MODULAR ARTICLE STORAGE AND DISPENSING ASSEMBLY

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ABSTRACT
A modular article storage and dispensing assembly which includes a side-by-side series of article dispensers for storing and advancing articles for removal. A series of support shelves are positioned end-to-end and supported from upright supports and each shelf section includes at least two spaced and horizontally disposed elongated parallel shelf bars supported on opposite ends by end brackets. The end brackets are removably securable to the upright supports. Support saddles depend downwardly from each of the dispensers and are positioned respectively to register over and engage the support bars to thereby support the dispensers. The support shelf end brackets are relieved and contoured to conform to the contours of the shelf bars whereby the support saddles may be supported on the support bars at the bracket locations, as well as between end brackets, thereby permitting a continuous side-by-side uninterrupted supported series of the article dispensers. The support saddles which are positioned over a forward positioned bar of the support shelves have downwardly facing C-shaped configurations with downwardly depending front and rear legs that are dimensioned and contoured to slide downwardly over the forward support bar. The rear leg of this C-shaped saddle is shorter than the front leg to thereby permit ease of removal of the dispensers from the support bars. A low stock indicator is also provided on the dispenser for indicating that restock of articles in the dispenser is required.
MODULAR ARTICLE STORAGE AND DISPENSING ASSEMBLY

CROSS REFERENCE

[0001] This application is a continuation-in-part of U.S. patent application Ser. No. 12/157,687, filed Jun. 12, 2008 and entitled Modular Gravity Feed Storage and Dispensing Assembly.

BACKGROUND OF THE INVENTION

[0002] The present invention relates generally to a storage and dispensing assembly, and more particularly, to a modular storage and dispensing assembly for dispensing rolling articles by gravity feed, such as cans and bottles, on flat and non-rolling stock.

[0003] Gravity feed dispensers have been used in the product dispensing markets, i.e., grocery stores, supermarkets, convenience marts and department stores, to provide on-shelf storage, automatic rotation of stock, and easy access for customers. The products are arranged on a rack which is inclined to horizontal such that when a customer removes one product at an end of a row of products, the entire row of products indexes forward one location equivalent to one product. The modular storage and dispensing assemblies of the prior art include a plurality of panels and connecting assembly for connecting adjacent disposed panels such that a chute is formed between each of the adjacent disposed upright panels. A rail or ramp assembly is provided in each chute for defining a travel path through the chute. The rail or ramp assembly is sloped in a downward direction whereby the produce cans or bottles roll down the chutes. A removal area is disposed at the lower portion of the chute which allows for selective removal of one or more articles, which are sequentially replaced by gravity feed.

[0004] Examples of such prior art assemblies are illustrated in U.S. Pat. Nos. 5,462,198; 6,991,116 and 7,207,447.

[0005] Problems encountered with prior art modular display racks or assemblies are that such assemblies are overly limited in storage capacity, conform to conventional shelving systems when in fact there are better alternatives, are difficult to relocate from one shelf section to another when it is desired to move the product, they are too expensive to manufacture and difficult to assemble, do not indicate when it is time to restock, and the articles do not always freely flow down the chutes. When store resets are required with some of the prior art systems, the product must be emptied from the assemblies before moving them and the assemblies must be disassembled and are difficult to reassemble.

SUMMARY OF THE INVENTION

[0006] The present invention provides a modular article storage and dispensing assembly for storing, displaying, and dispensing cans, bottles, boxes, and other articles. The assembly is comprised of a side-by-side series of article dispensers for storing and articles for removal. In some instances, the article dispenser is of the gravity feed type for displaying, advancing and dispensing rolling articles, such as bottles and cans. In other instances, the article dispenser is in the form of a flat shelf for storing and displaying articles, and may include a spring biased pushing element to continually advance the articles forward for removal.

[0007] A series of support shelves are positioned end-to-end and are supported from upright supports. These shelves each include at least two spaced and horizontally disposed parallel shelf bars (a rear bar and a forward bar) supported on opposite ends by brackets that are removable secured to the upright supports. Support saddles depend downwardly from each of the dispensers and are positioned to respectively register over and engage the support bars to thereby support the respective dispensers.

[0008] Each of the end brackets, which support the plural shelf bars therebetween, are relieved and contoured to conform to contours of the shelf bars supported from the end brackets. This permits the underlying support saddles of the dispensers to be supported on the support bars at the location of the brackets, as well as between the brackets, for thereby permitting a continuous side-by-side supported series of the dispensers, uninterrupted by the periodic occurrence of the end brackets. Two parallel support bars may be provided at a minimum to support the article dispensers. However, three such shelf bars are preferred for supporting a series of heavier or larger dispensers.

