

E. F. HULBERT.
CAN CLOSURE.
APPLICATION FILED MAY 19, 1917.

1,319,081.

Patented Oct. 21, 1919.
2 SHEETS—SHEET 1.

Fig. 1.

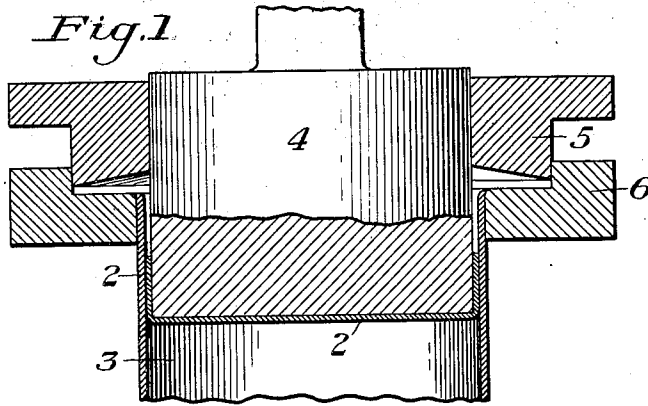


Fig. 2.

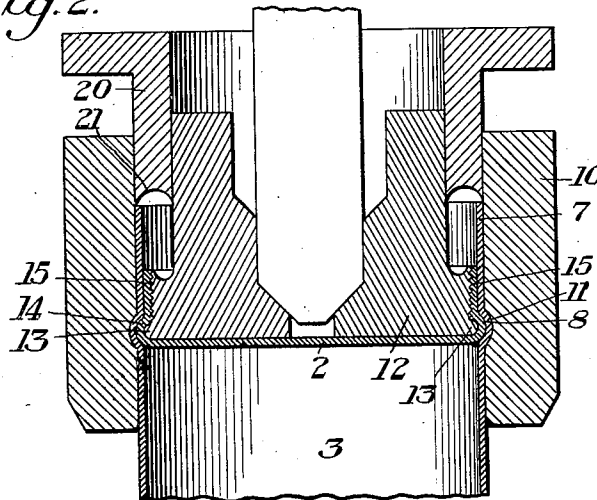
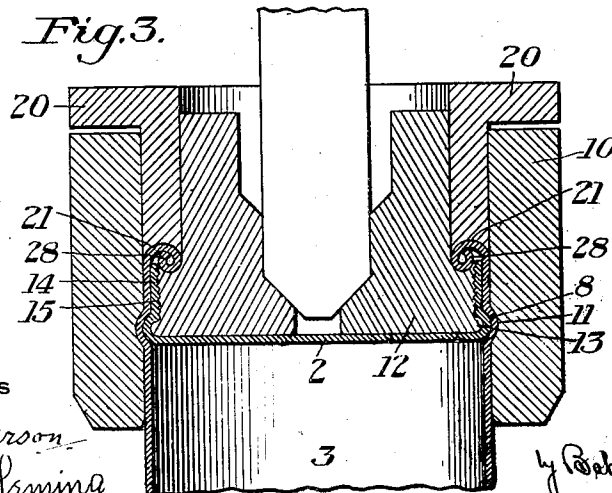


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

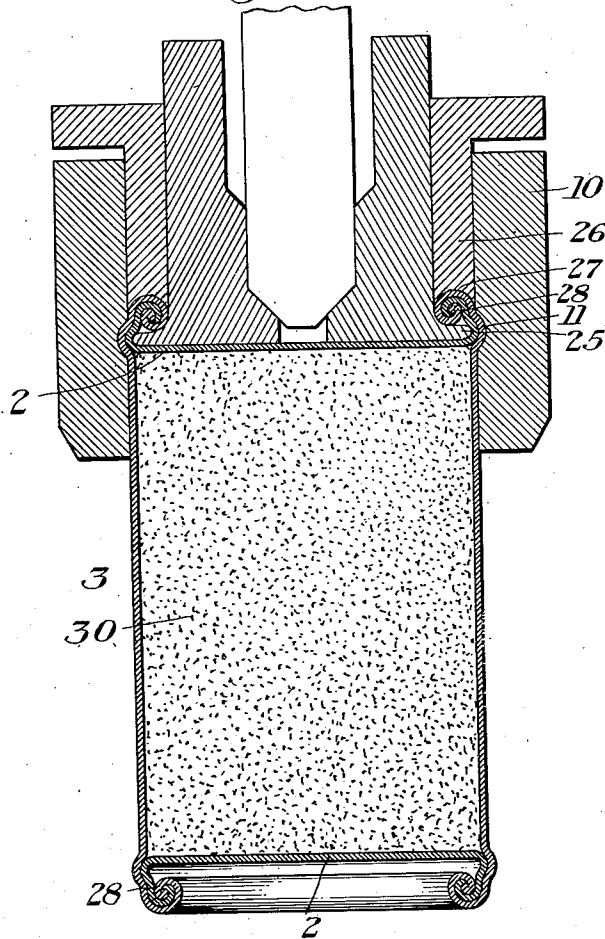


Fig. 5.

