

March 15, 1966

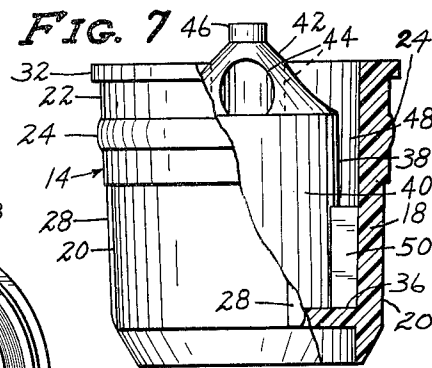
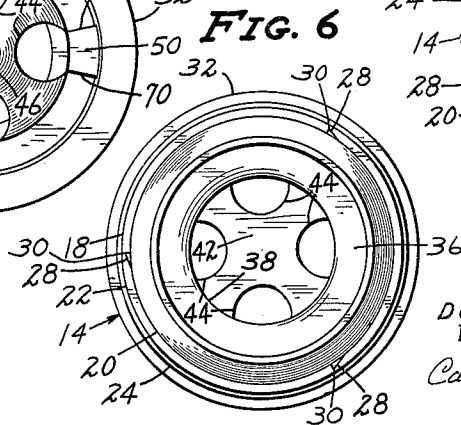
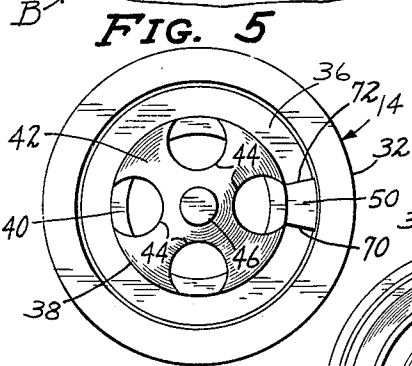
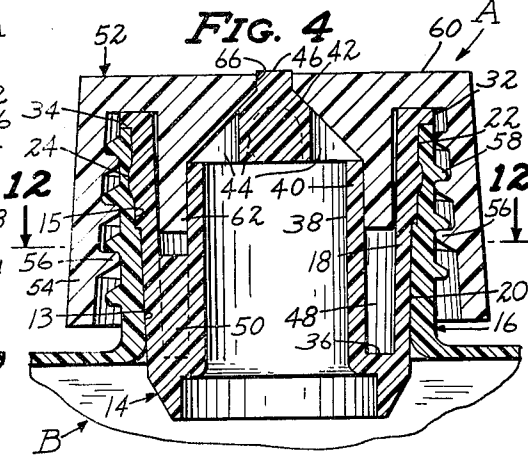
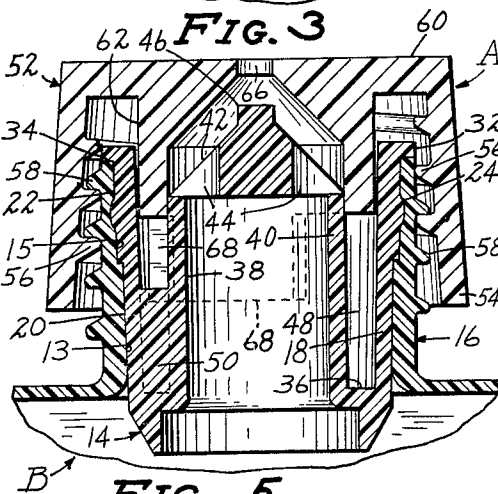
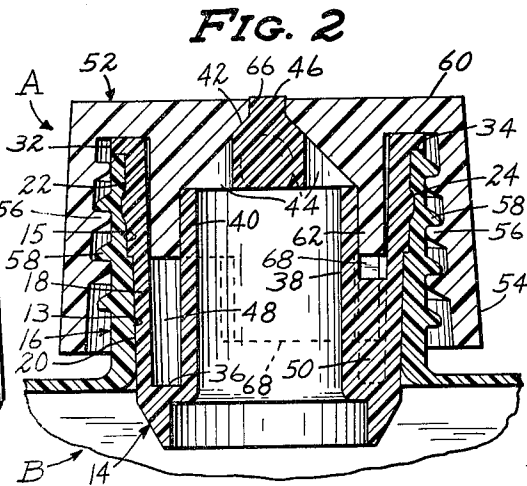
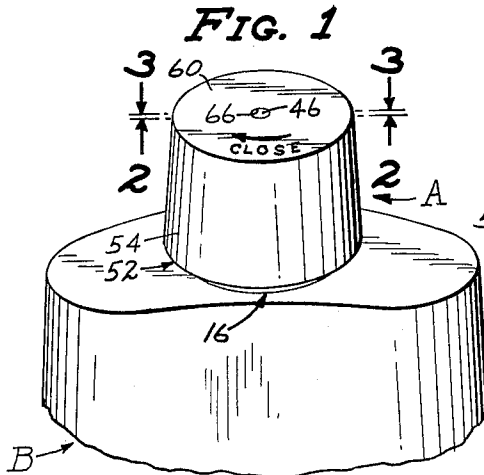
A. J. PORTER ET AL

