. 60/575,604, entitled “SPEAKER SYSTEM FOR A GAMING MACHINE” (Attorney Docket
10 1842.066PRV) and is also related to United States Provisional Patent Application Serial No. 60/575,605, entitled “CHAIR INTERCONNECTION FOR A GAMING MACHINE” (Attorney Docket 1842.067PRV) and is also related to United States Provisional Patent Application Serial No. 60/575,153, entitled “GAMING DEVICE WITH ATTACHED AUDIO-CAPABLE CHAIR” (Attorney Docket
15 1842.068PRV), all filed on May 28, 2004, and all of which are hereby incorporated by reference herein for all purposes.

FIELD

The invention relates generally to gaming systems, and more specifically to chair interconnections for gaming systems.

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BACKGROUND

A wide variety of gaming devices are now available to game players and to gaming establishment operators in computerized form, from slot machines to games that are traditionally played live such as poker and blackjack. Computerized video game systems must provide sufficient feedback to the gamer to make the game fun to play, and they must provide a gaming experience that is at least as attractive as the older mechanical gaming machine experience to the gamer, to ensure success in a competitive gaming market. A chair for a gaming device can be mechanically and electrically coupled to the gaming device via a sled.

SUMMARY

A gaming system a chair having a base and a mechanical connector mounted to the base, and a gaming machine having a rotary locking mechanism to mate with the mechanical connector of the chair to latch the base to the gaming machine. The gaming machine and base can include an electrical connection.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows the general environment for a gaming system according to one embodiment.

Figure 2A shows a rear perspective view of a base and gaming machine interconnection system, in accordance with one embodiment.

Figure 2B shows further details of the interconnection system of Figure 2A.

Figure 3A shows a front perspective view of the interconnection system of Figure 2.

Figure 3B shows further details of the view of Figure 3A.

Figure 4A shows a top view of the interconnection system of Figure 1.

Figure 4B shows a side section view of Figure 4A.

Figure 4C shows a detail of Figure 4B.

Figure 5A shows a top view of the interconnection system of Figure 1.

Figure 5B shows a side section view of Figure 5A.

Figure 5C shows a detail of Figure 5B.

Figure 6A shows a top view of the interconnection system of Figure 1.

Figure 6B shows a side section view of Figure 6A.

5 Figure 6C shows a detail of Figure 6B.

DETAILED DESCRIPTION

In the following detailed description, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments
10 are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that the embodiments may be combined or that other embodiments may be utilized and that structural changes may be made without departing from the spirit and scope of the invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the
15 invention is defined by the appended claims and their equivalents.

Note that in the description, references to “one embodiment” or “an embodiment” mean that the feature being referred to is included in at least one embodiment of the invention. Further, separate references to “one embodiment” in
20 are such embodiments mutually exclusive, unless so stated and except as will be readily apparent to those of ordinary skill in the art. Thus, embodiments of the invention can include any variety of combinations and/or integrations of the embodiments described herein.

As used herein, the term “gaming machine” refers to a machine into which a
25 coin or token is deposited, or which is activated by a card or token associated with data regarding non-monetary chattel, to play a game that uses a video display or an electromechanical device with a spinning reel. The gaming machines include slot

machines and push button machines. The gaming machines include coin operated machines and machines having a serial interface. Gaming machines also include gaming tables capable of being initiated by a card or token. Gaming machines can be stand-alone or they can be mounted on a stand. As used herein, gaming machine
5 also refers to the stand for the gaming machine, if one is provided.

Figure 1 shows the general environment for a gaming system according to one embodiment. In this example, the system includes chair 100 electrically and mechanically coupled to a gaming machine 102. Gaming machine 102 can be a gaming machine such as a slot machine, for example. It can be stand-alone or
10 mounted on a stand, for example. In one embodiment, chair 100 is coupled to the gaming machine via a base 104, such as a sled. In some embodiments, the electrical connection between chair 100 and gaming machine 102 is omitted and chair 100 is only mechanically coupled to the gaming machine.

In one embodiment, the system further includes electronics, such as a
15 speaker package 110 incorporated into chair 100 and coupled via an electrical connection 112 to gaming machine 102. Gaming machine 102 includes hardware and software and produces sound signals which are delivered to speaker package 110. Speaker package 110 provides sound effects, game noises, and other audio effects from gaming machine 102. In one example, electrical connection 112 runs
20 through base 104 from machine 102 to speaker package 110 in the chair. In other examples, other electrical signals can be delivered to other types of electronics in the chair, for example video signals or power signals for lights. In other embodiments, the gaming machine includes speakers and the sound signals are delivered to the gaming machine speakers instead of, or in addition to, the chair speakers.

25 Chair 100 generally includes a back 120 and a seat 125. The chair is swivel mounted to a seat post 130. Seat post 130 is at least partially hollow to allow connection 112 to run through the post. An access panel 135 can be provided in the

seat post 130 to allow access to connection 112 to allow a user to connect wires running from speaker package 110 to a electrical connection 107 in base 104. Electrical connection 107 can be a circuit board or a flex cable, for example. Base 104 is removably connectable to gaming machine 102, both mechanically and electrically, at a connection assembly 105 coupled to machine 102. This allows for easier installation and maintenance than a permanent connection. Electrical signals from the machine go to a connector coupled to the cabinet of game machine 102 which mates with a connector on base 104 of the chair.