[0009] The support saddles provided on the bottom of the article dispensers for support thereof on the underlying parallel support bars, are positioned over the forward support bar and have a downwardly facing C-shaped configuration with downwardly depending front and rear legs which are dimensioned and contoured to slide snugly down opposite sides of the forward most support bar. The rear leg of each of these forward support saddles is considerably shorter than the front leg for thereby permitting ease of removal of the dispenser when lifted from the support bars and pulled forward.

[0010] In the article storage and dispensing assembly of the present invention which includes gravity feed storage for rolling stock, the dispenser includes an inclined ramp for sequential rolling advancement of cylindrical articles down the ramp to a removal area for selective removal of one or more of the articles. The dispenser assembly of the present invention provides a low stock indicator on an exposed front face of the dispenser for indicating that restock of articles in the dispenser is required.

[0011] In a preferred embodiment of the low stock indicator, it is comprised of a pivoted lever arm located at the removal area of the dispenser and includes a cover extension which normally covers a restock warning or an indicating surface on the dispenser when sufficient articles are aligned on the ramp at the removal area. When sufficient articles remain in the removal area, the lever is engaged by an article on the ramp surface and the indicator is covered from view. When a predetermined minimum number of articles remain on the ramp at the removal area, the lever is no longer engaged by an article on the ramp and the lever is dimensioned and weighted whereby when it is not engaged by an article it pivots to thereby expose the indicating surface on the front of the dispenser to indicate that restock is required.

[0012] In the gravity feed storage and dispensing assembly of the present invention which includes means for advancing rolling stock, the dispenser includes an inclined ramp for sequentially rolling advancement of cylindrical articles down the ramp to the removal area. In this embodiment the ramp has an upper portion and a lower portion, and a secondary ramp, which is inclined to receive extra rolling stock from an upper end thereof for additional storage, is positioned under the upper ramp portions, but above the lower ramp portions, for storing extra articles when the main feed ramp is full. To ease the removal of these articles stored on this secondary ramp, the secondary ramp includes a finger access slot therein for
finger access from the bottom of the secondary ramp to assist in removal of the articles stored thereon.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0013] Other objects and advantages appear hereininafter in the following description and claims. The accompanying drawings show, for the purpose of exemplification, without limiting the scope of the present invention or appended claims, certain practical embodiments of the present invention wherein:

[0014] FIG. 1 is a perspective view of a modular storage and dispensing assembly constructed in accordance with the teachings of the present invention, the modular storage and dispensing assembly being shown with three chutes, without the inclusion of the cans to be contained and dispensed therein;

[0015] FIG. 2 is a view of the modular storage and dispensing assembly of FIG. 1 shown in reverse perspective with the vertically disposed end cover panel removed to disclose the interior thereof;

[0016] FIG. 3 is a perspective view of the modular storage and dispensing assembly constructed in accordance with the teachings of the present invention, the modular storage and dispensing assembly being shown with two chutes, each of which contain a plurality of cans;

[0017] FIG. 4 is a perspective view of the modular storage and dispensing assembly of the type illustrated in FIG. 1 with three chutes, each of which contain a plurality of cans in the removal area of the assembly and with the assembly supported on the spaced front and rear shelf bar support system of the present invention;

[0018] FIG. 5 is a perspective view of multiple modular storage dispensing assemblies of the type shown in FIG. 3 as stored side by side on the front and rear bar support system shown in FIG. 4 to make up a completed display shelf in accordance with the teachings of the present invention;

[0019] FIG. 6 is a perspective view of a modular storage and dispensing assembly constructed in accordance with the teachings of the present invention, the modular storage and dispensing assembly being shown with one chute and with the end cover panel removed to disclose the interior, including a secondary ramp assembly for storing additional articles than those already stored in the single chute;

[0020] FIG. 7 is a left side end view of the modular storage and dispensing assembly shown in FIG. 6 with an end panel secured over the dispenser and illustrating another embodiment of the support shelf rails supporting the dispenser and the support saddles for retaining the dispenser to the support rails assembly, the view of the support rails being an end view of the configuration shown in FIG. 8;

[0021] FIG. 8 is a frontal perspective view of the underlying support shelf rails shown in FIG. 7;

[0022] FIG. 9 is a frontal perspective view of the multiple bar shelf shown in FIG. 8 illustrating an embodiment thereof incorporating three support rails instead of two;

[0023] FIG. 10 is an enlarged perspective view illustrating the rail support shelf shown in FIG. 9 with a flat display shelf supported thereon instead of, or in addition to, the gravity dispensers otherwise illustrated herein; and

