This invention relates to container openers of the self-dispensing type and more particularly to openers of the type that are used with containers having a longitudinal body member of chipboard or the like which is closed at both ends by discs of cardboard, plastic, or like material.

Containers of one type to which the present invention is applicable are described in patents to J. K. M. Harrison such as the container described in Patent No. 2,261,621 issued November 4, 1941. In general, the Harrison containers are cylindrical although the invention may be used in connection with containers of other cross section and are closed at each end by a disc. The ends of the cylindrical container wall are spun inwardly and downwardly to form disc-retaining annuli.

The development of a dispensing opener to work with containers of the foregoing type has presented many difficulties. Ideally the construction should be simple and economical to reduce original cost and should be easy and positive in action so as to assist service station attendants and others who use such dispensers in the prosecution of their work. It has been found desirable to effect a two-stage opening of containers of the Harrison type; the first stage involving displacing the end disc and the second stage involving holding that disc in such a position as not to obstruct the passageway of the pour spout.

One development along these lines has involved the disposition of a cutting member and a disc-positioning member within a container provided with a pour spout. The operation of this assembly is first to pass the opener over the end of the paper container to be opened and to strike a sharp blow causing the disc to be displaced and positioned in a non-obstructing position relative to the top end of the open container. This construction, while affording many advantages, has the disadvantage that once the opening has been effected the dispensing can and the containing can are not locked together, and hence cannot be safely used except in fully inverted position. Furthermore, any difference between the discharge rate of the inner paper container and the spout attached to the outer dispensing container must be compensated for by a very long skirt on the dispensing container to catch any oil that may flow therealong and tend to spill out.

In accordance with the present invention the foregoing difficulties are overcome and a pour spout is provided which tightly engages the entire end edge of a container simultaneously with the displacement of the end disc of that container so that the original storage container can, and does, function as a dispensing container with resulting economies in the construction of the dispenser and in the time of the operator who is using it.

It is contemplated, in accordance with the teachings of the present invention, to provide a vented dispensing spout which can be rapidly engaged with a container of the Harrison type and which is leakproof and reliable in operation.

Other objects and advantages of this invention will be apparent upon consideration of the following detailed description of several embodiments thereof in conjunction with the annexed drawings wherein:

Figure 1 is a view in vertical section of a preferred self-dispensing opener constructed in accordance with the principles of the present invention, said opener being shown in the position assumed thereby immediately prior to the opening of the container;

Figure 2 is a view similar to Figure 1 showing partially in vertical section and partially in elevation the position of the apparatus immediately after the opening of the container;

Figure 3 is a bottom plan view of the apparatus of Figures 1 and 2; and

Figure 4 is a fragmentary, vertical sectional view of a modified type of pour spout and opener constructed in accordance with the principles of the present invention.

Referring now in greater detail to Figures 1–3 inclusive, the assembly comprises a pouring nozzle or funnel portion 10 which is provided with integral spaced annular flanges 11 and 12 which are adapted to grip and receive therebetween the end edge of a container 13. The inner annular flange 12 is provided with a port at 14 and with a downwardly depending projecting portion 15 which is used to displace the closure assembly including the end closure disc 16 of the container 13. Extending across the interior of the pour spout assembly about in the plane of the bottom of the groove defined between the flanges 11 and 12, is a plate 17 which is held in position by a screw 18 which is threaded into the body portion of the spout assembly. The plate 17 is provided with a bearing 19 for the reception of a rod 20 for vertical sliding movement therein. The rod 20 is provided at one end with a stop 21 and at the other end with a stop 22. Between the stop 22 and the plate 17 there is disposed a helically wound spring 23,
the thrust of which tends to bias the rod 20 to the position shown in Figure 2. Above the plate 11, and held in position by the screw 18, there is a strainer screen 24 of conventional construction. To the right of the plate 17, as it is shown in Figures 1 and 2, there is provided a tubular vent member 25 which establishes communication through the porous plate, held securely to the interior zone defined by the flange 12 to the exterior atmosphere. The purpose of this vent will be hereinafter more fully set forth.

If reference is made to the portion of the container that is shown in Figure 1, it will be noted that the end closure assembly is maintained in position by close contact against the inner wall of the cylindrical container and by a bead 26 which is formed by spinning over the end of the cylindrical wall of the container. A small disc 27 is fibrous material such as cellulose or parchment or thermoplastic materials. The disc 28 is firmly bonded to the inner face of the closure disc 16 as by glue, which, however, does not extend to the edges of the disc 16. The disc 28 lies over the edges of the disc 16 and is bonded in this region to the inner wall of the container by glue. In the formation of the container the interior wall of the cylindrical portion is coated with an adhesive 29, which is tacky at the time of insertion of the closure disc assembly. The closure disc assembly is a tight fit in the tubular body and is preferably of a slightly greater diameter than the internal diameter of the body. Consequently, as the disc 28 is rotated it scrapes off a portion of the adhesive 29 into an annular flillet 30, and the flillet, together with the adhesive which remains between the wall of the cylinder and the disc 28 firmly cements these two elements together. Thus, the container is closed at the composite disc held in place primarily by tight engagement with the walls and by the bead 26, while the liquid and vapor type seal is provided by the disc 28 which is bonded in its central area to disc 16 and at its edges to the inner wall of the cylindrical portion of the container while having an intimate contact in a portion free of both the wall and the disc. Since the disc 28 is nonfibrous and may be comprised of parchment, the container may be opened by the application of pressure on the top edge of the disc 27 near its margin, the pressure functioning to tear the parchment and to break the fillet sufficiently to permit the disc assembly to move from the position shown in Figure 1 to the position shown in Figure 2.