Figures 2A and 2B show a perspective view of base 104 and game machine connection assembly 105, in accordance with one embodiment. Extending from a front end of the base is a guide pin 202 which is for engaging with a guide pin receiver 222 on the gaming machine. A second guide pin and pin receiver are located on the other side of the front end of the sled, but are not shown on Figure 2B. At the front end of base 104 is a rigidly mounted mechanical coupling member, such as a cross-pin 204. Cross-pin 204 extends outward from the front end of the base and has a longitudinal orientation parallel with the front end of the sled. In one embodiment, cross-pin 204 includes a folded or curled metal piece defining a tubular structure. In other examples, the cross-pin can be a solid member. Cross-pin 204 is located so as to go through a slot opening 224 exposed through a front plate 207 of the connection assembly 105. As will be discussed in further detail below, cross-pin 204 is part of a rotary locking mechanism, in accordance with one embodiment.

After being inserted through opening 224, cross-pin 204 enters a mechanical locking member, such as a tubular locking member which has a cut-away section allowing the cross-pin to enter the interior of the tubular locking member. The tubular locking member is operatively coupled to a removable actuator 226 which is accessible on the front side of the gaming machine. When actuator 226 is inserted

and then rotated downward, the tubular locking member rotates and holds cross-pin 204 in place within the interior of the tubular locking member.

Figures 3A and 3B show a rear perspective view of base 104 and connection assembly 105. Mounted to a back side of plate 207 is a housing 320. Located within housing 320 is a mechanical coupling member, such as a tubular locking member 302. In one embodiment, tubular locking member 302 includes ends which protrude from holes at each end of housing 320 and pins 304 hold the tubular member in position. A portion of actuator 226 can be seen extending through front plate 207. Again, as actuator 226 is rotated downward, tubular locking member 320 rotates to encompass and hold cross-pin 204 (Fig. 2B).

In one embodiment, a mounting plate 310 is float-mounted to front plate 207 and is located behind opening 227 (FIG. 2B). In this example, both ends of plate 310 are mounted to the front plate by bolts 312 with springs 314 located between a head of the bolt and the plate. The springs 314 allow plate 310 to move back and forth relative to front plate 207. In one example, springs 314 are attached to plate 310 and the holes in the plate for bolts 312 are larger than the bolt diameter. This allows plate 310 to translate left and right, up and down, and diagonally relative to front plate 207. This allows substantial misalignment between the base 104 and the gaming machine and allows for tolerance to mount the electrical connection together. For example, as pins 202 (Fig. 2B) reach receivers 222, they may be off-line by about ¼" to about ½" or so depending on the floor surface, for example. As the pins enter the receivers, the spring-loaded plate adapts to the misalignment and can move up/down, left/right, or diagonally, as needed. Moreover, this is a blind-mate connection system and the user does not manually manipulate the interconnection. Accordingly the system automatically adjusts as necessary.

Electrical connector 330 is also mounted to plate 310. In one example, connector 330 is float-mounted to plate 310, allowing for further adjustment

between the connector on the sled and connector 330 when the connectors are mated. Thus, as the sled is being pushed toward the gaming machine, plate 310 can adjust depending on the alignment of pins 202 and receivers 222, and then connector 330 can adjust depending on the relative alignment between the sled connector and
5 itself. In some embodiments, the electrical connector 330 is rigidly mounted to plate 310.

Figure 4A shows a top view of the system. Figure 4B shows a section of Figure 4A and Figure 4C shows further details of connection assembly 105. Figure 4C shows the base 104 separated from connection assembly 105 before being
10 connected. In one embodiment, base 104 includes an electrical connector 410 coupled to a front end of the sled. The electrical connector 410 is exposed on the front end and is located below a top surface 404 of base 104. This helps prevent a user from intentionally or unintentionally accessing the connection. Connector 410 is operatively coupled to the electronic devices in the game seat via electrical
15 connection 415.

In one embodiment, connector 410 on base 104 is a receptacle side of a blind-mate drawer connector. One embodiment uses Tyco Electronics AMP 213974-1, for example. Connector 330 can be a blind-mate drawer style connector from AMP with up to 30 contacts (AMP part number 213973-1), for example. The
20 plug side of connector 330 floats and has alignment guides. Connector 410 can be rigidly fixed to base 104 with the connector mating occurring when the base 104 is moved towards connection assembly 105. Alignment between the base 104 and connection assembly 105 is configured to ensure that the base, and thus the connectors 330, 410 are aligned in the horizontal and vertical direction prior to the
25 connector housings coming into contact with each other, since guiding pin 202 extends farther forward than connector 410. Accordingly, pin 202 is pushed into guiding hole receiver 222 (Figure 2B) before the connector 410 contacts its mating

connector 330. Again, receiver 222 and connector 330 are both located on the spring-loaded plate 310 and thus allow for misalignment to be overcome. Furthermore, connector 330 can be float-mounted to plate 310. In some embodiments, the connector on the base can be float mounted and the connector on the gaming machine is fixed.

As the electrical connection is made between connectors 330 and 410, cross-pin 204 enters tubular locking member 302 and actuator 226 is rotated downward to latch the base 104 to the connection assembly 105. In this embodiment, front plate 207 includes an overhanging lip 402 to help stiffen the plate.

