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STOPPERS FOR LIQUID CONTAINERS

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FIG. 1

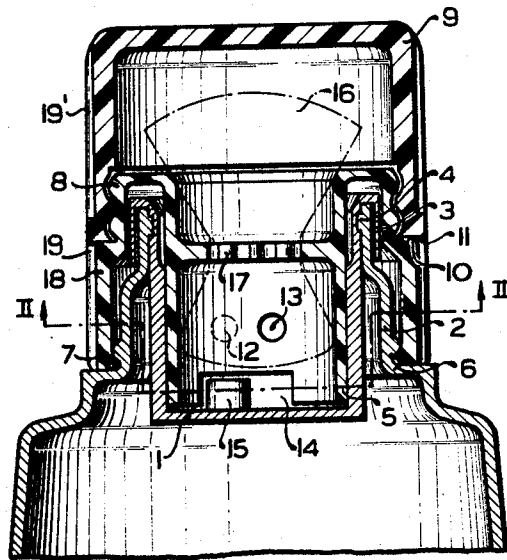
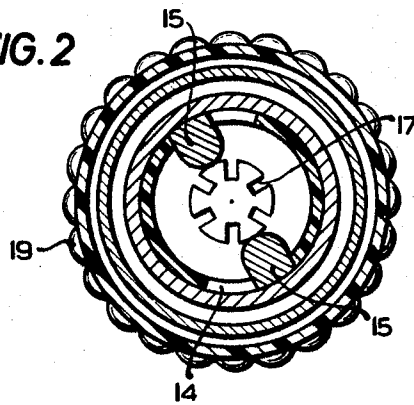


FIG. 2



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STOPPERS FOR LIQUID CONTAINERS

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W 37,599

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ABSTRACT OF THE DISCLOSURE

An applying stopper in which a cylindrical inner stopper is rotatably mounted in a holder pressed into the opening in a container, the stopper and holder having spaced openings which can be placed into and out of registry by rotation of the inner stopper, a distributor member being mounted in the inner stopper and covered by a cap which is threadably engageable on the outer limb of a U-shaped rim on the inner stopper such that as the cap is threadably engaged in place on the inner stopper, the holes are brought out of registry whereas as the cap is disengaged, the holes are brought into registry.

This invention relates to stoppers for liquid containers. More particularly, the invention is concerned with an applying stopper for a liquid container.

For the application of small amounts of fluids to any surfaces, for example the application of fluid shoe cleaning materials possibly with the aid of a distributing member made of absorbent material, it is known to use containers with a hollow cup-shaped plastic stopper pressed under tension into the neck portion; the bottom of the stopper contains a central aperture through which the distributing member projects into the interior of the container and, about this central aperture, a ring of additional smaller apertures through which the fluid can pass into the pores of the absorbent material. In other known applying stoppers the porous distributor is held by tongues stamped out of an unscrewable sleeve and bent back inwardly, or alternatively the porous distributor is adhesively secured onto the holder or else onto a special intermediate disc which can then be mechanically joined to the holder. Holding means of this type, particularly those in which adhesive is to be used for mounting the distributing member, did not prove successful in practice, because the distributing member was inadequately secured, or because they were too expensive to produce or because with certain filling materials the adhesion tended to be destroyed. An improved applying stopper was therefore constructed, comprising a one-piece holder containing a continuous aperture wherein the porous distributing member was fastened outside a circularly closed form of the holder by ribs extending obliquely downwardly lengthwise on the inside of the holder with their ends projecting inwardly at an acute angle. In order to prevent the filling material from running out and drying up, the holder and distributing member must in all cases be surrounded by a removable closing cap.

All known applying stoppers for containers filled with fluid material have the disadvantage that, when the container is in an inclined or horizontal position, possibly when it is being dispatched or used for travelling, the fluid contents run into the cavity between the distributing member and the closing cap since the connection between the interior of the container and the distributing member is not broken even during storage. This means that when the cap is removed after the container has been stored in an inclined or horizontal position the liquid which has passed into the cavity between the distributing member

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and the cap runs out, is wasted and may easily soil other articles.

The object of the present invention is to provide an applying stopper for containers filled with fluid material wherein the aforementioned disadvantage of all known applying stoppers is eliminated and the flow connection between the interior of the container and the distributing member is established only when the applying means are being used, whereas when the container is being stored or dispatched, i.e. whenever the applying means are not being used, the stopper can be closed in such a way that no fluid can pass from the container to the distributing member. In this way the device according to the invention ensures that none of the liquid contents can possibly pass from the interior of the container into the cavity between the distributing member and the cap and thus run out when the cap is taken off.

