

Sept. 13, 1966

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3,272,399

DISPENSER FOR FLUENT MATERIALS

Filed Oct. 27, 1964

2 Sheets-Sheet 1

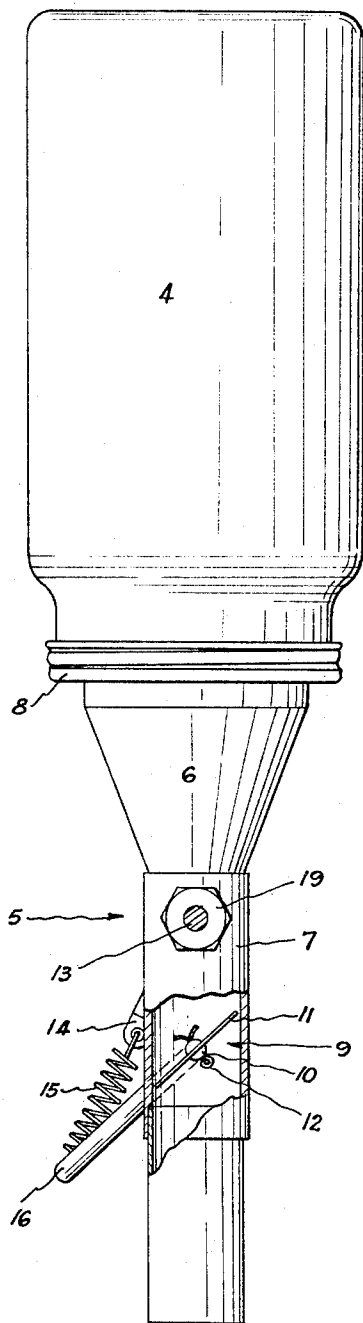


FIG. 1.

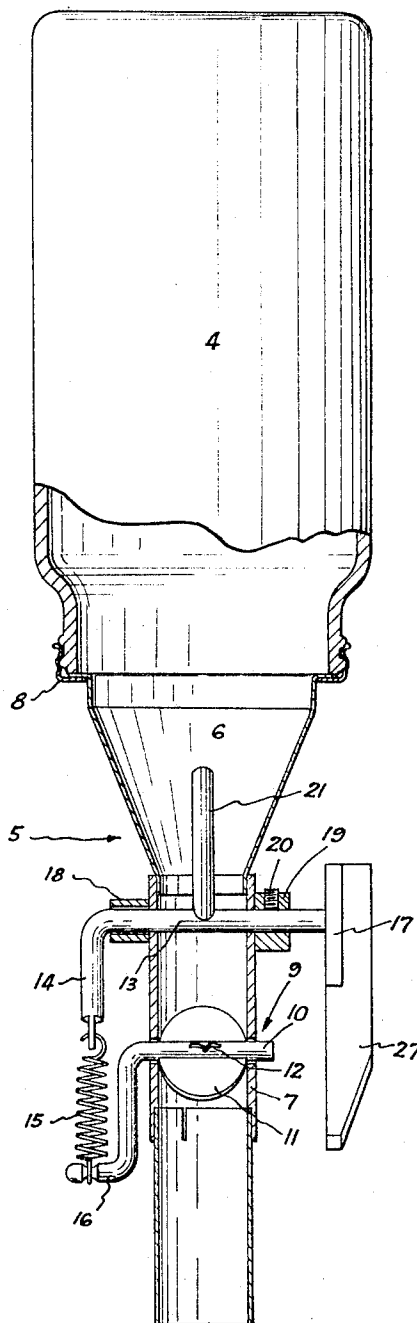


FIG. 2.

