

July 7, 1942.

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2,289,021

COMBINED SEALING CLOSURE AND DISCHARGE MEANS FOR DISPENSING CONTAINERS

Filed May 29, 1940

2 Sheets-Sheet 1

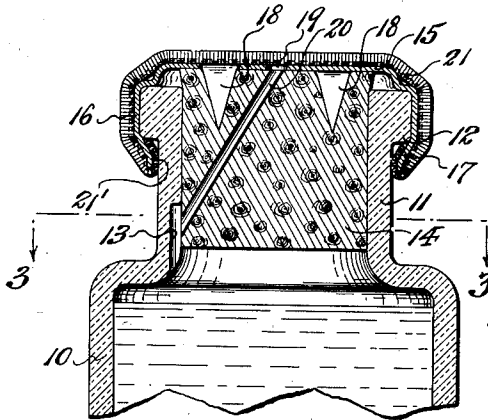


Fig. 1

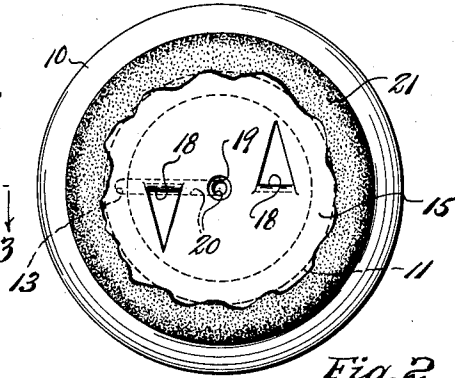


Fig. 2

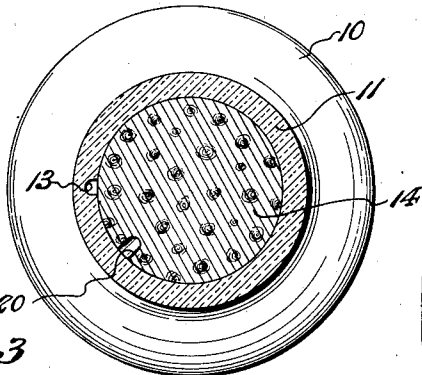


Fig. 3

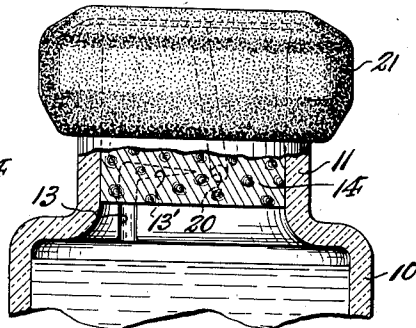


Fig. 4

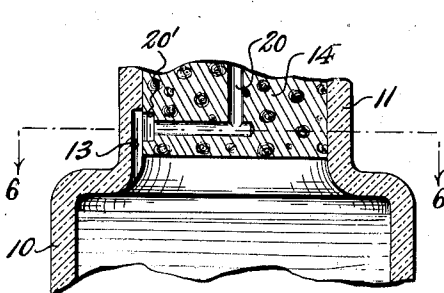


Fig. 5

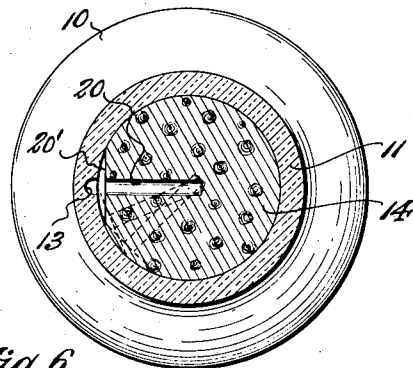


Fig. 6

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2 Sheets-Sheet 2

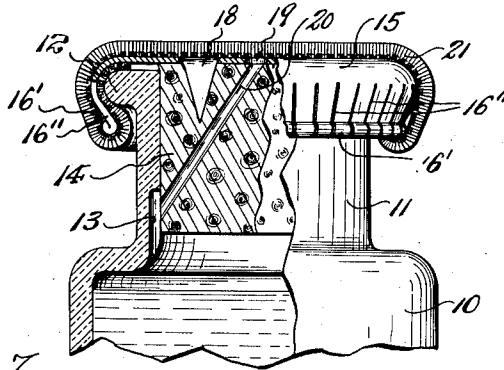


Fig. 7

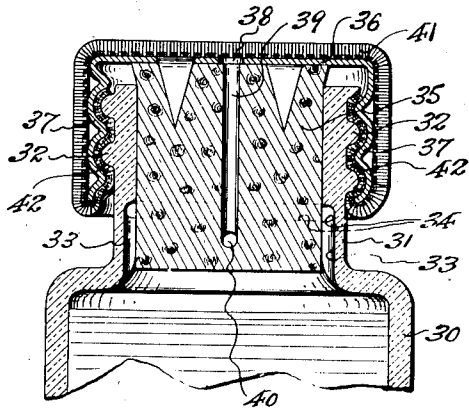


Fig. 8

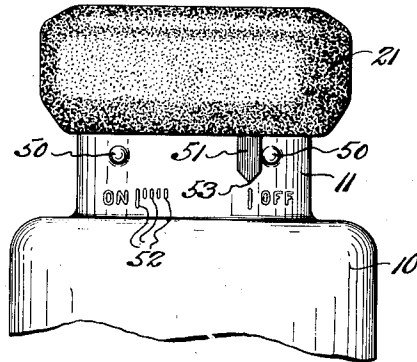


Fig. 9

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# UNITED STATES PATENT OFFICE

2,289,021

## COMBINED SEALING CLOSURE AND DISCHARGE MEANS FOR DISPENSING CONTAINERS

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Application May 29, 1940, Serial No. 337,770

2 Claims. (Cl. 215-74)

This invention relates to improvements in dispensing containers equipped with a combined sealing closure and discharge means, and also, if desired, including an applicator element, said closure being manipulatable at will to either close and seal the container against outward passage of the content therefrom, or to open the same for emission of the content.

In most combined container closure and discharge means as heretofore devised, it has been attempted to control the discharge by means of various forms of valve structures which, by appropriate manipulation could be opened and closed at will, but difficulty has been experienced therewith with respect to obtaining a tight seal in the closed condition thereof, and especially a seal which is adequately gas and vapor proof, which is essential particularly when the container content is of a highly volatile character.

I have observed that the most effective method of sealing a container mouth against escape of vapor or gas as well as against discharge of liquid substances is provided by the old and well-known removable stopper of cork or similar material, but, so far as I am aware, no satisfactory means has yet been devised for utilizing this type of stopper in such manner as to permit dispensing of the container content without necessity for bodily removal of the stopper, or in such manner as to utilize limited movement of the stopper within the container mouth to open and close discharge passage means at will.

