

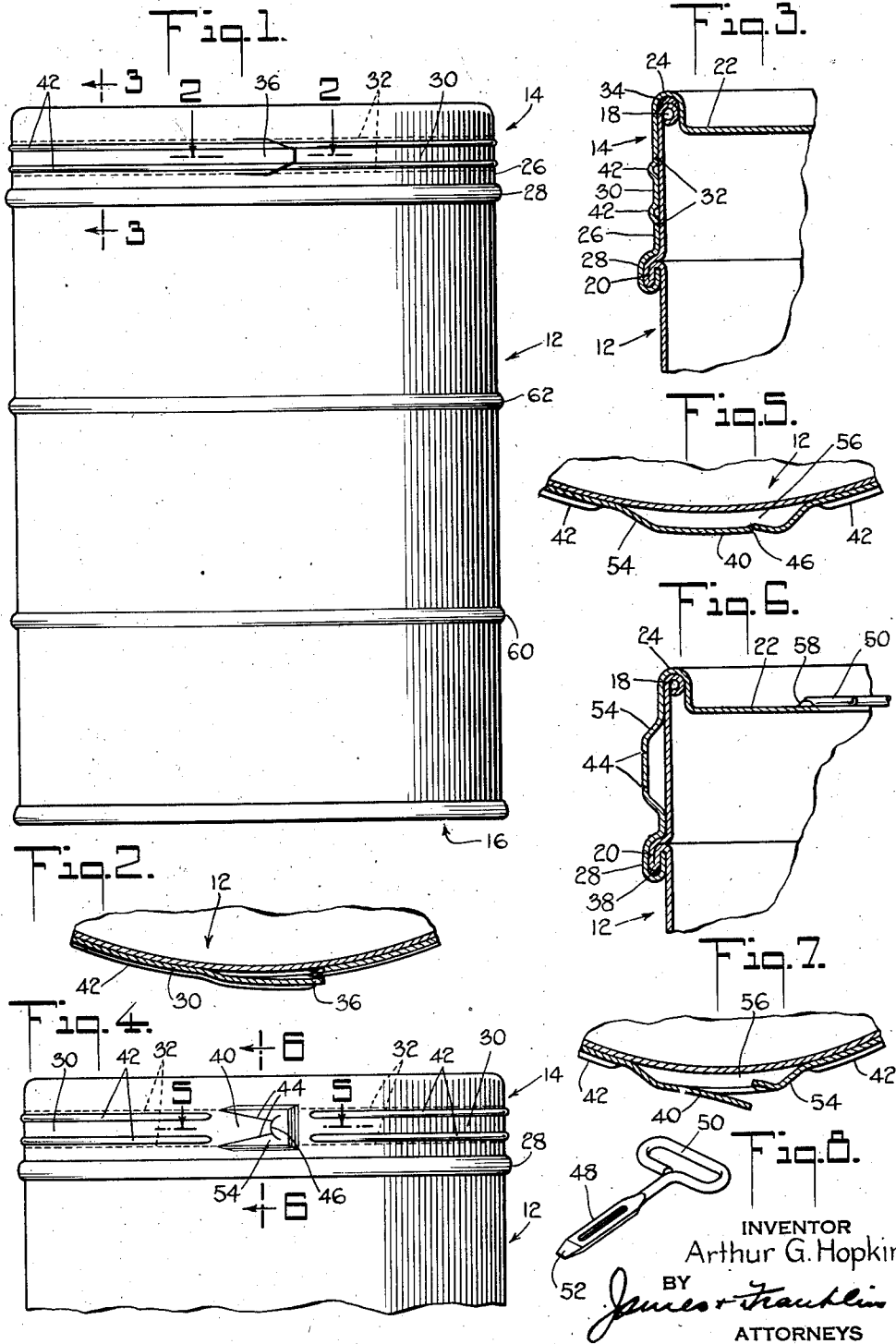
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SHEET METAL CAN AND RIP STRIP THEREFOR

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SHEET METAL CAN AND RIP STRIP
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3 Claims. (Cl. 220—54)

This invention relates to metallic receptacles, and more particularly to sheet metal cans provided with a rip strip or tearing strip for opening the same.

Many kinds of metallic containers are known which are provided with a rip strip, ordinarily defined by a pair of score lines, for opening the container. Considerable difficulty is experienced by reason of the rip strip tearing transversely across its width, thereby preventing further opening of the can. This difficulty frequently arises regardless of the nature of the can construction and may be caused, for example, by hasty or uneven manipulation of the key used to roll up the rip strip, or by imperfections in the score lines defining the rip strip, or by flaws in the metal. The difficulty is particularly common in containers having the rip strip located on a wall which is drawn up from a flat piece of metal, because in such case the drawing operation tends to cause a seaming or graining of the metal which extends transversely of the rip strip and weakens and predisposes the rip strip toward this undesirable cross tearing.

