United States Patent

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[54] **DISPENSER**
6 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **221/310,** 221/307
[51] **Int. Cl.** **A47f 1/04**
[50] **Field of Search** 221/307, 308, 310, 303

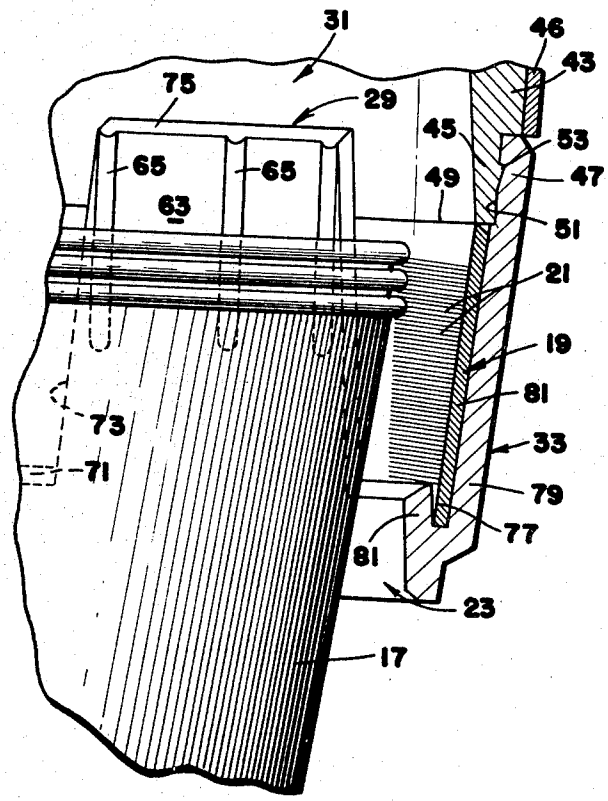
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2,487,736	11/1949	Sims	221/310
3,342,375	9/1967	Johnson et al.	221/308

Primary Examiner—M. Henson Wood Jr.
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ABSTRACT: A dispenser is formed with an elongated housing the interior of which is hollow for receiving a stack of nested cups. Each bottom cup is removed one at a time by pulling it past a retaining means including flexible bristles extending radially inward in the housing to engage the cups adjacent the rims thereof. A guiding means in the housing limits tilting or angular movement of the cups from a position substantially in alignment with a longitudinal axis for the dispenser. The guide means may be in the form of angularly spaced and longitudinally extending guiding ribs which are arranged to define a guiding surface having an internal diameter slightly greater than the exterior diameter of the cup rim.