3,240,404

DISPENSING CAP

Filed July 30, 1963

2 Sheets-Sheet 1



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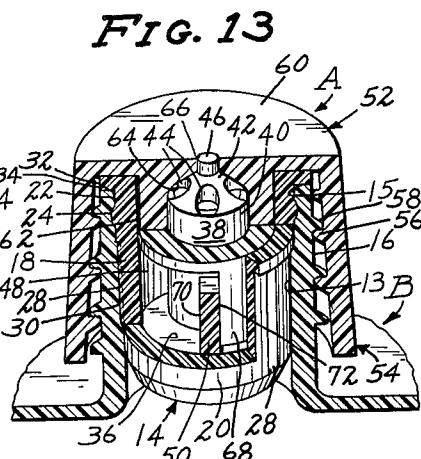
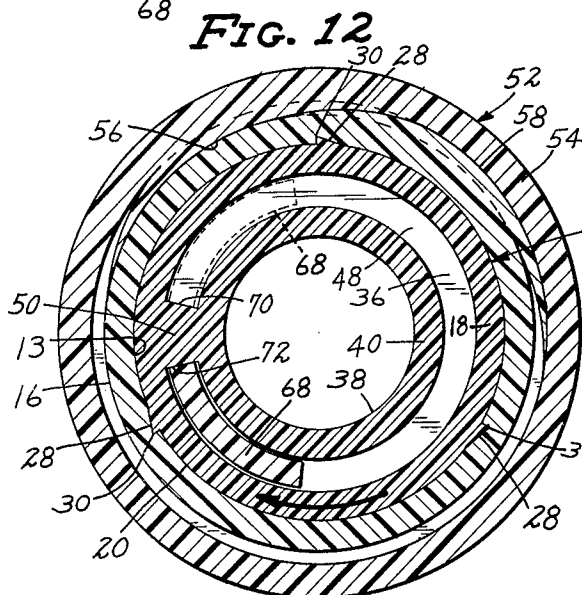
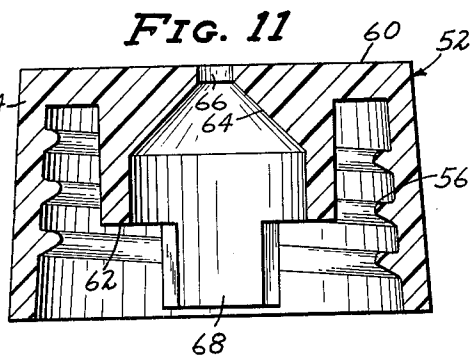
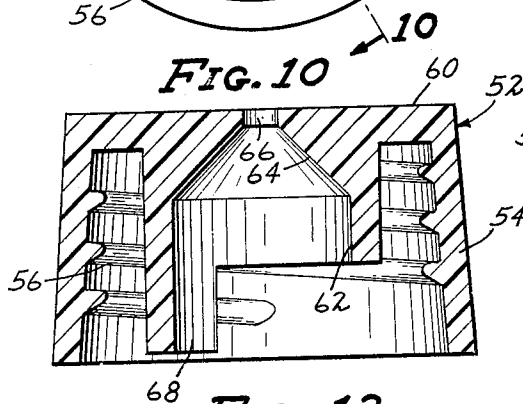
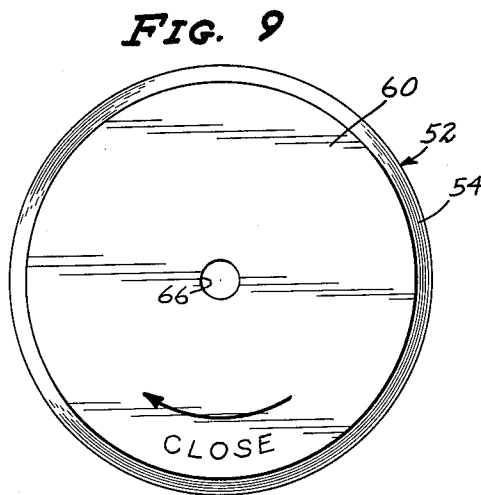
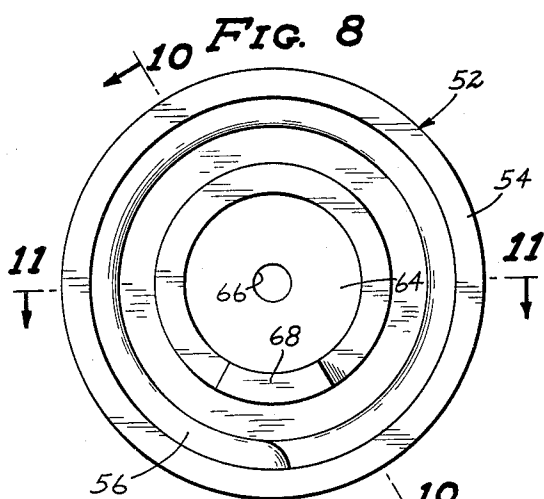
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DISPENSING CAP

