

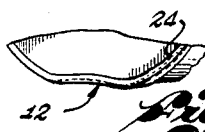
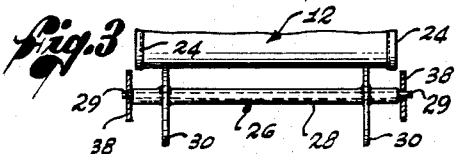
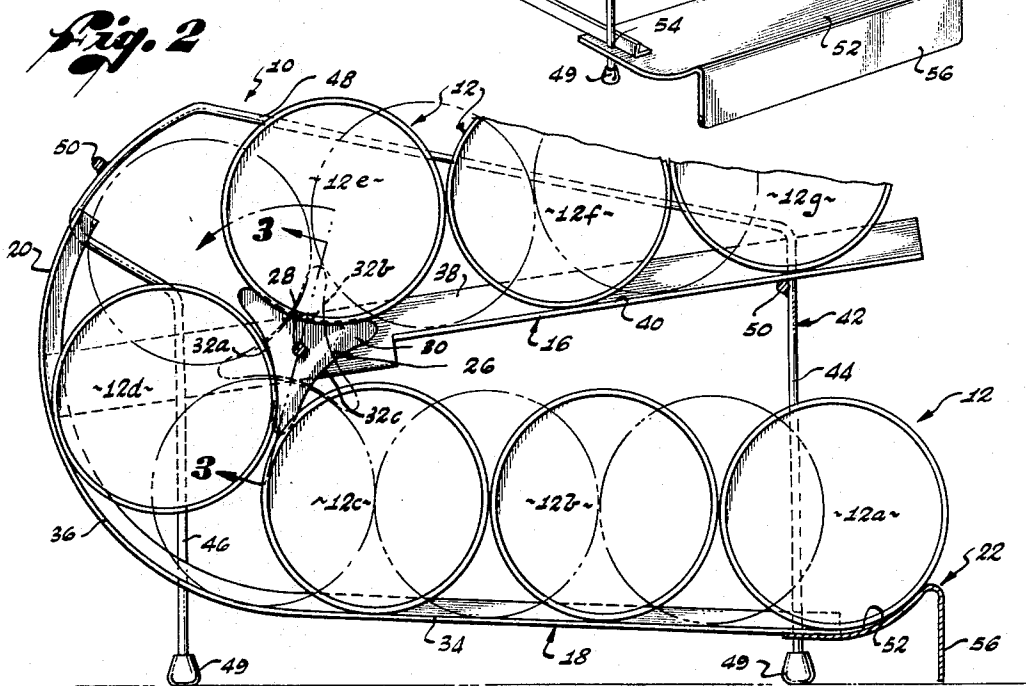
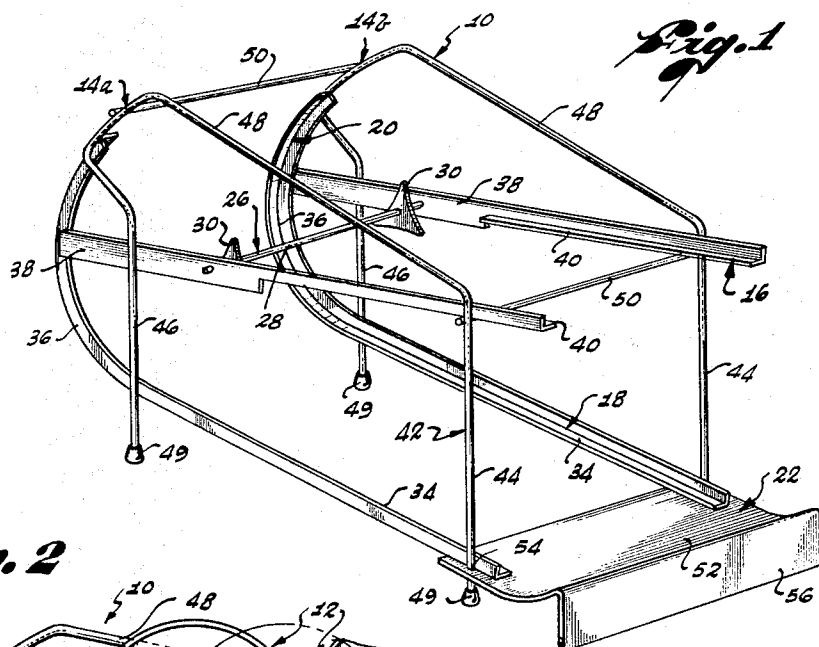
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RACK FOR STORING AND DISPENSING CONTAINERS

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3,286,846 RACK FOR STORING AND DISPENSING CONTAINERS

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This invention relates to an improved rack for storing and dispensing cylindrical containers and, more particularly, to such a rack for canned goods.

