Aug. 1, 1961 A. A. TOBIAS 2,994,420

CUP GUIDING AND POSITIONING MEANS

Filed Nov. 8, 1957 2 Sheets-Sheet 1

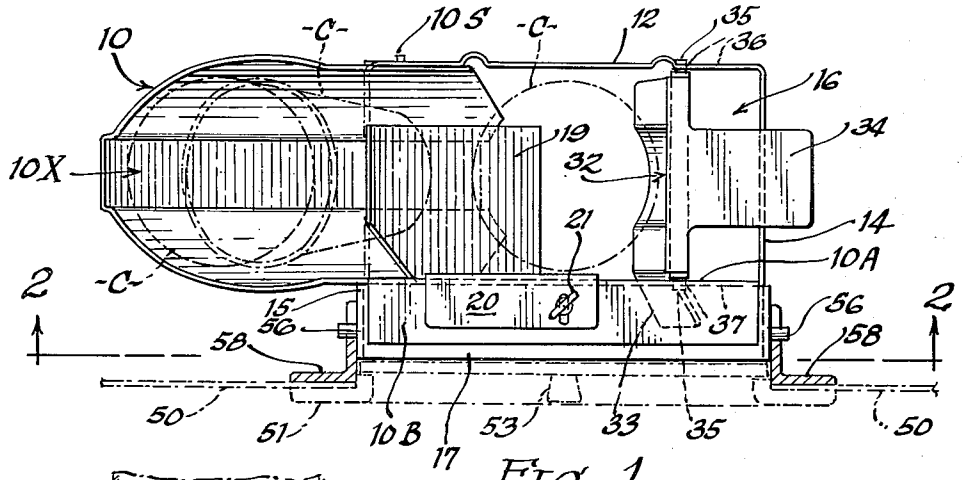


FIG. 1

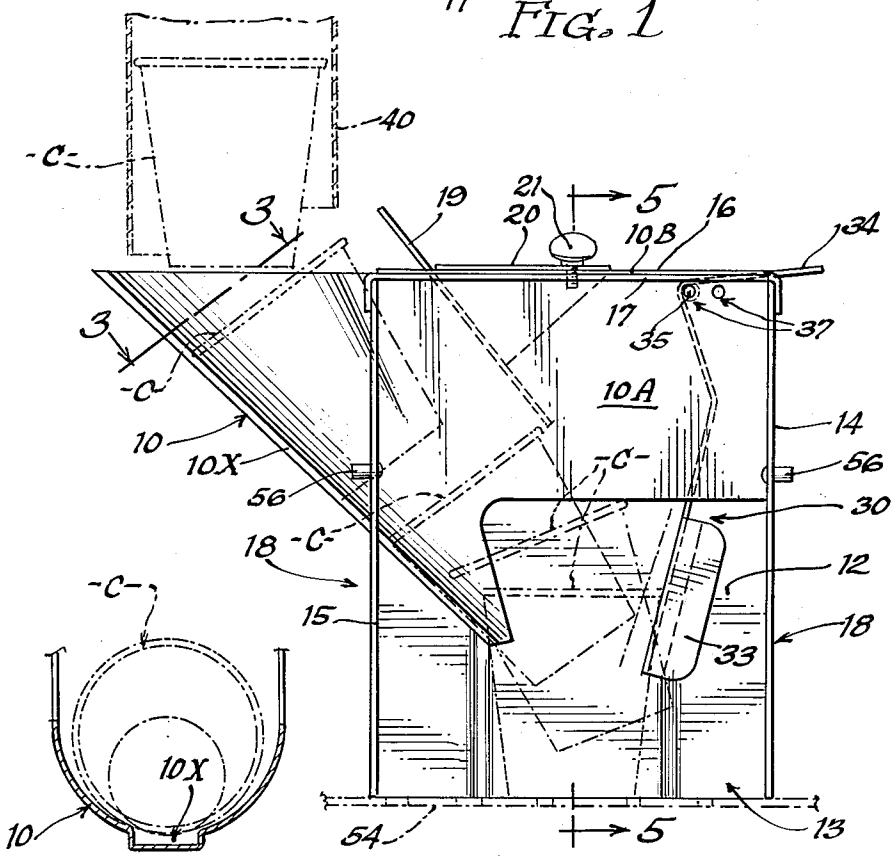


FIG. 2

FIG. 3

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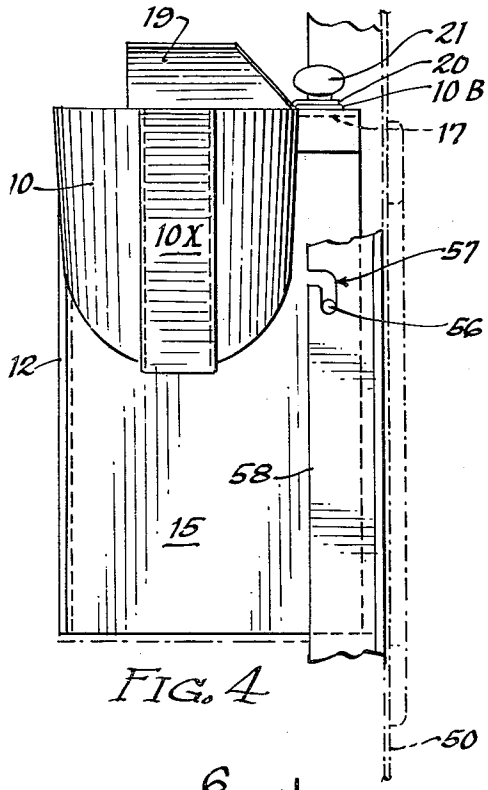


FIG. 4

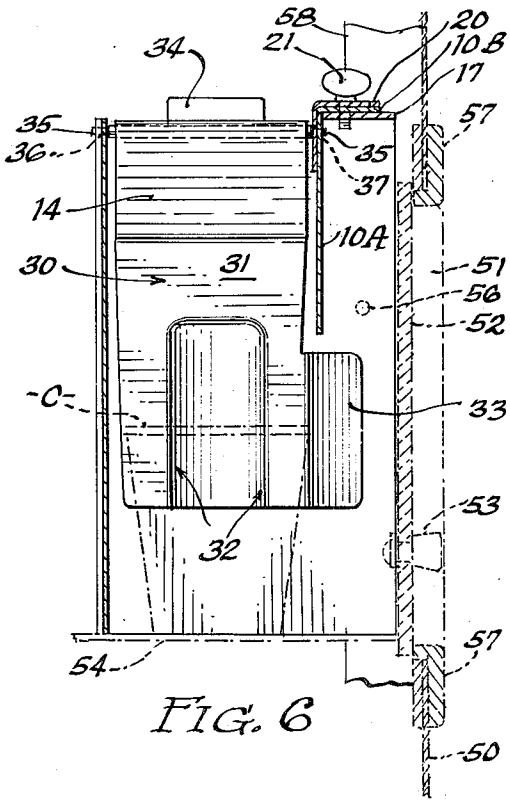


FIG. 6

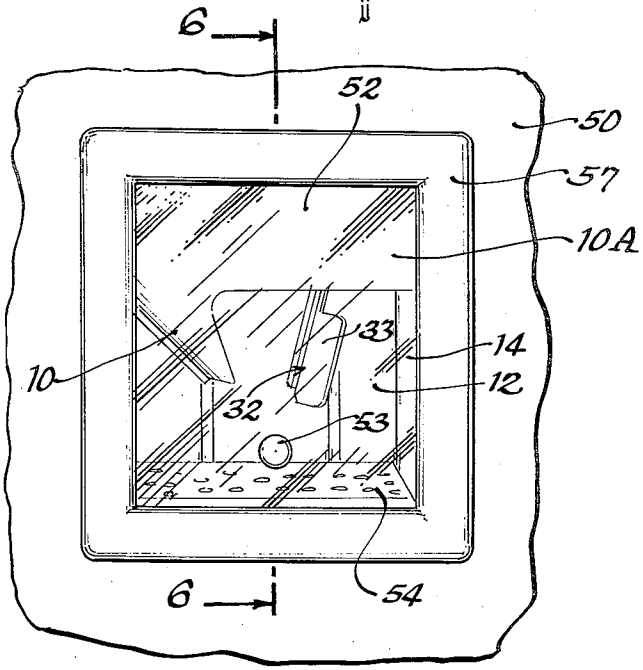


FIG. 5

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CUP GUIDING AND POSITIONING MEANS

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The disclosure provides an improved cup guiding and seating unit for use in beverage dispensing machines and the like employing paper cups which are automatically released one at a time from a cup dispensing mechanism and caused to gravitate into a position at which they will thereupon receive a measured quantity of a soft drink or the like by automatic action of some form of beverage dispensing apparatus, and also in such position be accessible, when filled, for removal by the patron of the machine.

