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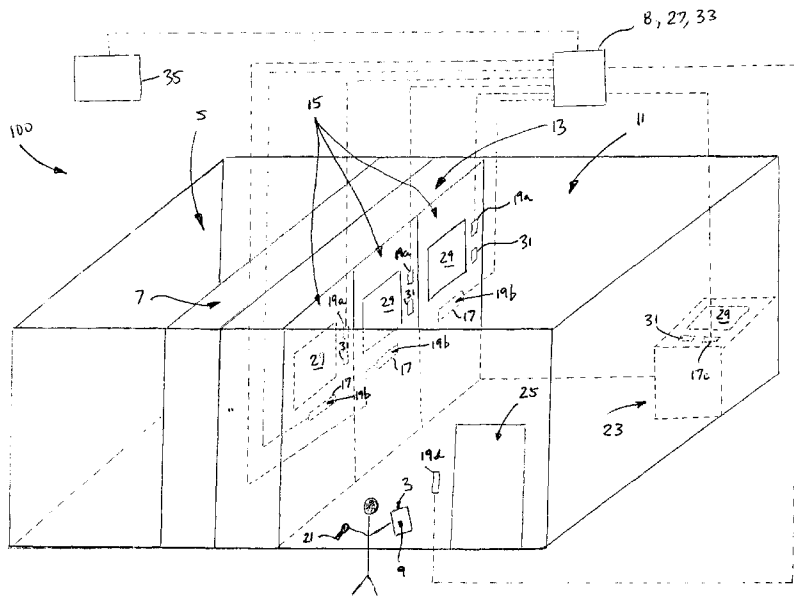
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(54) Title: AUTOMATED SYSTEM FOR RECEIVING AND DISTRIBUTING RENTAL ITEMS



(57) Abstract: An automated system for receiving and distributing rental items to users of the automated system. The automated system includes a first physical space including a storing system for containing the rental items to be received and distributed, the rental items being associated to a corresponding database, each of the rental items being provided with a physical tag recognizable by the automated system, and corresponding information being associated to each tag of each rental item for cooperation with the database. The automated system also includes a second physical space, substantially separate from the first physical space, for receiving users of the system. The automated system also includes an interface interconnecting the first physical space to the second physical space, the interface including a plurality of terminals, each terminal

being configured for allowing a given user to browse, order and receive available rental items from the first physical space, each terminal being further provided with a corresponding slot for distributing rental items having been ordered from the storing system of the first physical space and for allowing items to be returned to said storing system via an insertion into said slot. The automated system also includes an identification system operatively connected to the database of the automated system and employing a single identification technology for recognizing physical tags of both users and rental items of the automated system, the identification system being configured to not only selectively allow recognized users to access the automated system and use the same via the interface thereof, but also to selectively allow a third party to return recognized rental items of a given user of the automated system into a given slot of one of the terminals of the interface without the presence of said given user.

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AUTOMATED SYSTEM FOR RECEIVING AND DISTRIBUTING RENTAL ITEMS

Field of the invention:

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The present invention relates to an automated system for receiving and distributing items. More particularly, in its intended preferred use, the present invention relates to an automated system for receiving and distributing rental items, such as DVDs and the like. The present application claims the priority of
10 US provisional patent application No. 60/712,408 dated August 31st, 2005, the content of which is incorporated herein by reference.

Background of the invention:

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Known to the Applicant are the following US patents and patent applications which describe different automated systems and the like: 4,803,348; 5,133,441; 5,455,409; 5,561,604; 5,726,898; 5,850,442; 5,903,878; 5,927,544; 5,934,439; 5,949,411; 6,109,524; 6,182,857 B1; 6,366,914 B1; 6,445,309 B1; 6,453,352 B1; 6,457,640 B2; 6,539,417 B2; 6,553,404 B2; 6,591,247 B2;
20 6,644,455 B2; 6,655,580 B1; 6,931,406 B2; 2002/0013771 A1; 2002/0046122 A1; 2003/0040838 A1; 2004/0064377 A1; 2004/0158871 A1; 2004/0254676 A1; and 2006/0080253 A1.

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Also known to the Applicant is foreign patent No. EP 0,577,121 B1, as well as the following web sites: www.cinematic.ie; www.dvdplay.net; www.dvdexpress.net; www.dvomatic.com; www.flexplay.com; www.touchautomation.com; www.redbox.net; and www.videomatic.com.

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Also known in the art are automated systems which are used for receiving and distributing rental items (such as DVD movies and the like, for example), and which are used either separately or in conjunction with a conventional rental outlet, whether during and/or outside normal business hours of the outlet. Also

known in the art are the various drawbacks associated with such conventional automated rental systems, namely, but not exclusively: a) the fact that they disadvantageously employ two distinct identification technologies for identifying and/or allowing access to users and/or rental items (typically, a magnetic card technology is employed for identifying and allowing the users to access the system, and a bar code technology is employed for the rental items); b) they fact that as a result thereof, very often, conventional automated systems are not designed to allow a given rental item of a given automated system to be returned to said automated system without the corresponding user having accessed or "logged in" beforehand into the system; c) they fact that as a result thereof, conventional automated rental systems are not designed to allow a non-member of a given automated system to return rental items belonging to said system similarly to what is possible with personnel-run conventional rental outlets where a non-member can return corresponding rental items to the outlet by simply inserting them in a conventional "drop-off" bin; d) the fact that conventional automated systems typically comprise a single terminal for browsing, ordering, carrying payment and/or the like, and very often also comprise a corresponding single and separate receive/return slot for the rental items themselves, distant from the single terminal, for receiving and/or returning said rental items, thereby in turn causing undesirable bottlenecks of users in the event of a plurality of users wanting to employ the automated system with single terminal, and single and separate receive/return slot, or in the event of a plurality of users where one of said users has several movies to receive and/or return or is simply taking an excessive amount of time in carrying out a given action with the single terminal, thereby in turn also causing undesirable bottlenecks of users and decreasing transactional throughput efficiency (in terms of volume, revenue, etc.); and e) the fact that conventional automated systems are designed to carry out actions sequentially, thereby preventing a given user to both return rental items and browse for new rental items at the same time while the returned rental items are being handled and stored back into the system, or preventing for several movies to be returned all at once, as typically with conventional automated systems, each returned rental item is handled and stored back into a corresponding storing

system in a sequential manner before allowing another rental item to be returned into the given system for processing (i.e. handling and storing), which once again in turn causes substantial and undesirable time delays for the users, and decreases transactional throughput, etc.

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Therefore, in view of the above, there is a need for a system, which by virtue of its design and components, would be able to overcome some of the above-discussed prior art problems.

10 **Summary of the invention:**

The object of the present invention is to provide a system which, by virtue of its design and components, satisfies some of the above-mentioned needs and is thus an improvement over other related systems and/or methods known in the
15 prior art.

In accordance with the present invention, the above object is achieved, as will be easily understood, with a system such as the one briefly described herein and such as the one exemplified in the accompanying drawings. The system is
20 preferably one used for performing automated functions, and more particularly, for receiving and distributing rental items (such as DVDs and the like, for example) to users of the system.

According to the present invention, there is provided an automated system
25 for receiving and distributing rental items to users of the automated system, said automated system comprising:

a first physical space for containing the rental items to be received and distributed, the first physical space comprising a storing system for manipulating the rental items, and individually and spatially storing the same into
30 corresponding respective racks of the storing system, the rental items being associated to a corresponding database of the automated system, each of the rental items being provided with a physical tag recognizable by the automated

system, and corresponding information being associated to each tag of each rental item of the automated system for cooperation with the database thereof;

a second physical space, substantially separate from the first physical space, for receiving users of the system;

5 an interface interconnecting the first physical space to the second physical space, the interface comprising a plurality of terminals, each terminal being configured for allowing a given user of the automated system in the second physical space to browse, order and receive available rental items from the first physical space, each terminal being further provided with a corresponding slot for
10 distributing rental items having been ordered from the storing system of the first physical space and for allowing items to be returned to said storing system via an insertion into said slot; and

an identification system operatively connected to the database of the automated system and employing a single identification technology for
15 recognizing physical tags of both users and rental items of said automated system, the identification system being configured to not only selectively allow recognized users to access the automated system and use the same via the interface thereof, but also to selectively allow a third party to return recognized rental items of a given user of the automated system into a given slot of one of
20 the terminals of the interface without the presence of said given user.

Preferably also, the identification system comprises a plurality of readers for reading physical tags of both users and rental items of the automated system, each reader being provided on a corresponding location of the automated
25 system. The plurality of readers preferably comprises at least one reader provided on each terminal of the interface. The plurality of readers preferably also comprises at least one reader provided on each slot of each terminal of the interface. The plurality of readers preferably also comprises at least one reader provided on an administrative post of the automated system, said administrative
30 post being separate from the interface.

Preferably also, the second physical space is a closed physical space encasing the terminals of the interface, said closed physical space being provided with an access door for accessing the closed physical space and corresponding terminals, and the plurality of readers comprises at least one external reader
5 operatively connected to said access door for recognizing users and rental items of the automated system via a recognition of the physical tags thereof, and for selectively allowing passage through the access door to allowed recognized users, as well as to individuals with allowed recognized rental items.

10 Preferably also, each of the users of the system is provided with a physical tag recognizable by the automated system for being able to access the same, and corresponding information being associated to each tag of each user of the automated system for cooperation with the database thereof, so as to provide the automated system with corresponding information regarding each user.

15 Preferably also, the single identification technology of the identification system is selected from the group consisting of radio frequency identification technology, computer chip identification technology, bar code identification technology, magnetic card identification technology, optical identification
20 technology and biometric identification technology.

Advantageously, and according to the preferred embodiment of the present invention, the single identification technology of the identification system is radio frequency identification (RFID) technology. Preferably also, the tags of
25 the users and rental items are tags with readable and writable information from the automated system.

Preferably also, the readers of the automated system are operatively connected to at least one timer for determining at which time corresponding tags
30 of corresponding users and rental items of the automated system are passed before said readers.

Preferably also, the storing system comprises a manipulating assembly cooperable with the interface for manipulating and displacing rental items from the slot of a given terminal of the interface to a corresponding rack of the storing system, and vice versa.

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Preferably also, each slot of each terminal comprises a buffering storage space configured for temporarily receiving and storing a plurality of rental items, prior to them being subsequently stored into the storing system by the manipulating assembly thereof after a return of a given individual, or prior to them
10 being subsequently distributed to a given user from the storing system after having completed a successful order and transactional payment within the automated system.

Preferably also, the terminals of the interface are independently operable
15 from one another within the automated system and are each operatively connected to the database thereof, and each terminal further comprises a computer with corresponding touch screen connected to the database for browsing and ordering available rental items from the automated system, each terminal also comprising a corresponding device for carrying out a transactional
20 payment to the automated system.

Preferably also, each slot of the interface is configured within the automated system so that insertion of returned rental items into said each slot is carried out irrespectively of browsing and ordering of new rental items by a user
25 with the corresponding terminal. The automated system preferably comprises three separate terminals.

According to the present invention, the embodiments for the rental items can be various but these are preferably physical support items each containing at
30 least one readable digital file. Each digital file is preferably selected from the group consisting of video files, audio files, document files, text files, Internet files, image files, ASCII files and binary files.

According to the preferred embodiment of the present invention, the rental items are digital video discs (DVDs). Preferably, each digital video disc comprises a corresponding physical tag provided under an adhesive layer mounted about a peripheral portion of a center orifice of the disc. Preferably, each digital video disc
5 comprises a casing for encasing the disc, the corresponding tag of the disc being readable by readers of the identification system when contained in the casing. Preferably also, the casings are shaped and sized for enabling a proper handling and storing by the storing system, via a robotic manipulating assembly, for
10 example.

Preferably also, the different components of the automated system are each self-sustained in terms of power supply and are also independently operable from one another. Preferably also, the different components of the
15 automated system are integrated thereto in a substantially modular manner.

According to one particular preferred variant of the present invention, the database of the automated system is connected to separate local and national servers for selectively transmitting information from the automated system to said
20 servers, and vice versa.

Preferably also, the automated system further comprises diagnosing means for diagnosing operating errors associated with the different components of the automated system, and for sending corresponding diagnostic messages to
25 corresponding personnel of the automated system, each diagnostic message being formatted depending on which member of said personnel the message is being sent to.

According to another aspect of the invention, there is also provided an
30 assembly provided with at least one of the above-mentioned system.

According to yet another aspect of the invention, there is also provided a kit for assembling the above-mentioned system and/or assembly.

5 According to yet another aspect of the invention, there is also provided a method for operating the above-mentioned system and/or assembly.

10 According to yet another aspect of the present invention, there is also provided a method of doing business with the above-mentioned system and/or assembly.

The objects, advantages and other features of the present invention will become more apparent upon reading of the following non-restrictive description of preferred embodiments thereof, given for the purpose of exemplification only, with reference to the accompanying drawings.

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Brief description of the drawings:

Figure 1 is a schematic perspective view of an automated system according to a preferred embodiment of the present invention.

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Figure 2 is a schematic representation of an automated system according to another preferred embodiment of the present invention.

25 Figure 3 is a schematic representation of an automated system according to yet another preferred embodiment of the present invention.

Figure 4 is a schematic representation of an automated system according to yet another preferred embodiment of the present invention.

30 Figure 5 is a perspective view of a manipulating assembly according to a preferred embodiment of the present invention.

Figure 6 is a perspective view of certain components of the manipulating assembly shown in Figure 5.

