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L. L. MALLARD

2,348,014

COMBINED BOTTLE CLOSURE AND DISPENSER

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Fig. 1.

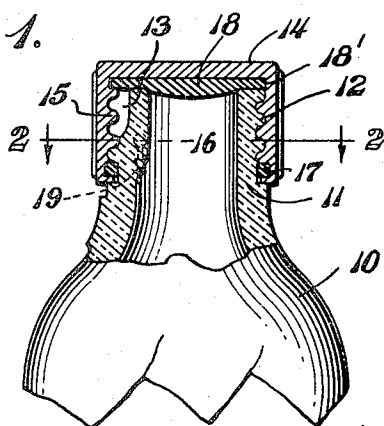


Fig. 2.

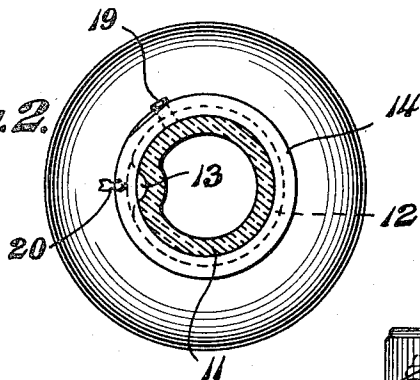


Fig. 3.

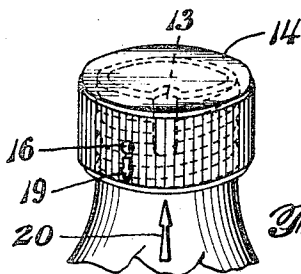
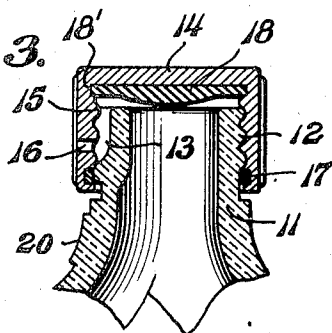


Fig. 4.

Fig. 5.

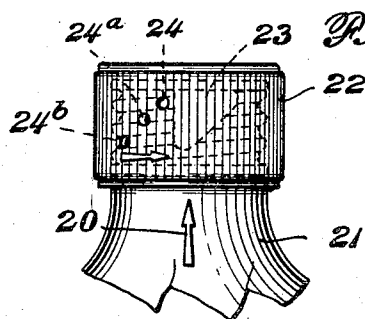


Fig. 6.

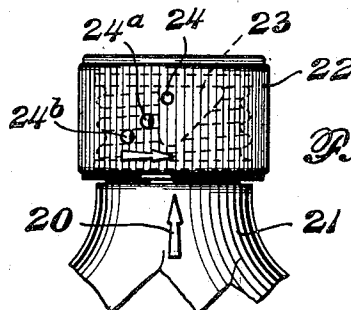


Fig. 7.

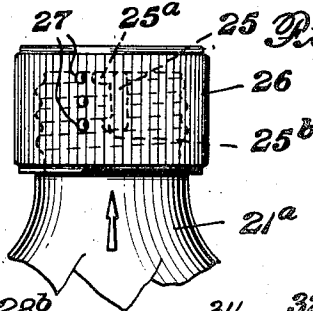


Fig. 8.

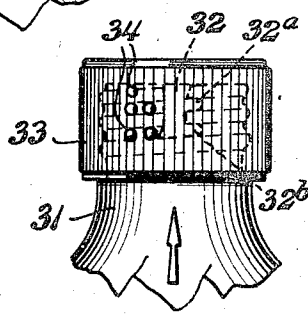
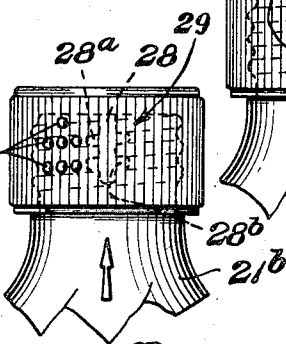


Fig. 9.

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Fig. 10.



