

Sept. 5, 1950

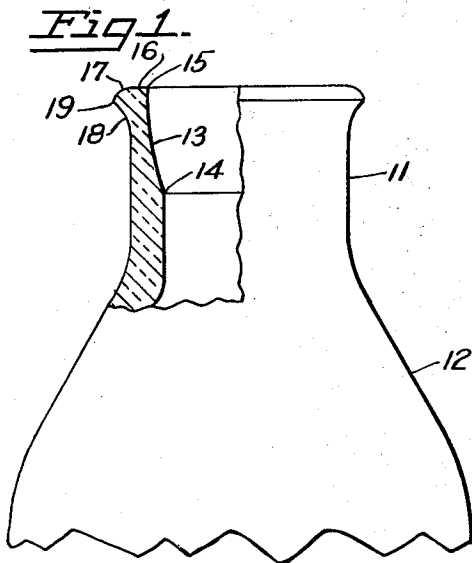
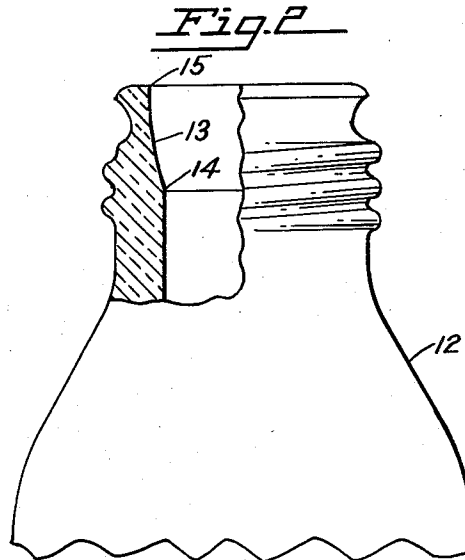
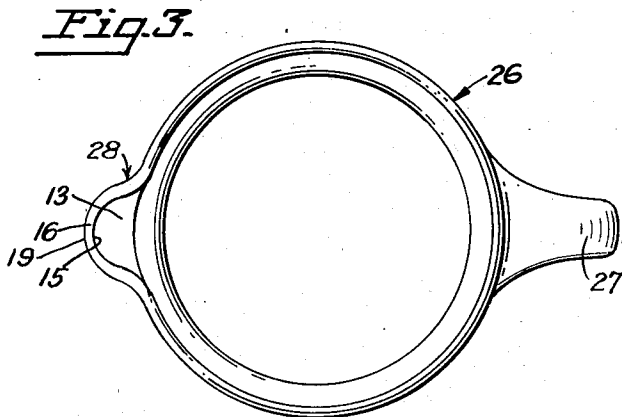
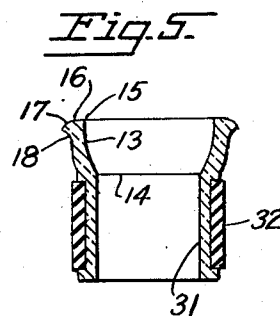
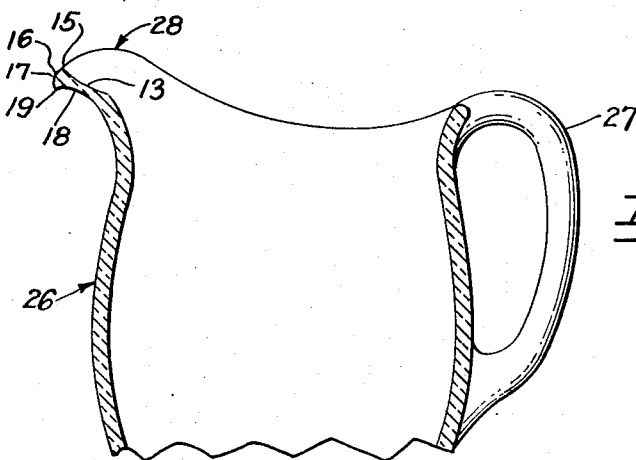
R. J. KEMPER