A further object of the invention further concerns an applying stopper for containers filled with fluids, wherein the action of putting on the closing cap automatically breaks the connection between the interior of the container and the distributing member, whereas the action of removing the cap automatically re-establishes the flow connection between the two said regions, so that the applying means are always ready for use without being manipulated. This form of the invention offers the advantage that the user need not specially break the connection between the interior of the container and the distributing member, which might be forgotten so that the advantages of the invention would not be obtained.

According to the invention, there is provided an applying stopper for a liquid container comprising a cup-shaped holder adapted to be pressed into an opening in the container, a substantially cylindrical inner stopper rotatably mounted in the holder and having a number of holes provided in its walls, the holes being capable of being moved by rotating the inner stopper with respect to the cup-shaped holder into and out of alignment with corresponding holes provided in the walls of the holder, distributing means mounted in the inner stopper and a removable closing cap adapted to engage with the holder or inner stopper and cover the distributing means and inner stopper.

The distributing means preferably comprises a member which may be made of many different types of material and may, in known manner, be one of a number of various constructions depending on the application to which the stopper is put. For example, the distributing member may be a tongue of flexible material, a bristle-type brush with an outlet for the fluid, such as may be used for applying adhesives, or a sponge of absorbent material such as may be used for applying shoe cleaning materials.

The holes in the cup-like holder and the inner stopper are preferably provided at the same level in the cylindrical wall so that the inner stopper can be made in the manner of a bottomless socket. If, however, the inner socket and the cup-like holder are each provided with a bottom, then the holes in the holder portion and the inner stopper which have to be aligned can be provided in the bottom of the two members. The size and shape of the holes, which may be circular or elongated, are chosen according to the application envisaged, i.e. are chosen specially so as to allow for the viscosity of the filling material and the nature of the distributing member, but care must be taken to make the sealing surface between the cup-like holder and the inner stopper large enough to prevent any liquid from emerging between these two portions.

In a preferred embodiment of the invention, stops are provided on the cup-shaped holder, possibly at the bottom thereof, and engage in arcuate recesses provided in the inner stopper to limit the rotary movement, so that when the recess in the inner stopper engages one of the stops,

the inlet for the filling material from the interior of the container to the distributing member will be automatically opened, whereas when the recess engages a second stop the influx of filling material will automatically be cut out. Similarly, the stops may of course be components of the inner stopper and engage in arcuate recesses provided in the cup-shaped holder to limit the rotary movement. Such recesses in the holder might be in the form of circular grooves in the bottom thereof.

As mentioned above, the cup-shaped holder must be inserted in the neck of the container in such a way that it is fixed non-rotatably therein, since otherwise on rotation of the inner stopper the holder surrounding it might be able to rotate with it with the result that the holes in the two parts would not be brought into alignment. In order to make sure that the cup-shaped holder cannot rotate in the neck of the bottle, it is preferable to provide the holder with a rim member bent about the neck of the container and provided on the inside with grooves and ridges, the grooves and ridges of the cup-shaped holder desirably engaging in corresponding parallel grooves and ridges in the neck of the container.

In a preferred embodiment of the invention, the applying stopper for containers filled with fluid is constructed so that when the closing cap is screwed in place, the inlet for the filling material from the interior of the container to the distributing member is automatically closed, whereas when the cap is unscrewed, communication between the interior of the container and distributing member is established so that the device is ready for use. For this purpose, the inner stopper preferably has a U-shaped rim profile and its outer wall surrounding the neck of the container preferably carries a screwthread for the cap and a circular shoulder on which the cap is in frictional contact when screwed in place. As a result of the friction between the circular shoulder on the inner stopper and the lower edge of the cup when the cap is screwed on, the rotatably mounted inner stopper is entrained until the stop limit the rotary movement of the inner stopper at a place where the holes in the stopper and those in the cup-shaped holder do no coincide. Consequently, the flow connection between the interior of the container and the distributing member is broken when the cap is screwed firmly on. When the cap is unscrewed, the friction between the circular shoulder on the inner stopper and the lower edge of the cap first causes the inner stopper to be entrained by the cap until a second stop limits the rotary movement of the stopper at a place where the holes in the latter coincide with those in the cup-shaped holder. Only when this abutment position of the inner stopper is reached is the lower edge of the closing cap freed from the circular shoulder on the inner stopper, whereupon the cap can be completely unscrewed and the applying device is ready for operation.

