

## PATENT SPECIFICATION



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### PROVISIONAL SPECIFICATION

#### Improvements in and relating to Closures for Containers for Liquids

We, FORREST BAIRD, a British Subject, of 157, St. Thomas' Road, Finsbury Park, London, N.4, and HENRY C. STEPHENS, LIMITED, a British Company, of 1, 5 Frederick's Place, Old Jewry, London, E.C.2, do hereby declare the nature of this invention to be as follows:—

This invention relates to closures for containers such as bottles of glass, earthenware or artificial condensation products or of metal, for liquids.

Usually when pouring liquid contents from containers of this character the outflow is in the form of an unsteady stream and it is the object of the present invention to provide containers with a closure through which the liquid can be poured in a substantially steady unvarying stream with accuracy and without drip or splash.

According to the present invention, a closure, adapted to be fitted in or on the neck or nozzle of a container, is provided with a chamber having an outlet and an air inlet therein, this chamber also communicating with the interior of the container by means of two separate passages. The outlet passage from the chamber may be provided with a slightly projecting lip adapted to prevent drips and for returning any liquid adhering to the outlet, back into the chamber when the container is set down in its normal position. The two passages which connect the chamber to the interior of the container are preferably of different cross-sectional area, the one of larger cross-sectional area being for the passage of the liquid contents in the container into the chamber and the smaller passage serving to allow air from the chamber to pass into the container. The outflow passage from the chamber is preferably in the form of a curved taper, whilst the outlet opening is of smaller cross-sectional area than the passage between the chamber and the container. The chamber may be of any suitable shape, but is preferably spherical. In the case of a spherical chamber an inward bulge is preferably provided on the wall provided with the passages leading into the container, so as to conduct any liquid that may remain

in the chamber when the container is set down, through one or other of the passages into the container.

In carrying the invention into effect a closure member is constructed in the form of a cylindrical cap which is open at one end and is closed at the other by a substantially spherical end. The open end of the cap may be screw threaded internally or externally so as to be engaged with a corresponding screw thread on the outside or inside of the neck or nozzle of a container. It will however be understood that the open end of the cap may be fitted into or over a smooth surfaced neck or nozzle, with or without the interposition of a suitable jointing sleeve. Preferably a jointing ring is located between the outer end of the neck or nozzle and the adjacent surface of the cap which for this purpose may be provided with a shoulder or recess.

In the spherical closed end of the cap is formed a chamber which communicates with the interior of the container by two passages of different cross-sectional area. The passage of smaller cross-sectional area is for the purpose of allowing air to pass into the container, whilst the passage of larger cross-sectional area serves for the outflow of liquid from the container into the chamber. These passages are preferably formed in a wall extending transversely across the cap. In a lateral wall of the chamber there is provided an air inlet opening, whilst substantially diametrically opposite this air inlet but at a higher level, preferably near the top of the chamber there is provided an outflow opening. This outflow opening is generally tapered and extends along a gradual curve, whilst at the outer end of the opening may be provided a lip. The cross-sectional area of the outflow opening is preferably smaller than the cross-sectional area of the passage through which the liquid is adapted to flow from the neck into the chamber. The cap may be constructed of any suitable material such as artificial condensation products, or of metal.

The chamber may be of any suitable shape. When the chamber is spherical

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or is provided with a curved base an upward bulge may be provided on the lower wall thereof between the two passages therein so as to cause any liquid which may be contained in the chamber to flow through one or both of the passages into the container. The closure above described is preferably adapted to be supplied as an accessory to a container for liquids, which container is normally closed by a suitable cap, plug or stopper. When the plug, cap or stopper has been removed from the container the closure in accordance with the invention is applied to the neck of the container for use in discharging the contents from the container. By tilting the container the liquid therein flows through the passage of larger cross-sectional area into the chamber, whilst air enters the chamber through the air inlet and can enter the container through the passage of smaller cross-sectional area. As the outlet from the chamber is of smaller cross-sectional area, than the passage between the chamber and the container, more liquid will pass into the chamber than can flow out through the outlet. This chamber con-

sequently forms a reservoir and as it is open to the atmosphere, a steady flow of liquid through the outlet can take place. By reason of the curvature of the outlet and/or the provision of a lip, any liquid which may adhere to the outlet when the container is set down in a vertical position, flows back into the chamber and from the latter into the container.