Figure 7 is an enlarged view of a section of what is shown in Figure 6.

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Figure 8 is an enlarged view of another section of what is shown in Figure 6.

6.

Figure 9 is a perspective view of a handler to be used with a manipulating assembly according to a preferred embodiment of the present invention.

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Figure 10 is a top view of what is shown in Figure 9.

Figure 11 is a front view of what is shown in Figure 9.

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Figure 12 is a side view of what is shown in Figure 9.

Figure 13 is a perspective view of a storage rack to be used with a storing system according to a preferred embodiment of the present invention.

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Figure 14 is an enlarged view of a section of what is shown in Figure 13.

Figure 15 is a top view of what is shown in Figure 13.

Figure 16 is a perspective view of an input-output device to be used with a slot of a terminal according to a preferred embodiment of the present invention.

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Figure 17 is a top view of what is shown in Figure 16.

Figure 18 is a front view of what is shown in Figure 16.

30

Figure 19 is a side view of what is shown in Figure 16.

Figure 20 is a handler idler assembly to be used with the handler shown in Figure 9 according to a preferred embodiment of the present invention.

5 Figure 21 is a top view of what is shown in Figure 20.

Figure 22 is a side view of what is shown in Figure 20.

Detailed description of preferred embodiments of the invention:

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In the following description, the same numerical references refer to similar elements. The embodiments, dimensions, physical properties and/or geometrical configurations shown in the figures and described herein are preferred variants and are used for exemplification purposes only.

15

Although the present invention was primarily designed for carrying out automated functions, such as, for example, receiving and distributing items (including "rental" items such as DVDs, and the like) to users of the system, it could be used with other suitable kinds of items (i.e. conventional physical books, etc.), or for other suitable purposes (e.g. "sale" of items, "giveaways" of items, etc.), as apparent to a person skilled in the art. For this reason, the expressions "automated", "system", "receiving", "distributing", "rental" and/or "DVD" should not be taken as to limit the scope of the present invention and includes all other kinds of purposes or items with which the present invention may be used and could be
20
25 useful.

Moreover, in the context of the present description, the expressions "system", "apparatus", "assembly" and "device", as well as "commerce" and "business", as well as any other equivalent expressions and/or compound words thereof, may be used interchangeably. The same applies for any other mutually
30 equivalent expressions mentioned herein, such as, for example, "outlet", "system", "store", "building", "door" and "establishment", as well as "member",

"user", "client" and "customer", as well as "disc", "casing", "rental item", "DVD", "movie", "product" and "media", as well as "terminal" and "kiosk", as well as "using", "accessing", "browsing", "ordering" and "receiving", as well as "handling" and "manipulating", as well as "slot" and "rack", as well as "renting", "selling" and
5 "giving", and/or any other mutually equivalent expressions having similar and/or different possible connotative meanings, as can be easily understood by a person skilled in the art.

In addition, although the preferred embodiment of the present invention as
10 illustrated in the accompanying drawings comprises various components such as the ones mentioned herein, etc., and although the preferred embodiments of the system 100 and corresponding parts of the present invention as shown consist of certain geometrical configurations as explained and illustrated herein, not all of these components and geometries are essential to the invention and thus should
15 not be taken in their restrictive sense, i.e. should not be taken as to limit the scope of the present invention. It is to be understood that other suitable components and cooperation thereinbetween, as well as other suitable geometrical configurations may be used for the system 100 according to the present invention, as will be briefly explained herein and as can be easily inferred
20 herefrom, without departing from the scope of the invention, as also apparent to a person skilled in the art.

Broadly described, and as can be easily understood by the accompanying drawings, namely FIG. 1, the present invention relates to an automated system
25 100 for receiving and distributing items 3 (e.g. rental items 3, etc.) to users of the automated system 100. The automated system 100 comprises a first physical space 5 for containing the rental items 3 to be received and distributed, the first physical space 5 comprising a storing system 7 for manipulating the rental items 3, and individually and spatially storing the same into corresponding respective
30 racks of the storing system 7, the rental items 3 being associated to a corresponding database 8 of the automated system 100, each of the rental items 3 being provided with a physical tag 9 recognizable by the automated system

100, and corresponding information being associated to each tag 9 of each rental item 3 of the automated system 100 for cooperation with the database 8 thereof.

5 The automated system 100 also comprises a second physical space 11, substantially separate from the first physical space 5, for receiving users of the system, as can be easily understood when referring more particularly to FIG. 1.

10 As also shown, the automated system 100 also comprises an interface 13 operatively interconnecting the first physical space 5 to the second physical space 11, the interface 13 comprising a plurality of terminals 15, each terminal 15 being configured for allowing a given user of the automated system 100 in the second physical space 11 to browse, order and receive available rental items 3 from the first physical space 5, each terminal 15 being further provided with a corresponding slot 17 for distributing rental items 3 having been ordered from the storing system 7 of the first physical space 5 and for allowing also items 3 to be
15 returned to said storing system 7 via an insertion into said slot 17.

The automated system 100 also comprises an identification system 19 operatively connected to the database 8 of the automated system 100 and
20 employing a single identification technology for recognizing physical tags 21,9 of both users and rental items 3 of said automated system 100, the identification system 19 being configured to not only selectively allow recognized users to access the automated system 100 and use the same via the interface 13 thereof, but also to selectively allow a third party to return recognized rental items 3 of a given user of the automated system 100 into a given slot 17 of one of the
25 terminals 15 of the interface 13 without the presence of said given user.

Preferably also, and as also better shown in FIG. 1, the identification system 19 comprises a plurality of readers 19 for reading physical tags 21,9 of
30 both users and rental items 3 of the automated system 100, each reader 19 being provided on a corresponding location of the automated system 100. The plurality of readers 19 preferably comprises at least one reader 19a provided on each

terminal 15 of the interface 13. The plurality of readers 19 preferably further comprises at least one reader 19b provided on each slot 17 of each terminal 15 of the interface 13. More particularly, and as can be easily understood, each slot 17 is provided with a corresponding reader 19b inside thereof to enable a proper cooperation with a tag 9 of a corresponding rental item 3 passing therethrough, for appropriate processing by the automated system 100. The plurality of readers 19 preferably further comprises at least one reader 19c provided on an administrative post 23 of the automated system 100, said administrative post 23 being separate from the interface 13, and being preferably used by personnel of the automated system 100 (such as a rental outlet, for example) during given business hours, for carrying a variety of work related to the automated system 100, such as the "tagging in" of new items 3 into the system 100, as can be easily understood by a person skilled in the art. A similar administrative post 23 could also be provided, if desirable, in the "back" of the store, namely in the first physical space 5, near the storing system 7, for example.

According to the preferred embodiment of the present invention, the second physical space 11 is a closed physical space 11 encasing the terminals 15 of the interface 13, said closed physical space 11 being provided with an access door 25 for accessing the closed physical space 11 and corresponding terminals 15, and the plurality of readers 19 preferably further comprises at least one external reader 19d operatively connected to said access door 25 for recognizing users and rental items 3 of the automated system 100 via a recognition of the physical tags thereof (either tags 9 of rental items 3 or tags 21 of users of the system 100, as can be easily understood when referring to Figure 1), and for selectively allowing passage through the access door to allowed recognized users, as well as to individuals with allowed recognized rental items 3 (in the latter case, these individuals would not have user tags 21 *per se* as in the case of members of the system 100 but could return rental items 3 back into the system 100 via the tags 9 thereof which would be preferably recognized by either one of readers 19a,19b,19c,19d of the system 100, for example, for accessing the closed physical space 11 and then returning rental items 3 into a

corresponding slot 17 for subsequent handling and storing by the storing system 7).

It is worth mentioning however, as can be easily understood by a person skilled in the art, that the provision of a closed physical space 11 for the second physical space 11 is not absolutely necessary for a proper operation of the present automatic system 100, but such a feature is advantageous in that, by providing a closed physical space 11 for the second physical space 11, an additional protective barrier is provided to the system 100 for protecting the terminals 15 thereof and other possible components against tampering by unauthorized users of the system 100, or by individuals not having been authorized to access the closed physical space 11 (for example, by individuals not carrying rental items recognized and authorized by the external reader 19d of the automated system 100, etc.), or against precipitations, harsh weather conditions and the like.

Preferably also, each of the users of the system 100 is provided with a physical tag 21 recognizable by the automated system 100 for being able to access the same (whether the interface 13 thereof, or the second physical space 11 in the event that the latter is a closed physical space 11 provided with an access door 25 and external reader 19d, as explained above, and as exemplified in FIG. 1), and corresponding information being associated to each tag 21 of each user of the automated system 100 for cooperation with the database 8 thereof, so as to provide the automated system 100 with corresponding information regarding each user. For example, if a given user has several outstanding fees not having been paid, then the tag 21 thereof would cooperate with the automated system 100 so as to indicate to the database 8 corresponding information pertaining to the user's situation, and thus access to said system 100 could be denied when said given user would attempt to access the automated system 100 by passing the corresponding tag 21 associated thereto before a given reader 19, whether one provided on the access door 19d, or one provided on a given terminal 19a. Preferably also, the tags 21 of the users come in the

form of cards, or suitable devices to be mounted onto a given key chain of a user, for example. Other suitable embodiments could be used for the tags 21 of the users, without departing from the scope of the present invention, as apparent to a person skilled in the art.

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Preferably also, the single identification technology of the identification system 19 is selected from the group consisting of radio frequency identification technology, computer chip identification technology, bar code identification technology, magnetic card identification technology, optical identification
10 technology and biometric identification technology.

Advantageously, and according to the preferred embodiment of the present invention, the single identification technology of the identification system 19 is radio frequency identification (RFID) technology. Preferably also, the tags
15 21,9 of the users and rental items 3 are tags 21,9 with readable and writable information from the automated system 100. Radio frequency identification technology (RFID) is well known in the art, and thus, in the context of the present description, there is no need to further elaborate on the working principle thereof, as apparent to a person skilled in the art.

20

Preferably also, the readers 19 of the automated system 100 are operatively connected to at least one timer 27 for determining at which time corresponding tags 21,9 of corresponding users and rental items 3 of the automated system 100 are passed before said readers 19. Thus, as can be easily
25 understood by a person skilled in the art, the provision of the above-discussed identification system 19 and corresponding readers 19, with corresponding components and features, as described herein, do not only enable to properly manage corresponding users and rental items 3 of the automated system, but could also be used to properly manage the employees of the rental outlet
30 associated to the automated system 100 by using said automated system 100 as an automated punch clock system for identifying employees provided with corresponding tags 21 so as to not only identify employees working at the rental

outlet (i.e. automated system 100), but also keep track of the time worked by each one of said employees, and other related information (i.e. how many times they did a demo rental that day, etc.).

5 Preferably also, the storing system 7 comprises a manipulating assembly cooperable with the interface 13 for manipulating and displacing rental items 3 from the slot 17 of a given terminal 15 of the interface 13 to a corresponding rack of the storing system 7, and vice versa. The manipulating assembly can be a
10 corresponding robotic manipulating assembly, for example, as explained in greater detail hereinbelow when referring to FIGS. 5-22, and as apparent to a person skilled in the art.

Preferably also, each slot 17 of each terminal 15 comprises a buffering storage space, as better shown in FIGS. 16-19 configured for temporarily
15 receiving and storing a plurality of rental items 3, prior to them being subsequently stored back into the storing system 7 by the manipulating assembly thereof after a return of a given individual, or prior to them being subsequently distributed out to a given user from the storing system 7 after having completed a
20 successful order and transactional payment within the automated system 100.

Preferably also, the terminals 15 of the interface 13 are independently operable from one another within the automated system 100 and are each
operatively connected to the database 8 thereof, and each terminal 15 preferably
25 further comprises a computer with corresponding touch screen 29 connected to the database 8 for browsing and ordering available rental items 3 from the automated system 100, each terminal 15 also comprising a corresponding device
31 for carrying out a transactional payment or other related action to the automated system 100.

30 Preferably also, each slot 17 of the interface 13 is configured within the automated system 100 so that insertion of returned rental items 3 into said each slot 17 is carried out irrespectively of browsing and/or ordering of new rental

items 3 by a user with the corresponding terminal 15. The automated system 100 preferably comprises three separate terminals 15.

According to the present invention, the embodiments for the rental items 3 can be various but these are preferably physical support items each containing at least one readable digital file. Each digital file is preferably selected from the group consisting of video files, audio files, document files, text files, Internet files, image files, ASCII files and binary files. However, it is worth mentioning that according to the present invention, the rental items 3 could be any other suitable rental items 3, such as conventional physical books provided with corresponding tags 9, for example, etc., with which the present automated system 100 could be used and may be useful, as apparent to a person skilled in the art.

According to the preferred embodiment of the present invention, the rental items 3 are digital video discs (DVDs). Preferably, each digital video disc comprises a corresponding physical tag 9 provided under an adhesive layer mounted about a peripheral portion of a center orifice of the disc. Preferably, each digital video disc comprises a casing for encasing the disc, the corresponding tag 9 of the disc being readable by readers 19 of the identification system 19 when contained in the casing. It is to be understood that if the single identification technology used for the identification system 19 of the automated system 100 is a technology other than the preferred radio frequency identification (RFID) technology, such as bar code technology, optical technology, biometric technology, and the like, for example, then the corresponding casings of the rental items 3 and the corresponding readers 19 of the identification system 19 would be thus adjusted accordingly so as to enable a proper interaction (contact, orientation, etc.) between the tags 9 of the rental items 3 contained in the casings and the corresponding readers 19. It is worth mentioning also that radio frequency identification technology used as the single identification technology for the identification system 19 of the present automated system 100 is the preferred embodiment thereof according to the present invention in that it can be used irrespectively of contact and/or orientation of a given tag 9,21 with the

corresponding reader 19. Indeed, the only substantial requirement is that the corresponding tag 9,21 be passed within the corresponding field of a given reader 19 so to be activated and read by said given reader 19 for relaying information thereto, in a suitable manner, as apparent to a person skilled in the art. Preferably also, the casings are shaped and sized for enabling a proper handling and storing by the storing system 7, via a robotic manipulating assembly, for example.

