C. HAMMER.

VACUUM CAP.

APPLICATION FILED MAR. 3, 1915.

1,280,020.

Patented Sept. 24, 1918.

3 SHEETS—SHEET 1.

Fig. 1

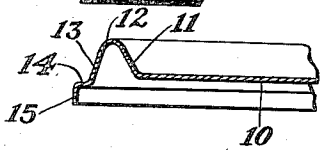


Fig. 2

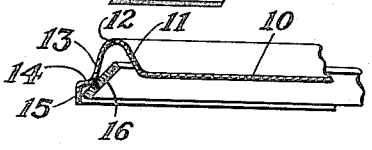


Fig. 3

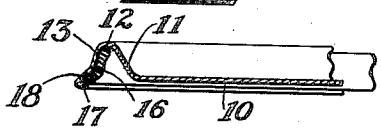


Fig. 4

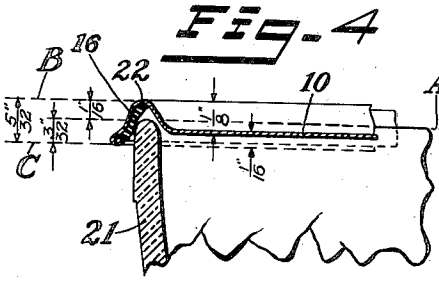


Fig. 5

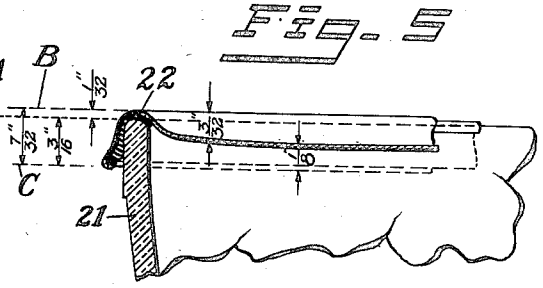
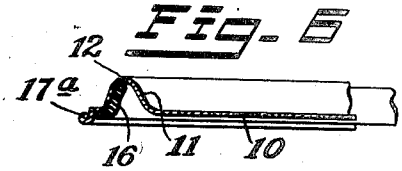


Fig. 6



Witnesses:
Edith B. Kramer.
Morris Reamer.

Inventor
CHARLES HAMMER.
By his Attorney
W. H. C. Clarke

C. HAMMER.

VACUUM CAP.

APPLICATION FILED MAR. 3, 1915.

1,280,020.

Patented Sept. 24, 1918.

