No. 730,729. PATENTED JUNE 9, 1903.

W. WÜST.

MEANS AND DEVICE FOR CLOSING BOTTLES.

APPLICATION FILED APR. 9, 1901.

NO MODEL.

Fig. 1.

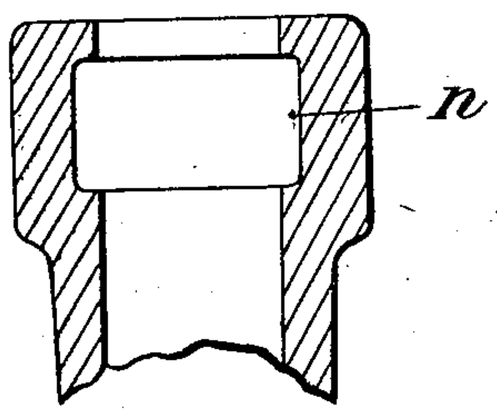


Fig. 2.

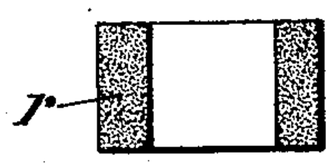


Fig. 3.

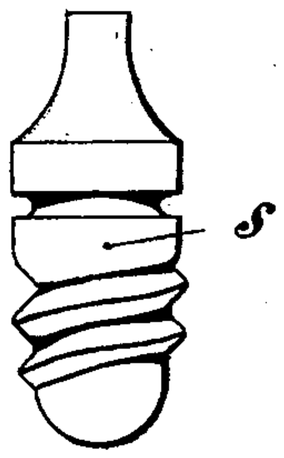


Fig. 4.

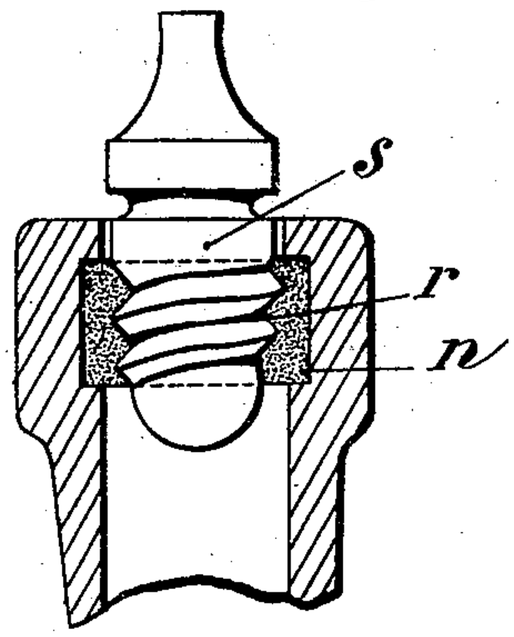


Fig. 5.

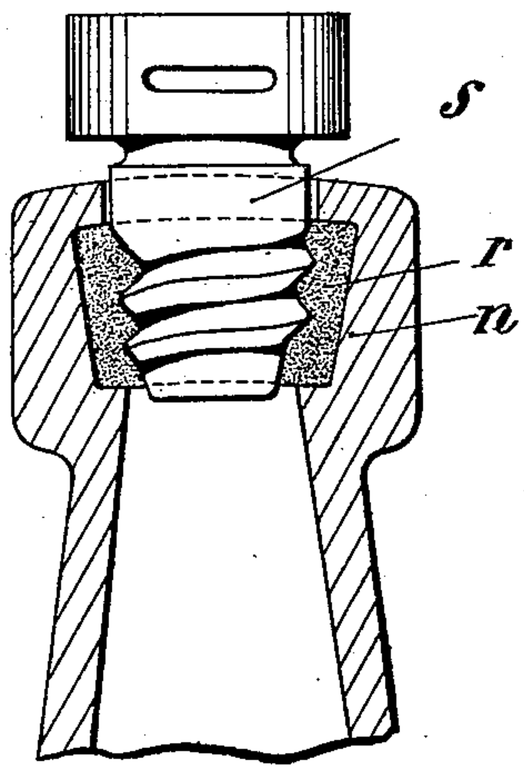
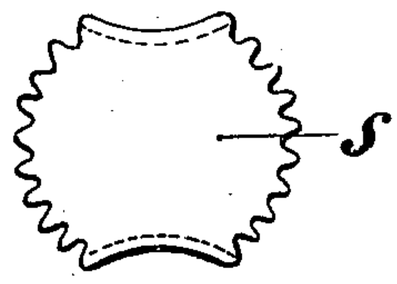


Fig. 6.



Witnesses:
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Attys

No. 730,729. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

WILHELM WÜST, OF ARIENHELLER-RHEINBROHL, BAD ARIENHELLER, GERMANY, ASSIGNOR TO EUGEN KEISER, OF HAGEN, GERMANY.

MEANS AND DEVICE FOR CLOSING BOTTLES.

SPECIFICATION forming part of Letters Patent No. 730,729, dated June 9, 1903.

Application filed April 9, 1901. Serial No. 54,992. (No model.)