Preferably also, the different components of the automated system 100 are each self-sustained in terms of power supply and are also independently operable from one another, as aforementioned. Preferably also, the different components of the automated system 100 are integrated thereto in a substantially modular manner.

As may be now better appreciated, the above-discussed components and features (single identification technology employed for both users and rental items 3, plurality of terminals 15 provided on the interface 13, each terminal 15 having its own slot 17, each slot 17 of each terminal 15 comprising a buffering storage space, each component of the system 100 being independently operable from one another, etc.) enable to overcome the various prior art problems associated with conventional automated systems.

According to one particular preferred variant of the present invention, the database 8 of the automated system 100 is connected to separate local and national servers 33,35 for selectively transmitting information from the automated system 100 to said servers, and vice versa, as can be easily understood when referring to FIG. 1, for enabling the creation of catalogue of rental items 3 and other similar related features, as apparent to a person skilled in the art.

Preferably also, the automated system 100 further comprises diagnosing means for diagnosing operating errors associated with the different components of the automated system 100, and for sending corresponding diagnostic messages to corresponding personnel of the automated system 100, each

diagnostic message being formatted (content, language, etc.) depending on which member of said personnel the message is being sent to.

It is worth mentioning also that according to the present invention, the expression "rental" as used in regards to "rental items" 3, it is not intended to be used or interpreted in a restrictive sense, in that, as can be easily understood by a person skilled in the art, when referring to the present description as a whole, the automated system 100 according to the present invention could also be used for "selling" items 3 available within the storing system 7 of the automated system 100. Indeed, it can be easily understood by a person skilled in the art that, in such a case, the automated system 100, corresponding database 8, corresponding operating software and/or other suitable corresponding components would be adjusted so that, in the event of a "purchased" item 3, the tag 9 thereof and/or its associated information in database 8 would be marked or modified accordingly (i.e. corresponding information of the tag 9 would be adjusted accordingly) when exiting the corresponding slot 17 of a given terminal 15, so that, when said purchased item 3 would exit the automated system 100, and more particularly, the second physical space 11 thereof, whether it be a closed physical space or not, subsequent access to the automated system 100 by means of said purchased item 3 would not be allowed, because said purchased item 3 would no longer belong to the automated system 100 (i.e. now belongs to the purchasing user of the system, so is thus not intended to be returned back into the automated system 100, and more particularly, the storing system 7 thereof), as also apparent to a person skilled in the art. Thus, it can also be easily understood that the purchase of an item 3 according to the present invention is not only very possible, but is also simply a subset or a special case of a "rental", wherein the rental is done "forever" via an appropriate amount (i.e. purchase price), and thus such a "rental" (i.e. "purchased" item 3) is to no longer be allowed back into the automated system 100. A "giveaway" of an item 3 available in the storing system 7 according to the present invention would be handled by the automated system 100 similarly to that of a "purchased" item 3, aside from the fact that the purchase

price would be zero, and perhaps other corresponding processing changes to be considered, as can be easily understood by a person skilled in the art.

In a similar line of thought, it can also be easy understood that the present
5 automated system 100 could be used for carrying out a variety of diversified
functions, other than "rentals", such as not only rentals *per se*, purchases and
giveaways, as aforementioned, but also used for carrying out different types of
digital commerce and the like, such as advertisement on the corresponding
10 screens 29 of the terminals 15, a corresponding promotion, Internet access, file
sharing, information processing, information storage, and the like, as also
apparent to a person skilled in the art.

Furthermore, it is worth mentioning also that several other modifications
and alterations could be made to the present automated system 100 without
15 departing from the scope of the present invention, as also apparent to a person
skilled in the art.

For example, instead of having rental items 3 in a ready-to-distribute
format being present and available in the storing system 7, the rental items 3
20 could take on different other types of embodiments, as aforementioned, wherein
the rental items 3 could, for example, be created or generated upon request of a
given user of the system 100, directly or indirectly from a corresponding source
33,35, operatively connected by suitable means to the automated system 100,
whether via the Internet or the like, as can be easily understood when referring to
25 FIG 1.

Furthermore, in such cases, digital information to be distributed to
consumers or to be recorded by the automated system 100 may comprise one or
more of a video file (e.g., .mov, .avi, .mpg, etc.), an audio file (e.g., .wav, .mp3,
30 .aiff, etc.), a document file (e.g., .doc, .txt, .pdf, etc.), an Internet file (e.g., .html,
.xml, .asp, .php, etc.), an image file (e.g., .bmp, .jpeg, .gif, etc.), an ASCII file, a
binary file, or any other class of digital information. The digital information to be

distributed to consumers or recorded by the automated system 100 may further comprise one or more of a movie, a television program, a sports event, software, a catalogue, a flyer, a video game, music, an advertisement, a promotion, a coupon, a web portal, an identification tag, consumer interaction history and/or trends, product interaction history and/or trends, employee interaction history and/or trends, or any other digital information an operator of the automated system 100 might find desirable to distribute or record.

The digital information to be distributed to consumers or to be recorded by the automated system 100 may still further comprise a plurality of digital informations to be distributed to consumers or to be recorded by the automated system 100 as described herein.

Indeed, as aforementioned, the automated system 100 according to the present invention could be further configured for performing automated digital commerce and would comprise suitable components and features for carrying out the same, such as, for example, at least one processor, at least one storage area, system control software, at least one means whereby a user can provide information to the automated system, at least one means whereby the automated system can provide information to a user, and at least one means of communicating with a remote computer, as will be explained in greater detail hereinbelow.

The processor may be one or more of a personal computer (PC), a local server, a remote server, a "thin client", a motherboard, a CPU, or some other computational device, and the processor may further include a plurality of processors, as apparent to a person skilled in the art.

The storage area may include any storage area for non-physical digital information such as a magnetic memory device (e.g., hard drive, RAM, tape drive, etc.), an optical memory device, a software memory device (e.g., a database, a file, etc.) or some other suitable memory device. In some

embodiments, the storage area may further include a non-physical information storage area on a remote computer, as apparent to a person skilled in the art. In still further embodiments, the storage area may include a storage area for physically recorded digital information to be distributed to consumers such as a storage rack for housing physically recorded digital information media (e.g., optical discs, memory sticks, identification tags, magnetic cards, smart cards, etc.), as also apparent to a person skilled in the art. In still further embodiments, the storage area may comprise a plurality of the storage areas as described herein.

10

The system control software may include means for the automatic processing of payment, means for restricting user access to the automated system 100, means of allowing a user to return purchased or rented digital information or products to the automated system 100, means of identifying a user, means of identifying a product, means of updating storage area inventory information, means whereby it may recognize users by the products associated with them or vice versa, means whereby digital information distributed from one automated system 100 may be returned to a different automated system 100, means whereby a product not distributed by any automated system 100 may be returned to the automated system 100, means of automated communication, means whereby profit realized from the distribution of digital information from one automated system 100 and returned to another is automatically shared between said automated systems 100, means of calculating the share of profits to be realized by each automated system 100, means of automatically performing a transaction between said automated systems 100 to transfer the balance of payment of said profits between said automated systems 100, means of detecting an alarm state, means of tracking and recording interactions between the automated system 100 and users and storing said interaction data in said storage area, means whereby the automated system 100 may distribute information to a consumer based on that consumer's transaction history, means whereby control of the automated system 100 may be ceded to a remote computer, means whereby control of the automated system 100 may be retaken based on some

interaction with the automated system 100, means whereby it may track the location of digital information to be distributed to consumer, means to generate physically recorded digital information from non-physically recorded information, means of generating said physically recorded digital information in one or more
5 formats and means of generating physically recorded digital information that will become unreadable after some elapsed time or once some other condition has been met. The system control software may further comprise a plurality of means as described herein.

10 The means whereby a user may provide information to the automated system may comprise one or more of a touch screen, a wireless access point, a USB port, a radio frequency (RF) reader, a wired network connection, a remote computer, or any other means of providing information to the automated system
15 100 such as a serial port, a parallel port, an optical port, some other memory stick port, a PCMCIA slot, a microphone, an Internet portal, a magnetic information input device, an optical information input device, a biometric information input device, a barcode reader, a telephone, a button, a dial, a joystick, a keyboard, a mouse, a touch pad, a scanner, a still camera, a video camera, an antenna, an email, a text message, a page, a cash acceptor, etc., as apparent to a person
20 skilled in the art.

In some other embodiment of the invention, said means whereby a user may provide information to the automated system 100 may comprise a plurality of means as described above.

25

The means whereby the automated system 100 may provide information to a user may comprise one or more of a printer, a touch screen, a wireless access point, a USB port, an RF writer, a wired network connection, a remote computer, or any other means of providing information to a user such as a computer screen,
30 a light, a television, a serial port, a parallel port, an optical port, some other memory stick port, a PCMCIA slot, an audio speaker, an Internet portal, a magnetic information output device, an optical information output device, an

antenna, an email, a text message, a voice message, etc., as also apparent to a person skilled in the art.

5 In some embodiments, the above-mentioned means may further comprise means of automatically transmitting said information to a user within some area surrounding the automated system.

10 In some further embodiments, means whereby the automated system 100 may provide information to a user may comprise a plurality of means as described above.

15 The means of communicating with a remote computer may be automated or an operator, an administrator or a user may manually initiate it. Such means of communication with a remote computer may comprise one or more of a wireless access point or some other wireless network (e.g., bluetooth™, mobile phone network, etc.), a wired network connection, or any other means of communication such as a telephone network, etc., as apparent to a person skilled in the art.

20 In another embodiment, the means of communication with a remote computer may comprise a plurality of means as previously described.

25 As aforementioned, the automated system 100 may also comprise means whereby control of the automated system 100 may be ceded to a remote computer. The ceding of control may include control of some or all of the elements of the automated system 100. Such means may further comprise means whereby control of the automated system 100 may be retaken by it based on some interaction with the automated system 100 (e.g., user input, reader input, administrator input, etc.), as apparent to a person skilled in the art.

30 Reference will now be made to FIGS. 2-22 in order to further describe components and features of other possible preferred embodiments of the present invention. FIG. 2 for example illustrates a schematic representation showing

basic elements of an automated system 100 according a preferred embodiment of the present invention. FIG. 3 illustrates a schematic representation of another preferred embodiment of the present invention comprising a processor, a hard drive and RAM, a local database, system control software, a touch screen display, an extended range radio frequency reader/writer for reading/writing information from/to an identification device, a printer, a wireless network access point, and a wired network connection. FIG. 4 illustrates a schematic representation of another preferred embodiment of the present invention comprising a processor, a hard drive and RAM, a local database, system control software, a storage rack, a database, a touch screen, a radio frequency reader/writer for reading/writing information from/to an identification device, a physically stored information transport system, a physically stored information input/output device, physical media generator, a printer, a USB port, a wireless network access point, a wired network connection, several remote reader/writers, a remote screen, a remote server and database, and a website for accessing information stored in said automated system. FIG. 5 illustrates the interaction between means 120 of transporting physically stored digital information, storage rack 118, and physically stored digital information input/output device 121, according to a preferred embodiment of the present invention. FIGS. 6-8 illustrate a preferred embodiment of means 120 of transporting physically stored digital information within the automated system 100. FIGS. 9-12 illustrate a preferred embodiment of a physically stored information handler 142 according to the present invention. FIGS. 13-15 illustrate a preferred embodiment of a storage rack 118 according to the present invention. FIGS. 16-19 illustrate a preferred embodiment of physically stored digital information input/output device 121 according to the present invention. FIGS. 20-22 illustrate a preferred embodiment of a handler idler assembly 157 according to the present invention.

Referring back to FIG. 2, the automated system 100 includes a processor 101. Processor 101 may be one or more of a personal computer (PC), a server, a "thin client", a motherboard, a handheld computer, or any other computational

device. In some embodiments, processor 101 may comprise a plurality of processors.

Referring again to FIG. 2, the automated system 100 of the invention
5 further includes a storage area 102 to house digital information to be distributed to consumers. Storage area 102 may further house digital information not to be distributed to consumers. Storage area 102 may still further house information necessary for or important to the operation of automated system 100.

10 As illustrated in FIGS. 3 and 4, storage area 102 may include one or more of a hard drive and RAM 163, a local database 129, or any other storage area for non-physical digital information such as a magnetic memory device (e.g., tape drive, etc.), an optical memory device, a software memory device (e.g., a file, etc.) or some other memory device. In some embodiments, storage area 102 may
15 include a non-physical information storage area on a remote computer 107. In another embodiment, as illustrated in FIG. 3, said storage area 102 may also include a storage area for physically recorded digital information such as a storage rack 118 for housing physically recorded digital information media (e.g., optical discs, memory sticks, identification tags, magnetic cards, smart cards,
20 etc.), as apparent to a person skilled in the art.

In further embodiments, storage area 102 may comprise a plurality of storage areas as described herein.