3 SHEETS—SHEET 2.

Fig. 7

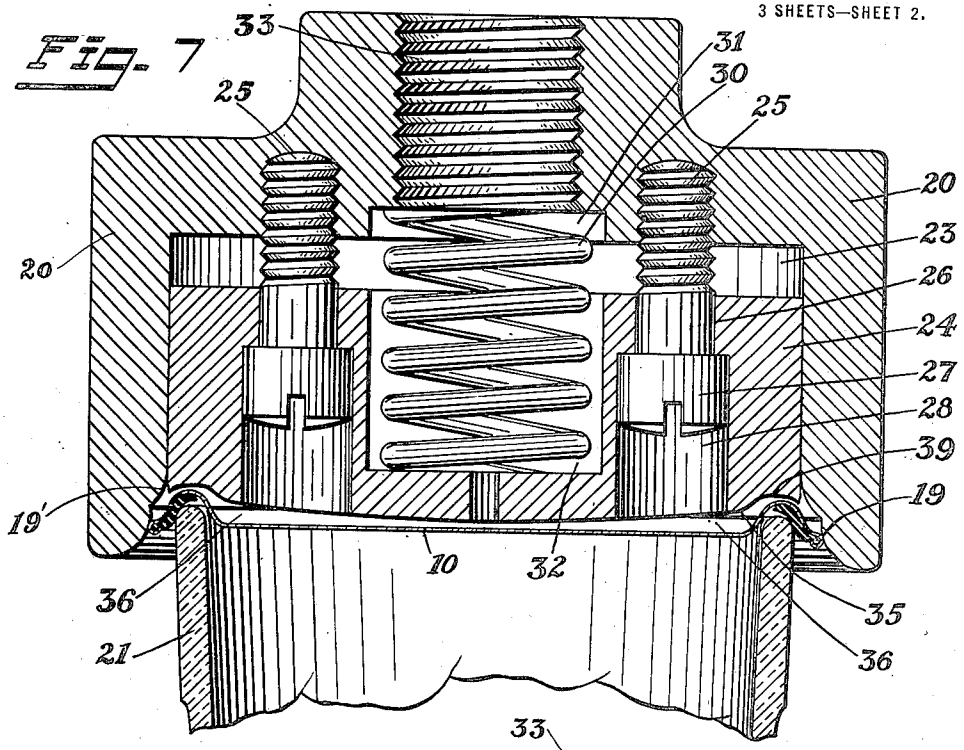
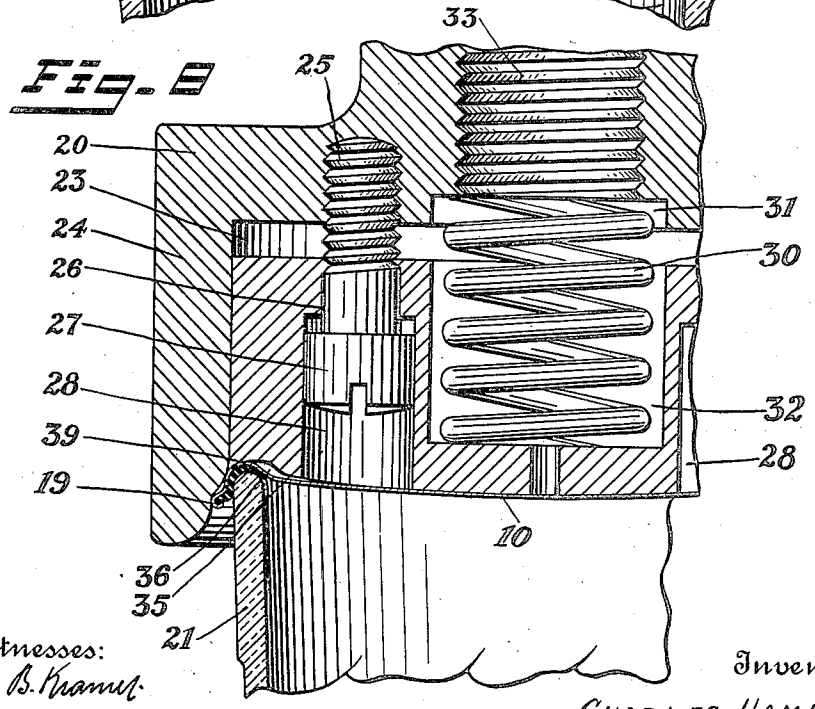


Fig. 8



Witnesses:
Eric B. Kramer.
Morris Kramer.

Inventor
CHARLES HAMMER.

By his Attorney
W. H. C. Clarke

C. HAMMER.

VACUUM CAP.

APPLICATION FILED MAR. 3, 1915.

1,280,020.

Patented Sept. 24, 1918.

3 SHEETS—SHEET 3.

Fig. 9

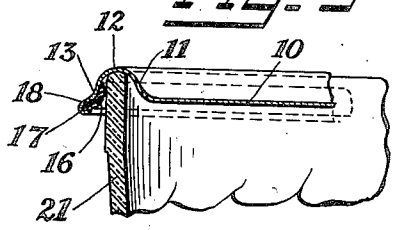


Fig. 10

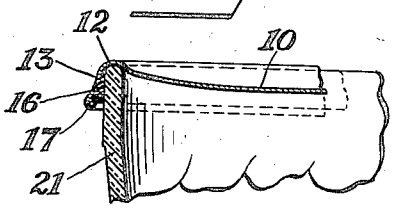


Fig. 11

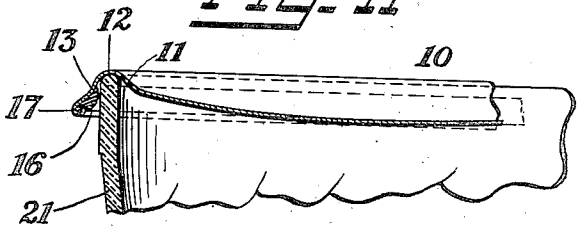
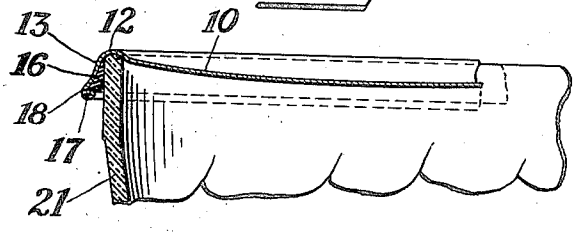


Fig. 12



Witnesses:
Eric B. Kramer.
Morris Reamer.

Inventor
CHARLES HAMMER.

