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ANTIDRIP POURING SPOUT

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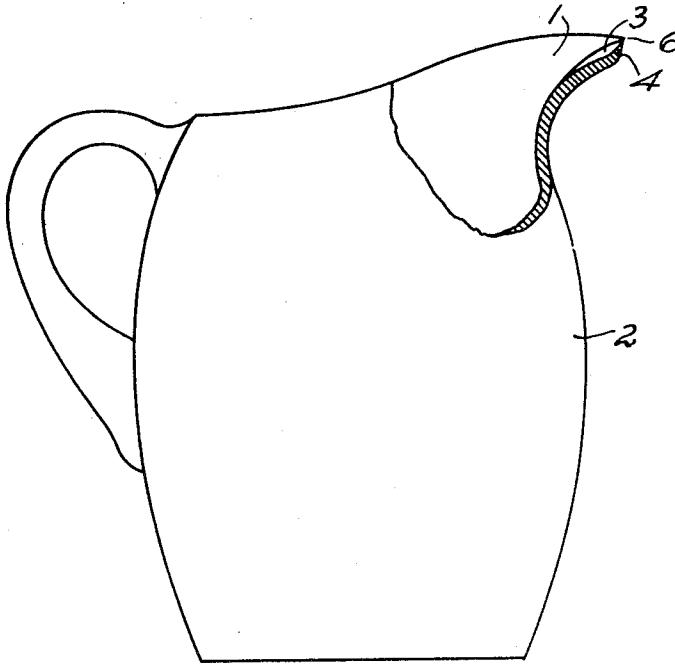


FIG. 1.

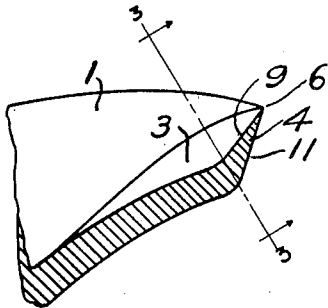


FIG. 2.

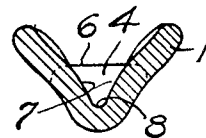


FIG. 3.

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ANTIDRIP POURING SPOUT

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2 Claims. (Cl. 222-571)

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My invention relates to pouring spouts; and the broad object of my invention is the provision of a pouring spout which cuts the flow of liquid therefrom sharply and completely, so that no portion of the liquid clings to the pouring edge to drip or run down the outside of the spout.

Another object is the provision of a pouring spout of such simple and unobtrusive design that it offers no added difficulty in making the container of which it is a part, and is noticeable only upon close scrutiny.

The invention possesses other advantageous features, some of which with the foregoing will be set forth at length in the following description where that form of the invention which has been selected for illustration in the drawings accompanying and forming a part of the present specification is outlined in full. In said drawings, one form of the invention is shown, but it is to be understood that it is not limited to such form, since the invention as set forth in the claims may be embodied in a plurality of forms.

Referring to the drawings: Figure 1 is an elevation of a pitcher embodying the pouring spout of my invention, a portion of the pitcher being broken away to disclose the structure. Figure 2 is a fragment of the spout in vertical section, and on a larger scale than Figure 1. Figure 3 is a sectional view of the spout, the plane of section being indicated by the line 3-3 of Figure 2.

Whenever a liquid is poured from a container, the problem presented by dripping of some portion of the liquid must be met. Although the economic element of waste may not be important in the direct loss of liquid, it can be a large element indirectly by reason of the effect of the lost portion. The handling of acids and other corrosive liquids in a laboratory presents such a problem. Perhaps equally, or more important, is the largely esthetic problem presented by dripping edges in the handling of medicines, milk, syrups, and other liquids in the home and public eating places, in which of course there is also the indirect waste of labor and materials.

I have discovered that dripping from a pouring spout can be prevented with complete certainty and irrespective of the character of the liquid poured, whether a light benzine or a heavy molasses. Upon analysis, a surprisingly large and interrelated number of physical phenomena are found to be involved. It is believed however that surface tension and viscosity in the liquid, capillarity, molecular or mass attraction between the liquid and the spout, and gravitational pull are the chief phenomena involved.

