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(54) Entertainment media rental and return system and a removable storage bin therefor

(57) An entertainment media rental and return system comprises a rental terminal (90) at which a customer can either rent entertainment media (36,38) or return entertainment media (36,38) which has been previously rented from the rental terminal (90), a return terminal (10) at which a customer can only return entertainment media (36,38) which has been previously rented from the rental terminal (90), and a removable storage bin (40) interchangeable between the terminals (10,90) and arranged to (i) receive entertainment media (36,38) which has been returned by a customer at the return terminal (10) when the bin (40) is installed in the return terminal (10), (ii) receive entertainment media (36,38) which has been returned by a customer at the rental terminal (90) when the bin (40) is installed in the rental terminal (90), and (iii) provide entertainment media (36,38) which is available to be rented to a customer at the rental terminal (90) when the bin (40) is installed in the rental terminal (90).

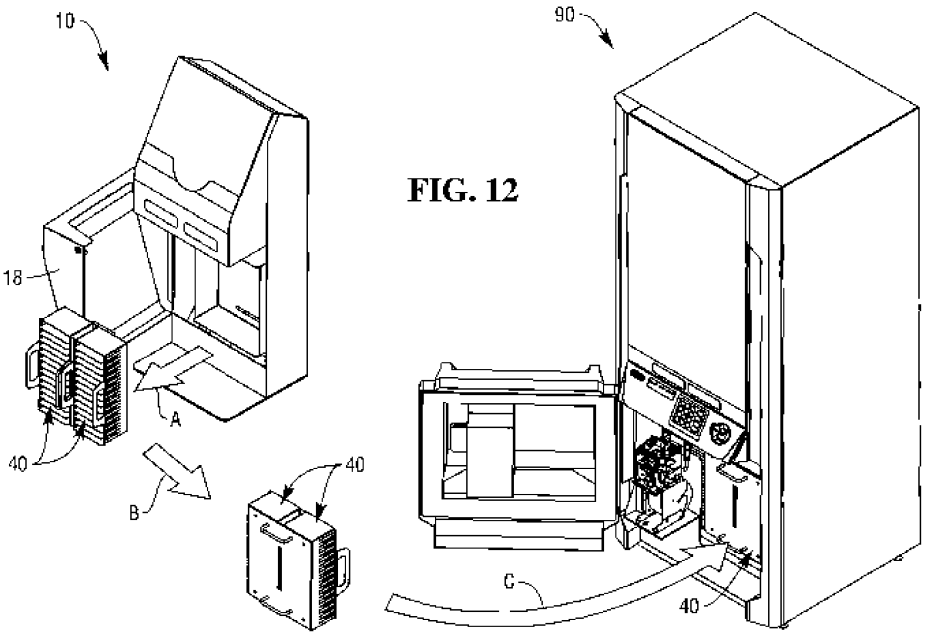

FIG. 12

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Description

[0001] The present invention relates to media on which entertainment data is stored, such as a digital versatile disc ("DVD"), and is particularly directed to an entertainment media rental and return system and a removable storage bin therefor.

[0002] A typical self-service media rental terminal for renting DVDs is capable of both dispensing a rented DVD to a customer and receiving a returned DVD from a customer. The self-service media rental terminal has a customer interface by which a customer interacts with the terminal to rent DVDs and return DVDs. A drawback in known self service media rental terminals which are capable of both dispensing rented DVDs and receiving returned DVDs is that a customer who just wants to return a DVD has to wait in a queue with other customers who want to rent (or both rent and return) DVDs at the terminal. This wait in a queue may be quite frustrating for the customer who just wants to return a DVD, especially if the queue is relatively long. It would be desirable to provide an improved way for a customer who just wants to return a DVD.

[0003] According to a first aspect of the invention there is provided an entertainment media rental and return system comprising:

a rental terminal at which a customer can either rent entertainment media or return entertainment media which has been previously rented from the rental terminal;
a return terminal at which a customer can only return entertainment media which has been previously rented from the rental terminal; and
a removable storage bin interchangeable between the terminals and arranged to (i) receive entertainment media which has been returned by a customer at the return terminal when the bin is installed in the return terminal, (ii) receive entertainment media which has been returned by a customer at the rental terminal when the bin is installed in the rental terminal, and (iii) provide entertainment media which is available to be rented to a customer at the rental terminal when the bin is installed in the rental terminal.

[0004] The removable storage bin optionally includes a first linear array of shelves and a second linear array of shelves adjoining the first linear array of shelves, and the first linear array of shelves are optionally positioned to receive bare entertainment media and the second linear array of shelves are positioned to received cased entertainment media when the storage bin is installed in the container of the return terminal.

[0005] According to a second aspect of the invention there is provided a method of operating an entertainment media rental and return system having a rental terminal at which a customer can either rent entertainment media or return entertainment media which has been previously rented from the rental terminal, a return terminal at which a customer can only return entertainment media which has been previously rented from the rental terminal, and a removable storage bin which is interchangeable between the terminals, the method comprising:

receiving in the storage bin entertainment media which has been returned by a customer at the return terminal when the bin is installed in the return terminal;
receiving in the storage bin entertainment media which has been returned by a customer at the rental terminal when the bin is installed in the rental terminal; and
providing entertainment media which is available to be rented to a customer at the rental terminal when the bin is installed in the rental terminal.

[0006] According to a third aspect there is provided a removable storage bin for use between a rental terminal at which a customer can either rent entertainment media or return entertainment media which has been previously rented from the rental terminal and a return terminal at which a customer can only return entertainment media which has been previously rented from the rental terminal, the removable storage bin comprising:

a first linear array of shelves for receiving bare entertainment media which has been returned at the return terminal when the storage bin is installed at the return terminal; and
a second linear array of shelves adjoining the first linear array of shelves and for receiving cased entertainment media which has been returned at the return terminal when the storage bin is installed at the return terminal.

[0007] The construction of the first and second linear arrays of shelves is optionally substantially the same.

[0008] According to a fourth aspect of the invention there is provided a dedicated self-service return terminal for receiving returned media on which entertainment data is stored, the dedicated self-service return terminal comprising:

a reader arranged to read data associated with returned media on which entertainment data is stored;
a media transporter mechanism having a media return slot for receiving returned media;
a shutter mechanism having a shutter door movable between an open position which allows returned media to be inserted through the media return slot and a closed position which blocks the media return slot and prevents returned media from being inserted through the media return slot; and
a controller arranged to (i) move the shutter door to the open position to allow returned media to be in-

serted through the media return slot when a determination is made that returned media is being returned to the correct location based upon data read from returned media, and (ii) maintain the shutter door in the closed position to prevent returned media from being inserted through the media return slot when a determination is made that returned media is not being returned to the correct location based upon data read from returned media.

[0009] The reader optionally comprises a radio frequency identification (RFID) reader.

[0010] The media transporter mechanism comprises a bare digital versatile disc (DVD) transporter, and/or a cased digital versatile disc (DVD) transporter.

[0011] According to a fifth aspect of the invention there is provided a dedicated self-service return terminal for receiving either returned bare media on which entertainment data is stored or returned cased media on which entertainment data is stored, the dedicated self service return terminal comprising:

a reader arranged to read data associated with either returned bare media on which entertainment data is stored or returned cased media on which entertainment data is stored;
a first media transporter mechanism having a first media return slot for receiving returned bare media;
a first shutter mechanism having a first shutter door movable between an open position which allows returned bare media to be inserted through the first media return slot and a closed position which blocks the first media return slot and prevents returned bare media from being inserted through the first media return slot;
a second media transporter mechanism having a second media return slot for receiving returned cased media;
a second shutter mechanism having a second shutter door movable between an open position which allows returned cased media to be inserted through the second media return slot and a closed position which blocks the second media return slot and prevents returned cased media from being inserted through the second media return slot; and
a controller arranged to (i) move the first shutter door to the open position to allow returned bare media to be inserted through the first media return slot when a determination is made that the returned bare media is being returned to the correct location based upon data read from returned bare media, (ii) maintain the first shutter door in the closed position to prevent returned bare media from being inserted through the first media return slot when a determination is made that returned bare media is not being returned to the correct location based upon data read from returned bare media, (iii) move the second shutter door to the open position to allow returned cased media to be inserted through the second media return slot when a determination is made that returned cased media is being returned to the correct location based upon data read from returned cased media, (iv) maintain the second shutter door in the closed position to prevent returned case media from being inserted through the second media return slot when a determination is made that returned cased media is not being returned to the correct location based upon data read from returned cased media.

[0012] The reader optionally comprises a radio frequency identification (RFID) reader.

[0013] The first media transporter mechanism optionally comprises a bare digital versatile disc (DVD) transporter, and the second media transporter mechanism optionally comprises a cased DVD transporter.

[0014] According to a sixth aspect of the present invention there is provided a method of operating a dedicated self-service return terminal which is capable of receiving either a returned bare digital versatile disc (DVD) on which entertainment data is stored or a returned cased DVD on which entertainment data is stored, the method comprising:

reading data associated with either a returned bare DVD or a returned cased DVD;
moving a first shutter door to an open position to allow a returned bare DVD to be inserted through a first media return slot when a determination is made that the returned bare DVD is being returned to the correct location based upon data read from the returned bare DVD; and
moving a second shutter door to an open position to allow a returned cased DVD to be inserted through a second media return slot when a determination is made that the returned cased DVD is being returned to the correct location based upon data read from the returned cased DVD.

[0015] The method may further comprise:

maintaining the first shutter door in a closed position to prevent a returned bare DVD from being inserted through the first media return slot when a determination is made that the returned bare DVD is not being returned to the correct location based upon data read from the returned bare DVD; and
maintaining the second shutter door in a closed position to prevent a returned cased DVD from being inserted through the second media return slot when a determination is made that the returned cased DVD is not being returned to the correct location based upon data read from the returned cased DVD.