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SHEET 1 OF 2

FIG. 1

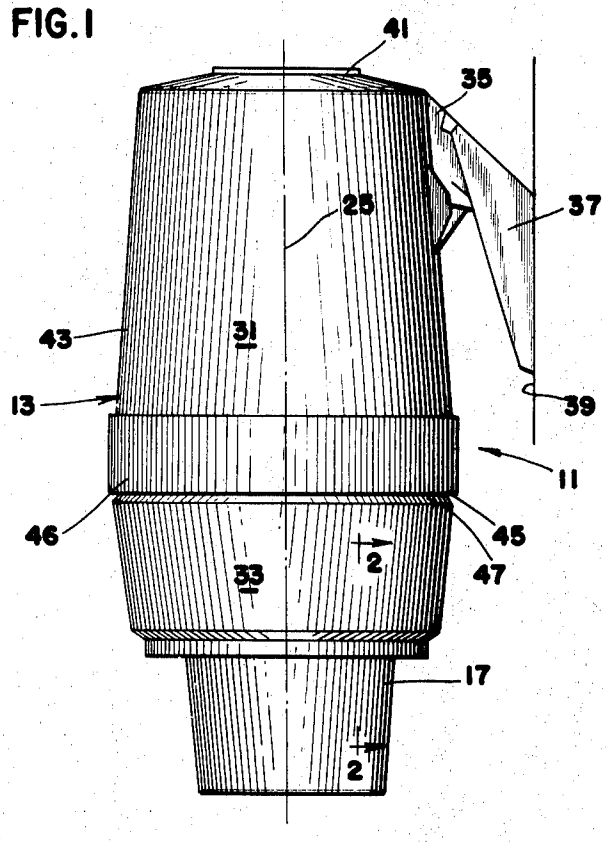


FIG. 3

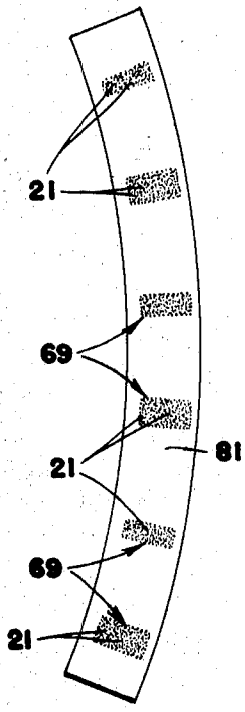
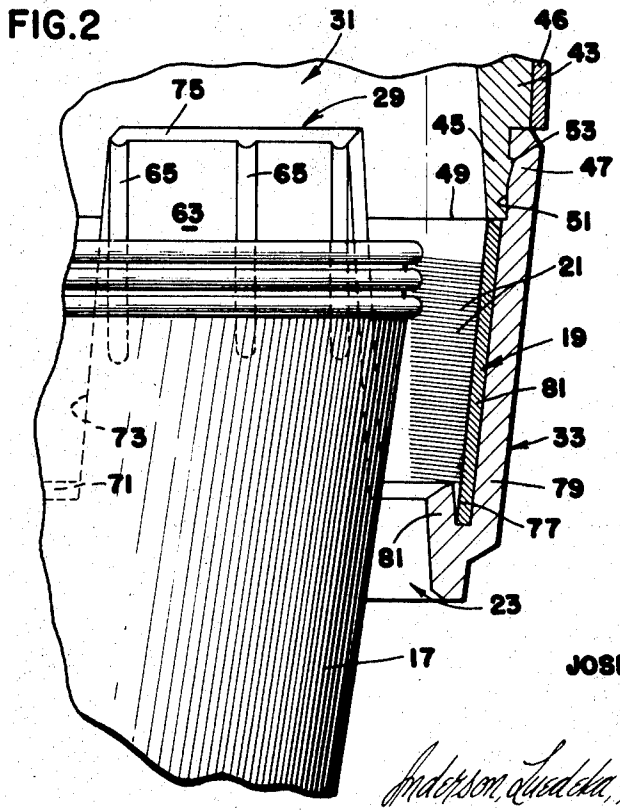