Figure 5A shows a top view of the system. Figure 5B shows a section of Figure 5A and Figure 5C shows further details of connection assembly 105 and base 104, in accordance with one embodiment.

Figure 5C shows a section view of base 104 pushed into assembly 105. Pin 202 has extended through guide hole receiver 222, and the electrical connector 330 on spring-loaded plate 310 is electrically mated to connector 410 on the base.

Figure 6A shows a top view of the system. Figure 6B shows a section of Figure 6A and Figure 6C shows further details of connection assembly 105, in accordance with one embodiment.

Figure 6C shows a cross-section of base 104 coupled to connection assembly 105. Actuator 226 has been rotated downward to lock or latch cross-pin 204 within tubular locking member 302. An end 602 of actuator 226 pushes a spring-loaded pin 606 into a cut-out 604 in housing 320. When the actuator 226 is removed, pin 606 will be biased inward toward the center and hold member 302 in place. This in turn holds the cross-pin 204 and the sled in place. To release the sled, the actuator 226 is inserted until it pushes pin 606 back into cut-out 604 and then the actuator is rotated upward. Some embodiments include a second spring-loaded pin at the second cut-out located 90 degrees from cut-out 604.

In some embodiments, member 302 can be mounted such that its rotational center is offset from its geometric center. Thus, when it is rotated it will further pull in the cross-pin 204 to help seat the electrical connection, for example.

5 In some embodiments, the system provides for substantially simultaneous mechanical and electrical connection. The blind-mate system allows the electrical and mechanical connectors to be situated such that the connections happen substantially simultaneously and without undue adjustment by the installer.

To mechanically couple the chair to the machine, the base is slid towards the machine and latched to the machine using the rotary latching mechanism discussed
10 above.

To electrically and mechanically connect the chair to the machine, the base is slid towards the machine and guided as discussed above. The base is then latched to the machine using one of the techniques described above or another latching system. The rotary latching mechanism provides a secure retention technique of the base and
15 connector, while providing a stress-free electrical connection. This is important if somebody lifts the chair for example. In other words, the mechanical coupling holds the units together tightly enough that twisting one or the other does not effect the electrical connection. Also, the floating connection allows for mounting the base on either hard floors or carpeting.

20 To remove the base, for example, for maintenance reasons, the actuator is rotated and the electrical and mechanical connections are decoupled as the base is slid away from the machine.

The above description is intended to be illustrative, and not restrictive. Many other embodiments will be apparent to those of skill in the art upon reviewing
25 the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled.

What is claimed is:

1. A system comprising:
a chair having a base and a mechanical connector mounted to the base; and
5 a gaming machine having a rotary locking mechanism to mate with the
mechanical connector of the chair to latch the base to the gaming machine.
2. The system of claim 1, wherein the rotary locking mechanism includes a
tubular member and the mechanical connector of the base includes a cross-pin, with
10 the tubular member adapted to receive the cross-pin of the chair base.
3. The system of claim 1, wherein the gaming machine includes one or more
receivers to guide one or more guide pins of the base.
- 15 4. The system of claim 3, wherein the one or more receivers are float-mounted
to the gaming machine.
5. The system of claim 4, wherein the receivers are mounted to a spring-
mounted plate.
20
6. The system of claim 1, further including an electrical connector on the
gaming machine to mate with an electrical connector on the base.
7. A system comprising:
25 a chair having an electrical connector mounted to a base of the chair and a
mechanical connector mounted to the base; and

a gaming machine having an electrical connector to mate with the electrical connector of the chair and a mechanical connector to mate with the mechanical connector of the chair, wherein the mechanical connector includes a rotary locking mechanism.

5

8. The system of claim 7, wherein the electrical connector on the gaming machine is float-mounted to the gaming machine and one or more guide pins on the base mate with float-mounted receivers on the gaming machine

10 9. The system of claim 7, wherein the electrical connector on the gaming machine is mounted to a plate which is spring mounted to the gaming machine.

10. The system of claim 7, wherein the receivers are mounted to a spring-mounted plate.

15

11. The system of claim 7, wherein the electrical connector on the base is rigidly connected to the base.

12. The system of claim 7, wherein the electrical and mechanical connectors are
20 situated such that the connections happen substantially simultaneously.

13. The system of claim 7, wherein the chair includes electronics and an electrical connection runs from the electronics through the base and towards a front of the base.

14. An apparatus comprising:
a connection assembly mountable to a gaming machine, the connection assembly including an electrical connector float-mounted to the gaming machine and a mechanical coupling member, wherein the mechanical coupling member
5 includes a tubular member adapted to receive a mating cross-pin of a chair base to latch the base to the gaming machine.
15. The apparatus of claim 14, wherein the electrical connector on the gaming machine is mounted to a plate which is spring-mounted to the gaming machine.
10
16. The system of claim 15, wherein the plate further includes receivers to mate with pins on the chair base.
17. The apparatus of claim 14, wherein the connection assembly includes one or
15 more receiver holes to guide a guide pin of the base of the chair when the base is mounted to the assembly.
18. A method comprising:
sliding a chair base toward a gaming machine;
20 electrically coupling the chair base to the gaming machine via a floating connector on the gaming machine; and
mechanically coupling the chair base to the gaming machine by receiving a pin member on the base into a tubular member on the gaming machine.
- 25 19. The method of claim 18, wherein electrically coupling includes electrically coupling a speaker attached to the chair to the gaming machine.

