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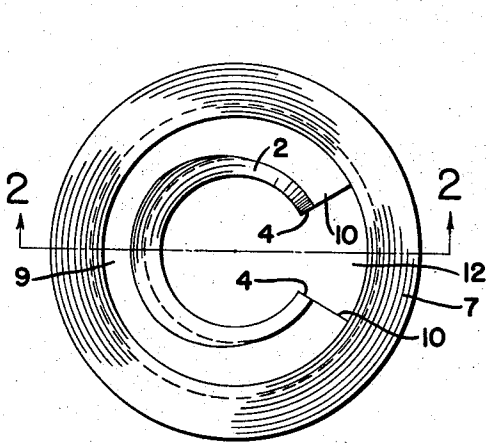


FIG. 1

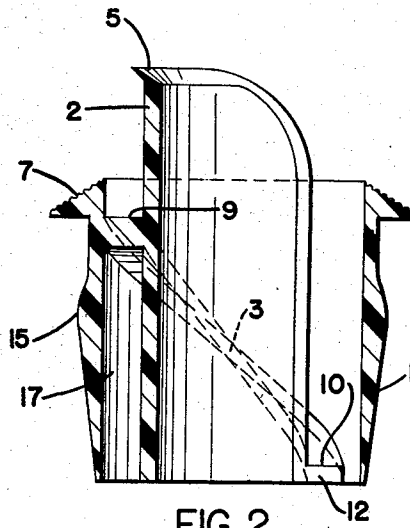


FIG. 2

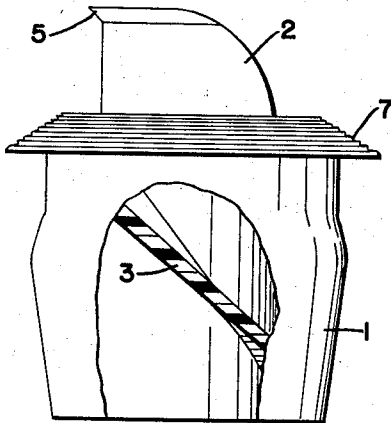


FIG. 3

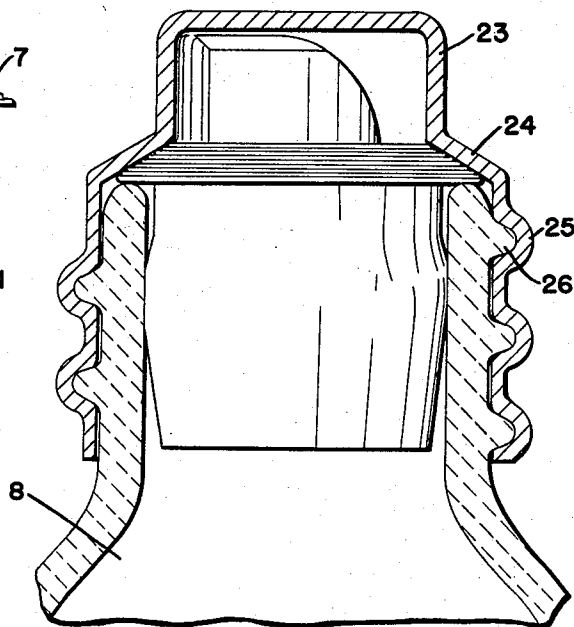


FIG. 4

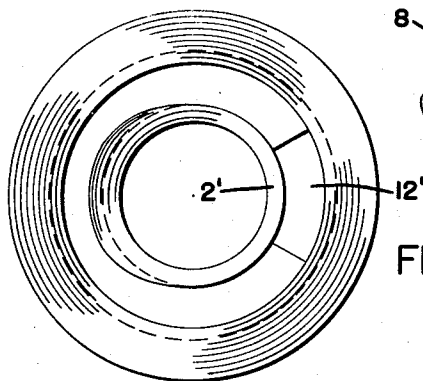


FIG. 5

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5 Claims. (Cl. 222—111)

This invention relates to a pouring spout with a run-back which collects liquid which drips from the lip of the pouring spout or runs down from the lip, and which returns such collected liquid to the container in which the pouring spout is fastened.

In my Patent No. 2,601,039 a pouring spout with a run-back is shown in which there is a baffle in the pouring passage on the opposite side of the spout from the pouring lip. This baffle provides relatively even flow of liquid through the pouring passage when the spout is tipped to pour the maximum amount of liquid through the spout, but this baffle is objectionable because it restricts the amount of liquid that can be poured through the pouring spout.

