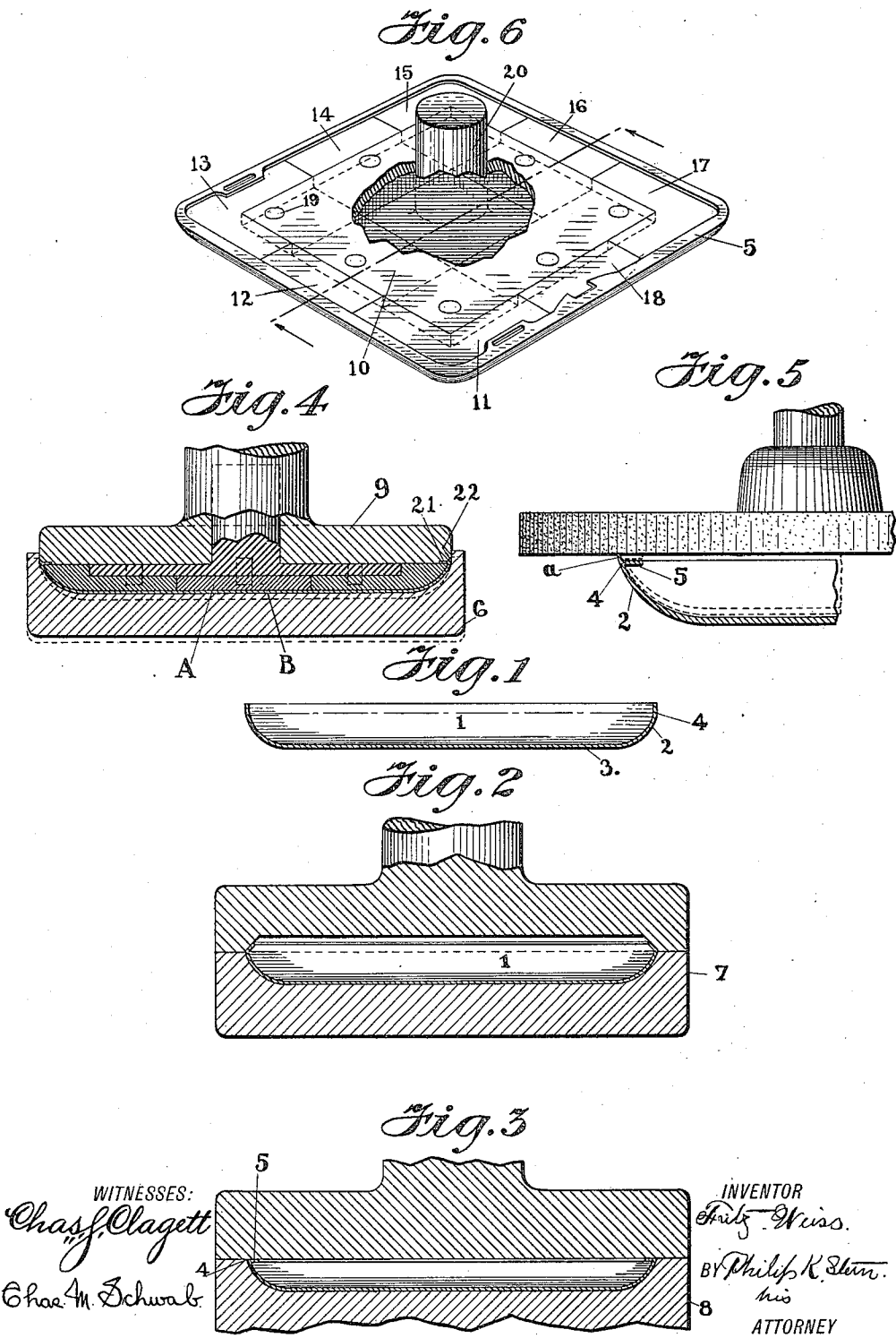


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METHOD OF MAKING CUP SHAPED ARTICLES.
APPLICATION FILED JAN. 16, 1912.

1,042,300.

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UNITED STATES PATENT OFFICE.

FRITZ WEISS, OF PFORZHEIM, GERMANY.

METHOD OF MAKING CUP-SHAPED ARTICLES.

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Specification of Letters Patent.

Patented Oct. 22, 1912.

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To all whom it may concern:

Be it known that I, FRITZ WEISS, a subject of the Emperor of Germany, residing in Pforzheim, Germany, have invented certain new and useful Improvements in the Method of Making Cup-Shaped Articles, of which the following is a specification.

My invention in the method of making cup-shaped articles, relates in the main to a process employed in the manufacture of articles formed from metal or other ductile material by a process known as stamping wherein blanks are cupped to form an annular wall and integral end portion or portions; it has reference more particularly to types of articles of this class provided with an integral annular wall and an end portion wherein the wall is in part or wholly turned over on its free edge to form a flange.

The object of my invention is to improve the finish of the corners or edges so turned over or bent whereby little or no line of demarcation may be detected when the bent or formed edges of a pair of the stampings to which my invention is directed are brought in contact with each other; this object I attain by the method of treating bent or formed stampings by several steps in an operation which is depicted in the drawings hereto attached, which when taken with the correlative detailed descriptive matter forms part of this specification, and the distinct features of novelty are referred to in the claims at the conclusion thereof.