20. The method of claim 18, wherein electrically coupling includes coupling a receptacle connector on the base to a plug connector on the gaming machine.
21. A system comprising:
5 a gaming machine having an electrical connector and a mechanical connector;
a chair having a base, the base having a mechanical connector to mate with the mechanical connector of the gaming machine and an electrical connector to mate with the electrical connector of the gaming machine, wherein the base electrical
10 connector is exposed on a front end of the base and is located below a top surface of the base.
22. The system of claim 21, wherein the mechanical connector on the base is higher than the top surface of the base.
- 15 23. The system of claim 21, wherein one or more guide pins on the base mate with float-mounted receivers on the gaming machine.
24. The system of claim 21, wherein the electrical connector on the gaming
20 machine is float-mounted to the gaming machine.

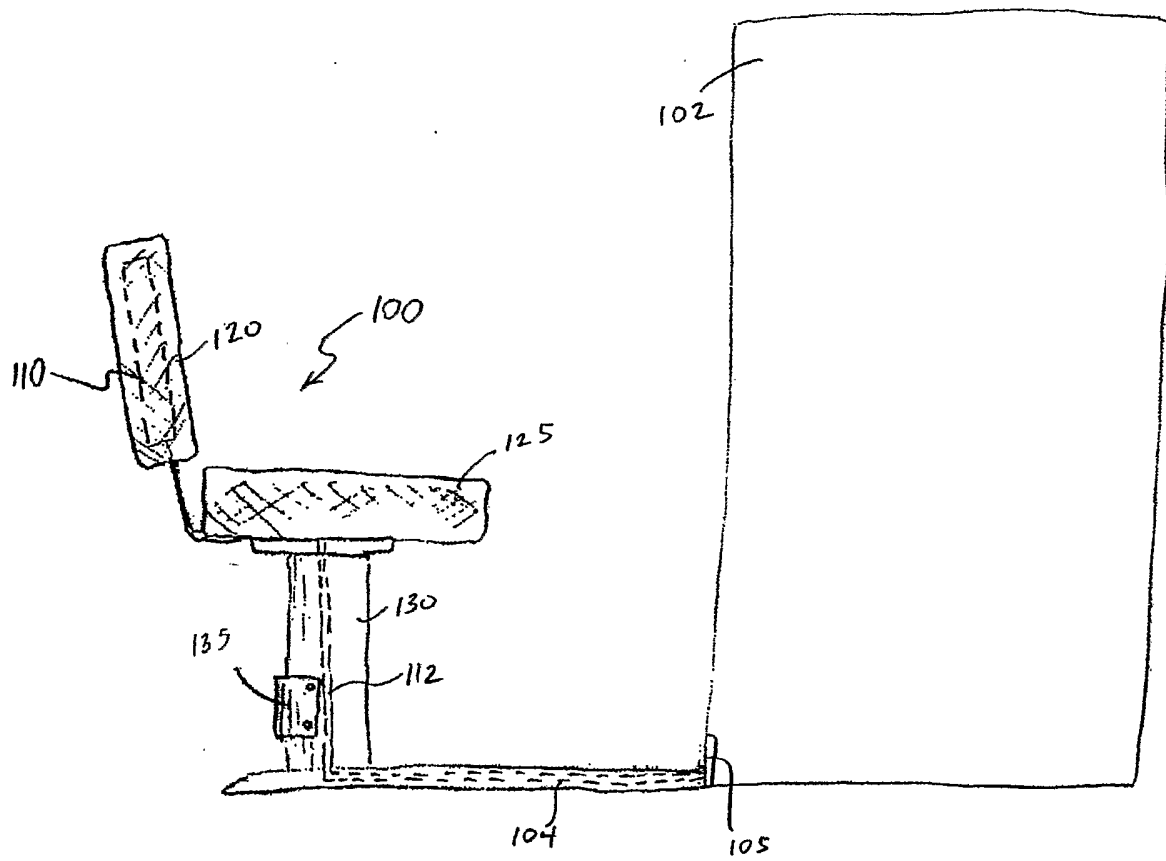


FIG. 1

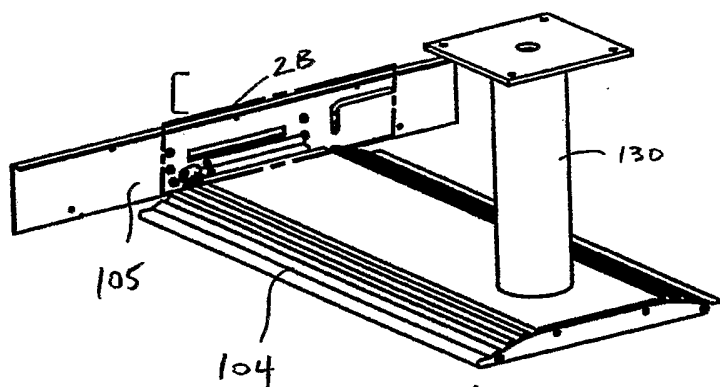


FIG. 2A

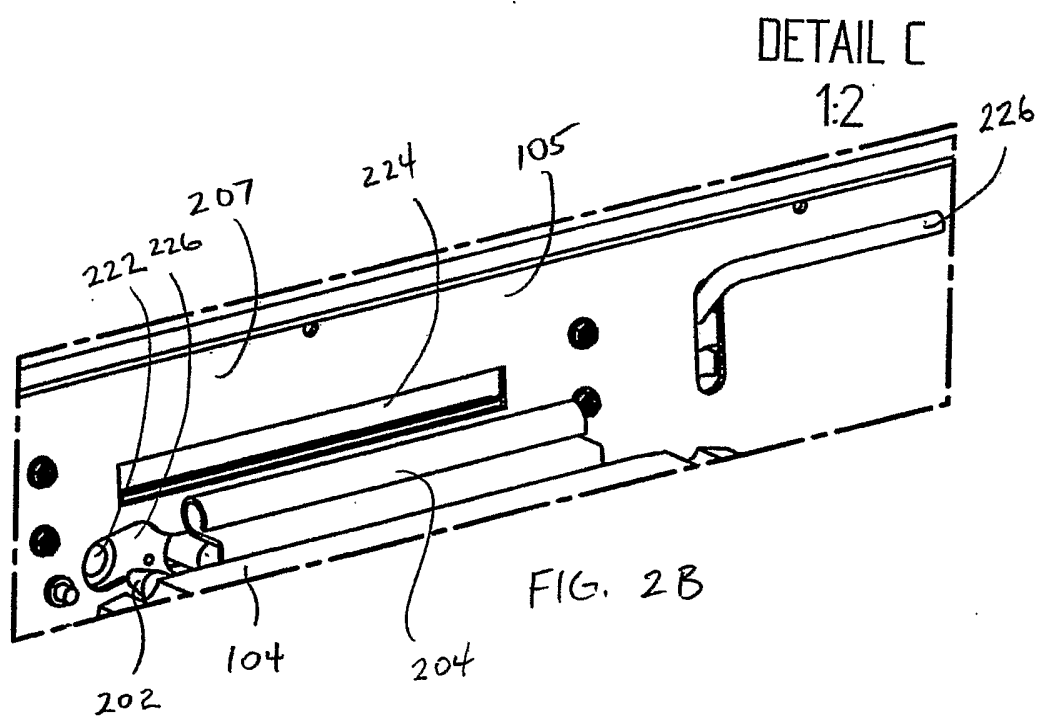
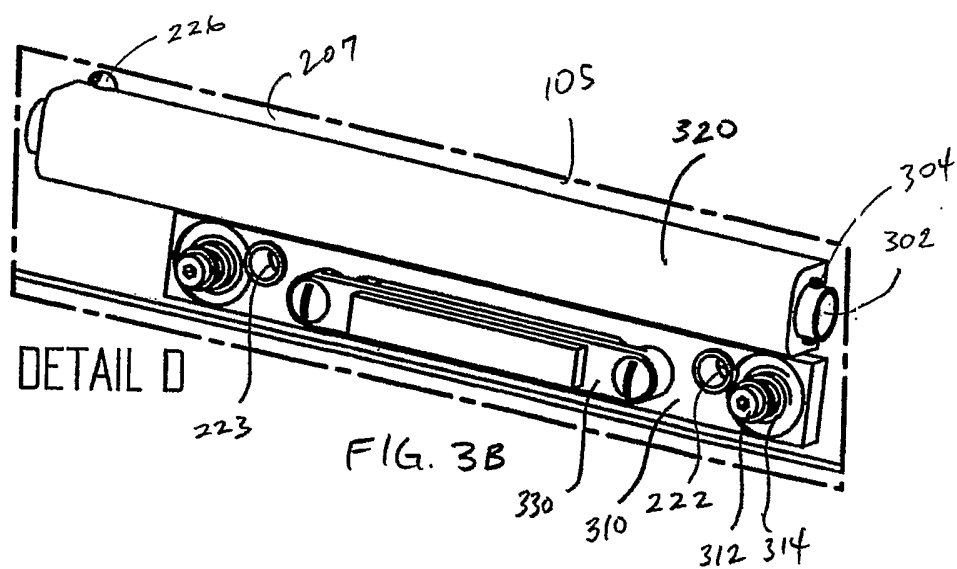
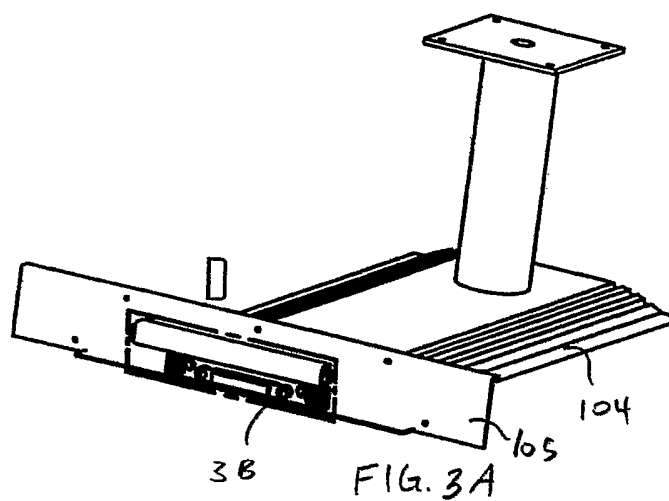
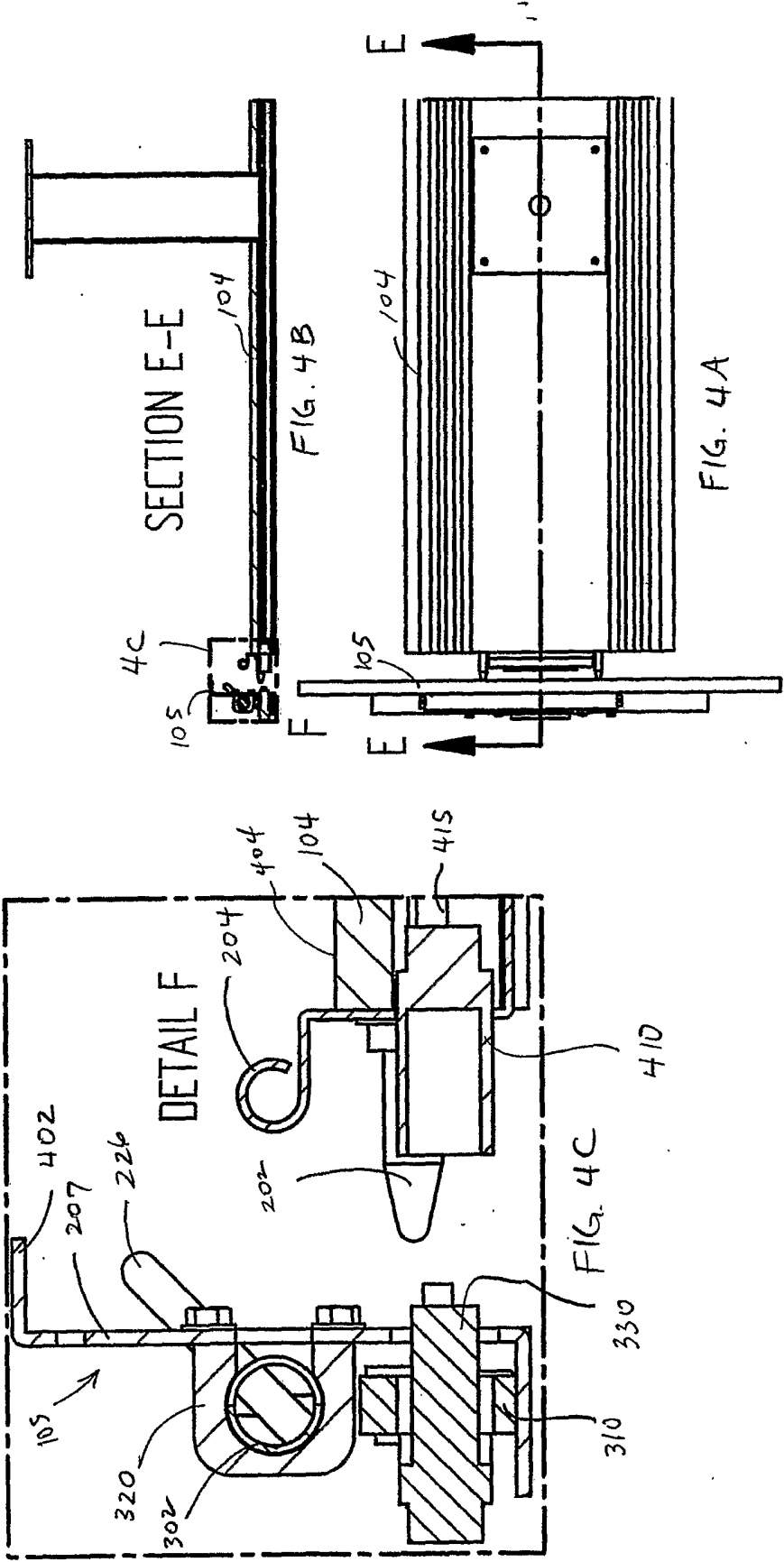