FIG. 2



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FIG.4

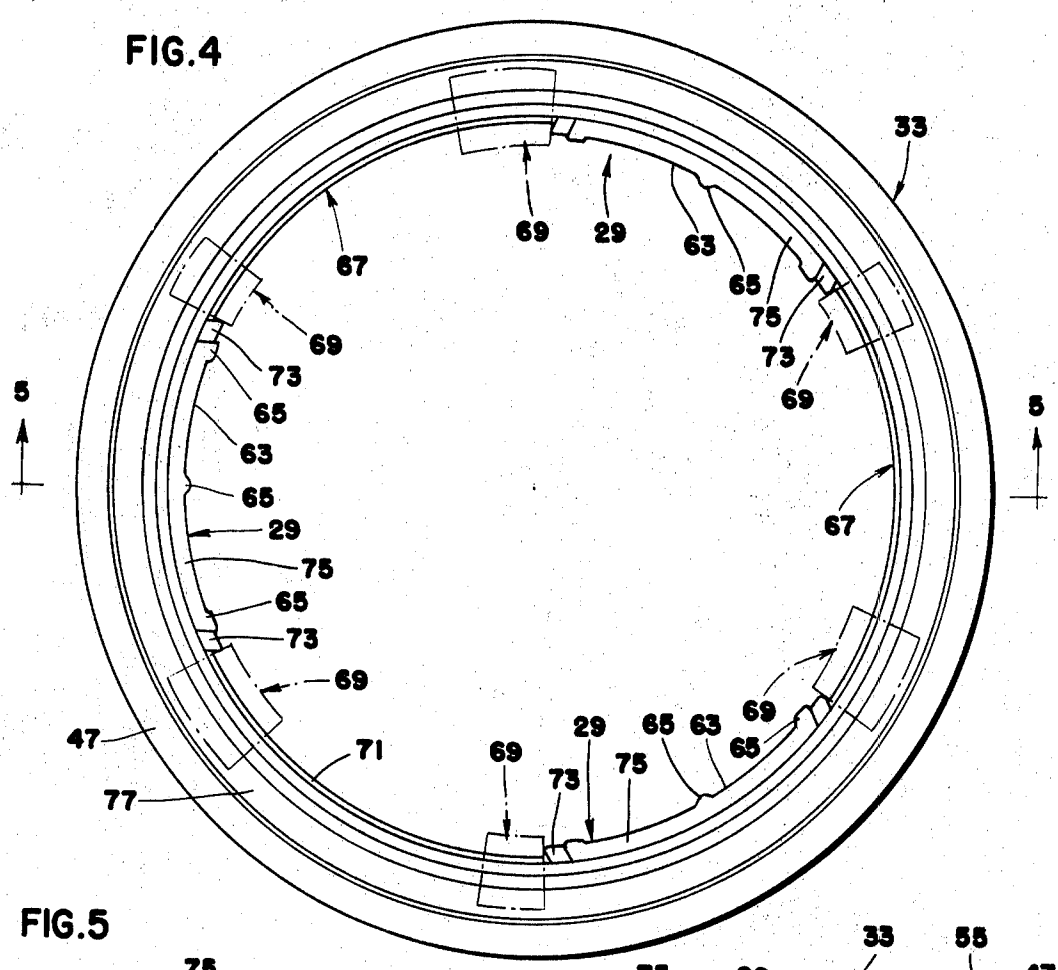
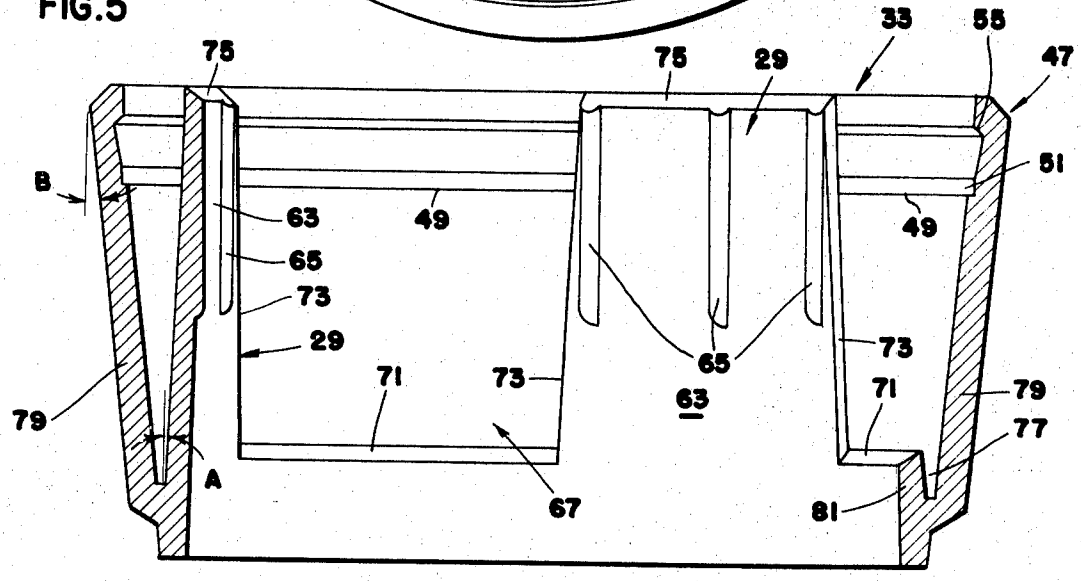


FIG.5



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DISPENSER

This invention relates to a dispenser for a stack of nested articles such as, for example, expendable drinking cups which may be removed one at a time from the stack in the dispenser and, more particularly, to a dispenser having flexible bristles for supporting the stack of cups and releasing the cups one at a time when pulled from the stack.

