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(54) **DISPENSING SYSTEM**

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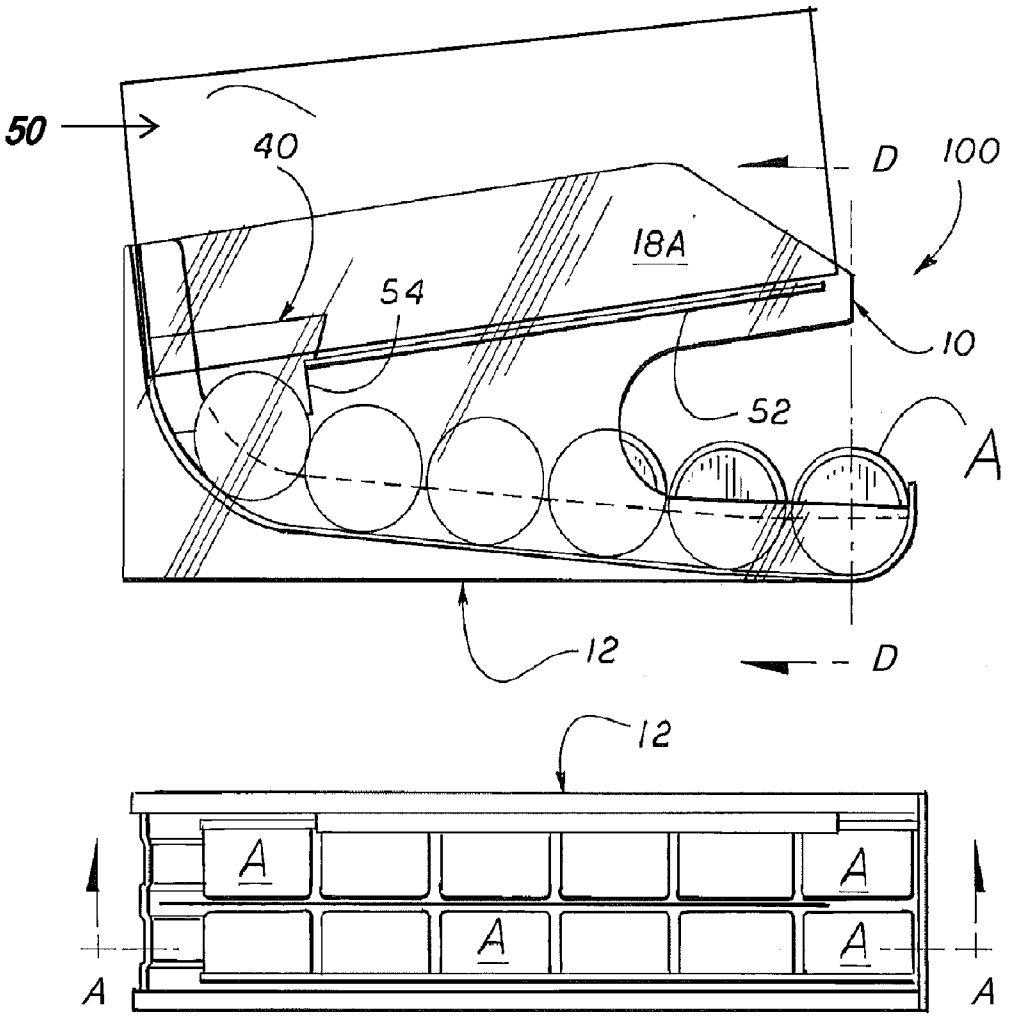
USPC **221/194**

(57) **ABSTRACT**

A system (**100**) for dispensing a plurality of products provided initially in a package (**50**) is disclosed that includes a dispensing device having laterally opposed side walls (**18**A, **18**B), a lower deck (**16**) connecting the opposing side walls and including at least one guide surface, and an upper deck (**14**) upon which a package is placed. The products are dispensed from within the package onto the lower deck where the guide surface assists the products to roll linearly from a rear end to a front end of the dispensing device. The dispensing system may include an opening tool (**40**) associated with the dispensing device and arranged to open the package when the package is moved longitudinally on the upper deck. The dispensing system may include a restocking indicator (**290**). The dispensing device may further include a structure on its rear end section to facilitate the dispensing of products.



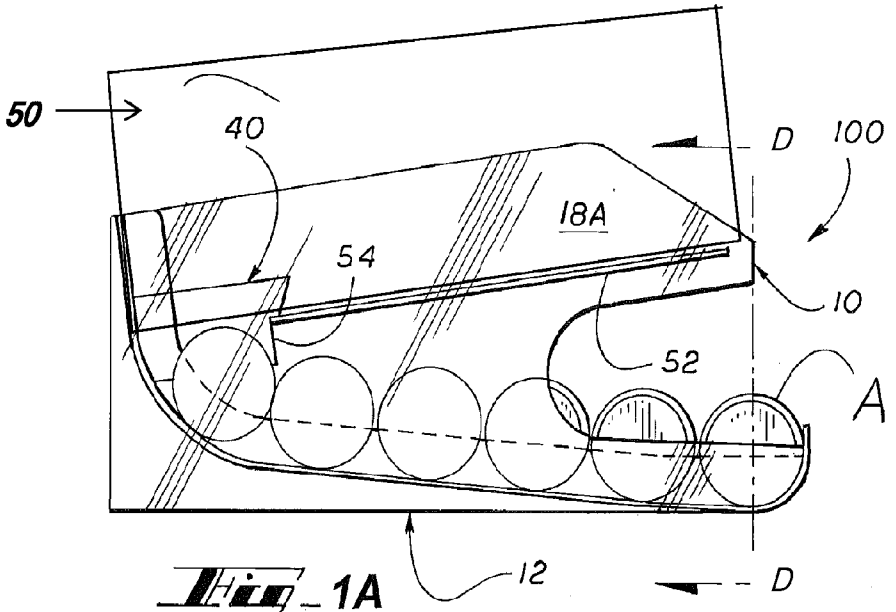


Fig_1A

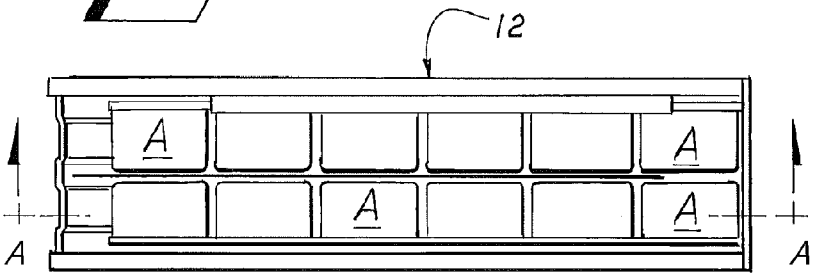


Fig_1B

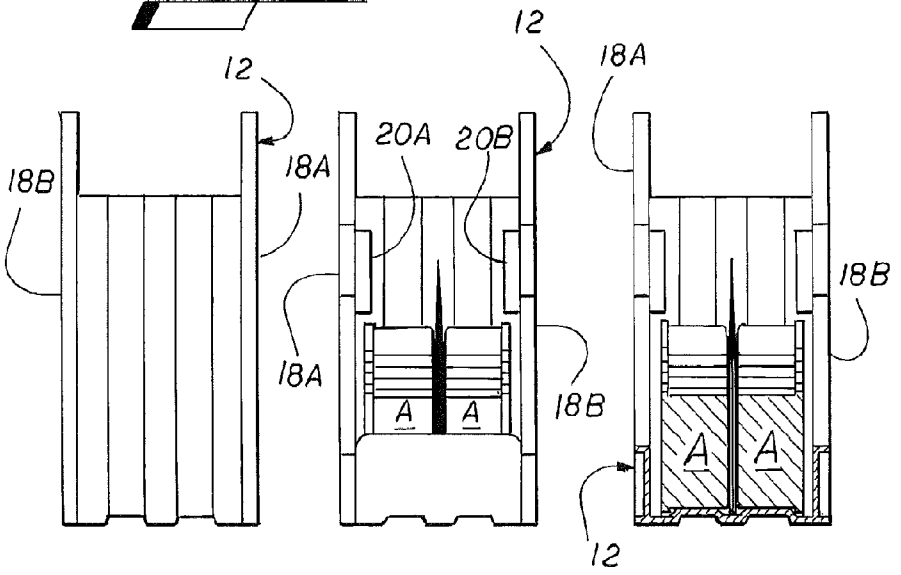


Fig_1C Fig_1D Fig_1E

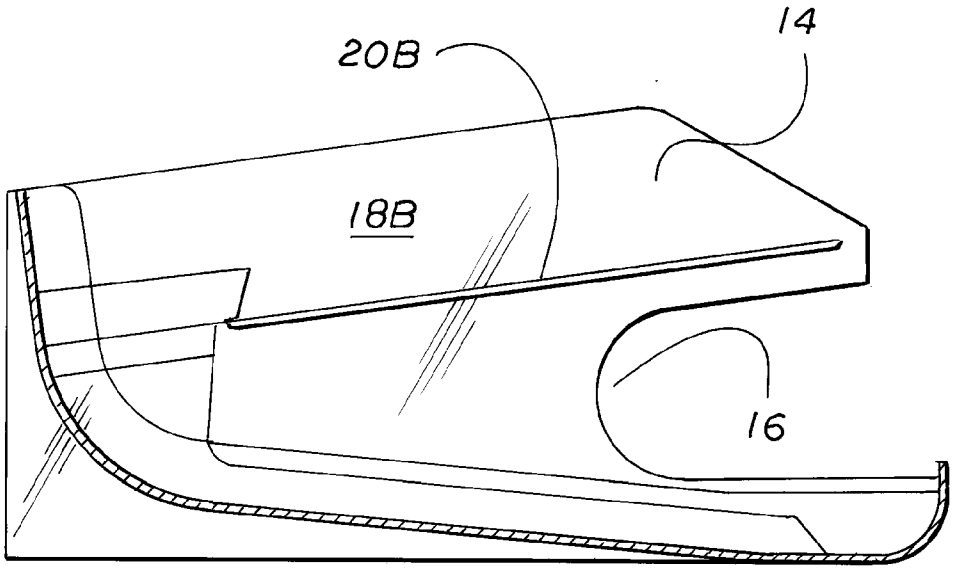
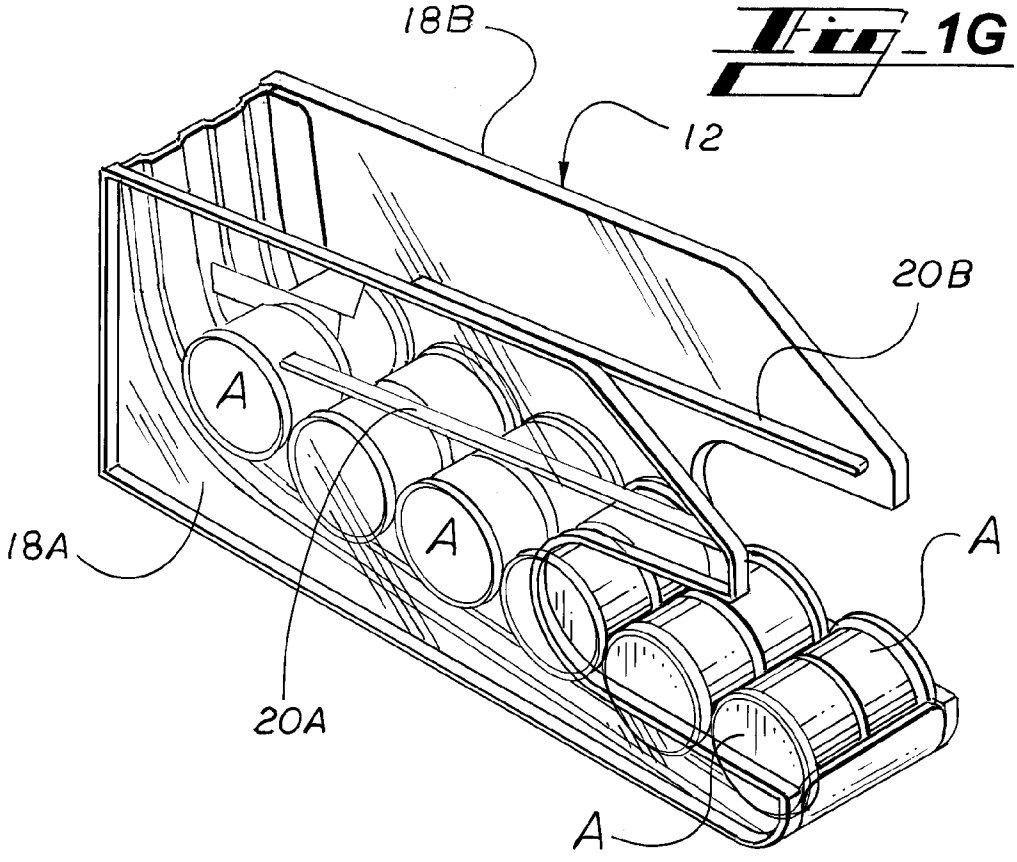


