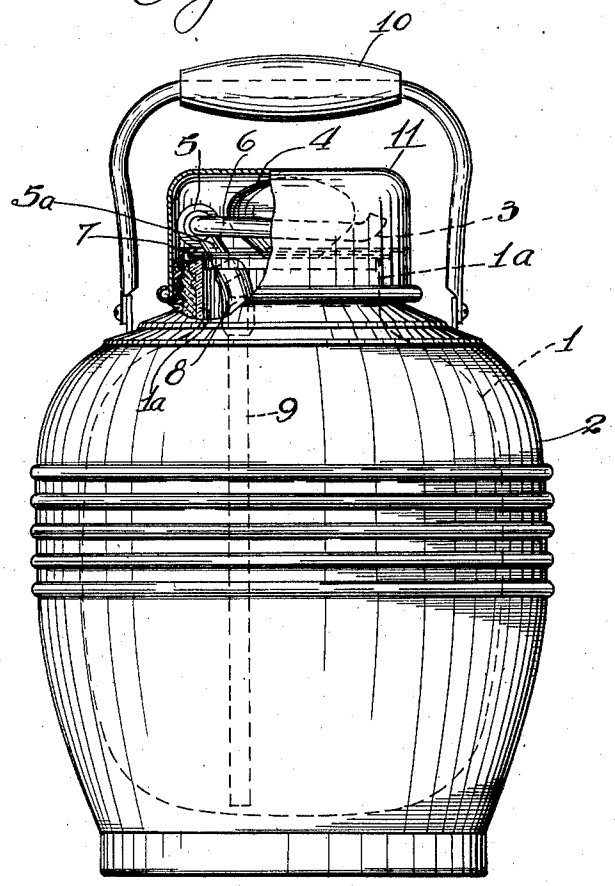
March 10, 1942. C. BRAMMING 2,275,607

DISPENSING STOPPER FOR RECEPTACLES

Filed April 19, 1940 2 Sheets-Sheet 1

Fig. 1.



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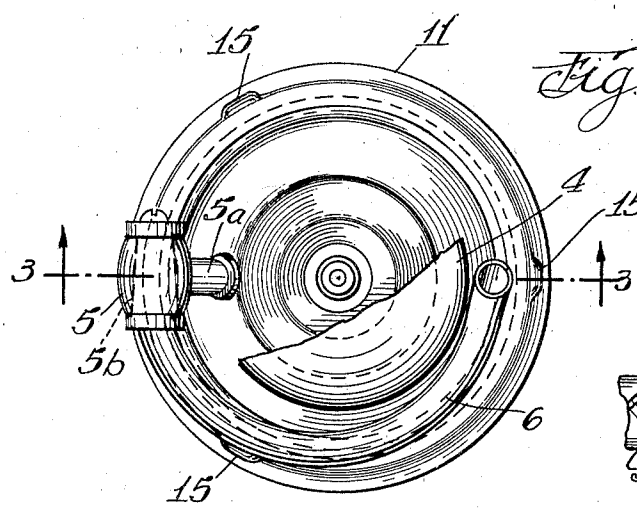


Fig. 2

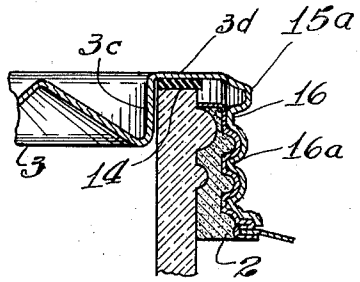
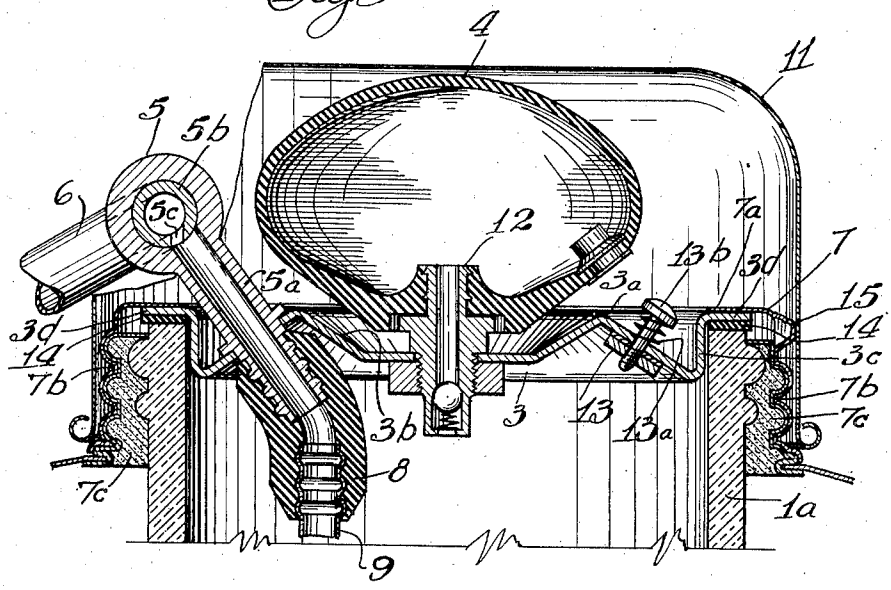


