The present invention relates to a package display and dispensing device. According to the present invention there is provided a novel display and dispensing device for packages or the like. The display and dispensing device is divided into a plurality of compartments, each of which is provided with spring actuated pusher means for advancing the packages therein so as to provide a package in frontmost position in the compartment at all times. Accordingly, no matter how many packages may be contained in each compartment, the display and dispensing device will appear fully loaded when viewed from the front, and a customer need only reach to the front of the compartment in order to remove a package therefrom.

According to another highly novel feature of the present invention, the aforementioned spring actuated pusher means exerts a constant force regardless of the elongation of the spring therein, and therefore independently of the number of packages in the compartment. Accordingly, even when relatively few packages remain in the compartment to cause comparatively little elongation of the spring, said pusher device nevertheless exerts sufficient force, upon removal of the frontmost package, to advance the remaining packages with the same swiftness as when the compartment is fully loaded.

The pusher means according to the present invention is constructed so as to occupy a minimum amount of space in the compartment thus allowing maximum utilization of the available space thereof for displaying and dispensing the packages.

According to another highly novel feature of the present invention there is provided at the front of each compartment package retaining means which may be inwardly pivoted to permit convenient reloading of the compartment.

It is therefore an object of the present invention to provide a display and dispensing device wherein provision is made for maximum utilization of the available space thereof for displaying and dispensing the packages therein.

Another object is to provide a display and dispensing device having a plurality of compartments, each compartment being provided with spring actuated means for advancing the packages therein at all times providing a package in the frontmost position of the compartment.

A still further object of the present invention is to provide package retaining means at the front of each compartment which may be inwardly pivoted to permit easy reloading of said compartment.

The above and other objects, features and advantages of the present invention will be more fully understood from the following description considered in connection with the accompanying illustrative drawings.

Referring now to the drawings which illustrate the best mode presently contemplated of carrying out the invention:

Fig. 1 is a front perspective view of a preferred form of the display and dispensing device according to the invention;

Fig. 2 is a vertical sectional view on line 2-2 of Fig. 1;

Fig. 3 is a fragmentary perspective view, on an enlarged scale, of the pusher device, with parts broken away;

Fig. 4 is a fragmentary perspective view, on an enlarged scale, showing the manner of installing the pusher device of Fig. 3 in a compartment;

Fig. 5 is a vertical sectional view, on an enlarged scale, on line 5-5 of Fig. 1;

Fig. 6 is a vertical section, on an enlarged scale, along line 6-6 of Fig. 2;

Fig. 7 is a perspective view of a preferred form of a pusher device;

Fig. 8 is a blank utilized in the making of the pusher device of Fig. 7;

Fig. 9 is a front perspective view of another form of the display and dispensing device according to the invention;

Fig. 10 is a vertical sectional view, along 10-10 of Fig. 9; and

Fig. 11 is an enlarged view showing the manner of releasably securing the free end of the spring in the device of Fig. 9.

Referring now to Figs. 1 and 2, there is shown display and dispensing rack 10 comprising shelves 12, 42 and 72 vertically spaced in setback relation. Lower shelf 12 comprises a plurality of transversely extending horizontally spaced wire rods 18 secured at their front ends between horizontally extending rods 20 and 22 and at their rear ends between horizontally extending rods 24 and 26. Rear rods 24 and 26 are secured at their extremities to vertically extending support members 28 (only one of which is shown in Fig. 1). A plurality of horizontally spaced inverted U-shaped spacer members 30 are secured at their front free ends 32, to rods 20 and 22, respectively, and at their free ends 34 to rod 24, thus providing shelf 12 with a plurality of transversely extending compartments. Spacer members 30 may be equally spaced (as shown) to provide compartments of equal size. However, it will be understood that spacer members 30 may be disposed according to any desired arrangement to form compartments having desired sizes. A horizontal rod 36, vertically spaced from rod 24 and coextensive therewith, is secured to the rear legs of spacer members 30. Securement of the above wire rod members may be by brazing or welding.

