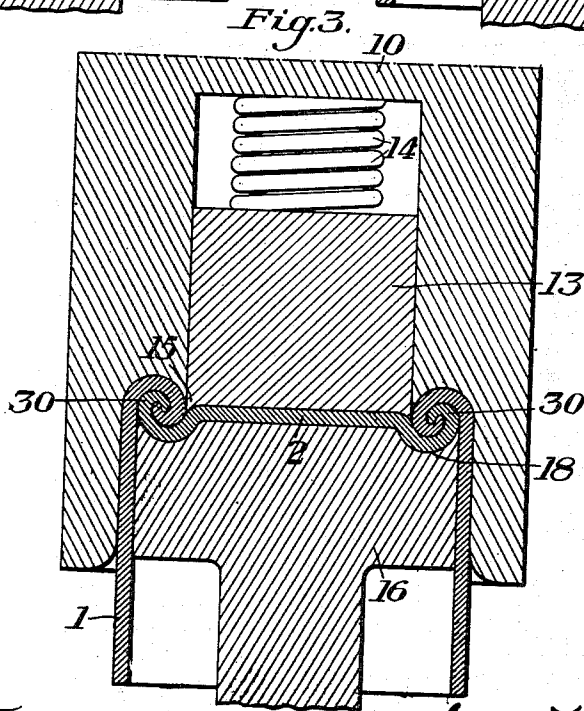
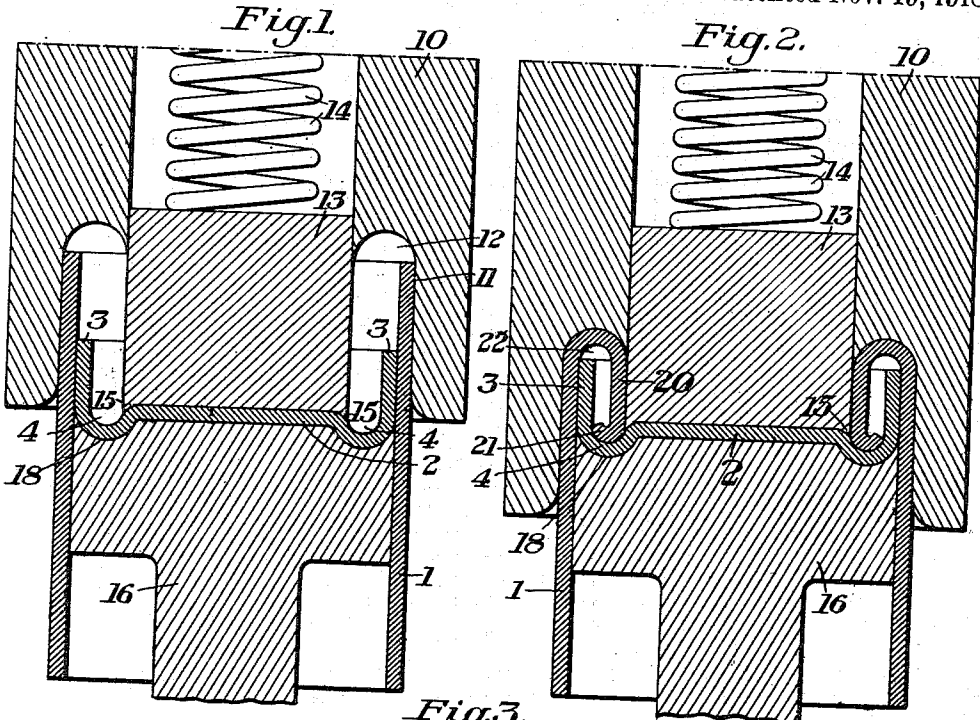


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 MANUFACTURE OF PAPER CANS OR CARTONS,
 APPLICATION FILED AUG. 17, 1916.

1,285,190.

Patented Nov. 19, 1918.



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MANUFACTURE OF PAPER CANS OR CARTONS.

1,285,190.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWIN F. HULBERT, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in the Manufacture of Paper Cans or Cartons, 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 vertical section through the can and forming dies showing the dies about to be pressed together;

Fig. 2 is a similar vertical section showing the dies pressed partially together; and

Fig. 3 is a similar vertical section showing the dies pressed together to their final position and the joint completed.

The present invention relates to the manufacture of paper cans or cartons, and more particularly, to an improved method of securing the cap or end closure to the shell or body portion.

The object of the invention is to provide an improved method of forming a curled locking joint for securing the cap or end closure to the body portion or shell of the can.

Referring to the drawings, the cylindrical paper or body portion or shell of the can is indicated at 1, and the disk-like paper can or end closure is indicated at 2. A disk of paper or cardboard is first formed by means of dies into the shape shown in Fig. 1, the edge of the cap being turned up to form a substantially straight upwardly extending flange 3. A round bottom groove 4 is pressed into the cap at the base of the flange 3. In turning up the flange 3, the paper at the edge is somewhat compressed and thickened because of the reduction in diameter of the edge of the disk when it is turned up.

The shell or body portion 1 is preferably formed by the usual method of winding a strip of paper around a mandrel. Both the shell and cap are preferably proofed with some water-proofing material, such as paraffin.

The method of joining the cap and shell is preferably carried out, as shown in the drawings, by means of dies. The upper die 10 is a hollow metal tube, the lower end of which is cut away at 11, to form a recess,

the top of which is formed with a curved end or groove 12. Within the die 10 is mounted the plunger 13, pressed downwardly by means of a spring 14. The bottom of the plunger 13 is substantially flat, the edge, however, being provided with a slight annular projection 15, which fits against the inner edge of the groove 4 of the cap. The lower or cooperating die 16 has a flat top face surrounded by a groove 18, which fits against the bottom of the grooved portion 4 of the cap. Suitable means (not shown) are provided for operating the dies.