Most canned goods tend to deteriorate after prolonged periods of storage. The time factor involved between processing the canned goods and sale to the ultimate consumer generally is quite short. Accordingly, it is desirable that such goods be used by a consumer more or less in the order in which they were purchased, this being some assurance that the oldest will be used first.

Very few home cupboards lend themselves to this orderly pattern of use. Instead, where many cans of like goods are available, a can from the front of the cupboard is normally selected. Then when replacements are purchased, they are put in the front. Thus, the usual procedure is to use the newest goods first, with many of the older ones remaining at the back of the cupboard indefinitely. It will be appreciated that this is a potentially dangerous situation as many spoiled foods are poisonous.

Moreover, the construction of most home cupboards is such that the spacing between shelves is much greater than the heights of the stored cans. Stacking is an unsatisfactory solution, since it makes access to underlying cans extremely inconvenient. Thus cans are not stacked and, as a general rule, inefficient use is made of the available space.

Various devices have been proposed in the past to overcome these problems. Such devices have embodied means for arranging the cans in two or more spaced tiers. The device is then adapted so that cans can be loaded into the front of one tier and removed from the front of another, thereby obtaining the desired first-in, first-out order of dispensing.

While such devices in theory afford solutions to the above-mentioned problems, various practical problems have prevented this from being so. In handling tin cans, it seems that an extremely large percentage of them are dented at least slightly. The effect of this has been for the cans to jam in these devices of the prior art, particularly when moving between tiers. When jamming occurs, the natural tendency is not to free the jammed cans, but instead to merely select them from the loading end. Even if this is not done, there is still the frequent inconvenience of freeing them.

In view of the foregoing, it is a primary object of this invention to provide an improved storage and dispensing rack for cylindrical containers that obviates the problems of the prior art.

A further object is to provide an improved rack of the type described especially adapted for efficient storage of canned goods and dispensing such goods in a manner as to facilitate use of the oldest goods first.

A more specific object is to provide a rack of the type described for storing canned goods in a home cupboard, further characterized in that it affords convenient access at the front of the cupboard to the oldest cans and may also be conveniently loaded from the front.

Another object is to provide a rack of the type described for aiding in organizing a home cupboard for storing canned goods and rendering possible efficient use of the available storage space.

It is still another object of the invention to provide an improved storage and dispensing rack for cylindrical

containers which functions effectively in spite of dents or other irregularities in the surface of such containers.

A still further object is to provide a rack of the type described capable of accomplishing all of the foregoing objects, yet which is simple in construction and may be mass produced at an extremely low cost.

These and other objects, features and advantages of the invention will be better understood by referring to the following detailed description, taken in conjunction with the accompanying drawing, in which:

FIG. 1 is a perspective view of a rack constructed in accordance with the invention;

FIG. 2 is a side elevational view on an enlarged scale of the rack of FIG. 1 and illustrating in full lines the initial storage position of the cans therein and in phantom lines such cans as they are advancing toward their next successive positions;

FIG. 3 is a fragmentary view on a reduced scale, partly in elevation and partly in section, and taken in the area of the line 3-3 of FIG. 2; and

FIG. 4 is a perspective view of the flanged end portion of a typical can which has been dented.

Referring to the drawing, the rack of the invention, designated generally by the reference numeral 10, comprises an elongated assembly for storing and dispensing cylindrical containers. Such containers may, by way of example, comprise conventional tin cans 12 which are of uniform height and diameter. The rack 10 includes generally a pair of identical, vertically oriented side assemblies 14a and 14b fixed to one another and spaced apart a distance slightly greater than the height of the cans 12, as illustrated in FIG. 3. The assemblies, in turn, provide an upper or loading trackway 16 and a lower or dispensing trackway 18, these two trackways being operatively connected at their rearward ends by a curved rear trackway 20.