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2 Sheets-Sheet 2



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3,240,404

DISPENSING CAP

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9 Claims. (Cl. 222—521)

The invention relates to an improvement in a cap for a container such as plastic bottles and the like and more particularly to a cap which allows dispensing primarily viscous and semi-viscous material from the neck of a container. It is an object of the invention to provide a dispensing cap which is captive upon the neck of the container and which may be rotatively moved from a positive closed position on the neck of a container to a positive open position and beyond which the cap cannot be removed without rupturing the cap and/or the neck of the container. If such is done the cap cannot be reused.

It is an additional object to provide a dispensing cap having a main cap portion and an insert for the neck of a container including cooperating lug and stop means together with means for engaging the insert with the container neck which prevent an unscrewing of the cap from a threaded neck of a container when the cap is in a fully retracted open position. It is a further object to provide new and novel means for sealing engagement of the cap insert portion with the neck of the container.

It is also an object to provide a dispensing cap with the above recited features which may be easily mounted on the neck of the container in captive position after the container has been filled.

It will not be here attempted to set forth and indicate all of the various objects and advantages incident to the invention, but other objects and advantages will be referred to in or else will become apparent from that which follows.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings, showing by way of example a preferred embodiment of the inventive idea wherein like numerals refer to like parts throughout.

In the drawings forming part of this application:

FIGURE 1 is a perspective view of the dispensing cap mounted on a container, a portion of the container being broken away.

FIGURE 2 is a vertical section on the line 2—2 of FIGURE 1 with the cap in the closed position.

FIGURE 3 is a section similar to that shown in FIGURE 2 on the line 3—3 of FIGURE 1 but with the cap in open dispensing position.

FIGURE 4 is a vertical section similar to FIGURE 3 but with the cap in closed position.

FIGURE 5 is a top plan view of the interior insert member.

FIGURE 6 is a bottom plan view of the interior insert member.

FIGURE 7 is a side elevation of the interior insert member, a portion thereof being broken away.

FIGURE 8 is a bottom plan view of the main cap body.

FIGURE 9 is a top plan view of the main cap body.

FIGURE 10 is a section on the line 10—10 of FIGURE 8.

FIGURE 11 is a section on the line 11—11 of FIGURE 8.

FIGURE 12 is a horizontal section through the entire cap and bottle neck on which the cap is mounted on the line 12—12 of FIGURE 4.