According to this invention the baffle is omitted. Uniform flow of liquid through the pouring passage is obtained by providing an opening in the drain of the run-back opposite the pouring lip, through which air enters the vessel as liquid is poured through the pouring passage. This opening may be connected with the pouring passage by providing an opening through the rear of the wall of the pouring passage, or the wall of the pouring passage may be imperforate in which case the opening in the drain will be separate from the pouring passage. If the opening in the drain is separate from the pouring passage and the spout is covered by a cap and the container provided with the spout is upset so that liquid collects in the pouring spout, when the container is righted the liquid in the run-back drains only relatively slowly back into the container through the opening in the drain. For this reason, the cap cannot be removed immediately after the container is righted, and the container then tipped for pouring. It is different when there is an opening through the rear of the wall of the pouring passage which connects with the opening in the drain, because with this construction, any liquid in the run back drains back into the container immediately upon righting the container.

Regardless of whether the opening in the drain is connected with the pouring passage or is separate from it, when the container is tipped to the pouring position this opening in the drain is above the pouring passage so that the pouring passage may be filled with liquid without interfering with the entrance of air through the opening in the drain. This opening in the drain has an area equal to substantially a third of the smallest cross-sectional area of the pouring passage.

This pouring passage is preferably of uniform cross-sectional area from one end thereof to the other, but in any event the area is everywhere at least as large as the area of the passage at the level of the air inlet. This permits unrestricted flow of the liquid through the portion of the pouring passage above the air inlet.

In pouring spouts which provide a run back for drainage the pouring passage is located substantially centrally of the spout. The front of the wall of the passage is advantageously provided with a pouring lip. The pouring passage extends above the outside wall of the spout at least at the front of the spout where the pouring lip is

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located. This lip is located above the outer wall of the spout so that when liquid is poured from it, it clears the top of the outer wall. Liquid dripping from the lip or running down from the lip is collected in the run-back passage and drains through this and eventually is returned to the container.

In order to provide drainage into the container it is necessary to provide an opening from the lowest level of the run-back passage into the container. Regardless of how this opening is constructed it is necessary to prevent liquid flowing out through it when the pouring spout is tipped to the pouring position, because otherwise liquid from the container would run up through the run back and spill over the outer wall of the container when the spout is in the pouring position. To prevent such undesirable spillage, the pouring passage is preferably made of uniform cross-sectional area, although restrictions in the cross-sectional area below the opening in the drain are not objectionable. In order to avoid lessening the cross-sectional area of the pouring passage, the wall of this passage extends below the opening in the drain. Likewise, extension of the pouring passage below the opening gives direction to the out-flowing liquid as it passes the level of the opening in the drain and prevents loss of liquid therethrough.

In the preferred construction, the wall of the pouring passage is made separate from the outer wall of the pouring spout which contacts the opening in the container and holds the pouring spout in place. By making the two walls separate the outer wall is maintained thin and flexible, and may be more readily compressed to fit an opening than if the outer wall were made to coincide with the wall of the pouring passage.

The back of the wall of the pouring passage is open throughout its length. This opening is preferably somewhat less than the width of the air inlet so that the opening from the air inlet into the pouring passage is somewhat restricted. This may be accomplished by providing an opening in the back of the pouring passage at the level of the air inlet, while providing no opening in the back of the pouring passage above the air inlet. However, by making the back of the pouring passage open above the air inlet, unrestricted flow of the liquid is insured.

If the back of the pouring passage is imperforate, a separate opening is provided at the lowest level of the drain which serves two purposes. When liquid is being poured from the container this opening serves as the air inlet, particularly when the maximum amount of liquid is flowing through the pouring passage. After pouring, when the container has been returned to the upright position, this opening returns any drainage in the run-back, to the container.

The pouring passage is preferably made of uniform cross-sectional area from one end to the other. The cross-sectional area may be greater at the pouring lip than at a lower level, but under no circumstances will the pouring passage be constricted above the level of the opening in the bottom of the drain. Such constriction would cause liquid to overflow through the open back of the pouring passage or through the separate opening in the drain and flow from the run-back passage instead of from the pouring lip at the top of the pouring passage. An outward flare at the bottom of the pouring passage and constrictions in the pouring passage below the opening in the drain have no adverse effect on the flow of the liquid. Likewise a decrease in the cross-sectional area of the pouring passage below the opening in the drain will not cause an overflow. However, a constriction in the pouring passage above the opening in the drain will cause liquid to flow out through the opening or through any opening there may be in the back of the pouring passage.