As may be seen in FIG. 2, the upper trackway 16 is inclined downwardly from front to rear (right to left in FIG. 2) and the lower trackway is inclined downwardly from rear to front. Accordingly, the cans 12 are adapted to move in tandem from a loading position adjacent the forward end of the upper trackway 16 to a dispensing position adjacent the forward end of the lower trackway 18. Such movement involves rolling down the upper trackway 16, moving in guided engagement around the rear trackway 20, and finally rolling down the lower trackway 18 until the lead can is arrested by stop means, here comprising a forward apron 22. The individual cans 12 have been further designated in FIG. 2 by the subscripts a to g to indicate their successive positions of advancement on the device. Can 12a is illustrated in the dispensing position and can 12g in the loading position.

As previously noted, it is important from an operational standpoint to prevent the cans 12 from jamming as they move from the upper to the lower trackway. The cans, and particularly those which are dented at the peripheral flanges at their ends, as in FIG. 4, are especially susceptible of jamming at this stage of progression through the rack. To achieve this desired anti-jamming function, a rotatable style 26 is provided and arranged to cooperate with the rear trackway 20. The style swings individual cans sequentially off the upper trackway 16 and onto the rearward trackway 20, maintaining spacing between adjacent cans during this crucial period. Moreover, the style operates to maintain spacing between adjacent cans as they are guided around the rear trackway 20. Referring to FIG. 2, such spacing may be seen to exist between cans 12c and 12d and cans 12d and 12e, and again in phantom lines as cans 12d, 12e and 12f move part way toward their next successive position.

By virtue of this spacing being maintained, jamming of even severely dented cans is prevented. Besides this important function, the style 26 also serves to prevent the cans 12 from dropping abruptly from the upper to the lower trackway and sustaining further damage.

The style 26 includes an elongated rod 28 mounting a pair of cradle elements or starwheels 30. Preferably, the style is fabricated out of a plastic which is strong and durable and may be conveniently molded into the desired shape. The rod 28 is arranged transverse to the side assemblies 14a and 14b in a plane coincidental with that of the upper trackway 16 and is journaled at its opposite ends, as at 29 in FIG. 3, by these assemblies. It is positioned just slightly to the rear of the upper trackway 16 and forwardly of the rear trackway 20.

Each of the cradle elements or starwheels 30 comprise a flat and generally triangularly shaped member which is symmetrical about its mid point. Three edge surfaces 32a, 32b and 32c are presented, each of which curves slightly inwardly toward the mid point of the element from its respective apexes. The elements 30 are oriented transverse to the rod 28 at axial spacing from one another and are fixed to the rod at their mid points. Preferably, the elements 30 are spaced so as to engage the cans 12 slightly inwardly of their peripheral end flanges 24, as illustrated in FIG. 3. Experience has shown that these annular areas on the cans 12 are less likely to be dented than either the flanges 24 (FIG. 4) or the central areas.

Preferably, the axis of rotation of the style 26 is positioned approximately on the center of curvature of the rear trackway 20. Further, the radius, i.e., the distance between the axis and the trackway 20, is just slightly greater than the diameter of the cans 12 plus the minimum radial distance across each of the elements 30 from its mid point; and, hence, the axis of rotation, to any one of its edge surfaces 32a, 32b and 32c. Because of this relationship, the cans 12 are suspended between the style 26 and the rear trackway 20 in the manner of can 12d in FIG. 2.

The curved edges 32a, 32b and 32c on the elements 30 enable them to make cradle-like engagement with the cans to swing them off the upper trackway 16 onto the rear trackway 20 during progression of the cans through the rack. The two elements 30 are aligned with one another so that corresponding edges engage simultaneously. By virtue of the positioning of the style and the dimensions of the elements 30 in relation to those of the cans 12, all three edges 32a, 32b and 32c normally engage different ones of the cans during any given stage of operation, as illustrated in full and phantom lines in FIG. 2. This assumes, of course, in the case of the illustrative rack 10, that it is filled to capacity or near capacity.

Considering now the detailed structure of the side assemblies 14a and 14b, each comprises a number of configured parts joined together to form a generally flat structure with ample strength to support the full complement of cans 12a-12g. Preferably, in order to facilitate fabrication and assembly of the parts and to obtain the required strength, the parts are formed of metal. Included in each assembly is a lower rail 34 that is shaped like an angle and arranged to receive the peripheral flanges 24 of the cans. Each rail 34 is inclined downwardly from rear to front and forms one side of the lower trackway 18.

A curved rear rail 36, which like the lower rail 34 comprises an angle, extends upwardly and rearwardly from the latter and serves as one side of the rear trackway 20. For convenience of manufacture, the rear rail 36 is formed integrally with the lower rail 34.