25 The digital information may comprise one or more of a video file (e.g., .mov, .avi, .mpg, etc.), an audio file (e.g., .wav, .mp3, .aiff, etc.), a document file (e.g., .doc, .txt, .pdf, etc.), an Internet file (e.g., .html, .xml, .asp, .php, etc.), an image file (e.g., .bmp, .jpeg, .gif, etc.), an ASCII file, a binary file, or any other form of digital information. Said digital information may further comprise one or
30 more of a movie, a television program, a sports event, software, a catalogue, a flyer, a video game, music, an advertisement, a promotion, a coupon, a web portal, an identification tag, consumer interaction history and/or trends, product

interaction history and/or trends, employee interaction history and/or trends, or any other digital information an operator might find desirable to distribute.

5 The digital information may still further comprise a plurality of digital informations as described herein.

The digital information distribution to consumers may comprise a purchase, a rental, an advertisement, fee-based access, a promotion, Internet access, file sharing, etc., as apparent to a person skilled in the art.

10

The digital information distribution may further comprise a plurality of information distributions as described herein.

15 Referring to FIGS. 2, 3 and 4, the automated system 100 of the invention may further include system control software 103, which is preferably housed in the aforementioned non-physical information storage portion of storage area 102. The system control software preferably controls all interactions, processes and functions undertaken by the automated system 100.

20 System control software 103 may include means 104 for the automatic processing of payment. Said payment may include one or more of a payment by credit card, debit card, cash, a stored value card or any other form of payment, as apparent to a person skilled in the art.

25 It is important to note that any credit with an automated system of the invention could be honored by another corresponding automated system, if for example, an owner or a franchisee of said automated system(s) would want to allow such an interaction.

30 System control software 103 may further include means 105 for restricting user access to the automated system 100. The restricted access may include one or more of a complete inability to access the automated system 100, limited

access to information housed in storage area 102, or some other limited access to the automated system 100 as deemed appropriate by the operator, administrator or governing authorities. Said restricted access may be based on information obtained by one or more of means 106 whereby a user can provide
5 information to the automated system 100, information housed in storage area 102, or information housed in a remote computer 107 via means 117 of communication with a remote computer 107.

The information on which said restricted access is based may further
10 comprise a plurality of informations from a plurality of sources as described herein.

The information resulting in restricted access to the automated system 100 may comprise one or more of an age rating applied to digital information to be
15 distributed to consumers, user credit data, user login and/or password, or any other information deemed important by the automated system operator, administrator or governing authorities.

In some embodiments of the invention, said information resulting in
20 restricted access to automated system 100 may comprise a plurality of information types as described above.

System control software 103 may allow a user to return purchased or rented digital information or items to the automated system 100 ("returned
25 product"). As such, referring now to FIG. 2, means 106 whereby a user can provide information to the automated system 100 may include a reader device 108 to read information from an identification device. The identification device may comprise an identification tag. The identification tag may be used for the purpose of identifying a user, physically stored digital information (e.g., a CD,
30 DVD, etc.) or both. Each reader may further be capable of reading both user and physically stored digital information identification tags.

The reader device 108 may comprise one or more of a radio frequency (RF) reader, a magnetic reader, an optical reader, a biometric reader, or some other form of reader device, as apparent to a person skilled in the art. The reader device 108 may further be configured to read identification information from products and/or users not explicitly associated with the automated system. Reader 108 may still further comprise a plurality of readers as previously described.

The identification tag may comprise one or more of an RF tag, a magnetic "strip", a UPC code, an optical identifier, a biometric identifier, or some other form of identification device or means. The identification tag may further include one or more of a unique identifier, a shared identifier, a partially unique and partially shared identifier, or a plurality of identifiers as described herein.

Referring again to FIG. 2, the automated system 100 of the invention can include means 115 whereby information can be provided to the user by the automated system. The means 115 may include a writer device 128 to write information to a device. Said device may comprise an identification tag as described above.

The writer device 128 may comprise one or more of a radio frequency (RF) writer, a magnetic writer, an optical writer, a printer, or some other form of writing device. Writer device 128 may still further comprise a plurality of writer devices as described herein.

The written information may comprise one or more of an automated system identifier, a physical location identifier, a user identifier, a time stamp, user transaction history, digital product transaction history, promotional data, a discount coupon, credit information, "cookies", or any other information chosen by the user, operator or administrator of the automated system. The written information may further be readable and/or recognizable by a reader device 108

of some other automated system 100. The written information may further comprise a plurality of written informations as described herein.

Referring to FIG. 4, said reader device 108 and said writer device 128 may
5 comprise a single reader/writer device 130.

Referring to FIG. 3, said reader device 108 and said writer device 128 may
comprise a single reader/writer device 132 with extended reading and/or writing
range.

10

In some other embodiments, the automated system may comprise a
plurality of reader/writer devices 130 and/or 132.

In one embodiment of the invention, system control software 103 may
15 identify a user via a user identification tag and reader 108 (herein "reader 108" is
to be understood as being interchangeable with "reader 108 or reader/writer 130
or 132"). If the user wishes to return a product, the user may then input returned
product identification information or product(s) to the automated system 100 via a
product identification tag and reader device 108. System control software 103
20 may then recognize the returned digital product identification as belonging to a
product distributed by it using information stored in storage area 102 and/or on a
remote computer 107, and allow return of said product to storage area 102 to be
distributed again later as required. System control software 103 may further
update inventory information stored in storage area 102 to reflect the availability
25 of the returned product to other consumers. System control software 103 may
further process one or more of an automated payment or refund for the returned
product via automatic payment means 104. In the case of a digital information
rental, said payment may be based on the time elapsed since the returned
product was initially distributed. Said elapsed time may be recorded on the
30 product identification tag, the user identification tag, in storage area 102, or on a
remote computer 107, as apparent to a person skilled in the art.

If a user provides only product identification information (and not user identification information) to reader 108, system control software 103 may include means 134 whereby it may recognize users by the products associated with them or vice versa. In this way, means 134 may reference transaction history stored on said identification tag, and/or in storage area 102, and/or in remote computer 107, to determine the user and/or product's identity using the identification information. System control software 103 may then process the returned product as previously described.

10 If a product is being entered into the automated system for the first time, system control software 103 may comprise means 166, whereby product identification information may be used to automatically update user-browseable inventory information stored in storage area 102. Said user-browseable inventory information may further comprise information downloaded from a remote
15 computer 107.

Referring to FIG. 4, the automated system 100 of the invention may comprise a remote reader 108. In some embodiments, the automated system 100 may comprise a plurality of remote readers 108.

20 .
The system control software 103 may comprise means 109 whereby digital information distributed from one automated system 100 may be returned to a different automated system 100 ("foreign media"). System control software 103 may further comprise means 135 whereby a product not distributed by any
25 automated system 100 may be returned to automated system 100.

System control software 103 may further comprise means 110 of automated communication.

30 The presence of foreign media may be communicated by said communication means 110 to the operator(s) of all automated systems in question.

Said communication means 110 may comprise an email and/or a text message and/or a voice message and/or a pager prompt and/or any other suitable form of communication.

5

Said communication means 110 may further comprise a plurality of communication means 110 as described herein.

System control software 103 may still further comprise means 111
10 whereby profit realized from the distribution of said foreign media from one automated system and return to another is automatically shared between said automated systems. Said automatic profit sharing means 111 may comprise means 112 of calculating the share of profits to be realized by each automated system. Said automatic profit sharing means 111 may further comprise means
15 113 of automatically performing a transaction between said automated systems to transfer the balance of payment of said profits between said automated systems 100. Said automatic profit sharing means 111 may still further comprise means 164 whereby the most efficient redistribution of said foreign media is calculated. Said profit calculation and/or said automatic transaction and/or said
20 efficient redistribution calculation may further be communicated to operator(s) of said automated systems by means 110 of communication, as apparent to a person skilled in the art.

System control software 103 may still further comprise means 131 of
25 detecting an alarm state. Said alarm state may include one or more of a tripped security alarm, a fire alarm, an alarm caused by a cash storage threshold reached by automated system 100, an automated system malfunction alarm, a temperature alarm, or any other suitable alarm deemed important by the operator or administrator of automated system 100.

30

Said alarm state may be communicated by means 110 of communication to one or more of a police department, a security service, a fire department,

automated system service personnel, an automated system operator, an automated system administrator, or anyone else chosen for notification by the operator or administrator of the automated system.

5 System control software 103 may comprise means 114 of tracking and recording interactions between automated system 100 and a user and storing said interaction data in storage area 102.

10 In some other embodiments, said means 114 may be capable of tracking and recording multiple simultaneous interactions between automated system 100 and several local users.

15 In some further embodiments, said means 114 may be capable of tracking and recording multiple simultaneous interactions between automated system 100 and several remote users.

20 Means 115 whereby the automated system may provide information to a user may be used by system control software 103 to automatically display digital information to be distributed to consumers to a user based on that user's transaction history as recorded by means 114.

25 In some other embodiments, system control software 103 may comprise means 116 whereby control of automated system 100 may be ceded to a remote computer 107. Said ceding of control may include control of some or all of the elements of automated system 100. Said means 116 may further comprise means whereby control of automated system 100 may be retaken based on some interaction with the automated system (e.g. user input, reader 108 input, etc.).

30 Said ceding of control may include control of processor 101. In this instance, said remote computer 107 may utilize processor 101 for its own purposes (e.g., information processing, data storage, data retrieval, automated

system diagnostics, system control software upgrade, web hosting, information backup, mirror server, etc.), as apparent to a person skilled in the art.

Said ceding of control may further include control of storage area 102. In
5 this instance, said remote computer 107 may utilize storage area 102 for its own purposes (e.g., information processing, diagnostics, web hosting, information backup, mirror server, etc.).

System control software 103 may further include means 165 whereby it
10 may track the location of digital information. Said information may be locally housed in storage area 102 or remotely housed on one of another automated system 100, a remote computer 107, or some other location.

Referring to FIG. 4, system control software 103 may comprise means 133
15 to generate physically recorded digital information from non-physically recorded information using physical media generator 119. Said information may or may not be for distribution to consumers.

Said means 133 may include means of generating physically recorded
20 digital information in one or more formats. Said format may be chosen by a user via said means 115 whereby a user can provide information to the automated system. In some instances, the automated system may automatically choose said format.

Said means 133 may further include means of generating physically
25 recorded digital information that will become unreadable after some elapsed time and/or based on some other condition as chosen by the user, administrator or operator of the automated system 100.

Said media generator 119 may further comprise means 167 of
30 automatically affixing an identification tag to generated physically recorded media. Said media generator 119 may still further comprise a reader 108 for

reading said identification tag information and/or writing information to said identification tag. Said information may then be stored in storage area 102 by system control software 103 and/or it may be distributed to a user via physically stored information transport 120 and physically stored input/output device 121, as
5 described below.

In some other embodiments, physical media generator 119 may comprise a plurality of physical media generators 119.

10 In some further embodiments, one or more means 167 of automatically affixing an identification tag to generated physically recorded media may exist separately from media generator 119.

Referring again to FIG. 2, system control software 103 may include means
15 168 whereby the automated system offers one or more options to a user if the user requests a product not present in the automated system. Said options may include one or more of directions to alternate locations where the product is available and/or delivery of said available product to the automated system and/or a remote location, a request for the purchase and stocking of said product
20 in some automated system in the future, generation of said product by media generator 119, and user notification of product availability via communication means 110.

Said means 168 whereby the automated system offers one or more
25 options to a user if the user requests a product not present in the automated system may further comprise a plurality of options as described herein.

System control software 103 may include means 169 of offering delivery of a user's chosen product(s) to some remote location(s).

30

System control software 103 may further include means 170 of allowing remote users to update their credit with automated system 100. Said update may

be performed by one or more of a telephone network, a wireless network, a wired network, the Internet, etc. Said credit information may be valid at one or more automated systems 100.

5 System control software 103 may still further include means 171 whereby prices associated with the purchase and/or rental of digital information or products may vary based on some method chosen by the automated system user, operator or administrator. Said variation may be automatically or manually initiated and/or discontinued by said user, operator or administrator.

10

Referring to FIG. 4, system control software 103 may include means 172 whereby the user can share information with other users via a remote screen 173.

15 Referring again to FIG. 2, system control software 103 may include means 174 whereby users may register to a waiting list to purchase and/or rent products not yet available.

20 As further illustrated in FIG. 4, in one embodiment of automated system 100, means 115 whereby the automated system may provide information to a user may comprise means 120 of transporting physically stored digital information within automated system 100 and a physically recorded digital information input/output device 121.

25 In some other embodiments, physically recorded digital information input/output device 121 may be an output device only.

30 Furthermore, according to another embodiment of automated system 100, means 106 whereby a user may provide information to the automated system 100 may comprise means 120 of transporting physically stored digital information within automated system 100 and a physically recorded digital information input/output device 121.

According to another embodiment, physically recorded digital information input/output device 121 might be an input device only.

5 In some other embodiments, physically recorded digital information input/output device 121 may be one or more of a plurality of physically recorded digital information input/output devices 121, a plurality of physically recorded digital information input devices 121, or a plurality of physically recorded digital information output devices 121.

10

Said means 120 of transporting physically stored digital information within automated system 100 may transport physically stored digital information between two or more of storage rack 118, physically stored digital information input/output device 121 and physical media generator 119.