One primary object of the present invention is to overcome this difficulty and to strengthen and reinforce the rip strip against cross tearing, and further to provide means acting as a guide or track for insuring smooth and even rolling up of the rip strip, and to further insure that the severed edges left after rolling up the rip strip will be smooth and continuous rather than ragged and dangerous.

For rolling up the rip strip it customarily is provided with a tab which is raised from the surface of the container and adapted to be received by an appropriate key for rolling up the rip strip. Where the tab need not be sealed, its provision is a relatively simple matter for it is only necessary to strike up from the surface of the container wall an appropriately shaped tab of metal. Where, however, the package must be sealed against leakage at the tab, considerable difficulty and expense are occasioned, for it then is necessary to slit the container wall and insert a tab and solder the same in place, or to solder or weld a tab on the outside of the container wall. A further and important object of the present invention resides in the provision of a solderless sealed tab which will not necessitate the insertion or addition of metal other than the normal continuous container wall; and further to provide an appropriate key for the utilization of such an improved tab.

Still another object of the present invention

resides in the application of either or both of the foregoing features of invention to a particularly desirable form of double closure can of the general type disclosed and claimed in my copending application Ser. No. 463,411, filed June 24, 1930 for "Sheet metal can". This can is desirable in type because when the tearing strip is removed there is left a slip cover adapted for use with the can until the contents have been consumed, and at the same time the can is not reduced in height, and the interior surface or wall of the can is formed of a continuous, smooth, and uninterrupted single piece of metal. Still another object of the present invention as applied to such a double closure can is to so seal the can that the slip cover remaining after removal of the rip strip will fit the container with a snug and sealing fit so that the can will be nearly if not perfectly air-tight for the protection of the remaining contents of the can after some of the contents have been removed.

In consequence of the various foregoing and other features of the present invention which will subsequently appear, it is possible to produce within the present vacuum container a vacuum far higher than any heretofore employed for metal package or metal can purposes. In fact the vacuum producible and maintainable by the sealing methods used is so high that the can is apt to be collapsed inwardly by the surrounding air pressure; and it is still another object of the present invention to guard against this possibility and to so improve the can construction that it will be greatly stiffened and strongly resistant to collapse under high vacuum.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the sheet metal can elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by a drawing in which:

Fig. 1 is a front elevation of one form of double closure metal can embodying features of my invention;

Fig. 2 is a horizontal section through the tab, and is taken in the plane of the line 2—2 in Fig. 1;

Fig. 3 is a vertical section through the upper portion of the can, and is taken in the plane of the line 3—3 in Fig. 1;

Fig. 4 is a side elevation of the upper portion of a modified form of double closure can employing my novel solderless sealed tab;

Fig. 5 is a horizontal section through the tab, and is taken in the plane of the line 5—5 in Fig. 4;

Fig. 6 is a vertical section through the tab, and is taken in the plane of the line 6—6 in Fig. 4;

Fig. 7 is a section similar to Fig. 5, showing the condition of the tab after it has been pried open; and

Fig. 8 is a perspective view of a key specially modified and adapted for use with my solderless sealed tab.

A number of features of the present invention, such as my improved rip strip and my improved solderless sealed tab, are applicable to innumerable forms of metal container, but for purposes of illustration are here shown applied to an improved form of double closure can two modifications of which are illustrated in the accompanying drawing. Referring to the said drawing, the can selected by way of illustration comprises a generally cylindrical can body 12 which is preferably made of a single continuous piece of metal. The can is further provided with an exterior one-piece top 14 and a conventional bottom 16, the latter preferably being applied after the can has been filled and subjected to a vacuum, all in the usual manner.

The cylindrical can body 12 is provided with a rolled top edge 18 and an intermediate circumferentially projecting bead 20, while the cover 14 may be and preferably is dished, as is indicated in Figs. 3 and 6, to form a cover wall 22 and a marginal groove 24 adapted to mate with and fit over the rolled upper edge 18 of the can. The cover 14 further comprises a depending side wall 26 and a flanged bottom edge 28 which overlies and mates with the peripheral bead 20 of the can body, the bottom edge 28 and bead 20 preferably being not only rolled together into a permanent lock seam joint, but also being rolled downwardly, as is clearly indicated in Fig. 3, in order to force the marginal groove 24 of the cover into close and sealing engagement with the rolled edge 18 of the can body. A rip strip 30 is provided on the depending wall 26 of the top 14, said rip strip being defined by a pair of score lines 32 extending peripherally around the wall. It will be evident that upon rolling up and removing the rip strip 30, the upper portion of the top 14 may then be removed and used as a slip cover in association with the can body; and it will further be evident that this slip cover will fit snugly on the rolled upper edge 18 of the can body. There is no decrease in height of the can, and the interior of the can is formed of a smooth and continuous single piece of metal.