Extending forwardly from the rear rail 36 and inclined upwardly with respect to horizontal is an elongated, flat strip 38. This strip is attached to the rear rail 36 at about half way between its ends and is arranged in overlying relationship with the lower rail 34, terminating just slightly beyond the end of the latter. Attachment of

the strip 38 to the rail 36 is accomplished by any suitable means, as by spot welding. The lower portion of the strip 38, commencing at a location slightly more than one-third the distance from the rear toward the forward end thereof and continuing to such end, is bent upwardly and inwardly at a 90 degree angle to afford an upper rail 40 similar to the rails 34 and 36. As will be readily understood, rail 40 forms one side of the upper trackway 16.

In order to position the various rails 36, 38 and 40 in the desired orientation with respect to the underlying support surface and to maintain them in the desired relative positions, a wire-like frame 42 is provided. The frame 42 includes, as a part of each of the side assemblies 14a and 14b, an elongated wire configured to afford vertical front and rear legs 44 and 46 at its opposite ends. The legs are arranged adjacent the opposite ends of the respective side assembly and extend upwardly at least slightly beyond the upper rail 40. The section 48 of wire connecting the upper ends of the legs serves as a brace and extends rearwardly and upwardly from the front leg 44, then curves downwardly and rearwardly, and finally is offset forwardly and downwardly to its junction with the upper end of the rear leg 47.

As may be seen in FIGS. 1 and 2, the frame 42 is configured so that contact is made with the rails 34, 36 and 40 at numerous locations. The respective parts are fixed to one another at these areas of contact as by spot welding, so as to enhance structural strength. Preferably caps or feet 49 formed of a resilient, deformable material, such as rubber or plastic, are press fit on the lower end of the ends of the legs 44 and 46 to prevent marring or scratching of the underlying support surface.

To maintain the side assemblies 14a and 14b at the desired lateral spacing so as to enable the various pairs of cooperating rails to form trackways 16, 18 and 20 of proper width, the frame embodies cross pieces 50. These are positioned in the illustrative case adjacent the front and rear ends of the frame and arranged so as not to interfere with movement of the cans 12 through the rack. Further lateral support is gained by the apron 22 which, as previously noted, is positioned at the forward end of the lower trackway 18. The apron is here secured to the rails 34 forming the lower trackway and, in addition, the front legs 44 of the frame 42 extend through apertures 54 in the apron.

The apron 22 has an upper surface 52 that curves forwardly and upwardly away from the forward end of the lower trackway 18. Accordingly, as shown in FIG. 2, this surface engages the lead can 12a and blocks it against inadvertently rolling out of the lower trackway 18. At its forward end, the apron 22 has a flange 56 that projects downwardly a distance sufficient to engage the support surface, thereby cooperating with the legs 44 and 46 to afford a firm foundation for the rack. The apron 22 may be conveniently formed of various metals or plastics.

The rack of the invention is sized for the particular cupboard in which it is to be used, as well as for the containers it is intended to store and dispense. The illustrative rack 10 is intended for storing canned goods in a relatively shallow cupboard and, accordingly, is relatively short from front to rear and has a maximum capacity of seven cans. In this connection, it will be appreciated that the rack occupies very little cupboard space over that occupied by the total complement of cans 12. Considering the ease of access to the cans, the rack is of great advantage from the standpoints of enhancing organization of the cupboard and rendering possible effective use of the available storage space.

To load the rack in use, cans 12 are conveniently placed on the upper trackway 16 at its forward end. The lead can 12a rolls down the trackway 16 and onto a cooperating pair of edges 32a on the elements 30 of the style 26. Transfer of that can from the upper trackway 16 to the

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lower trackway 18 results, since the inertia of the rolling can is ample to cause the style to rotate, swinging the can 12a up off the trackway 16 and onto the rear trackway 20. The lead can 12a is then guided down and around the rear trackway 20 and onto the lower trackway 18, as the style 26 continues its rotation. As the can enters the lower trackway 18, transfer having been completed, it is freed from the style 26 and rolls down into engagement with the apron 22. Assuming cans 12b and 12c have been received on the upper trackway 16, they are picked up by successive pairs of edges 32b and 32c on the style and move in tandem into positions behind the lead can 12a.