[0024] FIG. 11 is a perspective view of an alternative embodiment of the gravity feed dispenser of the present invention, with a rear portion thereof sectioned away, for illustrating easy stock removal access to the secondary intermediate storage ramp and for further illustrating the low stock indicator of the present invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

[0025] Referring to FIGS. 1 through 6, the gravity feed storage and dispensing assembly of the present invention includes a dispenser 10 which is comprised of a plurality of spaced vertically disposed panels 11 with a ramp assembly 12 disposed between adjacent vertically disposed panels 11 whereby a chute 13 is provided between each of the adjacent vertically disposed panels 11 for defining a travel path to guide articles 14 traveling along between adjacent panels 11. The ramp assembly 12 is slightly inclined so it will allow cylindrical articles 14 to be rollingly advanced by means of gravity from an upper portion 15 between panels 11 in said chutes 13 to a lower portion 16 between said panels 11 in said chutes 13.

[0026] A removal area 17 disposed approximate the lower portion 16 of chutes 13 is provided for allowing selective removal of one or more of the articles 14 from dispenser 10.

[0027] As best illustrated in FIG. 4, a parallel pair of spaced horizontally disposed elongated shelf bars 20 and 21 are supported on opposite ends by shelf brackets 22, thereby providing front and rear dispenser shelf support bars 20 and 21 respectively. Support brackets 22 in turn are provided with conventional finger cans 23 for supporting the entire shelf system on a conventional shelf vertical support (not shown).

[0028] Spaced front and rear support saddles 24 and 25 respectively depend downwardly from each dispenser 10 and are positioned to respectively register over the front and rear support bars 20 and 21 respectively, with a front portion 26 of each dispenser 10 containing the removal area 17 overhanging front dispenser support bar 20. This permits the storage of extra articles 14 due to the overhang or cantilever capabilities of the dispenser 10 on support bars 20 and 21. This cantilever support system is permitted due to the fact that the rear support saddles 25 have a rearward facing C-shaped configuration dimensioned and contoured to slide rearwardly over rear support bar 21, and front support saddles 24 have a downwardly facing C-shaped configuration dimensioned and contoured to slide downwardly over the front support bar 20 after the rear support saddle 25 has been slid in position over rear support bar 21, whereby the dispenser 10 is thereby prevented from sliding or tipping over in the forward direction. In the configuration illustrated in FIG. 4, the rear support bar 21 is positioned higher than the front support bar 20. This provides additional advantages of permitting more storage capabilities for the articles 14, a fuller display and additional incline for the ramp assembly 12, thereby insuring continued rolling of the articles 14 in their respective chutes 13.

[0029] For additional safety in securement of the system on support bars 20 and 21, front support saddles 24 are provided with opposed inwardly extending protrusions 27 on the distal end of the front saddles 24 to protrude slightly under front support bar 20 for thereby serving as a removal resistance retention of front saddles 24 from front support bar 20.

[0030] A second embodiment of the present invention is provided in the ramp assembly 12 which is provided with a central raised ramp surface 28 running with each chute 13 for engagement with a rolling article 14 to be dispensed. Side relief channels 30 are provided on opposite sides of ramp surface 28 to receive annularly protruding end rims 31 of each
article 14 rolling down the ramp surface 28 whereby the article 14 will always be in rolling contact with the ramp surface 28.

[0031] A third embodiment of the present invention is provided in that each vertically disposed panel 11 is provided with a horizontally extending ledge 31 protruding in one direction therefrom for thereby providing the entire of the ramp assembly 12. In other words, each vertically disposed panel 11 is integrally or unitarily molded with a ledge 31 to provide a unitarily molded subassembly 32. Accordingly, in order to assemble a three-chute dispenser 10 as illustrated in FIGS. 1 and 2, three of these molded subassemblies 32 are secured side by side together by any conventional means, such as by snap fit conventions, (here by self tapping screws received in molded screw passages 34) to provide the completed three-chute assembly. In order to close off the vertical face of the last subassembly 32, the last vertically disposed panel 11 in the form of cover panel 35 is secured in place. Accordingly, due to this ability to manufacture the dispensers 10 by the stacking of molded subassemblies, the manufacture thereof is inexpensive and the assembly is extremely easy.

[0032] Referring to FIGS. 3 and 6, another feature of the dispenser 10 of the present invention is illustrated which includes a secondary ramp assembly 40 which is also slightly inclined to receive rolling stock 14 at an upper end 41 thereof, and positioned under the upper portion 15 of said chute or chutes 13 but above the lower portion 16 for storing extra articles 14 therein in the otherwise unused space between the upper and lower portions. Secondary ramp assembly 40 at the bottom end thereof includes a bottom article access 47 for dropping or passing articles 14 from the secondary ramp assembly 40 to the underlying lower portion 16 of chute 13 when no articles 14 remain under the access 47. Accordingly, articles 14 contained within secondary ramp assembly 40 also have access to chute 13 for dispensing access at 17.