The present invention is directed to a cup dispenser of the general kind shown in H. W. Johnson et al. U.S. Pat. No. 3,342,375 in which a housing is formed with a hollow interior with an opening at one end through which cups may be removed. The cups are retained in the dispenser by bristles extending inwardly from an inner wall of the housing toward the cup stack with the inner ends of the bristles engaging and projecting between rims of adjacent cups and causing the cups to separate as the cups are removed one at a time from the stack. The flexibility of the bristles permits ready removal of cups without distorting the mouth of the cup during the removal thereof. This is in contrast to some of the prior art dispensers having spring loads, knobs, shoulders or the like which tended to pinch the mouth of the cup out of round.

When filling the dispenser, the cups are inserted through an open end thereof into the longitudinally extending hollow interior of the housing and it sometimes occurs that a careless insertion of the stack results in the stack being inclined at an angle to the longitudinal axis of the dispenser. On the other hand, cups in the dispenser and adjacent the bottom of the stack may become tilted within the housing due to a person's grasping and pulling of a previously dispensed cup at an angle to the longitudinal axis of the dispenser. As the bristles have insufficient strength to center the stack, the cups will remain tipped or inclined to the axis.

Accordingly, a general object of the invention is to center a stack of nested cups substantially on the longitudinal axis of a dispenser of the foregoing kind.

Other objects and advantages of the invention will become apparent from the detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a side elevational view of a dispenser embodying the invention;

FIG. 2 is a fragmentary, enlarged sectional view taken substantially along the line 2–2 of FIG. 1;

FIG. 3 is a layout view of a retaining strip having bristles thereon for use in the dispenser of FIG. 1;

FIG. 4 is an enlarged plan view of a portion of the housing having means for guiding the stack of cups; and

FIG. 5 is a cross-sectional view taken along the line 5–5 of FIG. 4.

As shown in the drawings for purposes of illustration, the invention is embodied in a dispenser 11 having an elongated housing 13 with a hollow interior for receiving a stack 15 (FIG. 2) of nested cups 17 which are removed one at a time by pulling lowermost cup past a retaining means 19 including flexible bristles 21 extending radially inward to engage the cups adjacent the rims thereof. In this instance, the nested cups are inserted through a bottom open end 23 of the housing and are guided for movement upwardly to a position in which a longitudinally extending axis through the center of the stack is substantially aligned on a longitudinally extending axis 25 for the dispenser. The cups at the bottom of the stack are also held and guided against turning to a tilted position in which the lowermost cup or cups have their respective longitudinal axes disposed angularly relative to the dispenser axis 25. To accomplish these alignments, the dispenser is provided with guide means in the form of angularly spaced, longitudinally extending ribs 29 which are arranged to define a guiding surface having a diameter slightly greater than the diameter of the cup rim. The guiding ribs 29 are interspersed with the bristles 21 and cooperate therewith in assuring a one at a time and easy separation of cups from each other and from the dispenser.

Referring now in greater detail to the individual elements comprising the illustrated dispenser, the housing 11 is formed

with an upper cylinder 31 and a lower cylinder 33 which are molded of a plastic material such as polyethylene or polypropylene. Integrally formed on the outer surface of the upper cylinder is an outwardly extending connector 35 which is releasably fastened to a bracket 37 which may be mounted on a suitable support such as a wall 39. In this instance, the dispenser 11 is spaced slightly outward from the wall 39 with its longitudinal axis disposed substantially vertically. The upper cylinder has a closed top wall 41 joined to a generally cylindrical side wall 43 which tapers downwardly and outwardly towards a lower, open end 45 joined to the lower cylinder. A decorative band 50 may be secured about the end 45 of the upper cylinder above the lip 47 of the lower cylinder. This lower end 45 of the top cylinder is disposed inwardly of an upper lip 47 of the lower cylinder and abuts the latter at a horizontally disposed, annular shoulder 49 and vertically disposed ring wall 51.