2,521,523

DRIPLESS POURING DEVICE

Filed May 26, 1945

2 Sheets-Sheet 1



INVENTOR.  
ROBERT J. KEMPER  
BY  
Naylor and Lussigny  
ATTORNEYS

Sept. 5, 1950

R. J. KEMPER  
DRIPLESS POURING DEVICE

2,521,523

Filed May 26, 1945

2 Sheets-Sheet 2

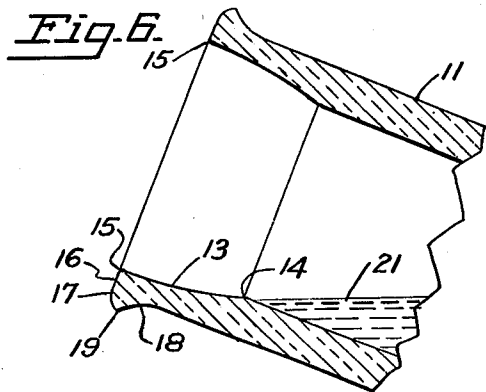
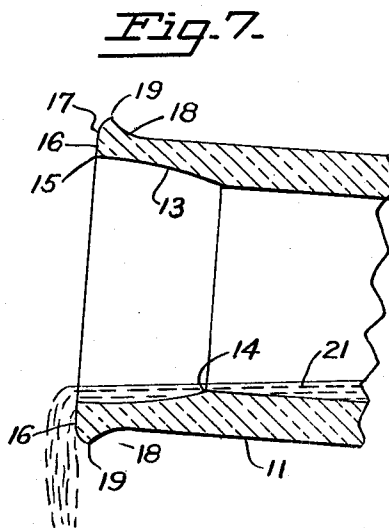
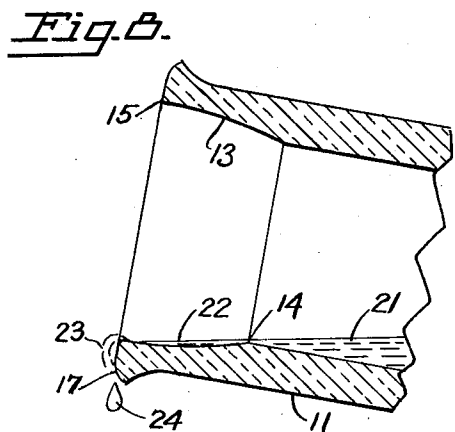


Fig. 9.

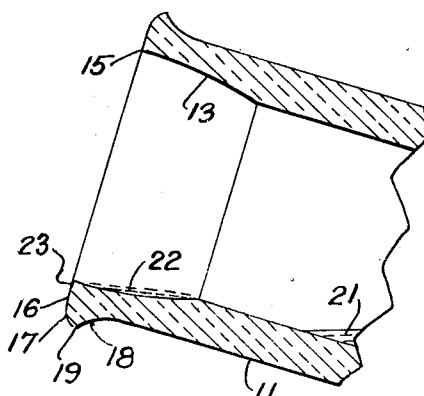
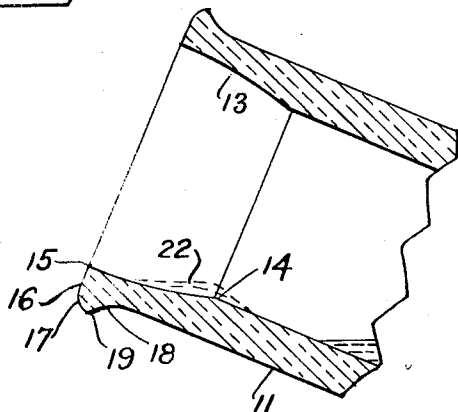


Fig. 10.



INVENTOR.  
ROBERT J. KEMPER  
BY  
Naylor and Lassagne  
ATTORNEYS

## UNITED STATES PATENT OFFICE

2,521,523

## DRIPLESS POURING DEVICE

Robert J. Kemper, San Carlos, Calif.

Application May 26, 1945, Serial No. 596,021

5 Claims. (Cl. 222-571)

1

This invention relates to the serving of thick or thin liquids from containers in a clean and economical manner.

A prime object of the invention is to provide a pouring mouth, lip or spout which permits of pouring the desired quantity of liquid from a bottle, can, teapot, pitcher, or other container, without subsequent dripping of any of the liquid outside of the container.

Another object of the invention is the provision of a pouring structure which will retract such portions of the liquid as would otherwise accumulate at the pouring edge or upon areas contiguous thereto, and to thus leave the structure free from drippings, in a sanitary condition, and ready for repetitive use for the intended purpose.

Another object of the invention is to prevent dripping, as an incident to the cessation of pouring, without the use of any device whatever accessory to the container neck or spout itself, except where such accessory itself is an embodiment of the invention.

A further object of the invention is the provision of a pouring structure having smooth contours, which is free of sharp edges or crevices, which will not interfere with the application of conventional closure means to containers embodying the invention, and which will lend itself readily to accepted manufacturing practices.