[0016] According to a seventh aspect of the present invention there is provided a dedicated self-service return terminal for receiving returned media on which entertain-

ment data is stored, the dedicated self-service return terminal comprising:

a media transporter having a media return slot through which returned media can be received from a customer returning the media;
a removable media storage bin for storing returned media which has been received through the slot;
a container having a chamber in which the media storage bin is installed when the media storage bin is in use;
a sliding mechanism arranged to support the container for vertical sliding movement between a top position in which the media storage bin can receive returned media received through the slot and a bottom position in which the media storage bin can be removed from the container; and
a controller arranged to control the sliding mechanism to effect movement of the container between the top and bottom positions during operation of the dedicated self-service return terminal.

[0017] The media transporter optionally comprises a bare digital versatile disc (DVD) transporter and/or a cased digital versatile disc (DVD) transporter.

[0018] The media transporter optionally comprises a bare digital versatile disc (DVD) transporter which has a bare DVD receiving slot and a cased DVD transporter which has a cased DVD receiving slot, and the removable media storage bin optionally comprises a first bin portion for storing bare DVDs which have been received through the bare DVD receiving slot and a second bin portion for storing cased DVDs which have been received through the cased DVD receiving slot.

[0019] According to an eighth aspect of the invention there is provided a dedicated self-service return terminal for receiving either returned bare media on which entertainment data is stored or returned cased media on which entertainment data is stored, the dedicated self-service return terminal comprising:

a first media transporter having a first media return slot through which returned media can be received from a customer returning the media;
a second media transporter having a second media return slot through which returned media can be received from a customer returning the media;
a first removable media storage bin for storing returned media which has been received through the first media return slot;
a second removable media storage bin for storing returned media which has been received through the second media return slot;
a container having a first chamber portion in which the first media storage bin is installed and a second chamber portion in which the second media storage bin is installed when the first and second media storage bins are in use;
a sliding mechanism arranged to support the container for vertical sliding movement between a top position in which the first and second media storage bins can receive returned media received through their corresponding first and second media return slots and a bottom position in which the first and second media storage bin can be removed from the first and second chamber portions of the container; and
a controller arranged to control the sliding mechanism to effect movement of the container between the top and bottom positions during operation of the dedicated self-service return terminal.

[0020] The sliding mechanism optionally comprises a pair of parallel rails, one side of the container is optionally securely coupled to one of the rails, and an opposite side of the container is optionally securely coupled to the other one of the rails.

[0021] The first media transporter optionally comprises a bare digital versatile disc (DVD) transporter, and the second media transporter optionally comprises a cased DVD transporter.

[0022] According to a ninth aspect of the present invention there is provided a method of operating a dedicated self-service return terminal which is capable of receiving either a returned bare digital versatile disc (DVD) on which entertainment data is stored or a returned cased DVD on which entertainment data is stored, the method comprising:

storing in a DVD storage bin a returned DVD which has been received through a DVD return slot from a customer returning the DVD; and
supporting the DVD storage bin for vertical sliding movement between a top position in which the DVD storage bin can receive returned DVDs received through the DVD return slot and a bottom position in which the DVD storage bin can be removed from the dedicated self-service return terminal.

[0023] The DVD storage bin optionally comprises one portion in which bare DVDs can be received and another portion in which cased DVDs can be received.

[0024] These and other aspects of the invention will become apparent from the following specific description, given by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a right-front perspective view of a dedicated self-service return terminal for receiving a returned DVD on which entertainment data is stored, and which return terminal is constructed in accordance with one embodiment of the present invention;
Fig. 2 is a perspective view similar to Fig. 1, and shows a back-lit message display removed to better illustrate certain internal components of the dedicated self-service return terminal;
Fig. 3 is a perspective view similar to Fig. 2, and

shows a bare DVD being inserted into a slot of a bare disc transporter;

Fig. 4 is a perspective view similar to Fig. 3, and shows a cased DVD being inserted into a slot of a cased disc transporter;

Fig. 5 is a perspective view, looking approximately in the direction of arrow "X" in Fig. 1, and showing a left-back perspective view of the dedicated self-service return terminal;

Fig. 6 is a perspective view similar to Fig. 5, and shows a number of panels removed to better illustrate a removable DVD cartridge bin;

Fig. 7 is a perspective view similar to Fig. 6, and showing the removable DVD cartridge bin in another position;

Fig. 8 is a perspective view similar to Fig. 6, and showing the removable DVD cartridge bin in yet another position;

Fig. 9 is a flow diagram which depicts typical operation of the dedicated self-service return terminal of Fig. 1;

Fig. 10 is a perspective view similar to Fig. 1, and showing a lower access door of the dedicated self-service return terminal in an open position;

Fig. 11 is a perspective view similar to Fig. 10, and showing the removable DVD cartridge bin of Fig. 8 removed from the dedicated self-service return terminal; and

Fig. 12 is a perspective view of a system which pictorially illustrates how the DVD cartridge bin shown in Fig. 11 is moved from the dedicated self-service return terminal to a main self-service rental terminal which is associated with the dedicated self-service return terminal.

[0025] The present invention relates to media on which entertainment data is stored, such as a digital versatile disc ("DVD"), and is particularly directed to an entertainment media rental and return system and a removable storage bin therefor.

[0026] Referring to Fig. 1, a dedicated self-service return terminal 10 constructed in accordance with one embodiment of the present invention is illustrated. The dedicated self-service return terminal 10 is capable of only receiving returned DVDs, and is not capable of dispensing DVDs. The self-service return terminal 10 comprises an exterior enclosure 12 which has a main panel 14 to which an upper customer interface panel 16 is fastened and to which a lower front access panel 18 is hingedly fastened. A first shutter mechanism has a first shutter door 24 movable between an open position and a closed position. Also, a second shutter mechanism has a second shutter door 26 movable between an open position and a closed position.

[0027] A backlit message display 20 is provided on the upper customer interface panel 16. The display 20 may be in the form of a liquid crystal display (LCD). The display 20 provides instructions for a customer desiring to return a DVD. As shown in Fig. 1, the display 20 is displaying an instruction line "PLEASE INSERT DISC BELOW". A radio frequency identification (RFID) reader 22 is also provided on the upper customer interface panel 16. The RFID reader 22 is located underneath the upper panel 16, and is therefore shown in dotted line. A fixed label marked "PLEASE SCAN DISC HERE" is adjacent to the RFID reader 22.

[0028] Referring to Fig. 2, the display 20 of Fig. 1 is removed to better illustrate certain internal components of the dedicated self-service return terminal 10. A bare DVD transporter 30 has a first media return slot 31 which is aligned with the first shutter door 24 (Fig. 1) of the first shutter mechanism. A cased DVD transporter 32 has a second media return slot 33 which is aligned with the second shutter door 26 of the second shutter mechanism.

[0029] A controller 35 controls the first shutter mechanism to move the first shutter door 24 from the closed position to the opened position to allow a returned bare DVD (i.e., a DVD which is by itself without a case) to be inserted through the first media return slot 31 of the bare DVD transporter 30. When no bare DVD is being returned, the controller 35 maintains the first shutter door 24 in the closed position. The controller 35 also controls the second shutter mechanism to move the second shutter door 26 from the closed position to the open position to allow a returned cased DVD (i.e., a DVD which is in a DVD storage case) to be inserted through the second media return slot 33 of the cased DVD transporter 32. When no cased DVD is being returned, the controller 35 maintains the second shutter door 26 in the closed position. The controller 35 may comprise an electronic processor, a microcomputer, or the like. Such devices are known and, therefore, will not be described further.

[0030] When a customer desires to return a bare DVD, the first shutter door 24 opens and the customer inserts the bare DVD through the first media return slot 31. When a customer desires to return a cased DVD, the second shutter door 26 opens and the customer inserts the cased DVD through the second media return slot 33. Structure and operation of the bare DVD transporter 30 and the cased DVD transporter 32 are known and, therefore, will not be described further. Also, structure and operation of the first and second shutter doors 24, 26 of the first and second shutter mechanisms are known and, therefore, will not be described further.

[0031] A container 34 has a chamber in which a removable disc storage bin 40 is installed when the storage bin is in use in the terminal 10. The removable storage bin 40 includes a first bin portion 42 which is aligned with the bare DVD transporter 30 to receive bare DVDs to be returned through the bare DVD transporter. As shown in Fig. 3, a bare DVD 36 is shown aligned with the first media return slot 31 and is ready to be inserted through the slot into the bare DVD transporter 30 to return the bare DVD. The removable storage bin 40 also includes a second bin portion 44 which is aligned with the cased DVD transporter 32 to receive cased DVDs to be returned

through the cased DVD transporter. As shown in Fig. 4, a cased DVD 38 is shown aligned with the second media return slot 33 and is ready to be inserted through the slot into the cased DVD transporter 32 to return the cased DVD. Each of the first and second bin portions 42, 44 has a linear array of shelves. The array of shelves of the first bin portion 42 and the array of shelves of the second bin portion 44 are substantially the same.

[0032] Fig. 5 is a perspective view, looking approximately in the direction of arrow "X" in Fig. 1. More specifically, Fig. 5 shows a left-back perspective view of the dedicated self-service return terminal 10. Fig. 6 is a perspective view similar to Fig. 5, and shows the main panel 14 (Fig. 1) removed to better illustrate internal components of the dedicated self-service return terminal 10. As shown in Fig. 6, an internal frame 48 supports a sliding mechanism 50 which, in turn, supports the container 34 for vertically sliding movement between a topmost position (as shown in Fig. 7) and a bottommost position (as shown in Fig. 8). The container 34 is in a default and stowed position when it is in its bottommost position shown in Fig. 8. The container 34 shown in Fig. 6 is in some intermediate position between the topmost position of Fig. 7 and the bottommost position of Fig. 8. When the container 34 in an intermediate position (such as shown in Fig. 6) between its topmost and bottommost positions, the first and second bin portions 42, 44 of the storage bin 40 are in position for receiving either a returned bare DVD from the bare DVD transporter 30 or a returned cased DVD from the cased DVD transporter 32.