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2,348,014

COMBINED BOTTLE CLOSURE AND DISPENSER

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Application May 6, 1943, Serial No. 485,904

11 Claims. (Cl. 215—43)

This invention relates to a combined bottle closure and dispenser, and an object of the same is to provide an improved device of this type which will serve as an effective closure member or seal when turned to its down position, and which when retracted to a predetermined point will function as a convenient means for dispensing the contents of the bottle.

More specifically, the invention contemplates a screw-on type of cap or closure having one or more dispensing outlets therein and in combination therewith a bottle or analogous container having an exteriorly threaded neck provided with a dispensing channel adapted for communication with the interior of the bottle over the top edge of the neck beneath the cap but starting at a point above the lowermost thread of the neck. When the cap is rotated to its "down" or closed position, it seats on said edge and effectively closes off the channel from the interior of the bottle, and when it is retracted or unscrewed to a predetermined point, the dispensing openings in the cap are brought into registration with the channel and material may be dispensed simply by oscillating or shaking the bottle with the cap end directed toward the object or surface to be supplied. The channel may be made in various forms and the dispensing openings arranged to co-act therewith in a manner such as to permit adjustable or controlled dispensation.

Other important objects include a dispensing container and closure therefor which will not readily clog and which is easily cleaned and sanitary, is simple in construction and manufacture so that it may be produced at a cost commensurate with the type of market to be supplied, is capable of accurate regulation of the quantity of liquid or other material to be dispensed, and to generally improve dispensing devices of this type.

The foregoing and other objects and advantages will become apparent in view of the following description taken in conjunction with the drawing, wherein:

Fig. 1 is a view in transverse vertical section of the neck portion of a bottle and a dispensing cap or closure therefor in accordance with the invention;

Fig. 2, a section taken on the line 2—2, Fig. 1;

Fig. 3, a view similar to Fig. 1 but showing the cap rotated to dispensing position;

Fig. 4, a view in perspective of the closure cap of Figs. 1, 2 and 3;

Figs. 5 and 6, views in elevation of a modified

type of container and closure therefor with respect to that shown in Figs. 1 to 4, inclusive, the cap being shown in closed position in Fig. 5 and rotated to one of its dispensing positions in Fig. 6;

Figs. 7, 8, and 9, views in elevation of additional modified forms of the device; and

Fig. 10, a perspective of a bottle having the improved closure cap applied thereto and illustrating the manner in which liquid may be dispensed therefrom.

The closure cap and container as disclosed herein is primarily adapted for liquids such as hand lotions, medicines, tonics, etc., although it may be used for any type of material capable of being dispensed therefrom.

Referring to the drawing in detail, the numeral 10 generally indicates a bottle which may be made of glass, plastic or any other suitable material and is provided with a neck portion 11 having formed therearound screw threads 12.

The outer threaded surface of the bottle neck is formed with a dispensing channel 13, which may take various forms, as exemplified in Figs. 5 to 9, inclusive, but which in Figs. 1 to 4 consists of a vertical extending trough-like depression, the bottom of the channel starting beyond the lower thread and the top portion of the channel extending through the top thread so that it may communicate with the interior of the bottle over the top edge of the neck when the cap is unscrewed to move its sealing surface clear of said edge, note Figs. 2 and 3. This channel may be formed in the neck of the bottle in any suitable manner. In the form of the channel illustrated in Figs. 1 to 4 it is adapted to be moulded in the bottle simply by making provisions for the same in the original mould and which can be done with very little trouble and expense.

A closure cap 14 is provided in conjunction with the container 10, said cap being interiorly threaded as at 15 and having a dispensing opening 16 therein so located with respect to the channel 13 that it will be out of registration with the channel when the cap is closed and will register with the channel when the cap is given a predetermined unscrewing turn.

Within the lower edge of the cap a resilient gasket 17 is seated in a groove provided therefor to insure an effective seal at this point, and an additional gasket 18 of suitable resilient material is preferably located beneath the top of the cap and having its peripheral edge engaged in an annular groove 18'.

Suitable indicating indicia such as arrows 19 and 20 are formed on the cap and the bottle respectively. By moving these arrows into substantial registration, the user of the bottle will be apprised when the cap is in dispensing position.

