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W. J. WARDELL

2,220,135

METHOD OF MAKING SLIP-COVER OPENING DEVICES

Filed July 1, 1938

Fig 1

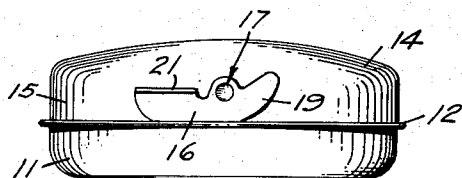


Fig 2

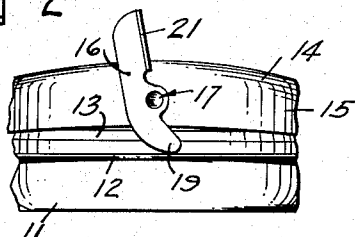


Fig 3

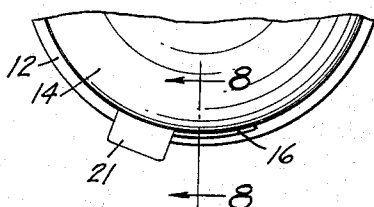


Fig 4

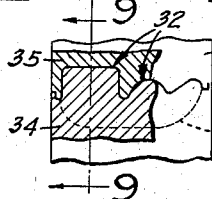


Fig 9

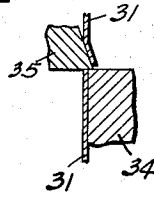


Fig 7

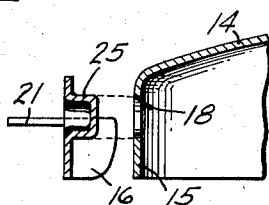


Fig 5

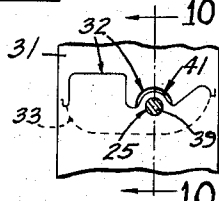


Fig 10

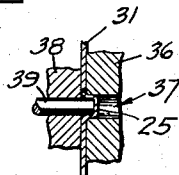


Fig 12

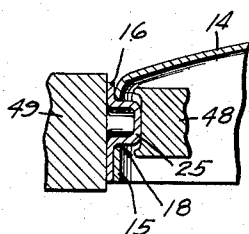


Fig 6

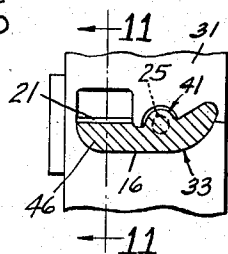


Fig 11

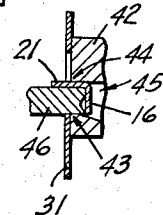
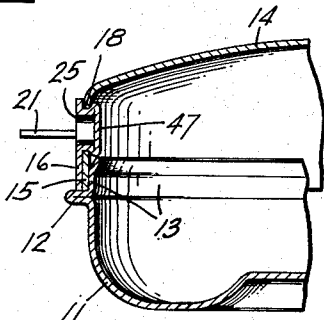


Fig 8



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METHOD OF MAKING SLIP-COVER OPEN-
ING DEVICES

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3 Claims. (Cl. 113—121)

The present invention relates to lever opening containers of the slip-cover type and is embodied in its preferred form in a shoe polish box of the usual construction, the invention having particular reference to a method of producing a special form of opening device for such containers.

Lever opening devices have been utilized for opening shoe polish boxes in which the opening device has been pivotally connected to either the body or the cover of such a box and by turning the opener on its pivotal connection the body and cover are separated and the box is opened. In some forms of pivotal connection for the opener a separate rivet has been used on which the opener pivots, while in still other forms such, for example, as in the Hothersall Patent 1,154,020, a struck-up stud is formed as an integral part of the opening device. This stud is inserted into an opening in a box wall to provide the pivot on which the opener operates when shifted to separate the box parts.

In the Hothersall patent referred to the struck-up portion of the lever is located centrally of the lever body and in drawing this struck-up portion the metal surrounding and entering into the same is stretched and pulled more or less severely as increased metal must be drawn into a more confined space to provide the desired pivotal part. This pulling of the metal, where steel or the usual tin plate is used, often results in a crystallization of the metal. Again the stretching at this confined space is so severe that often times the metal part entering into the stud is fractured.

Furthermore, the end of the stud must be later upset as the usual enlarged head is formed on the inside of the box. This means that the same stretched and at least partially crystallized metal area is subjected to a further bending and stretching. The result is that too great a percentage of cracks occur in the manufacture of such a box.

The present invention is particularly concerned with the formation of a struck-up stud in a lever opening device and with the container having such a device, the principal feature being that the opening device is not stretched and its metal is not crystallized, in short, it is an opening device which can be made satisfactorily from ordinary tin plate, this being the logical material from which polish boxes are produced. An important feature is the location of the struck-up stud of the opening device so closely adjacent to an edge instead of being spaced inside of its

boundary that the required stock of metal is easily obtained.