[0033] As shown in Figs. 6-8, the sliding mechanism 50 comprises a pair of parallel rails 52 which extend vertically. One side of the container 34 is slidably coupled to one of the rails 52, and an opposite side of the container is slidably coupled to the other one of the rails. A direct current (DC) motor 54 is drivingly coupled through an endless continuous belt 56 to the container 34. The controller 35 controls the DC motor 54 in known manner to rotate in one direction to move the container 34 along the rails 52 towards the topmost position of the container (Fig. 7), and to rotate in the opposite direction to move the container along the rails 52 towards the bottommost position of the container (Fig. 8).

[0034] Referring to flow diagram 100 of Fig. 9, typical operation of the dedicated self-service return terminal 10 will now be described. The RFID reader 22 (Fig. 1) reads data from a DVD (bare or cased) intended to be returned by a customer arriving at the self-service return terminal 10 and "swiping" the DVD in front of the RFID reader (step 102). Based upon the data read from the DVD, the controller 35 (Fig. 2) makes a determination as to whether the DVD is being returned to the correct location (steps 104 and 106). If the determination is negative (i.e., the DVD is not being returned to the correct location), then a message is displayed on the display 20 to inform the customer that the DVD is not being returned to the correct location (step 108).

[0035] However, if the determination in step 106 is affirmative (i.e., the DVD is being returned the correct location), then a determination is made as to whether the DVD is a bare DVD (step 110). If the determination in step 110 is affirmative (i.e., the DVD being returned is a bare DVD), then the controller 35 controls the first shutter mechanism to move the first shutter door 24 from the closed position to the open position to allow the bare DVD to be inserted through the first media return slot 31 into the bare DVD transporter 30 (step 120). The controller 35 then controls the DC motor 54 to move the container 34 from the bottommost position (i.e., its stowed position) shown in Fig. 8 to a position such as shown in Fig. 6 so that the returned bare DVD can be received and stored in a shelf of the first bin portion 42 of the storage bin 40 (step 122). After the bare DVD is received and moved into the storage bin 40, the controller 35 controls the first shutter mechanism to close the first shutter door 24 (step 126). The controller 35 then controls the DC motor 54 to move the container 34 back to its stowed position shown in Fig. 8 (step 140).

[0036] However, if the determination in step 110 is negative (i.e., the DVD being returned is not a bare DVD), then it is assumed that the DVD being returned is a cased DVD. Under this assumption, the controller 35 controls the second shutter mechanism to move the second shutter door 26 from the closed position to the open position to allow the cased DVD to be inserted through the second media return slot 33 into the cased DVD transporter 32 (step 130). The controller 35 then controls the DC motor 54 to move the container 34 from the bottommost position shown in Fig. 8 to a position such as shown in Fig. 6 so that the returned cased DVD can be received and stored in a shelf of the second bin portion 42 of the storage bin 40 (step 132). After the cased DVD is received and moved into the storage bin 40, the controller 35 controls the second shutter mechanism to close the second shutter door 26 (step 136). The controller 35 then controls the DC motor 54 to move the container 34 back to its stowed position shown in Fig. 8 (step 140).

[0037] Referring to Fig. 10, the lower front access panel 18 is shown opened and the container 34 is in its stowed position. When the lower access panel 18 is open and the container 34 is in its stowed position, the storage bin 40 can be easily removed and uninstalled from the container, such as shown by arrow "A" in Fig. 11. As shown in Fig. 12, the removed storage bin 40 can then be rotated around (as depicted by arrow "B"), and then installed into a self-service rental terminal 90 (as depicted by arrow "C"). The self-service rental terminal 90 is a full-featured DVD rental terminal at which a customer can only rent DVDs (or possibly both rent and return DVDs). As shown in Fig. 12, the dedicated self-service rental terminal 10 and the full-featured self-service rental terminal 90 are separate and spaced apart from each other.

[0038] It should be apparent that the dedicated self-service return terminal 10 described hereinabove is conveniently provided for a customer who just wants to return a DVD. The customer who just wants to return a DVD

need not have to wait in line with other customers who want to either rent or both rent and return DVDs at a full-featured self-service rental terminal such as shown in Fig. 12.

[0039] Also, it should be apparent that both the first and second shutter doors 24, 26 are maintained in their closed positions until only after the RFID reader 22 has verified the

[0040] DVD is being returned to the correct location. This helps to keep a customer from returning a DVD to the wrong location. This also helps to keep non-customers from placing junk and trash into the slots of the bare DVD transporter 30 and the cased DVD transporter 32, and thereby vandalizing the terminal 10. Such a vandalized terminal may be unable to operate until a service person has been called and arrives at the terminal to clean out the junk and trash.

[0041] Further, it should be apparent that the bottommost position of the container 34 shown in Fig. 8 maintains the storage bin 40 at a relatively low center of gravity. This bottommost position also makes the storage bin 40 easily available for servicing when the lower front access panel 18 is opened. Although the above-description describes the bottommost position of the container 34 as being the default position of the storage bin 40, it is conceivable that a position other than the bottommost position be the default position. It should also be apparent that the container 34 can be positioned at numerous intermediate positions between the topmost and bottommost positions. Typically, the number of different intermediate positions is directly related to the maximum number of shelves available for each of the first and second bin portions 42, 44 of the storage bin 40.

[0042] It should also be apparent that design of the dedicated self-service return terminal 10 allows a relatively full storage bin 40 to be easily removed from the dedicated self-service return terminal 10 and then quickly moved to the full-featured self-service rental terminal 90 (Fig. 11), without having to empty contents of the full storage bin. This interchangeability feature of the removable storage bin 40 allows a service person to quickly and efficiently service both the dedicated self-service return terminal 10 and the full-featured self-service rental terminal 90.

[0043] The above-description describes one embodiment of the present invention. It is conceivable that the dedicated self-service return terminal may be any type of device in a publicly accessible, unattended environment. Dedicated self-service return terminals are generally public-access devices that are designed to allow a customer to return a media item (such as a bare DVD or a cased DVD) on which entertainment data is stored. Dedicated self-service return terminals typically include some form of tamper resistance so that they are inherently resilient. Dedicated self-service return terminals allow a customer to more quickly return a media item on which entertainment data is stored without having to wait in line with customers who want to rent (or both rent and return) media items on which entertainment data is stored.

[0044] Also, although the above-description describes entertainment media in the form of a DVD being returned, it is conceivable that other types of entertainment media may be returned. For example, the entertainment media may comprise a flash memory which stores entertainment data. As another example, the entertainment media may comprise optical media which is other than a DVD. Entertainment media may be of different technologies, different forms, or different sizes.

[0045] Further, although the above-description describes using a DC motor to effect movement of the removable disc storage bin between its top and bottom positions, it is conceivable that other types of motors or moving mechanisms may be used to effect movement of the removable disc storage bin.

[0046] Various modifications may be made to the above described embodiments within the scope of the present invention.

Claims

1. An entertainment media rental and return system comprising:

   a rental terminal (90) at which a customer can either rent entertainment media (36,38) or return entertainment media (36,38) which has been previously rented from the rental terminal (90);
   a return terminal (10) at which a customer can only return entertainment media (36,38) which has been previously rented from the rental terminal (90); and
   a removable storage bin (40) interchangeable between the terminals (10, 90) and arranged to (i) receive entertainment media (36,38) which has been returned by a customer at the return terminal (10) when the bin (40) is installed in the return terminal (10), (ii) receive entertainment media (36,38) which has been returned by a customer at the rental terminal (90) when the bin (40) is installed in the rental terminal (90), and (iii) provide entertainment media (36,38) which is available to be rented to a customer at the rental terminal (90) when the bin is installed in the rental terminal (90).

2. An entertainment media rental and return system according to claim 1, wherein (i) the rental terminal (90) includes an exterior enclosure, and (ii) the return terminal (10) includes an exterior enclosure (12) which is separate from the exterior enclosure of the rental terminal (90).

3. An entertainment media rental and return system according to claim 2, wherein the exterior enclosure of

the rental terminal (90) and the exterior enclosure of the return terminal (10) are spaced apart from each other.

4. An entertainment media rental and return system according to any preceding claim, wherein (i) the rental terminal (90) includes a container in which the storage bin (40) is placed when the storage bin (40) is installed in the rental terminal (90), and (ii) the return terminal (10) includes a container (34) which is similar in construction to the container of the rental terminal (90) and in which the storage bin (40) is placed when the storage bin (40) installed in the return terminal (10).

5. An entertainment media rental and return system according to claim 4, wherein (i) the removable storage bin (40) includes a first linear array of shelves (42) and a second linear array of shelves (44) adjoining the first linear array of shelves (42), and (ii) the first linear array of shelves (42) are positioned to receive bare entertainment media (36) and the second linear array of shelves (44) are positioned to received cased entertainment media (38) when the storage bin (40) is installed in the container (34) of the return terminal (10).

6. A method of operating an entertainment media rental and return system having a rental terminal (90) at which a customer can either rent entertainment media (36,38) or return entertainment media (36,38) which has been previously rented from the rental terminal (90), a return terminal (10) at which a customer can only return entertainment media (36,38) which has been previously rented from the rental terminal (90), and a removable storage bin (40) which is interchangeable between the terminals (10, 90), the method comprising:

receiving in the storage bin entertainment media which has been returned by a customer at the return terminal when the bin is installed in the return terminal;
receiving in the storage bin entertainment media which has been returned by a customer at the rental terminal when the bin is installed in the rental terminal; and
providing entertainment media which is available to be rented to a customer at the rental terminal when the bin is installed in the rental terminal.

7. A removable storage bin (40) for use between a rental terminal (90) at which a customer can either rent entertainment media (36, 38) or return entertainment media (36,38) which has been previously rented from the rental terminal (90) and a return terminal (10) at which a customer can only return entertainment media (36,38) which has been previously rented from the rental terminal (90), the removable storage bin (40) comprising:

a first linear array of shelves (42) for receiving bare entertainment media (36) which has been returned at the return terminal (10) when the storage bin (40) is installed at the return terminal (10); and
a second linear array of shelves (44) adjoining the first linear array of shelves (42) and for receiving cased entertainment media (38) which has been returned at the return terminal (10) when the storage bin (40) is installed at the return terminal (10).

