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BOX

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5 Claims. (Cl. 220—97)

My invention relates to boxes and particularly to boxes made from comparatively thin sheet metal such as tin plate, black iron and the like which are used as containers for shoe polish, waxes, ointments, etc. More particularly it relates to improvements in substantially air-tight boxes of the type disclosed in my copending applications Serial Nos. 431,361 and 480,861.

Boxes which are used as containers for shoe polish and other compositions having volatile constituents must be so designed as to maintain a substantially air-tight fit between the cover and the body of the container. The fact that such an air-tight fit is required makes it very difficult to remove the cover from a box of the ordinary type, and the boxes which have been heretofore extensively used for shoe polish are, for the most part, so designed that the cover can be pried off with a coin or by means of a lever which is pivotally secured to the box. In my copending applications aforesaid I have disclosed boxes having tight fitting covers which can easily be removed merely by pressure exerted on a certain marginal zone thereof either by the foot or by the hand. These boxes function satisfactorily but a rather unexpected difficulty has been encountered in the shipment thereof. The boxes are usually packed in cartons holding one dozen (3 rows, 4 high) and then, depending upon how many are ordered, anywhere from 2 to 12 cartons are packed in a shipping case. Such cases are evidently thrown around considerably in transit and, because the bottom of one box rests upon the cover of the box next below, and particularly on the marginal portions thereof where applied pressure will effect an unseating of the cover, it frequently happens that the covers on the boxes in the bottom of the carton are thus unseated by the weight of the boxes above. Another difficulty arises from the slight resistance to deformation which is offered by boxes having a flat top of thin metal. Consumers, instead of applying pressure to the extreme edge of the cover where it is most effective, often apply this pressure, or a substantial portion of it, to a zone between the edge and the center of the cover with the result that the top of the cover is dented or bent inwardly and thereafter is difficult to remove.

One of the principal objects of my present invention is to provide a box of the character described above but of such a design that it may be shipped without danger of the covers of any of the boxes becoming dislodged from the containers by reason of pressure transmitted to the marginal portions of the cover by the weight of other boxes

stacked thereon. Another object is to provide a box of this character but of such design that it, and particularly the cover element thereof, is highly resistant to deformation under pressure applied to effect an unseating of the cover. Another object is to provide a box of this type but of such design that when pressure is applied to a marginal portion of the cover in order to unseat the same such pressure will automatically be concentrated in large part at the extreme edge of the cover where it is most effective and where it can be made highly resistant to deformation.

I accomplish these and other objects which will be apparent as the description proceeds by means of the novel elements and combinations and arrangements thereof described below and illustrated in the accompanying drawing in which

Fig. 1, in the upper half, is a fragmentary top plan view of the cover of my box and, in the lower half, is a fragmentary top plan view of the container portion thereof; and

Fig. 2 is a section of Fig. 1 in the plane 2—2 showing, in section, a fragmentary portion of another box on the cover of which the box shown in full section rests.

Referring to the drawing 1 is the cover element and 2 the container element. At the top, the container element is provided with an outwardly expanded portion 3 which projects somewhat beyond the peripheral portions of the container therebelow. Within this expanded portion and projecting outwardly therefrom is a narrow continuous peripheral bead 4 which forms the contact for the cover. Since the cover must fit perfectly and tightly on the container element and yet be readily tiltable to effect the removal thereof it is a considerable advantage to have this comparatively narrow contact bead disposed in about the central zone of the expanded portion mentioned above. Thus, clearance between the cover and the container is provided both above and below the contact bead. Some variation in gauge of the sheet metal used in fabricating these boxes is frequently encountered and, where the contact is formed in the usual way, variations in metal gauge cannot be compensated for with the result that some boxes having loose fitting covers and others having tight fitting covers are produced by the same dies due to this variation in metal gauge. However by rolling instead of die-forming the contact bead it is a simple matter to adjust the rolls to compensate for any variation in stock gauge which may be encountered.