In operation, the cap 14 is threaded firmly onto the bottle when the latter is not in use. When the cap is turned to its full down position as shown in Figs. 1 and 4, the dispensing opening 16 is out of alignment or registration with the channel 13 and the gasket 18 seats firmly on the top edge of the bottle neck and tightly seals the bottle.

When the user desires to dispense liquid from the bottle, it is only necessary to retract or unscrew the cap to a point where the opening 16 moves into partial or full registration with the channel 13, thereby raising the sealing gasket 18 clear of the top edge of the bottle and permitting liquid to pass over said edge and downwardly into the channel 13 and out through the dispensing opening 16, note Figs. 3 and 10. By moving the dispensing opening only partially in registration with the channel 13, the said opening may be adjusted to suit the consistency of the liquid and also in accordance with the amount of liquid to be dispensed.

When the cap is fully closed, the channel is effectively closed off from the interior of the bottle, but even though the dispensing opening is then out of registration with the channel, any residual liquid remaining in the channel may pass along the intervening thread or threads and out through the dispensing opening.

Both the cap and the bottle or other container may be readily manufactured by a simple moulding operation and the materials used may be the same as those commonly used on articles of this type as sold in the open market.

Figs. 5 and 6 illustrate a modification in structure, the bottle in this instance being indicated at 21 and the cap at 22. The neck of the bottle is exteriorly screw-threaded and the cap interiorly threaded as in the form first described but in this instance the dispensing channel or flattened thread area, herein indicated at 23, is somewhat in the form of an inverted right-angle triangle with the narrowest portion of the area lying at the base of the neck. The cap in this instance is formed with a plurality of dispensing openings 24, 24a and 24b arranged and spaced both vertically and laterally as to cause all of the openings to lie within the area when the cap is unscrewed to a predetermined point. It will be apparent that in this manner the amount of liquid or other material dispensed from the bottle may be readily controlled or adjusted, note Fig. 6 where the cap 22 has been turned to bring the dispensing opening 24 in registration with the area 23. If it is desired to increase the amount of liquid to be dispensed, the cap would be retracted or reversed to a point where the dispensing opening 24a registers with the area 23, or where all three dispensing openings are brought into registration with said area.

Figs. 7, 8 and 9 illustrate modified types of closure caps and dispensing channels. In Fig. 7 the channel area is generally indicated at 25 and has a substantially vertically extending portion and upper and lower horizontal branches 25a and 25b of different lengths, the upper branch being longer than the lower branch. The cap in this instance is generally indicated at 26 and is formed with a plurality of dispensing openings 27 and arranged in substantial vertical alignment. By

bringing the upper and lower dispensing openings successively in registration with the upper and lower legs 25a and 25b of the channel 25, or by a further angular turn bringing all three of the openings in alignment with the vertical portion of said channel, the amount of liquid to be dispensed may be readily controlled or adjusted.

In Fig. 8 the neck of the bottle is formed with a dispensing channel 28 having a substantially vertically extending portion and a series of horizontally extending portions 28a and 28b extending in both directions from the central channel area. The cap in this instance is indicated at 29 and is formed with a plurality of dispensing openings 30. These openings may be brought successively in partial or full registration with the channel area to control the amount of liquid to be dispensed. By making the openings 30 relatively small, or by varying the sizes or dimensions thereof, the liquid may be dispensed in relatively small drops or in the form of a spray.

In Fig. 9 the neck of the bottle is generally indicated at 31 and is formed with a main channel 32 having a relatively wide main body portion or area and upper and lower horizontal portions 32a and 32b extending to the right of the main channel, or in a direction such that the nearest dispensing openings in the cap will first be caused to register with the main channel area, and by further angular movement of the cap, cause the entire group of openings to register with the entire channel area. The cap herein indicated at 33 is formed with a series of dispensing openings 34 adapted to be brought into full or partial registration with the channel and its communicating portions in the manner above described.