Various types of cup-delivery chute are known in the art, and all of the gravity feed variety employ some form of seating or locating means at the terminal position at which the cup comes to rest in readiness for the filling operation. Commonly, such devices employ an abutment which is struck by the descending cup and is placed to arrest the cup in an upright position beneath the filling spigot.

Such prior devices do not absorb the terminal energy of the descending cups, and while the latter are relatively light in weight, care must be exercised in designing and installing the prior types of cup stop to avoid improper position of the cup relative to the beverage dispensing means.

Many beverage vending machines are adjustable to deliver several sizes (i.e. volumes) of beverage, for instance a six-ounce or eight-ounce cola drink or carbonated flavor drink, and in such machines it is usually necessary to change the cup seating means entirely to accommodate a different size of drink for a particular installation or location, and this in turn may entail not only the labor of making the change, but also the necessity for an inventory of different sizes of cup seat and the tools for making the same.

Accordingly, it is the principal object of the present invention to provide a combination cup guide and seating means which is consistently positive in its operation to direct a released cup into proper upright condition at the dispensing position, and which has a simple cup-stopping means easily adjustable to accommodate different sizes of cups, and which has the further characteristic of acting to absorb energy from the arrested cup.

It is a further object to provide a cup guiding chute having a bottom channel in which circular portions of the cup ride as though on rails for stabilizing the descent of the cup into engagement with the movable seating and stopping means, so that the cups will be accurately and consistently spotted or positioned relative to the dispensing spigot.

More detailed objects and advantages of the device will become apparent as the following description proceeds in view of the annexed drawings, in which:

FIG. 1 is a top plan view of the new cup guide and seating device with portions of a vending machine cabinet shown in dotted lines;

FIG. 2 is a front vertical section of the same looking in the direction of lines 2—2 of FIG. 1;

FIG. 3 is an oblique sectional detail of the chute section of the same looking along lines 3—3 of FIG. 2;

FIG. 4 is a side elevation of the structure shown in FIG. 1;

FIG. 5 is a fragmentary front elevational view of a vending machine cabinet and the cup access door with

the new cup guide and seating means therebehind, the structure shown corresponding generally to that shown in FIGS. 1 and 4;

FIG. 6 is a vertical section taken along lines 6—6 of FIG. 5.

Referring to FIG. 2, which shows the new unit in front elevation, the same consists of an inclined cup slide or chute section 10 secured by means of an offset flange portion 10A thereof resting on a strap 17 secured across the top of an upstanding compartment or enclosure section generally indicated at 18, the latter having a closed backwall 12, an open bottom 13, and opposite side walls 14 and 15, together with a top portion 16 which is substantially open except for the aforesaid narrow strap 17 and a deflector 19.

The chute section 10 (FIG. 3) is mainly curvilinear in cross section, but has along its bottom a gutter or channel 10X which is rectangular in cross section with parallel opposite margins and of such depth that a portion of both the top rim and the bottom periphery of a paper cup C will fit therein, with the result that the descending cup is guided in a straight path downwardly owing to the fact that the curved top and bottom rims each engage the opposite parallel margins of said gutter and ride the same as though on rails, whereby the cup is prevented from bouncing, rolling or jogging sidewise in its downward course without being substantially retarded, the various stages of descent being depicted in dotted lines in FIG. 2 following initial release of the cup from the discharge throat 40 of any suitable cup dispenser (not further illustrated).

An inclined deflector plate or apron 19 (FIGS. 1 and 2), having an offset mounting flange 20 fitted down upon the chute flange 10A and strap 11, is positioned above the chute 10 to prevent any upward bouncing resulting from the initial discharge of the cups from the cup dispenser. The mounting flanges of both the deflector 19 and chute 10 are secured to the compartment strap 17 by a thumb screw 21; but the chute section is additionally stabilized by means of a stud 10S (FIG. 1) on a side thereof engaging in a seating aperture in the rear wall 12 of the compartment.