The provision of a cap as above described prevents any oscillatory pulsating effects when liquid is being discharged and which are usually caused by the intermittent entry of air bubbles into the container whilst this is being emptied and the level of liquid in the container is higher than the air inlet level.

If desired a suitable cover may be fitted over the cap so as to close the air inlet and the liquid outlet when the device is not in use so as to prevent the entry of dust or the like into the liquid.

Dated this 21st day of October, 1938.

For the Applicants,  
 GEORGE HAM & Co.,  
 Chartered Patent Agents,  
 93—94, Chancery Lane, London, W.C.2.

## COMPLETE SPECIFICATION

### Improvements in and relating to Closures for Containers for Liquids

We, FORREST BAIRD, a British Subject, of 157, St. Thomas' Road, Finsbury Park, London, N.4, and HENRY C. STEPHENS, LIMITED, a British Company, of 1, Frederick's Place, Old Jewry, London, E.C.2, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to closures for containers such as bottles of glass, earthenware or artificial condensation products or of metal, for liquids.

Usually when pouring liquid contents from containers of this character the outflow is in the form of an unsteady stream and it is the object of the present invention to provide containers with a closure through which the liquid can be poured in a substantially steady unvarying stream with accuracy and without drip or splash.

According to the present invention, a closure, adapted to be fitted in or on the neck or nozzle of a container, said closure being provided with a chamber or reservoir having an outlet and an air inlet therein, this chamber also communicating with the interior of the container, is characterised in that the chamber com-

municates with the interior of the container by means of two separate passages. The outlet passage from the chamber may be provided with a slightly projecting lip adapted to prevent drips and for returning any liquid adhering to the outlet back into the chamber when the container is set down in its normal position. The two passages which connect the chamber to the interior of the container are preferably of different cross-sectional area, the one of larger cross-sectional area being for the passage of the liquid contents in the container into the chamber and the smaller passage serving to allow air from the chamber to pass into the container. The outflow passage from the chamber is preferably in the form of a curved taper, whilst the outlet opening is of smaller cross-sectional area than the passage between the chamber and the container. The chamber may be of any suitable shape, but is preferably spherical. In the case of a spherical chamber an inward bulge is preferably provided on the wall provided with the passages leading into the container, so as to conduct any liquid that may remain in the chamber when the container is set down, through one or other of the passages into the container.

The invention will now be described with reference to the accompanying drawing showing a sectional elevation of a closure member fitted on the neck of a container.

As shown in the drawing a closure member is constructed in the form of a cylindrical cap 1 which is open at the end 2 and is closed at the top by a substantially spherical end 3. The lower end of the cap 1 is screw threaded internally at 3 so as to engage with a corresponding screw thread 4 on the outside of the neck or nozzle 5 of a container 6. It will however be understood that the lower end 2 of the cap may be screw threaded externally so as to engage with a corresponding screw thread on the inside of the neck or nozzle 5 of the container. The lower end 2 of the cap may also be smooth so as to fit into or over a smooth surfaced neck or nozzle of a container with or without the interposition of a suitable jointing sleeve or ring.

A jointing ring 7 is located between the upper end of the neck or nozzle 5 and the adjacent surface of the cap 1 which for this purpose is provided with a recess 8 or with a shoulder.

In the cap 1 is formed a chamber 9 which communicates with the interior of the container 6 by two passages 10 and 11 of different cross-sectional area. The passage 11 of small cross-sectional area is for the purpose of allowing air to pass from the chamber 9 into the container 6 whilst the passage 10 of larger cross-sectional area serves for the outflow of liquid from the container 6 into the chamber 9. These passages 10, 11 are preferably formed in a wall 12 which extends transversely across the cap 1.

The wall 12 is preferably formed as a member separate from the cap 1 and is secured therein in any suitable manner, whilst a jointing ring 16 is preferably arranged between the wall 12 and the cap 1.