FIGURE 13 is a perspective view of the cap shown in closed position mounted on the neck of a container, por-

tions of the cap and neck being in section and portions broken away.

Referring to the drawings in particular, the dispensing cap A includes the interior insert member 14 which is mounted coaxially in the cylindrical neck 16 of the container B. The neck 16 includes the slightly reduced portion 13 and the enlarged portion 15. The insert member 14 includes the outer cylindrical wall portion 18 formed of the lower slightly reduced portion 20, the upper edge of which is coterminous with the upper edge of the reduced portion 13 of neck 16 and the slightly enlarged upper portion 22, the lower edge of which is coterminous with the lower edge of the enlarged portion 15 of neck 16. Formed on the outer surface of the upper portion 22 of insert 14 is the annular rib 24 which together with the outer surface of portion 22 makes positive sealing engagement with enlarged portion 15 of neck 16.

Further provided are the elongated barb portions 28 which are formed and extend longitudinally on the outer surface of the reduced portion 20 of the insert, the outer cutting edge 30 thereof reduced slightly radially and inwardly of the outer surface of the upper portion 22. Such slightly reduction of the barb portions 28 prevents the same from scoring the inner surface of the enlarged neck portion 15 when the insert is inserted into the neck thus assuring positive sealing of portion 22 of the insert with portion 15 of the neck together with annular bead 24. The barbs are angularly disposed on the lower cylindrical portion 20 of the insert whereby the same do not cut into the reduced portion 13 of 16 when inserted with a clockwise rotation but do cut in when a counterclockwise rotation is attempted. The upper edge of the upper wall portion 22 terminates in the small outwardly extending annular flange 32 which abuts the upper edge 34 of the neck 16 of the container when the insert 14 is fully inserted into the neck 16.

Extending inwardly of the lower edge of the lower portion 20 of insert 14 is the narrow annular bottom portion 36 which is concentric with wall 18 and which terminates in the axially disposed nozzle 38 formed of the upstanding inner cylindrical wall portion 40 and terminating with the conoidal end portion 42. The wall portion 18 of insert 14 and the annular bottom portion 36 form means for supporting the nozzle 38 within the neck 16. The conoidal nozzle end 42 is formed with the outlet holes 44 and the axially disposed tip portion 46. As a result of the annular bottom portion 36 the nozzle 38 is thereby spaced from the wall portion 18 of insert 14 and the neck 16 thereby forming an annular channel 48 extending around the nozzle, except for the stop lug 50 extending radially and inwardly from wall 18 to wall 48 of nozzle 38.

The numeral 52 designates the main cap member which includes the cylindrical skirt portion 54 formed with the threads 56 for engagement with the threads 58 of the container neck 16. The cap 52 also includes the top portion 60, and depending from the underside of top portion 60 is the annular collar formation 62, the inner annular surface of which terminates in the conoidal nozzle seat 64 which in turn terminates in the axial cap hole 66. The conoidal nozzle end 42 seats upon the conoidal nozzle seat 64 with the tip 46 extending through the cap hole 66 to close off the cap in the manner more fully hereinafter described.

Extending downwardly and axially from the collar formation 62 of cap 52 is the arcuate lug portion 68 which lug is movable horizontally through the length of the annular channel 48 from the edge 70 of stop 50 to the opposite edge 72 thereof when the cap 52 is rotated within the fixed insert 14.

The cap is assembled and operates in the following manner: The insert 14 is positioned loosely within the

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cap 52 with the lug 68 out of alignment with stop 50. The insert and cap are then placed upon the neck 16 of container with the insert extending partially within the neck. The insert 14 is then forced into the neck 16 by pressure being applied to the cap which causes the barb edges 30 to bite slightly into the inner surface of the reduced portion 13 of the container neck 16. As the cap is pressed downwardly upon the neck 16 the threads of the cap come in contact with the threads of the container neck. The cap is then rotated clockwise whereby the insert 14 is drawn downwardly into the neck 16 as a result of the engaging action of the threads of cap upon the threads of the neck until the insert is fully within the neck 16 with the flange 32 of the insert 14 abutting the top edge of the neck 16. As the cap is thus rotated, the insert 14 is rotatively drawn into the neck, for the lug 68 of the cap bears against the stop 50 of the insert 14. The barbs 28 of the wall 20 of the insert 14 are disposed so that the insert may be rotatively moved into the neck 16 by the rotative movement of the cap in one direction, preferably clockwise due to standard threads on a container neck as shown by the arrow in FIGURE 12.

