ABSTRACT: A pourer tube for cans and the like fluid containers including a body having a tubular discharge portion at one end and a container-piercing means at the other end. A radial flange having a sealing ring thereon is provided intermediate the two ends, and the body between the flange and the container-piercing means is tapered toward the container-piercing means. The tapered body portion includes cam surfaces whereby upon inserting the pourer tube into a container and turning the tube, the cam surfaces and the container opening thus formed cooperate so as to draw said flange and said sealing ring into sealing relationship with the container.
POURER TUBE FOR FLUID CONTAINERS

DESCRIPTION OF INVENTION

This invention relates to a combined pouring tube and container-piercing device for cans and the containers.

Pourer tubes insertable into cans and the like liquid containers are known which possess a conical stem of round cross section having a piercing tip which is driven through the wall of the can to form an insertion hole. Other pourer tubes possess merely a flat and wedge-like piercing tongue, which, starting from a point, widens towards an abutment flange and is set back so as to be able to engage beneath the pierced can lid. In the former example this is effected by two noses protruding laterally on the stem.

As is known, these known pourer tubes are met with no enthusiasm in the market, because they make the piercing of the cans toilsome and do not ensure an absolutely firm and secure seating on a can. The friction in the piercing of a can is much too great, and the rotation of the pourer tubes in the produced attachment hole, in order that the cans can be engaged beneath the lid of the can, an undesired effect of scraping away material occurs in the direction of wearing away the noses, so that after a short time these no longer secure the pourer tube on the can. Then the tip of the known pourer tubes is so loose or wobbly that liquid can escape from the can between the abutment surface of the pourer tube and the can itself. It even occurs that the pourer tube drops off from the can during the pouring out of the liquid from the can.

The present invention seeks to eliminate these and other disadvantages of known pourer tubes by providing a pourer tube for cans and the like liquid containers having a stem adjoining an abutment of sealing flange of the tube and terminating at the free end of the tube in a piercing point, from the outer edge of which there are throughflow passages rising into the tube situated above the sealing flange.

In accordance with the invention, in order to form a polygonal attachment hole in a can, which hole is cut open in several segments and beaded over in the edge parts, the stem, which widens conically from the piercing tip towards the sealing flange, is made multisided in cross section by means of widening ribs and surfaces situated between these ribs. The ribs merge directly beneath the sealing and abutment flange into transverse channels, and from these ribs, can surfaces rise into the transverse channels. The whole device is so formed that on rotation of the pourer tube diagonally in the multisided and uniformly beaded-over attachment hole, this tube is pressed down by the can faces on to the can in order to achieve a firm press fit by means of the sealing flange. When the transverse channels thus come into the region of the can wall, the ribs engage in a rotationally offset position beneath the can wall without any effect of scraping away material. The transverse channels are so formed that, they have the effect of stops striking against the edge of the attachment hole, in order to avoid excessive rotation.

The invention will be explained in greater detail hereinafter by reference to an example of an embodiment which is illustrated in the accompanying drawing, wherein:

FIG. 1 shows the pourer tube in elevation,
FIG. 2 shows the same in longitudinal section,
FIG. 3 shows a plan view,
FIGS. 4 and 5 show cross sections along the section lines I-I and II-II respectively in FIG. 1.

As shown in the drawing, the pourer tube consists of the tube 1, the sealing and abutment flange 2 and the piercing stem 3 with piercing point 4. The abutment flange 2 is situated between the tube 1 and the stem 3. 5 indicates a lid placed upon the tube 1. A sealing ring 7 is seated in channel 6 in the abutment flange.

The piercing point 4 and the stem 3 are multisided, preferably triangular in cross section according to FIGS. 4 and 5, with widening blunt ribs 9 rising from the sharp edges 8 of the piercing tip 4 towards the abutment flange 2. Between these ribs there are surfaces 10. The piercing point 4 consists preferably of a hard steel inserted in the stem 3, the latter being produced with the tube 1 from a synthetic plastics material. The ribs 9 merge directly below the abutment flange 2 into transverse channels 11 into which rise can surfaces 12 situated in the ribs 9. The depth of the transverse channels extends to the surfaces 10. From surfaces 10 throughflow passages 13 commence and open out in the interior of the tube 1. 14 indicates grasping lugs protruding laterally on the exterior of the tube 1 so that the tube can be grasped conveniently for rotation.

