

[54] **PLASTIC CUP DISPENSER**

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[51] **Int. Cl.**.....**B65h 1/00**

[58] **Field of Search**.....**221/63, 303-310**

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[57] **ABSTRACT**

A plastic cup dispenser includes a housing to receive a stack of plastic cups, and a resilient plastic strip which is mounted within the housing above, and in encircling relation to the bottom opening of the housing so that projections extending inwardly from the strip in a circular array and having a special shape will be engaged by rims of the cups at the bottom of the stack to ensure the one-at-a-time withdrawal of the cups through that bottom opening. Each projection has an inwardly convex surface of substantial vertical extent formed with a central recess to achieve the desired one-at-a-time withdrawal, and each projection is preferably in the form of a bowed ribbon joined to the remainder of the strip only at its upper and lower ends.

4 Claims, 6 Drawing Figures

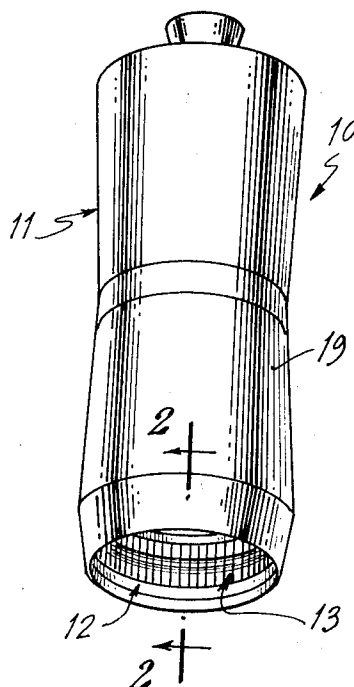


FIG. 1.

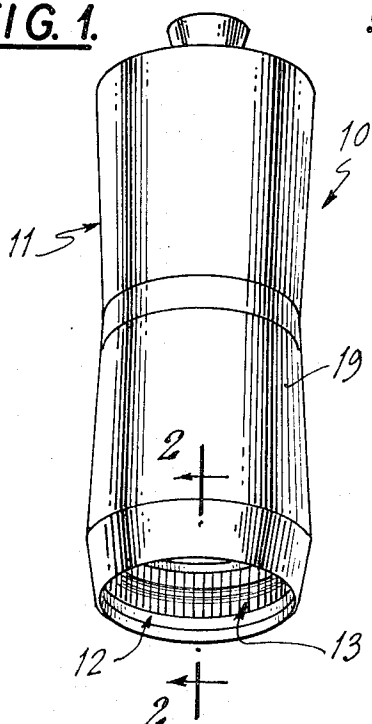


FIG. 2.

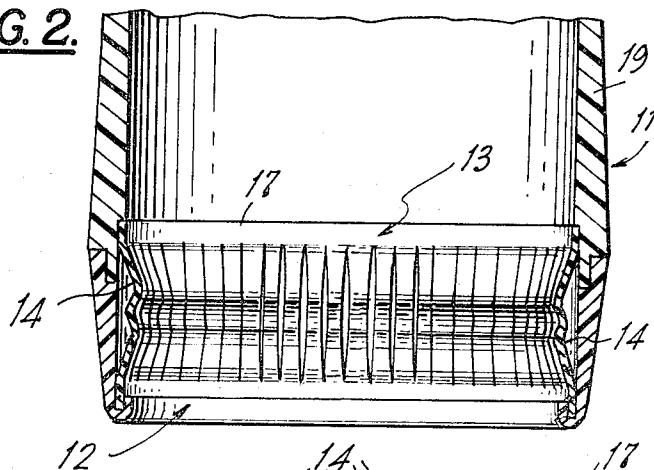


FIG. 4.