In all the forms shown, the lower end of the dispensing channel formed in the neck of the bottle starts beyond the lower or final thread of the bottle neck and is effectively sealed against leakage at the point where the base of the cap engages the base of the neck, and also in all the forms shown, the top of the channel is effectively sealed against leakage of liquid by the top of the cap when the latter is in screwed-down position. Any residual liquid that may remain in the channel may be dispelled therefrom when the cap is in its sealed position by forcefully shaking the bottle with the cap end downwardly or by immersing the cap end in hot water or a suitable sterilizing fluid. Thus there is no necessity for the liquid to become caked in the channel or in the dispensing openings. Furthermore the channel is always accessible for cleaning without communicating the cleaning fluid with the interior of the bottle.

It will be understood that no attempt has been made herein to illustrate all of the various forms the dispensing channel and its co-acting dispensing openings may take, and it will also be understood that certain other limited changes in construction and design may be adopted without departing from the scope of the invention as defined by the amended claims.

What is claimed is:

1. In combination, a bottle or analogous container having a neck formed with exterior screw threads and a dispensing channel in said threads starting at a point above the lowermost thread on said neck and extending to the top edge of the neck so as to communicate with the interior of the bottle over said edge when the latter is unsealed, an interiorly screw-threaded cap

mounted on said neck and formed with a dispensing opening so located with respect to said channel as to be out of registration with the latter when the cap is screwed to closed position and to register with said channel when given a predetermined unthreading turn, a resilient seal disposed in the top of the cap and adapted to seat on the top edge of the bottle and tightly seal the latter and said channel when the cap is closed, and an additional seal in the form of a resilient sealing ring disposed around the interior of the bottom edge of the cap.

2. In combination, a bottle or analogous container having a neck formed with exterior screw threads and a dispensing channel in said threads extending substantially vertically from a point upwardly beyond the lower thread and extending through the upper thread so as to communicate with the interior of the bottle over the top edge of the neck when the edge is unsealed, an interiorly screw-threaded cap mounted on said neck and having a dispensing opening formed therein, the inner top surface of the cap being adapted to seat flush against the top edge of the neck and effect a tight closure of the bottle and at the same time close off communication between the channel and the interior of the bottle when the cap is screwed to its down position, and said dispensing opening being so located with respect to said channel as to be out of registration with the latter when the cap is screwed to its down position and to register with the channel when the cap is given a partial turn to retracted position, the top of the cap clearing the channel to permit the contents of the bottle to pass outwardly from beneath the cap and into said channel and then through said dispensing opening.

3. In combination, a bottle or analogous container having a neck formed with exterior screw threads and a dispensing channel in said threads extending substantially vertically from a point upwardly beyond the lower thread and extending through the upper thread so as to communicate with the interior of the bottle over the top edge of the neck, an interiorly screw threaded cap mounted on said neck and having a dispensing opening formed therein, the inner top surface of the cap being adapted to seat flush against the top edge of the neck and effect a tight closure of the bottle and at the same time close off communication between the channel and the interior of the bottle when the cap is screwed to its down position, and said dispensing opening being so located with respect to said channel as to be out of registration with the latter when the cap is screwed to its down position and to register with the channel when the cap is given a partial turn to retracted position, the top of the cap clearing the channel to permit the contents of the bottle to pass outwardly from beneath the cap and into said channel and then through said dispensing opening, said bottle and said cap being provided with indicia indicating when the dispensing opening is in registration with said channel.

4. In combination, a bottle or analogous container having a neck portion formed with exterior screw threads and a dispensing channel in said threads opening through the top thread so as to communicate with the interior of the bottle over the top edge of the neck, said channel at its lower extremity being of reduced width and gradually enlarging over a widened area as

it approaches the top edge of the bottle, and an interiorly screw threaded cap mounted on said neck and formed with a series of dispensing openings extending at an angle to the vertical axis of the bottle so as to bring said dispensing openings in registration successively with said channel when the cap is given an unthreading turn and to be out of registration with said channel when the cap is threaded to its down or closed position, the inner top surface of the cap being provided with a sealing surface adapted to seat on the top edge of said neck and close off the channel from communication with the interior of the bottle when the cap is screwed to its down position.