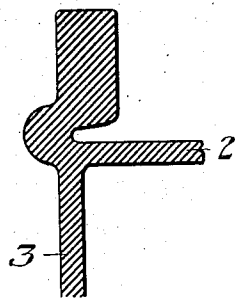


Fig. 6.

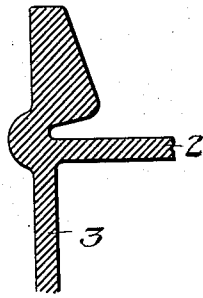
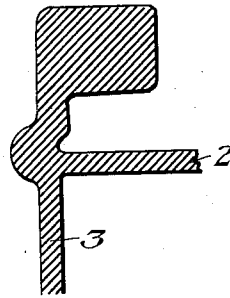


Fig. 7.



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CAN-CLOSURE.

1,319,081.

Specification of Letters Patent.

Patented Oct. 21, 1919.

Continuation in part of application Serial No. 834,362, filed April 25, 1914. This application filed May 19, 1917. Serial No. 169,657.

To all whom it may concern:

Be it known that I, EDWIN F. HULBERT, a citizen of the United States, residing at Milwaukee, Milwaukee county, Wisconsin, have invented a new and useful Improvement in Can-Closures, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view partly in cross section showing the die operating to place the cap in the can body;

Fig. 2 is a view partly in vertical section showing the operation of the expanding die forming the bead;

Fig. 3 is a view partly in vertical section showing the next operation of turning over the edge of the can body;

Fig. 4 is a view partly in vertical section showing the subsequent operation of rolling over the flange and can body; and

Figs. 5, 6 and 7 are diagrammatic views illustrating the form in which the seam may be pressed.

The present invention relates to can closures and the method and apparatus for making them; and more particularly to closing a can by placing therein a flanged cap and rolling over the edge of the can and flange to form a locking seam and supporting the can without engaging its inside. The method and apparatus have particular reference to forming closures of paper cans. These paper cans are now used for holding substances which it is desired to hermetically seal. To do this, the materials are first placed in the can and afterward the closure applied, as hereinafter described.

This application is a continuation in part of my copending application Serial No. 834,362 filed April 25, 1914, containing broad claims on the article divided out from said copending application.

By referring to the drawings, which illustrate the preferred embodiment of the invention, a flanged cap 2 is placed in the end of the can body 3. This is preferably done by a plunger or die 4, as shown in Fig. 1. As shown in Fig. 1, the cap 2 is first punched out of the sheet by means of a blank punch 5, operating against a blanking die 6, which cuts out the circular cap blank. Then the drawing die or plunger 4 draws this blank through the blanking die 6 into

the flanged shape shown in the drawings. The flanged cap 2 is pushed into the open end of the can body until the edge of the flange is positioned some distance within the open end of the can body, leaving the end or edge of the can body projecting beyond the flange, as indicated at 7 in Fig. 2. The base of the cap flange and can body are then forced outwardly to form a bead 8. This bead 8 serves to support the can against the endwise pressure of the seam-forming operation. The bead 8 is formed as shown in Fig. 2. A die 10 having an inwardly opening groove 11 fits around the outside of the can body. An expanding die 12 is placed within the flange. The die 12 has a toe 13, which forces out the base of the flange 14, together with the registering portion of the can body, to form the bead 8. The expanding die 12 is preferably formed with a number of scoring teeth 15, which score the flange 14 with a series of indentations. In drawing the cap from a flat blank of paper, the excess paper is folded and compressed into the flange, thickening and making it resist the inward rolling of the flange. The indentations score the fiber of the flange making it limp and facilitating the inward rolling or banding of the flange, subsequently described.

The next operation is forming the closure seam. The end of the projecting edge of the can body is rolled inward and upon itself, as shown in Fig. 3, by means of a die 20, which moves endwise against the edge of the body. The die 20 has an annular curved face 21, engaging and rolling over the projecting edge of the can body. This projecting edge of the can body is rolled over upon itself to form a rolled-over portion consisting of, at least, one complete turn of the paper, before it engages the edge of the cap flange.