Fig. 1F

Fig. 1G



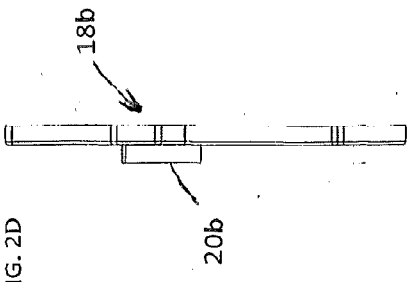


FIG. 2D

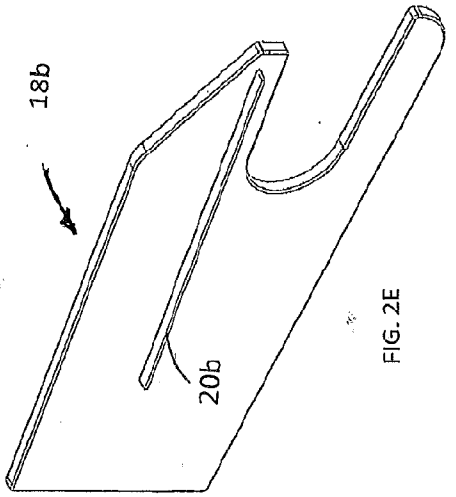


FIG. 2E

FIGURE 2

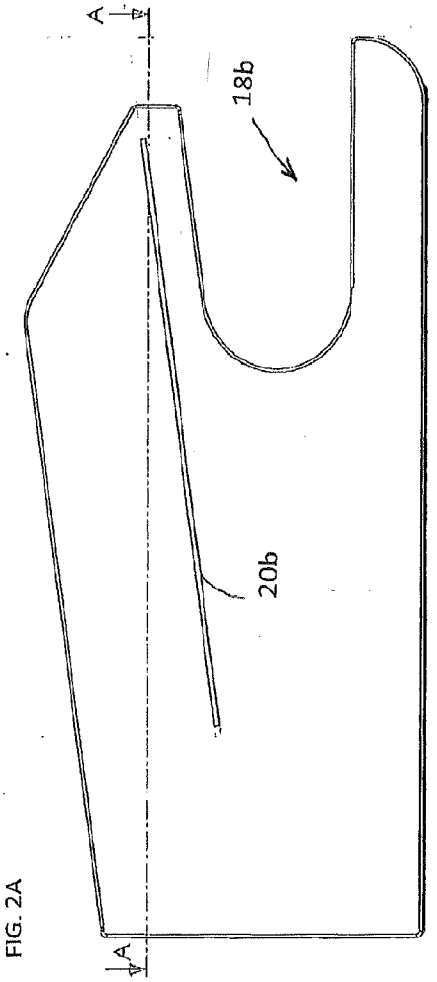


FIG. 2A

FIG. 2B

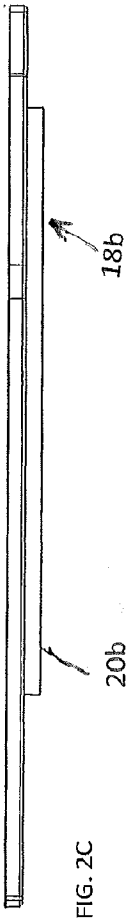


FIG. 2C

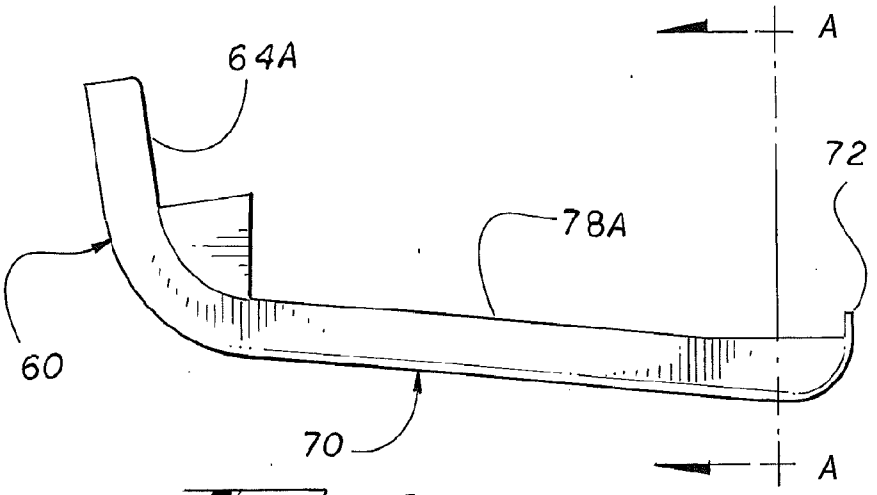


Fig. 3A

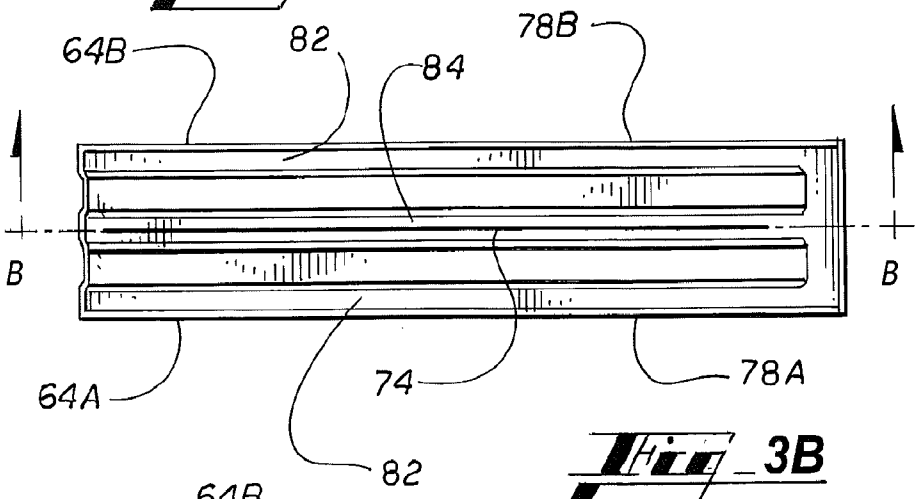


Fig. 3B

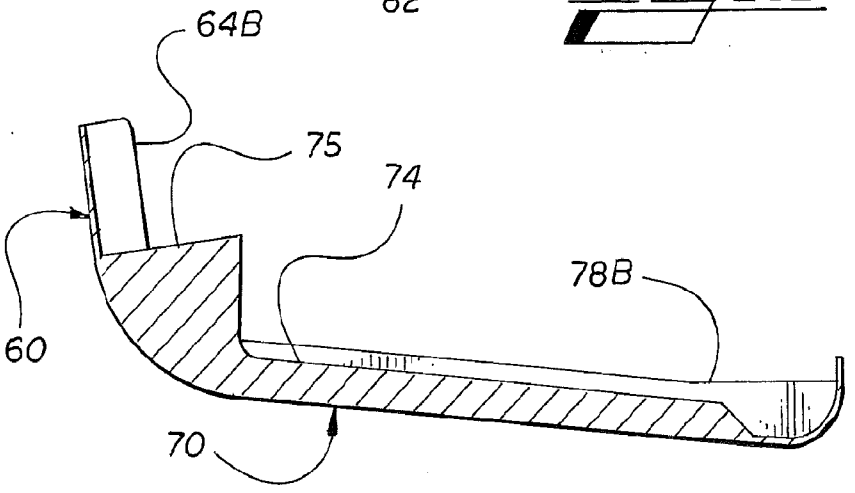


Fig. 3E

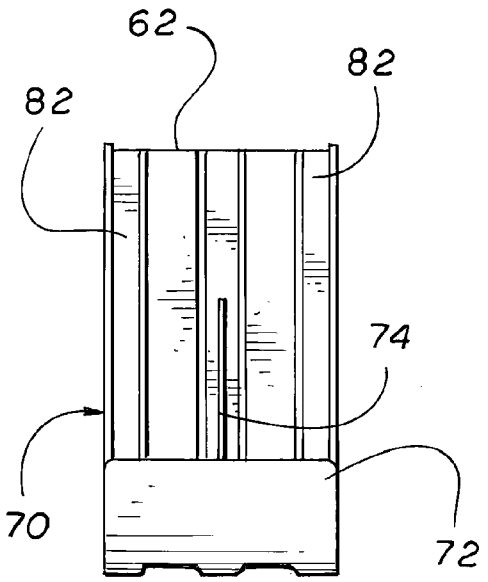


Fig_3C

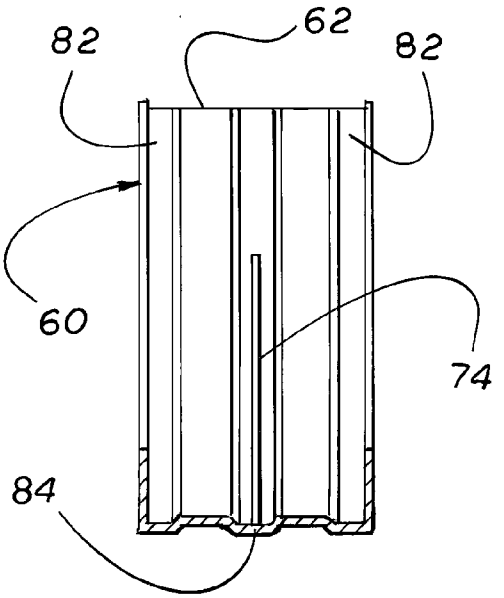


Fig_3D

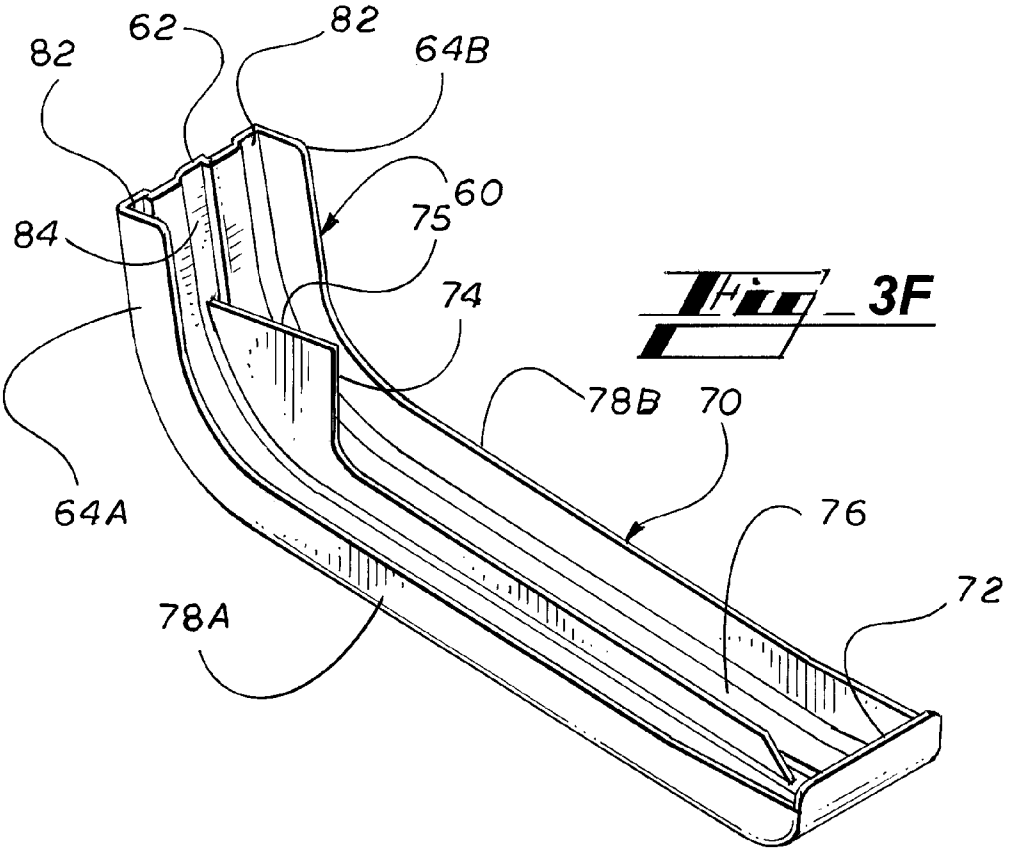


Fig_3F

FIGURE 4

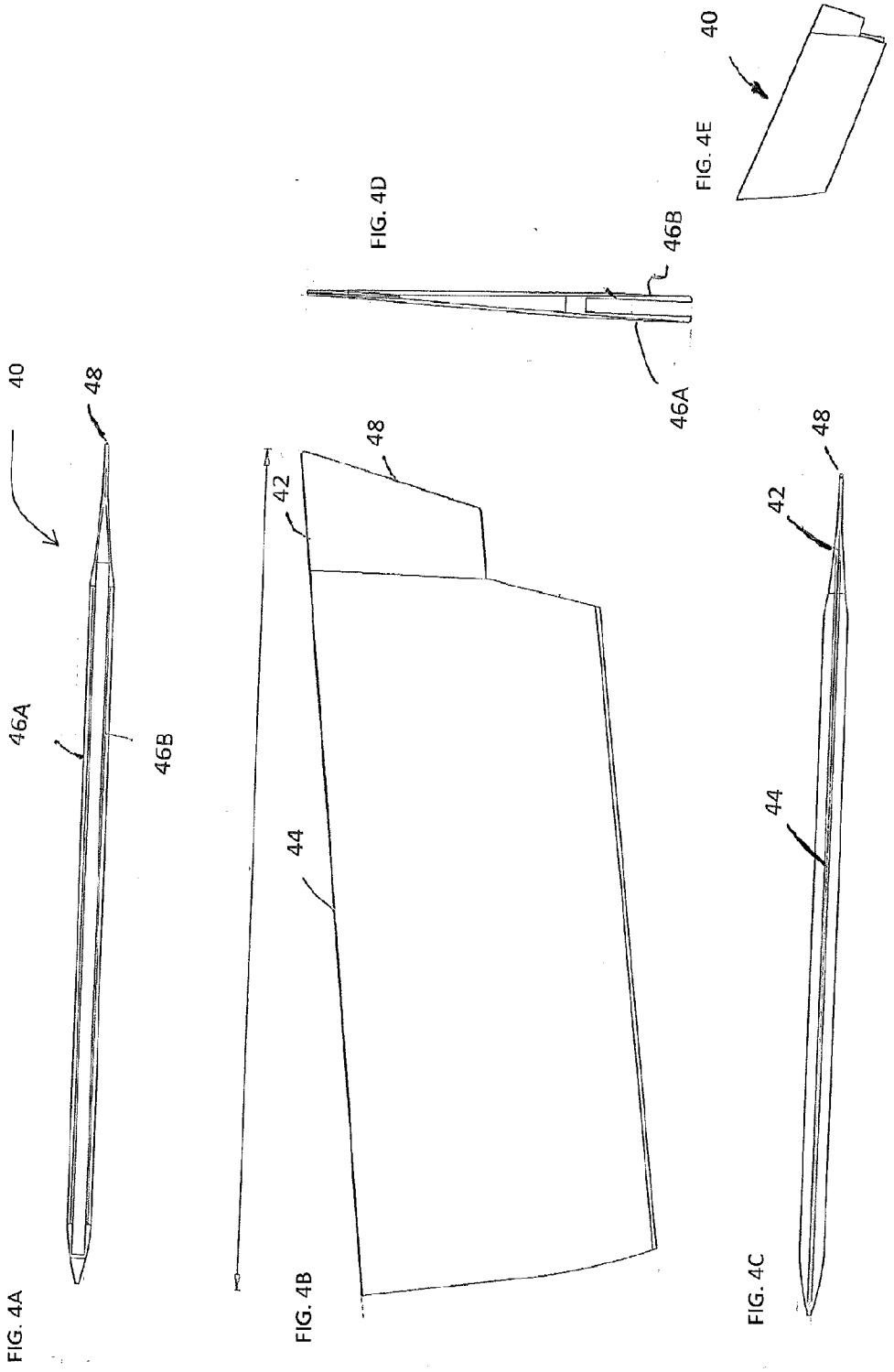

40
48
46A
46B
FIG. 4A
48
42
44
FIG. 4B
46B
46A
FIG. 4D