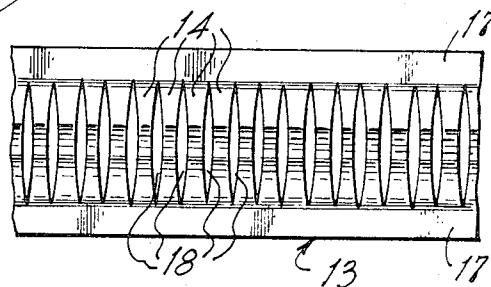


FIG. 3.

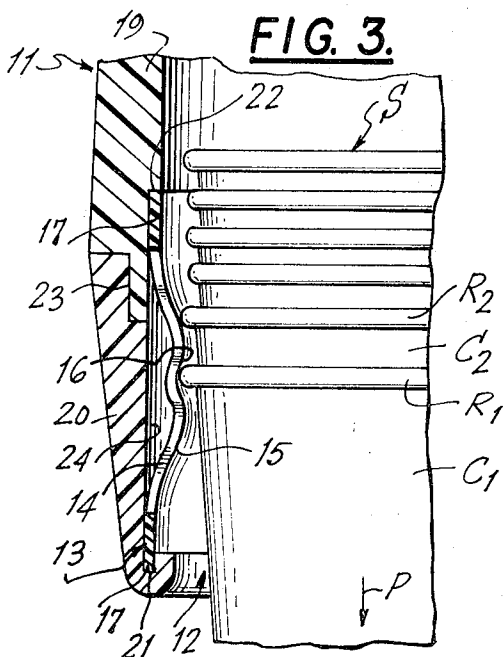


FIG. 5.

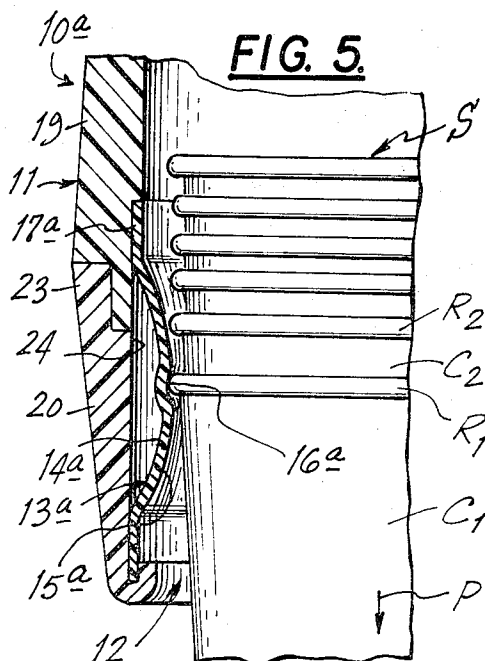
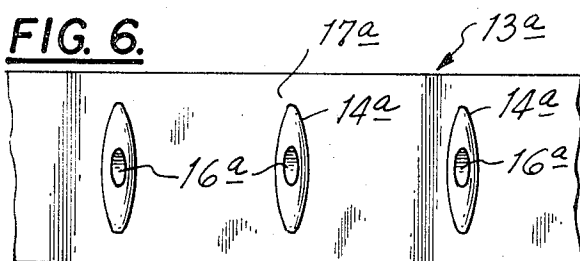


FIG. 6.



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PLASTIC CUP DISPENSER

This invention relates generally to cup dispensers, and more particularly is directed to an improved dispenser for plastic cups.

Many dispensers are available for the dispensing of paper cups, and such existing dispensers generally comprise a tubular housing for accommodating a substantially vertical stack of the cups and having an opening at the bottom of the housing to permit the passage therethrough of the cups. Such dispensers have elements at the interior of the housing above the bottom opening thereof which are engageable by the rim of the lowermost paper cup in the stack so as to retain the latter within the housing. When the lowermost cup is pulled or withdrawn downwardly through the bottom opening of the housing, the next cup in the stack has its rim engaged by the retaining elements and thus is not removed from the housing as a result of its frictional contact with the withdrawn lowermost cup. However, when the existing cup dispensers are employed for dispensing plastic cups, it is found that the cup-retaining elements provided in such dispensers are not effective to ensure the one-at-a-time withdrawal of the plastic cups so that the withdrawal of the lowermost cup in the stack is frequently accompanied by the removal therewith of one or more additional cups.