With reference to the drawings, Figure 1 is a sectional elevational view of a stamping having an integral annular wall and bottom. Fig. 2 is a sectional elevational view of the same together with a like view of a punch and die illustrating the manner in which the upper edge of the annular wall is initially bent in the formation of the flange. Fig. 3 is a similar view to that of Fig. 2 illustrating a successive step in the completion of the formation of the flange by a punch of different form than that illustrated in Fig. 2. Fig. 4 is a sectional elevational view of the punch, die and form retaining tool for swaging or drawing the material of the annular wall of the stamping toward and beyond the bent over or flanged edge thereof. Fig. 5 is a fragmentary sectional elevational view of the stamping illustrating a condition of the edge after the operation indicated in Fig. 4 has been performed and in addition illustrates the process of

sharpening the edge of the flange by removing the surplus of material by a grinding operation. Fig. 6 is an isometrical projection view of the flanged stamping and involved form-retaining tool with a center portion thereof broken away.

In the several figures similar characters of reference designate like or the same parts wherein—

1 depicts a stamping having the form of a shallow dish constructed of ductile metal which comprises an annular wall 2 and a bottom 3. The annular wall 2 is bent at the corners 4 to form a flange 5 by the operation indicated in Fig. 3 which operation leaves the corner 4 slightly rounded. In the instance illustrated the stamping 1 after having the flange 5 formed upon the annular wall 2 provides one-half of a receptacle for the containing of cigarettes and by uniting two of these by a hinge with their flanges adjacent and the corners thereof coinciding, the resulting construction constitutes a cigarette case. Due to the rounding of the edge 4, in the formation of these blanks into a receptacle, by a stamping operation, a rather promiscuous and objectionable line of demarcation appears around the edge which impairs the appearance of the article and it is toward the circumventing of this objectionable feature that my invention is more particularly directed. After the stamping 1 has been flanged over, I subject the wall 2 to a swaging or drawing operation and in a manner whereby the material of the wall 2 is forced toward the corner 4 which reduces the thickness of the material and drags the stock past this corner to form an annular lip *a*. To accomplish this I provide a drawing die 6 as referred to in Fig. 4, which is smaller in the area of its cavity than either of the dies 7 or 8 referred to in Figs. 2 and 3, to an extent which will necessitate the forcing of the stamping 1 therein which fits the dies 7 and 8, by a punch 9 until the said stamping is bottomed in the die 6. In order to prepare the stamping 1 for the swaging or drawing of the wall 2 in the die 6, I provide a structural form-retainer 10, having fitted marginal sections 11, 12, 13, 14, 15, 16, 17 and 18 and a center section or abutment A which are secured together and against displacement by dowels 19. The form-retainer 10 is countersunk into these sections on the upper surface thereof and the under side of the structure

is finished to fit the interior of the stamping 1 snugly and under the flange 5. The form-retainer 10 has an integral neck 20 which is telescopically housed in the neck of the punch 9. The punch 9 has an annular relief recess 21 around its face which is occupied by the flange 5 when these corresponding parts are in conjunction within each other and the perimeter of the punch 9 adjacent to the recess 21 has a second annular recess 22 to receive a lip *a*.

To assemble the structural form-retainer and stamping 1 the corner sections 11, 13, 15 and 17 are first introduced and positioned in the corners under the flange 5 and the sections 12, 14, 16 and 18 are introduced between them respectively, after which the center or abutment section A is positioned and finally, the form-retainer 10 is secured to the whole by dowels 19. Upon the die 6 being set up in a suitable press and the stamping 1, together with the assembled form-retainer 10 and the punch 9 being positioned for the operation of drawing or the swaging of the walls 2 to form the lip *a*; upon the operation of the press whereby the requisite pressure is applied to the punch 9 and die 6, the retainer 10 and the stamping 1 will be forced to the bottom B of the die 6, and the lip *a* will be squeezed out or drawn from the surplus material of the wall 2 and lie in the annular space 22 of the punch 9. Thus it will be understood that the material which had previously been absent at the rounded corner 4 will be contributed by this drawing operation which not only fills the corner but produces thereat sufficient material to reach beyond the said corner to allow for finish. After the operation of the die 6, just described, has been completed, the punch 9 together with the retainer 10 and stamping 1 may be removed, and the lip *a* is ground off by the grinding operation as illustrated in Fig. 5, resulting in the formation of an acute angle at the junction of the wall 2 and the flange 5, whereby the edge around the face of the stamping has been made sharp.

It will be obvious that in the method of converting the round corner 4 into a sharp corner, the material has been collected there-

for at the expense of the wall 2, while the thickness of the flange 5 is retained as originally. This reduction in the thickness of the wall 2, while the thickness of the flange 5 has been retained, in the operation of sharpening the corner 4, does not materially impair the rigidity of the finished article, since the free edge of the wall 2 is stiffened by its integral connection with the flange 5, which has not been reduced whatsoever.

It will be clear to those who are familiar with the manufacture of articles developed from blank forms in stamping operations, that the method herein described, of finishing the corners at the bends, in order to sharpen them, provides an expedient for overcoming the objections of the rounded edges of such stampings when they are united to form an article where superior fit or finish is a desideratum, and

Having fully described my invention I claim as new and desire to secure by Letters Patent of the United States—

1. The herein described method of making cup-shaped articles, consisting first, in subjecting the edges of the material to a drawing operation, whereby the surplus material resulting from the drawing operation, will be carried to and beyond the edge to form a lip and second, in subjecting the lip to a grinding operation to remove it.

2. The method of making cup-shaped articles, consisting first, in suitably supporting a cup-shaped article in a die, and subjecting the walls of the material in the vicinity of the edge, to a drawing operation, performed in a direction to bend the edge and to accumulate the material thereat and beyond the corner thereof, and to form a projection therebeyond, and second, in grinding the edge at the bend by a surface grinding operation across the edge to remove the surplus metal; substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

FRITZ WEISS.

Witnesses:

PHILIP K. STERN,
J. G. HEMERICH.