April 24, 1956 J. S. HAWKSWELL ET AL 2,743,128

SNAP-ON SECURING CLIPS FOR THE LIDS OF SHEET METAL CONTAINERS

Filed Oct. 20, 1952

FIG. 1.

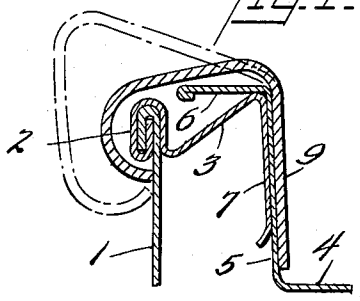


FIG. 2.

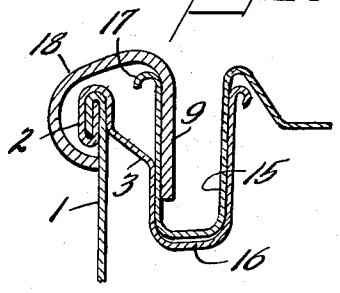


FIG. 3.

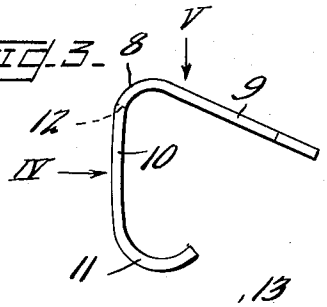


FIG. 4.

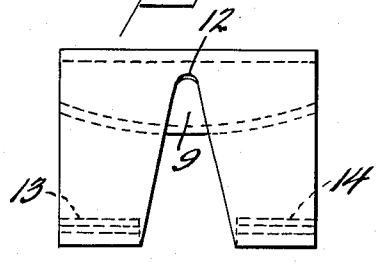
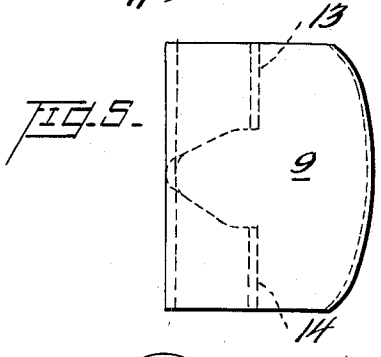


FIG. 5.



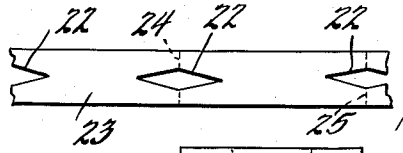


FIG. 7.

FIG. 8.



FIG. 9.

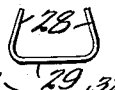


FIG. 10.

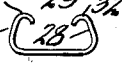


FIG. 11.

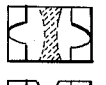


FIG. 12.

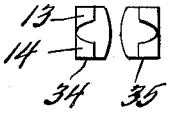
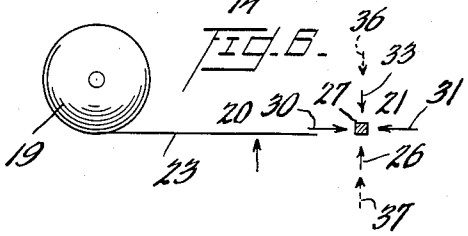


FIG. 13.

FIG. 6.



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SNAP-ON SECURING CLIPS FOR THE LIDS OF SHEET METAL CONTAINERS

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Application October 20, 1952, Serial No. 315,706

2 Claims. (Cl. 292—258)

This invention relates to snap-on securing clips for the lids of sheet metal containers of the type having a lever lid seated in a ring secured to the top of the side wall of the container by a seam overhanging said side wall outwardly thereof so as to form in effect a bead therearound, said lid having the usual peripheral flange, curl, bead or the like by which it is levered off to open the container, contiguous in the cross-section of the lid with the side wall of the depression therein which is pushed into the seating ring when the lid is in the closed position therein.