FIG. 2B





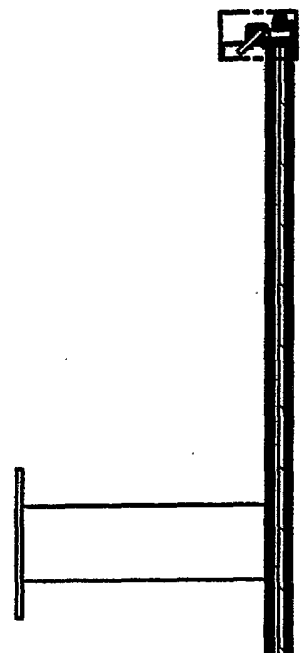


FIG. 5B SECTION A-A B

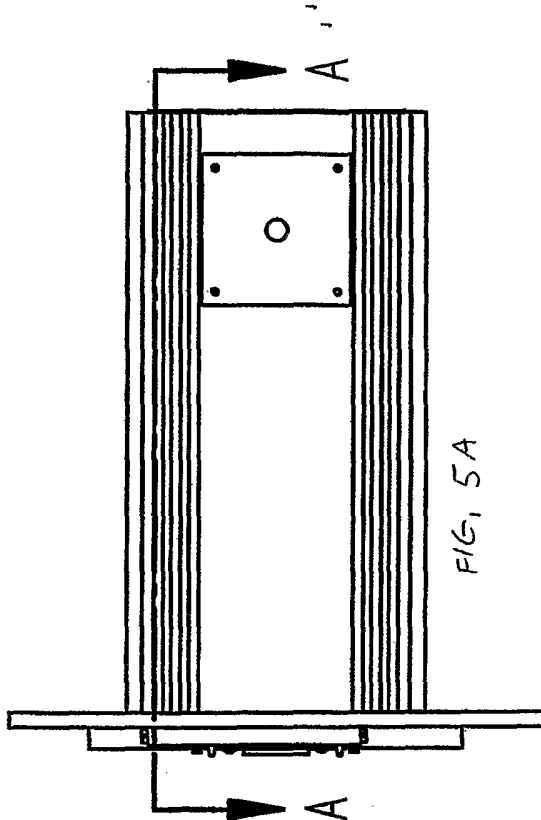
