

(2)

Description

The invention relates to a device for piercing containers filled with liquid, particularly cans filled with beer, the said device comprising holding means for fixing the device relative to the container, and with, piercing the wall of the container, a frontally sharp piercing tube on which there is mounted a tap and with a sealing ring surrounding the piercing tube and bearing on the container wall.

In the case of a known device of this type (US-PS 22 46 693), the piercing tube is disposed for displacement in the holding means. After insertion into the holding means of the container which is to be pierced, the piercing tube must be pushed forward relative to the fixed holding means until it pierces the wall of the container. For this, a particular feed device is required. In the case of the known device, the sealing ring is likewise not stationary relative to the holding means but is displaceable against spring pressure in relation thereto. All in all, therefore, the known device is composed of a plurality of individual components, is complicated in construction, susceptible to breakdown and cannot be easily operated by unskilled persons.

The object of the invention is so to improve a device of the type described that while being easily produced and reliable in action, it can easily be used even by unskilled persons for piercing a container, particularly a container filled with beer.

According to the invention, the problem is resolved in that the piercing tube is immovably connected to the holding means and pierces the wall of the container when the holding means is applied to the wall, the sealing ring protruding beyond the cutting edge of the piercing tube so that when the device is fixed on the container the sealing ring bears thereon in a sealingtight manner before the piercing tube penetrates the container wall.

The ensuing description of a preferred embodiment of the invention will provide further explanation in conjunction with the accompanying drawings, in which:

Fig. 1 is a side view of a can with a piercing device;

Fig. 2 is a plan view of the arrangement shown in Fig. 1;

Fig. 3 is an enlarged sectional view of a piercing tube with a sealing ring and a tap;

Fig. 4 is a sectional detail and

Fig. 5 is a view similar to Fig. 1 with a modified device for piercing smaller containers.

As the drawings show, a device for piercing containers filled with liquid, particularly liquids which are pressurised, e.g. cans filled with beer, comprise as a holding means a single-armed lever 1 of substantially U-shaped cross-section (Fig. 4). The length of the lever 1 corresponds substantially to the height of a can 2, the casing 3 of which is to be pierced immediately above the container bottom 4 which is at the bottom. The lever 1 has in the region of its bottom end and bent over towards the container bottom 4, two claws 5, 6 (Fig. 4) which serve as a pivoting or rotary mounting for the lever 1. With these claws or catches, the lever is suspended in a depressed edge 7 between the container casing and the container bottom 4, the outer edge 8 forming a kind of pivot axis for the lever 1.

At its end opposite the catches 5, 6, the lever 1 comprises at least one notch 9 which is at such a distance from the catches 5, 6 as is required to bridge the wrapping on the container 2. The lever 1 is in the region of its end adjacent the notch 9 constructed to be slightly flexible so that the notch 9 can be engaged with the edge 10 of the returned edge 11 on the top end 12 of the container. To facilitate engagement and thus fixing of the lever 1 on the container 2, the latter is of flexible construction in the region of its end adjacent the notch 9. In the case of the embodiment illustrated, this is achieved in that in this region the lever 1 is relatively thin and is constructed as a handle 13 on which the lever can be conveniently gripped and pivoted.

As illustrated, the lever 1 comprises, extending substantially vertically on the container 2 which is to be opened, a main part 14 from which essentially at a right-angle two parts 15, 16 project towards the container 2 and on which the catches 5, 6 or the notch 9 are disposed.

Connected rigidly to the lever 1 (Fig. 3) and projecting towards the container 2 is a piercing tube 17 of which the front or free edge is sharpened for the purpose of easily piercing the container wall (casing 3). Likewise rigid on the lever 1 and engaging around the piercing tube 17 is a sealing ring 18 of rubber-elastic material, the cross-sectional form of which can be seen in Fig. 3. As shown, a free edge 19 of the sealing ring 18 projects beyond the front end of the piercing tube 17 somewhat so that when the lever 1 is applied against the container 2, in other words prior to the actual piercing process, the sealing ring 18 always bears in sealingtight fashion on the outside of the container casing 3 before the piercing tube 17 comes in contact with the casing. In this way, it is possible reliably to prevent liquid flowing or spurting out of the container and into the free air when the container is pierced.