To all whom it may concern:

Be it known that I, WILHELM WÜST, mineral-spring master, a subject of the King of Prussia, Emperor of Germany, residing at Arienheller-Rheinbrohl, Bad Arienheller, in the Kingdom of Prussia and Empire of Germany, have invented certain new and useful Improvements in Means and Devices for Closing Bottles, of which the following is a full, clear, and exact description.

The subject of the present invention is a bottle-closer for liquids containing carbonic acid, which device is essentially characterized in that the groove provided in the bottle-head for the annular packing-ring is conical, converging toward the bottom for the purpose of producing the greatest pressure at the lower edge of the packing-ring in screwing down a stopper provided with threads, both for the purpose of inserting the said stopper with the bottle-filling machine and facilitating the taking out of the stopper by hand.

A further essential advantage of this bottle-closer consists in that the packing-ring being a little thicker than the depth of the groove in the bottle-head is vertically pressed together in the latter. The consequence resulting therefrom is that the packing-ring firmly presses against the upper and lower edges of the circular groove, and in screwing down the stopper in such cases, in which the liquid is under a pressure of four to five atmospheres and a strong friction between stopper and packing-ring is present, the packing-ring is prevented from turning with the stopper in said groove.

In the accompanying drawings, Figure 1 is a detail sectional view of the neck of a bottle, showing an annular groove therein to receive a packing-ring. Fig. 2 is a detail sectional view of the packing-ring. Fig. 3 is a detail elevation of the screw-stopper. Fig. 4 is a sectional view showing the packing-ring and stopper in position in the neck of the bottle. Fig. 5 is a similar view showing the groove in the neck of the bottle of downwardly-tapered annular form and showing the stopper and packing-ring in place to effectually close the bottle. Fig. 6 is a detail view of the stopper.

The packing-ring *r* has a central orifice, as clearly shown in Fig. 2, which opening, as well as the surrounding wall, has a cylindrical form. In the bottle-head a groove *n* is provided, which is conically pointed toward the bottom, as indicated in Fig. 5. The groove *n* serves for receiving the packing-ring *r*. The latter being a little thicker than the depth of the groove in the bottle-head is when inserted in said groove firmly pressed against the upper and lower edges of said groove, thereby preventing a turning movement of the packing-ring in screwing down the stopper. By combining an annular packing-ring of compressible material of the cylindrical form shown in Fig. 2 with a downwardly-tapering annular groove in the bottle-neck, as illustrated in Fig. 5, it results that when the elastic cylindrical packing-ring is forced into the downwardly-tapering groove the walls of the packing-ring assume the downwardly-tapering form of the groove, so that the lower end of the packing-ring is chiefly compressed and the lower end of the aperture therein reduced in diameter, while the upper end may retain its original diameter. It further results that when a screw-threaded stopper is introduced in the downwardly-tapering orifice thus formed in the elastic packing-ring the said stopper enters easily at first and exerts increasing pressure toward the lower end, so that a very tight closure is effected in the compressed lower end of the packing-ring, where a tight joint is most important, and much less pressure exists between the parts at the upper end. A beneficial result of the latter condition is that it facilitates removal of the stopper. In this opening the cylindrical stopper *s*, provided with threads, is screwed in, and as the upper end remains in its original diameter the screwing down will be easily done, but results in a pressure between stopper and packing-ring, which increases in screwing down the stopper, the greatest pressure being always at the lower edge of the packing-ring. The consequence resulting therefrom is that the escape of carbonic-acid bubbles between the packing-ring and the stopper is prevented to the completest extent.

For the inserting of the stopper it is of

great importance that this may be easily done through the upper part of the opening, which remains at this point in its original diameter, especially if this is done by the bottle-filling machine as mostly used to-day. The latter works in such manner that if the inserting of the stopper cannot be done easily and without hindrance great loss of carbonic acid occurs, and, moreover, the upper edge of the packing-ring is compressed. In taking out the stopper, which is always done by hand, it is of great importance that the pressure necessary for a good tight closure is only produced at the lower edge of the stopper or packing-ring, according to which condition the force required therefor is much less than in such bottle-closers which receive upon all contact-surfaces between stopper and packing-ring a uniform pressure. As aforesaid, the packing-ring is made a little thicker than the depth of the groove, so that it is compressed in inserting it in the groove, and is so firmly held that turning movement of the packing-ring in the groove is prevented even if the stopper be screwed down with great force, which is always necessary if liquids contained in the bottles are under a pressure of four to five atmospheres.

Having thus described my invention, the following is what I claim as new therein, and desire to secure by Letters Patent:

The combination with a bottle having a neck provided with an internal downwardly-tapered annular groove and an overhang at the upper side of said groove at the mouth of the bottle, of a packing-ring in said groove, and a downwardly-tapered screw-stopper in said ring expanding the latter in said groove and upwardly against the said overhang, substantially as described.

In witness whereof I subscribe my signature in presence of two witnesses.

WILHELM WÜST.

Witnesses:

CHARLES LESIMPLE,

KARL SCHMITT.