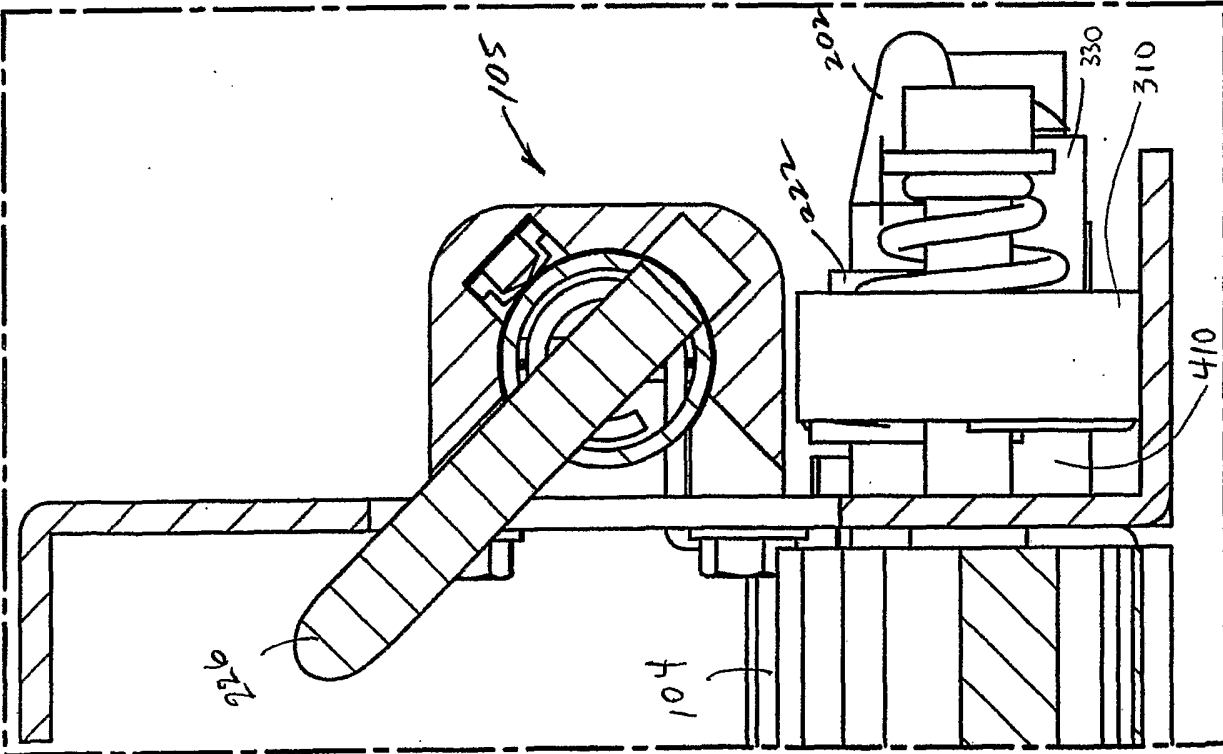
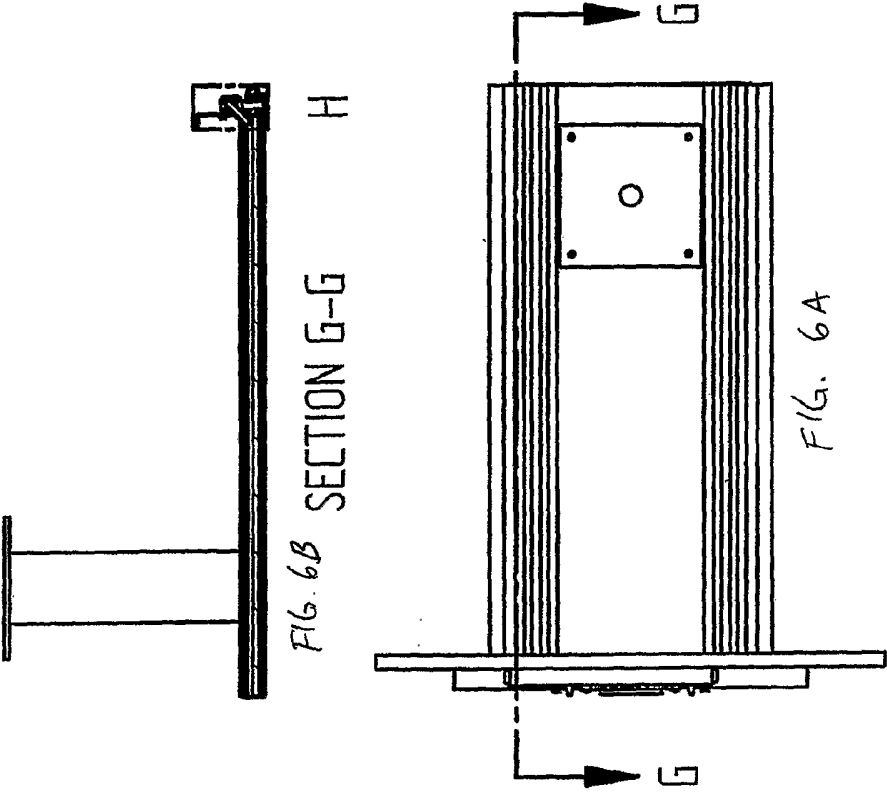
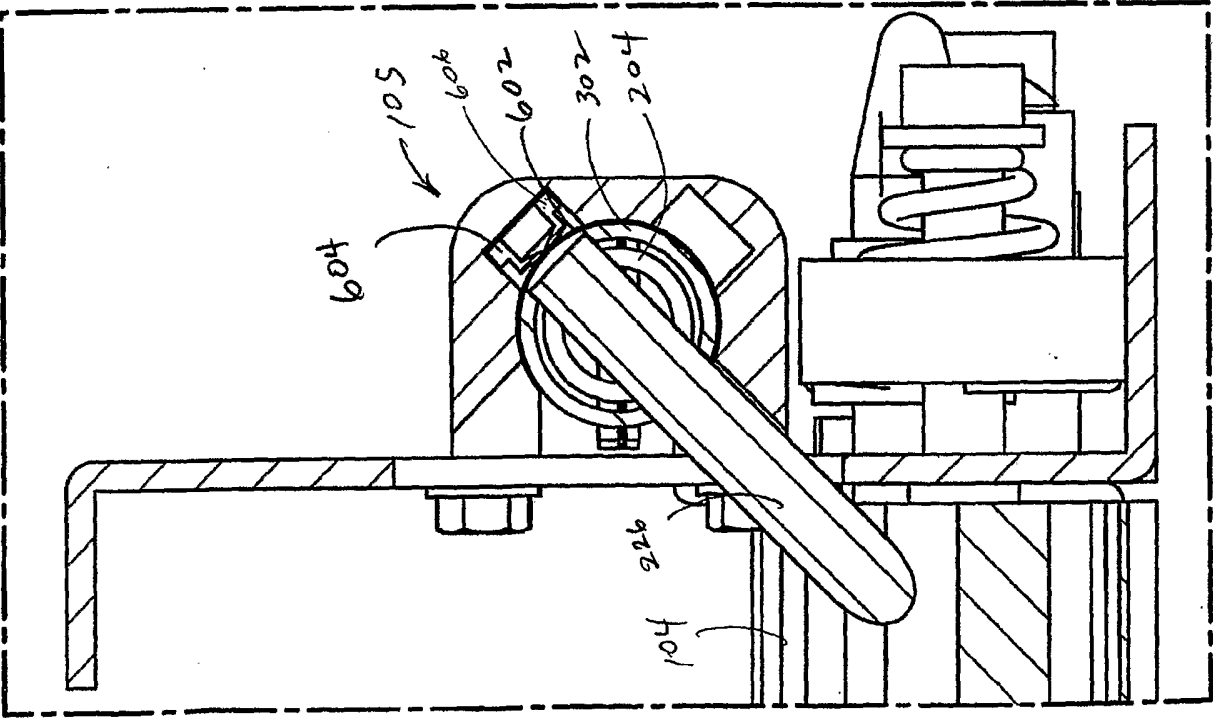