8. A removable storage bin (40) according to claim 7, wherein construction of the first and second linear arrays of shelves (42,44) is substantially the same.

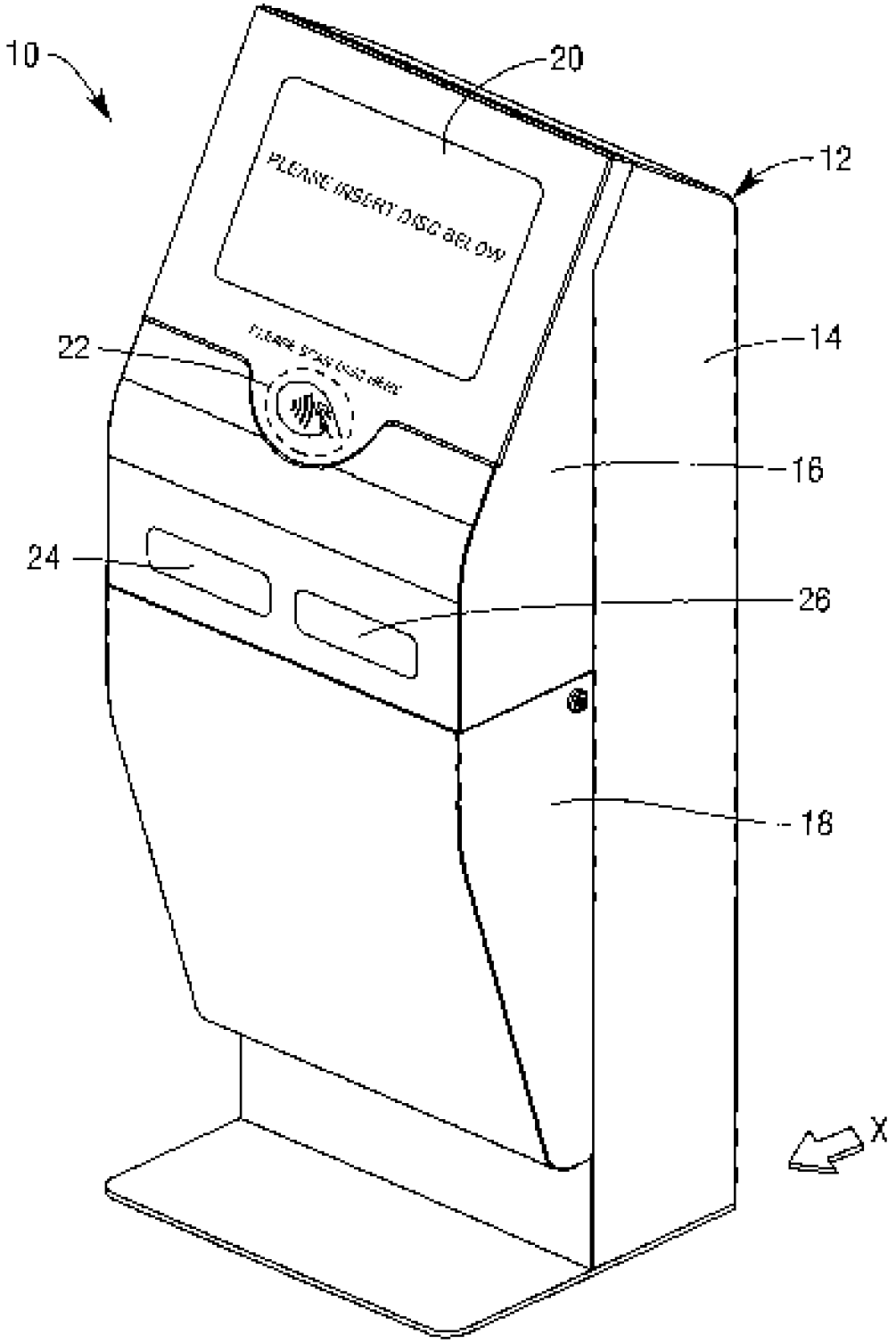


FIG. 1

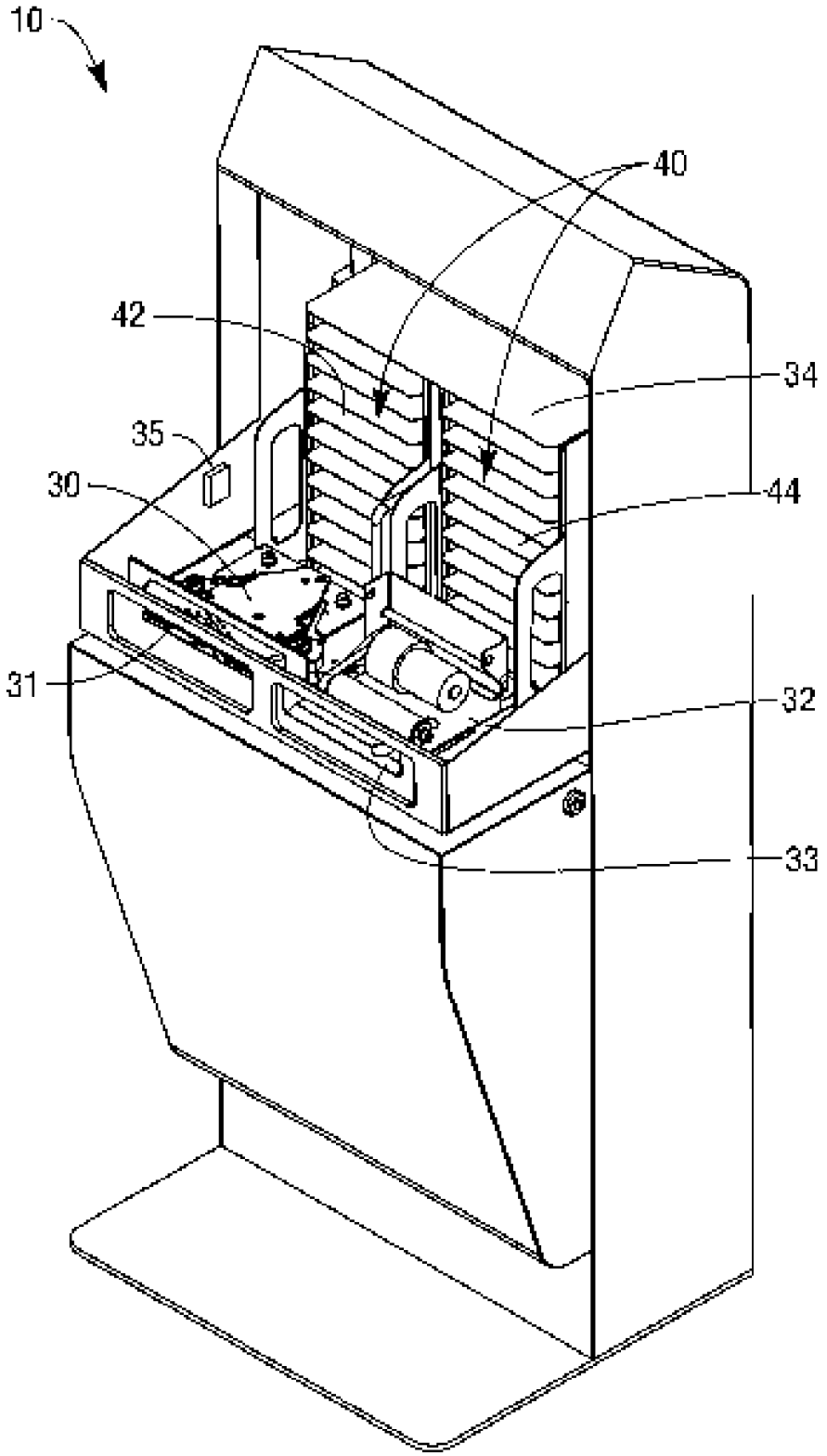


FIG. 2

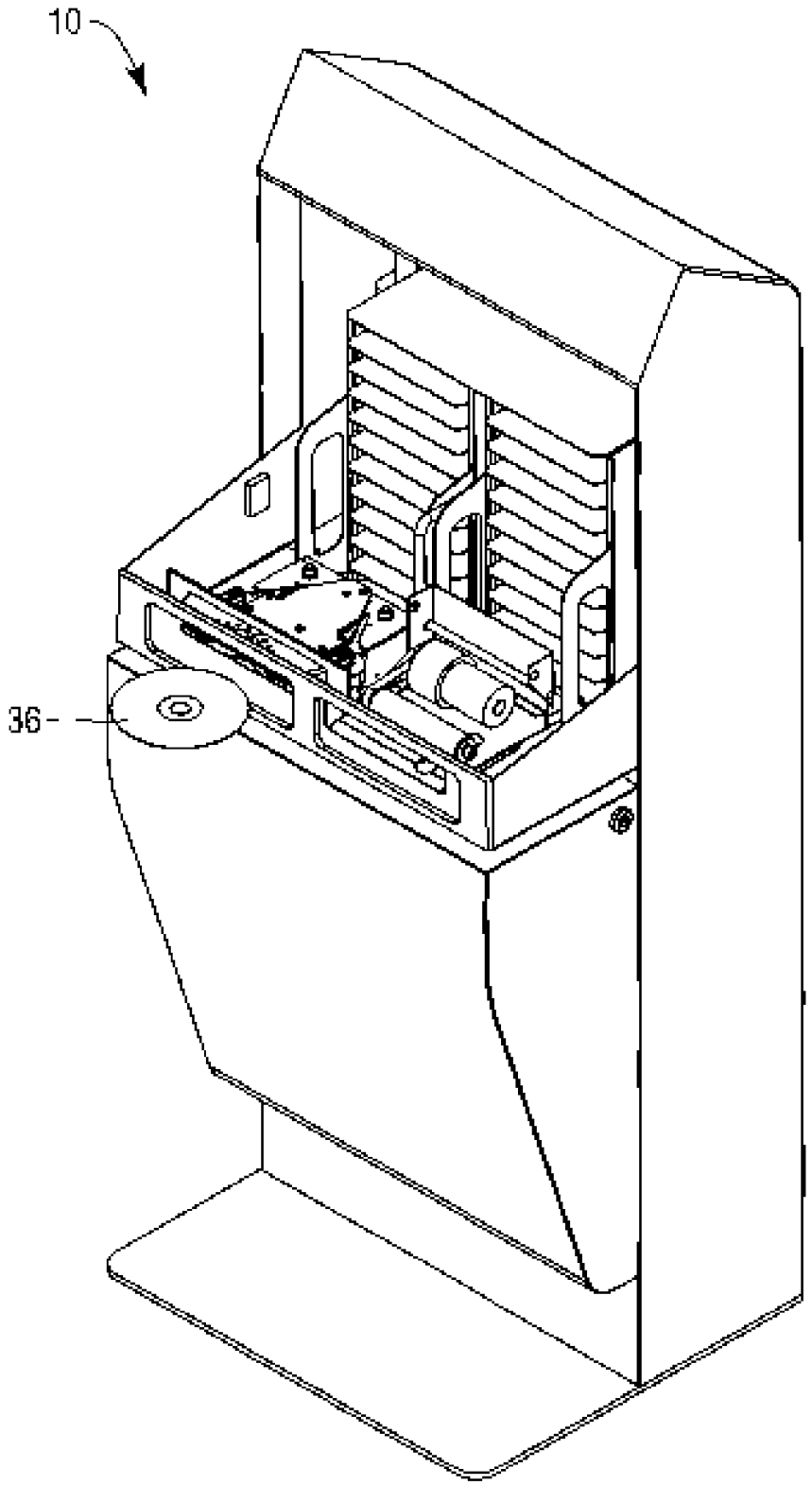


FIG. 3