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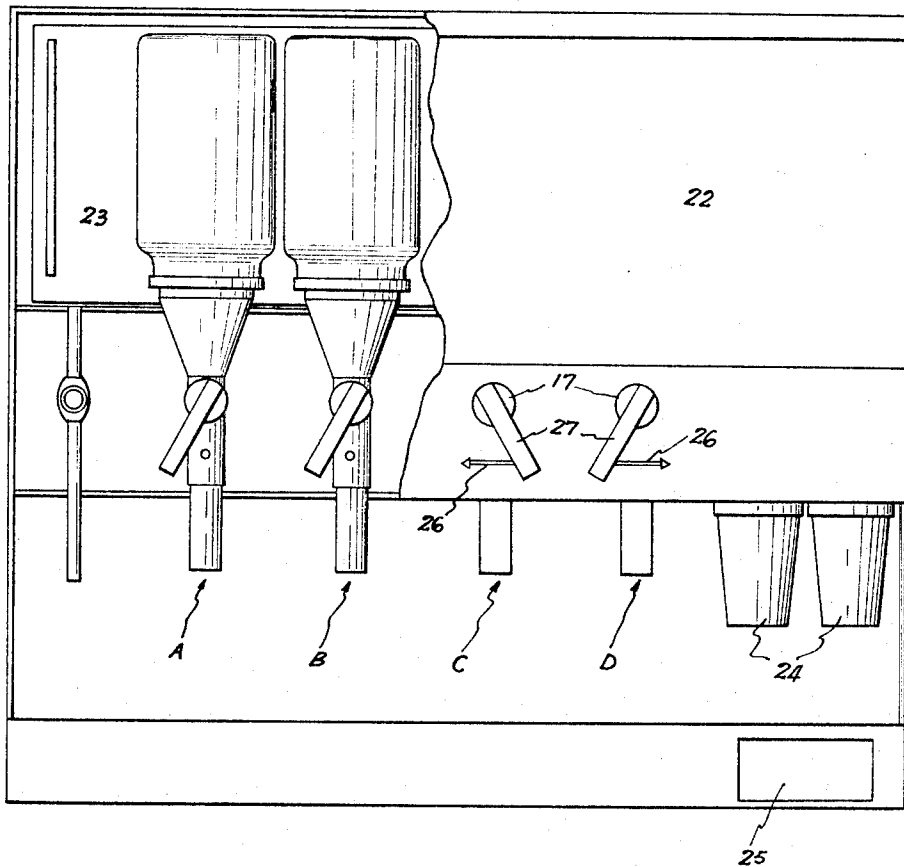


FIG. 3.

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DISPENSER FOR FLUENT MATERIALS

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Filed Oct. 27, 1964, Ser. No. 406,793

Claims priority, application Australia, Nov. 12, 1963,

37,558/63

10 Claims. (Cl. 222-232)

This invention relates to the supply of predetermined quantities of pourable or fluent materials from a bulk supply thereof.

The invention was devised principally, but not exclusively, for dispensing serve-sized quantities of powdered coffee, sugar and other powdered or granular ingredients of beverages, and it is primarily described hereinafter as applied to that purpose.

According to the invention a dispenser is provided for a fluent material comprising a container, a material outlet neck extending downwardly from said container, a butterfly valve in said neck comprising a spindle piercing the neck and a valve vane thereon, and valve operating means adapted to shift said butterfly valve rapidly from one closed position through an intermediate open position to another closed position.

Many powdered or granular foodstuffs are hygroscopic and some (for example, powdered coffee) will absorb sufficient moisture from the atmosphere to convert the powdered material into a partially liquefied or sticky mass. It is important, therefore, to keep such materials in a relatively tightly sealed container.

With the foregoing in mind preferred embodiments of the invention are characterised by a butterfly valve which in either of its closed positions bears positively against the neck along the entire periphery of the valve vane.

Thus, preferred embodiments of the invention are characterised in that the boundary of the neck cross-section, taken on the transverse cross-sectional plane in which the valve spindle lies, does not include appreciable portions perpendicular to the spindle, in that the width of said cross section, when measured in directions parallel to the spindle, progressively decreases as the distance from the spindle increases, in that the cross-section of the neck is constant throughout the portion of the neck surrounding the valve, and in that the valve vane is the shape of an oblique-section through said portion taken on an oblique-sectional plane in which the valve spindle lies.

For example, the neck may have a circular cross-section with a valve spindle extending diametrically thereof and the valve vane may be an ellipse. Then again, the neck may have a square cross-section with the valve spindle extending diagonally thereof and the valve vane may be "diamond" shaped with the diagonal perpendicular to the spindle longer than the diagonal coincident with the spindle. It will be appreciated that many other neck cross-section and corresponding vane shapes are possible which fulfill the above described characterisation.

By way of example, a dispenser according to the invention and a beverage dispensing unit including a plurality of those dispensers are described hereinafter with reference to the accompanying drawings.

FIG. 1 is a partly sectioned front elevation of a dispenser according to the invention.

FIG. 2 is a partly sectioned side elevation of the dispenser of FIG. 1.