The seal at the top of the can between the rolled edge 18 and the groove 24 may, if desired, be made the only and primary seal for the top of the can, in which case a sealing liquid or paste may be applied in the groove 24, as is indicated at 34 in Fig. 3. In such case it is not necessary for the tab 36 of the rip strip to be sealed, and a simple outwardly struck tab such as is illustrated in Figs. 1 and 2 may be employed. What is even more important, however, is the fact that the sealing compound, particularly if of the elastic rubber-like type now frequently employed, may be relied upon to help beneficially seal the container during its subsequent use after it has been opened by removal of the rip strip 30, that is, the sealing material 34 remains in the groove 24 and acts as a washer or gasket for helping make the joint between the slip cover and the can body an airtight one.

It will be understood, however, that if desired the permanent vacuum seal of the container may be made at the rolled lock seam joint 20, 28, and in such case sealing fluid or paste may be applied at that joint, if desired, and such a construction is illustrated in the modified form of container of Figs. 4-7, the presence of the sealing compound at the lock seam joint 20, 28 being clearly evident at 38 in Fig. 6. With this construction, it is evident that an open tab such as the tab 36 should not be employed, but rather a sealed tab, and in such case I prefer to use a novel form of solderless sealed tab such as the tab 40 shown in Fig. 4. It will further be appreciated that if desired sealing fluid or compound may be applied both in the groove 24 and in the lock seam joint 20, 28, in which case a double seal will be provided to guard against leakage before the container is first opened, while an improved seal will be maintained by the slip cover during its normal use after the container has been opened.

Considerable difficulty arises due to failure or cross tearing of a rip strip regardless of the type of package on which it is used and particularly when used on a wall of metal which has been drawn in a direction transverse to the rip strip, as is here exemplified by the depending wall 26 of the top 14, which is drawn in a direction normal to the longitudinal direction of the rip strip 30. I have found that this long-existent difficulty with rip strips may be remarkably effectually overcome by the simple expedient of providing the rip strip with one or more and preferably two beads or channels 42 which greatly stiffen and strengthen the rip strip by reason of the channel effect created thereby, and which act as guides or tracks when rolling up the rip strip, and thereby cause the rip strip to roll up in a straight and even manner. These beads 42 are preferably struck outwardly from the rip strip 30 and preferably extend parallel to and within but adjacent to the score lines 32. This location of the strengthening beads is apparently the most favorable one, although I have found that considerable variation in location may be made without losing the beneficial effect of such beads in the way of strengthening the rip strip against cross tearing. Each of the beads acts as a definite interruption to any transverse tearing stress such as might be caused by uneven manipulation of the key, or by reason of graining of the metal due to the drawing operation. Furthermore, these beads stiffen the rip strip and strengthen it in various directions, and seem to act as a guide for insuring a smooth and accurate tearing of the rip strip at the score lines 32, as well as an even and regular rolling up of the rip strip on the winding key.

Another feature of the present invention resides in the provision of a solderless sealed tab such as is here exemplified in connection with the second form of container, that illustrated in Figs. 4-7. This tab is indicated at 40 and is formed simply by scoring the continuous wall of the metal container with a plurality of score lines 44 and 46 for outlining and defining the tab 40. Inasmuch as these score lines do not extend entirely through the metal, the tab is sealed against leakage. A key for winding up the rip strip is illustrated in Fig. 8 and is conventional in comprising a slotted stem 48 and a handle 50 for rotating the same, but differs from the conventional key in being provided with a chisel edge 52 properly dimensioned for use with the tab 40. It will be evident that by forcing the chisel edge 52 of the

key 50 into the incised or scored metal, particularly at the score line 46, the tab 40 may be pried open or outwardly from the can body, after which the end of the tab may be passed into the slotted portion 48 of the key and rolled about the key.

To facilitate prying open of the tab and subsequent rotation of the same, the tab 40 is preferably formed on an outwardly struck portion or bulge 54 formed on the side wall of the container. The protuberance 54 provides a space between the tab 40 and the inner wall or can body 12, so that the chisel edge of the key is readily forced inwardly at the score line 46, thereby exposing the end of the tab so that it may be lifted outwardly. It should also be noted that the score line 46 is preferably made arcuate and extends for a substantial distance beyond the outline of the tab itself, for this makes it possible to then force the metal within the arcuate score line 46 inwardly. Furthermore, the configuration of the metal at the score line 46 may be arranged with an inwardly bent portion, such as is indicated at 56 in Fig. 5, so that the chisel end of the key may be guided correctly against the portion 56 at the score line 46 when starting to open the can.