It is therefore an object of this invention to provide a novel combined closure and discharge means comprising a stopper body of cork or other similar more or less compressible material including outflow passage means adapted to be opened and closed at will for dispensing a container content therethrough without necessity for bodily removal of the stopper body and without disturbing the efficiency of the sealing effect of the latter when the outflow passage means is closed.

Another object of this invention is to provide a combined closure and discharge means of the stopper body type mentioned which is subject to selective manipulation whereby the volume of outflow of the container content may be selectively controlled and determined within and between minimum and maximum limits.

Another object of the invention is to provide a combined closure and discharge means of the stopper type mentioned which may be provided either in a form adapted for permanent attachment to a container or in a form which is re-

movably attached thereto, whereby, in the latter case, refilling of the container would be permissible.

Another object of the invention is to provide a combined closure and discharge means of the kind mentioned having an applicator element in connection therewith by means of which the discharged substance may be applied to work desired to be treated therewith.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

Illustrative embodiments of this invention are shown in the accompanying drawings, in which:

Fig. 1 is a vertical central sectional view of a container equipped with one form of the novel combined sealing closure and discharge means according to this invention, the same being shown with its discharge passage means in open condition; Fig. 2 is a top-plan view of the same, with portions broken away to show underlying structure; and Fig. 3 is a horizontal section, taken on line 3-3 in Fig. 1, but showing the sealing closure and discharge means positioned to close the discharge passage means thereof.