Also disposed on that end of the lever 1 which carries the piercing tube 17 and connected to the piercing tube is a tap 21 which consists of the following component parts: an outlet tube 22 which is in flow connection with the inside of the piercing tube 17, a displaceable plug 24 loaded by a spring 23 and having a sealing washer 25, a spindle 26 projecting from the plug 24 and a lever 28 engaging the spindle 26 and resting pivotally on an edge 27. Upon pivoting of the lever 28 (clockwise in Fig. 3), the sealing washer 25 of the plug 24 is lifted off its seat so that liquid can pass out of the piercing tube 17 into the outlet 22 and thence into a glass or the like.

The device described is used as follows: the lever 1 is engaged by the catches 5, 6 into the marginal edge 8 of the bottom returned edge 7 and then pivoted into the position (clockwise) shown in Fig. 1 and engaged with the notch 9 on the edge 10 of the upper returned edge 11. When this is done, firstly the front edge of the sealing ring 18 bears in sealingtight manner on the outside of the casing 3 of the container and then the sharp edge of the piercing tube 17 pierces the wall of the container so that liquid from the interior of the container can enter the piercing tube 17. If the lever 28 is now operated in the manner described, then liquid can emerge via the outlet 22.



The essential advantage of the device described lies in the simple, rigid disposition of piercing tube 17 and sealing ring 18 on the lever 1 which serves as a holding means and in that the front edge 19 of the sealing ring 18 projects beyond the cutting edge of the piercing tube 17 so that when the lever 1 is applied against the container 2, there is firstly a sealing effect and only then does the piercing tube penetrate the wall of the container.

These advantages can also be achieved if the holding means comprising piercing tube 17 and sealing ring 18 is not constructed as a pivoting lever but in some other manner, in particular the holding means could also be constructed as a clamping bracket engaging wholly or partially around the periphery of the container 2 so that when it is fitted, in the vicinity of the bottom of the container 4, the piercing tube 17 disposed rigidly on the bracket penetrates the wall of the container after the sealing ring 18 has been able to effect a fluidtight seal. Such a clamping bracket can advantageously also be constructed as an elastic clamping band. Also other holding means have proved usable, so that to this extent the invention is not limited to the holding means being constructed as a lever.

For the purpose of piercing the container, the latter is placed on a table or some other supporting surface in such a way that the part of the container rim which carries the catches 5, 6 and thus also the outlet 22 project beyond the edge of the table or of the supporting surface so that a glass or the like can be applied to the outlet.

As Fig. 3 shows, it is particularly favourable for the tap 21 with outlet 22, the piercing tube 17 and the sealing ring 18 to be disposed on an insert piece 29 which is in particular constructed as a synthetic plastics injection moulded part, which is produced separately and then inserted into the end of the lever 1 which carries the catches 5, 6, the outlet 22 snapping into position in a corresponding recess 31 in the lever 1, the latter being consequently rigidly connected to the insert piece 29. As shown, the piercing tube 17 has a flange-like widening 32 by which it is anchored in the insert piece 29 by having

material moulded around it. The sealing ring 18 is fitted into a corresponding annular groove in the insert piece 29. Also displaceably disposed in the insert piece 29 is a plug 24 with the spindle 26, the surface on which the sealing washer 25 can bear also being constructed in the insert piece.