FIG. 3 is a front elevation of a beverage dispensing unit with portion of its cabinet cut away to disclose the interior.

The embodiment of the invention illustrated by FIGS. 1 and 2 comprises a container in the form of an inverted,

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wide-mouthed glass jar 4 having a stainless steel or other metal or plastics outlet neck 5.

The neck 5 comprises an upper conical portion 6 tapering downwardly to a lower cylindrical or tubular spout 7. The neck 5 may be screw-connected to the mouth of the jar 4, or may be clamped in position by an annular nut 8 or other conventional means.

The tubular spout 7 has a butterfly valve 9 in it. That valve comprises a horizontal valve spindle 10 extending through the spout 7 and intersecting the longitudinal axis thereof, and an elliptical valve vanes 11. The valve vane 11 is fixed to the spindle 10 in conventional manner. For example, the vane 11 may be inserted into a longitudinally extending slot in the spindle 11 and retained in that slot by means of a split pin 12. As the vane 11 is elliptical in shape it may block the spout 7 in either of two rest positions wherein the vane 11 bears firmly against the spout walls throughout its entire periphery. When rotated from either rest position to the other the plane of the valve vane 11 momentarily coincides with the spout axis and thus the spout is open to the flow of material during each such change-over from one rest position to the other.

The valve change-over is effected by a high speed snapping operating means of the kind including an operating spring which is stretched and at the same time shifted until its line of action crosses a dead-centre position whereon the spring contracts to move the valve.

For example, a manually rotatable operating shaft 13 may be provided which is parallel to the valve spindle 10 and has a crank-arm 14 thereon directed generally towards the valve spindle 10. The free end of the crank-arm 14 is connected by a stretched tension spring 15 to the free end of a second crank arm 16 on the valve spindle 10 directed generally away from the operating shaft 13.

The operating shaft 13 may, for convenience, be mounted above the valve spindle 10 and may pierce the spout 7 in the same way as the spindle 10. In that event the crank-arms 13 and 16 may be disposed at the respective ends of the spindle 10 and shaft 13 behind the spout 7 and the other end of the operating shaft 13 may have a control knob 17 or handle on it (in front of the spout) to enable it to be manually twisted one way or the other as needed to cause the valve to move from one rest position to the other.

The operating shaft 13 may be restrained from axial movement by collars 18 and 19. Collar 19 is fixed on the shaft 13 by, for example, a grub screw 20.

When the dispenser is to be used for powdered or granular material there is a risk that the material may become compacted in the spout and thus fail to flow to the valve. This may be prevented by means of an agitating rod 21 projecting upwardly, rigidly from the operating shaft 13 into or towards the mouth of the jar 4. As the shaft 13 is twisted, the rod 21 is rocked to or fro; so the material is stirred.

The beverage dispensing unit illustrated by FIG. 3 comprises four dispensers, A, B, C, and D of the kind illustrated by FIGS. 1 and 2 are mounted together in a cabinet 22 to constitute a unit for use in offices, factories, cafeterias, and the like for the preparation of beverages. The illustrated unit may have its four dispensers loaded with coffee powder, "instant" tea powder, dried milk powder and granulated sugar respectively. In the cabinet 22 a thermostatically controlled water heater 23 may be provided to maintain a supply of hot water. That water heater includes a water outlet spout 23A with a push-button control valve 23B. The cabinet 22 may also house one or more magazines of cardboard or plastics cups or mugs 24. The cabinet may include a drawer or recess 25 to store wooden or other spoons.

Thus, all the requisites for the rapid and convenient

preparation of servings of white or black, sweetened or unsweetened, tea or coffee are provided in a single unit.

It will be appreciated that the direction in which the manual control knob of each dispenser has to be turned in any instance may not be obvious (as the direction alternates from operation to operation). With this in mind an escutcheon plate may be provided having a double ended (two-headed) arrow 26 in association with each dispenser. The control knob 17 of each dispenser has an arm 27 or other elements on it which moves with it and obscures one or other end of the relevant arrow 26 depending on the rest position in which the knob is for the time being. The arrangement is such that the unobscured portion of the arrow 26 always indicates the correct direction for the next operation.