Fig. 4 is a view similar to that of Fig. 1, with parts in elevation, and showing a modified construction of discharge passage means in closed condition.

Fig. 5 is a fragmentary vertical sectional view showing another modified arrangement and form of discharge passage means; and Fig. 6 is a horizontal sectional view thereof, taken on line 6-6 in Fig. 5.

Fig. 7 is a vertical sectional view similar to that of Fig. 1, but showing the combined sealing closure and discharge means in a form thereof detachably coupled in operative relation to a container.

Fig. 8 is a vertical sectional view of another modified construction of the combined sealing closure and discharge means.

Fig. 9 is a side elevational view of a container equipped with the sealing closure and discharge means of this invention, and including visible means for indicating open and closed conditions thereof.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

In the embodiment of this invention shown in Figs. 1 to 3 inclusive, the reference character 10 indicates a container for holding a supply of fluent material desired to be dispensed. Illustrations

tively said material may be a liquid cleaning fluid such as is commonly used for removing soil spots from garments and other materials. It will be understood, however, that any other fluent material may be dispensed from the container. Said container is illustratively shown in the form of a glass bottle or jar, but it will be obvious that the same may comprise a can, box or other receptacle form which may be made of metal, paper, plastics or other suitable material.

In one form thereof, the container 10 is provided with a tubular neck portion 11 of the cylindrical shape, having at its free extremity an external annular flange 12. Formed in the internal side of the wall of said neck portion 11, to extend upwardly from the point of juncture of the neck portion passage with the interior of the container body, is at least one vent channel 13 of limited length, whereby the same terminates a substantial distance below the upper open end of the neck-portion passage.

In one form thereof, the novel combined closure and discharge means for the container comprises, a substantially cylindrical stopper body 14 which may be inserted into the neck-portion passage in tight fitting and sealing contact with the walls thereof, and yet capable of movement relative thereto. Said stopper body 14 is made of such length that its lower or inner end portion overlaps the open side of said vent channel 13. Said stopper body 14 is made of a somewhat compressible material, such e. g. as cork or other somewhat resilient material which is unaffected deleteriously by the character of the fluid material desired to be dispensed from the container.

Fixedly secured to the upper end of said stopper body 14 is a cap member 15, preferably made of metal, which is provided with a peripheral skirt portion 16 adapted to fit over and around the external annular flange 12 of the container neck portion, and so that its lower marginal portion may be pressed inwardly beneath said flange 12, thereby forming a keeper flange 17 for holding the cap against detachment from the container neck portion, although being nevertheless free for rotative movement relative to the latter. A satisfactory means for affixing the cap member 15 to the stopper body 14, so that rotative movement of the former may be transmitted to the latter, comprises one or more anchor members 18 which are preferably struck out of the material of the cap member to project downwardly from the underside thereof in the form of spurs or blades adapted to be driven downwardly into and become imbedded in the material of the stopper body 14. It will be obvious, however, that other methods of joining the cap member and stopper body together may be resorted either in substitution for said anchor members or in addition thereto, such e. g. as a cementing or adhesive binder. The cap member 15 serves as a means for manually grasping the closure means and manipulating it to turn stopper body 14 to which said cap member is affixed so as to open and close the closure means at will through the agencies about to be described.

Formed in the cap member 15 in suitably selected location are one or more outlet ports 19; and provided in the stopper body 14 is a discharge passage means 20, the outlet of which communicates with said outlet port or ports 19, while the intake of which may, by rotary movement of the stopper body 14, be brought into and out of communication with the vent channel means 13, accordingly as it may be desired to

permit or shut off outflow of the fluid desired to be dispensed from the container.