As the cap 52 and insert 14 bottom out on the neck 16 the tip 46 of the nozzle 38 positions within the hole 66 of the cap with the nozzle end 42 seating upon the nozzle seat 64 thereby closing the holes 44 of the nozzle. The cap is then in a "closed" condition. In this position the lug 68 is in contact with the edge 72 of the stop 50 as illustrated in FIGURES 2, 12 and 13. When the cap 52 and insert 14 bottom out on the neck 16, the stop 50 is brought to a permanent fixed position relative to the neck, for the cap portion 52 is screwed upon the neck as far as it will go, and the insert cannot be rotated in the opposite direction due to the engagement of the barbs with the neck.

To open the cap A, the cap portion 52 is rotated counterclockwise, and as a result of the action of the threads of the container neck and those of the cap, the cap 52 is backed off the neck and insert 14 with the lug 68 moving outwardly of the insert and throughout the length of the channel 48 until the lug 68 strikes the edge 70 of the stop 50. In this condition, the end 42 of nozzle 38 is separated from seat 64 thereby opening holes 44 and removing tip 46 from axial hole 66 of cap portion 52 to allow flow of material through the cap A. The cap is then in an "open" position. When the lug 68 strikes the stop 50, as shown in broken lines in FIGURES 3 and 12, further unscrewing rotative movement of cap 52 is prevented. At this point the threads of the cap portion 52 are still engaged with the threads of the container neck 16 so that the cap is therefore captive, but the cap portion 52 cannot be rotated or unscrewed further due to the fact that the lug 68 abuts the stop 50, and the stop 50 is fixed against rotation due to the engagement of the barbs 28 with the reduced neck portion 13. The axial length of the downwardly extending lug 68 of cap portion 52 is such that it is not withdrawn beyond the upward axial limit of the stop 50 when the cap 52 is unscrewed to its uppermost limits, particularly as in FIGURE 3.

Further, if it is attempted to unscrew the cap portion 52 by further counterclockwise unscrewing movement of both cap 52 and insert 14, the edges 30 of barbs 28 are caused to penetrate into the inner surface of the portion 13 of the neck 16 due to lug 68 abutting stop 50 thereby preventing removal of the cap 52 and insert 14 unless, of course, enough force is used to rupture the insert 14 and/or neck 16.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

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Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a dispensing cap for the threaded neck of a container, an insert for the neck of the container, said insert including an outer cylindrical wall portion, a hollow nozzle secured axially within said cylindrical wall portion and spaced therefrom to form an annular channel surrounding said nozzle, a stop lug fixedly secured within said annular channel, a main cap portion having a top portion and a cylindrical skirt with internal threads for engagement with said threaded neck, said top portion having a nozzle seat terminating in an outlet hole, an annular collar depending from said top portion of said cap adapted for rotative movement in said annular channel, said collar having lug means depending from the lower edge thereof and extending into said channel adapted to engage said stop lug to limit the threaded rotative movement of said cap on said neck portion from a position where said nozzle seals off said nozzle seat and outlet hole of said cap to a position where said nozzle is fully withdrawn from said nozzle seat and outlet hole with the threads of said cap portion remaining in engagement with the threads of said neck.

2. In a dispensing cap for the threaded neck of a container, a nozzle, means for axially mounting said nozzle in the neck of the container and radially spaced therefrom to form an annular channel between the nozzle and the neck, a stop lug secured within said channel, a main cap portion having a top portion and a cylindrical skirt with internal threads for engagement with said threaded neck, said top portion having a nozzle seat terminating in an outlet hole, an annular collar depending from said top portion of said cap adapted for rotative movement in said annular channel, said collar having lug means depending from the lower edge thereof and extending into said channel adapted to engage said stop to limit the threaded rotative movement of said cap on said neck portion from a position where said nozzle seals off on said nozzle seat and outlet hole of said cap to a position where said nozzle is fully withdrawn from said nozzle seat and outlet hole with the threads of said cap portion remaining in engagement with the threads of said neck.