15

Referring to FIGS. 6-8, a preferred embodiment of means 120 of transporting physically stored digital information within automated system 100 may include at least one vertical guide 140 (hereafter referred to also as "y-guide 140"), at least one guide 141 (hereafter referred to also as "x-guide 141") perpendicular to y-guide 140, and at least one physically stored information handler 142. Means 120 of transporting physically stored digital information within automated system 100 may still further include at least one motor 144 (hereafter referred to also as "y-motor 144"), at least one y-motor belt 148 fixed to guide 141 and driven by y-motor 144, at least one motor 145 (hereafter referred to also as "x-motor 145"), at least one x-motor belt 149 fixed to handler 142 and driven by x-motor 145, and at least one counterweight 146 for balancing mass driven by y-motor 144. In this way, once y-motor 144 has ceased driving x-guide 141 vertically, no energy is required to hold said assembly immobile, since it is preferably balanced by counterweight 146.

30

In some other embodiments, said means 120 of transporting physically stored digital information within automated system 100 may comprise a plurality

of means 120 of transporting physically stored digital information within automated system 100 as described herein.

5 The y-motor belt 148 may comprise one or more of a friction belt, a timing belt, or any other motion transmission means.

The y-motor belt 148 may further comprise a plurality of motion transmission means.

10 The x-motor belt 149 may comprise one or more of a friction belt, a timing belt, or any other motion transmission means.

The x-motor belt 149 may further comprise a plurality of motion transmission means.

15

Referring to FIGS. 9-12, according to a preferred embodiment, handler 142 may further include at least one guide 143 (hereafter referred to also as "z-guide 143") perpendicular to both y-guide 140 and x-guide 141. Handler 142 may still further include at least one z-guide actuation motor 156 (hereafter referred to also as "z-motor 156"), one handler motor 150 (hereafter referred to also as "belt motor 150"), at least one handler belt 151, at least one sensing means 155, at least one handler idler assembly 157, and at least one drive pulley 162.

20

According to another embodiment, handler 142 may comprise a plurality of components as described herein.

25

Said sensing means 155 may comprise one or more of a contact sensor, a light sensor, a magnetic sensor, or any type of sensing device, as apparent to a person skilled in the art.

30

According to other embodiments, said sensing means 155 may comprise a plurality of sensing means 155 as described herein.

FIGS. 20-22 illustrate handler idler assembly 157. Handler belt 151 is fixed to handler 142 by multiple idler assemblies 157 and drive pulley 162. Idler assembly 157 includes a belt pulley 158, a pulley shaft 159, pulley bushings 160, and pulley grommets 161. Handler motor 150 rotates drive pulley 162, driving handler belt 151. The overall form of the handler belt 151 is preferably maintained by handler idler assemblies 157. Pulley bushings 160 allow handler idler assemblies 157 to rotate on pulley shaft 159. Compliant pulley grommets 161 allow handler idler assembly 157 freedom to translate and/or rotate slightly in any direction, thus allowing handler cart 142 to grasp products whose dimensions may be somewhat varied, as apparent to a person skilled in the art. Compliant pulley grommets 161 may be made of rubber or some other similarly elastic or elastomeric material.

FIGS. 16-19 illustrate one possible embodiment of physically stored digital information input/output device 121, including at least one input/output motor 152, at least one compliant drive roller 153, at least one motion transmission means 154, and at least one sensing means 155. This embodiment may allow the storage of three cases of rental items, and sensing means 155 may allow input/output device 121 to move different CD cases in opposing directions simultaneously. Compliant drive roller 153 may be made of rubber or any similar elastic or elastomeric material.

In some other preferred embodiments, physically stored digital information input/output device 121 may comprise a plurality of components as described herein.

Motion transmission means 154 may comprise one or more of a belt transmission, a gear transmission, or any other form of motion transmission.

30

In some other preferred embodiments, motion transmission means 154 may comprise a plurality of motion transmission means 154 as described herein.

FIGS. 13-15 illustrate one possible embodiment of storage rack 118 intended to house physically stored disc-based digital information.

5 FIG. 5 illustrates one embodiment of an assembly of means 120 of transporting physically stored digital information within automated system 100, physically stored digital information input/output device 121, and storage rack 118. The nominal position of handler 142 is preferably centered between opposing storage racks 118 such that it can be moved by x-motor 145 and y-
10 motor 144 without interfering with storage racks 118. In this embodiment, y-motor 144 and x-motor 145 may position handler 142 according to instructions from system control software 103. Once handler 142 is in position to retrieve a product as instructed by system control software 103, z-motor 156 moves handler towards a product stored in storage rack 118. Simultaneously, belt motors 150
15 begin to spin handler belts 151 such that once handler belts engage the sides of a product or product case (hereafter referred to also as "product"), it will be drawn into handler 142. Z-motor 156 will then, based on feedback from sensors 155, return handler 142 to its nominal position midway between opposing storage racks 118. Belt motors 150 will also receive feedback from sensors 155, and will
20 cease turning once the product is centered in handler 142. Y-motor 144 and x-motor 145 may then drive handler 142 via x-guide 141 and y-guide 140 into a position where it may exchange the product housed in handler 142 with the input/output device 121. Once in a position suitable for this exchange, z-motor 156 will move handler 142 towards input/output device 121 while belt motors 150
25 spin handler belts 151 in a direction whereby the product is moved towards input/output device 121. Once the product's presence is detected by input/output device's sensors 155, input/output motor 152 is engaged, driving compliant drive roller 153 via motion transmission means 154, pulling the product into input/output device 121 and out of handler 142. Once handler 142's sensing
30 means 155 detects that the product has left handler 142, belt motors 150 cease turning, and z-motor 156 returns handler 142 to its nominal position. The product may then be delivered to a user by driving it through to the other side of

input/output device 121 and through a slot in the automated system. System control software may decide after some timeout period wherein the user has not removed the product from input/output device 121, to return the product to storage rack 118. In this case, it will reverse the process outlined herein to return
5 said product to storage rack 118.

A product may be returned to storage area 102 by a user by reversing the process described above.

10 It is important to note that although only one input/output device 121 is shown in FIG. 5, a plurality of input/output devices 121 may be served by a single means 120 of transporting physically stored digital information within automated system 100. Said means 120 may also include any number of the
15 aforementioned components, in any suitable configuration, as apparent to a person skilled in the art.

Referring again to FIG. 3, according to a preferred embodiment of automated system 100, means 115 whereby the automated system 100 may provide information to a user may comprise one or more of a printer 121, a touch
20 screen 122, a wireless access point 123, a USB port 124, an RF writer 108, a wired network connection 125, a remote computer 107, or any other means of providing information to a user such as a computer screen, a light, a television, a serial port, a parallel port, an optical port, some other memory stick port, a PCMCIA slot, an audio speaker, an Internet portal, a magnetic information output
25 device, an optical information output device, an antenna, an email, a text message, a voice message, etc., as apparent to a person skilled in the art.

Means 115 whereby the automated system may provide information to a user may further comprise means of automatically transmitting said information to
30 a user within some area surrounding the automated system 100.

In some other embodiments of automated system 100, means 115 whereby the automated system may provide information to a user may comprise a plurality of means 115 as described above.

5 Again referring to FIG. 4, according to a preferred embodiment of automated system 100, means 106 whereby a user may provide information to the automated system may comprise one or more of a touch screen 122, a wireless access point 123, a USB port 124, an RF reader 108, a wired network connection 125, a remote computer 107, or any other suitable means of providing
10 information to the automated system such as a serial port, a parallel port, an optical port, some other memory stick port, a PCMCIA slot, a microphone, an Internet portal, a magnetic information input device, an optical information input device, a biometric information input device, a barcode reader, a telephone, a button, a dial, a joystick, a keyboard, a mouse, a touch pad, a scanner, a still
15 camera, a video camera, an antenna, an email, a text message, a page, a cash acceptor, etc., as apparent to a person skilled in the art.

Means 106 whereby a user may provide information to the automated system may further include an automated user registration information interface
20 including any of the components listed above.

In some other embodiments of automated system 100, means 106 whereby a user may provide information to the automated system may comprise a plurality of means 106 as described above.
25

In a further embodiment of the invention, one or more of said means 106 whereby a user may provide information to the automated system or means 115 whereby the automated system may provide information to a user may be physically isolated from the remainder of automated system 100. Said means of
30 physical isolation may comprise a wall, etc., as apparent to a person skilled in the art.

Referring again to FIG. 2, the automated system may include means 117 of communicating with a remote computer 107. Said communication may be automated or it may be manually initiated by an operator, an administrator or a user.

5

As illustrated in FIGS. 3 and 4, said means 117 of communication with a remote computer 107 may comprise one or more of a wireless access point 123 or some other wireless network (e.g., bluetooth™, mobile phone network, etc.), a wired network connection 125, or any other means of communication such as a telephone network, etc., as apparent to a person skilled in the art. In another preferred embodiment, means 117 of communication with a remote computer may comprise a plurality of means 117 as previously described.

Referring again to FIGS. 3 and 4, said remote computer may comprise one or more of a remote PC 126, a remote server 127, or any other remote device including a processor such as a handheld device, another automated system 100, a telephone, etc., as apparent to a person skilled in the art.

As may be now better appreciated, and as aforementioned, the above-discussed components and features (namely, but not exclusively: single identification technology employed for both users and rental items 3, plurality of terminals 15 provided on the interface 13, each terminal 15 having its own slot 17, each slot 17 of each terminal 15 comprising a buffering storage space, each component of the system 100 being independently operable from one another, etc.) enable the present invention to overcome the various prior art problems associated with conventional automated systems, for advantageously reducing user bottlenecks and increasing transactional throughput, as well as improving and simplifying interactions with the automated system 100 from a user's point of view.

30

Of course, numerous modifications could be made to the above-described embodiments without departing from the scope of the invention, as defined in the appended claims.

CLAIMS:

1. An automated system for receiving and distributing rental items to users of the automated system, said automated system comprising:

5 a first physical space for containing the rental items to be received and distributed, the first physical space comprising a storing system for manipulating the rental items, and individually and spatially storing the same into corresponding respective racks of the storing system, the rental items being associated to a corresponding database of the automated system, each of the
10 rental items being provided with a physical tag recognizable by the automated system, and corresponding information being associated to each tag of each rental item of the automated system for cooperation with the database thereof;

a second physical space, substantially separate from the first physical space, for receiving users of the system;

15 an interface interconnecting the first physical space to the second physical space, the interface comprising a plurality of terminals, each terminal being configured for allowing a given user of the automated system in the second physical space to browse, order and receive available rental items from the first physical space, each terminal being further provided with a corresponding slot for
20 distributing rental items having been ordered from the storing system of the first physical space and for allowing items to be returned to said storing system via an insertion into said slot; and

an identification system operatively connected to the database of the automated system and employing a single identification technology for
25 recognizing physical tags of both users and rental items of said automated system, the identification system being configured to not only selectively allow recognized users to access the automated system and use the same via the interface thereof, but also to selectively allow a third party to return recognized rental items of a given user of the automated system into a given slot of one of
30 the terminals of the interface without the presence of said given user.

2. An automated system according to claim 1, wherein the identification system comprises a plurality of readers for reading physical tags of both users and rental items of the automated system, each reader being provided on a corresponding location of the automated system.

5

3. An automated system according to claim 2, wherein the plurality of readers comprises at least one reader provided on each terminal of the interface.

4. An automated system according to claim 2 or 3, wherein the plurality of readers further comprises at least one reader provided on each slot of each terminal of the interface.

5. An automated system according to any one of claims 2-4, wherein the plurality of readers comprises at least one reader provided on an administrative post of the automated system, said administrative post being separate from the interface.

6. An automated system according to any one of claims 2-5, wherein the second physical space is a closed physical space encasing the terminals of the interface, said closed physical space being provided with an access door for accessing the closed physical space and corresponding terminals, and wherein the plurality of readers comprises at least one external reader operatively connected to said access door for recognizing users and rental items of the automated system via a recognition of the physical tags thereof, and for selectively allowing passage through the access door to allowed recognized users, as well as to individuals with allowed recognized rental items.

7. An automated system according to any one of claims 1-6, wherein the single identification technology of the identification system is selected from the group consisting of radio frequency identification technology, computer chip identification technology, bar code identification technology, magnetic card

identification technology, optical identification technology and biometric identification technology.

8. An automated system according to claim 7, wherein the single
5 identification technology of the identification system is radio frequency
identification (RFID) technology.

9. An automated system according to any one of claims 1-8, wherein the
tags of the users and rental items are tags with readable and writable information
10 from the automated system.

10. An automated system according to any one of claims 2-9, wherein
readers of the automated system are operatively connected to at least one timer
for determining at which time corresponding tags of corresponding users and
15 rental items of the automated system are passed before said readers.

11. An automated system according to any one of claims 1-10, wherein the
storing system comprises a manipulating assembly cooperable with the interface
for manipulating and displacing rental items from the slot of a given terminal of
20 the interface to a corresponding rack of the storing system, and vice versa.

12. An automated system according to any one of claims 1-11, wherein each
slot of each terminal comprises a buffering storage space configured for
temporarily receiving and storing a plurality of rental items, prior to them being
25 subsequently stored into the storing system by the manipulating assembly thereof
after a return of a given individual, or prior to them being subsequently distributed
to a given user from the storing system after having completed a successful order
and transactional payment within the automated system.

30 13. An automated system according to any one of claims 1-12, wherein the
terminals of the interface are independently operable from one another within the
automated system and are each operatively connected to the database thereof,

and wherein each terminal further comprises a computer with corresponding touch screen connected to the database for browsing and ordering available rental items from the automated system, each terminal also comprising a corresponding device for carrying out a transactional payment to the automated system.