When cans 12a, 12b and 12c are in the storage positions as in FIG. 2, the edges 32c on the elements 30 of the style 26 abut the surface of the can 12c. This, in turn, results in the style temporarily being held against rotation even though additional cans 12d-12g had been loaded into the rack. In this connection, the next can 12d is suspended between the edges 32a and the rear trackway 20, while can 12e rests in cradle-like engagement on the edges 32a of the elements 30 of the style. Remaining cans 12f and 12g fall into line behind the can 12e. As may be seen in FIG. 2, this, of course, represents the fully loaded condition of the rack.

When can 12a is removed from dispensing position on the apron 22, the remaining cans advance one position, such cans being illustrated in phantom lines in FIG. 2 after partial advancement has occurred. In so advancing, can 12c first moves away from the style 26 and frees it for further rotation of one increment. The gravitational force exerted by the can 12d against the edges 32a together with the force exerted by the cans 12e, 12f and 12g against the edges 32b cause the style 26 to rotate to effect the desired transfer of cans from the upper trackway 16 to the lower trackway 18. Style rotation, in turn, results in the can 12e being swung onto the rear trackway where it is guided to the position formerly occupied by can 12d. Additional cans are, of course, loaded into the forward end of the upper trackway to replace those dispensed. Even if the rack is not maintained loaded to full capacity, ample force is still exerted by the cans that are available to bring about the desired sequential operation of the style 26.

It is significant to note that the rack 10 functions so that cans are dispensed in the order in which they are received and, hence, in all likelihood in the order in which they were purchased. Of further significance is the fact that spacing is maintained between the cans being transferred from the upper to the lower trackway. As may be seen in FIG. 2, such spacing exists between cans 12c and 12d and cans 12d and 12e in the storage condition of the rack. Furthermore, as illustrated in phantom in that figure, spacing is maintained as the style 26 rotates to advance the cans one position. This anti-jamming feature is highly important as it insures that proper functioning takes place in spite of the usual dents in the cans, and in particular in their flanges 24, as illustrated in FIG. 4.

While one embodiment of the invention has been illustrated and described with particularity, it will be understood that this is only by way of illustration and that various changes in construction and arrangement may be made without departing from the spirit and scope of the invention.

I claim:

1. A rack for storing and dispensing cylindrical containers, comprising:

frame means;

an elongated dispensing trackway on said frame means having forward and rearward ends and inclined slightly downwardly with respect to horizontal from its rearward toward its forward end, said dispensing trackway being adapted to receive a plurality of

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such containers for rolling movement thereon in tandem from its rearward toward its forward end; an elongated loading trackway on said frame means having forward and rearward ends, and vertically spaced above said dispensing trackway and inclined slightly downwardly with respect to horizontal from its forward toward its rearward end, said loading trackway being adapted to receive a plurality of such containers for rolling movement thereon in tandem from its forward toward its rearward end;

stop means on said frame means at the forward end of said dispensing trackway to limit such forward movement of containers thereon; and

anti-jamming means including a rotatable style on said frame means for transferring sequentially containers from the rearward end of said loading trackway onto the rearward end of said dispensing trackway.

2. A rack for storing and dispensing cylindrical containers, comprising:

frame means;

an elongated dispensing trackway on said frame means adapted to receive such containers at its rearward end for rolling movement thereon in tandem toward its forward end;

an elongated loading trackway on said frame means overlying said dispensing trackway and spaced thereabove, said loading trackway being adapted to receive such containers at its forward end for rolling movement thereon in tandem toward its rearward end; and

anti-jamming means on said frame means including a rotatable style for transferring sequentially containers from the rearward end of said loading trackway to the rearward end of said dispensing trackway, said style engaging simultaneously a plurality of containers and maintaining spacing between containers so engaged.

3. The subject matter of claim 2 further characterized in that the style is rotated by gravitational force exerted by containers.

4. The subject matter of claim 2 further characterized in that said style has means adapted to engage such containers only at a pair of laterally spaced locations adjacent to, but spaced slightly inwardly of the ends of such containers.