3. In a dispensing cap for the threaded neck of a container, a nozzle, means for axially mounting said nozzle in the neck of the container and radially spaced therefrom to form an annular channel between the nozzle and the neck, a stop lug secured within said channel, a main cap portion having a top portion and a cylindrical skirt with internal threads for engagement with the threaded neck, said top portion having a nozzle seat terminating in an outlet hole, lug means depending from said top portion of said cap adapted for rotative movement in said annular channel and engagement with said stop lug to limit the threaded rotative movement of said cap on said neck portion from a position where said nozzle seals off on said nozzle seat and outlet hole of said cap to a position where said nozzle is fully withdrawn from said nozzle seat and outlet hole with the threads of said cap portion remaining in engagement with the threads of said neck.

4. In a dispensing cap for the threaded neck of a container, an insert for the neck of the container, said insert including an outer cylindrical wall portion and an annular partial bottom portion, a hollow nozzle extending from said annular bottom axially within said insert and spaced from said cylindrical wall portion to form an annular channel, a stop lug secured within said channel, a main cap portion having a top portion and a cylindrical skirt with internal threads for engagement with said threaded neck, said top portion having a nozzle seat terminating in an outlet hole, an annular collar depending from said top portion of said cap adapted for rotative movement in said annular channel, said collar having lug means depending from the lower edge thereof and ex-

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tending into said channel adapted to engage said stop lug to limit the threaded rotative movement of said cap on said neck portion from a position where said nozzle seals off said nozzle seat and outlet hole of said cap to a position where said nozzle is fully withdrawn from said nozzle seat and outlet hole with the threads of said cap portion remaining in engagement with the threads of said neck.

5. The device of claim 4 in which said cylindrical wall portion of said insert has an annular rib formed on the outer surface thereof for sealing engagement with the inner wall surface of said neck.

6. The device of claim 4 in which said insert has means allowing said insert to be rotatively forced into said neck upon the progressive threaded engagement of the threads of said main cap portion upon said threaded neck in one direction but not in the opposite rotative direction.

7. In a dispensing cap for the threaded neck of a container, said neck having an internal reduced portion and an enlarged adjacent portion, an insert for the neck of the container, said insert including an outer cylindrical wall portion, said wall portion having a slightly reduced lower portion and a slightly enlarged upper portion, said upper portion having an annular bead formed thereon for engagement with said enlarged portion of said neck, said reduced lower portion of said insert having barb means formed thereon for penetrating engagement with said reduced portion of said neck when said insert is caused to rotate in one direction, a hollow nozzle secured coaxially within said insert and spaced therefrom to form an annular channel surrounding the nozzle, a stop lug fixedly secured within said annular channel, a main cap portion having a top portion and a cylindrical wall with internal threads for engagement with said threaded neck, said top portion having a nozzle seat terminating in an outlet hole, an annular collar depending from said top portion of said cap adapted for rotative movement in said annular channel, said collar having lug means depending from the lower edge thereof and extending into

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said channel adapted to engage said stop to limit the threaded rotative movement of said cap on said neck from a position where said nozzle seals off on said nozzle seat and outlet hole of said cap to a position where said nozzle is fully withdrawn from said nozzle seat and outlet hole with the threads of said cap portion remaining in engagement with the threads of said neck.

8. The device of claim 7 further characterized by said barb means of said insert having a radial extent slightly less than the radial extent of said enlarged upper portion of said insert to allow the same to bypass said enlarged portion of said neck.

9. In a dispensing cap for the threaded neck of a container, an insert for the neck of the container, said insert having a nozzle mounted coaxially therein, a main cap portion having threads for engagement with said threaded neck, said main cap portion having a nozzle seat and outlet hole communicating therewith, said nozzle being withdrawn from said nozzle seat upon the rotative movement of said main cap portion upon said neck, stop means formed in said insert, said insert having means for limiting rotative movement of the same in said neck in one direction only, and lug means formed on said main cap portion and extending into said insert for engagement with said stop means of said insert upon rotative threaded movement of said main cap portion upon said neck whereby removal of the cap portion from the neck is prevented.

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