It will be understood that volume outflow of fluid may be controlled accordingly as the intake of the discharge passage means 20 is moved into partial and up to complete registration with the vent channel means 13. This effect may be enhanced by variously shaping either the vent channel means 13 or the intake end of the discharge passage means 20. For example, as shown in Fig. 4, the vent channel means 13 may terminate in an angular extension 13' of tapering width and depth, so as to provide in conjunction with the intake of the discharge passage means 20, as progressively moved relative thereto, a gradually increasing area of communication up to the maximum provided by the full width and depth of said extension 13'. Again, as shown in Figs. 5 and 6, the discharge passage means 20 of the stopper body 14 may terminate at its intake end in a transverse segmental channel 20' which, as progressively moved relative to the vent channel means 13, will effect a gradually increasing area of communication up to the maximum provided by the full depth of said segmental channel 20'.

Since the stopper body 14 effects a tight sealing contact with the walls of the container neck portion 11, it will be obvious that, when the stopper body is turned so as to carry the intake end of its discharge passage means out of register and communication with the vent channel means 13 (as shown e. g. in Fig. 3), said passage means 20 will be closed by the abutting walls of the neck portion 11, while at the same time the vent channel means 13 will be closed by the abutting surfaces of the stopper body. When the stopper body 14 is disposed in such discharge passage closing position, and by reason of its tight sealing contact with the container neck portion walls, the fluid contained in the container body is hermetically sealed against evaporation, leakage or loss from like causes.

For some kinds of fluent material desired to be dispensed from a container there would be no necessity for use of any applicator medium in connection with the closure device, and in such case the perforate cap member 15 would alone be provided as the external element of the closure. On the other hand, it is convenient to provide a pervious or absorbent applicator means in connection with the closure device when fluent material such as spot cleaning fluids are to be dispensed. In the latter case, the cap member 15 may be jacketed with an applicator member 21, which may be made of any suitable flexible pervious material, fabric or the like. Preferably a pile textile fabric is used, such e. g. as a mohair fabric which possesses a comparatively stiff brush-like pile. The applicator member 21 may be secured in overlying relation to the cap member 15 in any suitable manner. For example, the applicator member 21 is superposed upon the top of the cap member, and its marginal portions carried downwardly around the skirt portion 16 of the cap member, and then around and upwardly over the inner side of the keeper flange 17 so as to provide an anchored portion 21' securely wedged or otherwise fastened between the latter and the adjacent exterior sides of the container neck portion 11.

In the above described construction, the cap member 15 is permanently attached or coupled to the container neck portion in such manner that removal thereof without risk of destroying

the same would be difficult. Such arrangement is very satisfactory in cases where it is not desired that stopper body 14 be permitted to be removed whereby the container could be opened, refilled and the stopper body replaced. In the event, however, it is desired that the closure means be so arranged as to permit of removal of the stopper body so as to allow the container to be opened, refilled and the stopper body replaced, the closure means may be made in a removable form. An example of such removable form is shown in Fig. 7, wherein the cap member 15 is provided with an expandible skirt portion 16' having spaced radial slits 16'' formed therein so as to divide its extent into a series of yieldable or springy tongues. A cap member skirt portion of this character may be sprung over the external flange 12 of the container neck portion 11, so as to be held in operative coupled relation to the latter, and yet, when desired, so as to be capable of being sprung off the same when it is desired to remove the closure means from the container.