In view of the fact that the change over of the valves is effected by a spring contracting rapidly from one set length to another, the total time of operation is substantially constant and small. Thus the quantity of material dispenser depends primarily upon the amount of the material resting on it which is "bitten-off" by the valve disc as it shifts position. This is so as the operation is so rapid that normal gravitational flow while the valve is open is virtually negligible. The amount may be varied as required for different sizes of serve by altering the size of the valve or spout, but more conveniently the valve spindle diameter may be selected to set the quantity.

The unit described above may thus have four identical dispensers therein except for their respective valve spindle diameters.

I claim:

1. A dispenser for fluent materials comprising a container, a material outlet neck extending downwardly from said container, a butterfly valve in said neck comprising a valve vane mounted so as to rotate about an axis piercing said neck, the neck being such that the boundary of the neck cross-section taken on the transverse cross-sectional plane in which said axis lies does not include appreciable portions perpendicular to the axis, such that the width of said cross-section, when measured in directions parallel to said axis, progressively decreases as the distance from the axis increases, and such that the cross-section of the neck is constant throughout the portion of the neck surrounding the valve, and the valve vane having the shape of an oblique section through said neck portion taken on an oblique sectional plane in which said axis lies, and valve operating means adapted to shift said butterfly valve rapidly from one closed position through an intermediate open position to another closed position, said operating means being snap-acting and including an operating spring which may be stretched and at the same time shifted until its line of action crosses a dead center position whereon the spring contracts to move the valve.

2. A dispenser according to claim 1 wherein said neck portion has a circular cross-section and the valve vane is elliptical.

3. A dispenser according to claim 1 wherein said operating means comprise a manually rotatable operating shaft which is substantially parallel to the valve axis, a first crank arm on said operating shaft directed generally towards the valve axis, a second crank arm on the valve extending from said axis and directed generally away from the operating shaft, and a tension spring extending from the free end of the first crank arm to the free end of the second crank arm.

4. A dispenser according to claim 1 wherein an agitator rod projects rigidly from said valve.

5. A dispenser for fluent materials comprising a container, a material outlet neck extending downwardly from said container comprising a conical portion tapering downwardly to a lower cylindrical spout of constant cross-

section, a butterfly valve comprising a vane mounted so as to rotate about an axis piercing said spout which spout completely surrounds said valve, said valve vane having the shape of an oblique section through said neck portion taken on an oblique sectional plane in which said axis lies, and valve operating means adapted to shift said butterfly valve rapidly from one closed position through an intermediate open position to another closed position, said operating means being snap-acting and including an operating spring which may be stretched and at the same time shifted until its line of action crosses a dead center position whereon the spring contracts to move the valve.

6. A dispenser according to claims 5 wherein said operating means comprising a manually rotatable operating shaft which is substantially parallel to the valve axis, a first crank arm on said operating shaft directed generally towards the valve axis, a second crank arm on the valve extending from said axis and directed generally away from the operating shaft, and a tension spring extending from the free end of the first crank arm to the free end of the second crank arm.

7. A dispenser according to claim 5 wherein an agitator rod projects rigidly from said valve.

8. A beverage dispensing unit comprising a cabinet housing a thermostatically controlled water heater and a plurality of dispensers, each said dispenser comprising a container, a material outlet neck extending downwardly from said container, a butterfly valve in said neck comprising a valve vane mounted so as to rotate about an axis piercing said neck, the neck being such that the boundary of the neck cross-section taken on the transverse cross-sectional plane in which said axis lies does not include appreciable portions perpendicular to the axis, such that the width of said cross-section, when measured in directions parallel to said axis, progressively decreases as the distance from the axis increases, and such that the cross-section of the neck is constant throughout the portion of the neck surrounding the valve, and the valve vane having the shape of an oblique section through said neck portion taken on an oblique sectional plane in which said axis lies, and valve operating means adapted to shift said butterfly valve rapidly from one closed position through an intermediate open position to another closed position, said operating means being snap-acting and including an operating spring which may be stretched and at the same time shifted until its line of action crosses a dead center position whereon the spring contracts to move the valve.

9. A unit according to claim 8 wherein the cabinet also houses a magazine of disposable drinking vessels.

10. A unit according to claim 8 wherein the dispenser operating means are operated by means of a control knob disposed in front of an escutcheon plate having a two-headed arrow on it, and wherein said control knob has an arm adapted to cover one head of that arrow when the valve is in one closed position and the other head of that arrow when the valve is in the other closed position such that the unobscured portion of the arrow always indicates the direction the control knob is to be moved for the next required operation.

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