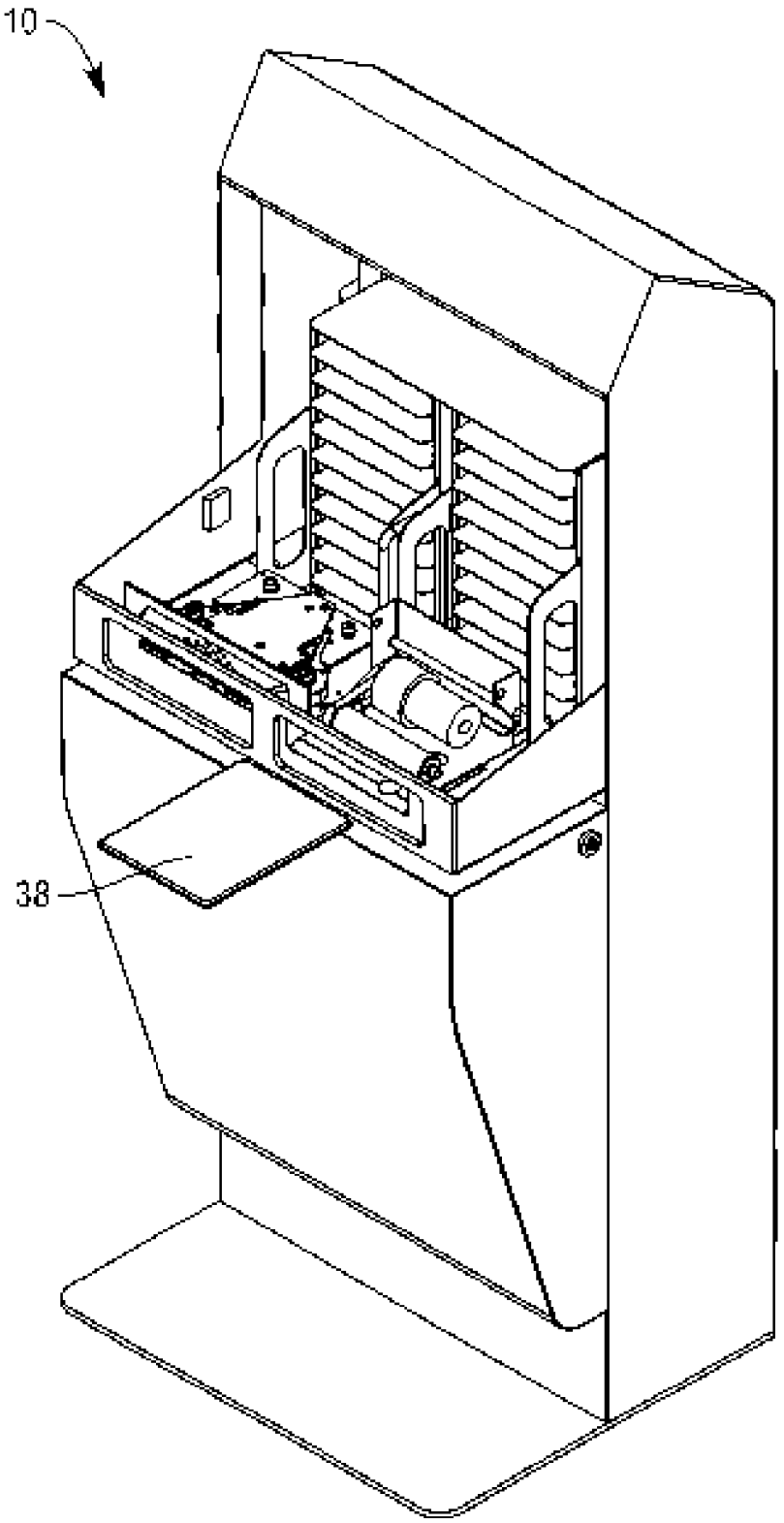


FIG. 4

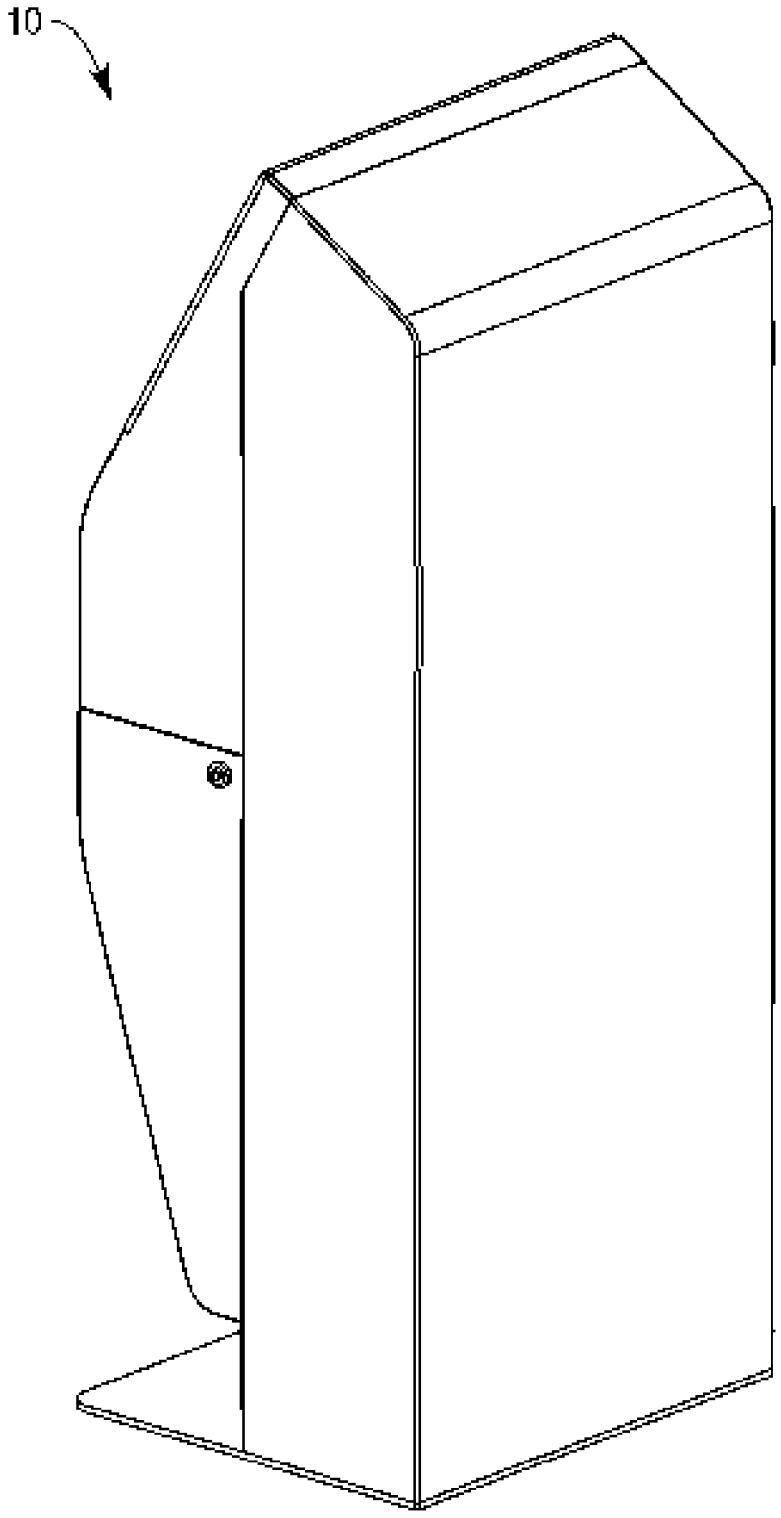


FIG. 5

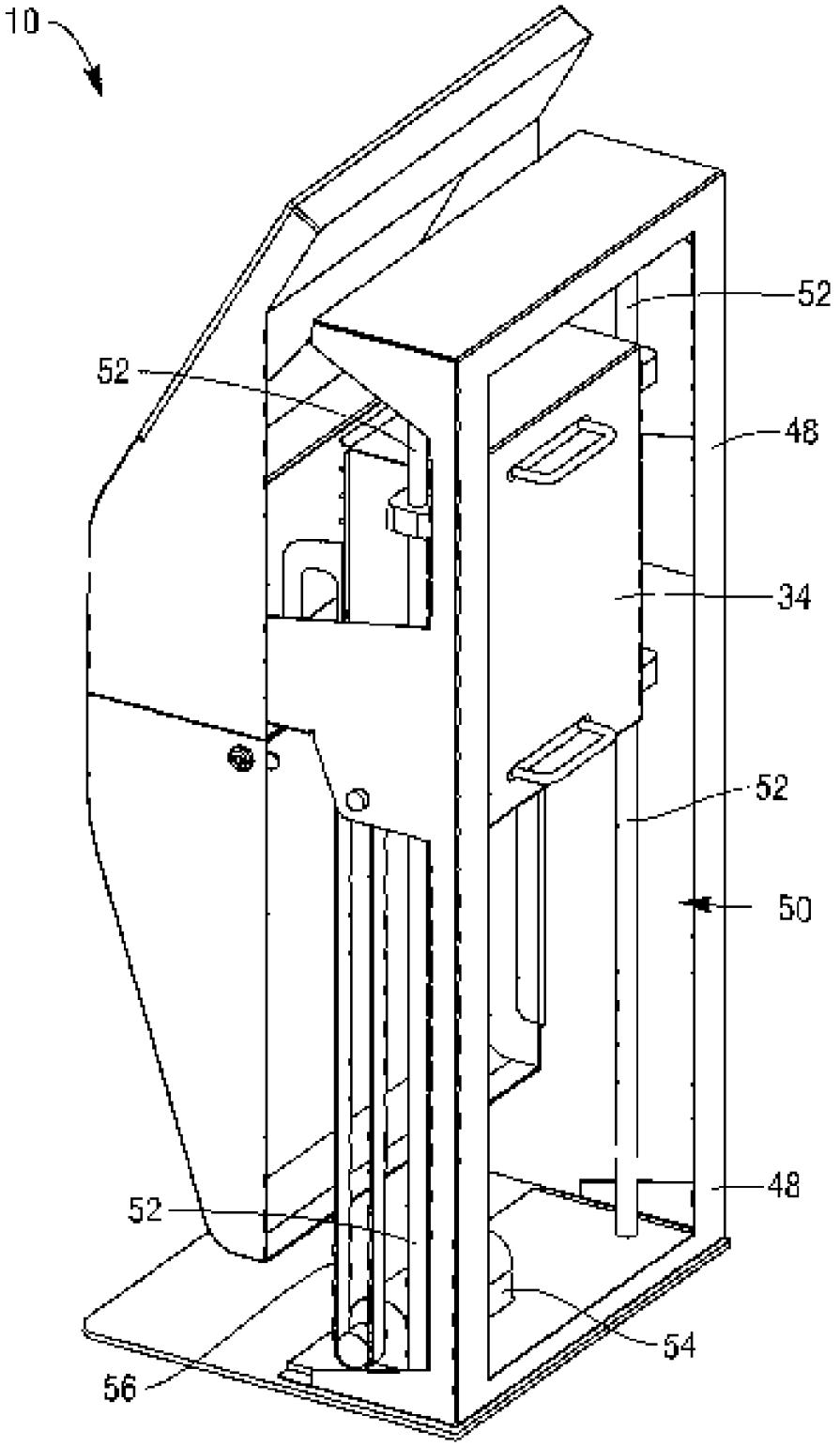


FIG. 6

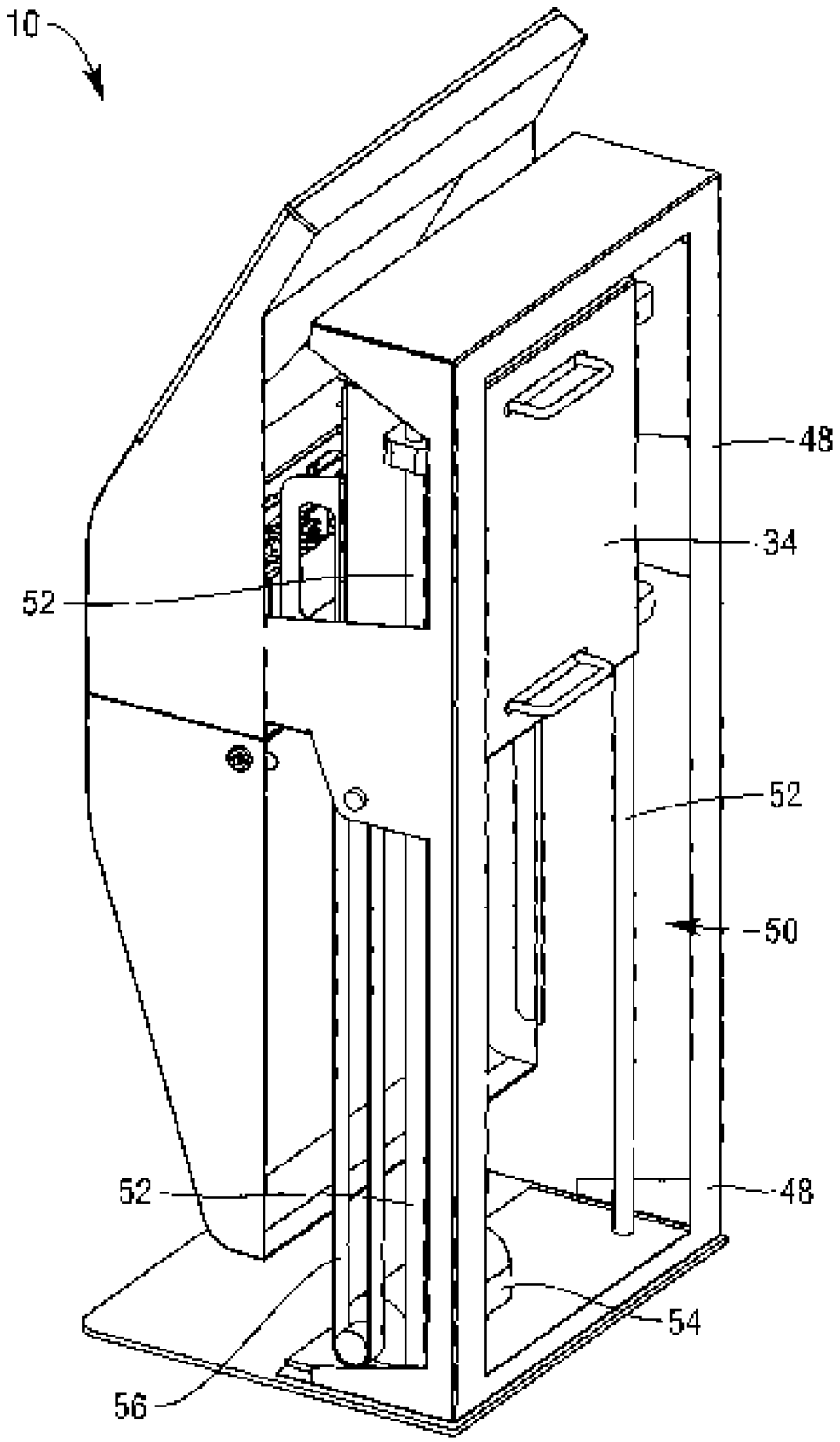


FIG. 7

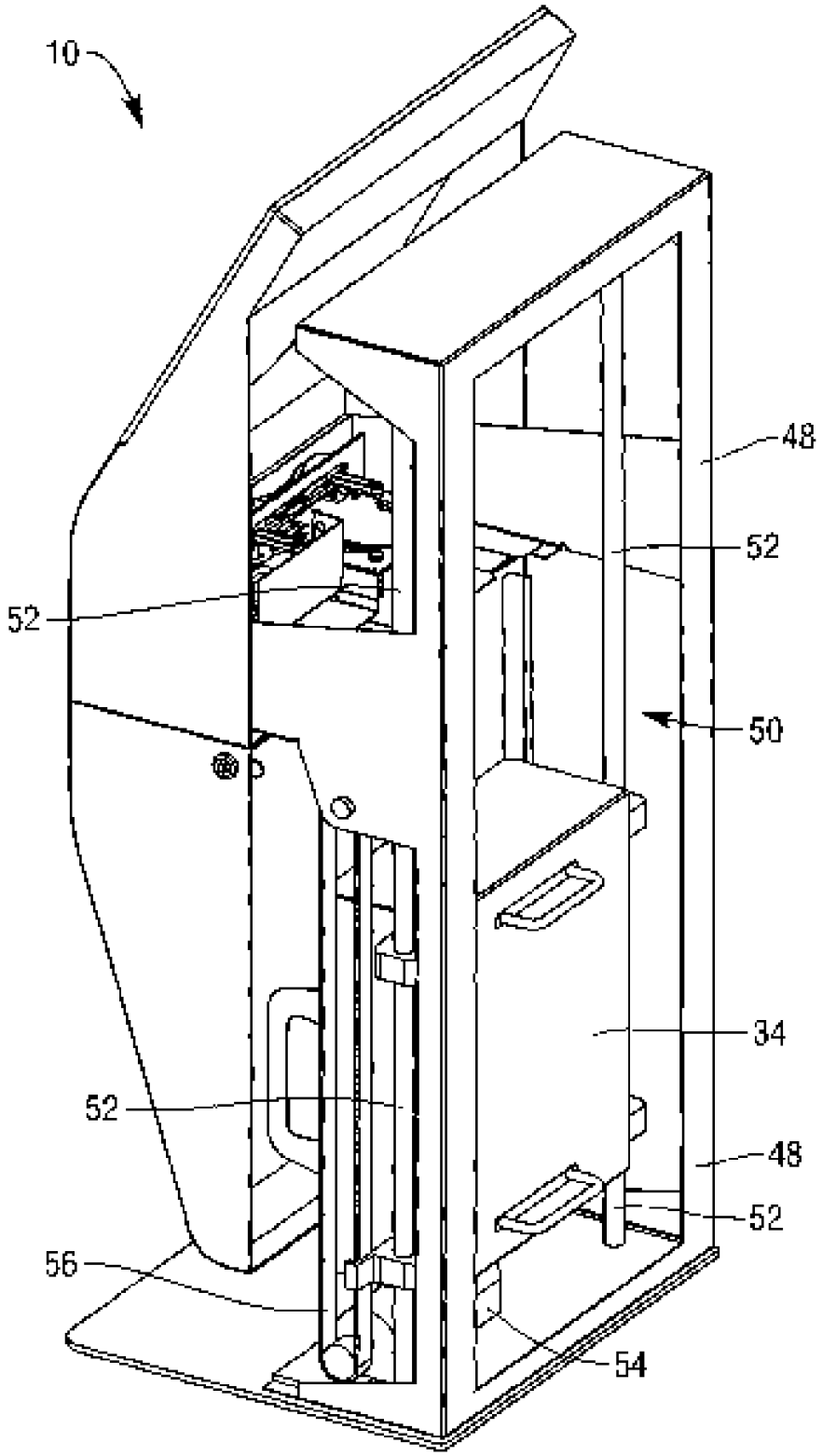


FIG. 8

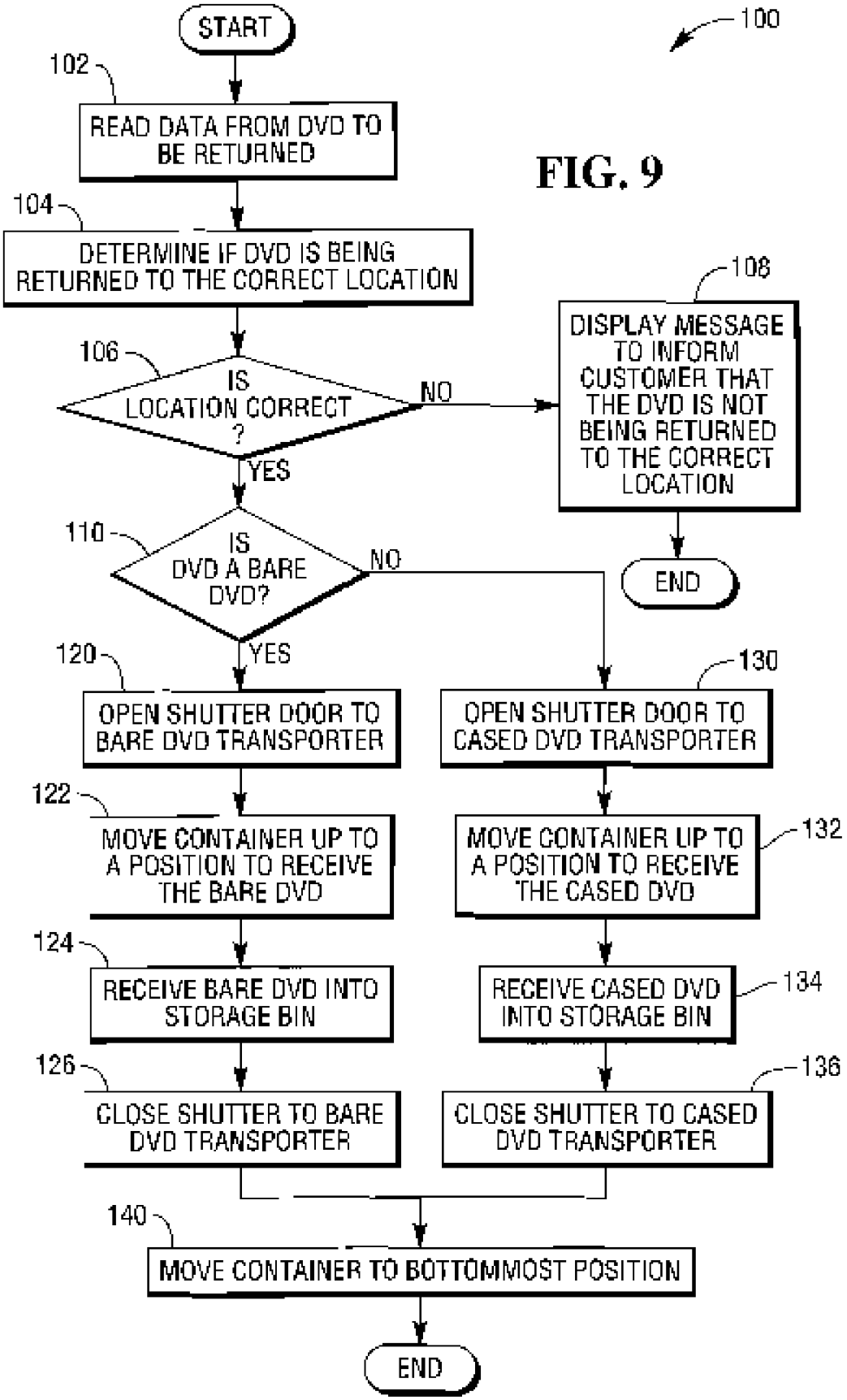

START
100
102
READ DATA FROM DVD TO BE RETURNED
104
DETERMINE IF DVD IS BEING RETURNED TO THE CORRECT LOCATION
106
IS LOCATION CORRECT ?
NO
108
DISPLAY MESSAGE TO INFORM CUSTOMER THAT THE DVD IS NOT BEING RETURNED TO THE CORRECT LOCATION
END
YES
110
IS DVD A BARE DVD?
NO
YES
120
OPEN SHUTTER DOOR TO BARE DVD TRANSPORTER
130
OPEN SHUTTER DOOR TO CASED DVD TRANSPORTER
122
MOVE CONTAINER UP TO A POSITION TO RECEIVE THE BARE DVD
132
MOVE CONTAINER UP TO A POSITION TO RECEIVE THE CASED DVD
124
RECEIVE BARE DVD INTO STORAGE BIN
134
RECEIVE CASED DVD INTO STORAGE BIN
126
CLOSE SHUTTER TO BARE DVD TRANSPORTER
136
CLOSE SHUTTER TO CASED DVD TRANSPORTER
140
MOVE CONTAINER TO BOTTOMMOST POSITION
END