By his Attorney
W. H. C. Clarke

UNITED STATES PATENT OFFICE.

CHARLES HAMMER, OF QUEENS, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO AMERICAN METAL CAP CO., OF BROOKLYN, NEW YORK.

VACUUM-CAP.

1,280,020. Specification of Letters Patent. Patented Sept. 24, 1918.

Application filed March 3, 1915. Serial No. 11,932.

To all whom it may concern:

Be it known that CHARLES HAMMER, a citizen of the United States, residing at Queens, Queens county, Long Island, New York, has invented new and useful Improvement in Vacuum-Caps, of which the following is a specification.

The object of the present invention is to provide an improved form of closure for jars and similar vessels, whereby upon placing the closure on the jar top and subjecting it to a downward pressure on the portion extended beyond the outer wall of the jar, the closure flange will be bodily moved both downwardly and inwardly, while the portion of the closure above the top edge of the jar will have a slight outward and downward movement over the edge of the jar; which operation, effected by drawing means, will draw upwardly about the edge of the central portion of the closure. Consequently, the area of the central portion which is considered beneath the plane of the top of the closure will also be lessened.

In the accompanying drawings illustrating embodiments of my invention Figure 1 is a fragmentary partial sectional view of the cap before application of the sealing ring. Fig. 2 is a similar view showing the ring as first applied. Fig. 3 is a similar view with the sealing ring applied and the cap in condition ready for application. Fig. 4 is a view of the cap as shown in Fig. 3, as placed loosely on a jar. Fig. 5 shows the closure as applied to the jar, in the sealed position. Fig. 6 shows a modification with the bead on the jar edge rolled outwardly. Figs. 7 and 8 show a form of chuck device for applying the closure to the jar. Fig. 9 shows a modified form of the closure, as first applied to a jar, and Fig. 10 shows the same in sealing position. Fig. 11 shows another form of closure with the central portion of more curvature, as first applied; and Fig. 12 shows the same in final sealing position on a jar.

In forming the cap of the present invention as set forth in Figs. 3, 4 and 7, a sheet metal blank is formed into the shape shown in Fig. 1, having a central portion 10 that is comparatively flat, from which a portion extends upwardly as at 11, and is curved outwardly and downwardly to form an arch portion 12, having a flange portion 13 and constituting a kind of rim-groove. As shown the outer wall 13 is extended outward to form a kind of shoulder 14, terminating in a downwardly extending flange or rim 15, see Figs. 1 and 2. A ring washer or gasket 16, of suitable elastic or plastic composition is placed inside of the closure as indicated in Fig. 2, and thereupon the rim 15 is bent inwardly to form a kind of channel or bead on the inside, that incloses the lower or outer edge of the washer 16, as indicated in Figs. 3 and 4.

The closure is so designed relative to the dimensions of the jar 21, that when placed thereon the top of the jar will engage the middle portion of the gasket as indicated in Figs. 4 and 7. The closure having been placed loosely on the jar, as indicated in Figs. 4 and 7, pressure is brought against the projecting bead portion 18 of the closure and also on the flange portion 13, in a vertically downward direction. This will have the effect of forcing the closure down upon the jar and will also draw downwardly and inwardly on the flange and beaded portion of the closure, as will be understood by comparing Fig. 5 with Figs. 3 and 4. Such drawing operation will cause the arch portion 12 to move outwardly, and also downwardly to a slight extent. The gasket or washer will thereby be compressed, and will assume the shape of the jar wall on its inner face, and be very tightly compressed between the flange and the outer top wall of the jar 21. This compression will also have the effect of forcing the gasket somewhat inwardly at the arch portion 12, whereby it will be also compressed between the top of the jar and the arch portion, as shown in Figs. 5 and 8. By comparison of Fig. 5 with Fig. 4, it will be seen that the flange portion 13, is somewhat lengthened or extended downwardly, which is the result of the drawing operation causing a movement or flowing of the central portion of the closure, inside of the arch portion 12 over the edge of the jar, such outward sliding over the jar edge being facilitated by the flexible washer. The portion 10 will be drawn upwardly at its edge as the annular connecting portion 11 of the closure is moved outwardly over the edge of the jar. It will be understood that the closure is free from contact or engagement with the jar when placed thereon, as indicated in Figs. 4 and 7, and in Figs. 5 and 8 it will be observed that the

washer is interposed between the jar and the closure.