In the preferred adaptation of the invention illustrated

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in the drawings the outer wall of the pouring outlet tapers gradually downwardly and inwardly to facilitate insertion of the spout in an opening in a bottle, a metal can, or other container. The flange at the top of the outer wall of the spout rests on the area of the container around the opening which may be the top of the neck of a bottle, etc., and serves as a flexible gasket when the spout is covered with a rigid cover. Such cover may be drawn from aluminum or it may be a hard plastic, etc. The cover will be domed to cover the upper end of the pouring passage and will be stepped to provide sealing pressure on the flange. The top of the flange will preferably be slanted as shown in the drawing so that the step in the cover need not be horizontal but may be slanted at approximately the same angle as the top of the flange. The neck of the bottle or other container will advantageously be threaded externally and there will then be complementary threads on the inner surface of the skirt of the cap.

The invention will be further described in connection with the accompanying drawings, in which—

Fig. 1 is a plan view of the pouring spout;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is an elevation partly broken away to show the drain which is located in the run-back channel;

Fig. 4 shows the spout in combination with a bottle and cap; and

Fig. 5 is a plan view of an alternative construction.

The spout, which is preferably formed of polyethylene or other resilient plastic, includes the outer circular wall 1, the wall 2 of the pouring passage, and the run-back passage 3 in the annular passage between these two walls. The back of the pouring passage is open from one end to the other and the edges 4 of the pouring passage define this opening. The pouring lip 5 at the top of the front of the pouring passage facilitates pouring.

The top of the outer wall 1 is flanged at 7 and this flange rests on the top of the bottle or other container which is identified by the numeral 8 in Fig. 4.

The drain 3 slopes from the higher level 9 at the front of the pouring spout to the lower level 10 at the rear of the pouring spout. At the rear of the pouring spout the drain 3 is cut away forming the opening 12, the edges of which in the drawing coincide with the edges 4 of the wall 2 of the pouring passage.

The outer wall 1 tapers downwardly inwardly to a narrow bottom edge. The upper portion of the wall bulges outwardly at 15. This forms a snug seal with the inner wall of the neck of a bottle, or opening in another container. When inserted in the opening there is pressure on the bulging portion 15 and this tends to decrease the circumference of this bulging portion, and in turn this tends to elongate the outer wall downwardly. This is done more expeditiously with a relatively thin wall than with a thicker wall, and for this reason the outer wall 1 is made separate from the lower portion of the wall 2 of the pouring passage.

There is a further reason for making these walls 1 and 2 separate, and that is to provide a pouring passage of uniform cross-sectional area. Bringing the wall 2 outward to coincide with the wall 1 would increase the cross-sectional area of the pouring passage, resulting in a decrease in its cross-sectional area toward its upper end. This is objectionable, as explained above. To replace the two walls by a single thick wall would also be objectionable. The single thick wall would be less flexible and less easily extended, and could not be inserted in an opening as easily as a thinner bulged wall, such as is illustrated. Such a thick wall would also utilize an unnecessary amount of the molding material. By making the walls separate both walls are constructed most advantageously for efficient operation of the pouring spout.

By having the outer wall 1 taper downwardly the opening 17 between the outer wall 1 and the wall 2 of the pouring passage is made to gradually widen toward its lower

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end. This facilitates separation of the spout from the mold. The pouring passage 2 may likewise gradually increase upwardly in cross-sectional area to facilitate its separation from the mold, although by opening the wall at the rear such increase is not necessary.

Figure 4 illustrates the use of the pouring spout on a bottle 8 of glass or rigid plastic, etc. The tapered wall 1 is forced into the opening in the bottle, and the polyethylene or like plastic from which the spout is molded is sufficiently resilient to permit the bulge 15 to be forced into the neck of the bottle. It then forms a tight seal with the neck. The flange 7 rests snugly against the top of the bottle. The cap 20 of aluminum or other rigid material is formed with a dome 23 which covers the top of the pouring passage. Below the dome the cap is stepped outwardly at 24 and this step presses against the flange 7. The flange 7 being resilient serves as a gasket to make a tight seal between the cap and the top of the bottle. The cap is held on to the bottle by the threads 25 which are complementary to the threads 26 in the outer surface of the neck of the bottle.