An important feature of the improvement resides in the provision of a dynamically-balanced swinging cup stop and energy-absorbing means in the form of a plate member 30 (FIG. 2), seen partially in dotted lines, having a lower face portion 31 (FIG. 6) constituting a cup-engaging stop or contact area in the center of which is a concavity 32 to engage and receive the rim portion of a cup C, together with an offset wing 33 which lies toward the final exit path of the cup, as will appear.

The swing stop 30 at its upper end has a further counterbalancing offset or wing 34 (FIGS. 1 and 2) which lies on the opposite side of a pivot member 35 spot welded into the angle formed by said offset.

The opposite ends of the pivot 35 are seated respectively in one of several selectable pairs of pivot holes 36—37 situated in the rear wall 12 and the mounting-extension or wing 10A of of the chute.

The manner in which the new device is employed in a typical beverage vending machine is illustrated in FIG. 5, which shows an outside portion 50 of the front door or wall of such a machine in which there is a dispensing opening ornamented by a frame 51 and normally closed by a clear plastic drop panel 52 which the patron raises by manipulation of knob 53.

Behind the dispensing door is a perforated drain panel 54, constituting a floor upon which the dropped cup will ultimately rest and which removes any beverage overflow or spillage in known manner, the novel cup guiding and stopping unit being positioned securely relative to the drain panel by means of opposite mounting studs 56

(FIGS. 1, 2, and 4) projecting from the side walls **14** and **15** thereof and each adapted to seat in an offset slot **57** (FIG. 4) formed in angle brackets **58** (FIG. 1) secured on the machine wall **50** at the rear of the dispensing window.

The operation of the cup guide and positioning or stopping means is such that normally the positioning stop means **30—35** hangs balanced pendantly at rest as in FIG. 5 in spaced relation opposite the lower discharge or terminal end of the chute means **10—10X**.

When the cup-dispensing mechanism is actuated and releases a cup C from the outlet **40** (FIG. 2) such cup will gravitate into chute **10** with the top and bottom arcuate edge portions thereof riding down into the wide bottom channel or groove portions **10X** so that the two opposite parallel margins of this channel serve as rails to keep the cup bedded and moving in a straight line toward the lower terminus of said chute; and as the bottom portion of the cup moves from said terminus into space, it will strike the lower face portion **31** of the swinging stop and more particularly the concave portion **32** thereof and impart sufficient of its kinetic energy to the stop to swing the latter toward the right (FIGS. 2 and 5) and the cup, guided by said concave portion **32** and urged by reaction of the stop, will abruptly drop almost vertically into a final, consistently uniform, upright, position on the drain **54** in readiness to receive a measured quantity of beverage from a known type of dispenser (not shown).

While the newly positioned cup undergoes the filling operation aforesaid, the lower part of the swing stop bears lightly against the cup which is now trapped between said part of the stop and the lower end of the chute and thereby steadied during such filling operations.

When the cup is full, the patron of the machine will lift the transparent drop door **52** and exert a slight hand pressure against the side wing **33** of the swinging stop to move the latter easily toward the right and withdraw the full cup. However, if such a displacement of the stop by pressure on wing **33** is not effected, but instead the lower part of the cup is seized directly and the cup pulled straight out, the curved upper rim of the cup acting against the curvature of the concavity **33** on the stop will cam the latter easily out of the way so that the same easy withdrawal may be effected in this manner.

While the paper cups are ordinarily quite light in weight, they can acquire sufficient momentum upon release from the cup dispenser to bounce and jump out of their intended line of travel when guided by prior types of chute, and various expediencies have been resorted to in such constructions to prevent jamming and improper positioning due to such causes and related irregularities in automatic cup delivery. The disclosed channelized chute means **10—10X** achieves consistently accurate and uniform delivery of the cups to the drop-off end of the chute; and the cooperative swinging and dynamically balanced stop and positioning device **30—35** finally settles the cup in the required filling or utilization position, absorbing excess cup energy in the operation, and releasably holding the cup in place during the filling operation and until removed manually.