The structure of my invention comprises a spout 1 on the container 2 and having a groove 3 for channelling the final dribble of the pouring liquid. Across the groove at its end is a dam 4 having a sharp crested edge 6. The groove 3 concentrates the liquid at the end of the flow into a narrow stream or thread in which its surface tension and viscosity tend to exert their maximum restrictive influence. The groove also presents surfaces 7 between which and the liquid, an attraction exists; and this attraction whatever its value is an added force tending toward and contributing to the result sought.

The shape of the groove as shown in Figure 3, is not perhaps the ideal one if this molecular or mass attraction were the only consideration to be taken into account. Certain practical values and the operation of other phenomena also enter; and the resultant of these suggests a groove having a broadly triangular section with a rounded bottom 8, and of the general shape shown in Figures 2 and 3.

The dam 4 is placed at the discharge end of the groove, which is best located centrally in the bottom surface of the spout, and which extends to the end of the spout, terminating against the inner face 9 of the dam.

Preferably the dam is shaped on this inner face to extend smoothly from the crest edge into the bottom of the groove, in order to give at least a small effect, to the momentum of the last portion of the poured liquid, so that such momentum, small as it may be, tends to carry the final portion of liquid outwardly and away from the discharge or outer face 11 of the dam.

When pouring is completed, the container, which may be a pitcher of milk or a beaker or bottle of acid, or any other vessel having a pouring lip or spout, is returned to its normal upright position, as suggested in Figure 1. During this return movement the bulk of the flowing liquid is of course cut off almost immediately by the mere action of gravity. However there will always be a small portion of the liquid in the groove and between the sides of the spout, about to pass over the crest of the dam. Much of this will pass over, clearing the dam and falling free into the receiving receptacle. The remainder may be considered as composed of two portions, one on the inside of the dam which collects in the groove and runs down into the container; and the second portion which is small, and which for a fraction of a second, remains at the crest but on the outside of it. This portion corresponds to what ordinarily constitutes the drop-

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lets which cling to and run down the outside of the container.

It will be noted that the outer face 11 of the dam, in the normally upright position of the container is undercut, sloping downwardly and backwardly with reference to the body of the dam. Because of the sharp crest edge of the dam and this undercut front or discharge face; or more properly perhaps, because of the shape and position of the entire dam, the second portion of flowing liquid which lies momentarily against and on the outside of the crest of the dam, is small in volume—appreciably smaller than is ordinarily formed from a smooth or rounded pouring lip.

Because of the small mass of this second portion, the forces of surface tension, molecular cohesion and capillarity are increased relative to the gravitational pull and other small influences tending to cause the second portion to drip from the spout or run down the outside of it, with the result that it is pulled back over the dam and into the groove, leaving the dam crest and its discharge face completely free of liquid. This retraction or actual uphill flow of the drop, according to the position of the receptacle at the instant it occurs, is readily observed; and always follows under the conditions I have described, irrespective of the character of the liquid or the rapidity with which the pouring is performed.

While I have chosen an ordinary pitcher for illustration, it will be obvious that my invention may be applied to the widest range of chemical and pharmaceutical laboratory ware. Medicine bottles especially afford a tremendous field; and the application of the invention to all manner of kitchen and table furnishings, as well as to containers for liquids in commercial packages will be obvious.

While the container proper may vary widely

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in size and volume, the pouring spout is usually small, and because of the simple nature of the structure of my invention it may be incorporated into the spout structure with no complications in the manufacture thereof. Such a spout appears like any other; and it is only on close examination that the small groove and dam are observed.

I claim:

1. A pouring spout including a groove extending along the bottom of the spout in the direction of fluid pouring therefrom, and a dam having a sharp crest and an outer face undercut from the crest edge in the normally upright position of the spout and disposed across the outer end of the groove.

2. A pouring spout including a groove of generally triangular cross-section and extending along the bottom of the spout in the direction of fluid pouring therefrom, and a sharp crested dam disposed across the outer end of the groove, the inner face of the dam extending smoothly into the groove and its outer face being undercut from the dam crest in the normally upright position of the spout.

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