The object of the invention is to provide an improved snap-on lid securing clip for sheet metal containers of this type which will be marked by a high measure of efficiency in use, coupled with the characteristic that it is easily and cheaply producible in large quantities.

According to the invention, a snap-on securing clip for the lid of a sheet metal container of the type above referred to is characterised in that (*a*) it has the shape in side elevation of a letter C whose curl at one end of the letter is prolonged to the form of a straight tail lying at an angle substantially less than 90° to the center portion of the C, the clip being thereby capable, after having been engaged at the end opposite the end at which the straight tail portion of the clip is situated under the overhanging seam at the top of the container wall, of being sprung over the inner edge of the peripheral flange, curl, bead or the like of the lid (i. e. as regards said tail portion) to a position in which the tail portion lies snugly against the side wall of the depression in the lid, the said seam serving in this movement of the clip as a fulcrum therefor, and (*b*) it is a sheet steel stamping which has been bent to the shape specified and then tempered to a desired degree of hardness to render permanent the bent shape of the stamping and at the same time impart the necessary resilience thereto to enable it to be sprung to the position specified with a snap action.

It is found that a clip of the foregoing description is easily and cheaply manufactured in large quantities, particularly if, according to a further feature of the invention, the stampings which are first bent to the required shape and then tempered in the manner set forth are stamped from a strip of steel of the required width of the clips, the stamping operation being in this way considerably facilitated and simplified as compared with a case where the stampings are stamped out of a blank in the form of a sheet. In addition, owing to the fact that the stampings after having been bent to the required shape, said shape being exactly the finished shape of the clip, are then tempered to a desired degree of hardness to render the bent shape of the stamping permanent and at the same time to impart to the stamping the necessary resilience to enable it to be sprung to the lid securing position with a snap action in the manner hereinbefore set forth, the clips of this invention exhibit a remarkable measure of efficiency in use; on the one hand they are very easily applied, being readily sprung to the lid securing position by manual pressure applied to the clip (although, if desired, a tool may be employed for this purpose),

while on the other hand once they have been sprung to the lid securing position they remain there permanently (i. e. until removed to release the lid) however much the container may be knocked about in the course of handling, transportation or storage.

The latter mentioned characteristic of the clip, viz. its capacity to remain in the lid securing position permanently until removed to release the lid, is the more pronounced if in accordance with a further feature of the invention, the clip is bifurcated at the curled end so as to be of a pronged formation thereat, the pronged formation preferably extending to a point near the root of the tail portion of the clip.

The invention will now be further described with reference to the accompanying drawings which illustrate the invention by way of example.

In these drawings:

Figure 1 is a vertical cross-section through the upper part of a container of the type hereinbefore referred to at one side thereof and through a clip in accordance with the invention in the lid securing position;

Figure 2 is a similar section showing the application of the invention to a clip for use with a container in which the depression in the lid as hereinbefore referred to is an annular depression extending around the lid near the periphery thereof and providing in conjunction with a correspondingly shaped seating ring for the lid the effect of a double sealing joint as between the lid and the container body, one part of the joint being at the radially inner side of the annular depression in the lid and the other at the radially outer side thereof, the construction illustrated in Figure 1 being one in which the depression referred to is a dish shaped depression;

Figure 3 is a side elevation of the clip appearing in section in Figure 1;

Figure 4 is a front elevation of the clip looking in the direction of the arrow IV in Figure 3;

Figure 5 is a plan view of the clip looking in the direction of the arrow V in Figure 3;

Figure 6 is a diagrammatic view illustrating the method by which the clips of the invention are produced from a strip of steel of a width corresponding to the required width of the clips to be produced; and

Figures 7, 8, 9, 10, 11, 12 and 13 are views showing the clip in a succession of stages of manufacture thereof from a strip of steel as referred to in the description of Figure 6.

Like reference numerals are applied to like parts in the various figures.

Referring first to Figure 1, the side wall of the container is marked **1**. Secured by a so-called "double top seam" **2** is a seating ring **3** for the lid of the container.

The lid of the container is of the usual dished formation, the bottom of the dish being marked **4** and the side wall thereof **5**. At the top of the side wall **5** is the peripheral flange **6** of the lid by which the latter is levered off to open the container and, as will be seen, said side wall **5** seats against a skirt portion **7** of the seating ring **3** extending inwardly of the container in the customary manner, the lid having a tight push-in fit relatively to the seating ring.

The securing clip forming the subject matter of the invention has the shape hereinbefore specified, this shape being clearly illustrated in Figures 1, 3, 4 and 5 of the drawings.

Thus, as shown in Figures 1 and 3, the shape of the clip in the side elevation thereof is similar to that of a letter "C" whose curl **8** at one end of the letter is prolonged to the form of a straight tail **9** lying at an angle of substantially less than 90° to the centre portion **10** of the C. As clearly shown in Figures 4 and 5, the clip is bifurcated at the curled end **11** thereof so as to

be of a pronged formation thereat, the pronged formation extending to a point **12** near the root of the tail portion **9** of the clip. The two prongs of the clip characteristic of said pronged formation are marked **13, 14.**

In applying the clip to secure the lid of the container, the latter having been pushed fully home to its closed position in the seating ring **3** of the container, the clip is first engaged at the curled end **11** of the clip under the double top seam **2** (Figures 1 and 2) with the tip of the tail portion **9** engaging the peripheral flange **6** of the lid at or near the root thereof, where the flange joins the side wall **5** of the depression in the lid, this position of the clip being shown in chain line in Figure 1. The clip is then pressed by pressure (e. g. manual pressure) applied in the direction of the arrow "A" in Figure 1 to spring the tail portion **9** over the inner edge of the flange **6** of the lid to the position in which it appears in Figure 1, viz. a position in which it lies snugly and firmly against the inner surface of the side wall **5** of the depression in the lid. During this latter operation the double top seam **2** functions as a fulcrum to the clip in the manner hereinbefore set forth, and as will be understood the clip assumes its final lid securing position with a snap action, the angle between the tail portion **9** of the clip and the centre portion **10** thereof being greater when the clip is in its lid securing position and greater still during the operation of springing the clip into said position past the inner edge of the peripheral flange **6** of the lid, than it is in the clip in the rest (i. e. untensioned) condition thereof in which it appears in Figures 3, 4 and 5 of the drawings.

Referring to Figure 2, the annular depression hereinbefore referred to in the lid is marked **15** and, as shown, the seating ring **3** is formed with a correspondingly shaped U-section flange portion **16.** This portion **16** co-operates with the depression **15** to provide a double sealing joint as hereinbefore referred to in the description of Figure 2, and as will be seen, the lid in this construction of Figure 2 is provided with a peripheral curl **17** taking the place of the flange **6** of the lid of Figure 1, and although the clip which is generally marked **18** in Figure 2 is somewhat narrower along the center portion of the C than the clip of Figures 1, 3, 4 and 5, to accommodate the shorter distance between the curl **17** and the seam **2,** as compared with the distance between the inner edge of the flange **6** and the seam **2** of the construction according to Figure 1, the clip is otherwise of precisely the same construction as that of the Figures 1, 3, 4 and 5 and its method of application is the same as that of the clip of these other figures.

Referring now to the process of manufacture of the clip, this is illustrated in Figures 6 to 13 as hereinbefore indicated.

Figure 6 shows a supply reel **19** of untempered steel strip from which the clips of the invention are produced in a machine in which the strip is fed from the reel past a succession of operating stations marked **20, 21.**

All of the operations which are performed upon the strip are performed automatically in the machine.