In order to stiffen the upper edge 5 of the container and thus enhance its resistance to de-

formation under laterally applied or vertically applied pressure, it is rolled over as shown. The bottom of the box is generally flat but it is substantially stiffened and made resistant to deforming stresses by striking down an annulus 6 in the central portion thereof. The bottom is also preferably struck down in a circular zone immediately adjacent the side walls to a level somewhat below the general level of the flat portions 7 so that the marginal portions of the bottom as well as the struck down annulus will rest upon or be very close to any flat surface upon which the box is placed.

The cover element comprises a substantially cylindrical skirt portion 9 having an inside diameter adapting it closely and frictionally to engage the contact bead 4. To provide high resistance to deformation under laterally applied forces an outstanding peripheral flange 10 having its outer edge rolled inwardly as shown at 11 is provided around the bottom of the skirt. The skirt is also provided with substantially diametrically-opposed, struck-in portions 12 which form trunnions resting upon the top edge of the container when the cover is seated thereon. A third struck-in portion 13 is also preferably provided intermediate the struck-in portions 12 which also rests upon the top edge of the container when the cover is in place and serves to insure its being squarely seated on the container.

To enhance its resistance to deformation, the top 14 of the cover is arched, preferably as shown, with the central portion thereof substantially above the marginal portions, and is further stiffened or reinforced against deformation by downward pressure thereon by striking up the central portion thereof as shown at 15. This central portion is flat on top, circular in outline, and may conveniently be made of a diameter adapting it to be nested within the struck-down annulus in the bottom of the container portion. The zone 16 of the cover, between the struck-up portion 15 and the extreme marginal portions, is frustoconical in form. It will be noted, that the marginal zone 17 of this conical portion which is adjacent the skirt is somewhat lower than the top of the skirt and is connected to the top of the skirt by a torus-like transition surface 18. Thus, when downward pressure is applied at the point indicated by the arrow A the skirt portion of the cover in the zone of pressure will be forced further downwardly over the contact bead 4, the trunnions 12 will roll on the top edge of the container, and the cover will be tilted upwardly into the position shown in dotted outline 1' and unseated from the container. The torus-like transition surface serves further to stiffen the cover in the zone where pressure must be applied to effect an unseating thereof and, because the top of this transition surface is somewhat above the immediately adjacent portions of the cover, pressure applied to the cover by squeezing the box in the hand or by placing the box on the floor and pressing the edge with the foot will be largely, if not entirely, concentrated at the extreme edge of the cover and directly over the skirt where it is most effective.

In shipping, as described above, the boxes are set one upon the other and the bottom reinforcement on each box cooperates with the reinforcement on the cover of the box next below so that the boxes are thus partially nested together. The marginal portions of the upper box are substantially spaced from the marginal portion of the cover on the box next below and thus, there is no

pressure on the cover of the box below tending to unseat the same. In addition to functioning as a reinforcing means and also as a means for preventing the unseating of the covers in shipment, those portions of the covers and containers which cooperate to permit a plurality of boxes to be partially nested together make it very easy to stack the boxes in perfectly straight, stable columns for storage or display purposes.

What I claim is:

1. A substantially cylindrical metal box of the character described comprising a container element, and a cover element therefor provided with circumferentially-spaced struck-in portions forming trunnions adapted to rest on the top edge of said container element when said cover is seated thereon, whereby pressure on the edge of said cover in a zone between said struck-in portion will cause said cover to tilt on said trunnions and effect an unseating thereof; said cover element having the central zone of the top thereof raised substantially above the edge zones thereof, and the bottom of said container element being provided with a centrally disposed recess adapted to receive the raised portion of said cover; the height of said raised portion of the cover above the edge of said cover and the depth of said recess being such that when one box is stacked on another the edge portions of said boxes are out of contact; whereby, in shipping, a plurality of said boxes may be partially nested in a stack with the bottom of each box spaced from the edge portions of the cover of the box next below to prevent cover-unseating pressure on the lower box.