The upper cylinder 31 has a snap fit interlock with the lower cylinder 33 to hold the housing cylinders against separation. For this purpose, the upper cylinder 31 is provided with an annular extending and outwardly projecting ring 53 which is adapted to fit into a complementary shaped, inwardly facing and annularly extending groove 55 (FIG. 5) formed in the lip 43 of the lower cylinder. The cylinder walls are sufficiently thin and flexible at these mating portions to permit the contraction of one and the expansion of the other when joining the cylinders together. If desired, a suitable adhesive or bonding agent may be used to join the upper and lower cylinders permanently together.

To guide a series of cups rather than only a single cup, the guide means is formed with ribs 29 having an appreciable vertical extent from a location about midway of the bristles to an equal or greater height above the bristles. Herein, the guiding means includes three guiding ribs 29 spaced angularly at 120° from each other and equidistantly from the longitudinal axis of the lower cylinder 33. In this instance, the guiding ribs are integrally attached at the lower ends thereof to a bottom end 61, as best seen in FIGS. 2 and 5, of the lower cylinder. Each of the longitudinally extending guiding ribs 29 is inclined inwardly at a slight angle, e.g. 2°, to the vertical and is arcuately formed within an inner curved surface 63 on the upper half of which are vertically extending projections 65 extending radially inward from the curved surface 63 to abut the rim on a cup being turned toward it. Between the guiding ribs are spaced windows or openings 67 each of which is adapted to accommodate two groups 69 of bristles 21 which project inwardly beyond the circumferential surface of the guiding ribs. The openings 67 are defined by a lower wall 71 and upwardly converging sidewalls 73 for the guiding ribs 29. These converging sidewalls 73 terminate at a top wall 75 for the guiding rib 29. These top walls 75 are slanted downwardly and inwardly toward the axis 25 at about 30° to facilitate a cup rim sliding therealong should a cup rim engage it.

The lower cylinder 33 also serves to support and hold the retaining means 19 in an annular groove or seat 77 formed between its outer wall 79 and a smaller diameter inner wall 81 located adjacent the bottom of the lower cylinder 33. The cylinder outer wall 79 is inclined at angle B of about 6° to the vertical in this instance.

The preferred bristles are made of a plastic material such as polyethylene or polypropylene and are conveniently supported in clusters 69 on a bandlike supporting strip 81. The preferred band itself is a curved strip of plastic material with the bristles integrally formed therewith by molding techniques well known in the art. Due to the curvature of the strip, as best shown in FIG. 3, the band is shaped into a truncated cone when inserted into the seat 77 and disposed between the guiding ribs 29 and the outer wall 79 of the lower cylinder.

The action of the bristles 26 with respect to the cup rims is best understood in relationship to the illustration of FIG. 2 in which a stack of cups is shown inserted into the interior of the dispenser with the bristles resiliently engaging the cup at and about the cup rims to retain the stack in position. The lower-

most cup can be removed from the stack and the dispenser by grasping and pulling it downwardly. As it is pulled downwardly, its rim riffles the bristles **26** beneath it and this removal operation causes the next above cup to separate slightly from the cups thereabove. That is, the resilient bristles snap into the space between the rims as shown in FIG. **2** to progressively separate the few lowermost cups for subsequent ready removal from the lowermost cup, as fully described in the aforesaid patent.

As best seen in FIG. **2**, the bristles **26** at the discharge end of the dispenser have progressively decreasing lengths in the downward direction with the lowermost and shortest bristles being less flexible than the longer upper bristles. The inner ends of the bristles terminate at a right circular cylinder of slightly less internal diameter than the external diameter of the cup rim, although the strip **81** carrying the bristles **21** is shaped as a truncated cone when seated in the seat **77**.

