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[54] **CAN DISPENSER WITH POSITIONING AND RELEASE MEANS**
9 Claims, 5 Drawing Figs.

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[50] Field of Search..... **221/226,**
227, 279, 280, 289, 290

ABSTRACT: A tubular form of can dispenser having a dispensing spring that urges the cans through the open upper end of the tube, but the cans are initially prevented from passing therethrough by the coaction of a stopping means, which is a lateral surface located near the open end of the tube, and an offsetting spring. To dispense cans, a displacement means, located under the lateral surface, and basically consisting of a movable piece, is activated to move a can under and away from the lateral surface, thereby allowing it to pass through the open end of the tube.

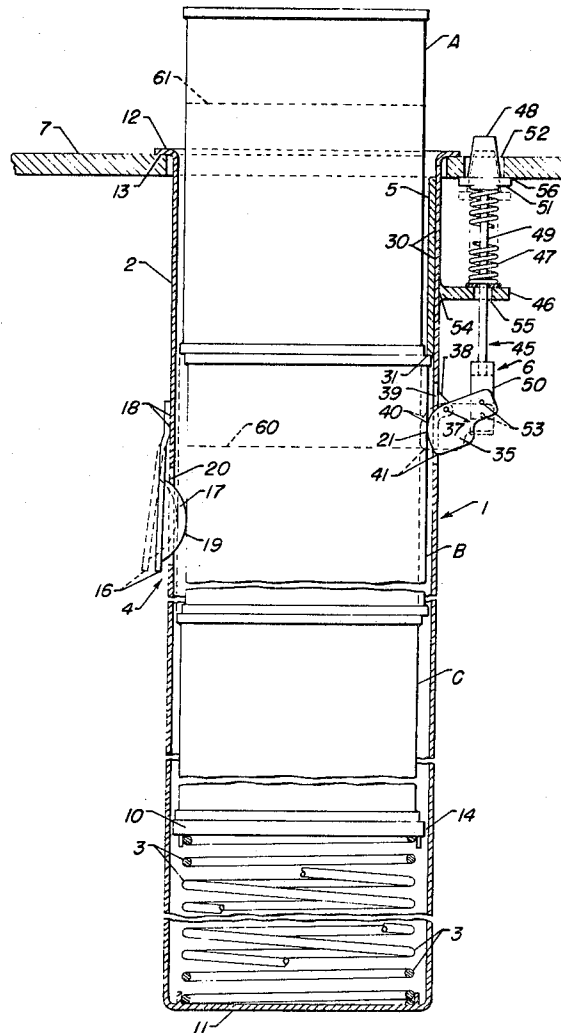
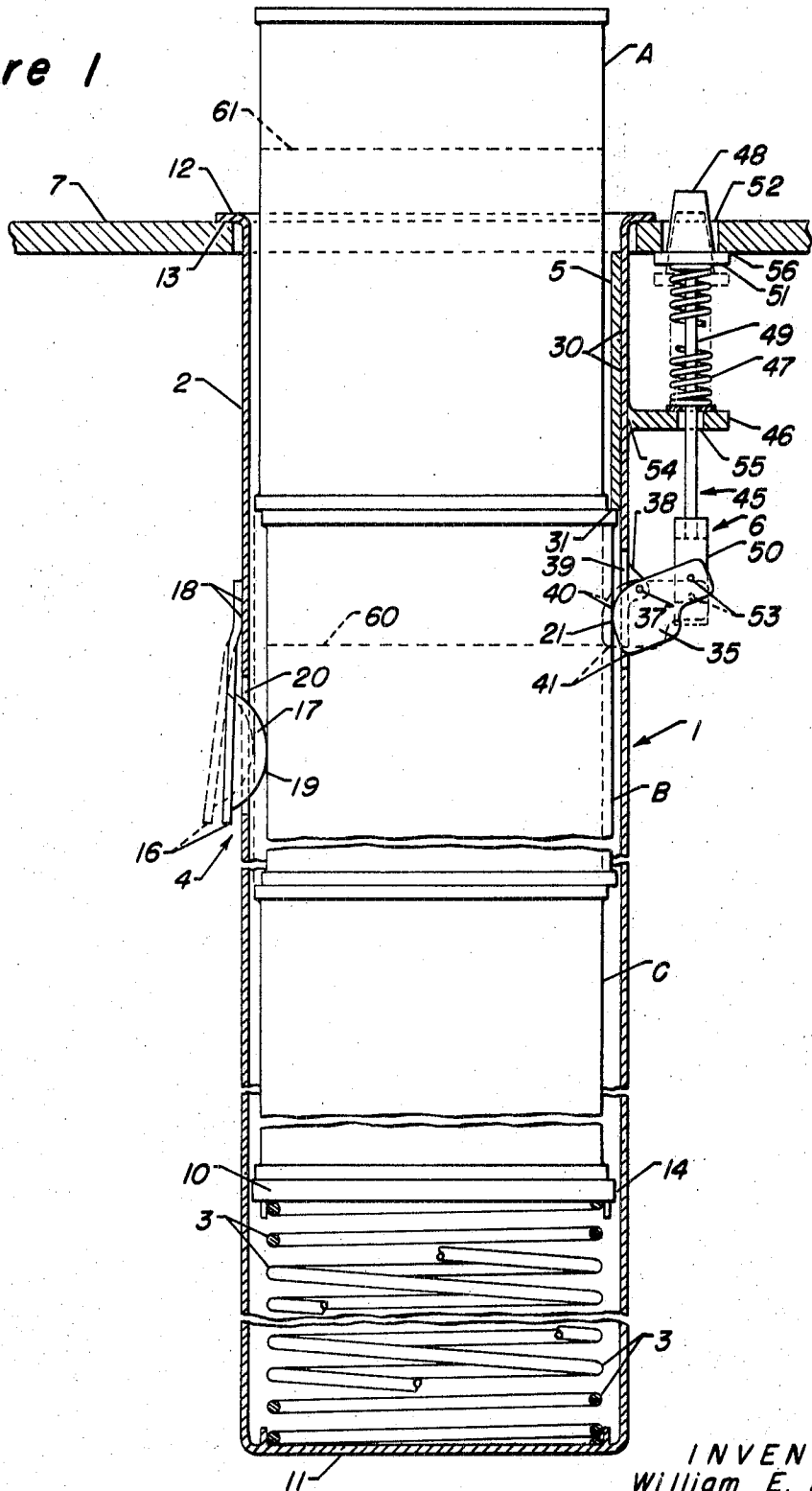