Fig. 4

Fig. 3



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UNITED STATES PATENT OFFICE

2,275,607

DISPENSING STOPPER FOR RECEPTACLES

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Application April 19, 1940, Serial No. 330,475

5 Claims. (Cl. 221—76)

The invention pertains to heat-insulated receptacles of the kind commonly used for hot or cold liquids or beverages for various purposes such as trips, picnics, etc. Receptacles of the kind referred to have frequently a capacity of a gallon or more, and when used for holding liquids or beverages in the past, it has been necessary to tilt or move the entire receptacle to pour the liquid or beverage therefrom, an operation not always convenient and frequently difficult to perform. It has therefore been the practice to provide such receptacles with lateral spigots extending through the metal jackets customary with such receptacles, to the outside, but the spigots have considerably increased the frangibility of the receptacles and have been found to be impractical.

The present invention has for its object to provide an improved form of stopper for receptacles of the kind referred to including means for dispensing the contents of these receptacles without the necessity of tilting them or moving them bodily in any way and without requiring spigots of any kind through the metal jacket and frangible container. The discharging means used by the present invention include a bulb pump and a discharge pipe extending from close to the bottom of the container upward through the stopper and ending in a spout through which the liquid contents of the receptacle are forced towards the outside by pressure of air in the container produced by the bulb pump. It is a particular object of the present invention to provide a stopper for these receptacles including such dispensing means so arranged and constructed that while the spout is sufficiently long to enable the user to direct the liquid into a cup, glass or the like without spilling, the complete arrangement is so compact that in inoperative condition it can readily be housed within a cup cap of the customary dimensions used in connection with receptacles of the type referred to.

The improved stopper is provided with a centrally positioned inlet valve upon which is mounted a pumping bulb having a larger horizontal than vertical diameter, and also with a curved discharge spout having an inoperative position around said bulb and movable to an operative position extending radially away from said stopper. Said discharge spout is connected to a discharge valve disposed above the edge portion of said stopper which has a tubular connection with a discharge pipe extending substantially to the bottom of the receptacle with which said stopper is used.

The body of the improved stopper consists of a circular plate of metal, Bakelite or other suitable material to be placed upon the neck of the receptacle which is so shaped as to include a trunco-conical area ascending towards the center axis of the stopper, through which area passes the tubular connection from the spout to the discharge pipe approximately at right angles thereto. This enables the discharge valve and the spout to be disposed above the very edge of the container neck or even further away from the center of the container while the discharge pipe may nevertheless be sufficiently spaced from the inside wall of the neck to facilitate assembling the parts on the stopper and to avoid friction or inconvenience in placing the stopper on the receptacle, the only limitation of this eccentric position of spout and discharge valve being the diameter of the cup cap which is to cover the complete assembly. Hence maximum space is reserved for the pumping bulb.

Additionally the improved stopper is so formed that it has a crater-like depression towards the center shaped to substantially correspond with the bottom of the bulb, thus giving support to same during compression with the result that the pump operation becomes more efficient.

The discharge valve is of the tapered-plug type, the plug being rigidly connected to the spout in such a manner that the valve is closed when the spout is in its inoperative position adjacent to the bulb and that it is opened when the spout is swung into its operating position.