Shelf 42 is in all respects constructed in the same manner as shelf 12 and comprises a plurality of transversely extending horizontally spaced wire rods 48 secured at their front ends between horizontally extending rods 50 and 52 and at their rear ends between horizontally extending rods 54 and 56. Rear rods 54 and 56 are secured at their extremities to vertically extending support members 58. A plurality of horizontally spaced spacer members 60 are secured at their free ends 62 and 64 to rods 50, 52 and 54, respectively, to provide shelf 42 with a plurality of transversely extending compartments. Horizontal rod 66, vertically spaced from rod 54 and coextensive therewith, is secured to the rear legs of spacer members 60. It will be noted, however, that rods 48 of shelf 42 are shorter than rods 18 of shelf 12 and, accordingly, the compartments in shelf 42 are shorter in depth than those in shelf 12.

Shelf 72 is in all respects constructed similarly to shelves 12 and 42 and comprises a plurality of transversely extending horizontally spaced wire rods 78 secured at their front ends between horizontally extending rods 80 and 82 and at their rear ends between horizontally extending rods 84 and 86. Rear rods 84 and 86 are secured at their extremities to vertically extending support members 88. A plurality of horizontally spaced...
Spacer members 90 are secured at their free ends 92 and 94 to rods 80, 82 and 84, respectively, to provide shelf 72 with a plurality of transversely extending compartments. Horizontal rod 96, vertically spaced from rod 84 and co-extensive therewith, is secured to the rear edge of spacer members 90. It will be noted, however, that rods 78 of shelf 72 are shorter than rods 48 of shelf 42 and, accordingly, the compartments in shelf 72 are shorter in depth than those in shelf 42. Inverted V-shaped members 14 and 16, may be secured to the spacer members left and right side of display device 10, respectively, for the carrying thereof.

Each compartment of display and dispensing device 10 is adapted to receive a plurality of packages to be displayed and dispensed thereby. As best seen inFig. 2, no matter how many packages may be contained in a given compartment, the front package is always disposed at the frontmost part of the compartment, thus giving device 10 an appearance of being fully loaded (as long as there is at least one package in each compartment) when viewed from the front. Consequently, it will be observed that to remove a package, the customer need not reach into the rear end of the compartment. Toward this end, each compartment is provided with a pusher device 100, the details of which will now be described with particular reference to Figs. 1-6.

As best shown in Fig. 3, pusher device 100 comprises a channel shaped lower part 102, the rear end of which has a recess 104 defined by upwardly extending arms 106 and 108. Shaft 110 extends transversely of arms 106 and 108 and is supported therein. A bushing 112 is rotatably mounted on shaft 110 and a spring 114 is wound onto bushing 112. Spring 114 has a zero gradient or, expressed in another way, said spring exerts a constant force irrespective of the length of deflection. Essentially, a gate is introduced in spring 114 giving it a concave-convex cross section. The force of the spring device results when the spring is uncoiled and it is the section of the spring which is in the process of being straightened out by being drawn off the coil but which has not yet been fully straightened which exerts the force. The portion of the spring remaining in the solid coil and the portion which has been pulled out exerts no force. Thus it will be apparent that as the spring is extended or contracted, constantly changing sequential increments of the spring act to exert the spring force. And if all the increments of the spring are of the same size, it will be apparent that, irrespective of the amount which spring 114 is extended, it will exert the same pulling force. Such springs are well known in the art and further description thereof is not deemed to be necessary.

An L-shaped bracket 116 has its horizontal leg 118 welded or brazed on the upper surface of channel 102, centrally thereof, and a top disc 122 is welded onto the front surface of bracket leg 120, in the upper region thereof, for transmitting the spring force to the packages causing advancement thereof. As has been stated earlier, each compartment is provided with a pusher device 100. To insert the pusher device 100, in a compartment, two adjacent transversely extending rods, as for example wire rods 18 in a compartment of lower shelf 12, are brought toward each other (Fig. 4) while the pusher is snapped down thus causing channel part 102 to engage said wires. Obviously, the wire rods 18 nearest the center of the compartment should be selected. Spring 114 is unwound from below bushing 112 and said unwound portion is extended longitudinally of the compartment and looped about horizontal rod 22. When pusher 100 is so mounted on said rods 18, it is apparent that said pusher is free to slide along the entire length of the compartment under the action of spring 114.