14. An automated system according to any of claims 1-13, wherein each slot of the interface is configured within the automated system so that insertion of returned rental items into said each slot is carried out irrespectively of browsing and ordering of new rental items by a user with the corresponding terminal.

15. An automated system according to any one of claims 1-14, wherein the plurality of terminals comprises three separate terminals.

16. An automated system according to any one of claims 1-15, wherein the rental items are physical support items each containing at least one readable digital file selected from the group consisting of video files, audio files, document files, text files, Internet files, image files, ASCII files and binary files.

17. An automated system according to claim 16, wherein the rental items are digital video discs.

18. An automated system according to claim 17, wherein each digital video disc comprises a corresponding physical tag provided under an adhesive layer mounted about a peripheral portion of a center orifice of the disc.

19. An automated system according to claim 17 or 18, wherein each digital video disc comprises a casing for encasing the disc, the corresponding tag of the disc being readable by readers of the identification system when contained in the casing.

20. An automated system according to any one of claims 1-19, wherein the different components of the automated system are each self-sustained in terms of power supply and are also independently operable from one another.

5 21. An automated system according to any one of claims 1-20, wherein the database of the automated system is connected to separate local and national servers for selectively transmitting information from the automated system to said servers, and vice versa.

10 22. An automated system according to any one of claims 1-21, wherein the automated system further comprises diagnosing means for diagnosing operating errors associated with the different components of the automated system, and for sending corresponding diagnostic messages to corresponding personnel of the automated system, each diagnostic message being formatted depending on
15 which member of said personnel the message is being sent to.