To accomplish this result with the apparatus of the present invention, the operator grips the porous spout assembly and strikes downwardly in the direction of the arrow of Figure 1 against the top of the container. The first thing to strike the end closure disc is the stop 22 on the rod 20. However, since the rod 20 is mounted for free reciprocatory movement in bearing 13, the only effect of this striking action is to compress the space 23 about to the position shown in Figure 1. At this point, when stop 22 and depending portion 15 of flange 12 lies in the same horizontal plane, depending portion 15 begins to bear directly against a portion of the margin of the end closure disc. As movement in the direction of the arrow continues, the parchment disc 28 and the fillet 30 are ruptured first immediately below the depending portion 15, and then for the rest of their length. The disc as a whole is swung in a counterclockwise direction about an axis which may be about at point X shown in Figure 2. At this point, compressed spring 23 exerts force through stop 22 against the disc assembly which has now been broken loose from the side wall of the container and the part of the interior zone out of the way of the mouth of the container so that flow into the pour spout is not obstructed. In other words, movement of the disc into an obstructing position at the mouth of the container is prevented by the action of the rod 20, the stop 22 of which is in bearing engagement with the upper disc 27 of the end closure assembly.

The annular space defined between the flanges 11 and 12 is such as to receive tightly the bead 26 of the container. This being the case, it is not necessary to provide a long skirt on the outside of the container 13 to prevent leakage or to insure the maintenance of a good fit between the pour spout assembly and the container.

In Figure 4 there is shown a modified form of apparatus for the closure of the container shown in Figure 1. In this case a spout assembly 40 is provided with depending annular flanges 41 and 42 which are adapted to fit over the bead at the top end of a Harrison-type container. The inner flange 42 is provided with an aperture in structure and function to the part 15 described in connection with Figures 1 and 2. Similarly, the flange 42 is provided with a vent aperture at 44. Another vent aperture from the interior of the space defined by the flange 42 to atmosphere is provided by the part 43. Screw 45 supports in position a strainer 47 and a spring member 48, the function of which corresponds generally to the function of the rod 20 and the spring and stops associated therewith.

In the operation of the device shown in Figure 4 the container is closed by a composite disc held in place primarily by tight engagement with the walls and by the bead 26, while the liquid and vapor type seal is provided by the disc 28 which is bonded in its central area to disc 16 and at its edges to the inner wall of the cylindrical portion of the container while having an intimate contact in a portion free of both the wall and the disc. Since the disc 28 is nonfibrous and may be comprised of parchment, the container may be opened by the application of pressure on the top edge of the disc 27 near its margin, the pressure functioning to tear the parchment and to break the fillet sufficiently to permit the disc assembly to move from the position shown in Figure 1 to the position shown in Figure 2.

In describing Figures 1-4 inclusive reference has been made to vents 25 and 45 and to ports 14 and 44. The vents 25 and 45 are for the purpose of admitting air to the interior of the container as the oil is poured out, and for that reason they are disposed about 180° away from the pouring direction. The ports 14 and 44, however, are for the purpose of releasing air which may become trapped between the top of the end closure and the space defined by the flanges 11 and 42, as the case may be, so that the end closure disc will be knocked out sharply by the action of the depending portions 15 and 43 respectively and not by compressed air. The ports 14 and 44 also function to permit oil to flow out from behind the disc assembly to complete the drainage of the flanges 12 and 42 and the respective inner walls of the container during the completion of the draining operation.

While this invention has been described with respect to but two embodiments thereof, it is to be understood that other modifications of the invention are contemplated so long as means are provided to grip the end flange of a container
while rigid means knock out the end disc and resilient means hold the end disc out of flow-obstructing position.

What is claimed is:

A pour spout assembly having a fluid passageway defined by a spout member and an integral circumferentially continuous inner flange, an outer flange spaced from said inner flange and defining therewith an annular channel for the reception of the end edge of a container, said flanges adapted to grip said end edge in leak-proof relation within said channel, said inner flange being of greater length than said outer flange and depending to engage the end disc of a container adjacent its periphery at points 180 degrees apart, said inner flange having a groove therein remote from its free end and facing the passageway, a supporting member extending across said passageway with one of its ends in said groove, means attaching the other end of said member to said spout, a pin mounted in said member and resilient means normally urging said pin to a depending position below the depending portion of said inner flange.

JOHN KEARSLEY M. HARRISON.

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