An object of the invention, therefore, is the provision of a method of producing an opening device of the lever type for a shoe polish box or similar container, the device having a struck-up stud section so located relative to its edge that the metal during manufacture flows without undue stretching and without crystallization, producing an opening device which is easily assembled for rocking movement with a part of the container and which functions to separate the container parts in opening when moved on the stud section as a pivotal element.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing:

Figure 1 is a front elevation of a shoe polish box and its opening device produced by the method steps embodying the present invention;

Fig. 2 is a view similar to Fig. 1 with parts broken away illustrating the opening device in position for separating the container parts;

Fig. 3 is a fragmentary plan view of the box illustrated in Fig. 1;

Fig. 4 is a schematic sectional view showing fragments of suitable blanking dies operating on a strip of metal from which the opening device is formed, the view illustrating the first or partial blanking of the opening lever, one side edge of the lever being cut at that time;

Fig. 5 is a view similar to Fig. 4 illustrating a further step in the formation of the opening lever, this view showing the struck-up stud section completely formed and illustrating the results of movement of the adjacent boundary edge to allow for the extra metal needed in the stud;

Fig. 6 is a face view of the completed opening lever after the remainder of its side edge has been struck out of the metal and also a sectional view through suitable dies for performing the operation, the view also showing a finger piece bent at an angle to the plane of the lever;

Fig. 7 is a composite cross section construction detail illustrating a portion of the container cover and showing the opening lever in position relative to the cover and prior to assembling therewith, the composite view being drawn to a slightly larger scale than the scale of the other figures already described;

Fig. 8 is a cross sectional view of the com-

pletely formed opening device showing it pivotally connected to the cover member, the latter being in closing position on the container body, said view being taken on line 8—8 of Fig. 3 but on a somewhat larger scale; and

Figs. 9, 10, 11 and 12 are fragmentary transverse sectional views of suitable die mechanism utilized in carrying out the steps of the instant method invention, the views being taken substantially along the lines 9—9, 10—10, 11—11 in the respective Figs. 4, 5 and 6, the die members in Fig. 12 being shown in relative position to the assembled container parts shown in Fig. 7.

As a preferred embodiment of the invention the drawing illustrates one form of container which may be used with the opening device produced by the various method steps of the invention. The container includes a body or box 11 of the conventional form used for the packaging of shoe polish, this box being provided with a flattened peripheral bead 12 (Figs. 1 and 8). The box has the usual upstanding friction seat wall 13 for the reception of a cover member 14 of the slip-cover type, this cover member having a side wall section 15 which is adapted to frictionally engage around the wall part 13 of the box. When in the position illustrated in Figs. 1 and 8 the box is closed, the bottom edge of the cover wall 15 at such time resting upon the upper surface of the flattened bead 12.

An opening device or lever 16 is provided for separating the cover 14 and body 11 to open the container and this opening device is pivotally seated at 17 into an opening 18 cut through the cover wall 15. By turning the opening device a cam part 19 thereof is caused to bear against the bead 12 of the body and to press body and cover apart.

A finger piece 21 is also formed as an integral part of the opening device and is bent at substantially right angles to the major portion of the device. This provides for easy application of the necessary force to turn the opening device on its pivotal connection 17 to open the box. Fig. 2 illustrates such an open position.

To provide the pivotal connection for the opening device a struck-up stud 25 (Fig. 7) is formed and is located adjacent one edge of the device. This stud is preferably formed from an ear-like projection at a side of the lever. The opening device is formed in steps which are graphically illustrated in Figs. 4, 5, 6, 9, 10 and 11 and just that part of a forming operation is used at each step to prevent undue stretching of the metal as will become evident as the description proceeds.

A strip 31 of tin plate or other suitable sheet material is first subjected to a suitable die cutting operation (Fig. 4) and a scroll outline 32 is cut into the metal, this action forming an outer edge of one side of the opening device. The dotted line 33 in this figure indicates the remaining outline or other side of the device but this is not cut or blanked until after an intermediate operation takes place.

Cutting of the outline 32 may be effected in any suitable manner, as for example, by cooperating die and punch members 34, 35 (Fig. 9).

The partially severed strip 31 is next subjected to a forming operation in which the stud 25 is produced. As illustrated in Figs. 5 and 10 the drawing or forming of the stud pulls in sufficient material to produce the cylindrical structure of the stud illustrated in Fig. 7. The excess metal required is gathered in with a minimum of stretching of the adjacent parts of the strip 31

as this metal excess comes from a part adjacent the scroll edge 32.