[0033] A hinged access door 42 covers the stock access area for the upper portion 15 in the upper end 41 of secondary ramp assembly 40. When access door 42 is hinged to its closed position, as illustrated for example in FIG. 5, removable exterior advertising display indica is disposed on the exterior surface 46 of hinged doors 42 for indicating the article 14 contained in the respective chutes 13 for advertising purposes. Note that the contours of the doors 42 may take on different configurations to better distinguish between articles 14 contained within the dispensers 10. For example, the hinged access door 42 in FIG. 3 is convex when closed as illustrated in FIG. 5 and the hinged door 42 in FIG. 4 is concave when closed.

[0034] While the present invention as been discussed in relationship to rolling stock in the form of articles 14 which are shown in the forms of cans, it must be remembered that other articles may be used in the same system. For example, plastic or glass bottles.

[0035] It can also be readily visualized that when store stock resets are required, that the dispensers 10, with stock articles 14 included, may be easily moved from one bar shelf support system of the present invention to another without having to remove articles 14 from the dispensers, and without having to disassemble the dispensers 10.

[0036] Referring next to FIGS. 7, 8 and 9, another embodiment of the support shelf for the modular article storage and dispensing assembly of the present invention is illustrated. The support shelf, as previously described, includes two spaced and horizontally disposed elongated parallel shelf bars 20 and 21, the forward bar being designated as item 20 and the rear bar being designated as item 21. This shelf support functions in all respects in the identical manner as the shelf previously described with the exception that the end brackets 22 are relieved and contoured at 50 and 51 respectively to conform to the contours of the respective shelf bars 20 and 21 supported from end brackets 22, whereby the respective support saddles 24 and 25 may be supported on support bars 20 and 21 respectively at the brackets 22 or the bracket positions themselves, as well as between the end brackets 22. This accordingly permits a continuous side-by-side supported series of the dispensers 10 on an end-to-end supported series of the support shelves.

[0037] Accordingly, an end-to-end series of the support shelves shown in FIGS. 7 and 8 may be engaged with end plates 22 positioned end-to-end or side-by-side in a series, whereby the entire series is supported from vertical supports in a fashion hereinbefore described. In this particular situation a side-by-side series of the dispensers 10 may be supported on the rails 20 and 21 in an uninterrupted fashion, even though one or more of the support saddles 24 or 25 is positioned directly on an end bracket or a pair of adjaeently engaged end brackets 22. Accordingly, no shelf space is wasted by the periodic interruption of end brackets 22 for the supporting shelves.

[0038] It should also be noted in the embodiment shown in FIG. 7 that the forward positioned support saddles 24 for the dispenser 10, have a downwardly facing C-shaped configuration with downwardly depending front and rear legs 52 and 53 respectively which are dimensioned and contoured to slide downwardly over the forward support bar 20 in the same manner as illustrated with the prior described embodiments. However, in this embodiment the rear leg 53 is considerably shorter than the front leg 52 for thereby permitting ease of removal of the dispenser 10 from the support bars 20 and 21. The rear leg 53 being shorter, the dispenser 10 does not have to be raised as high off of front support bar 20 for removal in the forward direction as is required with the previous embodiments.

[0039] Referring to FIG. 9, an alternative embodiment of the support shelf for the assembly of the present invention is illustrated with the incorporation of three shelf bars 20, 21 and 54. The additional forward support bar 54 is added for situations wherein the shelf bars must support a series of heavier or larger dispensers 10.

[0040] By way of example, a flat dispenser shelf 55, which may carry a large number of relatively heavy articles, is shown supported on the support shelf of FIG. 9. An additional advantage of the embodiment illustrated in FIG. 10 is that the flat shelves, such as flat shelves 55, may be interdispersed side-by-side with a series of dispensers 10, thereby providing extensive versatility in the ultimate display. The flat shelves 55 may also include conventional spring biased pushers (not shown) to continually push articles resting thereon forward for display and removal.

[0041] Referring next to the embodiment shown in FIG. 11, the modular gravity feed dispenser 10 includes a low stock indicator to indicate to store personnel that the dispenser 10 needs to be restocked. The restock indicator is provided in the form of a pivoted lever arm 55 located at the removal area 17 and is pivoted about axis 56. Lever arm 55 is also provided with a stock contact surface 57 that normally rises above ramp surface 28 by protruding through slot 58. The opposite end of pivoted lever arm 55 is provided with an upright extension 59
which has a restock indicating surface 60 thereon, which may be a bright color, such as red or blaze orange, to indicate that restock is required.