After the rolled-over projecting edge of the body portion engages the edge of the cap flange, the rolling action is continued, the body portion and flange being rolled over around the previously rolled-over edge of the body portion, which acts as a mandrel or core. This is shown in Fig. 4. After the projecting edge of the body portion is rolled over, as shown in Fig. 3, another expanding die is inserted having a toe 25, which engages in the bead 11 and supports the can against endwise pressure. Another

die 26 having a curved face 27, is moved downward against the partially rolled edge shown in Fig. 3, completing the closure, as shown in Fig. 4. As shown in Fig. 3, the rolled-over edge 28 of the can body is turned over, the edge of the flange being pinched or gripped by it. During the subsequent rolling operation, as shown in Fig. 4, this previously rolled-over portion 28 serves as a mandrel, compelling the edge of the cap to be rolled or turned into a scroll-like seam. The edge of the flange of the cap has an excess of paper in it, due to forming the flange from a flat disk. This pinching and mandrel-like rolling action of the previously rolled-over portion 28 insures that this thickened cap flange is properly rolled over with the body wall to form a tight rolled closure seam.

After the seam is formed, as shown in Fig. 4, it may be left in the shape therein shown, or it may be pressed into various shapes by the subsequent action of forming dies. In Figs. 5, 6 and 7, are indicated diagrammatically in cross section the shapes in which the rolled-over seam may be pressed, no attempt being made in these diagrammatic figures to show the layers of the paper.

The term, paper, as used in this specification and in the claims is intended as a word of description and not of limitation, and is intended as a generic term to include such kinds of papers or paper-like substances, as cardboard, fiber board, or other fibrous sheets having the same general characteristics as paper.

The present method and apparatus for closing the can is particularly applicable to the closure of paper cans, which are first filled with the materials and afterward sealed. As shown in Fig. 4, the can is filled with some material 30, and the closure is applied without engaging the inside of the can. The can is supported against the endwise thrust of the seam-rolling tools by means of the grip between the toe of the expanding die and the registering groove of the die surrounding the can body. In this way, a paper can having a weak paper wall can be hermetically sealed at both ends without subjecting the walls of the can body to endwise pressure.

While it is preferred to use the apparatus and method herein described for closing both ends of a paper can with rolled closure seams, it is to be understood that the article produced, particularly as defined in the broader article claims, might be produced by other mechanisms and methods, for example, such as is disclosed in my co-pending application Serial No. 834,362.

While the preferred embodiment of the invention has been specifically illustrated and described, it is to be understood that

the invention is not limited to its preferred embodiment or to the details of the method herein described, but may be varied within the scope of the following claims.

I claim:

1. A can having a flanged cap, and a rolled closure seam consisting of a core formed of the edge of the can body rolled over on itself and surrounded by rolled portions of the cap flange and can body, substantially as described.

2. A can having a flanged cap, a rolled closure seam consisting of a core formed of the edge of the can body rolled over on itself and surrounded by rolled portions of the cap flange and can body, and a bead on the can body adjacent the closure seam, substantially as described.

3. The method of closing a can, consisting in placing a flanged cap within the can body with the end of the can wall projecting beyond the flange of the cap, rolling over the projecting edge of the body upon itself until it engages the edge of the flange, thereby forming such rolled over edge into a core and then rolling over both the flange and body around such core to form a locking seam, substantially as described.

4. The method of closing a can, consisting in placing a flanged cap within a can body with the edge of the body projecting beyond the edge of the flange, rolling over the projecting edge of the body upon itself until it engages the edge of the flange, and then rolling over both the flange and body to form a locking seam, the rolled-over edge of the body serving as a core or mandrel upon which the flange and body are subsequently wound, substantially as described.

5. The method of closing a can, consisting in placing a flanged cap within a can body with the edge of the body projecting beyond the flange, forcing out a portion of the flange together with the registering portion of the can body and forming thereby an outwardly extending bead, rolling over the projecting edge of the body, then rolling over both the flange and body by endwise pressure, thereby forming a locking seam, and supporting the can against such endwise pressure by means of the bead, substantially as described.

6. The method of closing a can, consisting in placing the flanged cap within a can body with the edge of the can body projecting beyond the flange, rolling over the projecting edge of the body upon itself to form a core, and then rolling over both the flange and body around such core by endwise pressure to form a locking seam, and supporting the can against such endwise pressure by means engaging the outer surface of the can in proximity to said seam, substantially as described.

7. The method of closing a can, consisting

in placing a flanged cap within a can body with the edge of the can body projecting beyond the flange, scoring the flange, rolling over the projecting edge of the body upon itself until it engages the edge of the flange, and then rolling over both the flange and body to form a locking seam, substantially as described.

8. Apparatus for securing a flanged cap or closure to a can without engaging the inside of the can, comprising a die surrounding the can body and having an inwardly opening groove, means for placing a flanged cap within the can body so that the edge of the can body projects beyond the flange of the cap, an expanding die fitting within the flanged cap and having a projection registering with the groove and operating to force a portion of the flange and registering can body into the groove, thereby forming an outwardly extending bead on the can body, and means operating to first roll over the projecting edge of the body upon itself and until it engages the edge of the flange and thereafter to roll over both the flange and the body to form a locking seam, the outwardly extending bead engaging the groove in the first named die and serving to support the can during the seam-forming operation, substantially as described.