Commercially available are ordinary containers of the type shown in Fig. 1 and their heights vary according to their volume. In order to be able to use one and the same lever on containers of different heights, in other words in order to be able to apply and engage such a lever, the invention provides for an adapter or spacer by means of which the effective gap between the catches 5, 6 and the notch 9 on the lever 1 can be reduced. This is illustrated in Fig. 5. In known manner, the spacer 33 is fitted, pushed or otherwise separably mounted on that part 16 of the lever 1 which carries the notch 9. The spacer 33 comprises a notch 34 which in the operating position is situated beneath the notch 9 by an amount corresponding to the difference in heights of various containers 2. Thus, once the spacer 33 has been fitted, the lever 1 can also be used for piercing smaller containers than those shown in Fig. 1.

In order to guarantee complete discharge of the liquid contained in the container 2, especially where liquids which are not pressurised are concerned, it is necessary to provide an opening in the upper part of the container so that atmospheric pressure is able to act on the liquid stored in the container. Where commercially available beer cans are available, a bung-hole is provided at the top end 12 of the container, through which the container is filled. After filling is completed, the bung-hole is occluded by a plug-like bung-hole closure means consisting of rubber or the like and identified in Fig. 2 by reference numeral 35 and which has on the inside face a diaphragm-like transverse wall which can easily be pierced by a corresponding instrument, for example a piercing tool or the like. Once the membrane has been pierced, atmospheric pressure in the container 2 above the surface of the liquid can be propagated and cause the remaining liquid to be discharged. Instead of a pierceable membrane, it is also possible to provide in the bung-hole closure

means 35 an inner core which can be pushed into the container.

A further embodiment of the invention is characterised in that on the said spacer 33 there is in addition a venting pin 36 which if necessary can be used for piercing the said membrane of the bunghole closure means 35 or for pushing in the inner core. The venting pin 36 can be rigidly or even separately connected to the spacer 33. The venting pin 36 may also have a sharp point by means of which it is possible directly to puncture the container wall, particularly the top end 12 of the container.

Claims

1. A device for puncturing containers (2) filled with liquid, and particularly cans (2) filled with beer, the said device comprising holding means (1) for fixing the device in relation to the container and, piercing the wall of the container (2), a frontally sharpened piercing tube (17) on which is mounted a tap (21) and with a sealing ring (18) surrounding the piercing tube and bearing on the container wall, characterised in that the piercing tube (17) is immovably connected to the holding means (1) and pierces the wall (3) of the container when the holding means (1) is applied to the wall (3), the sealing ring (18) protruding beyond the cutting edge of the piercing tube (17) so that when the device is fixed on the container (2), the sealing ring bears thereon in a sealingtight manner before the piercing tube penetrates the container wall.

2. A device according to Claim 1, characterised by the following features:

- a) the holding means is constructed as a single-armed lever (1), of which one end (part 15) rigidly carries the piercing tube (17) and the sealing ring (18);
- b) the lever (1) has in the vicinity of the piercing tube (17) at least one catch (5, 6) for pivotable engagement of the lever on a returned edge (7, 8) on the container (2);
- c) the lever has at its other end (part 16) which is remote from the piercing tube (17), at least one indexing notch (9) for fixing the lever on the container (2).

3. A device according to Claim 2, characterised in that the lever (1) is elastic in its part (16) which carries the indexing notch (9).

4. A device according to one of Claims 1 to 3, characterised in that in the vicinity of its part (15) which carries the catch (5, 6), the lever (1) comprises, connected to the sealing ring, a synthetic plastics insert piece (29) into which the piercing tube (17) is rigidly moulded.

5. A device according to Claim 4, characterised in that the insert piece (29) contains a plug (24) of the tap (21).



6. A device according to one of the preceding Claims, characterised by a spacer (33) with an indexing notch (34) for shortening the effective length of the lever (1) between the catch (5, 6) and the indexing notch.

7. A device according to Claim 6, characterised in that a venting pin (36) is disposed on the spacer (33).

8. A device according to one of the preceding Claims, characterised in that a handle (13) is constructed on the lever (1).

Three sheets of drawings