FIG. 9

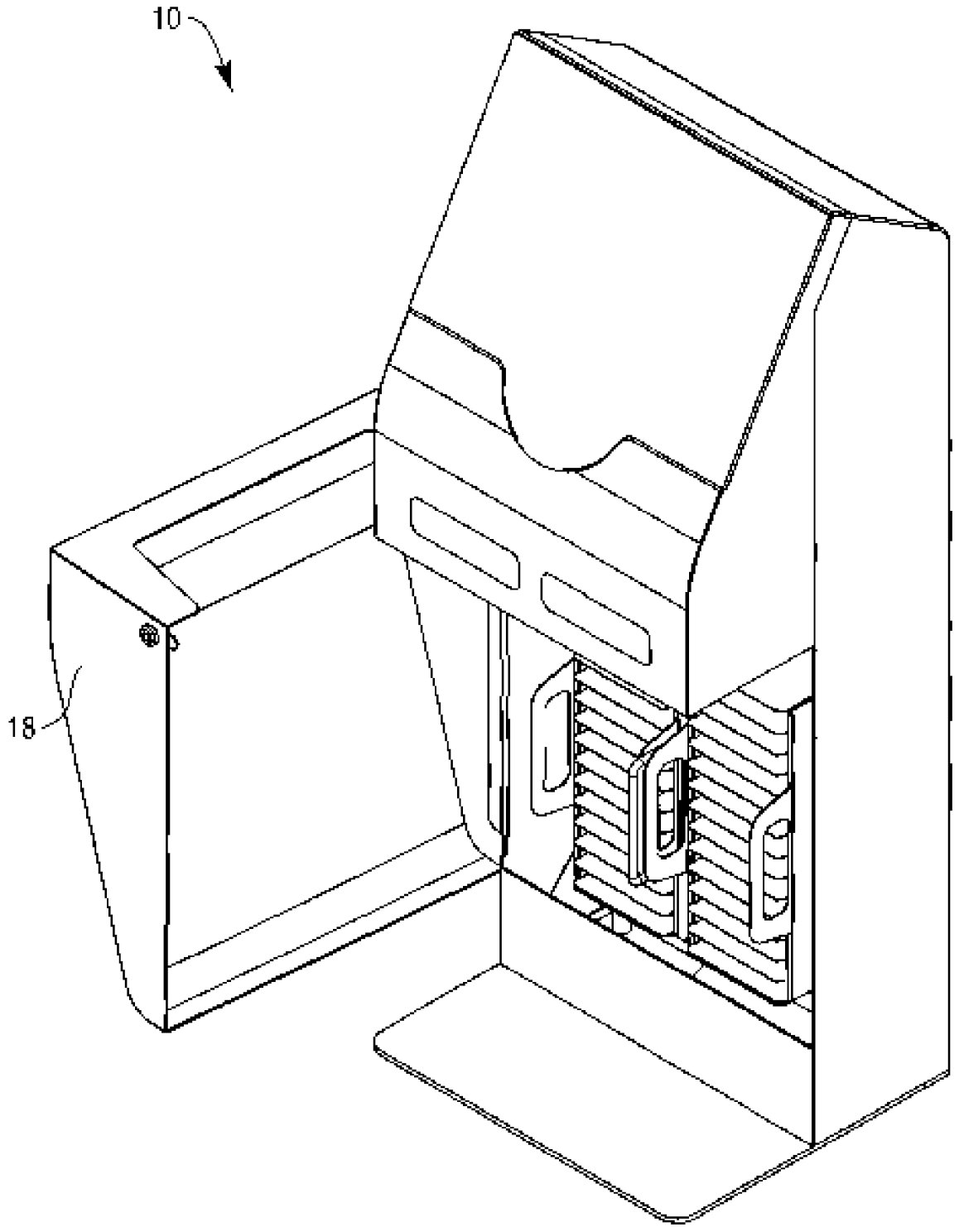
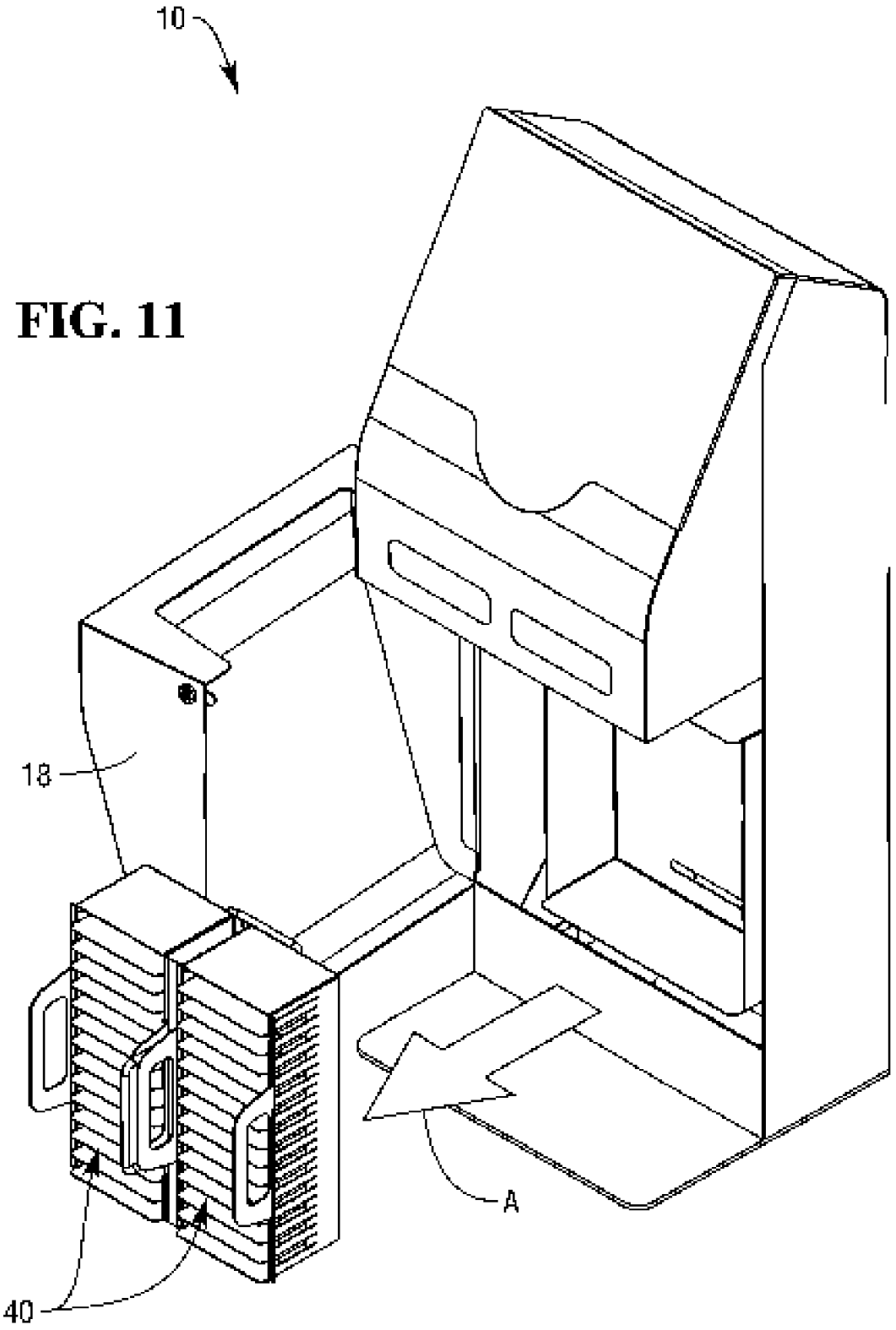


FIG. 10

FIG. 11



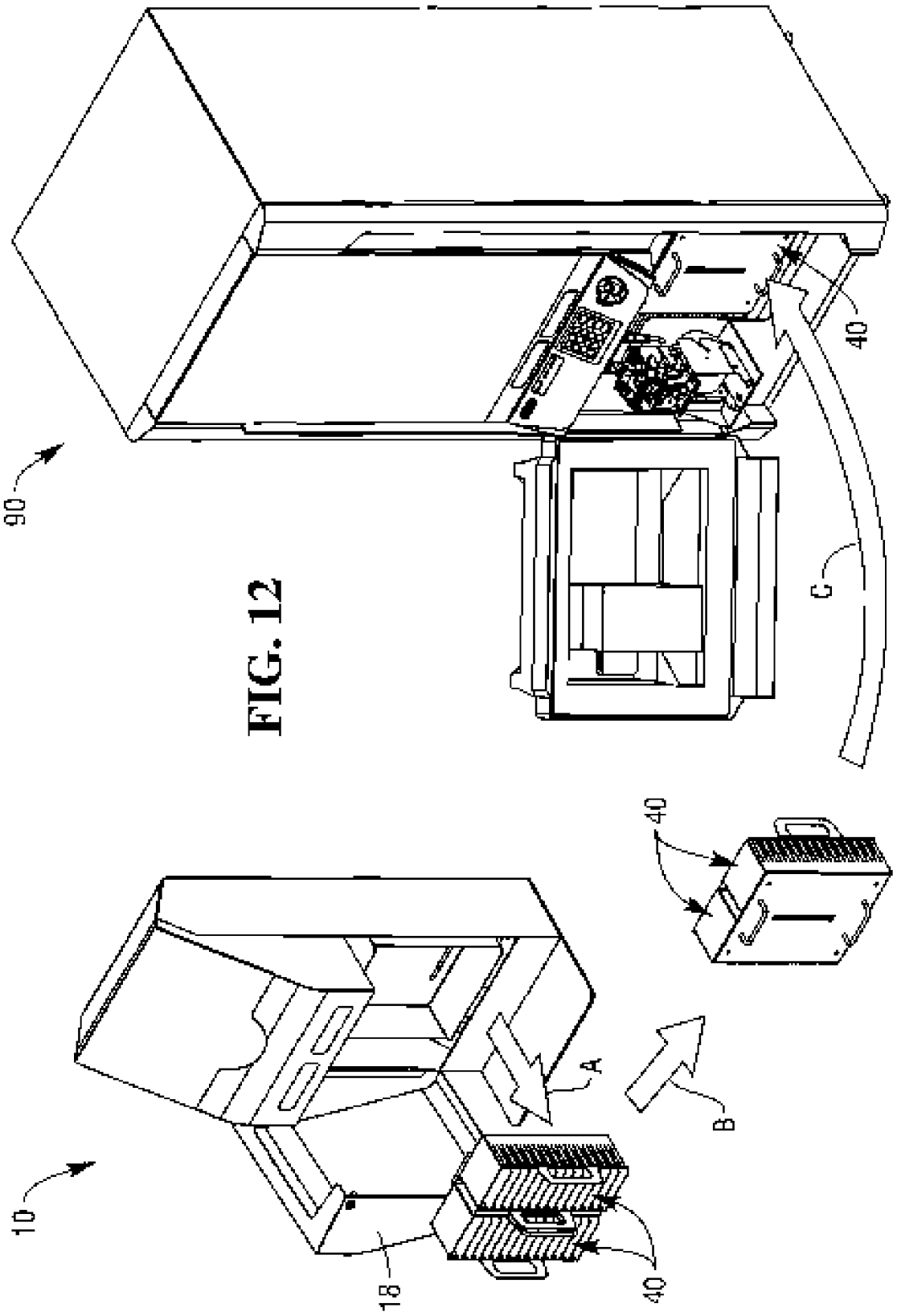


FIG. 12

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EUROPEAN SEARCH REPORT

Application Number
EP 10 19 3029

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	DE 20 2004 005815 U1 (KLIMEK FRANK G [DE]; LANZHAMMER REINHARD [DE]; MUNZINGER STEFAN [DE]) 18 August 2005 (2005-08-18) * paragraphs [0006], [0008], [0020], [0025] *	1-4,6	INV. G07F7/00 G07F7/06
Y	US 2005/192829 A1 (ZANDT MICHAEL V [US] ET AL) 1 September 2005 (2005-09-01) * paragraph [0082] *	1-4,6	
A	JP 2007 219597 A (TOSHIBA TEC KK) 30 August 2007 (2007-08-30) * paragraphs [0017], [0059]; figures 3,5 *	1-8	
A	FR 2 777 380 A1 (ROBUC [FR]) 15 October 1999 (1999-10-15) * abstract *	7,8	
A	WO 2006/130638 A2 (VIGIX [US]; ALVAREZ EDUARDO [US] VIGIX INC [US]; ALVAREZ EDUARDO [US]) 7 December 2006 (2006-12-07) * page 3,, line 19 - line 24; figure 6 * * page 9, line 17 - line 21 * * page 11, line 16 - line 23 *	1-8	TECHNICAL FIELDS SEARCHED (IPC) G07F G06F A47F B65G B42F G11B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 March 2011	González Rodríguez

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

Europäisches Patentamt
European Patent Office
Office européen des brevets

Application Number
EP 10 19 3029

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☒ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 10 19 3029

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-6

   A media rental system with a rental terminal (to either rent or return media) and a return only terminal with interchangeable storage bin.

   ---

2. claims: 7, 8

   A removable storage bin, interchangeable between rental and return terminals with a first array of shelves for receiving bare media and a second array of shelves for receiving cased media adjoint to the first one.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 19 3029

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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29-03-2011

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US 2005192829 A1	01-09-2005	NONE	
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FR 2777380 A1	15-10-1999	AU 4118599 A WO 9953498 A1	01-11-1999 21-10-1999
WO 2006130638 A2	07-12-2006	EP 1915730 A2 JP 2008546097 T US 2010314405 A1	30-04-2008 18-12-2008 16-12-2010

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82