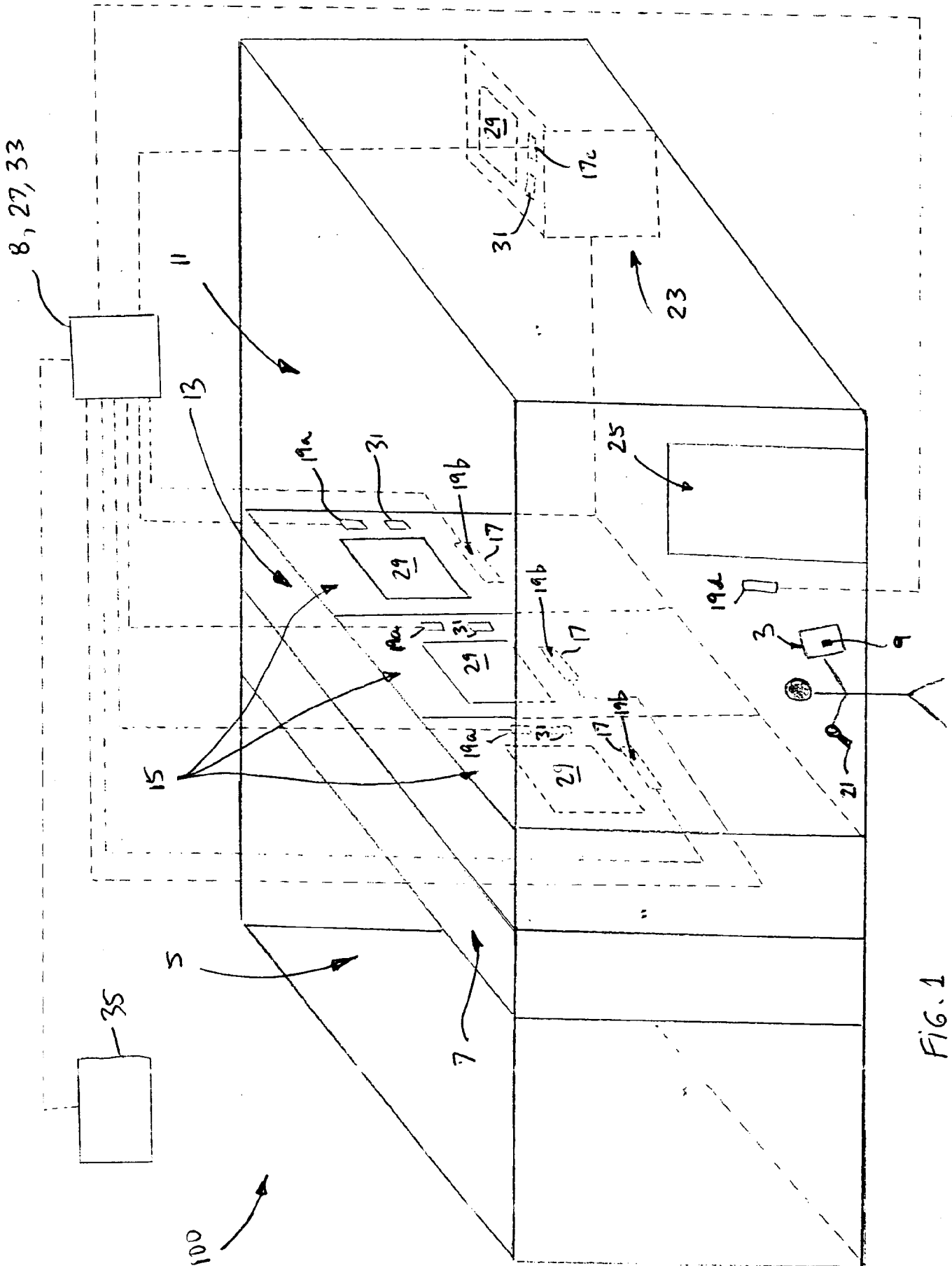


FIG. 1

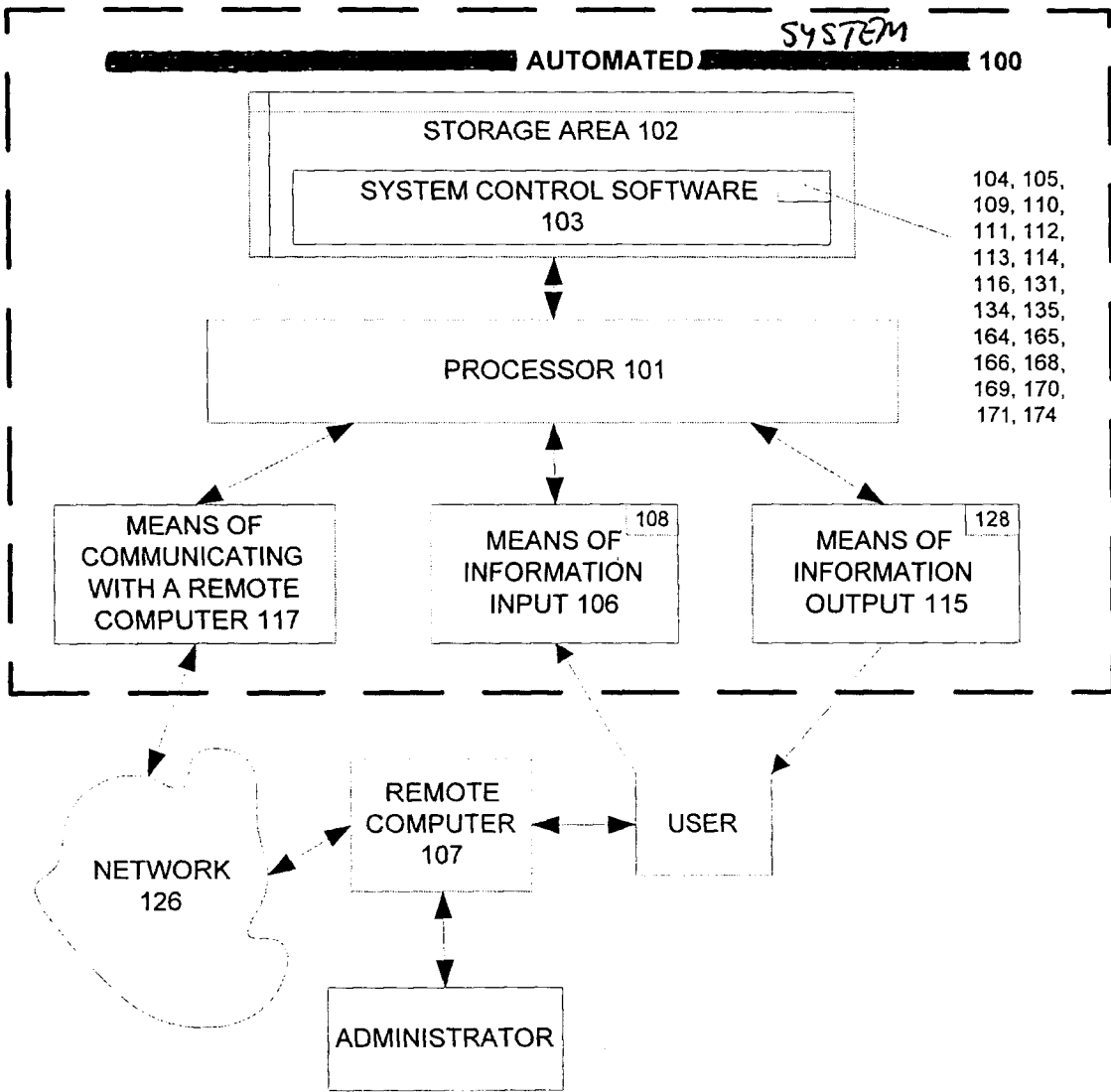


FIG. 2

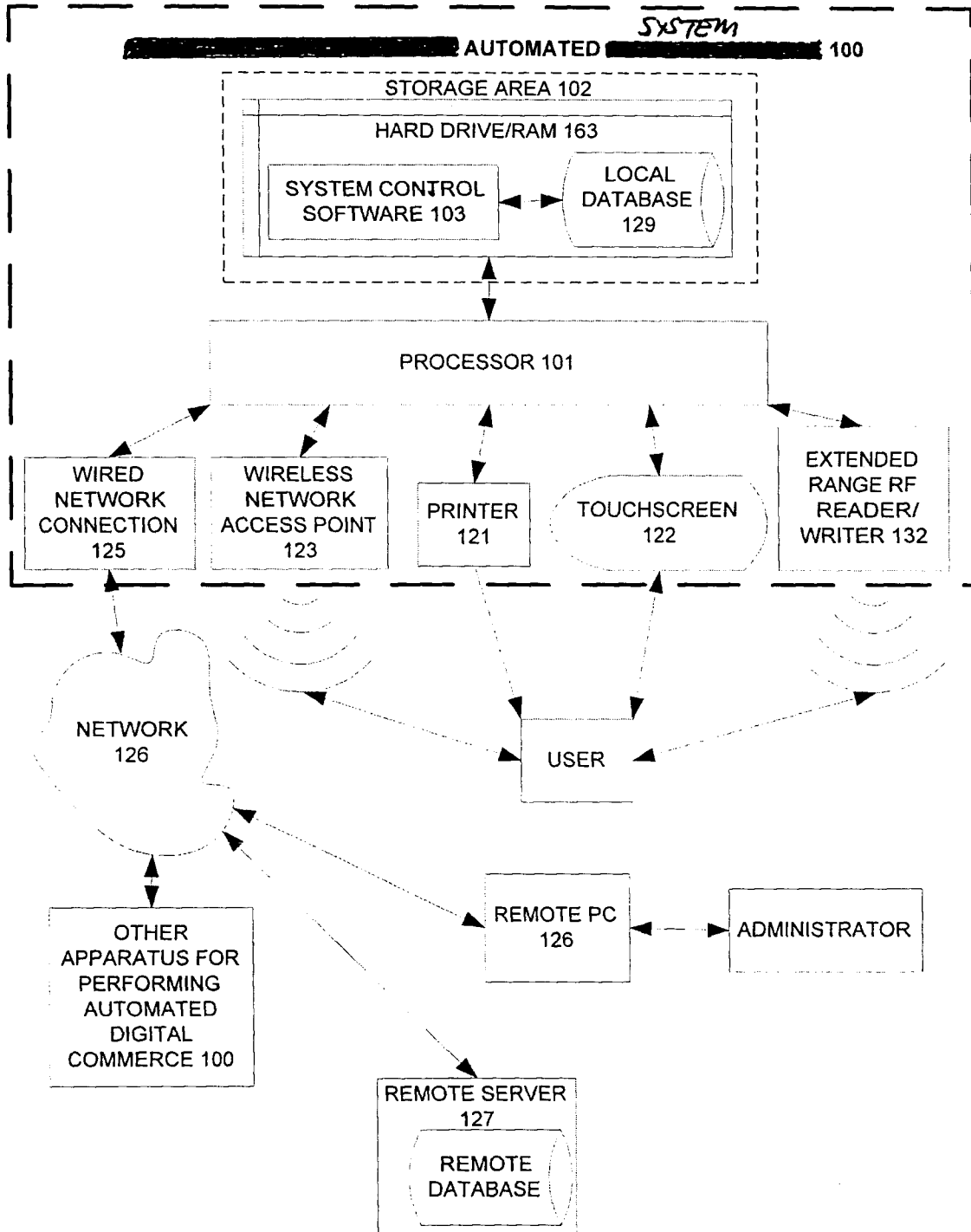


FIG. 3

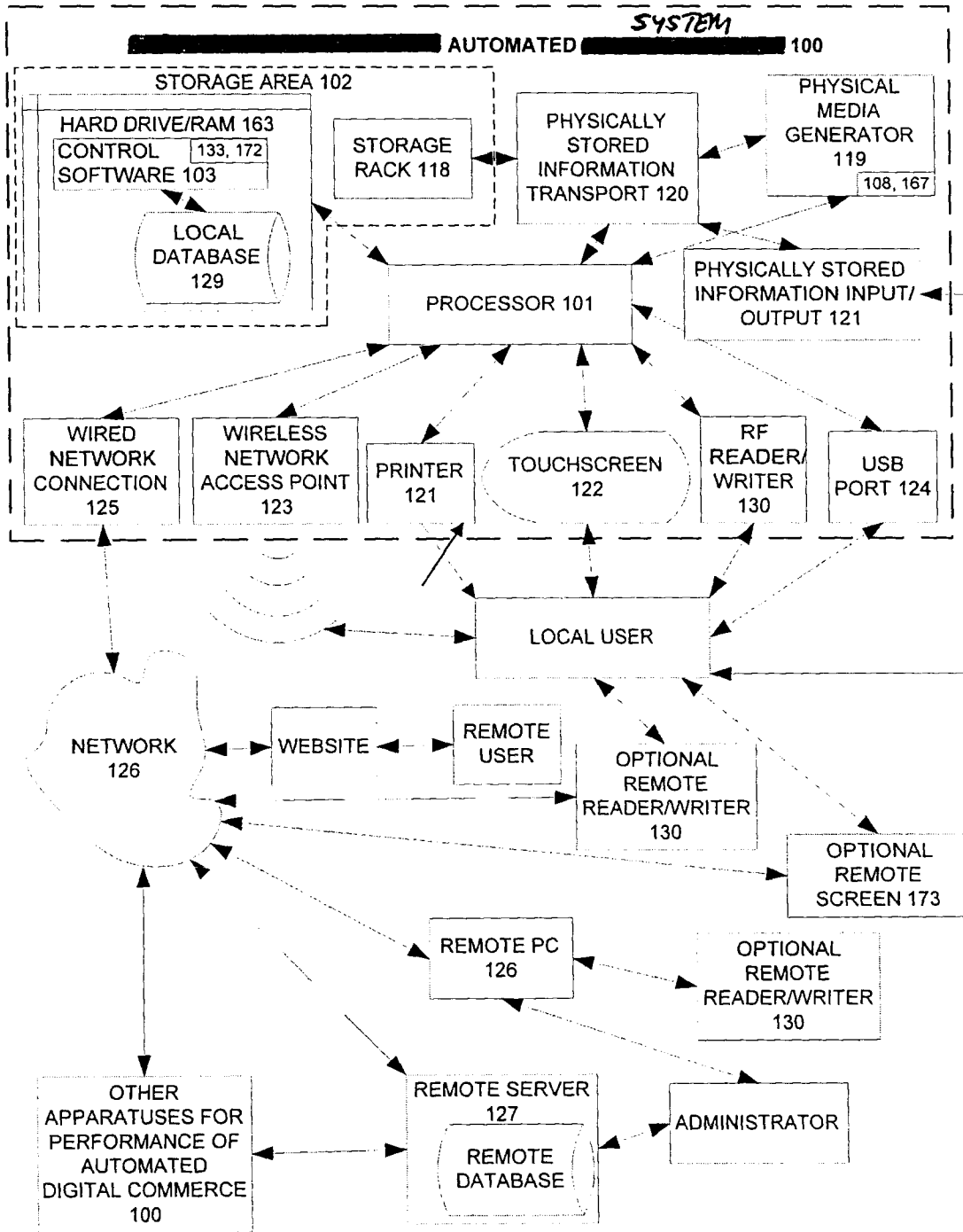


FIG. 4

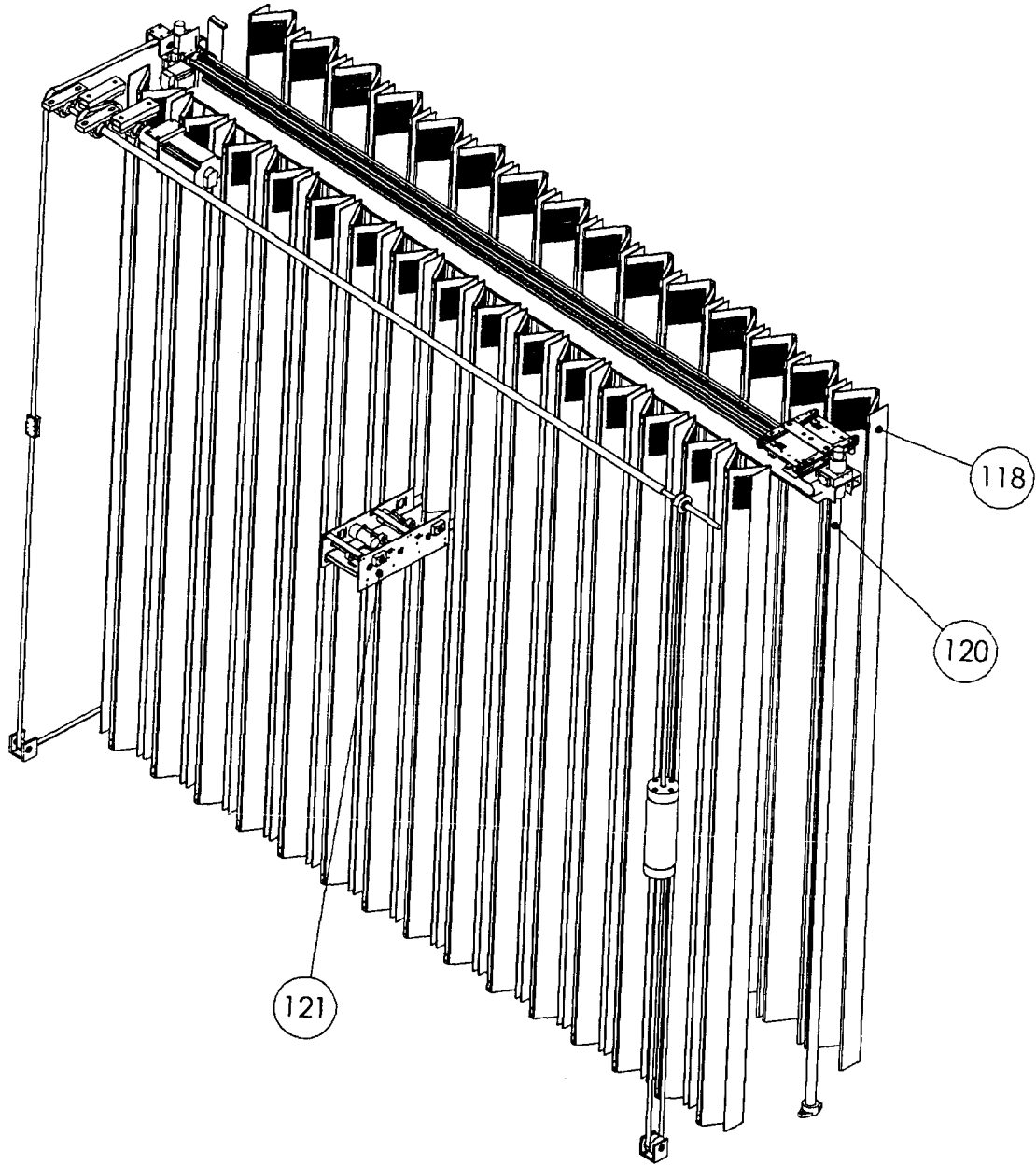
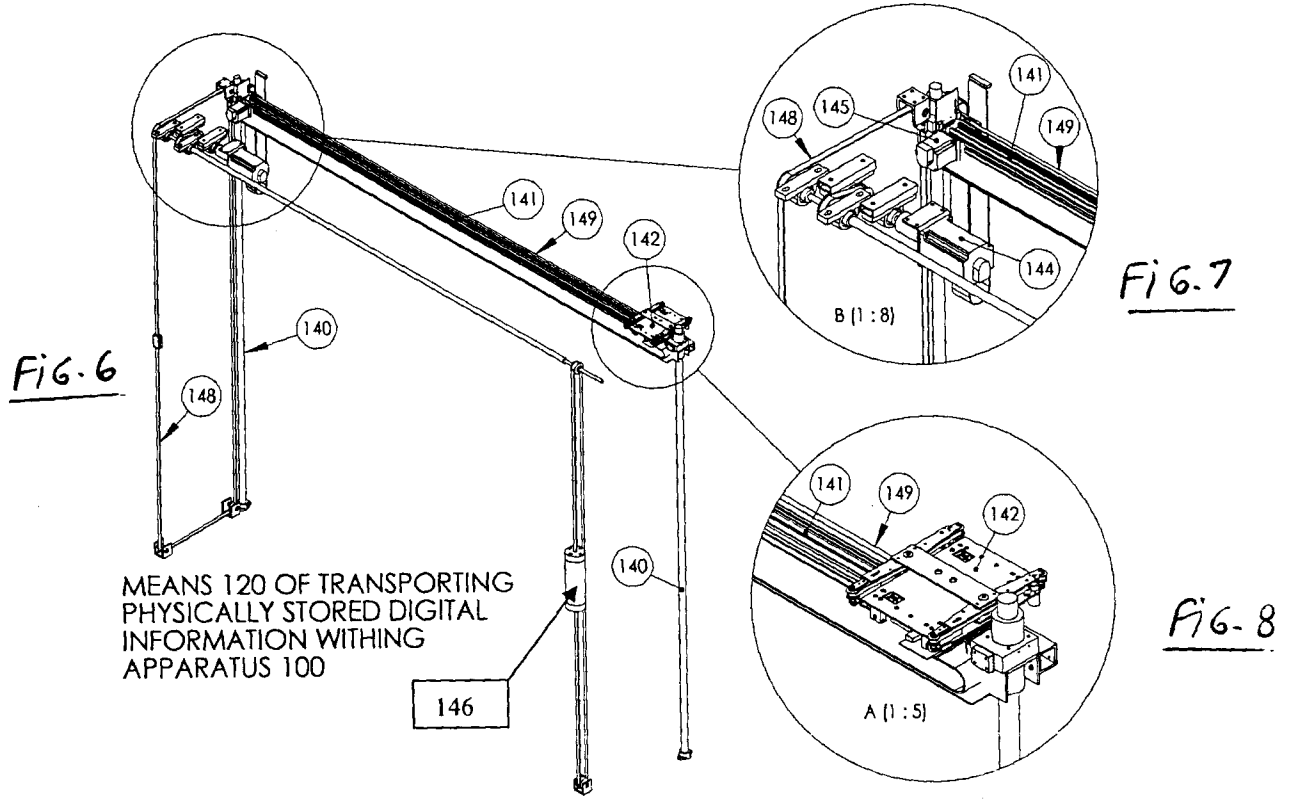
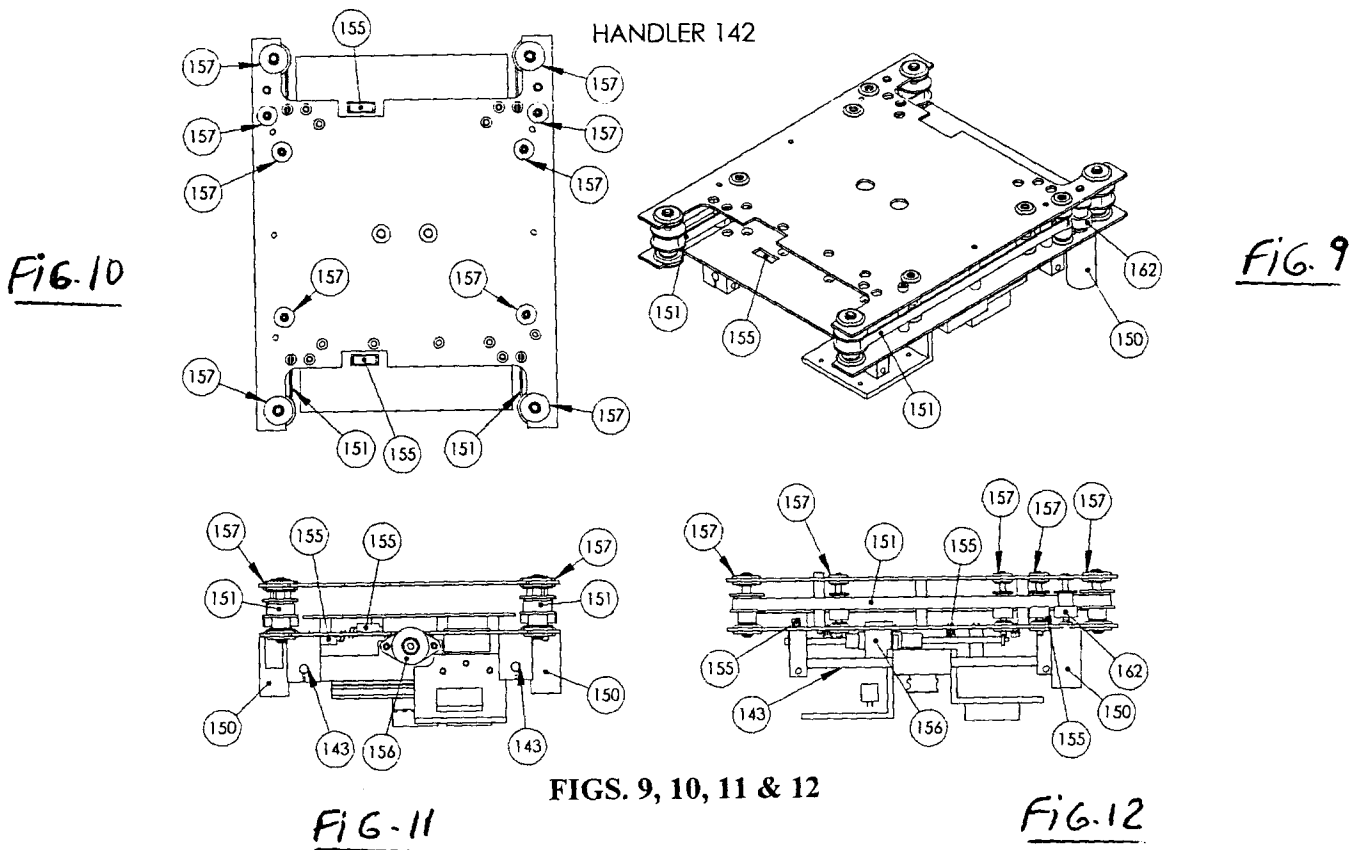