As illustrated in Fig. 5, it is not necessary to have any opening through the back of the pouring passage. The wall 2' of the pouring passage then separates the opening 12' in the drain from the interior of the pouring passage. The opening 12' serves as an air inlet when the pouring passage is filled with liquid.

For maximum efficiency it is desirable to have the run-back passage as narrow as feasible, consistent with drainage of the liquid therethrough, and the edges of the opening 12 should coincide with the edges 4 of the opening in the back of the wall 2. This provides an opening of the maximum size possible in a run-back adapter or spout provided, of course, the walls of the spout are made as thin as is consistent with providing walls of the required strength. For thick sirups, such as molasses and the like, a wider run-back channel is required to provide proper drainage than is required for watery liquids. The width of the run-back channel should be made as narrow as is consistent with the rate of drainage required in order to provide a pouring passage of the largest feasible cross-sectional area. The top of the flange 7 may be flat or it may be grooved as illustrated.

This application is an improvement over my application Serial No. 362,046, filed June 16, 1953, now Patent No. 2,763,403.

What I claim is:

1. A pouring spout with an outer wall adapted to fit snugly in an opening in a container, a second wall within the first wall enclosing an elongated passage which is adapted to serve as a pouring passage, a pouring lip on the second wall at the front of the spout, the space between said walls being provided with a bottom which drains from a higher level at the front of the spout to a lower level at the back of the spout and is referred to herein as a run-back passage, the cross-sectional area of said pouring passage above said lower level being everywhere as great as at said lower level, and at said lower level an opening through said bottom through which liquid draining down the run-back passage is returned to the container.

2. A pouring spout with an outer wall adapted to fit snugly in an opening in a container, a second wall within the first wall enclosing an elongated passage which is adapted to serve as a pouring passage, a pouring lip on the second wall at the front of the spout, the space between said walls being provided with a bottom which drains from a higher level at the front of the spout to a lower level at the back of the spout and is referred to herein as a run-back passage, the cross-sectional area of said pouring passage above said lower level being everywhere as great as at said lower level, and at said lower level an opening through said bottom through which liquid draining down the run-back passage is returned to the container, the second wall being open at said lower level

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at the rear of the spout into said opening to facilitate drainage of liquid from the run-back passage into the container, whereby when the spout is in the pouring position the pouring passage may be filled with liquid and air may simultaneously enter the container through the opening in the drain.

3. A pouring spout with an outer annular wall adapted to fit snugly in an opening in a container, a second wall within said annular wall which encloses an elongated opening which is adapted to serve as a pouring passage and in the rear of which is an opening which extends from the top of the passage to a level adjacent the bottom of the passage, said second wall being substantially annular except for said opening, a pouring lip on the second wall at the front thereof, the passage between said walls being provided with a bottom which extends from a higher level at the front of the passage to a lower level at the rear of the passage which serves as a run-back passage, with an opening in said bottom at said lower level at the rear of said run-back whereby liquid flowing down the drain passes through the opening into the container, the cross-sectional area of said pouring passage above said lower level being everywhere as great as at said lower level, with the pouring passage extending below said lower level, said opening in the drain connecting with said opening at the rear of the second wall whereby the spout may be tilted so that liquid flowing from the container fills the pouring passage and air simultaneously flows countercurrent thereto into the container through the opening in the drain.

4. A pouring spout with an outer wall adapted to fit snugly in an opening in a container, a second wall within

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the outer wall which encloses an elongated passage adapted to serve as a pouring passage therethrough, the space between said walls being provided with a bottom which extends from a higher level to a lower level and forms a run-back passage, and at said lower level an opening through said bottom into the container for the drainage of liquid therethrough when the pouring spout is upright an opening in said outer wall extending upwardly from said opening in the bottom, said walls being separate from one another at said opening in the bottom.

5. A pouring spout with an outer wall adapted to fit snugly in an opening in a container, a second wall therein which encloses a passage therethrough adapted to serve a pouring passage, the space between said walls being provided with a bottom which extends from a higher level to a lower level and constitutes a run-back passage, and at said lower level an opening through the bottom into the container for the drainage of liquid therethrough when the pouring spout is upright, said walls being separate from one another at said opening, an opening in the outer wall extending upwardly from the opening in the bottom with the bottom of the outer surface of said outer wall tapering downwardly inwardly to facilitate the insertion of the pouring spout in the opening in a container.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,851,196

September 9, 1958

Jay G. Livingstone

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 20, after "run-back" insert -- passage --.

Signed and sealed this 2nd day of December 1958.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents