

Feb. 28, 1939.

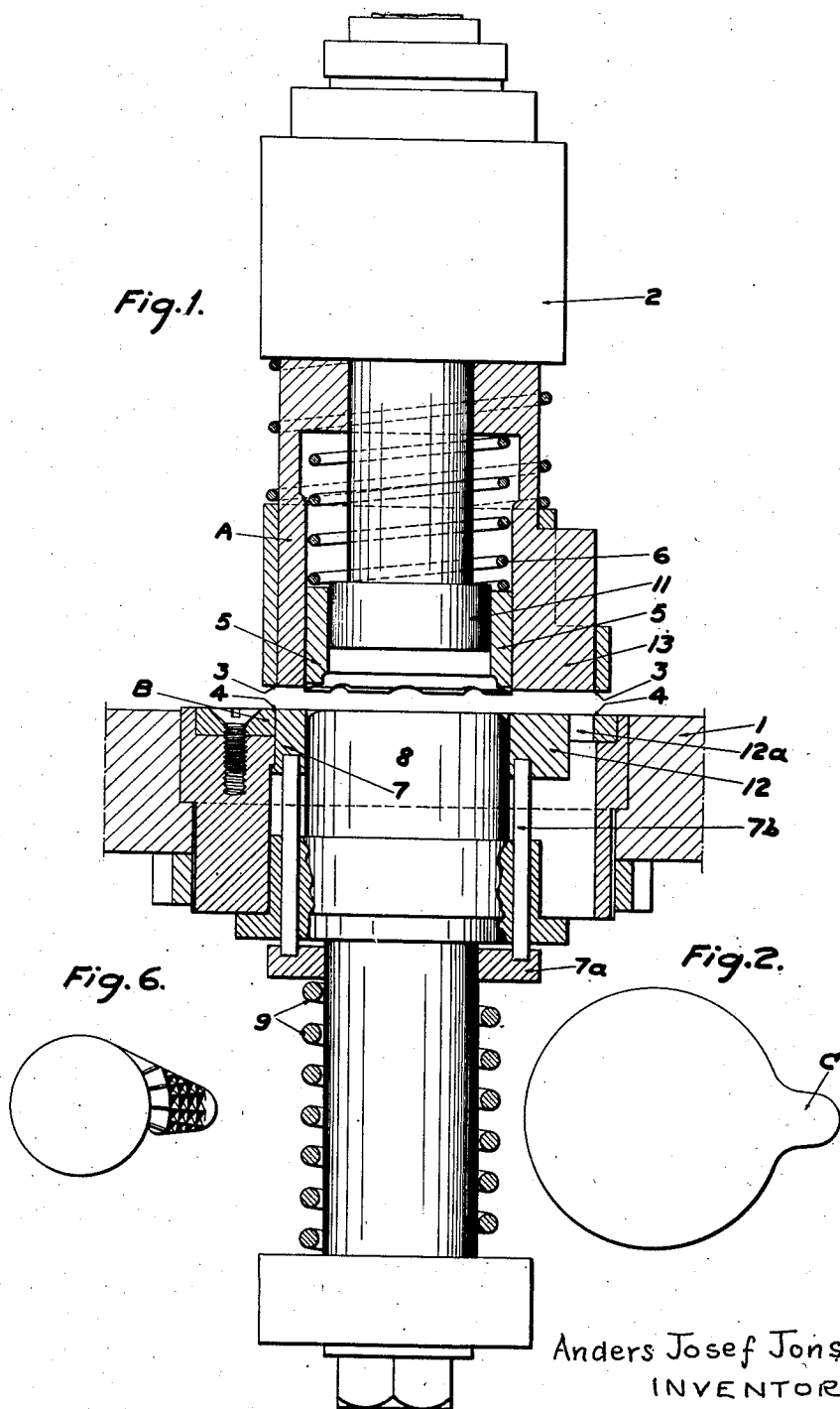
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2,148,906

TOOL FOR THE MANUFACTURE OF CONTAINER CAPS OF SHEET METAL

Filed March 29, 1935

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

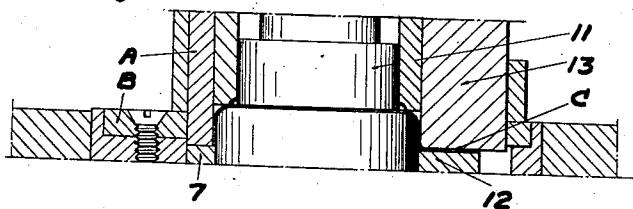


Fig. 4.