[0042] In operation, when rolling articles 14 (see the previous embodiments) are present in sufficient quantity on ramp surface 28 at removal area 17, the stock will engage surface 57 and thereby pivot arm 55 slightly counterclockwise to thereby raise extension 59 upwardly, and accordingly hide indicating surface 60 behind downwardly depending lip 61 on the front face 26. Thus, indicating surface 60 is hidden from view behind lip 61, indicating that restocking is not yet required.

[0043] However, once there are insufficient articles 14 remaining in the removal area 17, contact surface 57 of lever arm 55 will no longer be engaged by an article, and due to the dimensions and weighting of lever arm 55, contact surface 57 will rise and lever arm 55 will rotate slightly clockwise to expose indicating surface 60 below downwardly depending lip 61, thereby indicating to store personnel that restock is required.

[0044] In this embodiment, indicating surface 60 is provided on the extension 59 of lever arm 55. Instead, the indicating surface 60 may be provided on the front face 26 of the dispenser 10 and the extension 59 of arm 55 may act as a cover or shield to cover the indicating areas 60 as applied to the dispenser front 26 itself. In other words, the purpose of indicating surface 60 and downwardly depending lip 61 may be reversed whereby the upwardly extending extension 60 will overlie the downwardly extending lip 61 to indicate an alternative surface applied to lip 61 as an alternative arrangement.

[0045] The embodiment of FIG. 11 further discloses a modification regarding the secondary ramp 40, which is positioned under upper portion 15, but above lower portion 16 of the dispenser 10 for storing extra articles therein when the main chute 13 of the dispenser 10 is full. In order to provide easy removal of articles 14 contained on secondary ramps 40, when the door 42 is hinged open, a finger access slot 62 is provided in the secondary ramp surface 40 for finger access from the bottom of secondary ramp 40 to assist in removal of articles stored on secondary ramps 40 through the access provided when door 42 is hinged open.

We claim:

1. A modular article storage and dispensing assembly, comprising:
   a side by side series of article dispensers for storing and advancing articles for removal;
   a series of support shelves positioned end to end and supported from upright supports, said shelves each including at least two spaced and horizontally disposed elongated parallel shelf bars supported on opposite ends by brackets removably secured to said upright supports;
   support saddles depending downwardly from each of said dispensers and positioned to respectively register over and engage said support bars to thereby support said dispensers;
   said brackets relieved and contoured to conform to contours of said shelf bars supported from said brackets whereby said support saddles may be supported on said support bars at the location of said brackets as well as between said brackets for thereby permitting a continuous side by side supported series of said dispensers.

2. The modular article storage and dispensing assembly of claim 1, including three of said shelf bars for supporting a series of heavier or larger dispensers.

3. The modular article storage and dispensing assembly of claim 1, wherein said dispensers include a flat shelf.

4. The modular article storage and dispensing assembly of claim 1, said support saddles which are positioned over a forward positioned of said support bars having a downwardly facing C-shaped configuration with downwardly depending front and rear legs and dimensioned and contoured to slide downwardly over said forward support bar, said rear leg being considerably shorter than said front leg for thereby permitting ease of removal of said dispensers from said support bars.

5. A modular gravity feed storage and dispensing assembly, comprising:
   a dispenser including an inclined ramp for sequential rolling advancement of cylindrical articles down said ramp to a removal area for selective removal of one or more of said articles; and
   a low stock indicator on an exposed face of said dispenser for indicating that restock of articles in said dispenser is required.

6. The modular gravity feed storage and dispensing assembly of claim 5, said low stock indicator comprised of a pivoted lever arm located at said removal area and including an upright extension which covers an indicating surface on said dispenser when sufficient articles are aligned on said ramp at said removal area whereby said lever is engaged by an article, said lever dimensioned and weighted whereby it is not engaged by an article when a predetermined minimum number of articles remain on said ramp at said removal area to thereby cause pivoting of said lever arm to expose said indicating surface.

7. A modular gravity feed storage and dispensing assembly, comprising:
   a dispenser including an inclined ramp for sequential rolling advancement of cylindrical articles down said ramp to a removal area, said ramp having an upper portion and a lower portion;
   a secondary ramp which is inclined to receive rolling stock therefrom from an upper end thereof, and positioned under said upper portion but above said lower portion for storing extra articles;
   said secondary ramp including a finger access slot for finger access from the bottom of said secondary ramp to assist removal of articles stored on said secondary ramp.

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