At station **20** a flat-diamond shaped aperture is stamped in the strip. Figure 7 shows a length of the strip having a succession of such apertures stamped in it, said apertures being marked **22** and the strip **23.**

At station **21** a series of successive operations are performed, as follows:

(1) The strip is cut along two lines marked **24, 25** in Figure 7 so as to form a blank of the shape shown in Figure 8.

(2) The blank (Figure 8) is bent to the U form in which it appears in Figure 9, Figure 9 being a view of the blank edge on, i. e. looking in a direction parallel to the direction of width of the blank. This operation and the preceding operation (1) are performed almost simultaneously and by one and the same tool assembly indicated diagrammatically in Figure 6 by the arrow **26,** which tool assembly co-operates with a stationary tool part **27** past which the strip **23** is fed in a succession of steps.

(3) The bent ends **28** of the stamping are further bent in the direction towards one another to the position in which they appear in Figure 10, i. e. to a position in which they are at an angle of substantially less than 90° to the center portion **29** of the stamping. Usually this angle is in the neighbourhood of 70°, although it may be any other necessary angle according to the shape and dimensions of the container and its lid with which the clip is to be used. This operation is performed by two further tool assemblies indicated diagrammatically in Figure 6 by the arrows **30, 31,** these tool assemblies **30, 31** operating simultaneously upon the stamping in respectively opposite directions and co-operating as in the case of the tool assembly **26** with the stationary tool part **27** of the machine.

(4) Immediately afterwards the outer extremities **32** of the bent ends **28** of the stamping are curled over to the form in which they appear in Figure 11. Such curling over is produced by a fourth tool assembly indicated diagrammatically in Figure 6 by the arrow **33,** which also cooperates with the stationary tool part **27.**

(5) The stamping is now slid down the stationary tool part **27** to a lowered position thereon.

(6) At this lowered position an hour-glass shaped portion of the stamping, located at the centre of length thereof and shown in hatched lines in Figure 12, is stamped out of the stamping so as to part the latter into two identical halves, shown respectively at **34** and **35** in Figure 13. This operation is performed by two complementary cutting tools, one a female tool and the other a male tool, indicated in Figure 6 by the arrows **36** and **37.**

(7) The parted stamping halves **34, 35** are now ejected from the machine.

Each of the said stamping halves **34, 35** is of the shape already described with reference to Figures 1, 3, 4 and 5 and it remains to perform the final step in the manufacture of the clip, which consists in tempering the bent stamping to a desired degree of hardness to render permanent the bent shape of the stamping and at the same time impart the necessary resilience thereto to enable it to be sprung to the lid securing position in which it appears in Figure 1, or as the case may be, Figure 2. Such tempering is performed by heat treatment of the bent stamping in an oven maintained at the requisite temperature.

What we claim as our invention and desire to secure by Letters Patent of the United States is:

1. A resilient spring steel snap-on clip for securing a dished lid to a container of the type having a top peripheral seam, said clip having a substantially straight main body portion, a crook-shaped portion at one end of said body portion, and a tail portion at the other end defining with said body portion an included angle of somewhat less than 90°, said tail portion being essentially flat from end-to-end, said crook-shaped portion and said straight main portion being bifurcated to a point adjacent the base of said tail portion, whereby when in operative securing position said crook-shaped portion contacts the side wall of the container immediately below said seam at at least two points and said tail portion projects downwardly within the lid and fits snugly against the inner surface of the side wall of the dished lid.

2. A resilient spring steel snap-on clip for securing to a container of the type having a top peripheral seam a lid having an upstanding generally cylindrical rim, said clip being generally C-shaped in side elevation with one end in the form of a straight tail which defines with the upright portion of the C an included angle of less than 90°, the other end and said upright portion being notched to a point adjacent the base of the straight end,

whereby when in operative position said notched end contacts the side wall of the container immediately below said seam at at least two points, each of the two prongs defined by said notch being capable of independent movement relative to the other, and said straight end fits snugly against the inner surface of the cylindrical rim of the lid.

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