In order to avoid breakage the discharge pipe protruding into the receptacle is preferably made of metal, since glass or other vitreous material fractures so readily that it would not be suitable for use in receptacles for the purposes referred to. To prevent the undue conduction of heat from the hot contents of the receptacle when the latter is used to contain hot liquid or beverage, and to prevent the undue conduction of heat from without the receptacle to the contents thereof when the latter is used to contain cold liquid or beverage, a connecting member of heat-insulating material, for example, rubber compound, is preferably employed between the upper end of the discharge pipe and the inlet connection of the discharge valve carried by the stopper.

The stopper is also preferably provided with a relief valve for manual operation, so that at the end of any liquid dispensing period, the pressure inside of the jar may be dissipated by operation of said valve.

A further object of the invention is to provide

improved means for holding dispensing stoppers on the necks of the receptacles with which they are used. A still further object of the invention is to provide such holding means that the usual screw threaded engagement of the cup caps customary with such receptacles may be dispensed with, whereby the cup caps can be quickly applied to and quickly removed from the neck of the receptacles, and yet the cup caps are held so firmly in place as to be safe from accidental displacement.

The improved stopper plate is provided at its periphery with a horizontal annular flange connected with the remaining portion of the plate by a vertical wall preferably of such height that said annular flange will be of a higher level than the rest of the plate. Said vertical wall is of such an outside diameter that it loosely fits the neck of the receptacle and said annular flange forms a seat for a washer of rubber or similar material intended to rest upon the neck of the receptacle. Due to the height of the vertical wall the main part of the plate and the lower portions of the dispensing mechanism will be disposed within the neck of the receptacle when the stopper is placed on the receptacle, thus reducing the height by which the complete stopper arrangement will rise above the neck of the receptacle.

The improved stopper is secured to the neck of the receptacle by a retaining ring having a horizontal portion which partly overlaps the annular flange of the stopper plate, and a vertical portion which is provided with screw threads that engage screw threads arranged on the neck of the receptacle. Alternatively the above-mentioned annular flange of the stopper plate may be extended into a vertical lip provided with screw threads which engage the screw threads on the neck of the receptacle so that no separate retaining ring is required.

For the attachment of the cup cap, which preferably is of resilient material, the vertical portion of said retaining ring or the vertical lip of said stopper plate respectively, is provided with one or several lugs radially projecting outwardly which are preferably disposed above the uppermost screw thread lest they interfere with the screw threads on the ring or lip, and which extend sufficiently far to keep the cup cap in flexed condition when it is slipped over the neck, thus assuring a firm hold of same. They should also extend far enough to prevent contact of said cup cap with any of the screw threads in the retaining ring or lip thus preserving said screw threads from deformation.

The dispensing stoppers and cup caps of the present invention are readily interchangeable with the plain stoppers and ordinary cup caps heretofore used in well-known types of receptacles of the kind under consideration, with the result that the dispensing stoppers are available for use to those who already have and are using such receptacles without requiring the use of any new parts whatsoever excepting the cup caps.

Fig. 1 illustrates a heat insulated receptacle in front elevation with part of the cap being broken away revealing a central vertical section of the neck of the receptacle with the improved stopper in place thereon.

Fig. 2 is a plan view to an enlarged scale of the stopper shown in Fig. 1 with the pumping bulb partly removed to more clearly show the remaining parts of the structure.

Fig. 3 is a vertical sectional view to a further enlarged scale of the stopper construction and neck portion of the receptacle taken along the line 3—3 of Fig. 2, part of the cap being shown in place over the stopper and the discharge spout being in its operative position.

Fig. 4 shows a modification to an enlarged scale of an arrangement by which the improved stopper is held on the neck of the receptacle.

Similar numerals refer to similar parts throughout the several views.

As shown in Fig. 1, a heat insulated receptacle of the kind referred to, includes a ceramic or vitreous container 1 having a neck portion 1a. The container is surrounded by a metal jacket 2 spaced therefrom and with heat insulating material between the jacket and the container. The dispensing stopper of the invention includes a lid plate 3, a pumping bulb 4, a discharge valve 5, a discharge spout 6 connected with the discharge valve and movable to operative and inoperative positions, the inoperative position of the spout being shown in Fig. 1. It also includes a retaining ring 7. The discharge valve 5 has a tubular inlet 5a connected with a member 8 of heat insulating material, for example, rubber compound which in turn is connected with a discharge pipe 9 preferably of metal, that extends substantially to the inner lower surface of the container 1. A cup cap 11 of metal or other suitable material fits over the whole dispensing stopper including its retaining ring 7. The jacket 2 of the jar is provided with a carrying handle 10.