This drawing of the metal into the stud 25 is preferably done in a die mechanism which includes a stationary die 36 having a die recess 37 and a movable holding block 38 which carries a drawing punch 39. The block first moves down against the strip 31 thereby holding it against the die 36 and then the punch descends on the strip forcing the metal into the die recess and thereby forming the stud 25.

A modified edge results after this drawing operation, its new outline being indicated by the numeral 41 in Fig. 5. It will be observed that the changed contour of this new outline is smaller leaving an open space between the boundary edges 32 and 41. In other words, the required metal has been obtained by crowding in a metal excess instead of stretching an adjacent part into a thinner piece as is usually done in a drawing action.

The partially formed and severed strip 31 is then subjected to a third combined forming and cutting operation at which time the opening device 16 is entirely removed from the strip 31. Its outline is now included in the lines 32, 33, 41 best indicated in Fig. 6. During the same severing operation the finger piece 21 is bent at right angles to the body of the opening device.

This severing of the opening device and bending of its finger piece 21 into place is preferably accomplished in a combined cutting and bending die mechanism illustrated in Fig. 11. The mechanism includes a stationary die 42 having a cutting edge 43 and a bending edge 44 adjacent a die recess 45. A movable punch 46 cooperates with the die in severing the opening device from the strip 31 while it simultaneously wipes the finger piece 21 against the bending edge 44 of the die and thereby brings it into proper position.

In assembling opening device and cover these are brought into the relative position illustrated in Fig. 7. The struck-up stud 25 is aligned with the opening 18 in the wall 15 of the cover 14 and then the stud is pushed into the opening 18 as the assembling proceeds. The body of the opening device is brought against the outer wall of the cover. The assembled cover and opening device are then subjected to a suitable die action which upsets or flattens the inner end of the struck-up stud and produces an enlarged head 47 (Fig. 8). At the same time the flat body part of the opening device is slightly curved to conform to the cylindrical wall of the cover as best shown in Fig. 3.

Upsetting or heading of the stud may be effected in any suitable manner, as by cooperating punch and anvil members 48, 49 (Fig. 12) which may be a part of a suitable die mechanism. The upsetting takes place when the punch and anvil members 48, 49 are moved closer together. This completes the method steps utilized in producing the finished opening device 16 and in movably attaching it to the box part.

By moving the opening device on its pivotal connection 17 the cam part 19 is caused to ride on the flattened bead 12 of the box body and this separates the cover and body as illustrated in Fig. 2. The opening 18 which is cut through the cover wall is closed by the opening device. The cylindrical part of the stud 25 is a snug fit substantially filling the opening, the enlarged head 47 extends beyond the edges of the opening and covers it from the inside and the flat body part of the device covers the opening on the outside.

By reason of the forming of the pivotal parts in the operations just described in connection with Figs. 4, 5, 6, 9, 10, 11 and 12 the metal entering into those parts which are altered in form is not unduly stretched or crystallized there being ample free flowing metal undergoing a shape change. Accordingly no crack or opening is produced in the opening device and its manner of assembling insures it being movable within its seat while it substantially closes the pivotal opening of the cover.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the steps of the process described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the process hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. The process of forming a sheet metal pry-off opening device for a container having a slip-cover member frictionally engaging the wall of a body member thereof, which consists in slitting a side boundary line of said opening device in a strip of metal, forming a struck-up stud section providing a pivot portion adjacent said slit boundary line while drawing inwardly the metal from the slit side with a minimum of stretching and insuring free flowing of the metal while avoiding undue crystallization, and then completing the severance of the opening device from said strip by cutting across between the ends of said slit portion.

2. The process of forming a sheet metal pry-

off opening device for a container having a slip-cover member frictionally engaging the wall of a body member thereof, which consists in drawing inwardly the metal of a strip adjacent and from a free edge thereof to form a rivet stud and to insure free flowing of the metal while avoiding undue stretching and crystallization during the formation of said stud, said rivet stud providing a pivot for the opening device, and then completely severing said opening device from said strip by cutting across between spaced portions of the free edge of said strip on opposite sides of the rivet stud.

3. The process of forming a metal pry-off opening device for a container having a slip-cover member frictionally engaging the body wall member thereof preparatory to assembling said device on an apertured wall of a said container member, which consists in first slitting a metal strip to form a side boundary partially defining said opening device, then forming a struck-up stud section in the metal of the strip located adjacent said slit boundary by drawing inwardly the metal of the strip from the slit side thereof to insure free flowing of the metal while avoiding undue stretching and crystallization thereof, said stud providing a pivot for the opening device, then completing the severance of the opening device from the metal strip by cutting through the remainder of the metal defining said device including said stud between the ends of the side boundary slit, whereby the opening device so formed may be movably attached to said apertured wall of a said container member by reshaping said stud after its insertion in said aperture.

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