The flanged cap 2 is placed within the shell 1, and the can placed in the dies, as shown in Fig. 1, the plunger 13 engaging the middle of the cap and the edge of the shell 1 extending into the recess 11 of die 10 above the end of the flange 3 of the cap. The die 10 is then forced downward toward the die 16. The groove 12 of the recess 11 engages the edge of the shell, turning it over to form a downwardly extending flange 20 on the shell. In forming the flange 20, the material of the shell 1 is somewhat compressed and the flange hugs the plunger 13, forming a substantially straight flange similar to the flange 3 of the cap, but extending in the opposite direction, and, as shown in Fig. 2, spaced somewhat away from the flange 3. The shell and cap are so assembled and initially placed in the dies that the portion of the shell extending above the edge of the cap flange 3 is longer than the flange 3, so that the flange 20, formed by turning over the edge of the shell, is slightly longer than the flange 3. Therefore, on continued movement of the dies together, the edge of the shell flange 20 engages the round part of the groove 4 in the cap and is turned up, as indicated at 21 in Fig. 2. As above pointed out, the flange 3 is formed by turning up an edge of the circular cap, and therefore, contains an excess amount of material, due to its reduction in diameter. The flange 3 is therefore comparatively stiff and more difficult to curl than the flange 20, which is formed by turning in the edge of the cylindrical shell. It is apparently essential that the flanges 20 and 4 be so proportioned that the edge of the flange 20 will first engage the base of the flange 3, and thereby support the flange 3, and assist in holding it during the subsequent curling operation. After the parts assume the position shown

in Fig. 2, with the curled edge 21 of the flange 20 engaging the groove 4 at the base of the flange 3 and the cap flange 4 about to engage the round bottom groove 22, formed at the base of the flange 20, the movement of the dies toward each other is continued, pressing the flanges toward each other longitudinally. When the flanges are thus pressed together, the round bottom groove 4 acts as a forming die for the edge of the flange 20, and the round bottom groove 21 acts as a forming die for the edge of the flange 3, causing the edges of the flanges to curl over and wind around each other to form a curled locking joint, as shown in Fig. 3. Fig. 3 illustrates the end of the operation, the upper and lower dies being pressed together, compress and solidify the curled locking joint 30. The dies are then separated and the can removed. As shown in Fig. 2, the curled-over lower edge of the flange 20 is pressing against the base of the flange 3 and on continued movement of the dies together, the edge of the flange 20 moves outwardly against the flange 3, pressing against it and effectively supporting it against buckling, so that the flange 3, although stiffer, is compelled to curl over and around the end of the flange 20, forming the curled locking joint shown in Fig. 3.

It is found in manufacture that by forming the curled locking joint by this method a substantially perfect joint is produced. Moreover, the method obviates the difficulty heretofore encountered in making curled locking joints for paper cans, namely, that of more or less occasionally forming an imperfect joint. The method is reliable and in practising it with the dies illustrated in the drawings, a perfect locking joint is secured at each operation. This is believed to be due in part to the proper proportioning of the lengths of the cap and shell flanges 3 and 20, so that the edges of the shell flange 20 first engage the base of the cap flange 3. It is also to be noted that the flanges 3 and 20 are both formed substantially straight and of the proper length before the edges of such flanges engage the round bottom grooves 22 and 4, by means of which the curling operation is commenced. The forming of the flanges and afterward pressing them together to curl them is also believed to be one of the things contributing to form a perfect curled joint.

While it is preferred to first place the flanged cap 2 within the shell 1, and thereafter form on the shell the flange 20, it is obvious that the flange 20 might be first

formed and thereafter the cap 21 placed within the shell. Therefore, in the claims, I do not intend to limit myself to any particular sequence of these two operations, namely, placing the cap within the shell and forming the flange on the shell.

While the preferred apparatus for carrying out the method has been illustrated, it is to be understood that the method may be carried out by the use of other apparatus, and is not limited to the details described above, but may be otherwise employed, within the scope of the following claims.

I claim:

1. The method of securing a cap or end closure to the shell or body portion of a paper can or carton, which consists in turning a flange on the edge of the cap, placing the cap within the shell, turning over the edge of the shell and forming a flange which is sufficiently longer than the cap flange to engage the cap near the base of its flange before the edge of the cap flange is curled, and pressing the flanges together so as to curl them together into a curled locking joint, substantially as described.

2. The method of securing a cap or end closure to the shell or body portion of a paper can or carton, which consists in turning a flange on the edge of the cap, forming a round bottom groove or depression at the base of the flange, placing the cap within the shell, turning over the edge of the shell to form an oppositely extending flange longer than the flange on the cap and with a round bottom groove at its base, and pressing the flanges together so that the round bottom grooves act as dies to guide the edges of the flanges and curl them together into a curled locking joint, substantially as described.

3. The method of securing a cap or end closure to the shell or body portion of a paper can or carton, which consists in turning up the edge of the cap and compressing and thickening the edge thereof to form a flange, placing the flanged cap within the shell, turning over the edge of the shell to form an oppositely extending flange slightly longer than the flange on the cap, and pressing the flanges longitudinally together so that the edge of the shell flange first engages the cap flange near its base to support it during its subsequent curling operation and in continuing to press the flanges together so as to curl them together into a locking joint, substantially as described.

In testimony whereof, I have hereunto set my hand.

EDWIN F. HULBERT.