The more flexible, longer bristles at the top edge of the strip will snap into the space between the cup rims causing the cups to separate slightly before reaching the lowermost position for removal from the dispenser. This slight separation prior to removal assures that only a single cup is removed when the lowermost cup is gripped and pulled downwardly in the usual manner. It is to be understood that since the bristles **26** project slightly under the cup rims and there are a great number of them, a considerable portion of which are curved downwardly by the rims, the tendency for them to return to their original shape provides sufficient support for the stack of the cups, yet permits comparatively easy removal for the lowermost cup regardless whether the stack of cups is a full stack or only a few. Also, it is to be understood that the bristles are sufficiently stiff to support the stack and yet sufficiently resilient to permit individual removal of cups without distorting the cup rims permanently as in prior art dispensers having solid projections engaging under the cup rims. As the guiding ribs **29** limit the tilting of the cups from positions substantially centered on the longitudinally extending axis **25**, the cups are substantially centered and equally supported on bristles **26** and may be readily pulled one at a time from the dispenser without exerting an unusual pulling force which could damage the cup.

While a preferred embodiment has been shown and described, it will be understood that there is no intent to limit the invention by such disclosure but, rather, it is intended to cover all modifications and alternate constructions falling within the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A dispenser for receiving a stack of nested cups and for dispensing the cups one at a time, said cups having a rim at the top edge thereof of a predetermined diameter, said dispenser comprising an elongated housing having a hollow interior to receive the stack of nested cups and having an axis extending longitudinally of said housing, cup retaining means including a plurality of bristles disposed in said hollow interior of said housing adjacent the bottom thereof and projecting radially inwardly and defining at the inner ends thereof an opening having a diameter smaller than the diameter of said cup rim so that the bristles project to engage said cup rims and support the stack of nested cups, said inner ends of bristles being arranged substantially circumferentially disposed about the longitudinal axis of said housing means and being sufficiently stiff to support said stack of cups by engaging the rims of each of the lowermost cups of the stack and resilient to snap in the space of the adjacent cups when a bottom cup is removed from the stack, and guide means in said housing operatively associated with said bristles to maintain said stack substantially centered on said longitudinal axis so that said individual cups are centered for dispensing movement.

2. A dispenser in accordance with claim **1** in which said bristles are formed in groups spaced about the interior of said housing and in which said guide means includes longitudinally extending guide ribs disposed in the spaces between said bristol groups.

3. A dispenser in accordance with claim **2** in which said longitudinally extending guide ribs are integrally formed on said housing and project radially inward toward the longitudinal axis of said housing.

4. A dispenser in accordance with claim **3** in which said guide ribs are integrally attached to said housing adjacent the bottom thereof and extend upwardly and inwardly therefrom to define a seat in the housing, and in which said cup retaining means includes a retaining strip to which said bristles are fastened, said retaining strip being seated in said seat between said guide ribs and said housing wall.

5. A dispenser for receiving a stack of nested cups and for dispensing the cups one at a time, the cups having a rim at the top edge thereof with a predetermined diameter, said dispenser comprising an elongated housing having a hollow interior to receive the stack of nested cups and having an axis extending longitudinally of said housing, said housing having an opening at the lower end thereof through which cups may be discharged, cup retaining means including a plurality of bristles disposed in said hollow interior of said housing adjacent the said lower end, said bristles projecting radially inwardly and defining at the ends thereof a surface having a diameter smaller than the diameter of said cup rim so that the bristles project to engage said cup rims and support the stack of nested cups, said bristles being formed in groups spaced angularly about the interior of said housing and being sufficiently stiff to support said stack of cups by engaging the rims of each of the lowermost cups of the stack and sufficiently resilient to snap in the space between adjacent cups when the bottom cup is removed from the stack, and a series of guide ribs integrally formed in said housing and spaced angularly about said housing and projecting radially inward to define a surface having an internal diameter slightly larger than said outer diameter of said rims of said cups, said groups of bristles projecting inwardly into spaces intermediate said guide ribs for engagement with said cups so that cups being tilted relative to said longitudinal axis may engage said guide ribs to remain substantially in alignment with said longitudinal axis of said housing.

6. A dispenser in accordance with claim **5** in which means are provided to join said guide ribs to said housing at a position located downwardly from said bristles and in which said guide ribs project upwardly and inwardly from said means to said guide surface having an internal diameter slightly larger than said diameter of cup rims.