As shown in Figs. 1 and 3, and for reasons to be hereinafter set forth, each compartment is provided at the front thereof with a gate 124 comprising a metal plate and having laterally extending portions 125 and 127. Said gate is pivotally mounted on horizontally extending rod 20 (as in the case of lower shelf 12) by means of a downwardly extending hinge member 126 provided near each end of the engagement with rod 20. It will be apparent that the gates 124 provided in the compartments of shelf 42 are pivotally mounted on horizontal rod 50, and the gates 124 of the compartments in upper shelf 72 are pivotally mounted on horizontal rod 80.

The free end of spring 114, as stated before, is unwound below bushing 112 and looped around horizontal rod 22, curved inwardly and upwardly therefrom and then engages the rear surface of gate 124, as best shown in Fig. 5. With spring 114 engaging gate 124 as hereinafore described, said gate is biased outwardly and occupies its normally vertical position as shown by the full lines in Fig. 5, laterally extending portions 125 and 127 engaging spacers 30 (Fig. 1) to limit movement of gate 124. However, when a force is applied to the gate tending to push it rearwardly, said gate will rotate about rod 20 and the gate and spring will assume the position indicated by the dashed lines in Fig. 5. In the normal position thereof, gate 124 acts as a package retaining means at the front end of the compartment (Fig. 2). The front surface of gate 124 may contain printed matter in the nature of advertisement or identification of the contents of the compartment.

Referring to Figs. 1 and 2, it will be seen that in each compartment, the pusher may be pushed to the rear of the compartment against the action of spring 114, rear horizontal rods 24 and 26 (in the case of lower shelf 12) acting as a stop and limiting the rearward movement of pusher 100. A plurality of packages may now be inserted in the compartment between top disc 122 and gate 124. As the front package is removed, it is apparent that pusher 100 will advance all the remaining packages in the compartment and consequently a new package will occupy the front of the compartment immediately behind gate 124. It will be noted that due to the zero gradient of spring 114 as explained before, even when there are only a few packages remaining in the compartment and the spring has consequently comparatively little deflection, the force exerted by said spring does not decrease, but instead remains constant, so as to advance the contents of the compartment to the same extent. Once one of the packages is removed, no matter how few may remain in the compartment.

It is noted that in order to move the pusher 100 rearwardly, pressure must be applied thereto in the lower region thereof, such as for example the lower part 120 of bracket 116. Application of force to the upper part of pusher 100, such as to top disc 122 for example, would cause a bending action tending to produce a rotational action between channel part 102 and rods 18 rather than the necessary sliding action. The purpose of gate 124 is to permit loading of a compartment in a simple and convenient manner. Referring specifically to Fig. 2 (top shelf 72) it will be noted that loading or reloading may be effectuated by merely placing the packages to be inserted in line immediately in front of gate 124. Pressure may now be applied to the lower portion of the packages to be inserted causing the gate to pivot, about point 80, assume the horizontal position shown by the dashed lines in Fig. 5. Due to the action of the gate, the pressure is transmitted to the lower part of the pusher 100, causing rearward movement thereof, and the added packages may slide past the gate at which time the gate will once more assume the full line position of Fig. 5. It is apparent that were it not for the pivotal feature of gate 124 it would be relatively difficult to transmit a force through the package at a sufficiently low point to enable rearward movement of the pusher 100.

With reference to Fig. 2, it will also be observed that each compartment may be used in nearly its entire longi-
tudinal extent for the purpose of holding the packages, the only usable space of the compartment occupied by the pusher 100 being defined by the relatively small distance between the front surface of top disc 122 and the rearmost edge 128 of pusher 100. In connection with the above, it will be noted that each compartment package is supported by the portion of channel part 102 which extends forwardly of bracket 116, and said package is therefore disposed at a slightly higher level than the other packages.