5. A rack for storing and dispensing cylindrical containers, comprising:

frame means;

an elongated dispensing trackway on said frame means having forward and rearward ends and inclined slightly downwardly with respect to horizontal from its rearward toward its forward end, said dispensing trackway being adapted to receive a plurality of such containers for rolling movement thereon in tandem toward its forward end;

an elongated loading trackway on said frame means having forward and rearward ends, and aligned with and vertically spaced above said dispensing trackway and inclined slightly downwardly with respect to horizontal from its forward toward its rearward end, said loading trackway being adapted to receive a plurality of such containers for rolling movement thereon in tandem toward its rearward end;

at rear trackway joining said dispensing trackway at its rearward end and extending rearwardly and upwardly therefrom at a location spaced rearwardly of said loading trackway and adapted to receive such containers from the rearward end of said loading trackway and guide them onto the rearward end of said dispensing trackway; and

a rotatable style supported on said frame means at a location adjacent, but spaced rearwardly of the rearward end of said loading trackway, said style being rotatable to swing containers sequentially from the

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rearward end of said loading trackway onto said rear trackway.

6. A rack for storing and dispensing cylindrical containers, comprising:

frame means;

an elongated dispensing trackway on said frame means having forward and rearward ends and inclined slightly downwardly with respect to horizontal from its rearward toward its forward end, said dispensing trackway being adapted to receive a plurality of such containers for rolling movement thereon in tandem toward its forward end;

an elongated loading trackway on said frame means having forward and rearward ends, and aligned with and vertically spaced above said dispensing trackway and inclined slightly downwardly with respect to horizontal from its forward toward its rearward end, said loading trackway being adapted to receive a plurality of such containers for rolling movement thereon in tandem toward its rearward end;

a rear trackway on said frame means operatively connected to said dispensing trackway at the rearward end thereof and extending upwardly therefrom at a location spaced rearwardly of said loading trackway and adapted to receive such containers from said loading trackway and guide them onto the rearward end of said dispensing trackway; and

a style mounted on said frame means at a location intermediate the rearward end of said loading trackway and said rear trackway, said style being operable to space containers on said rear trackway from adjacent containers on said loading and dispensing trackways.

7. A rack for storing and dispensing cylindrical containers, comprising:

frame means;

an elongated dispensing trackway on said frame means adapted to receive such containers at its rearward end for rolling movement thereon toward its forward end;

an elongated loading trackway on said frame means overlying said dispensing trackway and spaced thereabove, said loading trackway being adapted to receive such containers at its forward end for rolling movement thereon toward its rearward end;

a rear trackway on said frame means operatively connected to said dispensing trackway at the rearward end thereof and curving rearwardly and upwardly therefrom at a location spaced rearwardly of said loading trackway and adapted to receive such containers from said loading trackway and guide them onto the rearward end of said dispensing trackway;

a rotatable style supported on said frame means for rotation about an axis oriented transverse to said upper trackway and located adjacent to, but spaced rearwardly of said loading trackway and forwardly of said rear trackway, said style being operable to swing containers sequentially from the rearward end of said loading trackway onto said rear trackway; and including a pair of cradle-like elements symmetrical about their mid points mounted on said style and

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formed with a plurality of cooperating pairs of surfaces that engage containers at spaced locations during such swinging, said elements thereafter remaining so engaged with containers on said rear trackway as they are guided onto said dispensing trackway to maintain them separated from one another and thereby prevent jamming.

8. The subject matter of claim 7 further characterized in that the axis of rotation of said style is approximately at the center of curvature of said rear trackway, and the radial distance from said axis to said rear trackway is slightly greater than the diameter of a container plus the minimum radial width across said elements from their mid points to said rear trackway.

9. A rack for storing and dispensing cylindrical containers, comprising:

frame means;

an elongated dispensing trackway on said frame means having forward and rearward ends and inclined slightly upwardly with respect to horizontal from its rearward toward its forward end, said dispensing trackway being adapted to receive a plurality of such containers for rolling movement thereon in tandem toward its forward end;

an elongated loading trackway on said frame means having forward and rearward ends, and aligned with and vertically spaced above said dispensing trackway and inclined slightly upwardly with respect to horizontal from its forward toward its rearward end, said loading trackway being adapted to receive a plurality of such containers for rolling movement thereon in tandem toward its rearward end;

a rear trackway on said frame means operatively connected to said dispensing trackway at the rearward end thereof and extending upwardly therefrom at a location spaced rearwardly of said loading trackway and adapted to receive such containers from said loading trackway and guide them onto the rearward end of said dispensing trackway;

a style mounted on said frame means for rotation about a location intermediate the rearward end of said loading trackway and said rear trackway, said style being rotatable to swing containers sequentially from the rearward end of said loading trackway onto said rear trackway; and

including triangularly shaped elements on said style having three edge surfaces adapted to make cradle-like engagement with the cylindrical wall surfaces of successive containers during rotation of said style.

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