In Fig. 8 there is shown a somewhat modified construction of the novel combined closure and discharge means according to this invention, wherein the movement of the stopper body for opening and closing its discharge passage means involves axial as well as rotative movement thereof. In Fig. 8 the reference character 30 indicates the container body, the same having a tubular neck portion 31 provided with external screw-threads 32. Formed in the internal side of the wall of said neck portion 31, to extend upwardly from the juncture of the neck portion passage with the interior of the container body, is one or more vent channels 33 of limited length, whereby the same terminate a substantial distance below the upper open end of the neck portion passage. Cooperative with said vent channel means 33 is an annular vent channel extension 34. The stopper body 35 is provided at its outer upper end with a cap-member 36 which is suitably secured thereto, and which is provided with a screw-threaded skirt 37 to cooperate with the external screw-threads 32 of the container neck portion. Said cap-member 36 is provided with a suitably located outlet port 38. The stopper-body 35 is provided with a discharge passage means 39 the upper end of which communicates with the port 38 in the cap member 36, and the lower end of which terminates in a branch or branches 40, the outer ends of which open from the external surface of the stopper-body at a point normally below the level of the annular vent channel extension 34 of the container neck portion, so that, when the cap-member 36 is screwed home on the latter, said branches will abut the neck portion wall surfaces so as to be closed to fluid outflow. To open this form of closure means, the cap-member 36 is rotated to turn the same upwardly on the threaded container neck portion, thus lifting as well as rotating the stopper-body 35 until the open ends of the branch or branches 40 of the discharge passage means 39 are brought into communication with said annular vent channel extension 34. If desired, an applicator fabric 41 may be mounted in jacketing relation to the cap-member 36, with its marginal portions 42 wedged between the male and female screw-threads of the container neck portion and cap-member as shown, or otherwise secured in place.

In all of the above described constructions, it is desirable to limit the closure means opening

movement of the cap-member, as well as to give visible indication of the open and closed positions of the closure means. To this end suitable stops 50 may be formed on the external surface of the container neck portion to mark the limits of the open and closed position of the closure means. To cooperate with said stops 50, so as to limit rotary movement of the cap-member and stopper-body for determining the respective open and closed positions of the closure means, a finger member 51 may be provided in connection with the skirt of the cap-member for movement therewith between said stops 50. Where desired, the space on the container neck portion intermediate the stops 50 may be calibrated to indicate positions of partial opening of the closure means whereby regulation of volume of outflow is indicated. This calibration may be indicated by graduation marks 52 suitably provided on the container neck portion, either directly or indirectly by means of an applied label or the like, and, for cooperation with said marks 52, the finger member 51 may be provided with a pointer terminal 53, as shown. It will be understood that detail variation of the described indicating and stop means may be resorted to.

Various other changes could be made in the closure means structures herein shown and described without departing from the scope of this invention as defined in the following claims. It is therefore intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A container for dispensing fluent material comprising, a container body having a tubular neck-portion provided at the internal side of the lower portion of its wall with vent channel means communicating with the container interior and open toward the neck-portion passage, a stopper body entered in said neck-portion passage with its lower end portion contiguous to said vent channel means, said stopper body having discharge passage means therethrough, the outlet of which opens from the external end of said stopper body and the intake end of which opens from the side of said stopper body, whereby said intake end may be moved into and out of communication with said vent channel means by movement of said stopper body in and relative to said container neck-portion, means to regulate the outflow volume of fluent material passed between said vent channel means and said stopper body discharge passage means, comprising means intermediate the intake end of the latter and the outlet end of the former adapted, by relative movement of one to the other, to provide a communicating passage of variable cross-sectional area, and means to limit such relative movement from closed to fully open condition of said communicating passage.

2. A container for dispensing fluent material comprising, a container body having a tubular neck-portion provided at the internal side of the lower portion of its wall with vent channel means communicating with the container interior and open toward the neck-portion passage, a stopper body entered in said neck-portion passage with its lower end portion contiguous to said vent channel means, said stopper body having discharge passage means therethrough, the outlet of which opens from the external end of said stopper body and the intake end of which opens from the side of said stopper body, whereby said

intake end may be moved into and out of communication with said vent channel means by movement of said stopper body in and relative to said container neck-portion, means to regulate the outflow volume of fluent material passed between said vent channel means and said stopper body discharge passage means, comprising means intermediate the intake end of the latter and the outlet end of the former adapted, by relative movement one to the other, to provide a communicating passage of variable cross-sectional area, means to limit such relative movement from closed to fully open condition of said communicating passage, a cap member affixed to the external end of said stopper body, said cap member having discharge opening means in communication with the outlet of said stopper body discharge passage means, and means to externally and rotatably engage said cap member with the container neck-portion subject to manipulation whereby to impart operative movements to said stopper body.

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