Referring now to Figs. 7 and 8, there is shown a preferred embodiment of a pusher device 120 of greatly simplified construction and comprising a T-shaped upright member 132 having rearwardly extending ears 134, 136 formed integrally therewith and each provided with an opening for supporting shaft 138 extending transversely thereof. A bushing 140 is rotatably mounted on shaft 138 and a spring 142 is wound onto said bushing. Channel part 144 extends forwardly of the lower edge of upright 132 and is formed integrally therewith. Pusher device 130 may be formed by a single cut-out blank 146 as seen in Fig. 8. Pusher 130 functions in all respects in the same manner as pusher 100, previously described in connection with Fig. 3. It will be noted, however, that pusher 130 occupies even less usable compartment space than pusher 100.

Referring now to Figs. 9–11, there is shown another embodiment of a display and dispensing device 120 according to the invention and comprising a lower shelf 152 and upper shelf 182. Lower shelf 152 comprises rectangular wire frame member 154 and wire frame member 156 having generally inverted U-shaped side portions 158, 160 and straight portions 162 and 164 extending transversely of said side portions at the front and rear, respectively, of shelf 152. A plurality of transversely extending horizontally spaced wire rods 166 are secured, at their extremities, as by brazing or welding, between frame members 154 and 156. Wire rods 168 and 170 extend horizontally for the entire length of shelf 152, at the rear thereof, and are secured at their left extremities to rear leg of side portion 158 and at their right to rear leg of side portion 160 of frame member 156. Wire rod 172 extends horizontally for the entire length of shelf 152, at the front thereof, and is secured to the front legs of side portions 158 and 160, respectively, of frame member 156. Horizontally spaced spacer members 174 divide shelf 152 into a plurality of compartments and are secured at their rear ends to rod 168 and at their front ends to rod 172.

Upper shelf 182 is similar to lower shelf 152 and comprises rectangular wire frame member 184 and wire frame member 186 having generally inverted U-shaped side portions 188, 190 and straight portions 192 and 194 extending transversely of said side portions at the front and rear, respectively, of shelf 182. A plurality of transversely extending horizontally spaced wire rods 196 are secured at their extremities, as by brazing or welding, between frame members 184 and 186. Wire rods 198 and 200 extend horizontally for the entire length of shelf 182, at the rear thereof, and are secured at their left extremities to rear leg of side portion 188 and at their right extremities to rear leg of side portion 190 of frame member 186. Wire rod 202 extends horizontally for the entire length of shelf 182, of the front thereof, and is secured to the front legs of side portions 188 and 190, respectively, of frame member 186. Horizontally spaced spacer members 184 divide shelf 182 into a plurality of compartments and are secured at their rear ends to rod 198 and at their front ends to rod 202.

Vertical support members 206–208 are provided for supporting shelves 152 and 182, each comprising a base portion 208 and upwardly extending rear leg 210 and front leg 212, said legs being secured, as by welding or brazing, to the respective side portions of frame members 154, 156, 184, 186. It will be noted, however, that display and dispensing device 150 is supported on base portions 208 which are disposed at a slight angle to shelves 152 and 182, thus giving the latter a slight downward inclination from front to rear, as best seen in Fig. 10.

Each compartment is provided with a pusher 100, in the same manner as has been previously described. It will be noted, however, that unlike the display and dispensing device 100, no gates are provided in dispensing device 150 and, accordingly, the free end of spring 114, as it is unwound below bushing 112, is merely securely wrapped around the horizontal portion of wire frame member 154, as best seen in Figs. 10 and 11. The free end of spring 114 is bent as at 115 and 117, and at the latter bend the spring is biased downwardly to prevent accidental disengagement of spring 114 from frame member 154 as best shown by the full lines in Fig. 9; the dashed lines in said figure showing the manner of disengaging spring 114 from member 154.

At the front of each shelf there may be provided a strip 165 (as on lower shelf 152) extending between rod 172 and the horizontal portion of frame member 154, and secured at its ends to spacer 174 and frame member 156, respectively, and which may contain printed matter in the nature of advertisement or identification of the contents of the respective compartments.

A vertical extending inverted U-shaped member 214 extends upwardly of legs 210 and is secured thereto, thus forming a handle for conveniently carrying dispensing device 150. A rod 218 extends transversely of legs 215 and 216 and is secured thereto. A strip 220 is attached to the upper part of member 214 and may contain printed matter in the nature of advertisement.

It is thus seen that display and dispensing device 150 is provided with a plurality of compartments, each of which is provided with a pusher device 100 (Fig. 3) or 130 (Fig. 9). By moving the pusher device rearwardly a plurality of packages may be inserted in each compartment. As the frontmost package is removed from the compartment, the pusher will cause the remaining packages to move forwardly and a new package will occupy the frontmost position in the compartment. It is therefore apparent that as long as there remains at least one package in each compartment, there will be a package occupying the frontmost position in each compartment and the dispensing device will thus appear to be fully loaded when viewed from the front.

The slight downward inclination of each compartment causes the packages therein to have a slight rearward inclination as best shown in Fig. 10. Such inclination has been found to be very desirable in that it provides the display device with a generally more attractive appearance, causing it to be more readily noticeable to incidental observers. Furthermore, said slight rearward inclination of the packages facilitates removal thereof.

While I have shown and described the preferred embodiments of my invention, it will be understood that various changes may be made in the present invention without departing from the underlying idea or principles of the invention within the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A display and dispensing assembly for packages comprising, a plurality of compartments each having spaced transversely extending flexible wire rods forming the package supporting surface thereof, at least some of said compartments being provided with removably mounted spring actuated means having a lower open channel part for slidingly engaging two of said rods in each of some of said compartments, the removal of said spring actuated means being effected by moving said two rods toward each other to thereby free said open channel part from said sliding engagement with said two rods said means rotatably mounting in the rear portion thereof a zero gradient spring having an unwound portion extending below said channel part, the end of said portion
being secured at the front end of said compartment whereby said means are movable along the longitudinal extent of the compartment, a bracket secured to the upper surface of said compartment and extending upwardly thereof for transmitting the spring force to the contents of said compartment causing said contents to occupy the frontmost part thereof.

2. A display and dispensing assembly for packages comprising, a plurality of compartments each having spaced transversely extending wire rods forming the package supporting surface thereof, said wire rods being secured at their front ends between horizontally extending front upper and lower members and at their rear ends between horizontally extending rear upper and lower members, a plurality of horizontally spaced spacer members secured to said front and rear horizontally extending members to divide said assembly into a plurality of horizontally spaced compartments, at least one of said compartments being provided with a lower channel part for slidingly engaging two of said rods in said compartment, said channel part rotatably mounting in the rear portion thereof a bushing, a zero gradient spring wound onto said bushing and having an unwound portion extending forwardly and longitudinally of the compartment below said channel part and between said two rods, said unwound portion being turned upwardly and inwardly upon itself about said horizontally extending front lower member, said inturnd portion being biased against the spring part adjacent thereto for releasably securing said spring at the front of the compartment, said channel part mounting an upwardly extending member for engaging the rear surface of the contents of said compartment and for transmitting the spring force thereto thus causing said contents to occupy the frontmost part of said compartment.

3. A display and dispensing assembly for packages comprising, a plurality of compartments each having spaced transversely extending wire rods forming the package supporting surface thereof, at least some of said compartments being provided with spring actuated means having a lower channel part for slidingly engaging two of said rods in each of some of said compartments, said channel part having an upwardly extending force transmitting part integrally formed therewith at the rear thereof, said latter part having horizontally spaced rearwardly extending ears formed integrally with said part and mounting therebetween a bushing, a zero gradient spring wound onto said bushing and having an unwound portion extending below said channel part, the free end of said portion being releasably secured at the front end of said compartment whereby said spring actuated means may be moved along the longitudinal extent of所述 compartment for inserting packages therein and maintaining said packages in the frontmost part of the compartment.

4. A display and dispensing assembly for packages comprising, a plurality of horizontally spaced transversely extending wire rods forming the package supporting surface thereof, said wire rods being secured at their front ends between horizontally extending front upper and lower members and at their rear ends between horizontally extending rear upper and lower members, a plurality of horizontally spaced spacer members secured to said front and rear horizontally extending members to divide said assembly into a plurality of horizontally spaced compartments, at least one of said compartments being provided with spring actuated means having a lower channel part for slidingly engaging two of said rods in said compartment, said channel part rotatably mounting in the rear portion thereof a bushing, a zero gradient spring wound onto said bushing and having an unwound portion extending below said channel means longitudinally of said compartment, the end of said unwound portion engaging said gate for the normal biasing thereof in a vertical position whereby to retain said packages in said compartment, said gate being rotatably mountable in the rear portion thereof a housing, said compartment having package retaining means comprising a pivotally mounted gate at the front part thereof, said spring having a free end engaging said gate for the normal biasing thereof in a vertical position whereby to retain said packages in said compartment, said gate being rotatably mountable in the rear portion thereof a housing, said compartment having package retaining means comprising a pivotally mounted gate at the front part thereof.

5. A display and dispensing assembly for packages comprising, a plurality of horizontally spaced transversely extending wire rods forming the package supporting surface thereof, said wire rods being secured at their front ends between horizontally extending front upper and lower members and at their rear ends between horizontally extending rear upper and lower members, a plurality of horizontally spaced spacer members secured to said front and rear horizontally extending members to divide said assembly into a plurality of horizontally spaced compartments, at least one of said compartments being provided with spring actuated means having a lower channel part for slidingly engaging two of said rods in said compartment, said channel part rotatably mounting in the rear portion thereof a bushing, a zero gradient spring wound onto said bushing and having an unwound portion extending below said channel means longitudinally of said compartment, the end of said unwound portion engaging said gate for the normal biasing thereof in a vertical position whereby to retain said packages in said compartment, said gate being rotatably mountable in the rear portion thereof a housing, said compartment having package retaining means comprising a pivotally mounted gate at the front part thereof, said spring having a free end engaging said gate for the normal biasing thereof in a vertical position whereby to retain said packages in said compartment, said gate being rotatably mountable in the rear portion thereof a housing, said compartment having package retaining means comprising a pivotally mounted gate at the front part thereof.

6. A display and dispensing assembly for packages comprising, a plurality of horizontally spaced transversely extending wire rods forming the package supporting surface thereof, said wire rods being secured at their front ends between horizontally extending front upper and lower members and at their rear ends between horizontally extending rear upper and lower members, a plurality of horizontally spaced spacer members secured to said front and rear horizontally extending members to divide said assembly into a plurality of horizontally spaced compartments, at least one of said compartments being provided with spring actuated means having a lower channel part for slidingly engaging two of said rods in said compartment, said channel part rotatably mounting in the rear portion thereof a bushing, a zero gradient spring wound onto said bushing and having an unwound portion extending below said channel means longitudinally of said compartment, the end of said unwound portion engaging said gate for the normal biasing thereof in a vertical position whereby to retain said packages in said compartment, said gate being rotatably mountable in the rear portion thereof a housing, said compartment having package retaining means comprising a pivotally mounted gate at the front part thereof, said spring having a free end engaging said gate for the normal biasing thereof in a vertical position whereby to retain said packages in said compartment, said gate being rotatably mountable in the rear portion thereof a housing, said compartment having package retaining means comprising a pivotally mounted gate at the front part thereof.
partments, each of said compartments having package retaining means at the front part thereof comprising a gate pivotally mounted on said horizontally extending front upper member, spring actuated means having a lower channel part for slidingly engaging two of said rods in at least one of said compartments, said spring actuated means rotatably mounting in the rear portion thereof a bushing, a zero gradient spring wound onto said bushing and having the unwound portion thereof extending below said channel means longitudinally of said compartment and turned inwardly upon itself about said horizontally extending front lower member, the end part of said unwound portion engaging said gate for the normal biasing thereof in a vertical position whereby to retain said packages in said compartment, said gate being inwardly pivotable against the action of said spring from said normal position to a horizontal position to permit loading of said compartment from the front part thereof, said spring actuated means being movable along the longitudinal extent of said compartment and being operative to maintain the contents therein in the frontmost part thereof.

9. A display and dispensing assembly for packages comprising, a plurality of compartments each having spaced transversely extending flexible wire rods forming the package supporting surface thereof, and spring actuated means for said compartments slidingly engaging and removably secured to said rods for maintaining the contents of said compartments in the foremost part thereof, each of said spring actuated means including a lower open channel part slidably engaging two succeeding rods in each of said compartments, the opening of said channel part being disposed between said succeeding rods to permit the removal of said spring actuated means from said compartments.

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