As shown in Fig. 2 the discharge valve 5 is of the tapered-plug type, the tapered valve member 5b being rigidly secured to one end of the discharge spout 6. The body of valve 5 is located as far from the vertical axis of the stopper as the size of cup cap 11 will permit. This provides as large a diameter as possible for the pumping bulb 4 which is preferably of rubber compound. In order that the spout 6 when in the inoperative position will not interfere with the bulb 4 said spout is arcuate extending around the outer edge portion of the bulb.

As shown in Fig. 3 the lid plate 3 of the improved stopper is provided with a trunco-conical area 3a ascending towards the center of the stopper. The tubular connection 5a of the discharge valve 5 protrudes through said trunco-conical area 3a of the lid plate substantially at right angles thereto, thus supporting the body of the valve 5 in a position as far from the axis of the stopper as the cup cap 11 will permit with the inner end of tubular connection 5a being nevertheless sufficiently spaced from the inside wall of the neck 1a to avoid inconvenience in assembling the parts of the stopper or placing the stopper on the receptacle.

As shown in Fig. 3 the pumping bulb 4 is of substantially larger horizontal diameter than it is high in order to restrict the over-all height of the dispensing stopper. Also, the lid plate 3 contains a centrally positioned crater-like depression 3b in which the lower portion of the pumping bulb is disposed. Thus, the height by which bulb 4 rises above the level of the neck of the receptacle is reduced. Also, when the bulb is compressed in a pumping operation to deliver air into the container 1 the lower portion of the bulb will be positively supported and not be permitted to so deflect as to lose a large part of the pumping efficiency of the bulb. In the center of said depression there is arranged an inlet valve 12 upon which the bulb is mounted

and through which the air is pumped into the container. A relief valve 13 is provided in the trunco-conical part of said lid plate which is held in closed position by a spring 13a and is moved to its opened position against the action of said spring by an external button 13b connected with said valve as indicated in Fig. 3.

As also shown in Fig. 3 valve member 5b is provided with a discharge port 5c which is preferably rectangular and which is in alignment with the tubular mounting portion 5a of the valve when the discharge spout 6 is in its operative position. The open condition of the valve continues from substantially the position shown in Fig. 3 until the spout 6 is raised to an angle of approximately 45 degrees to a horizontal plane at which position the valve is completely closed. The spout may therefore be swung out from its inoperative position towards the cup or glass to be served and no liquid can be discharged until the opening of the spout is well above the cup or glass. Also, when it is desired to make certain that no liquid is retained in the spout 6 after a dispensing operation and before returning the spout to its inoperative position the relief valve 13 may be operated dissipating the pressure in the container 1, and when the spout is held at a position below 45 degrees to a horizontal plane any liquid or beverage contained in the spout will flow freely through the valve 5 into the container 1 after which the spout 6 may be moved into its inoperative position around the bulb 4 with the assurance that no liquid is retained in discharge spout 6 that may flow on to the bulb or the lid plate.

As shown at 3c the lid plate of the stopper is provided with a vertically rising wall of an external diameter that fits loosely the neck of the receptacle. At its upper end this wall is provided with an annular flange 3d which rests upon the neck of the receptacle with a washer 14 of rubber compound or similar material positioned between them. Vertical wall 3c is preferably of such height that said annular flange 3d is of a higher level than the rest of said lid plate so that said lid plate 3 and the elements mounted thereon are partly located within the neck of the receptacle when said lid is in place. This again reduces the effective height by which the dispensing stopper rises above the neck of the receptacle so that it can more readily be housed within a cup cap of the conventional size. The annular flange 3d is held down upon the neck by a retaining ring 7 having a horizontal portion 7a engaging the upper surface of said annular flange 3d and a vertical portion 7b provided with screw threads 7c which engage screw threads disposed on the neck of the jacket 2 that envelops the vitreous container. Thus, the dispensing stopper can be firmly secured to, or removed from the neck of the receptacle according to requirement. The upper portion of the descending wall 7b of said retaining ring 7 contains three radially projecting lugs 15 as more clearly shown in Fig. 2. These lugs frictionally engage the cup cap 11 that is slipped over the complete dispensing stopper when in its position on the neck of the receptacle. They extend sufficiently far to keep said cup cap in flexed condition, thus holding it firmly on the neck of the receptacle. They also should extend sufficiently far to prevent the walls of the cup cap from getting into contact with the screw threads provided beneath, in order to prevent deformation of same.