Figure 1



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Figure 2

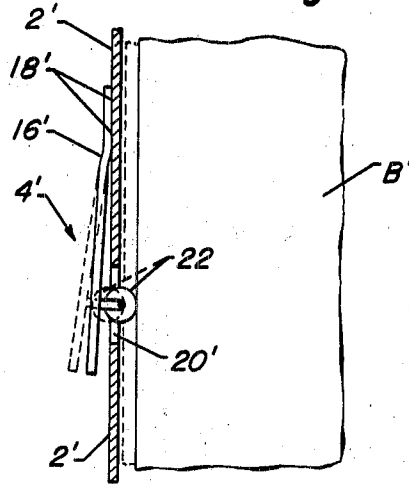


Figure 3a

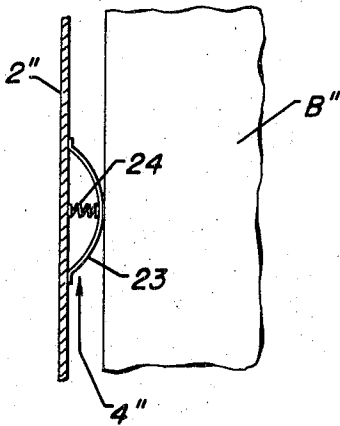


Figure 3b

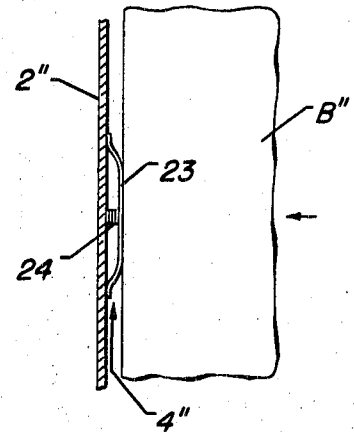
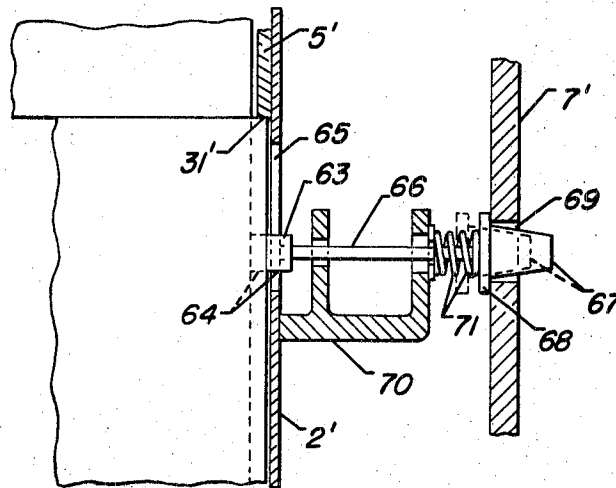


Figure 4



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CAN DISPENSER WITH POSITIONING AND RELEASE MEANS

This invention relates to a can dispenser for use in dispensing a can from a plurality of stored cans. The device is particularly adaptable for use and placement into countertops, moveable carts, bars, and other types of serving counters, where there is the frequent handling of canned beverages, soups, and the like.

One of the major industries having use for such a can dispenser is the transportation industry, and particularly, the airline branch of that industry where the serving of food is carried on in a relatively short period of time and within relatively confined areas. In the past, it has been particularly difficult to handle the serving of liquids in a moving airline, because of the narrow aisles and the motions of the plane itself. The serving of liquids in cans necessarily requires two hands and consequently, a means to store the cans not in use is desired to free the server's hands.

It is therefore an object of this invention to provide for a dispensing unit for storage and dispensing a plurality of tubular articles. More specifically, it is an object of this invention to provide for a dispensing unit for storage and dispensing of a plurality of cans.

A still further object of this invention is to provide a dispensing device which is constructed and arranged to hold a partially filled can of liquid after it has been opened and the contents only partly emptied.

In a broad aspect this invention provides for a dispenser for a plurality of tubular articles, and comprises in combination, an elongated hollow tube with an open upper end, a dispensing spring means within said tube located at the lower end thereof, whereby objects placed into said tube will be urged toward the open end of said tube, an offsetting spring means attached to said tube having a projecting portion in communication with the interior of said tube at a predetermined distance from said open end, said offsetting spring means biased to exert pressure in a radial inward direction, thereby causing articles within said tube to abut the opposite interior wall thereof, a stopping means attached to the interior wall at a point on the opposite side and above the level of said offsetting spring means, whereby the articles within said tube will be temporarily prevented from returning through the open end of said hollow tube, and a movable displacement means located below and in close proximity with said stopping means, said displacement means having a transversely movable piece in communication with the exterior of said hollow tube, whereby the activation of such displacement means causes an uppermost article to be laterally displaced and moved from below the stopping means, whereby the article is released through the open end of said tube.

As can be seen this invention provides for a dispenser that can be utilized for dispensing tubular objects. In one preferred embodiment, the hollow tube is cylindrically shaped to provide for the dispensing of cylindrical cans. This, however, should not be limiting upon the present improvement for other shapes are contemplated as within the scope of this improvement. In utilizing this tubular dispenser, a suitable sized opening will generally be provided in the counter or cart for insertion of the dispensing unit therein. The upper open end of the hollow tube of the dispenser unit will then be approximately flush with the countertop.

In connection with the operation of the displacement means of the dispenser, an activation means will necessarily be needed to cause the movable piece of the displacement means to move inward and displace articles placed within the tube. Normally, this activation means will comprise a pushbutton having communication with the countertop or the side of the cabinet in which the unit is placed. Various mechanisms can be used to provide article displacement, including electromagnetic means; however, simple mechanical operations are generally preferred.