Further objects of the invention are to provide containers with the invention as an integral part thereof, as well as to provide devices in which the invention is incorporated, which can be inserted into the mouths of conventional bottles and other containers for use therein; and still further objects will become apparent as this specification proceeds.

In the accompanying drawings:

Figure 1 is an elevation, partly in section and broken away, of a bottle provided with the invention and adapted to receive an insertable cork or stopper;

Figure 2 is a similar view of a bottle provided with the invention and adapted to be sealed by a screw cap;

Figure 3 is a plan view of a pitcher to which the invention is applied;

Figure 4 is a vertical section thereof;

Figure 5 is a sectional view of a device to which the invention is applied and which is usable with a conventional container;

Figure 6 is a cross section of a pouring mouth having the novel features of the invention, and in a position through which the container is being tipped for pouring just before pouring begins;

Figure 7 is a similar view with the container in pouring position;

Figure 8 is a similar view with the container tipped back slightly to stop the pouring;

Figure 9 is a similar view showing the adhering liquid which is outside of the mouth being retracted back into the container, and

2

Figure 10 is a similar view with the container tipped still further back.

The invention is applied at the locus of pouring. Within a neck 11 of a container 12, is a concave, curved portion 13 which extends from the top of the neck downwardly to the point of juncture with the vertical wall of the container, indicated at 14. Its dimension need be no more than sufficient to form a pool of the liquid being poured of a volume of at least 3 or 4 drops. This concavity flares outwardly so that the internal cross section of the neck is greater at the upper part of such portion than at lower points thereon. Around the periphery 15 of the upper end of the hollow neck portion is a pouring surface 16 which should be narrow, the maximum permissible width of which increases as the viscosity or cohesion of the liquid to be poured increases. It can conveniently have a width of  $\frac{3}{8}$  to  $\frac{1}{2}$  inch, and preferably less than the latter. It can be horizontal or inclined, and terminates at its outer edge in a curved cut-off rim 17 having a radius of curvature expediently of about  $\frac{1}{64}$  to  $\frac{1}{32}$  inch. The outside of the neck has a sharp concave or straight cut-back portion 18. The curves of the portions 17 and 18 meet at the line 19 which is best about  $\frac{1}{64}$  to  $\frac{1}{32}$  inch from the plane of the outer face of the neck.

The portions 15 and 19 preferably present rounded and not sharp edges.

The operation of the device is best understood by reference to the sequential views in Figures 6 to 10, inclusive. Commencing with the position shown in Figure 6 the container 11 is tipped toward the horizontal and the position indicated in Figure 7 wherein the fluid 21 flows through the concavity 13 and over the peripheral edge 15 which then functions as a dam crest.

When cessation of pouring is desired the container 11 is tipped back toward the vertical to break the stream of poured liquid, as indicated in Figure 8. Here all of the liquid 21 not poured, except a very small protruding portion 23, remains within the container or in the pool-forming concavity or depression 13. The numeral 24 denotes a drop of fluid breaking clear of the protruding portion 23 and completing the cut-off of the pouring operation.

As the tipping of container 11 continues back toward the vertical the small pool 22 of the fluid in concavity 13 will tend to flow back to join the main fluid body in the container, and the end 23 thereof, protruding beyond the peripheral edge 15, is prevented from dripping by surface tension or its cohesion to the rest of the pool, or whatever the physical phenomenon may be. As shown in Figure 9, in the continued tipping back of container 11, this phenomenon causes the protruding end 23 to be drawn back into the concavity 13 where it is commingled with the pool of fluid remaining therein. Figure 10 indicates that the pool 22 in concavity 13 will flow downwardly from the concavity and over the juncture point 14 upon the further

tipping of container 11 toward a vertical position.

It has been observed that when syrup or other viscous liquid is being poured and the container 11 is moved slowly from pouring to non-pouring position, the formation of the drop 24 is more pronounced than in the case of lower viscosity fluids, such as water. Otherwise the rest of the action is the same as that referred to in the foregoing description of the operation of the device.

The pool 22 is a very important feature of the invention. It must be of sufficient volume to draw back into the container the liquid which would otherwise drip and not be drawn out of depression 13 by it, and it must be close enough thereto to so function; and hence the portion 16 should be small.