9. Apparatus for securing a flanged cap or closure to a can without engaging the inside of the can, comprising a die surrounding the can body and having an inwardly opening groove, means for placing a flanged cap within the can body so that the edge of the can body projects beyond the flange of the cap, an expanding die fitting within the flanged cap and having a projection registering with the groove and operating to force a portion of the flange and registering can body into the groove, thereby forming an outwardly extending bead on the can body, a die movable endwise against the projecting edge of the can body and operating to roll it over on itself, another die movable endwise for subsequently engaging the rolled-over edge of the can body and operating to roll over the flange and can body to form a locking seam, the can being supported by its engagement with the groove against endwise pressure of the last mentioned dies, substantially as described.

10. Apparatus for securing a flanged cap closure to a can without engaging the inside of the can, comprising means for placing a flanged cap within the can body so that the edge of the can body projects beyond the flange of the cap, means operating to first roll over the projecting edge of the body upon itself until it engages the edge of the flange thereby forming such rolled over edge into a core, and then to roll over both the flange and body around such core to form a locking seam, and means engaging the out-

side of the can in proximity to said seam for supporting it against the thrust of the last mentioned means, substantially as described.

11. Apparatus for securing a flanged cap closure to a can, comprising means for placing a flanged cap within the body with the edge of the body projecting beyond the flange of the cap, and means operating to first roll over the projecting edge of the body upon itself to form a core and subsequently to roll over both the flange and the body around such core to form a locking seam, substantially as described.

12. A can of paper or the like material, having an open ended shell-like body portion and caps closing both ends of the body portion and united therewith by permanent locking rolled closure seams consisting of a core formed of the edge of the can body rolled over on itself and surrounded by rolled portions of the cap and can body.

13. A can of paper or the like material, having an open ended shell like body portion and caps having outwardly extending flanges inserted in both ends of the portion and united therewith by locking seams extending beyond the faces of the caps and formed of the edges of the can body rolled over on itself and surrounded by rolled portions of the cap flanges and can body.

14. A can, having an open ended shell-like paper body portion and paper caps closing both ends of the body portion and united therewith by closure seams formed by the rolled together edges of the caps and body portion.

15. A can, having an open ended shell-like paper body portion and paper caps inserted in both ends of the body portion and united therewith by permanent locking closure seams formed by the rolled together and compressed edges of the caps and body portion.

16. A can, having an open ended shell-like paper body portion and paper caps having outwardly extending flanged edges inserted in both ends of the body portion and united therewith by permanent locking closure seams formed by the rolled together and compressed edges of the cap flanges and body portion.

17. A can, having an open ended shell-like paper body portion and paper caps inserted in both ends of the body portion and united therewith by permanent locking closure seams extending beyond the faces of the caps and formed by the edges of the caps and body portion rolled together and inwardly.

18. A can, having an open ended shell-like paper body portion and paper caps inserted in both ends of the body portion and united therewith by permanent locking closure seams extending beyond the faces of the caps and formed by the edges of the caps and body portion rolled together and in-

wardly, said closure seams having beads formed on the faces of the body portion.

19. The herein described method of sealing a can which consists in permanently securing an end closure at one end of an open-ended paper can body, filling the can with the material to be canned, placing a paper cap in the open end of the can body, and rolling together the paper edges of the cap and body to form a rolled closure seam.

20. The herein described method of sealing a can which consists in permanently securing an end closure at one end of an open ended shell-like paper can body, filling the can with the materials to be canned, placing a flanged paper cap within the open end of the can body, turning over the paper edges of the cap flange and body by endwise pressure and thereby forming a permanent rolled closure seam, and supporting the can against such endwise pressure by engagement with the outside of the can only.

21. A can filled with material to be preserved having a paper body portion and having the closure which is applied after the can is filled with the material, made of paper and united with the can body by means of a closure seam formed by the

rolled together edges of the closure and can body.

22. A can filled with material to be preserved having a paper body portion and having the closure which is applied after the can is filled with the material, made of paper united with the can body by means of a closure seam formed by the rolled together and compressed edges of the closure and can body.

23. A can filled with material to be preserved and having the edges of both the can body and the closure which is applied after the can is filled with the material, made of paper and so deformed as to unite them with a permanent locking seam.

24. The herein described method of sealing a can which consists in permanently securing an end closure at one end of an open-ended paper can body, filling the can with the material to be canned, and thereafter placing a paper cap over the open end of the can body and so deforming the edges of both the cap and can body as to lock them together.

In testimony whereof, I have hereunto set my hand.

EDWIN F. HULBERT.