In one preferred embodiment of this dispenser, the movable piece of the displacement means is attached to the outside wall of the hollow tube about a pivot pin and is free to rotate

transversely inward into the interior of the hollow tube through an opening provided in the wall. It is thus free to laterally displace the article or can, as the case may be, from below the stopping means. In the same embodiment, the rotation of this movable piece is effectuated by a pushbutton means which is a combination of a shaft and guide means biased to remain in an deactivated position by a compression spring. The shaft is attached to the movable piece about a second pivot pin, and the guide means is attached to the outside of the wall of the hollow tube. When the shaft is caused to move downward, it in turn causes the movable piece to rotate transversely inward and displace an upper article laterally, within the tube. The compression spring keeps the shaft in a deactivated position. The movable piece of this displacement pin has a flat lateral surface on its lower side. This flat surface is transverse to the interior wall of the hollow tube when the movable piece is in the innermost position, and, thus, it provides a secondary stopping means to prevent lower articles from being released through the upper end of the tube when an upper article is being released.

Also, in a preferred embodiment, the dispensing spring means is of a coiled compression spring type which is biased to expand in the longitudinal direction and is positioned to rest on the closed end of the hollow tube. The spring must, of course, be of substantial length to cause the cans to pass through the open end.

In this preferred embodiment the offsetting spring means which, as already mentioned, is located on the wall opposite the stopping means and at a lower level, comprises an elongated spring bar which is attached to the exterior of the hollow tube, and a transverse projection which is attached to the spring bar and has communication with the interior of the hollow tube through an opening in the wall. This projection, which is attached to the spring bar, will usually be made of a material having a low coefficient of friction, such as nylon or Teflon, so that it will not prevent articles from passing by it.

The stopping means for the interior of the device may have different shapes or configurations, but normally will merely comprise a narrow projection shoulder or strip of material attached to the interior wall of the hollow tube, which establishes a lateral surface thereto, and which will catch the edge of a stored can or other tubular article. It must be of a narrow size so as not to prevent the passing of an released article through the open end of the tube.

Reference to the accompanying drawing and the following description thereof, will serve to point out and more fully illustrate the design and construction of our invention as well as to assist in further pointing out advantageous features in connection therewith. FIG. 1 is a longitudinal sectional view of one embodiment of the present improved article dispenser.

FIG. 2 is a longitudinal sectional view of a portion of this improved dispenser illustrating an alternate form of the offsetting spring means.

FIGS. 3a and 3b are longitudinal sectional views of a portion of the dispenser illustrating another alternate form of the offsetting spring means.

FIG. 4 is a longitudinal sectional view of a portion of the dispenser illustrating an alternate arrangement of the displacement means. Referring now more particularly to the drawing, reference numeral 1 designates the dispenser assembly which comprises an elongated hollow tube 2, a dispensing spring means 3, an offsetting spring means 4, a stopping means 5, and a displacement means 6. Also shown are tubular cans A, B, and C within the dispenser. Although this particular dispenser has been designed as one for use in dispensing cans, other stackable articles, as for example, flat top bottles, can be used and fall within the scope of this present improvement. For the sake of simplicity, further reference to such variant articles will not be made hereinafter unless needed to clarify the description herein.

The elongated tube 2 in this embodiment is cylindrically shaped and, as shown in the drawings, has a closed end 11 and an upper open end 12. The upper end 12 has been bent to

establish a lip 13, thereby providing for support of the dispenser on the surface of the cart 7. Of course, the shape of the tube is dictated by the shape of the items to be dispensed and may, under other circumstances, be of a different shape to suit the particular item, i.e. if the items to be dispensed were square, ordinarily the tube would be square shaped. Although the lower end 11 is closed in the embodiment shown, this is not absolutely necessary, but the closed end, or an inwardly projecting flange, does provide a supporting surface for spring means 3. It is to be noted, and should be obvious, that the tube must have enough clearance to allow the articles to pass therethrough when displaced from the stopping means 5.

The tube is shown with three cans, but it is contemplated that a dispenser for as many as practically feasible be within the scope of this invention. The limit as to the amount of cans will necessarily depend on the space limitation in the cart or in the counter in which the device is to be installed, and the practicalities in designing a spring of substantial length so as to dispense all of the cans displaced within the tube.