Accordingly, it is an object of this invention to provide cup dispensers particularly adapted for the dispensing of plastic cups, and which are constructed and arranged to ensure the one-at-a-time dispensing of such plastic cups.

Another object is to provide plastic cup dispensers of relatively simple construction which can be inexpensively produced and which are reliable in operation.

In accordance with an aspect of this invention, a dispenser for plastic cups comprises a housing for accommodating a substantially vertical stack of rimmed plastic cups and having an opening at the bottom of the housing to permit the passage therethrough of the cups, and a resiliently flexible plastic strip mounted within the housing above, and in encircling relation to the bottom opening, such strip having a plurality of projections extending therefrom so as to be directed radially inward in a circular array when the strip is mounted within the housing, each of the projections including an inwardly convex arcuate inner surface of substantial vertical extent which has an inwardly opening recess intermediate its upper and lower ends, with the projections extending sufficiently from the remainder of the strip to be engaged, at their arcuate inner surfaces, by the rims of the cups as the latter are withdrawn downwardly through the opening so that, as the lowermost cup in the stack is withdrawn, downward movement of the next cup thereabove is resisted by the engagement of its rim with the arcuate surfaces above the respective recesses and is then arrested by engagement of its rim in such recesses.

In a preferred embodiment of this invention, each of the above-mentioned projections is in the form of an inwardly bowed ribbon that is centrally indented and connected to the remainder of the strip only at its upper and lower ends so as to be free to flex outwardly in response to radially outward pressure of a cup rim thereagainst.

The above, and other objects, features and advantages of the invention, will be apparent in the following detailed description of illustrative embodiments thereof which is to be read in connection with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a plastic cup dispenser in accordance with an embodiment of this invention;

FIG. 2 is an enlarged, fragmentary vertical sectional view taken along the line 2—2 on FIG. 1;

FIG. 3 is a further enlarged, fragmentary vertical sectional view corresponding to a portion of FIG. 2 and illustrating the manner in which the structure there shown cooperates with a stack of plastic cups so as to ensure the one-at-a-time dispensing thereof;

FIG. 4 is a fragmentary elevational view of a portion of a plastic strip included in the dispenser of FIGS. 1, 2 and 3, and which is shown in its original straight form;

FIG. 5 is a view similar to that of FIG. 3, but illustrating another embodiment of this invention; and

FIG. 6 is a view similar to that of FIG. 4, but showing the plastic strip of the embodiment illustrated by FIG. 5.

Referring to the drawings in detail and initially to FIG. 1 thereof, it will be seen that a plastic cup dispenser 10 in accordance with this invention, as there illustrated generally comprises a substantially cylindrical housing 11 which is closed at its upper end either permanently or by a removable lid or closure, and which has an opening 12 at its bottom end dimensioned to permit the passage therethrough of plastic cups from a vertical stack thereof accommodated within housing 11. The housing 11 may be molded or otherwise formed of a suitable plastic, such as, for example, medium impact polystyrene, high density polyethylene or acetyl-butylate-styrate, or any other suitably rigid material. In accordance with the present invention, the stack of plastic cups is retained within housing 11 for dispensing one cup at a time through opening 12 by means of a resiliently flexible plastic strip 13 which is mounted within the lower portion of housing 11 above bottom opening 12 so as to encircle the latter. The strip 13 may be formed of any suitably resiliently flexible plastic, such as polyethylene or nylon.

The strip 13, which may be molded or otherwise formed in a longitudinally straight configuration, as shown on FIG. 4, is provided with a length equal to the interior circumference of housing 11 so that the ends of the strip will abut when strip 13 is curved to form a ring seated within housing 11. Strip 13 is formed with a plurality of projections 14 extending therefrom so as to be directed radially inward in a circular array when strip 13 is mounted within housing 11. Each of the projections 14 is shown to include an arcuate inner surface 15 (FIG. 3) which is inwardly convex and which has an inwardly opening recess 16 intermediate its upper and lower ends.