Although the embodiment described is specially preferred because of its automatic action, the same effect can substantially be obtained if the closing cap, instead of being screwed on is pushed firmly down until its lower edge lies on the circular shoulder and is then turned in the appropriate direction until the necessary abutment position of the inner stopper is reached. But in this case, it is desirable to provide an appropriate inscription on the stopper to warn the user of the necessity of turning it; this is unnecessary if a screwthread is provided between the cap and the outside edge of the inner stopper.

It will be evident that the inner stopper must be mounted in the cup-shaped holder in such a way that it cannot drop out or be loosened, since only in this way can a seal be produced between the stopper and the holder. It is therefore desirable for the inner stopper to have a U-shaped rim profile adapted to fit over the neck of the container or over the rim member formed on the cup-shaped holder, a circular protrusion on the inner stopper engaging in a circular groove in the neck of the container. In this way, the inner stopper is mounted rotatably on the

neck of the bottle and in the cup-shaped holder without being able to slide out of the latter and destroy the seal. The inner stopper may of course be fixed onto the neck of the bottle in any other suitable way using known means, possibly with the aid of studs provided on the neck of the bottle, extending perpendicular to the axis of the container and engaging in circular grooves or circular recesses in the outer rim of the inner stopper. Other possible ways of fixing the inner stopper onto the neck of the bottle and/or into the cup-shaped holder will be known and obvious to one skilled in the art.

For the specific purpose of attaching a distributing member made of absorbent material, such as felt or plastic foam, it is preferable to provide the inner wall of the inner stopper with radially inwardly extending studs to secure the distributing member. In this way a circular constriction such as a toothed band is formed inside the cylindrical inner stopper, through which construction a suitably shaped sponge of plastic foam may be forced and thus secured.

The invention will now be further described, by way of example, with reference to the accompanying drawing, in which:

FIG. 1 is a vertical section through one example of an applying stopper according to the invention; and

FIG. 2 is a sectional view taken along lines II—II in FIG. 1.

Referring to the drawing, the applying stopper comprises a cup-shaped holder 1 with rim members 3 which are bent in a U-shape about the edge of the neck 2 of a container and which are secured against rotary movement along said edge with the aid of grooves and ridges 4. Inserted in the cup-like holder 1 is a two-walled cylindrical inner stopper 5, the wall surface of which is in contact with the wall of the cup-shaped holder 1 in the sealing position. The inner stopper 5 is bent in a U-shape about the top edge of the neck 2 of the container and the bent rim member 3 of the cup-shaped holder 1, the outer edge being secured against withdrawal by a protrusion 7 extending around the inside edge of the outer limb of the U and engaging in a groove 6 in the neck 2 of the container. The inner stopper 5 is further provided at its outer edge with a screwthread 8 and with a circular shoulder 10 at the base of the screwthread 8. An internally screw-threaded cap 9 can be secured onto the stopper 5 until its lower edge 11 bears against the shoulder 10 with frictional contact.

The cup-shaped holder 1 is provided with a pair of diametrically-opposed holes 12 which, by suitable rotation of the inner stopper 5, can each be made to coincide with a hole 13 in the latter. Rotation of the inner stopper 5 is limited by two stops 15 provided on the holder 1 engaging in recesses 14 in the stopper 5, so that in one abutment position the holes 12 and 13 coincide and in the other abutment position hole 13 is against a wall portion of the cup-shaped holder 1 and hole 12 against a wall portion of the inner stopper 5 and no liquid can flow out of the inside of the container and through the holes into the cavity in the inner stopper.

A distributing member 16, shown in dotted lines and made of absorbent material such as plastic foam, has its lower portion pushed through the cavity formed by studs 17 on the cylindrical wall of the inner stopper 5 and extends into the space between the top edge of the inner stopper and the closing cap 9. To facilitate handling when they are screwed on and unscrewed, the cap 9 and the outer rim portion 18 of the stopper 5 are provided with vertical grooves and ridges 19 and 19' respectively.

When the closing cap 9 is screwed onto a screwthread 8, the lower edge 11 of the cap 9 makes frictional contact with the circular shoulder 10 and thus entrains the inner stopper 5 in its rotary movement until the recesses 14 engage the stops 15 so that holes 12 and 13 do not coincide. Conversely when the cap 9 is unscrewed the friction between the lower edge 11 and the circular shoulder 10

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causes the stopper 5 to be entrained in the opposite direction until the recesses 14 engage the opposite sides of the stops 15 so that the holes 12 and 13 coincide. Only then can liquid pass from the inside of the container, through the holes in the interior of the hollow cylindrical stopper 5 and thence through the distributing member 16 of absorbent material to the top applying surface thereof.