One form of means for producing such a drawing operation to seal the closure on the jar is indicated in Figs. 7 and 8, comprising essentially an annular chuck member 20 having a chamber 23 in which slides a pad or block 24. As shown the pad slides on bolts 27 that pass through openings 26 and are formed with screw shanks 25 engaged in the chuck member. The bolt heads seat in the apertures 28 in the pad to limit the downward movement of the pad in the chuck. For urging the pad yieldably downwardly, a coiled spring 30 is interposed between the pad and chuck member, seating in opposing recesses in said parts, the recess 31 in the chuck member leading through a screw-threaded opening 33 by which the chuck may be mounted and the recess 32 having an opening in its bottom, as shown. The chuck is provided with a shoulder portion at 19′ in its inner wall, and below this the lower edge of the chuck is preferably divergent or rounded as shown at 19. The pad is provided with a comparatively shallow annular groove at 39, inside of which the bottom of the pad is shown as slightly convex.

When the closure is placed upon the jar, it is brought to engage the chuck, and downward pressure is applied on the chuck, that will engage the closure as indicated in Fig. 7. The flange portion 13, and the beaded portion 18 are first engaged by the shoulder 19 of the chuck, that will force the closure down on the jar. Thereupon, the pad will be carried down against the central portion of the closure, whereupon the pad will yield and slide upwardly relative to the chuck. The pad will engage the closure first at the central portion, and then at the top of the arch portion 12 that will yield and permit the flattening movement of the central portion, that will be drawn upwardly against the pad, the latter being cut away at 35 to provide the space 36 for such upward movement. The groove portion 39 of the pad will assist in forcing the flange portion downward, and in compressing the gasket against the top wall of the jar as indicated in Fig. 8.

It will be observed from Figs. 5 and 8 that the lower portion of the flange 13, and the bead portion 18 are caused to move both downwardly and inwardly, as will be apparent by comparing Fig. 5 with Fig. 4. The washer 16 is forced upwardly somewhat to lie between the arch portion 12 and the top of the jar. The washer will assume a somewhat convergent form tapering upwardly from the lower edge; but it will be seen that the washer entirely separates the closure from the jar and prevents contacting of the closure and the jar at all points. By reason of the special bending operation of the die, the portion of the closure adjacent the flange will be caused to move or flow outwardly and thus provide metal for the flange portion that is utilized in the downward bending operation on the flange, whereby the outer portion of the flange is lengthened, as the central portion is made shallower, and the distance between the central portion of the closure and the top plane of the closure is less in the sealed jar than in the closure prior to its application, as clearly shown in Figs. 4 and 5, this being effected in the drawing operation by the yieldable pad 24.

The modification shown in Figs. 9 and 10 is similar to that shown in Figs. 4 and 5, except that the sealing ring is so constructed that it can seal only against the outer wall of the jar and not on the top wall.

In the modification shown in Figs. 11 and 12 the center of the closure is of greater depth and area, being curved upwardly at its edges to meet the arch portion 12 with but a slightly deflected portion 11 as shown in Fig. 3.

It will be understood that my form of closure as herein set forth, distinguishes from all others at present known or in use, in that the projecting flange of the closure is drawn downwardly and at the same time forced inwardly by reason of the top portion of the closure and the interior portion being caused to be drawn outwardly to furnish the metal whereby the flange becomes lengthened to permit the downwardly movement, and whereby the central portion of the closure is somewhat flattened by the sealing operation of the closure on the jar. I am aware that heretofore jar closures have been sealed on jars by causing an inwardly bending of a depending flange member; but this has not been done by drawing upwardly and outwardly on the portion of the closure inside of the flange. By reason of the pad 24 being yieldable or resilient in its mounting the central portion of the closure is permitted to move upwardly during the drawing operation, thus making the finished or sealed closure shallower than the unapplied closure, as is illustrated in both Figs. 5 and 12.

In the present invention the article itself, that is the closure only is claimed, the process or method of applying this closure to a jar forming subject matter of a divisional application.

What I claim is:

In combination with a jar having a substantially straight wall at the top portion and a substantially rounded top edge, of a jar closure composed of reformable thin sheet metal comprising a depending substantially concave central portion, and a depending annular conical flange connecting

with the central portion by an annular rounded arched portion considerably wider than the jar edge, the said flange being extended outwardly and then inwardly at the lower portion to form a channel, and a compressible ring washer secured in said channel, and lining the inner wall of the flange to be compressed between the jar wall and flange portion of the closure upon downward and inward pressure on the said flange extension and downward pressure on the central portion by a chuck member, whereby the said central portion will be drawn outwardly and the flange portion downwardly and inwardly to reform the closure.

In testimony whereof I have signed my name to this specification this 29th day of December, 1914.

CHARLES HAMMER.