In the preferred embodiment being presently described, each of the projections 14 is in the form of an inwardly bowed ribbon that is centrally indented to define the recess 16 and connected to the longitudinal margins 17 of the strip only at the upper and lower ends of such ribbon. Thus, each ribbon-like projection 14 is free to flex outwardly in response to radially outward pressure of a cup rim thereagainst, as hereinafter described. In order to define the ribbon-like projections 14, the strip 13 may be molded or otherwise formed with a suitably shaped cross-section, for example, as appearing in FIGS. 2 and 3, and with spaced apart slits 18 extending transversely with respect to the longitudinal edges of the strip for separating adjacent ribbon-like projections 14. Further, when the strip 13 is in its initial or molded longitudinally straight configuration, as shown on FIG. 4, the slits 18 preferably have widths that taper from maximum dimensions at the longitudinal medial line of the strip to minimum dimensions at the opposite ends of the slits. Thus, when strip 13 is curved to form a ring in connection with its mounting within housing 11, as in FIG. 2, the slits 18 do not close completely at their central portions and thereby permit the outward flexing of the ribbon-like projections 14, as mentioned above.

In order to facilitate the mounting of strip 13 within housing 11, the latter may include a generally cylindrical body 19 and a separately formed ring 20 secured on the lower end of body 19 to define the opening 12 at the bottom of the housing. The ring 20 has an annular, upwardly opening groove 21 at the lower margin of its inner surface which receives and retains the lower longitudinal edge portion 17 of strip 13, and the body 19 has a downwardly facing annular shoulder 22 formed in its inner surface to engage the upper edge of strip 13 and thereby prevent upward disengagement of the strip from groove 21 upon the securing of ring 20 on body 19. As shown, a rabbetted joint 23 may be provided between body 19 and ring 20 by which the ring is frictionally held on body 19 or, if desired, after the assembly of ring 20 on body 19 at joint 23, heat and pressure or ultrasonic energy may be conventionally applied to joint 23 so as to prevent subsequent removal of ring 20 from body 19.

As shown particularly on FIG. 3, projections 14 of strip 13 extend sufficiently from edge portions 17, that is, are dimensioned in the radially inward direction away from the surface

24 against which strip 13 seats or bears, so that such projections will be engaged, at their arcuate inner surface 15, by the rims of plastic cups in a stack S of such cups contained within housing 11.

When the lowermost cup C_1 of the stack S has its rim R_1 engaged by recesses 16 of projections 14, that cup C_1 projects downwardly through opening 12 at the bottom of housing 11 and can be grasped and pulled downwardly, as indicated by the arrow P, for effecting removal of the lowermost cup from the dispenser. When the lowermost cup has its rim R_1 engaged in recesses 16, the rim R_2 of the next cup C_2 thereabove engages the arcuate surfaces 15 of projections 14 above recesses 16. Thus, as the lowermost cup C_1 is pulled or withdrawn downwardly and the frictional engagement of that cup with the next cup C_2 thereabove tends to move the cup C_2 downwardly with the cup C_1 being withdrawn, the downward movement of cup C_2 is resisted by the engagement of its rim with the arcuate surfaces 15 above recesses 16 and such downward movement is then strongly arrested by the engagement of rim R_2 in recesses 16.