2. A substantially cylindrical box of the character described comprising a container element, and a cover element therefor provided with circumferentially-spaced, struck-in portions forming trunnions adapted to rest on the top edge of said container element when said cover is seated thereon; whereby pressure on the edge of said cover in a zone between said struck-in portions will cause said cover to tilt on said trunnions and effect an unseating thereof; said cover element having an arched top with the central portion thereof substantially above the edge portion, and said container element having a generally flat bottom but having the central portion remote from the edge portion thereof substantially complementary to the central portion of said cover element whereby, in shipping, a plurality of said boxes may be partially nested in a stack with the bottom rim portions of each box spaced from the rim portions of the cover of the box next below to prevent cover-unseating pressure on the lower box.

3. A substantially cylindrical metal box formed of comparatively thin sheet metal but characterized by its resistance to deformation and comprising a container element and a cover element tightly seated on said container; the periphery of said container adjacent the top thereof being outwardly expanded and projecting substantially beyond the adjacent peripheral portions therebelow; a comparatively narrow, continuous, peripheral bead within and outwardly projecting from said expanded portion; and the bottom of said container being generally flat but provided in the central portion thereof with a struck-down annulus adapted to stiffen said bottom; and said cover comprising a substantially cylindrical skirt portion of an inside diameter adapting it closely to engage the peripheral bead on said container, an outstanding peripheral flange on said skirt adapted to stiffen said cover

against laterally-applied deforming stress, and substantially diametrically opposed struck-in portions forming trunnions adapted to rest upon the rim of said container when said cover is seated thereon; whereby downward pressure on the marginal zone of said cover between said trunnions will effect a tilting and an unseating of said cover; the top of said cover being arched with the central portion thereof substantially above the portions adjacent said skirt and provided with a struck-up central reenforcing portion adapted to be nested within the struck-down annulus in the bottom of the container element; whereby, a plurality of said boxes may be partially nested together with their marginal portions out of contact with each other.

4. A substantially cylindrical box of the character described comprising a container and a cover therefor; said container, adjacent the top thereof, being provided with an outwardly-expanded, continuous, peripheral zone projecting beyond the adjacent peripheral portions therebelow and having a comparatively narrow, continuous, peripheral bead within and outwardly projecting beyond said expanded zone and forming the contact with the cover; said cover comprising a substantially cylindrical skirt portion of an inside diameter adapting it tightly and tangentially to engage the peripheral bead on said container, an outstanding peripheral flange on the bottom of said skirt adapted to stiffen said cover against laterally-applied, deforming stress, and substantially diametrically-opposed, struck-in portions in said skirt forming trunnions adapted to rest upon the rim of said container when said cover is seated thereon; whereby downward pressure on the marginal zone of said cover between said trunnions will effect a tilting and unseating of said cover; the top of said cover being arched with the central portion thereof substantially above the portions adjacent said skirt, whereby said cover is stiffened against

downwardly applied deforming stresses; and the bottom of said container being provided with a recess of a depth and configuration adapting the central portion of said arched cover top to be nested therein with the top edge of said cover in spaced relation to the bottom edge of said container; whereby cover-unseating pressure on said boxes is avoided when said boxes are shipped partially nested together in stacks.

5. A substantially cylindrical box of the character described comprising a container and a cover therefor; said container, adjacent the top thereof, being provided with an outwardly-expanded, continuous, peripheral zone projecting beyond the adjacent peripheral portions therebelow and forming the contact with the cover; said cover comprising a substantially cylindrical skirt portion of an inside diameter adapting it tightly and tangentially to engage said contact, an outstanding peripheral flange on the bottom of said skirt adapted to stiffen said cover against laterally-applied, deforming stress, and substantially diametrically-opposed, struck-in portions in said skirt forming trunnions adapted to rest upon the rim of said container when said cover is seated thereon; whereby downward pressure on the marginal zone of said cover between said trunnions will effect a tilting and unseating of said cover; the top of said cover being arched with the central portion thereof substantially above the portions adjacent said skirt, whereby said cover is stiffened against downwardly applied deforming stresses; and the bottom of said container being provided with a recess of a depth and configuration adapting the central portion of said arched cover top to be nested therein with the top edge of said cover in spaced relation to the bottom edge of said container; whereby cover-unseating pressure on said boxes is avoided when said boxes are shipped partially nested together in stacks.

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