The dispensing spring means 3, in its preferred form, is a compression spring which is resting upon the closed end 11. As previously mentioned, spring 3 must be of sufficient length and expansion bias to dispense all cans placed within the tube. It is contemplated that other forms of springs be utilized and still be within the scope of this invention, as for example: an extension spring or torsion spring coupled with pulleys may be utilized to pull the articles through the open end 12, or an air cushion may be utilized as the dispensing spring means.

Although not necessary, a seat 10 is placed on the top of spring 3, thus providing a surface for articles to be placed on within the tube. Seat 10 may be of rigid construction or, in the alternative, it may be a semirigid bolster pad to establish a cushioning effect for cans placed thereupon. It is to be noted that seat 10 has a relatively small amount of clearance with the tube, as shown at 14. This is to prevent it from passing the stopping means 5 when all cans have been released through open end 12.

Numeral 4 designates the offsetting spring means which, in this preferred embodiment, consists of a spring bar 16 and a transverse projection portion 17. The spring bar 16 is permanently attached to the outside wall of the hollow tube 2 at 18 and is biased to exert pressure toward the wall. Transverse projection 17 is preferably made from a material having a low coefficient of friction, such as nylon or Teflon, and has a curved surface 19. It communicates with the interior of tube 2 through opening 20 and must be of sufficient size to cause a can at that level to be offset and abut the opposite side at 21, as shown. The curved surface and low coefficient of friction prevents the spring from stopping a can at this point along the tube.

Other offsetting spring means are contemplated as being within the scope of this present improvement, as for example; FIG. 2 illustrates an offsetting means 4' which utilizes a spring bar 16' which is permanently attached to the outside of tube 2' at 18'. Instead of a fixed projection, a roller 22 is provided as a contacting transverse projection portion. Since roller 22 is free to rotate, it is not necessary that it be made of a material having a low coefficient of friction to prevent it from stopping a can from passing thereby.

In FIG. 3a and 3b an offsetting spring means 4'' is shown as consisting of a semirigid membrane 23 and a compression spring 24 which are attached to the interior wall of hollow tube 2''. In such an arrangement, since there is nothing attached to the exterior of the hollow tube, there is no need to have an opening in the tube. Membrane 23, however, must be flexible so as to give when pressure is exerted on it, and it must have a low coefficient of friction so as not to prevent passing of articles, when they are being released. It also must be rigid enough to retain a curve shape as illustrated in FIG. 3a so as not to act as a stopping means but only as an offsetting means. The workings of these offsetting means will become readily apparent as the explanation of this present improvement continues.

Above the level of offsetting spring means 4, and on the opposite side of hollow tube 2, is stopping means 5, which is permanently attached along the interior wall at 30. The stopping means 5 is merely a bar or strip of rigid material which has a lateral surface 31. It must have a substantially narrow cross section in order to allow for passage of cans that have been released from below lateral surface 31, as has can A. A can which is offset by the offsetting spring means 4, will be stopped from returning through the open end 12 by surface 31. It is for this reason that surface 31 is placed above the level of spring means 4 but well within the finite dimension of each can.

Lateral surface 31, as indicated in FIG. 1, is located approximately the length of half a can from the open end 12. By locating surface 31 at this level, any can which abuts it will form a platform for placement of a loose can thereupon at that level. In a preferred embodiment, the surface 31 is located at this half-can level, for it is contemplated, as has been mentioned hereinbefore, that the dispenser will be used in a movable cart and such a level will prevent a can in the position from tipping over.

One preferred form of the displacement means 6 is illustrated in FIG. 1. It consists of a movable piece 35 which is movable in the sense that it is free to rotate about a pivot pin 37, which is attached to bracket support 38 and which is, in turn, attached to the exterior of tube 2. The movable piece will normally be made of a material having a low coefficient of friction to allow passage of cans through the tube. It is in communication with the exterior of the tube through an opening 39 in the wall. In this present embodiment, the movable piece 35 has a curved surface 40 adapted to make contact with each can reaching position of can B. As movable piece 35 is rotated inward, it causes a can at that position to be displaced and moved laterally inward as shown by the dashed portions of the drawing. This particular curved surface should not be limiting as other surfaces are contemplated within the scope of this present improvement. Such a surface merely establishes an even pattern of displacement.