As will be understood from the drawings and this specification, the function of the concavity or depression 13 is limited to that portion thereof across which the pouring occurs. For example, in the device of Figures 6 to 10, inclusive, the lowermost portion only of the area 13 enters into the pouring operation while the remainder thereof is inoperative. It is, however, more convenient, although not necessary, to have the concavity 13 circumscribe the outlet to avoid the necessity of orienting the container or bottle provided with the invention to its pouring position. If desired, however, the concavity 13 can extend laterally for a limited distance only. This is convenient in the case of containers where pouring therefrom occurs only over a particular limited area, for example with a container having a handle to be grasped while pouring, or a container having a limited pouring lip.

The pitcher 26 shown on Figures 3 and 4 has a handle 27 and a pouring lip 28. This lip has the same features as the container having a circular mouth, except that such features are of only limited extent, and they are designated by the same reference numbers.

The device shown on Figure 5 is a tubular member 31 also having the same features indicated by the same reference numbers. It may be provided with a peripheral groove to accommodate a gasket 32 as one conventional means to retain it in the neck of a container when inserted therein.

The invention is suitable for dripless pouring of water, medicines, tea, coffee, milk, cream, syrup, and many other liquids. It functions equally well for pouring a continuous stream, or for measuring out drops, one at a time.

The invention claimed is:

1. In a bottle having a uniformly annular and vertically extending neck portion adapting said bottle for closure by a sealing member to be carried concentrically with respect to said neck portion, a non-drip pouring structure comprising a pouring surface at the upper end of said neck portion, a concavity forming at least a part of the inner surface of said neck portion and having a maximum depth at the inside margin of said pouring surface, the lower portion of said concavity being curved downwardly and inwardly to allow for gravity drainage of said concavity, said pouring surface having the outer portion thereof outwardly and downwardly curved and terminating in an outer edge.

2. In a bottle having a uniformly annular and vertically extending neck portion adapting said bottle for closure by a sealing member to be carried

concentrically with respect to said neck portion, a non-drip pouring structure comprising a pouring surface at the upper end of said neck portion, a concavity forming at least a part of the inner surface of said neck portion and having a maximum depth at the inside margin of said pouring surface, the lower portion of said concavity being curved downwardly and inwardly to allow for gravity drainage of said concavity, said pouring surface having the outer portion thereof outwardly and downwardly curved and terminating in an outer edge, and said neck portion having an external wall surface extending inwardly from said outer edge of the pouring surface.

3. In a bottle having a uniformly annular and vertically extending neck portion adapting said bottle for closure by a sealing member to be carried concentrically with respect to said neck portion, a non-drip pouring structure comprising a pouring surface at the upper end of said neck portion, a concavity, forming at least a part of the inner surface of said neck portion, having a maximum depth at the inside edge of said pouring surface and being smoothly curved downwardly and inwardly to merge with the surface of said inner wall therebeneath to allow for gravity drainage of said concavity, said pouring surface having an inner planar portion substantially normal to the adjacent surface of the concavity and an outer portion outwardly and downwardly curved and terminating in an edge, and said neck portion having an external wall surface extending inwardly from said outer edge of the pouring surface.

4. A non-drip pouring structure as set forth in claim 3, wherein the external wall surface of the neck portion is curved downwardly and inwardly from the outer edge of the pouring surface.

5. A dripless pouring bottle comprising a uniformly annular and vertically extending bottle neck adapting said bottle for closure by a sealing member to be carried concentrically with respect to said neck, a pouring surface formed at the upper end of the neck, a concavity forming at least a part of the inner surface of said neck and having a maximum depth at the inside margin of said pouring surface, the lower portion of said concavity being curved downwardly and inwardly to allow for gravity drainage of said concavity, said pouring surface having the outer portion thereof outwardly and downwardly curved and terminating in an outer edge.

ROBERT J. KEMPER.

REFERENCES CITED.

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number    | Name       | Date           |
|-----------|------------|----------------|
| 795,885   | Bethel     | Aug. 1, 1905   |
| 1,416,309 | Tunncliffe | May 16, 1922   |
| 2,014,330 | Hothersall | Sept. 17, 1935 |
| 2,239,065 | Wainwright | Apr. 22, 1944  |
| 2,350,596 | Douglass   | June 6, 1944   |

FOREIGN PATENTS

| Number  | Country       | Date          |
|---------|---------------|---------------|
| 47,928  | Germany       | July 31, 1889 |
| 100,769 | Germany       | Dec. 27, 1898 |
| 366,207 | Great Britain | Feb. 4, 1932  |
| 336,047 | Italy         | Feb. 12, 1936 |
| 505,455 | Great Britain | May 11, 1939  |