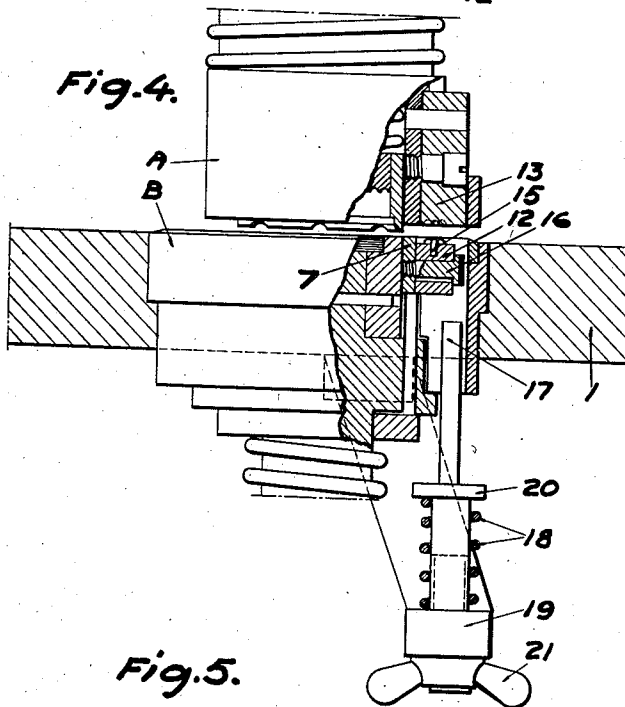
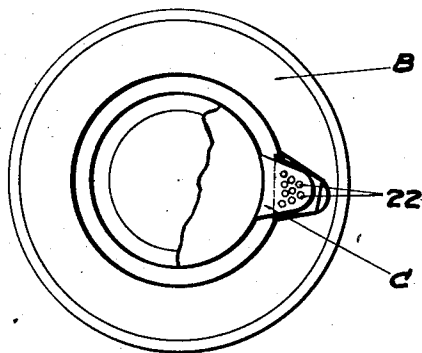


Fig. 5.



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UNITED STATES PATENT OFFICE

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TOOL FOR THE MANUFACTURE OF CONTAINER CAPS OF SHEET METAL

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In Denmark April 16, 1934

5 Claims. (Cl. 113—46)

The present invention relates to the manufacture of container caps of sheet metal (preferably of aluminum) provided with a tab or finger piece, in which manufacture the cap blank preferably is cut out and is drawn to its final shape in one and the same tool.

In order to assure a better grasp of the tab, when tearing off the cap from the container, folds, grooves, spots or the like, have been shaped in the tab but hitherto the said shaping or deforming operation has been performed after the cap has left the punching or bending tool. The present invention relates to a simplification of the manufacture in such a way that the said shaping or deforming operation is performed in connection with the making of the cap in the said tool by means of a suitable pressing or stamping device, which is applied to the tool in question.

To explain the invention reference is made to the accompanying drawings.

Figure 1 shows an axial section of a combined punching and bending tool of the type used heretofore.

Figure 2 shows a cap blank in plan prior to the drawing operation.

Figure 3 shows an axial section of a part of the tool according to Figure 1 during the drawing operation.

Figure 4 shows the same tool on another scale in side view and partially in section, provided with stamping or deforming means exemplifying this invention.

Figure 5 shows a plan view of the lower part, i. e. the die, of the tool according to Figure 4; in this figure part of a cap is shown when still on the die.

Figure 6 is a top view of a cap of a special shape.

As usual the tool consists of two main parts, viz. the punch A and the die B, each of which is composed of a plurality of elements, only the elements being shown, which are necessary to explain the invention. 1 indicates the machine table, and 2 the punch holder which is arranged to be reciprocated as usually in the machine, for instance by an eccentric press. The cutting edge 3 of the punch and the corresponding cutting edge 4 of the die have the contour of the blank shown in Figure 2. In the embodiment shown, the punch A and the female drawing sleeve are one and the same member, i. e. the outline of the bottom surface of the female drawing sleeve constitutes the cutting edge 3. The corresponding male drawing element is indicated by the refer-

ence character 8. Within a cavity of the punch and female drawing sleeve A, there is arranged an annular holding element 5, which is adapted to be pushed up in the cavity against the action of a spring 6. Within the die is a counter-sleeve 7 surrounding the male drawing element 8 and adapted to secure a proper drawing and to disengage the cap from the tool. The counter sleeve 7 is yieldingly guided in the die and is normally kept in the position shown in Fig. 1 by a spring 9 acting on a ring 7a fixed to the guide rods 7b. To the right (as viewed in Fig. 1) the counter sleeve 7 has a projection 12 extending into the die cavity 12a for the tab. The projection of the punch corresponding to said cavity is indicated by 13. The above described parts are known in the art, and so they need not be described in detail.