Of course, in the embodiment of the invention being described, in which the ribbon-like projections 14 are connected to the remainder of strip 13 only at their upper and lower ends, and thus are free to flex outwardly in response to radially outward pressure exerted thereon by a cup rim, the downward movement of the lowermost cup C_1 from the position shown on FIG. 3 serves to flex projections 14 outwardly in response to the downward displacement of rim R_1 from recesses 16 onto the underlying portions of arcuate surfaces 15. Such flexing of projections 14 facilitates the movement of the next cup C_2 to the position of the cup C_1 shown on FIG. 3, and it will be apparent that, as the cup C_2 attains the position of the cup C_1 on FIG. 3, the cup C_1 will have been moved downwardly to a sufficient extent to permit the resilient return of projections 14 radially inward to the position shown for secure engagement of the rim R_2 of cup C_2 in recesses 16. Thus, the described dispenser 10 embodying this invention is effective to ensure the one-at-a-time dispensing of plastic cups.

Referring now to FIGS. 5 and 6 in which another embodiment of this invention is illustrated, it will be seen that the dispenser 10a according to that embodiment may be the same as the dispenser 10 described above with reference to FIGS. 1-4 apart from the configuration of the strip 13, and that corresponding parts are identified by the same reference numerals. The resiliently flexible plastic strip 13a of the dispenser 10a is imperforate and is molded or otherwise formed with hollow embossments constituting the projections 14a which are spaced apart in the direction of the length of strip 13a and elongated in the direction transverse to such length, as shown on FIG. 6. Each elongated hollow embossment constituting a projection 14a has an arcuate surface 15a (FIG. 5) which is inwardly convex and of substantial vertical extent when strip 13a is mounted within the lower portion of housing 11 so as to encircle the bottom opening 12 in the same manner as has been described above with reference to the strip 13. Further, each hollow embossment 14a constituting a projection has a central dimple or indentation to define a

recess 16a in the arcuate surface 15a. Since the projections 14a defined by hollow embossments are joined to the remainder 17a of strip 13a at the entire periphery of each such embossment, it will be apparent that the projections 14a are not readily flexible under the influence of radially outward pressure exerted thereagainst by the rims of the plastic cups in stack S. Apart from the absence of such flexing action, the strip 13a, when mounted within housing 11 of dispenser 10a acts in the same manner as the previously described strip 13 to ensure the one-at-a-time dispensing of the plastic cups.

Although illustrative embodiments of this invention have been described in detail herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments, and that various changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of the invention.

What is claimed is:

1. A dispenser for plastic cups comprising a housing for accommodating a substantially vertical stack of rimmed plastic cups and having an opening at the bottom of the housing to permit the passage therethrough of the cups, and a resiliently flexible plastic strip mounted within said housing above, and in encircling relation to said opening, said strip having a plurality of projections extending therefrom so as to be directed radially inward in a circular array when said strip is mounted within said housing, each of said projections being in the form of an inwardly bowed ribbon that defines an arcuate inner surface of substantial vertical extent which is inwardly convex and which is centrally indented to define an inwardly opening recess intermediate its upper and lower ends, each said bowed ribbon being connected to the remainder of said strip only at said upper and lower ends of said ribbon so as to be free to flex outwardly in response to radially outward pressure of a cup rim thereagainst, said bowed ribbons extending sufficiently from the remainder of the strip to be engaged, at their arcuate inner surfaces, by the rims of the cups as the latter are withdrawn downwardly through said opening so that, as the lowermost cup in the stack is withdrawn, downward movement of the next cup thereabove is resisted by the engagement of its rim with said arcuate surfaces above the respective recesses and is then arrested by engagement of its rim in said recesses.

2. A dispenser for plastic cups according to claim 1, in which said strip has spaced apart slits separating adjacent bowed ribbons of the strip.

3. A dispenser for plastic cups according to claim 1, in which said strip is molded straight and curved to have its ends abut upon mounting within said housing.

4. A dispenser for plastic cups according to claim 3, in which said housing includes a generally cylindrical body and a ring secured on the lower end of said body to define said opening at the bottom of the housing, said ring has an annular, upwardly opening groove adjacent its inner surface retaining the lower edge of said strip, and said body has a downwardly facing annular shoulder in its inner surface engaging the upper edge of said strip for preventing upward disengagement of the strip from said groove.

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