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FIG. 4E
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42
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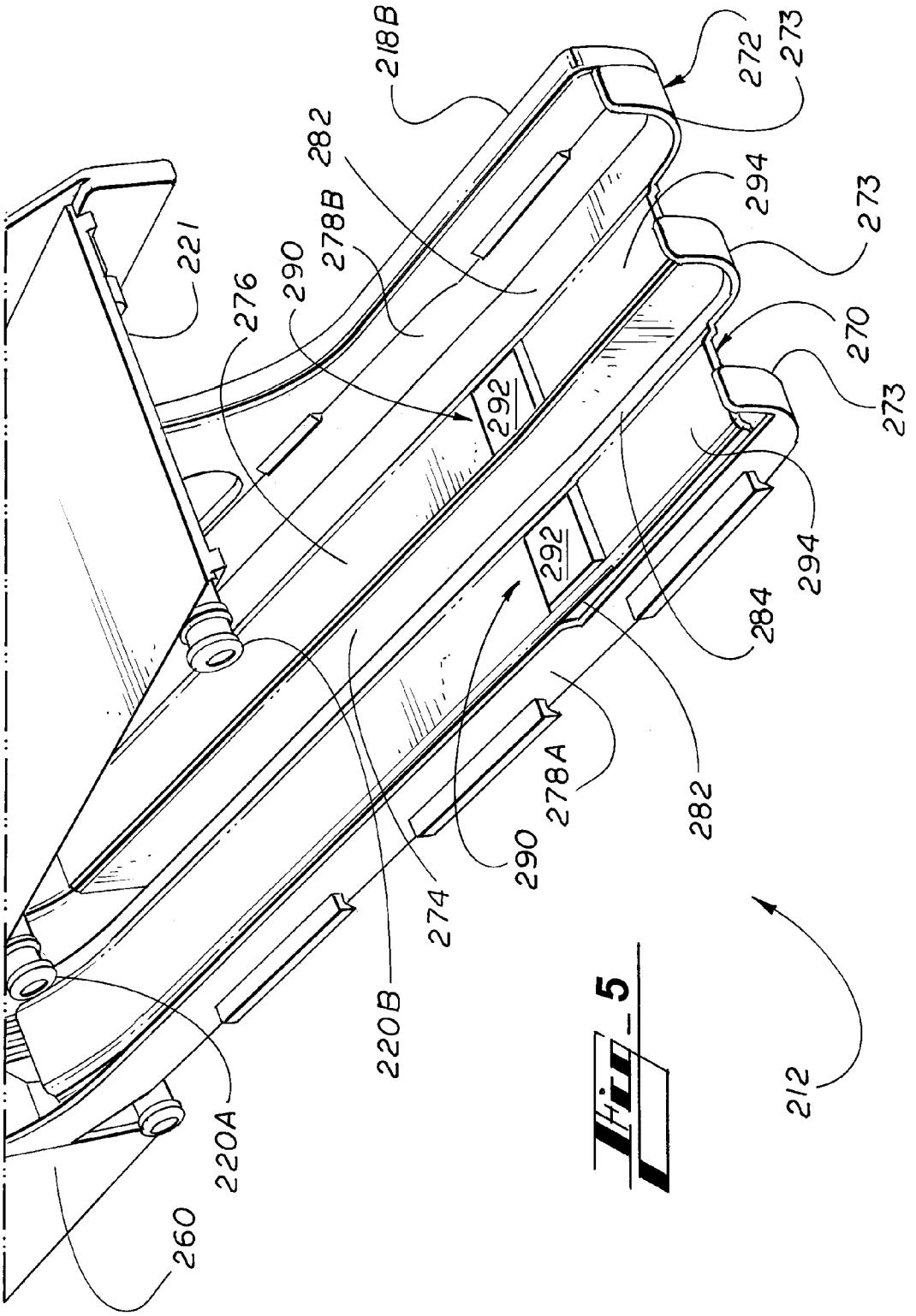
FIG. 4C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278A
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260
212

Fig. 5

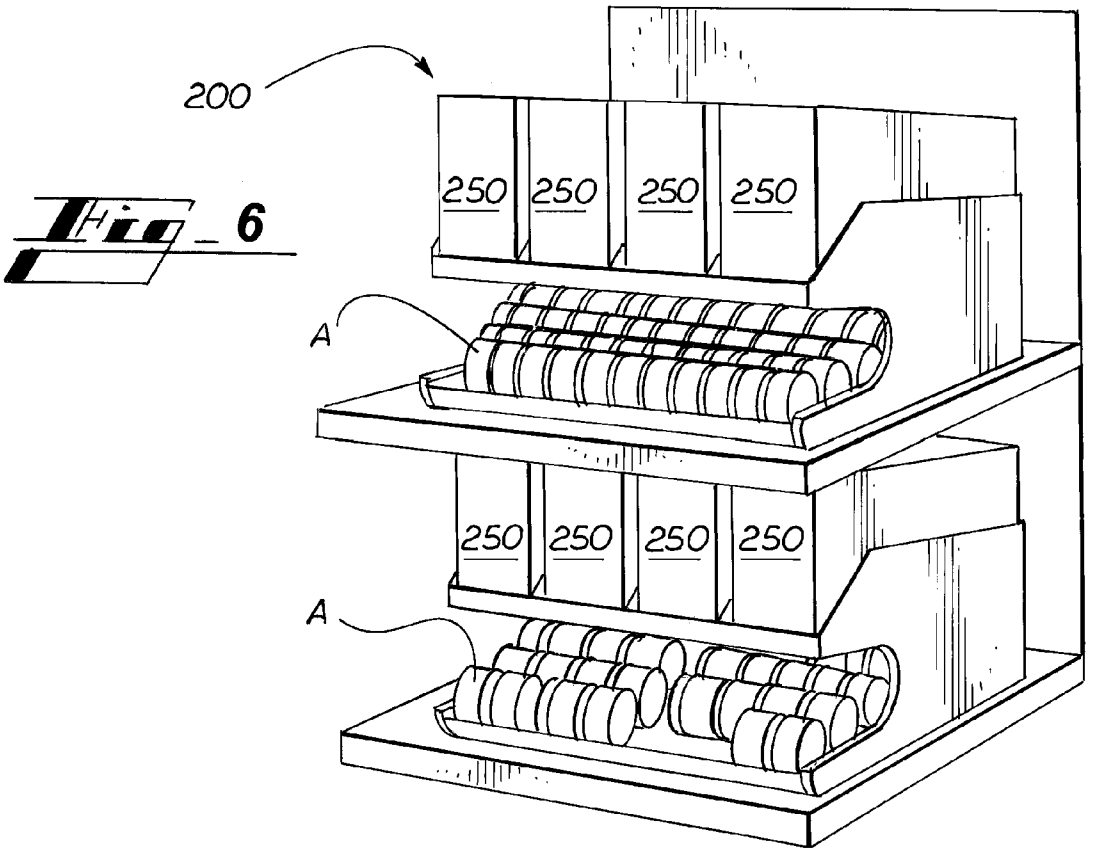


Fig_6

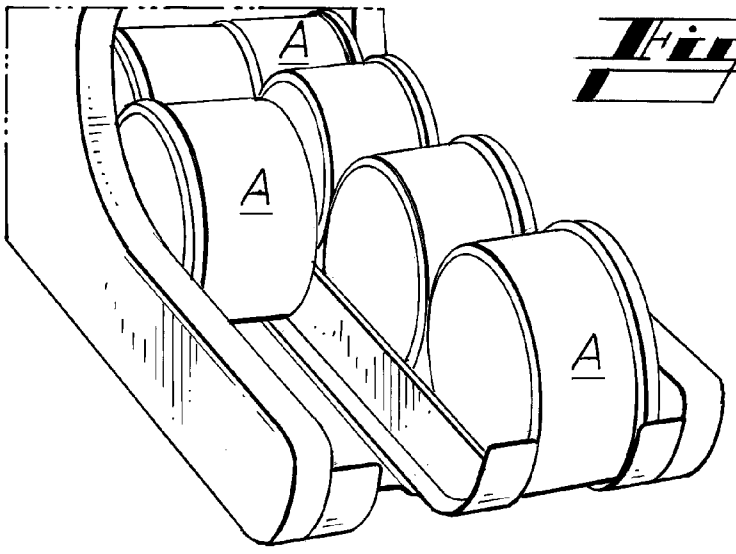
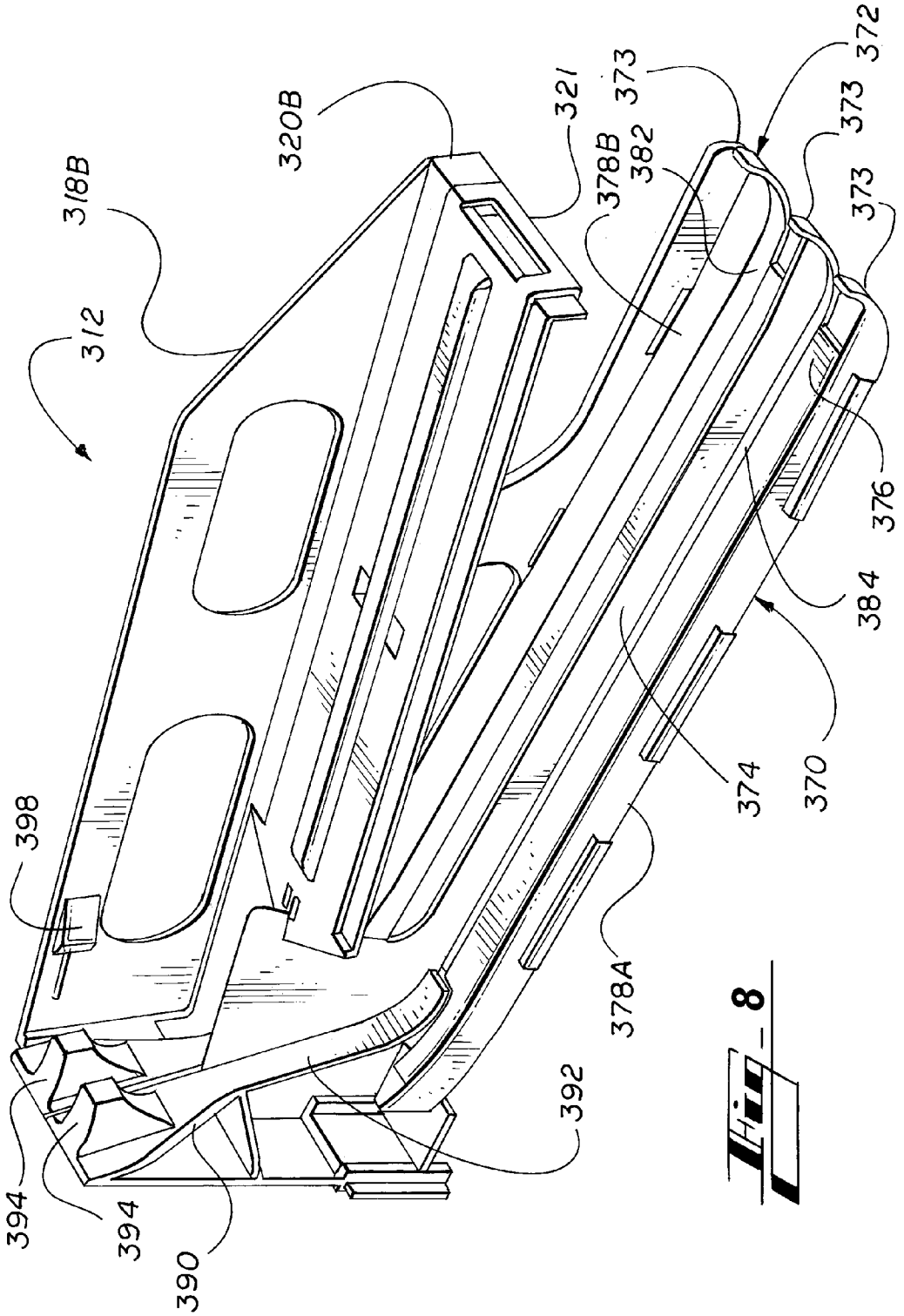


Fig_7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318B
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Fig. 8

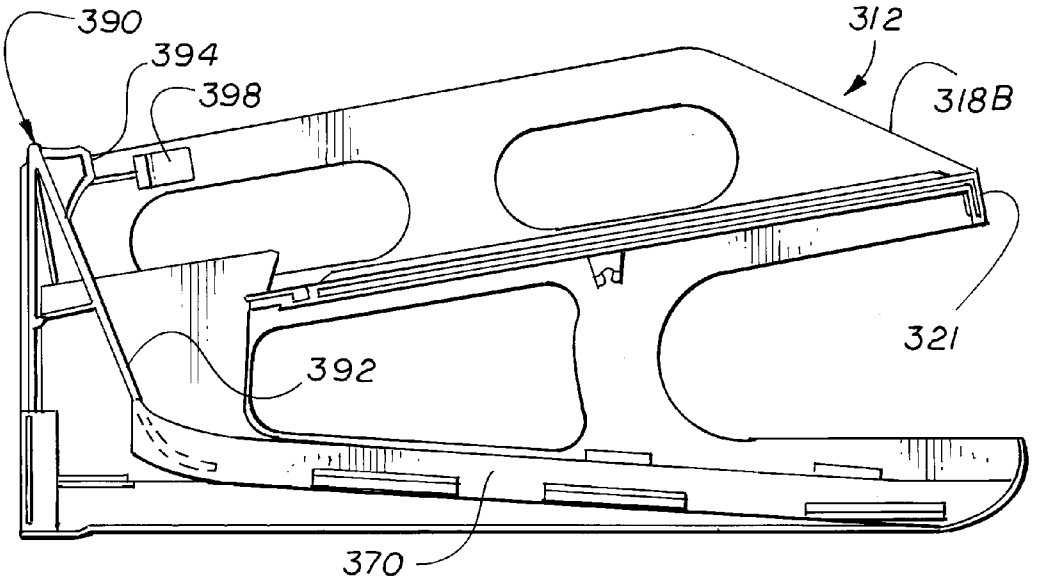
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Fig_9

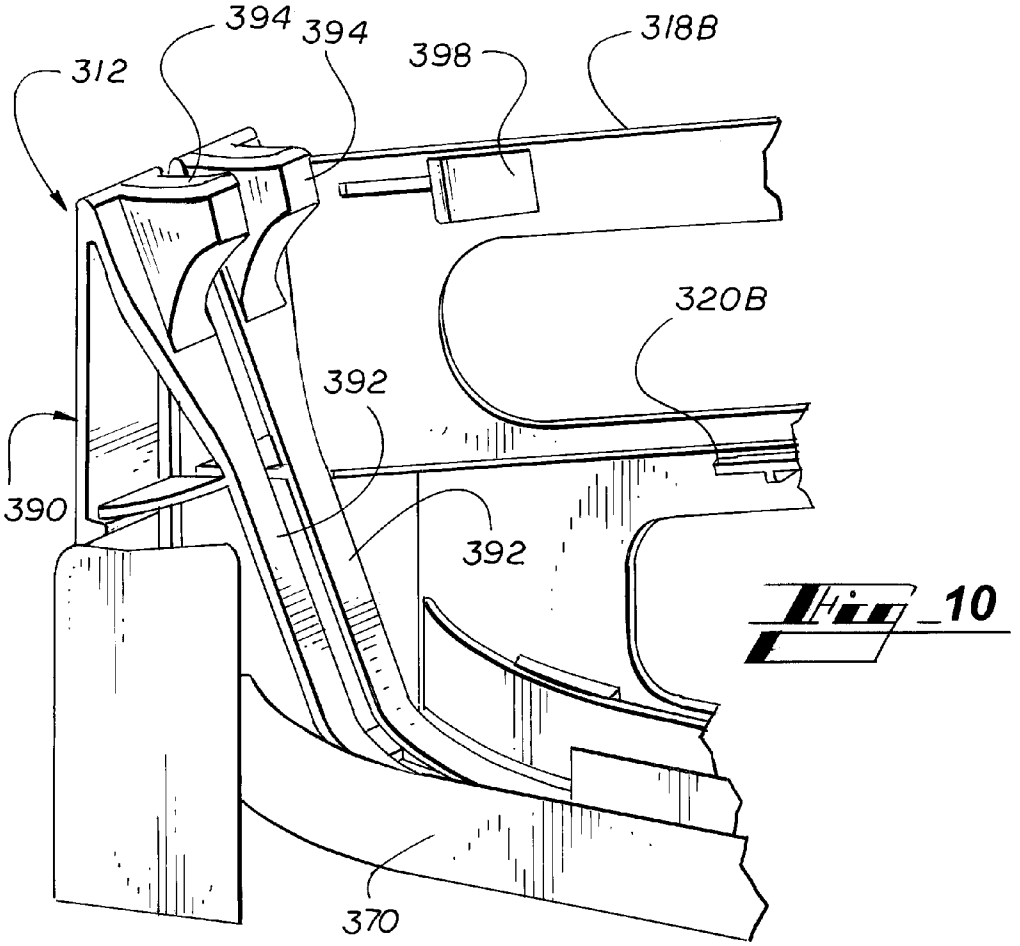
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Fig_10

FIGURE 11A

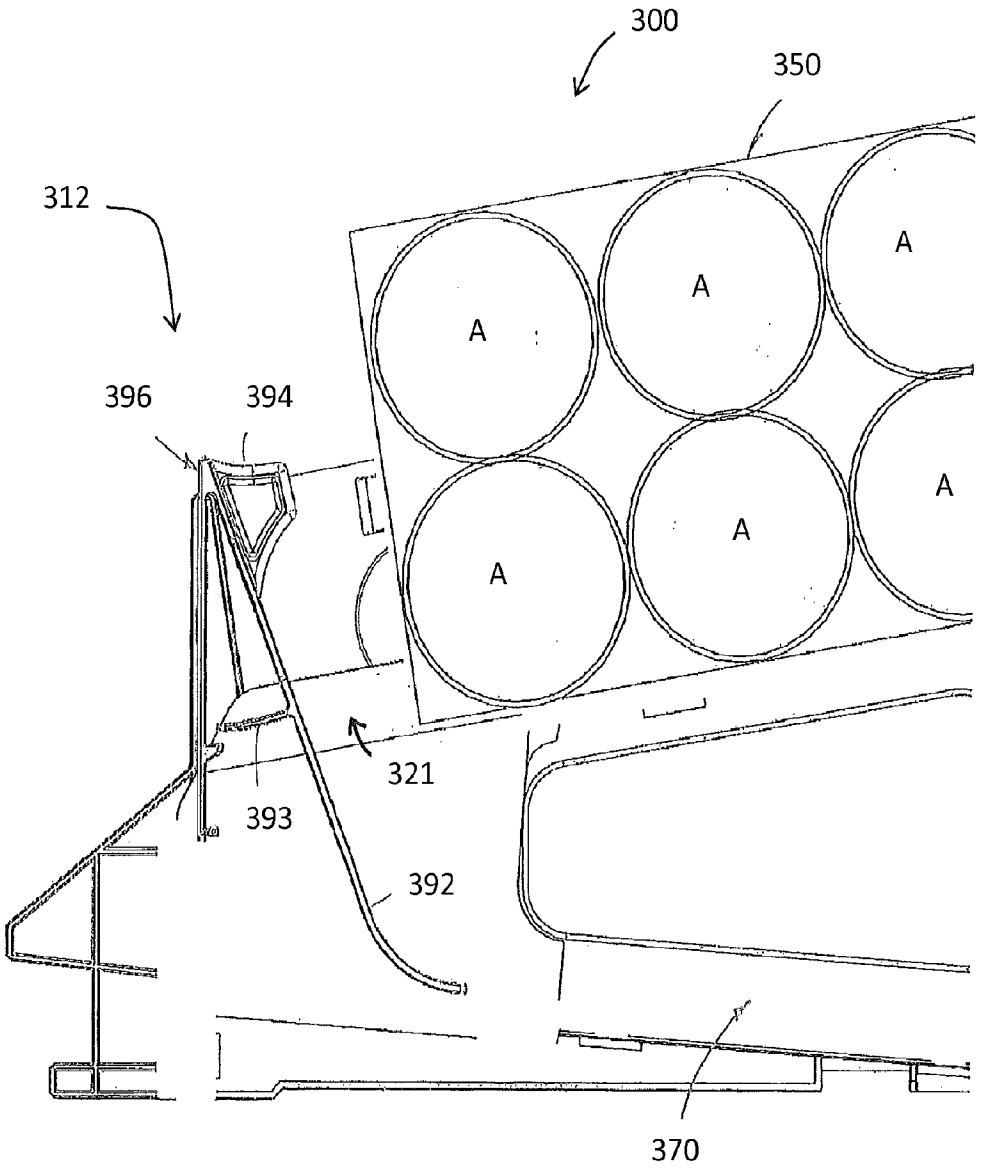


FIGURE 11B

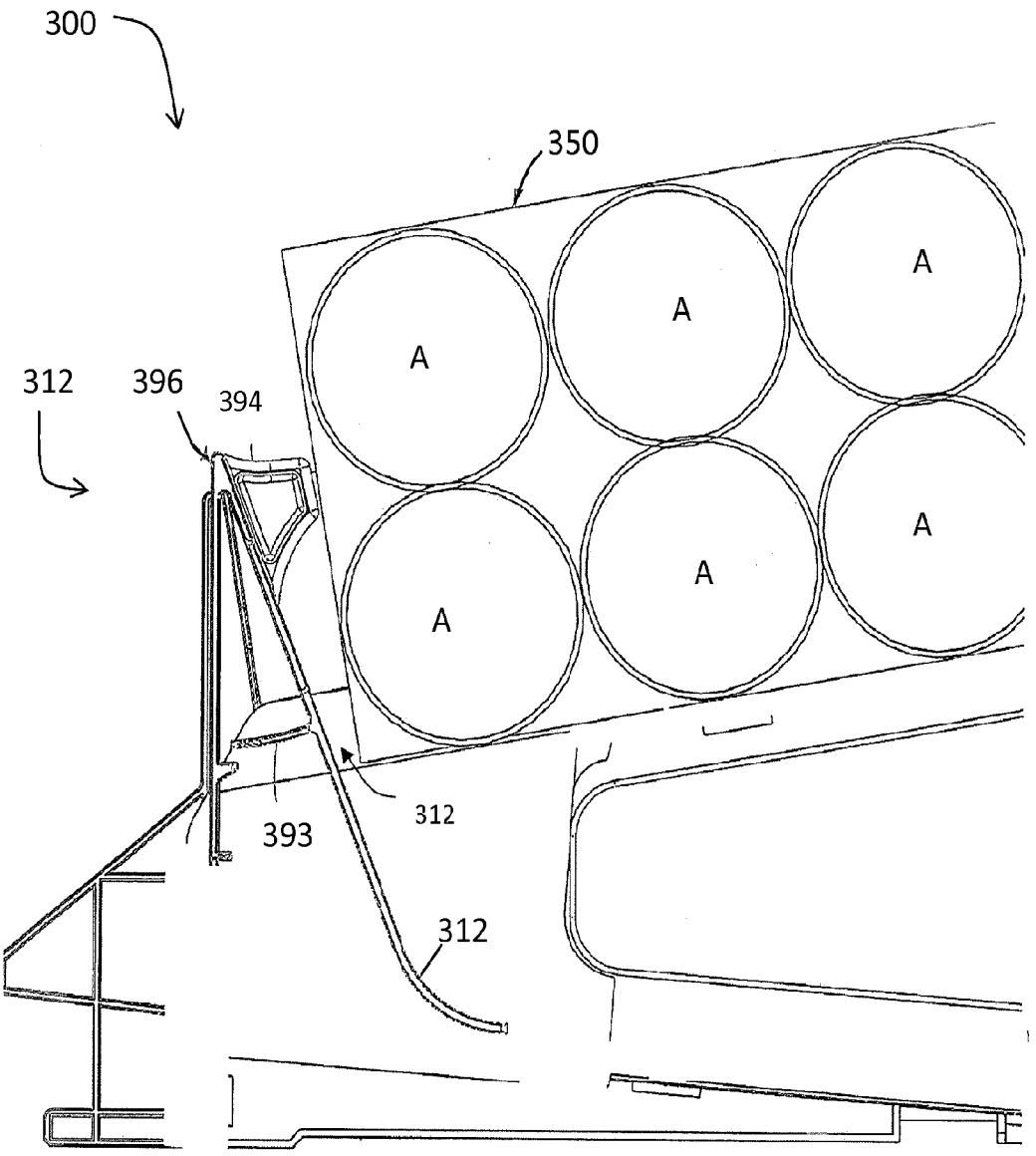


FIGURE 11C

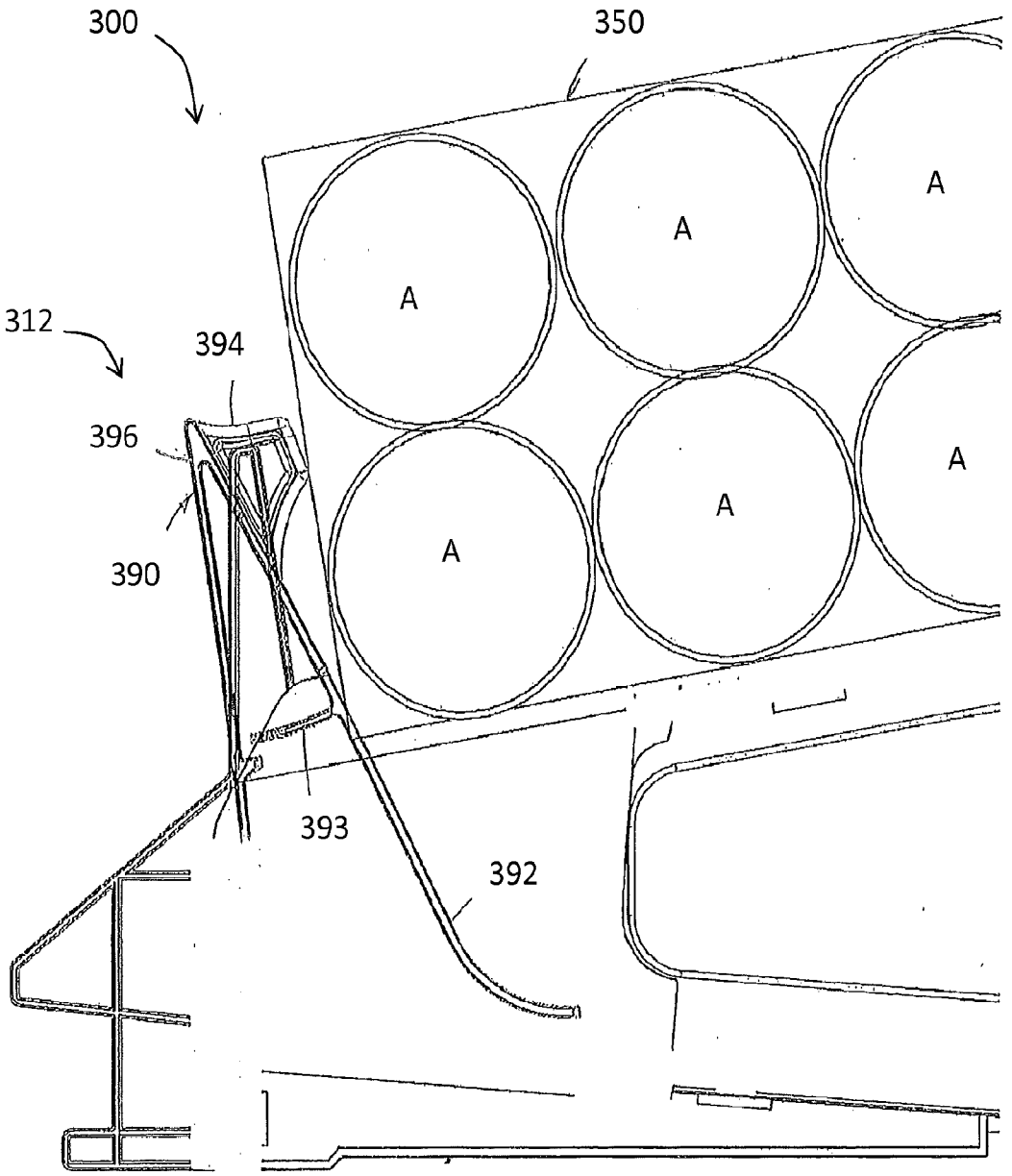


FIGURE 11D

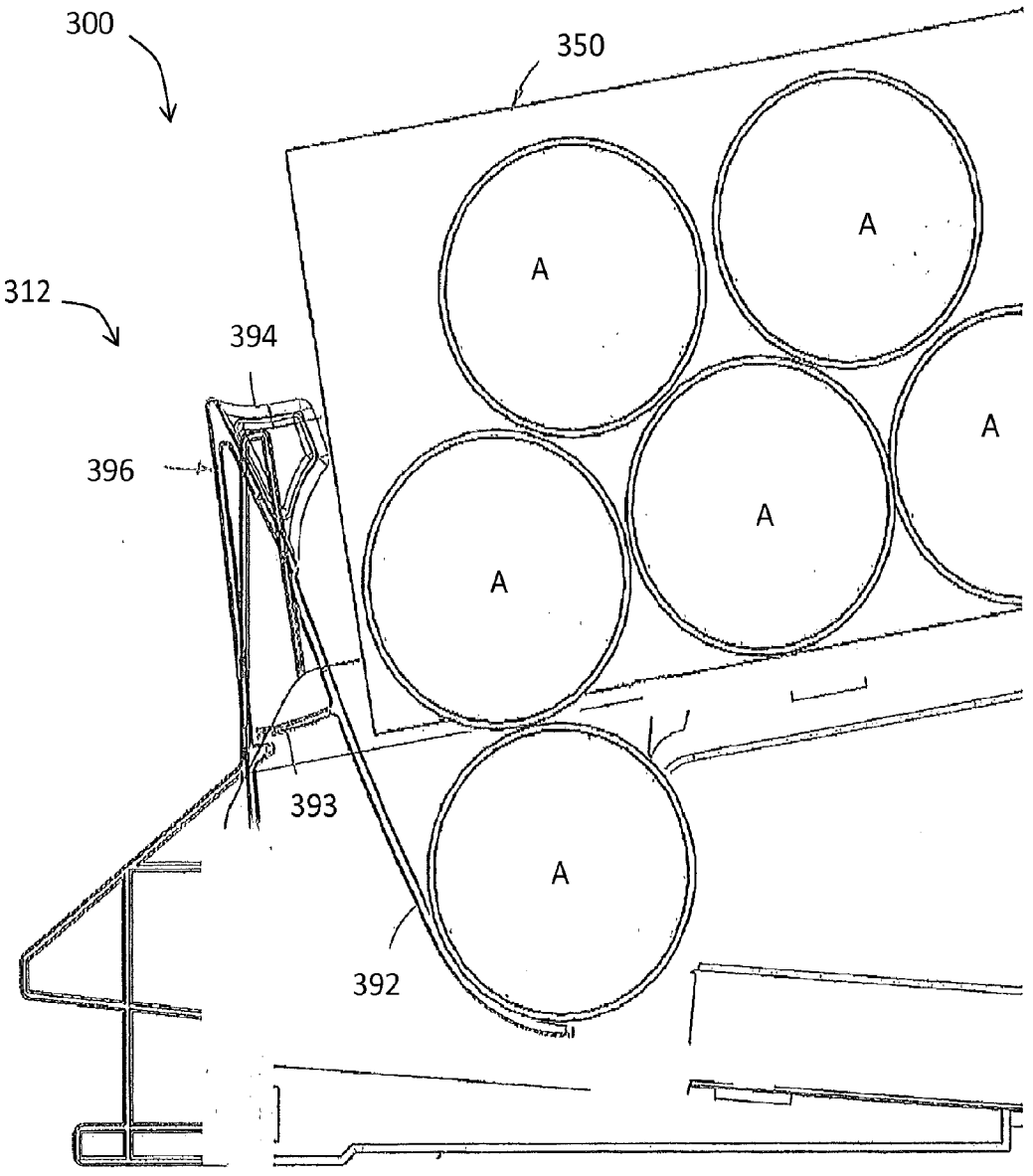


FIGURE 11E

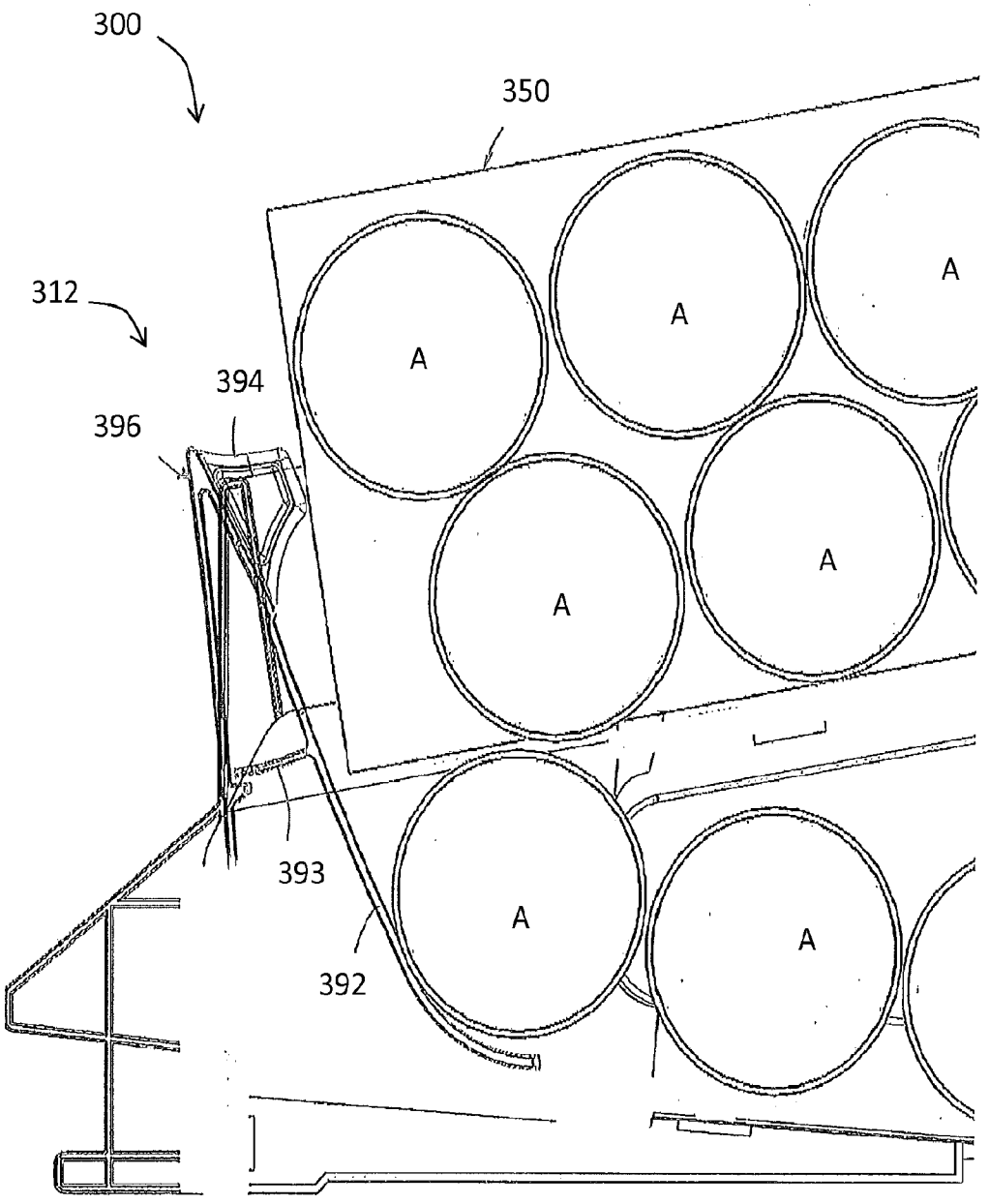
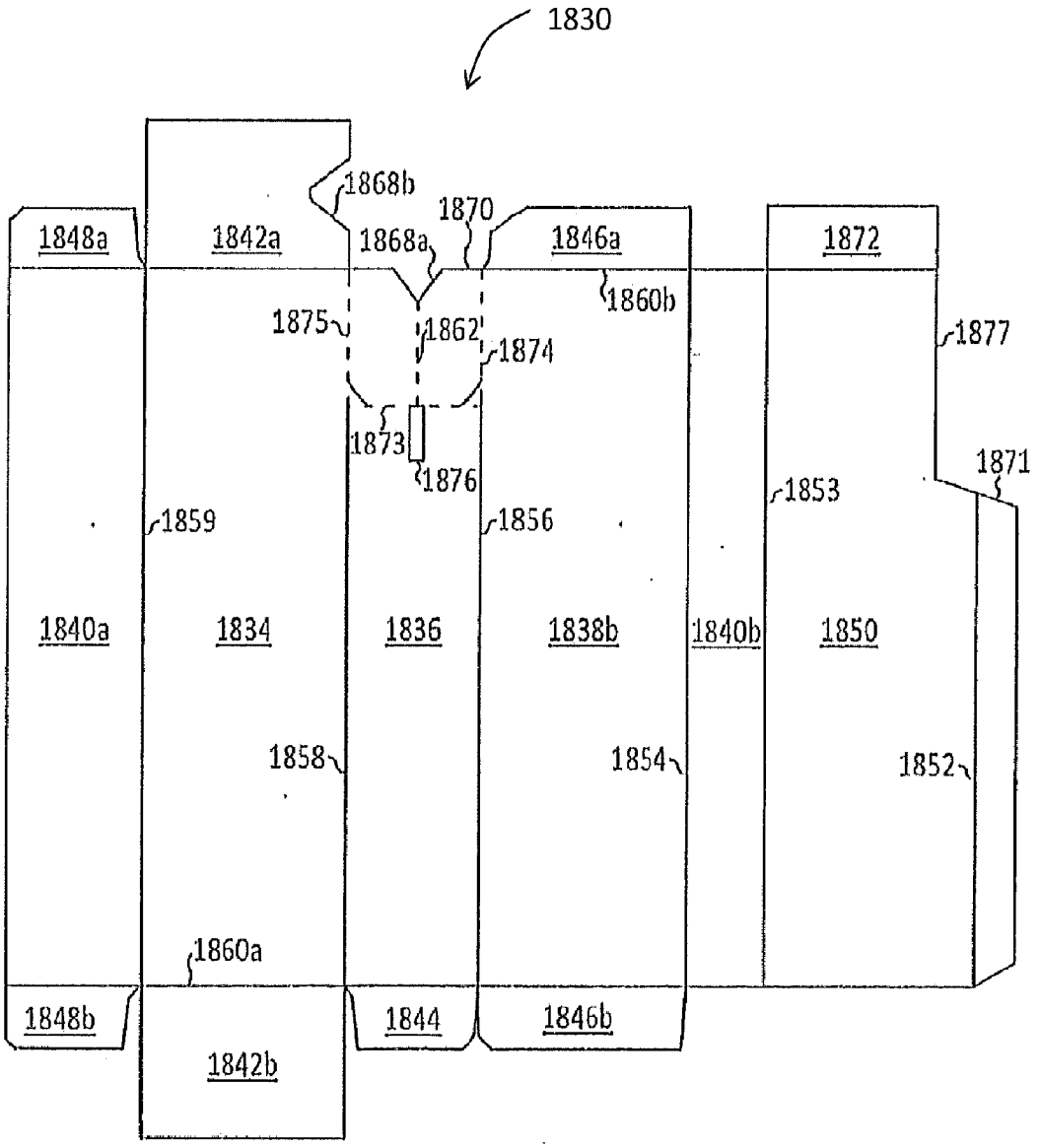


FIGURE 12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1856
1840a
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1860a
1848b
1844
1846b
1842b

FIGURE 13

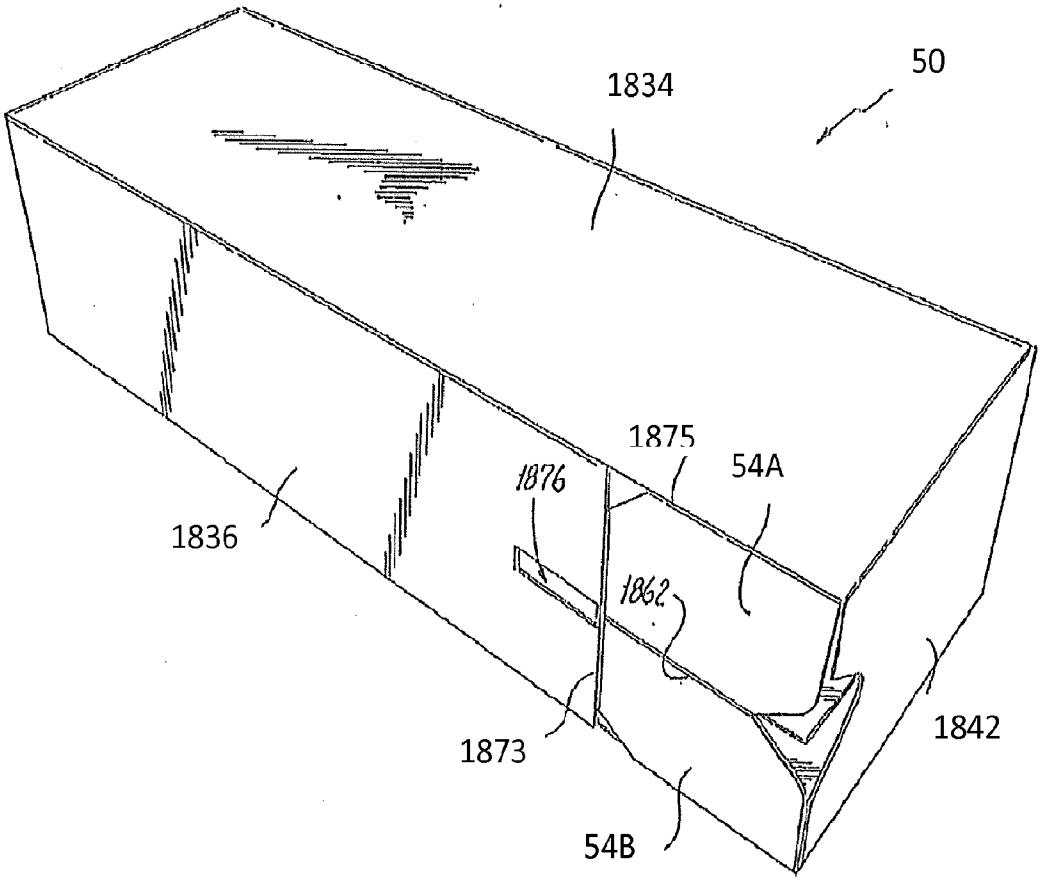


FIGURE 14

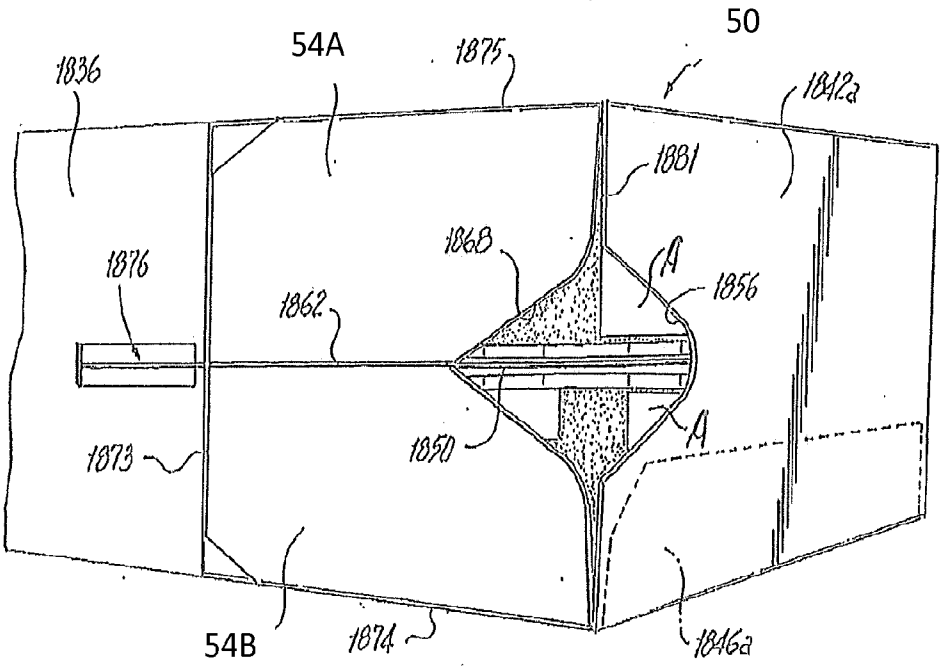


FIGURE 15

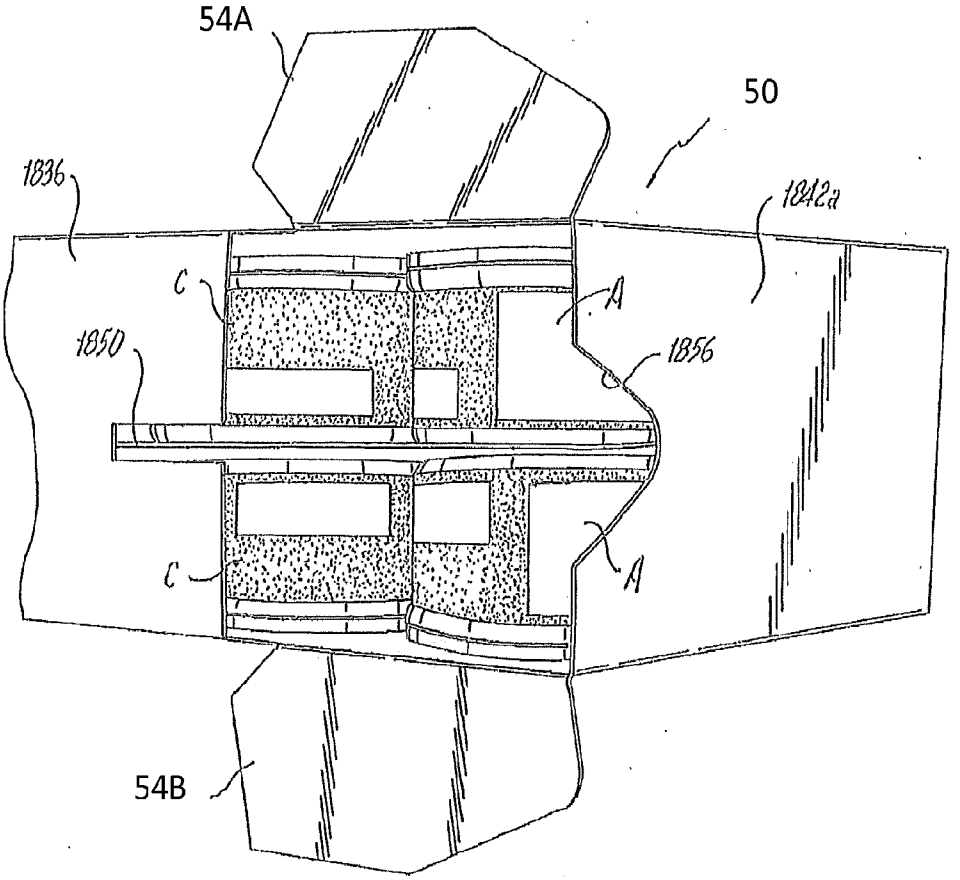
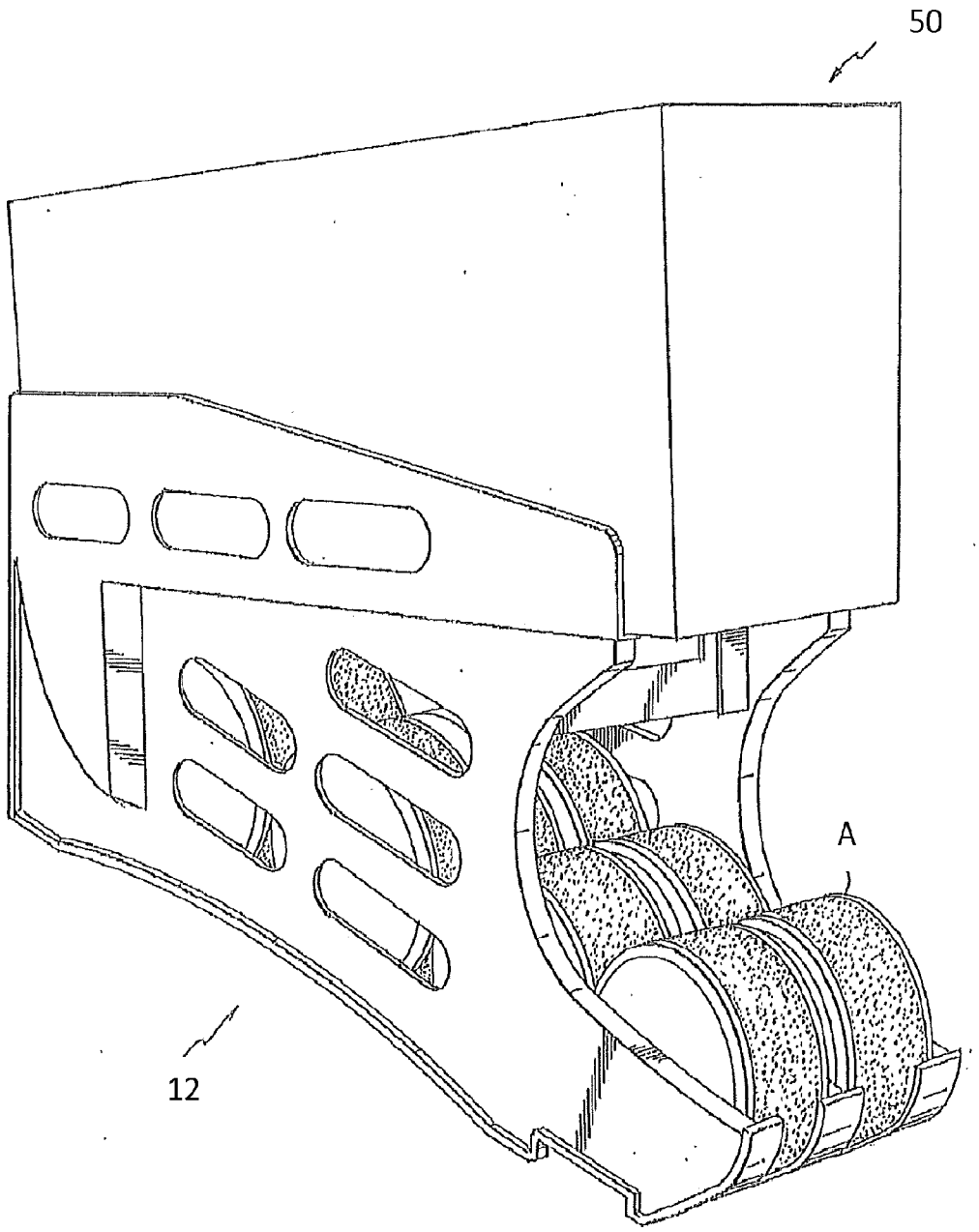


FIGURE 16



DISPENSING SYSTEM

BACKGROUND OF THE DISCLOSURE

[0001] 1. Field of the Disclosure

[0002] The present disclosure relates to a dispensing and display system for use in retail environment. The disclosed dispensing system includes a dispensing device configured to receive a carton or package containing a plurality of products on its upper deck and a mechanism for ensuring that tapered or unbalanced products roll linearly within the system. The disclosure also relates to a dispensing system, such as the aforementioned, that includes a mechanism for indicating when the system should be restocked. Still further, the disclosure also relates to a dispensing system, such as the aforementioned, that includes a mechanism for preventing the products which are dispensed from the carton from jamming. Additionally, the disclosure relates to a package or carton of articles which is specially adapted for use with the aforementioned dispensing system.

[0003] 2. Background of the Disclosure

[0004] At point-of-sale (POS) or display units in retail outlets/locations, it is convenient to present articles and products in an eye-catching and easily accessible manner. These POS or display units also act as a storage area for articles and products. It is therefore beneficial to maximize the amount of storage space utilized, whilst at the same time enabling a customer to easily select and take products away for purchase. To achieve this, as articles are removed, it is desirable for the shelf to forward fill to present the next stored article for easy selection by a customer. Some dispensers have sprung-biased mechanisms that push articles forward; other known display devices use gravity feed mechanisms to cause articles to flow to the forward-most sale position. One such dispensing device is disclosed in U.S. Pat. No. 5,396,997 to Johnson in which a dispensing device has upper and lower jar guides and a plurality of glass jar containers are loaded on their sides through a container loading area. The dispenser racks successively feed one container at a time to the container dispensing area to thereby provide a self-feeding and self-facing storage, dispensing and display system.

[0005] One drawback of systems, such as that disclosed in U.S. Pat. No. 5,396,997 to Johnson, is that loading of the dispensing device is done manually and individually. In Johnson, a rotatable door panel is provided so that loading occurs through the openable upper jar guide. As such, articles are fed one at a time into the upper jar guide. Loading in this manner is slow and, therefore, time-consuming. Additionally, the products being displayed in the dispensing device are usually transported to a retail outlet in a carton or box containing a number of such articles. If the dispensing device is not capable of holding all of the articles contained in the delivered carton, the leftover articles must be stored elsewhere in the retail stores in a partially emptied carton until such time as the dispensing device can accommodate those articles.

[0006] A further drawback of such systems is that often the products being displayed are not symmetrical about their rolling axis; therefore, the articles do not roll in a straight line. This results in the article becoming jammed in the dispensing device and not being displayed or dispensed properly.

[0007] Accordingly, there is still a need to improve the manner in which the filling of the dispensing systems takes place. It is desirable that the filling is quick and enables full cartons of delivered goods to be accommodated in the dispensing device to eliminate the requirement for storing any extra articles that cannot be displayed.

[0008] Additionally, it is beneficial to have dispensing systems that include mechanisms to facilitate the dispensing and displaying of tapered or unbalanced articles, as well as to prevent the jamming of articles as they are dispensed from within the shipping carton or package.

[0009] Furthermore, it is desirable that such dispensing systems are made from a minimum amount of material and are eye-catching to customers.

SUMMARY OF THE DISCLOSURE

[0010] A system for dispensing a plurality of products provided initially in a package is disclosed that includes a dispensing device having a lower deck and laterally opposed side walls secured to opposite sides of the lower deck. The opposed side walls extend longitudinally between front and rear end sections of the dispensing device and include upper deck upon which the package may be placed. The upper deck may be inclined at an acute angle with respect to a horizontal plane. However, those skilled in the art will readily appreciate that the upper deck may be horizontal without departing from the inventive aspects of the present disclosure.

[0011] The lower deck includes a least one guide surface which may be a longitudinally extending groove or rail. The guide surface is configured to ensure that the plurality of products roll linearly from the rear end section to the front end section of the dispensing device.

[0012] The dispensing system may include an opening tool associated with the dispensing device and arranged to open the package when the package is moved relative to the opening tool such that the products may be at least partially dispensed from the package onto the lower deck. The opening tool may be removably or permanently connected to the dispensing device. However, those skilled in the art will readily appreciate that an opening tool may not be required and that the carton may be opened prior to being placed on the upper deck or that the carton itself may include a mechanism for creating an access opening.

[0013] When desired, the dispensing device may include a rear wall which is configured to guide the products to the lower deck. The rear wall may be a separate element from the lower deck or side walls of the dispensing device. Alternatively, the rear wall may be formed as part of either or both of the lower deck and side walls.

[0014] Furthermore, the laterally opposed side walls of the dispensing device may be configured for guiding the package as it is moved longitudinally along or placed onto the upper deck.

[0015] The disclosed dispensing system may further include the package containing the plurality of products. In certain embodiments, the package may include a trap door defined by severance lines which may be severed by the opening tool when the package is moved longitudinally towards the opening tool to create an opening that allows the products to be at least partially dispensed from the package onto the lower deck of the dispensing device.

[0016] The present disclosure also relates to a system for dispensing a plurality of products provided initially in a package, wherein the system includes a dispensing device having a lower deck and laterally opposed side walls secured to opposite sides of the lower deck. The opposed side walls extend longitudinally between front and rear end sections of the dispensing device and include upper deck upon which the

package may be placed. The lower deck includes a least one restocking indicator associated therewith that is configured to indicate when less than a predetermined amount of the plurality of products remain on the dispensing system. In certain embodiments, the restocking indicator may be adapted to restrict at least one of the plurality of products from rolling from the rear end section to the front end section of the dispensing device when less than a predetermined amount of the plurality of products remain on the dispensing system.

[0017] In one embodiment, the restocking indicator may include a protuberance formed on the lower deck.

[0018] In one embodiment, the restocking indicator may include a concave section formed on the lower deck.

[0019] In one embodiment, the dispensing system further includes an opening tool associated with the dispensing device and arranged to open the package when the package is moved relative to the opening tool and allows the products to be at least partially dispensed from the package onto the lower deck.

[0020] The present disclosure also relates to a system for dispensing a plurality of products provided initially in a package, wherein the system includes a dispensing device having a lower deck and laterally opposed side walls secured to opposite sides of the lower deck. The opposed side walls extend longitudinally between front and rear end sections of the dispensing device and include upper deck upon which the package may be placed. The dispensing device may further include a mechanism associated with its rear end section to facilitate a dispensing of products from the package onto the lower deck.

[0021] In one embodiment, the mechanism for facilitating the dispensing of products from the package includes at least one spring arm.

[0022] In one embodiment, the mechanism may include at least one finger element.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] FIG. **1** illustrates a dispensing system according to a first embodiment of the present disclosure: FIG. **1**A for a side elevational view, FIG. **1**B for a top view, FIG. **1**C for a back view, FIG. **1**D for a front view, FIGS. **1**E and **1**F for two cross-sectional views, and FIG. **1**G for a perspective view;

[0024] FIG. **2** illustrates one embodiment of the opposed side panel of the dispensing device used in the dispensing system of FIG. **1**: FIG. **2**A for side elevated view, FIG. **2**B for a cross-sectional view, FIG. **2**C for a top view, FIG. **2**D for a front view, and FIG. **2**E for a perspective view;

[0025] FIG. **3** illustrates one embodiment of the lower deck of the dispensing device used in the dispensing system of FIG. **1**: FIG. **3**A for a side elevated view, FIG. **3**B for a top view, FIGS. **3**C and **3**D for front views, FIG. **3**E for a cross-sectional view, and FIG. **3**F for a perspective view;

[0026] FIG. **4** illustrates one embodiment of the opening device used in the dispensing system of FIG. **1**: FIG. **4**A for a bottom view, FIG. **4**B for a side elevated view, FIG. **4**C for a top view, FIG. **4**D for a front view, and FIG. **4**E for a perspective view;

[0027] FIG. **5** is a partial perspective view a dispensing device for use in a dispensing system in accordance with a second embodiment of the present disclosure, which includes protuberances formed on the lower deck;

[0028] FIG. **6** is a perspective view of a retail or POS display location which includes a plurality of the dispensing systems;

[0029] FIG. **7** is a partial perspective view of the dispensing system of FIG. **6** wherein the restocking indicator identifies that a new carton of articles should be loaded onto the dispensing device;

[0030] FIG. **8** is a perspective view of a dispensing device for use in a dispensing system in accordance with a third embodiment of the present disclosure, with the left side wall removed for ease of illustration;

[0031] FIG. **9** is a cross-sectional view taken along the longitudinal axis of the dispensing device shown in FIG. **8**;

[0032] FIG. **10** is a perspective view of the rear end section of the dispensing device shown in FIG. **8**, wherein the left side wall has been removed for ease of illustration;

[0033] FIGS. **11**A-**11**E are cross-sectional views of the rear end section of the dispensing system of FIG. **8**, illustrating the manner in which the spring arm and finger element prevents the jamming of articles during the dispensing process;

[0034] FIG. **12** shows one embodiment of carton blank for forming a carton or package suitable for use in the disclosed dispensing system;

[0035] FIG. **13** is a perspective view showing the bottom of the carton or package constructed from the carton of FIG. **12**;

[0036] FIG. **14** is a close-up perspective view of the trap doors formed in the bottom of the package of FIG. **13**, wherein the trap doors are shown in a close position;

[0037] FIG. **15** is a close-up perspective view of the trap doors formed in the bottom of the package of FIG. **13**, wherein the trap doors are shown in an open position to create an opening; and

[0038] FIG. **16** shows one embodiment of the disclosed dispensing system (shown in a perspective view) that includes the dispensing device and the carton.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0039] Disclosed herein are detailed descriptions of some embodiments of the dispensing systems, methods and package assemblies. It will be understood that the disclosed embodiments are merely examples of the way in which certain aspects of the disclosure can be implemented and do not represent an exhaustive list of all of the ways the disclosure may be embodied. Indeed, it will be understood that the systems, devices, methods and package assemblies described herein may be embodied in various and alternative forms. The figures are not necessarily to scale, and some features may be exaggerated or minimized to show details of particular components. Well-known components, materials or methods may not be necessarily described in great detail in order to avoid obscuring the present disclosure. Any structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the disclosure.

[0040] FIG. **1** shows one embodiment of the disclosed system. The dispensing system **100** comprises a dispensing device **12** and a package or carton **50** containing a plurality of articles A. In this example figure, the articles are cans which are arranged in two channels or lanes and each channel has two rows/tiers. Each can is disposed upon their sides with the lowermost row in rolling contact with a base **52** of the carton **50**.

[0041] The dispensing device **10** comprises an upper deck **14**, a lower deck **16**, and opposed side walls **18**A, **18**B which define the lateral edges of the upper and lower decks **14**/**16**.

The opposed side walls **18**A/**18**B guide the carton **50** along the upper deck **14**. As shown in FIGS. **1** and **2**, the side walls **18**A/**18**B may be formed with railings **20**A, **20**B which support the carton **50** from its base **52**.

[0042] As shown in FIG. **1**A, articles A are released from the carton **50** via an access means or trap doors **54**. When the trap doors **54** are in a closed position, articles A are securely retained within the carton **50**. When the trap doors **54** are in an open position, they are moved out of the plane of the base **52** of the carton **50**, thereby creating an access opening. As the trap doors **54** are moved from the closed position to the open position, articles A held within the carton fall free out of the carton **50** through the access opening onto the lower deck **16** where articles A are guided, one-by-one toward the front end of the dispensing device **12**. In certain embodiments, the trap doors **54** are not moved into a fully open position until the carton **50** is fully installed or nearly fully installed on the upper deck **14** of the dispensing device **12**.

[0043] In the embodiment as shown in FIG. **1**A, the access means/trap door includes two doors which are moved into the open position by an opening tool **40**. FIG. **4** shows one embodiment of the opening tool. Referring to FIG. **1**A, the opening tool **40** is co-operable with the trap door **54** of the carton. When the carton **50** is installed by sliding movement along the supporting ledges/railings **20**A/**20**B of the upper deck **14**, the opening tool **40** engages the perforated portion of the carton which defines the trap doors **54**. Once the carton **50** is so installed and the opening created, articles A are automatically released from the carton **50** and into the lower deck **16** of the dispensing device **12**.

[0044] Articles A may be successively released from the carton **50** with assistance of gravity. As shown in FIG. **1**F, the upper support railings **20**A/**20**B and the lower deck **16** of the dispensing device **12** are arranged at an angle with respect to horizontal. There, the upper support railings **20**A/**20**B slope in a downward direction from the front end to the rear end of the dispensing device **12**, while the lower deck **16** slopes downward in an opposite direction. This arrangement allows gravity to move the articles from within the carton down into the lower deck and towards the front end of the dispensing device **12** where they can be accessed by consumers. In one embodiment, the inclination angle (a) of the upper support railings **20**A/**20**B slope may be about 8 degrees. However, one skilled in the art will readily appreciate that the angle may vary without departing from the scope of the present disclosure.

[0045] FIG. **3** shows one embodiment of the lower deck for the dispensing device. A scoop shaped or arcuate back element **60** is associated with the dispensing device **12** to prevent the articles from rolling out of the dispensing device **12** and to encourage the articles, by providing a path for them to follow, to roll around and down onto lower deck **70** of the dispensing device **12**. The gravity feed mechanism causes articles A to be supplied automatically to the front of the lower deck **70** of the dispensing device **12**. A stopping mechanism **72** formed as an upturned or radiused portion prevents the front-most article A, contained in dispensing position, from rolling completely out of the dispensing device **12**. The stopping mechanism **72** acts to retain articles A within the lower deck of the dispensing device **12**. (FIGS. **3**A and **3**F)

[0046] In one embodiment as illustrated in FIG. **3**, the dispensing device **12** may further include a lane divider **74** which is formed as part of the back element **60** and/or the lower deck **70**. The lane divider **74** creates two product distribution channels within the lower deck **70** of the dispensing device **12**. Those skilled in the art will readily appreciate that the back element, the lower deck and the lane divider may be formed as separate elements which are assembled into a unit or they may be manufactured as a unitary structure.

[0047] FIG. **3** provides a side view (FIG. **3**A), a top view (FIG. **3**B), front views (FIGS. **3**C and **3**D), a cross-sectional view (FIG. **3**E), and a perspective view (FIG. **3**F) of back element **60** and lower deck **70**. As shown therein, the back element **60** of the dispensing device **12** includes a base portion **62** and lateral side walls **64**A and **64**B. Likewise, the lower deck **70** includes a base portion **76** and lateral side walls **78**A/**78**B. The base portion **62** of the back element **60** and the base portion **76** of the lower deck **70** define two continuous outer grooves or channels **82** and one central groove or channel **84**. The outer channels **82** are configured to ensure that the plurality of articles A roll linearly from the rear end section to the front end section of the dispensing device **12** for display. When being dispensed, articles A may have a tendency to roll in a non-linear manner due to for example an eccentricity in weight distribution. By providing a groove or channel, articles may roll linearly on the cylindrical base element. As such, any tendency of the articles to roll non-linearly is reduced because the vertical walls of the groove engage the rim of the articles and force the articles to roll longitudinally.

[0048] Those skilled in the art will readily appreciate that the shape, location and size of the groove or channel depends on the articles being dispensed and display. Moreover, a rail element may be used in lieu of a groove for articles that are tapered. Additionally, the rail element may include a circumferential channel or neck element.

[0049] FIG. **4** shows one embodiment of the opening tool **40** suitable for use in the disclosed dispensing system. Opening tool **40** has an upwardly projecting cutting or severing panel **42** which extends from a mounting section **44**. The mounting section **44** includes spaced apart mounting arms **46**A/B which are configured for slidably receiving the back portion **75** of lane divider **74** (shown in FIG. **3**F). The forward edge **48** of the severing panel **42** is adapted for cutting or severing a carton, when the carton is slid along the upper deck of the dispensing device **12**. It is to be understood that although the exemplary dispensing system includes an opening tool for severing the product carton, the dispensing system of present disclosure may or may not include the opening tool.

[0050] FIG. **12** shows one embodiment of the blank for forming the carton suitable for use in the disclosed dispensing system. The carton blank **1830** includes a bottom panel **1836**, a first side panel **1834**, a second side panel **1838**, an outer top panel **1840***a*, an inner top panel **1840***b*, a center panel **1850**, and a glue flap **1871**. These panels hinged together in series along fold lines **1852**, **1853**, **1854**, **1856**, **1858**, and **1859**. The carton blank **1830** also includes end flaps **1848***a-b*, **1842***a-b*, **1844**, **1846***a-b* and **1872**.

[0051] Bottom panel **1836** of the carton blank **1830** has a first longitudinally extending severance line **1862** positioned about its centerline which extends from a severance initiation notch **1868***a* to a second laterally extending severance line **1873**. Moreover, fold lines **1874** and **1875** are provided on the lateral edges of the bottom panel **1836**. Bottom panel **1836** further includes cutout **1876**. The end closure flap **1842***a* includes a severance notch **1868**. The center panel **1850** includes a notch **1877**.

[0052] Blank **1830** is foldable along the lateral fold lines **1860***a-b* and along the longitudinal fold lines **1852**, **1853**, **1854**, **1856**, **1858**, and **1859** into a carton **50** that has two longitudinally extending compartments separated by center panel **1850**. The end closure flaps **1848***a-b*, **1842***a-b*, **1844**, **1846***a-b* and **1872** are secured in overlapping, face contacting relationship using adhesive or other suitable securing techniques.

[0053] FIGS. **13** and **14** provide perspective views taken from below of the carton **50**.

[0054] FIG. **15** shows the carton **50** after the severance lines **1862** and **1873** have been cut, so as to create access doors **54**A/**54**B.

[0055] The carton **50** provides an ordered collection or a magazine of articles A that is easy to handle and manipulate. As discussed above, the carton **50** is loaded onto and guided by an upper deck of the dispensing device **12** and as such a full set of articles A is loaded in one single operation into the dispensing device. The opening tool **40** is operable in-conjunction with a complimentary formed access means or trap door **54** provided on the carton **50**. As the carton is loaded onto the dispensing device, the opening tool engages the trap doors **54** of the carton **50** to create an access opening in the base **52** of the carton **50** through which the articles A may be released into the lower deck of the dispensing device **12**. The dispensing device is thereby stocked, and articles A are either stored in the carton **50** for subsequent dispensing into the device or the articles A are displayed in the lower deck of the dispensing device for retrieval by a customer. Upon removal of the front most article A, a forward feed mechanism causes automatic replenishment of the lower deck wherein the front most position of the lower deck of the dispensing device is replenished with the supply of articles A contained in the carton **50**. Once the carton **50** is empty, the empty carton **50** may be removed from the dispensing device, such as simply by lifting out or by sliding withdrawal along the upper deck **14**. When the last article A drops out of the carton **50**, the lower deck of the dispensing device may be full. This means that the front-most article location contains an article A, and therefore, the display and presentation of articles for being picked by a customer is in its optimum position.

[0056] Furthermore, the carton **50** may be left on the upper deck of the dispensing device even after it has been emptied to serve as a billboard panel. As such, the carton **50** or at least its front end wall may be printed with graphics including trademarks and/or any other advertising indicia.

[0057] Alternatively, the carton **50** may be replaced by a new one when it is emptied to mitigate the chance that article A will be taken from the lower deck of the dispensing device **12** before a fresh supply of articles is available to replenish the lower deck and the front-most position. The need for any secondary storage of articles contained in the carton but not displayed by the dispensing device is mitigated by the loading of only completely full cartons onto the dispensing device.

[0058] It should be noted that channels or rails for ensuring the products/article roll in a linear manner within the carton may also be incorporated into the carton or package. For example, a rail may be inserted into the package during the folding and gluing process for the carton or incorporated into the design of the carton itself, allowing the carton to be a one-piece construction.

[0059] The principle of operation of the dispensing systems of later embodiments is the same or similar to that of the dispensing systems described in the first embodiment above. Accordingly, only differences and additional technical features of later embodiments will be described in greater detail.