When the cap blank has been cut or punched out of a blank, the punch and female drawing sleeve A continues some way further downwards (see Fig. 3), the counter-sleeve 7 is pressed downward, the holding element 5 meets the male element 8 in order to secure the position of the blank which, thereby, is bent slightly around the top of the male drawing element 8, whereupon the cap drawing operation proper is accomplished by the downward movement of the female cap drawing sleeve A drawing the cap blank over the male element 8. The drawing having been completed a stamp 11 meets the upper surface of the cap. The said stamp may be provided with a mark of a firm, or the like, which is then produced in the top of the cap. During the drawing operation the tab c is held sandwiched between the two projecting parts 12, 13 (see Figure 3) in a horizontal position, while both are being moved downward.

According to the invention the said projections 12, 13 constitute deforming elements (Figure 4) and are shaped for the corrugation or the like of the tab, in the shown embodiment as follows:

In one of the cooperating surfaces of the two projections 12, 13 for instance in the bottom surface of the projection 13 depressions have been made; the corresponding elevations such as pins 15 are disposed in the upper surface of the projection 12. As shown in Fig. 4, the latter projection consists of a member, adapted to move up and down on a guide screw 16 fixed in the counter sleeve 7. Beneath the movable projection 12 is a stop 17 which is yieldable in the stamping direction against the action of a spring 18, clamped between a flange 20 and a frame arm 19 support-

ing and guiding the stop 17. The strength of the spring is controlled by a wing nut 21.

When a cap blank has been cut out and the drawing operation takes place the counter-sleeve 7 with the movable projection 12 is displaced downwardly. Close to its bottom position the movable projection 12 meets the rod 17, by which it is stopped, so that the pins 15 in cooperation with the depressions in the lower surface of the projection 13 produce impressions or corrugations in the cap tab. The said corrugations 22 appear clearly from above in Figure 5.

It is obvious that the two projections 12, 13 may be shaped in many various ways for stamping the tab. For example, the faces may be shaped as a name of a firm or trade-mark so that elevations and depressions are obtained for the purpose described. Alternatively, holes may be provided in the tab. The term "deformation", as used in the appended claims, is intended to refer generally to any such effect upon the tab.

Also the details of the stamping device may be varied within the scope of the invention. Of course, the invention also includes embodiments of the stamping device in combination only with a punching device or only with a drawing device, i. e. in case the punching and drawing operations are carried out by separate tools.

It is to be understood, too, that the invention is not limited to a cap with one tab or to the shape shown and described. For instance both may be shaped as shown in Figure 6.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A tool for making metal caps having laterally projecting tabs with an impressed pattern thereon, said tool comprising a female drawing sleeve and a male drawing element cooperable to deform a sheet metal blank into a cap, a counter-sleeve encircling the male and being resiliently supported to yield to the female drawing sleeve, lateral projections on said female drawing sleeve and counter-sleeve, respectively, and adapted to slidably sandwich the laterally projecting tab between their contacting surfaces during the main portion of the cap forming step, one of said projections having the pattern to be impressed in the tab depressed in its contacting surface, the second projection being mounted on its sleeve for slight relative movement thereto and carrying the corresponding high relief pattern normally in a position slightly spaced from said last-mentioned contacting surface, and automatic means to project said movable part towards said con-

tacting surface and to press the high relief pattern against the depressed pattern when the drawing operation is approximately completed.

2. A tool, as claimed in claim 1, in which the movable projection carrying the high relief pattern is movably supported by said yieldable counter-sleeve and said means comprise a stop positioned to encounter said movable projection when the drawing of the cap has been almost completed, whereby upon the final depression of said counter-sleeve said movable projection is lifted beyond the contacting surface of the counter-sleeve and pressed against the depressed pattern in the surface of the projection on the female drawing sleeve.

3. A tool for making metal caps having laterally projecting tabs with an impressed pattern thereon, said tool comprising a female drawing sleeve and a male drawing element cooperable to deform a sheet metal blank into a cap, a counter-sleeve encircling the male element and being resiliently supported to yield to the female drawing sleeve, lateral projections on said female drawing sleeve and counter-sleeve, respectively, and adapted to slidably sandwich the laterally projecting tab between their contacting surfaces during the main portion of the cap forming step, the contacting surface of one of said projections being shaped to form one of the dies for the pattern to be impressed on the tab, the second projection being mounted on its sleeve for slight relative movement thereto and carrying the corresponding counter-die normally in a position spaced from said first mentioned die, and automatic means to project said movable part towards said first mentioned die and to press the die and the counter-die against each other when the drawing operation of the tool is approximately completed.

4. A tool as claimed in claim 3 in which said female drawing sleeve includes a cutting edge, said tool comprising further a stationary element having a cutting edge arranged for cooperation with said cutting edge on the female drawing sleeve to punch the blank from the said material before the drawing step.

5. A tool as claimed in claim 3 in which said movable projection has a slot and a guide screw secured in the corresponding sleeve and projects radially through said slot, the latter being larger than the diameter of the said screw in order to permit a slight vertical movement of the projection relative to its sleeve.

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