5. In combination, a bottle or analogous container having a neck portion formed with exterior screw threads and a dispensing channel in said threads opening through the top thread so as to communicate with the interior of the bottle over the top edge of the neck, said channel being generally in the form of an inverted right-angle triangle with the vertical side of the triangle located away from the direction of progression of said screw threads, and an interiorly screw threaded cap mounted on said neck and formed with a series of dispensing openings extending at an angle to the vertical axis of the bottle so as to bring said dispensing openings in registration successively with said channel when the cap is given an unthreading turn and to be out of registration with said channel when the cap is threaded to its down or closed position, the inner top surface of the cap being provided with a sealing surface adapted to seat on the top edge of said neck and close off the channel from communication with the interior of the bottle when the cap is screwed to its down position.

6. In combination, a bottle or analogous container having a neck formed with exterior screw threads and a dispensing channel in said threads extending to and through the top edge of the neck so as to communicate with the interior of the bottle over said edge when the latter is unsealed, said channel having a vertical extending portion and one or more horizontal extending portions branching off from the vertical portion, and an interiorly screw threaded cap having a series of dispensing openings formed therein, said openings being disposed in such relation as to register successively when the cap is given an unscrewing turn, first with said horizontal portions and then as a group with said vertical portions and said horizontal portions, the cap seating on the top edge of the bottle when screwed to a down position and sealing off communication between the channel and the interior of the bottle.

7. In combination, a bottle or analogous container having a neck formed with exterior screw threads and a dispensing channel in said threads extending to and through the top edge of the neck so as to communicate with the interior of the bottle over said edge when the latter is unsealed, said channel having a vertical extending portion, a plurality of horizontal portions of different lengths, horizontal extending portions branching off from the vertical portion, and an interiorly screw threaded cap having a series of dispensing openings formed therein, said openings being disposed in such relation as to register successively when the cap is given an unscrewing turn, first with said horizontal portions and then as a group with said vertical

portions and said horizontal portions, the cap seating on the top edge of the bottle when screwed to a down position and sealing off communication between the channel and the interior of the bottle.

8. In combination, a bottle or analogous container having a neck formed with exterior screw threads and a dispensing channel extending to and through the top edge of the neck so as to communicate with the interior of the bottle over said edge when the latter is unsealed, said channel having a vertical extending portion and one or more horizontal extending portions branching off from the vertical portion, at least one of said horizontal portions being of less lateral extent than the remaining horizontal portions of the channel, and an interiorly screw threaded cap having a series of dispensing openings formed therein, said openings being disposed in substantially vertical alignment and in such relation as to register successively when the cap is given an unscrewing turn, first with said horizontal portions and then as a group with said vertical portions, the cap seating on the top edge of the bottle when screwed to a down position and closing off communication between the channel and the interior of the bottle.

9. In combination, a bottle or analogous container having a neck formed with exterior screw threads and a dispensing channel in said threads extending to and through the top edge of the neck so as to communicate with the interior of the bottle over said edge, said channel being formed with a vertically extending portion and a plurality of horizontal portions branching off in opposite directions from said vertical portion, and an interiorly screw threaded cap mounted on said neck and formed with a plurality of

dispensing openings therein, said openings being arranged in a plurality of substantially vertically aligned rows, the first row moving into registration with the nearest horizontal branches of said channel when the cap is unscrewed a predetermined distance and thereafter the next row and succeeding row moving into successive registration with said channel and its branches until the entire group of openings register with the channel and maximum dispensation is permitted.

10. In combination, a bottle or analogous container having an exteriorly threaded neck portion formed with a channel extending through the top thread of said neck, an interiorly threaded cap adapted to engage over said neck, said cap being formed with a dispensing opening located in a manner such that it will align with said channel when the cap is unscrewed to a predetermined position, and means sealing said neck at the base of the cap and the top edge of the neck when the cap is screwed to closed position.

11. In combination, a container having an opening by means of which the contents of the bottle may be poured therefrom, a wall surrounding said opening and formed with a series of exterior screw threads having a channel formed therein, said channel communicated with said main opening over the top edge of said wall, and an interiorly threaded cap adapted to be screwed onto said wall and seat on the top edge thereof and close off said channel from communication with said main opening and at the same time close said latter opening, said cap being provided with a dispensing opening adapted to align with said channel when the cap is given a predetermined unscrewing movement.

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