It is to be noted that there exists a relatively flat portion 41 on the movable piece 35. This flat portion establishes a lateral surface, transverse to the interior wall of tube 2 when piece 35 is in its innermost position. Since surface 41 is located at a level above the offsetting spring means 4, and on a side opposite the spring means 4, it will establish a secondary stopping means when movable piece 35 is in its innermost position.

This rotating, movable piece 35 could stand alone as the displacement means and be operated by mere manual rotation. However, in this preferred arrangement, a pushbutton means is provided so that a straight motion can activate movable piece 35. The components of this pushbutton means are a shaft 45, a guide means 46, and a compression spring means 47. Shaft 45 in this embodiment consists of a pushbutton 48, a straight center section 49 and an extension section 50. Pushbutton 48 has a flanged portion 51 on its lower side to prevent it from returning through the opening 52 provided in cart 7. Extension 50 is provided with a pivot pin 53, which is attached to movable piece 35 and which is free to rotate thereupon. A guide means 46 is attached to the exterior wall of tube 2 at 54. It has an opening 55 with adequate clearance to allow center section 49 to move freely in a longitudinal direction and to prevent it from binding from the slight lateral motion caused by the rotation of pivot pin 53. The compression spring 47 is located between guide means 46 and the flange portion 51 of the pushbutton 48. It is biased to maintain the flanged portion 51 against the lower surface 56 of the cart 7.

In the operation of this dispenser, each can is initially forced downward through the open end 12 of tube 2. Of course, the force exerted must overcome that of the dispensing spring 3. Initially in Fig. 1, the first can C was placed on seat 10. As it was being initially forced into the tube, it contacted surface 19 of the offsetting spring 4. Since the spring is biased to move inwardly, it forced can C initially toward the opposite wall.

When the top of can C was forced below the level of lateral surface 31, it was consequently forced laterally below to abut that surface. At this point there was no need to maintain any downward force on can C, because it was prevented from returning through the open upper end 12 by the lateral surface 31 of stopping means 5. Of course, the alternate embodiments of FIGS. 2 and 3a, would work in a very similar manner.

The next can B was inserted into tube 2 in this same way; however, the surface of placement was now the top of can C. After inserted and located below lateral surface 31, its top became the surface for placement of can A. Can A was placed thereupon without exerting any forces against the dispensing spring 3. If other cans were to be placed within the dispenser, can A would have to be forced, as were cans B and C, below the stopping means 5. As illustrated, the top surface of can B actually becomes a recess surface of cart 7 for placement of other cans thereupon, such as can A. Can A can be removed, taken off, opened, partially poured and replaced onto that surface.

The interior walls of the hollow tube provide support so that can A will not fall off the cart when it is being moved. When can A is emptied and a new can is desired, the dispensing operation merely consists of a pressing pushbutton 48.

As button 48 is pushed, the shaft's straight downward motion causes pivot pin 53 to rotate downward in a slight arc, which approaches straight motion. This causes the movable piece 35 to rotate about pin 37. This rotation establishes an inward motion of surface 40 which displaces can B laterally from below surface 31, as shown by the dashed portion of FIG. 1, against the bias of offsetting spring means 4. The displacement against the alternative embodiments of offsetting springs are also shown in FIGS. 2 and 3b.

The dispensing spring 3 urges can B toward the open end of the tube; however, if pushbutton 48 is not released immediately, lateral surface 41 of the movable piece 35 will prevent can C, which is being forced against wall 21 by offsetting spring 4, from returning completely through open end 12. Its top surface will be located at 60, and thus can B's top surface will be located at 61.

As pushbutton 48 is released, it will be forced to abut the surface of cart 7 at 56 by spring 47, and movable piece 35 will rotate outwardly releasing can C to its new position under lateral surface 31. Can B is now free to be removed from the top surface of can C.