[0060] Referring now to FIGS. **5-7**, which illustrate a further embodiment of the disclosed system for dispensing a plurality of products provided initially in a package or carton. The dispensing system **200** is similar in structure and operation to the system **100**, but does vary in certain respects, some of which will be discussed in detail herein below.

[0061] Like system **100**, system **200** includes: a dispensing device **212** having laterally opposed side walls which are secured to opposite sides of a lower deck **270**. The laterally opposed side walls **218**A/**218**B extend longitudinally between front and rear end sections of the dispensing device **212** and include upper support structure **220**A/**220**B onto which an upper deck **221** is placed.

[0062] A scoop shaped or arcuate back element **260** may be associated with the dispensing device **212** to prevent the articles from rolling out of the dispensing device **212** and encourage the articles, by providing a path for them to follow, to roll around and down onto the lower deck **270** of the dispensing device **212**. The gravity feed mechanism causes articles A to be supplied automatically to the front of the lower deck **270** of the dispensing device e **212**. A stopping mechanism **272** formed as three separate upturned or radiused portions **273** preventd the front-most article A, contained in dispensing position, from rolling completely out of the dispensing device **212**. The stopping mechanism **272** acts to retain articles A within the lower deck of the dispensing device **212**.

[0063] The frame **212** may also include a lane divider **274** to establish product distribution channels within the lower display area of the frame **212**. The lane divider may be formed as a part of the back element **260** and/or the lower display deck **270**.

[0064] The lower deck **270** includes a base portion **276** and lateral side walls **278***a*/**278***b*. The base portion **276** of the lower deck **270** defines two continuous outer grooves or channels **282** and one central groove or channel **284**. The outer channels **282** may be configured to ensure that the plurality of articles A roll linearly from the rear end section to the front end section of the dispensing device **212** for display.

[0065] Each lane defined in the lower deck **270** may include a restocking indicator **290** associated therewith. The restocking indicator **290** may be used to alert store employees when the shelved inventory is low. When the plurality of articles A are dispensed from within the package/carton **250** onto the lower deck **270** (FIG. **6**), the restocking indicator **290** may be configured to restrict at least one of the plurality of articles A from rolling from the rear end section to the front end section of the dispensing device (FIG. **7**) when less than a predetermined amount of the plurality of products remain on display in a particular distribution channel/lane.

[0066] Referring to FIG. **5**, the restocking indicator **290** may include a protuberance **292** formed on the lower deck **270**. Alternatively, the restocking indicator may include a concave section formed on the lower deck.

[0067] The restocking indicator may further include a visual indicator associated with the front section **294** of the lower deck **270**. The front section **294** may be colored differently than the remaining sections of the lower deck **270** in order to provide further visual indication of the need to restock the dispensing device. For example, when the carton is empty there is no longer enough back pressure to push the product over the restocking indicator or protuberance. The

position and size of the protuberance **292** may be varied depending upon the angle of inclination for the lower deck **270** and based upon how many articles are desired to remain in the dispenser prior to refill. Moreover, the restocking indicator may be removably or permanently attached to the lower deck.

[0068] FIGS. **8**-**11**E illustrate a further embodiment of the disclosed systems for dispensing a plurality of products provided initially in a package which has been designated as reference numeral **300**.

[0069] Like system **100**, system **300** includes, among other elements, a dispensing device **312** having laterally opposed side walls **318**A, **318**B which are secured to opposite sides of a lower deck **370**. The laterally opposed side walls **318**A/**318**B extend longitudinally between front and rear end sections of the dispensing device **312** and include upper support structure **320**A/**320**B onto which an upper deck **321** is placed.

[0070] The dispensing device **312** may include a lane divider to establish product distribution channels within the lower deck of the dispensing device **312**. The lane divider may be formed as part of the back element and/or the lower deck **370**. Those skilled in the art will readily appreciate that product distribution channel is optional, and that any number of channels may be used in the dispensing device. The disclosed device may be provided with a single product distribution channel or more than two channels without departing from the inventive features of the present disclosure.

[0071] As showing in FIG. **8**, the lower deck **370** includes a base portion **376** and lateral side walls **378**A/**378**B. The base portion **376** of the lower deck **370** defines two continuous outer grooves or channels **382** and one central groove or channel **384**. The outer channels **382** may be configured to ensure that the plurality of articles A roll linearly from the rear end section to the front end section of the dispensing device **312** for display.

[0072] Unlike the previously described system **100**, system **300** may include a mechanism **390** for facilitating the dispensing of products from the package. As shown in FIGS. **8**-**10**, the mechanism **390** includes spring arm **392** and finger element **394**. Those skilled in the art will readily appreciate that the mechanism **390** may alternatively include only the finger element **394** without any spring arm **392**, or may include only the finger element **394** without any spring arm **392**. Moreover, the number of finger elements and spring arms may be adjusted to suit the numbers of product distribution channels provided in the dispensing device.

[0073] As shown in FIGS. **8** and **9**, the spring arm **392** defines the scoop shaped or arcuate back element to prevent the articles from rolling out of the dispensing device **312** and beneficially encourage the articles, by providing a path for them to follow, to roll around and down onto the lower deck **370** of the dispensing device **312**. The scoop shaped or arcuate back element may be removably secured to the dispensing device **312**. Alternatively, the back element may be removably secured to the dispensing device **312**. The gravity feed mechanism causes articles A to be supplied automatically to the front of the lower deck **370** of the dispensing device **312**.

[0074] Referring to FIG. **8**, a stopping mechanism **372** may be formed as three separate upturned or radiused portions **373** to prevent the front-most article A, contained in dispensing position, from rolling completely out of the dispensing device **312**. The stopping mechanism **372** acts to retain articles A within the lower level of the dispensing device **312**. It is understood that other structure of the stopping mechanism may be used in the disclosed system.

[0075] In instances for example where the products are stacked in two tiers and in two lanes/channels, when the products are dispensed, the first four articles (two from each lane) will fall onto the lower deck of the dispensing system. The next two top articles, however, will get jammed on top of the next two bottom articles as they try to dispense. This jamming prevents any article from falling, thereby preventing articles in the dispensing system from flowing freely.

[0076] FIGS. **11**A to **11**E illustrate the operation of the spring arms **392** and fingers **394**. There, the dispensing system **300** includes a dispensing device **312** and a carton **350** containing plurality of articles A. The spring arms **392** and fingers **394** may be configured to help reducing the jam of articles during dispensing by changing the moment of the top article as it falls in the dispensing device.

[0077] FIG. **11**A illustrates the carton **350** being slid along the upper deck **321** of the dispensing device **312**. In FIG. **11**B, the carton **350** has been slid along the upper deck **321** until it makes initial contact with the finger element **394**. The weight of the loaded carton **350** pushes on the finger element **394** and causes a support structure **396** for the finger element **394** to flex backwards (FIG. **11**C). The finger element **394** works to hold the top article A momentarily to let the bottom article A roll into the bottom part of the dispensing device **312**. (FIG. **11**D). Also, since articles A are tapered and naturally shingle against one another, the finger **394** helps to bring articles A back to a straightened position.

[0078] In FIG. **11**E, the dispensing articles causes a flexing of the spring arm **392**, which results in a vibration effect that helps articles A to continue rolling as they move toward the front end of the dispensing device. This configuration may be created to solve problems around product stacking and multiple channels dispensing. However, the disclosed system is not be limited by any means to this configuration.

[0079] The spring arm may be shaped like a capital "A". The cross section **393** of this "A" is a fulcrum point that is positioned midway in an angle of the spring arm **392**. The area below the fulcrum point on the front section of the spring arm **392** acts as a spring board to add an extra "kick" to the cans as they roll through the back radius of the dispensing system. The spring arm **392** may also have a radius built into the bottom area to help pushing articles A forward.

[0080] As shown in FIG. **11**B, the finger element **394** on the top of the front section of the "A" may be positioned below the central axis of the top article in order to help push the articles up and forward, as well as to assist in the straightening effect of the article. The spring arm **392** may be built to be symmetrical or asymmetrical depending on the opening feature of the cartridge and the orientation of the articles. The spring arm may also potentially be integrated into the back section of the dispenser or be individually inserted as separate components.

[0081] As the carton is nearly empty, mechanism **390** begins to flex forward towards its original position shown in FIG. **11**A and pushes the carton **350** forward on the upper deck which functions to provide a visual indication to the stocking clerk that the carton needs to be replaced. At least one side panel of the carton may be colored in a way so that when it is urged forward, a stripe of color may be seen, differentiating it from the other cartons on the shelf and alerting the stock clerk that the particular carton needs to be restocked.

[0082] It is also envisioned that the cartons in other embodiments of present disclosure may be provided with an additional means/mechanisms for detecting when the carton is nearly empty in order to minimize or eliminate the needs for the store employees to lift the carton or inspect the carton closely. Such means for detecting when the carton is empty or nearly empty of articles may take the form of a window, such as an aperture or shaped cut-out in the carton. Such a window may be disposed close to the bottom of the carton so that the presence or not of articles in the lowermost tier of the carton may be detected by observation. In some embodiments, the window may be provided by piece, strip, or section of clear, transparent or translucent material, such as plastic sheet to enable the interior of the carton to be viewed, yet maintaining other desirable characteristics of the carton such as structural integrity and barrier to dust. Alternatively, an inspection hole or aperture may be provided into which a pen or other instrument may be inserted in order to feel for the presence of articles in the lowermost row.

[0083] As shown in FIG. **8**, the dispensing device **312** may also be provided with removable wedges **398** (only one side shown) which operate to pinch the carton **350** as it is slid on the upper deck **321** and to assist the dispensing by urging the articles out of the carton **350**. The wedges **398** may also be slidably engaged within slot in order to allow them to be relocated if necessary based on the carton dimensions and the products being dispensed.

[0084] Where advantage may not be taken of the gravity and rolling to provide the forward feed mechanism, other mechanisms may be provided to assist in dispensing the articles. Examples of such mechanisms include, but are not limited to, a sprung biased mechanism or other suitable means.

[0085] Any suitable foldable sheet material may be used as blank for forming the carton/package of the present disclosure. Examples include, but are not limited to, paperboard, cardboard, plastics material, and the like. Furthermore, the carton or package for articles may be formed as a reusable dispenser with a reusable opening mechanism.

[0086] A variety of materials may be used for the dispensing device of the present disclosure. The dispersing device may be formed from other materials or combinations of materials for example: metal, wood, fibre glass, glass-reinforced plastic.

[0087] Although the articles illustrated in the exemplary drawings as cans, the present disclosure is applicable to a wide variety of products contained in various types and shapes of containers. For example, in one embodiment, the containers may have at least a cylindrical portion to encourage rolling of the articles from the carton to the lower deck and toward the front end of the dispensing device. Those skilled in the art recognize that the dispensing devices and systems of the present disclosure are applicable to other types and/or shapes and/or sizes of articles.

[0088] It will be recognised that as used herein, directional references such as "top", "bottom", "front", "back", "end", "side", "inner", "outer", "upper" and "lower" do not limit the respective panels to such orientation, but merely serve to distinguish these panels from one another. Any reference to hinged connection should not be construed as necessarily referring to a single fold line only; indeed it is envisaged that hinged connection may be formed from one or more of the following, a short slit, a frangible line or a fold line without departing from the scope of the disclosure.

We claim:

1. A system for dispensing a plurality of products provided initially in a package, the system including a dispensing device defined by a front and a rear end sections, the dispensing device comprising:

(a) laterally opposed side walls extending longitudinally between the front and the rear end sections;

(b) a lower deck connecting the opposed side walls and including at least one guide surface; and

(c) an upper deck connecting the opposed side walls and upon which the package being placed;

wherein the plurality of products are dispensed from within the package onto the lower deck, and the at least one guide surface is configured such that the plurality of products roll linearly from the rear end section to the front end section of the dispensing device.

2. The system of claim **1**, further comprising an opening tool associated with the dispensing device and arranged to open the package when the package is moved relative to the opening tool.

3. The system of claim **1**, wherein the dispensing device further includes a rear wall being configured to guide the products to the lower deck.

4. The system of claim **1**, wherein the upper deck is inclined at an acute angle with respect to a horizontal plane.

5. The system of claim **1**, wherein the guide surface includes a structure selected for a group consisting of a groove, a rail, or combinations thereof.

6. The system of claim **1**, further comprising the package containing plurality of products.

7. The system of claim **2**, further comprising the package containing plurality of products, wherein:

the package includes a trap door defined by severance lines, and

the opening tool engages the severance lines when the package is moved longitudinally towards the opening tool to create an opening on the package.

8. The system of claim **1**, wherein the lower deck further includes a least one restocking indicator associated therewith.

9. The system of claim **8**, wherein the restocking indicator includes a structure selected from a group consisting of: a protuberance, a concave section, and combinations thereof.

10. The system of claim **8**, further comprising an opening tool associated with the dispensing device and arranged to open the package when the package is moved relative to the opening tool.

11. The system of claim **8**, further comprising the package containing plurality of products.

12. The system of claim **1**, wherein the dispensing device further includes a resilient element associated with the rear end section to facilitate a dispensing of the products from the package onto the lower deck.

13. The system of claim **12**, wherein the resilient element includes a structure selected from a group consisting of: spring arm structure, finger structure, and combinations thereof.

14. The system of claim **12**, further comprising an opening tool associated with the dispensing device and arranged to open the package when the package is moved relative to the opening tool.

15. The system of claim **12**, further comprising the package containing plurality of products.

16. A dispensing device defined by a front and a rear end sections, wherein the dispensing device comprises:

(a) laterally opposed side walls extending longitudinally between the front and the rear end sections;

(d) a lower deck connecting the opposed side walls and including at least one guide surface; and

(e) an upper deck connecting the opposed side walls and upon which a package containing plurality of products being placed;

wherein the plurality of products are dispensed from within the package onto the lower deck, and the at least one guide surface is configured such that the plurality of products roll linearly from the rear end section to the front end section of the dispensing device.

17. The dispensing device of claim **16**, further comprising an opening tool arranged to open the package when the package is moved relative to the opening tool.

18. The dispensing device of claim **16**, further comprising a rear wall configured to guide a dispensing of the products to the lower deck.

19. The dispensing device of claim **16**, further comprising a least one restocking indicator associated with the lower deck.

20. The dispensing device of claim **19**, further comprising a resilient element associated with the rear end section to facilitate a dispensing of the products from the package onto the lower deck.

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