Fig. 4 shows a modified form of retaining means that may be employed in the improved stopper of the present invention. This modification has the advantage that no separate element, such as the retaining ring 7 of Fig. 3, is required. According to Fig. 4 the annular flange 3d of lid plate 3 possesses a descending lip 16 on which are provided screw threads 16a that engage the screw threads on the neck of the outer jacket 2. The upper portion of this descending lip 16 is provided with one or more lugs 15a in the same way and of the same construction as the upper portion of retaining ring 7 described in connection with Fig. 3.

The cup cap 11 used with the improved dispensing stopper of the present invention is of the same dimensions as the cup caps customary with receptacles of the kind referred to. As shown in the drawings the present invention permits that the previously customary screw threads in these cup caps may be dispensed with, and it is now much simpler to remove said cup cap from the receptacle and have the same ready for dispensing than was formerly the case when it was necessary to screw the cap from the neck of the receptacle which was frequently difficult as the screw threads had a tendency to jam.

While I have shown my invention in the particular embodiments described I do not limit myself thereto as I may employ equivalents thereof without departing from the scope of the appended claims.

Having thus described my invention what I claim is:

1. A liquid dispensing stopper for use with heat insulated receptacles of the jug or jar type, said stopper including in combination a circular lid plate, dispensing means of the type producing pressure of air in the receptacle to eject the liquid through a discharge spout provided in said lid plate, a retaining element at the periphery of said lid plate having a substantially vertically descending wall containing screw threads adapted to engage screw threads on said receptacle, and a plurality of lugs provided in said vertically descending wall and protruding radially beyond said screw threads to frictionally engage the inside wall of a cup cap to be placed over said stopper.

2. A liquid dispensing stopper for use with heat insulated receptacles of the jug or jar type, said stopper including in combination a circular lid plate, dispensing means of the type producing pressure of air in the receptacle to eject the liquid through a discharge spout provided in said lid plate, a retaining element at the periphery of said lid plate having a substantially vertically descending wall containing screw threads adapted to engage screw threads on said receptacle and a plurality of lugs provided in said vertically descending wall above said screw threads and protruding radially beyond said screw threads to frictionally engage the inside wall of a cup cap to be placed over said stopper.

3. A liquid dispensing stopper for heat insulated containers of the jar or jug type, said stopper having a circular lid plate, a pumping bulb mounted centrally thereon and a discharge spout disposed above and adjacent the edge portion of said lid plate and hinged to be swung radially outward from said plate, said discharge spout being curved to fit around said pumping bulb so as to provide an arrangement of such compactness as may readily be housed in a cup cap of the size ordinarily used on such containers.

4. A liquid dispensing stopper for heat insulated containers of the jar or jug type, said stopper having a circular lid plate, a pumping bulb mounted centrally thereon and a discharge spout disposed above and adjacent the edge portion of said lid plate and hinged to be swung radially outward from said plate, said discharge spout being curved in two planes, one curve to provide a downwardly pointed discharge opening and the other curve to fit around said pumping bulb in order to provide an arrangement of such compactness as may readily be housed in a cup cap of the size ordinarily used on such containers.

5. A liquid dispensing stopper for heat insulated containers of the jar or jug type, said stopper including a circular lid plate, a pumping bulb mounted centrally thereon and having a vertical dimension smaller than its horizontal diameter, a discharge spout disposed above and adjacent the edge portion of said lid plate and hinged to be swung radially outward from said plate, said spout being curved to fit around said pumping bulb and said lid plate having a depression in its upper surface adapted to receive and support the lower surface of said pumping bulb so as to provide an arrangement of such compactness as may readily be housed in a cup cap of the size ordinarily used on such containers.

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