In a lateral wall of the chamber 9 there is provided an air inlet opening 13 whilst substantially diametrically opposite the opening 13 but at a higher level, preferably near the top of the chamber there is provided an outflow passage 14. This outflow passage is generally tapered and the axis thereof extends along a line which is inclined at about 45° to the central axis of the closure. At the outer end of the passage 14 there is provided a lip or spout. The outer surface of the lip or spout is preferably arranged at an angle of 75° to the horizontal as it has been found that by arranging the outflow surface of the opening 14 at this angle the contents can

be poured out conveniently and without drip. The cross-sectional area of the outflow opening 14 is preferably smaller than the cross sectional area of the passage 10. The cap 1 may be constructed of any suitable material such as artificial condensation products, glass, or of metal.

The chamber 9 may be of any suitable shape. When the chamber 9 is spherical or is provided with a curved circular base an upward bulge 15 may be provided between the passages 10 and 11 so as to cause any liquid which may be contained in the chamber 9 to flow through one or both passages into the container 6.

The closure above described is preferably adapted to be supplied as an accessory to a container for liquids, which container is normally closed by a suitable cap, plug or stopper. When the plug, cap or stopper has been removed from the container 6 the closure 1 is applied to the neck 5 of the container for discharging the contents of the latter. By tilting the container 6 the liquid therein flows through the passage 10, whilst air enters the chamber 9 through the air inlet 13 and can enter the container 6 through the passage 11 or through the single passage above the level of liquid.

As the outlet 14 is of smaller cross sectional areas than the passage 10 more liquid passes into the chamber 9 than can flow out through the outlet 14. This chamber 9 consequently forms a reservoir and as it is open to the atmosphere a steady flow of liquid from the outlet 14 can take place. By reason of the curvature of the outlet and/or the provision of the lip or short spout, any liquid which may adhere to the outlet 14 when the container is set down in a vertical position, flows back into the chamber 9 and from the latter into the container 6.

By providing a closure 1 as above described oscillatory pulsating effects are prevented when the liquid is being discharged and which are usually caused by the intermittent inflow of air bubbles into the container whilst the container is being emptied and the level of the liquid in the container 6 is higher than the air inlet level.

The air inlet 13 may be closed by a finger whereby the device can be used for dispensing the contents of the container 6 in drops.

If desired a suitable cover may be fitted over the closure 1 so as to close the air inlet 13 and the outlet 14 when the device is not in use, thus preventing the entry of dust or the like into the liquid.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to

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be performed, we declare that what we claim is:—

1. A closure adapted to be fitted in or on the neck or nozzle of a container, said  
5 closure being provided with a chamber or reservoir having an outlet and an air inlet therein, this chamber also having means for communicating with the interior of the container, wherein the  
10 chamber communicates with the interior of the container by means of two separate passages.

2. A closure according to claim 1, wherein the outlet from the chamber is  
15 provided with a slightly projecting lip or spout.

3. A closure according to claim 1, wherein the two passages are of different cross sectional area the passage of larger  
20 cross sectional area serving for the passage of liquid contents from the container into the chamber, whilst the passage of smaller cross sectional area serves to allow air to pass from the  
25 chamber into the container.

4. A closure according to claim 2, wherein the outlet is in the form of a

curved taper and the outlet opening is of smaller cross sectional area than the means of communication between the  
80 chamber and the container.

5. A closure according to any one of the preceding claims wherein the chamber is of spherical shape.

6. A closure according to any one of the claims 1 to 5, wherein an inward  
85 bulge is provided in the chamber between the two passages by which the chamber communicates with the container.

7. A closure according to claim 2,  
40 wherein the axis of the outlet passage in the spout is inclined at about  $45^\circ$  to the central axis of the closure, whilst the outer surface of the lip or spout is preferably arranged at an angle of  $75^\circ$  to  
45 the horizontal.

8. A closure for containers substantially as hereinbefore described with reference to the accompanying drawing.

Dated this 21st day of October, 1939.

For the Applicants,

GEORGE HAM & Co.,

Chartered Patent Agents,

93—94, Chancery Lane, London, W.C.2.

[This Drawing is a reproduction of the Original on a reduced scale.]