An alternate arrangement of a displacement means is shown in FIG. 4. Here instead of a rotating movable piece, a translating piece 63 is utilized in the displacement mechanism. In other words, instead of rotating a piece to displace a can from under lateral surface 31; movable piece 63 moves in a straight lateral direction through opening 65 to displace the can from under surface 31. This particular piece also has a lateral surface 64, which serves as a secondary stopping means when piece 63 is in its most inward position. In this arrangement, moveable piece 63 is caused to move by direct movement of a shaft, which comprises the center shaft section 66 and a pushbutton section 67. The pushbutton 67 is provided with a flanged portion 68, to prevent it from passing through the opening 69 in the side of cart 7. Also provided is a guide means 70 which is attached to the outside wall of tube 2' and a compression spring 71 biased to keep the shaft and movable piece in its unactivated position.

This arrangement is particularly adaptable for use in a dispenser in which the pushbutton is to be put on the side of a cart; however, it is not limited to such use, since it is possible that in the design of a displacement means, either rotational or translational movable pieces be activated by horizontal, vertical, or angled pushbutton means, and all are contemplated as being within the scope of the present improvement.

Although we have described our invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without

departing from the spirit and the scope of the invention as hereinafter claimed.

We claim:

1. A dispenser for a plurality of tubular articles, comprising in combination an elongated hollow tube with an open upper end, a dispensing spring means within said tube located at the lower end thereof, whereby objects placed into said tube will be urged toward the open end of said tube, an offsetting spring means attached to said tube having a projecting portion in communication with the interior of said tube at a predetermined distance from said open end, said offsetting spring means biased to exert pressure in a radial inward direction, thereby causing articles within said tube to abut the opposite interior wall thereof, a stopping means attached to the interior wall at a point on the opposite side and above the level of said offsetting spring means, whereby the articles within said tube will be temporarily prevented from returning through the open end of said hollow tube, and a movable displacement means located below and in close proximity with said stopping means, said displacement means having a transversely movable piece in communication with the exterior of said hollow tube, whereby the activation of such displacement means causes an uppermost article to be laterally displaced and moved from below the stopping means, whereby the article is released through the open end of said tube.

2. The device of claim 1 further characterized in said dispensing spring means is a coiled spring which is biased to expand in the longitudinal direction.

3. The device of claim 1 further characterized in that a seat is attached to the upper end of said dispensing spring means, thereby providing a surface for placement of articles thereupon.

4. The device of claim 1 further characterized in that said elongated hollow tube is cylindrically shaped.

5. The device of claim 1 further characterized in that said offsetting spring means comprising an elongated spring bar which is attached to the exterior of said hollow tube and a transverse projection portion which is attached to said spring bar and has communication with the interior of said hollow tube through an opening provided within the wall thereof, whereby the tubular articles are caused to abut the opposite interior wall by said offsetting spring means, but are not prevented from returning through the open end of said tube when released by said displacement means.

6. The device of claim 1 further characterized in that said stopping means is a narrow projection attached to the interior wall of said hollow tube which establishes a lateral surface thereto, whereby an upper article is prevented from passing through the open end of said tube when abutting said lateral surface, but is permitted to pass thereby when displaced and moved from below said lateral surface.

7. The device of claim 1 further characterized in that the movable piece of said displacement means is attached to the outside wall of said hollow tube about a pivot pin and said movable piece is free to rotate transversely inward into the interior of said hollow tube through an opening provided in the wall thereof to laterally displace an article from below said stopping means.

8. The device of claim 7 further characterized in that a pushbutton means, comprising a shaft, a guide means and a compression spring means is attached to said movable piece about a pivot pin, whereby straight motion of said pushbutton means causes said movable piece to rotate transversely inward into said hollow tube, and when said pushbutton is released, said movable piece rotates outward back to its original position.

9. The device of claim 1 further characterized in that said movable piece has a substantial flat portion thereupon, said flat portion establishes a lateral surface transverse to the interior wall of said hollow tube when the movable piece is in its innermost position, thereby providing a secondary stopping means to prevent lower articles from being released through the upper end of said tube when an upper article is being released.

(10)