FIG. 5



FIGS. 6, 7 & 8



FIGS. 9, 10, 11 & 12

STORAGE RACK 118



FIG-15

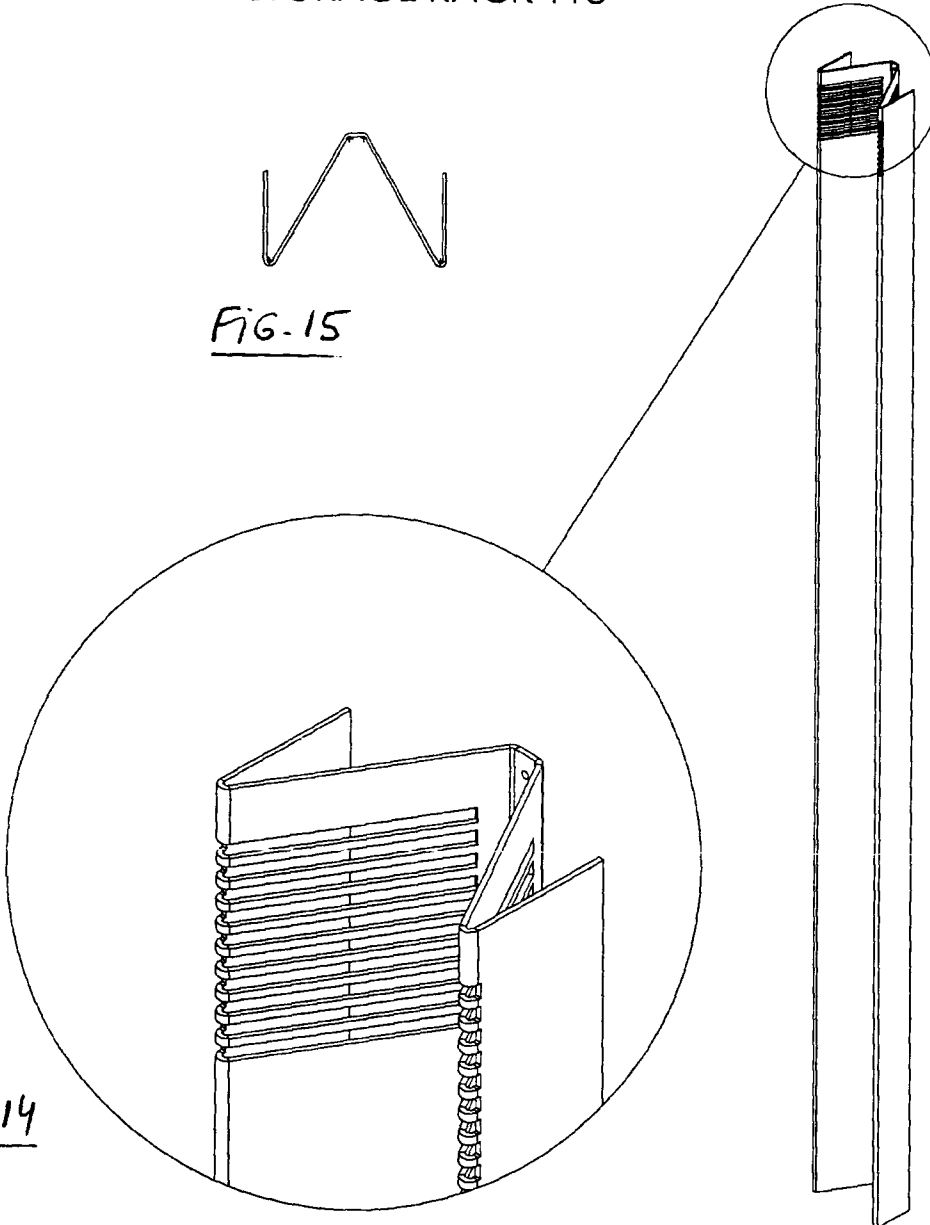


FIG-14

FIG-13

A (1 : 2)

LIMITED NUMBER OF 'SHELVES' SHOWN FOR CLARITY, IN REALITY THEY EXTEND VERTICALLY TO BOTH EXTREMITIES.

FIGS. 13, 14 & 15

PHYSICALLY STORED INFORMATION
INPUT/OUTPUT DEVICE 121

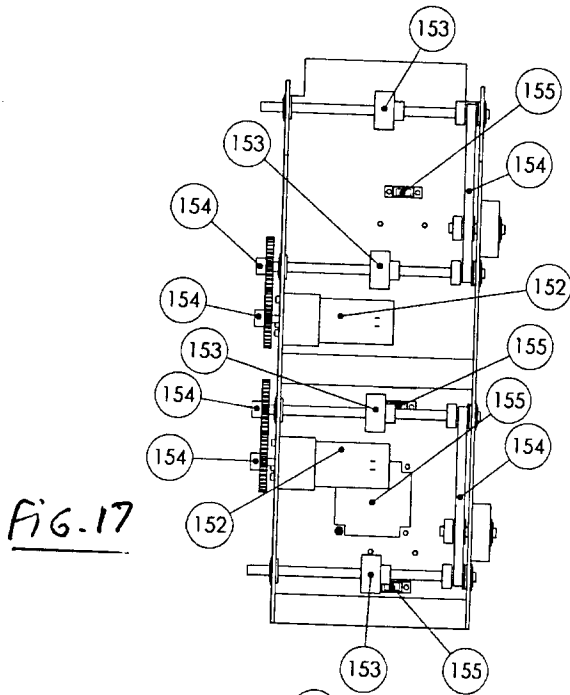


FIG. 17

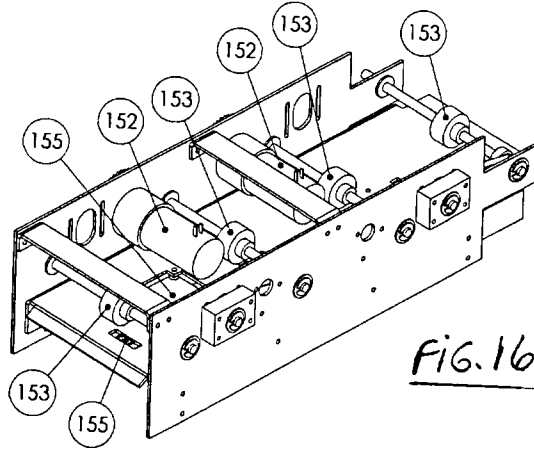


FIG. 16

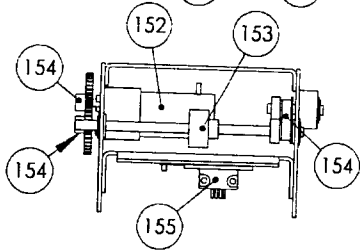


FIG. 18

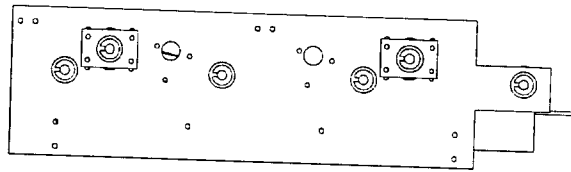
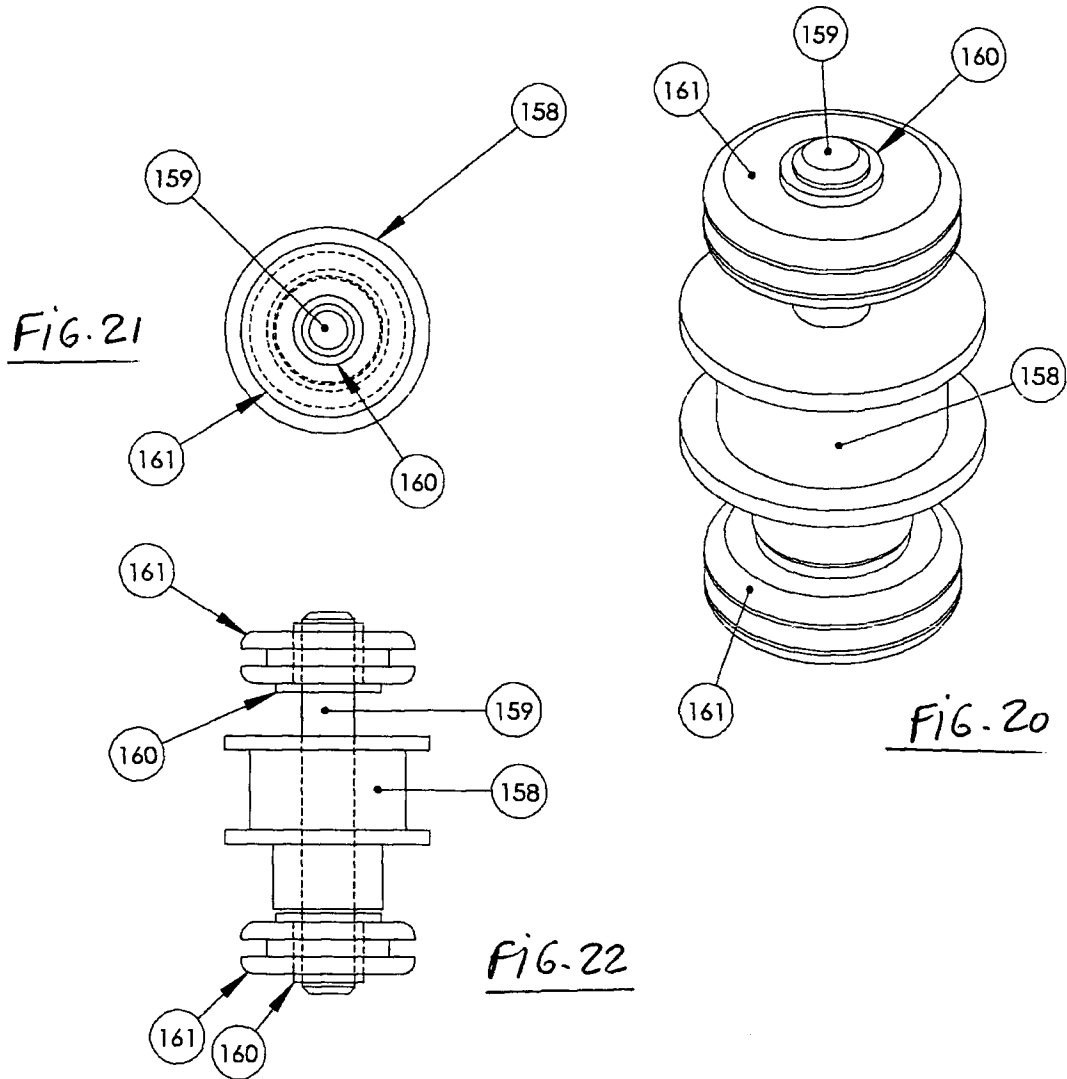


FIG. 19

FIGS. 16, 17, 18 & 19

HANDLER IDLER ASSEMBLY 157



FIGS. 20, 21 & 22

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC: G07F 17/00 (2006.01) , G06Q 30/00 (2006.01) , G06Q 10/00 (2006.01) , G07C 9/00 (2006.01) , G07F 7/00 (2006.01) According to International Patent Classification (IPC) or to both national classification and IPC</p>		
<p>B. FIELDS SEARCHED</p>		
<p>Minimum documentation searched (classification system followed by classification symbols) IPC: G07F (2006.01), G06Q (2006.01), G07C (2006.01)</p>		
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>		
<p>Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used) Canadian Patent Database, WEST (US granted/published, JP/EP abstracts): terminal/machine/kiosk, rent/rental/renting, store/storage/storing, tag/RFID, database, return</p>		
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 577 121 (DALLA VALLE) 29 January 1997 (29-01-1997) entire document	1 to 4, 6 to 11 and 13 to 22
Y	US 2004/0 254 676 (BLUST ET AL.) 16 December 2004 (16-12-2004) entire document	1 to 4, 6 to 11 and 13 to 22
P, Y, &	US 2005/0 216 120 (ROSENBERG ET AL.) 29 September 2005 (29-09-2005) entire document &: GB 0 411 531 (ROSENBERG ET AL.) 23 June 2004 (23-06-2004)	1 to 4, 6 to 11 and 13 to 22
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		<input checked="" type="checkbox"/> See patent family annex.
* Special categories of cited documents :	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 07 November 2006 (07-11-2006)	Date of mailing of the international search report 15 December 2006 (15-12-2006)	
Name and mailing address of the ISA/CA Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001(819)953-2476	Authorized officer Tara Derickx 819-997-4502	

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 020 958 (TUTTOBENE) 04 June 1991 (04-06-1991) entire document	6 and 10
A	US 6 109 524 (KANOH ET AL.) 29 August 2000 (29-08-2000) entire document	1 to 4, 6 to 11 and 13 to 22

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