Other embodiments and modifications are envisaged without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. An applying stopper for a liquid container having a neck and an opening in said neck, said stopper comprising:

- (a) a cup-shaped holder adapted to be pressed into the opening in said container and having a wall with a number of spaced holes therein;
- (b) a substantially cylindrical inner stopper rotatably mounted in said holder and having a wall with a number of holes provided therein, the latter said holes being capable of being moved by rotating said inner stopper with respect to said holder, into and out of alignment with the holes in said holder;
- (c) distributing means mounted in said inner stopper; and
- (d) a removable closing cap adapted to engage said inner stopper and cover said distributing means and inner stopper, said inner stopper being provided with arcuate recesses, said holder including stops engaged in said recesses whereby respective rotary movement between said holder and stopper is limited by said stops abutting the ends of said recesses.

2. An applying stopper for a liquid container having a neck and an opening in said neck, said stopper comprising:

- (a) a cup-shaped holder adapted to be pressed into the opening in said container and having a wall with a number of spaced holes therein;
- (b) a substantially cylindrical inner stopper rotatably mounted in said holder and having a wall with a number of holes provided therein, the latter said holes being capable of being moved by rotating said inner stopper with respect to said holder, into and out of alignment with the holes in said holder;
- (c) distributing means mounted in said inner stopper; and
- (d) a removable closing cap adapted to engage said inner stopper and cover said distributing means and inner stopper, said inner stopper having a U-shaped rim profile adapted to fit over the neck of said container, a screwthread formed on the outer limb of the U and a shoulder provided at the base of said screwthread, said closing cap being provided with a screwthread for engagement with said screwthread on said inner stopper and said shoulder serving to limit the amount by which said cap may be screwed onto said inner stopper.

3. A stopper as claimed in claim 2, in which the outer limb of said U-shaped rim of said inner stopper surrounding said neck of said container is provided with a protrusion engageable in a groove formed in the neck of said container.

4. A stopper as claimed in claim 1, in which said inner stopper is provided with an aperture and studs which

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extend radially inwardly from the edge of said aperture, said distributing means being received in said aperture and said studs serving to secure said distributing means in said aperture.

5. An applying stopper for a liquid container having a neck and an opening in said neck, said stopper comprising:

- (a) a cup-shaped holder adapted to be pressed into the opening in said container and having a wall with a number of spaced holes therein;
- (b) a substantially cylindrical inner stopper rotatably mounted in said holder and having a wall with a number of holes provided therein, the latter said holes being capable of being moved by rotating said inner stopper with respect to said holder, into and out of alignment with the holes in said holder;
- (c) distributing means mounted in said inner stopper; and
- (d) a removable closing cap adapted to engage said inner stopper and cover said distributing means and inner stopper, said holder including a rim member adapted to fit over the neck of said container and a number of ridges engageable with said neck.

6. A stopper as claimed in claim 5 in which said inner stopper has a U-shaped rim profile adapted to fit over the rim member of said holder, a screwthread being formed on the outer limb of the U-shaped rim of said stopper and a shoulder being provided at the base of said screwthread, said closing cap being provided with a screwthread for engagement with the screwthread on said inner stopper and said shoulder serving to limit the amount by which said cap may be screwed onto said inner stopper.

7. A stopper as claimed in claim 6, in which the outer limb of said U-shaped rims of said inner stopper is provided with a protrusion which is engageable in a groove formed in the neck of said container.

8. A liquid container comprising:

- (a) a container having a neck, an opening being provided in said neck;
- (b) a cup-shaped holder pressed into said opening, the holder having a wall with a number of spaced holes therein;
- (c) a substantially cylindrical inner stopper rotatably mounted in said holder and having a wall with a number of holes provided therein, said holes being capable of being moved, by rotating said inner stopper with respect to said holder, into and out of alignment with the holes in said holder;
- (d) distributing means mounted in said inner stopper; and
- (e) a removable closing cap engageable with said holder to cover said distributing means and inner stopper, said neck being provided with a number of ridges, and said holder including a rim member adapted to fit over said neck, and a number of ridges engageable between the ridges in said neck.

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EDWARD L. ROBERTS, *Primary Examiner*.