The purpose of this particular form of the piercing point 4 of the stem 3 is that when the stem is driven into a can or the like liquid container, a multisided attachment hole, which is cut open in segments and uniformly beaded over in the marginal parts, is formed in the can according to FIGS. 1 and 5. Due to the fact that the piercing point 4 first precuts a sharp-angled small polygonal hole with the sharp cutting edges 8 and in the further driving in of the stem 3 widens out this hole in segmented manner by uniform beading over of the wall of the can by means of widening ribs 9 and surfaces 10, driving in is facilitated and the beading over of the sharp metal material proceeds more easily. Upon rotation of the thus inserted pourer tube in a clockwise direction, the oblique surfaces 12 pull the sealing flange 7 and the seal 7 down firmly on to the can, the transverse channels 11 coming into the region of the beaded-over can hole 16. This rotation operation is completed without any harmful effect of scraping away material on the ribs 9. The path of rotation is limited by the transverse channels 11 formed as stops, so that overrotation is prevented. The ribs 9 engage beneath the lid of the can at least three points, and thus effect a wobble-free press fit of the pourer tube on the can. The sealing ring 7 is made U-shaped or V-shaped in cross section. The flanges 17 of the sealing ring 7 extend downwardly outwards from the sealing flange 2 and thus form two concentric sealing ring surfaces.

The sharp cutting edges 8, becoming more blunt, merge into the widening ribs 9, and thus they lie in alignment therewith.

As may be seen from FIG. 5, when the tube 1 is in the rotated attachment position, the throughflow passages 13 lie opposite to the wider parts of the attachment hole 16. Thus the outflow of liquid and the inflow of air is maximized. The ribs 9 engage beneath the beaded-over hole 16 at the narrower parts of the hole. Further rotation or overrotation is prohibited by the structural arrangement of each of the transverse channels 11 which merge on one side thereof with the sharp edge into the throughflow passage 13, while on the other side thereof it opens out into the passage with a substantial rounding off. In the case of an attempt at overrotation the structural arrangement of each of the transverse channels 11 jams with the first-mentioned one side against the attachment hole 16.

The pourer tube as described permits a more effortlessly piercing of the wall material of the can and formation of a uniformly beaded-over attachment hole, as a result of the segment-type cutting open and uniform beading-over of the attachment hole by means of the cutting edges 8, ribs 9 and surfaces 10. Since in the subsequent rotation of the attached tube any effect of scraping away material is avoided, the ribs 9 engaging beneath the can lid and thus not wearing away guarantee an absolutely wobble-free press fit with satisfactory seal between the abutment flange 2 and the can. At least three ribs 9 engage beneath the wall of the can.

What I claim is:

1. A combined pouring tube and container-piercing device for cans and like fluid containers comprising:
   a. a pouring portion having a passage therein and a sealing and abutment flange adjoining the lower end of said pouring portion;
   b. a sealing ring having an either U-shaped or V-shaped cross section
   c. said flange being provided with a downwardly open annular groove for the positioning of said sealing ring;
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3. A penetrating portion having a piercing stem at one end and a body portion extending from said piercing stem to said flange;

said piercing stem having a hexagonal cross section and extending pyramidal into a point;
said hexagonal cross section displaying three lateral surfaces and three intermediate surfaces, respectively;
said point consisting of a sharp metallic tip embedded in said stem;
said body portion having laterally positioned inlet openings and transverse channels disposed below said flange in the longitudinal edges of said body portion;
said inlet openings being disposed below said flange in said lateral surfaces;
whereby said body portion has formed an alternate arrangement of identical wider and identical narrower lateral surfaces which widen from said point towards said flange;
said narrower lateral surfaces extending and terminating into sharp cutting edges in the area of said point;
and a plurality of grasping lugs protruding laterally on the exterior of said pouring portion for the purpose of grasping said combined pouring tube and piercing device for rotation thereof.