I claim:

1. A cup guiding and positioning means comprising a downwardly inclined cup chute adapted to receive a downwardly-moving cup at its upper end and to discharge the cup bottom foremost from the lower end of said chute into space above a desired position of rest at which the cup must stand upright; and a combination stop and positioning means including a stop member mounted opposite said lower chute end for movement toward and away from the latter, and presenting a contact area spaced away from said end, in the direction of cup travel, to be struck by said cup bottom, and further having such a moment of inertia as to absorb energy from the cup and yield away from said end of the chute whilst guiding the movement of the cup downwardly into an upright position of complete rest at said desired position; and means acting on said stop member yieldingly urging the same toward said chute end into a predetermined normal position spaced as aforesaid from said end a distance sufficient to cause the same to bear against said positioned cup with the latter substantially against said chute end to further but releasably locate the cup in said desired position.

2. Apparatus according to claim 1 in which said stop is a pivotally mounted member with its pivotal axis above said chute end and said urging means is a counter-balance attached thereto on a side of its pivotal axis opposite from the part of the stop which is engaged by, and engages, the cup.

3. Apparatus according to claim 2 in which said cup-engaging part of the stop has a concavity directing the engaged part of said cup toward said desired position.

4. Apparatus according to claim 1 in which said chute is adapted to receive cups having substantially round top and bottom portions, and the bottom of said chute has a lengthwise channel therein of a width such that the curvatures of said top and bottom portions may seat therein to ride on the opposite lengthwise margins of the channel as guiding rails to keep the descent of the cup straight.

5. In a cup guiding unit, a downwardly inclined chute means adapted to receive dispensed cups and direct same from an end thereof for discharge into space toward a predetermined location; and a pendant swinging stop and means mounting the same opposite said end and said location to swing about a horizontal axis toward and away from said end and location in the direction of cup discharge and normally gravitating to a normal position of rest to be engaged by the bottom of a cup directed by the chute means as aforesaid and guide and maintain the cup into upright position cooperably with said chute.

6. In a cup delivery apparatus, means for guiding and discharging a cup gravitatingly into space toward a utilization position at which the cup is to stand upright; and an energy-absorbing stop and positioning means in juxtaposition to said position comprising a stop pendulum counterbalanced to move toward and away from the position in the direction of movement of said cup into space and having a wide apron portion located in spaced confrontation to the discharge terminus of said guiding means to be struck by the cup and to yield in said direction of movement thereof and to react against the cup to arrest the same and urge it onto said position.

7. A drop chute for supportably guiding cups having an exterior surface which is curvilinear crosswise of the length at least in the region of one end thereof, said chute comprising a major trough portion which is curved transversely to receive said cups loosely therein and inclined to receive said cups for support therein to gravitate down the same; said major trough portion having a bottom wall with another but smaller trough portion formed therein and extending lengthwise of the major trough portion but of lesser depth and lateral width and having opposite, parallel side margins defined along the conjunction of said margins with the bottom of the major trough portion to serve as a pair of rail surfaces, said lateral width of the smaller trough portion relative to the radius of curvature of said curvilinear cup portions being such that said rail margins are engaged by curvilinear portion of the cup at substantially angularly spaced-apart points on the arc of curvature thereof such that said cups are supported at these points, at least, for gliding movement down the major trough portion as though on rails whereby the travel of the cups is straight and wobble is eliminated.

8. A chute for guidedly supporting rounded paper cups from an upper to a lower level and preventing any substantial sidewise motion and wobble of such cups during transit, said chute being curvilinear in cross section and having along a substantial portion of the length of its bottom an integrally formed depression of substantially

uniform width and wide enough to admit between its side margins arcuate portions of the descending cup resting there in such manner that spaced points on the arc of the cup so admitted will engage the opposite parallel side margins of said depression whereby to constrain the travel of the cup in the direction of its length along a line corresponding to the mid-line of the depression.

9. In a paper cup handling device of the class described, a guide for cups which have at least one curvilinear margin lying in a plane which is generally transverse to the length of the cup, said guide comprising a downwardly-inclined chute body wide enough to freely receive said cup to lie lengthwise therein and having a similarly-directed integral depression formed along the bottom

thereof and comprising a narrower trough with opposite side margins spaced to a width such that said curvilinear margin of the cup spans the trough and rides on said opposite margins thereof for stabilizing guidance thereby to direct the cup in a substantially straight gravitating path down the chute.

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