FIG. 5A



DETAIL B FIG. 5C



INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A47B 97/00; A63F 13/08

US CL : 297/217.3; 463/47

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. : Please See Continuation Sheet

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
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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.
Y	US 5,791,731 A (INFANTI) 11 August 1998 (11.08.1998); abstract; column 21, lines 18-23.	1-24
Y	US 6,012,755 A (HECHT ET AL.) 11 January 2000 (11.01.2000); figures 3, 6; column 5, lines 6-16; column 1, lines 54-57.	1-24
Y	US 5,622,511 A (JARRETT) 22 April 1997 (22.04.1997); figure 3; column 2, lines 34-54.	4-24
Y	US 6,206,335 B1 (HUBER ET AL.) 27 March 2001 (27.03.2001), abstract, figure 1.	5-24
Y	US 5,807,177 A (TAKEMOTO ET AL.) 15 September 1998 (15.09.1998); figures 1, 6, 9; column 5, lines 27-31.	19-24

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
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Date of the actual completion of the international search

06 September 2005 (06.09.2005)

Date of mailing of the international search report

24 OCT 2005

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/18681

Continuation of B. FIELDS SEARCHED Item 1:

403/321; 248/503, 503.1; 297/217.1; 403/323, 324, 325, 327; 411/347; 267/136; 297/217.3, 172, 463.1, 67, 440.6; 463/47, 36; 273/148B

Continuation of B. FIELDS SEARCHED Item 3:

EAST, search terms: rotary locking mechanism, slide, rail, rotary, lever, lock, position, tube, tubular, cross-pin, cross pin, cylinder, cylindrical member, tubular member, slot, rotary lock, receive, pin, latch, latching mechanism, chair, seat, audio, game, gaming, opening, guide pin, cylindrical channel, channel, floating, self-centering connector, bias, spring,