The key 50 is provided with the can and may be secured thereto by a drop of solder or other means. This is indicated by the portion of the key 50 visible in Figs. 3 and 6 showing the soldering of the key at the point 58 to the cover wall 22 of the can. To open the can, the key is lifted and thus freed and separated from the top of the can, after which the chisel end 52 is inserted in the recess 56 shown in Fig. 5, and forced inwardly. The metal at the point 56 then yields inwardly, as is shown in Fig. 7, after which the chisel end of the key passes directly underneath the tab 40 so that the latter is readily lifted or raised outwardly, as is also shown in Fig. 7. The tab is then passed through the key and the key rotated to roll up and remove the rip strip. The key and rip strip may then be discarded, the can thereafter being used as a simple slip cover can.

The type of seal obtainable with this metal can, particularly the seal indicated at 34 in Fig. 3 or at 38 in Fig. 6, is an excellent seal permitting evacuation of the container to a very high degree heretofore not attempted. The evacuation may be readily carried to a point resulting in collapse of the container; and to guard against this I stiffen the cylindrical wall of the container by the use of peripheral channels or beads. Thus, in Fig. 1, the container body 12 is provided with two intermediate outwardly struck channels or beads 60 and 62 which extend peripherally around the cylindrical container wall and stiffen the same against collapse. It should also be kept in mind that the container wall is very greatly stiffened and strengthened by the permanent lock seam 20, 28, for this is made up of a double thickness of metal, and the resulting seam thus acts to strengthen the container against collapse under vacuum. Furthermore, this rugged strengthening seam is of value even after the can has been opened because it serves to preserve and maintain the true circular configuration of the upper portion of the can which mates with the slip cover.

It is believed that the mode of constructing and using my improved metal can, and the several individual features thereof, as well as the many advantages thereof will be apparent from the foregoing detailed description. The improved rip strip is utilizable with any form of can having a rip strip, and serves to strengthen the rip strip to

prevent cross tearing; to stiffen the rip strip and to insure even continuous rolling of the same; as well as to obtain a smooth and clean severance or separation of the rip strip from the remaining metal. The solderless sealed tab makes possible the provision of a tab which is formed out of the continuous metal wall of the container, without slitting and inserting or adding additional pieces of metal, and without soldering, welding, or similar operations such as have heretofore been necessary when it was desired to provide a tab while at the same time sealing the container against leakage or air admission. The particular double closure can illustrated possesses numerous and manifest advantages many of which need not be outlined in detail, and some of which are common to the containers here shown and that disclosed in my prior application already referred to. However, in addition it should be noted that a secure seal may be obtained by the use of a sealing compound at the top edge of the container, thereby dispensing with the necessity for sealing the rip strip tab. Furthermore, the sealing compound remains in place and acts as a washer or gasket for insuring an excellent seal between the slip cover and the can during normal use of the can after it has been opened. If, however, it is preferred to obtain a vacuum seal at the lock seam joint between the edge of the top and the bead on the can body, such an arrangement also may be employed, and in that case it becomes necessary to seal the rip strip tab. For this purpose my new and improved solderless sealed tab is, of course, desirable. It will also be appreciated that sealing compound may be employed both at the top and intermediate joints of the container, thereby providing a double seal and a high vacuum protection. In any of the three cases the vacuum obtainable is so high as to tend to cause collapse of the container; and to guard against this the container may be additionally reinforced by one or more stiffening beads or channels. From the standpoint of the packer, no disadvantage or complication results because the can is manufactured with its top and without its bottom, and is filled in inverted condition and closed and sealed at the bottom by the ordinary machinery already used by the packer. The consumer, of course, is presented with a greatly improved package making the container desirable for continued use until completely emptied.

It will be apparent that while I have shown and described my invention in preferred forms, many changes and modifications may be made in the structures disclosed without departing from the spirit of the invention, defined in the following claims.

I claim:

1. A sheet metal container comprising a wall provided with a rip strip, said rip strip being defined by a pair of parallel score lines extending around the wall and further including means to prevent tearing, said means consisting solely of a plurality of outwardly struck simple smooth elongated continuous beads or channels extending around the wall in parallel relation to the score lines and within the said score lines.

2. A sheet metal container comprising a cylindrical wall provided with a rip strip, said rip strip being defined by a pair of parallel score lines extending around the cylindrical wall, and further including means to prevent tearing, said means consisting solely of a pair of outwardly struck simple smooth elongated continuous beads or channels extending around the wall in parallel

relation to the score lines and within and closely adjacent to the aforesaid score lines.

3. A double closure sheet metal vacuum can comprising a can body, a one-piece drawn can top consisting of a cover wall and a continuous depending side wall having its bottom edge sealed to the can body, the downwardly drawn depending wall of the can top being provided with a rip strip defined by a pair of parallel score lines ex-

tending peripherally around the wall, said rip strip further including a pair of outwardly struck simple smooth elongated continuous beads or channels extending along the rip strip in parallel relation to the score lines and within and closely adjacent to the aforesaid score lines in order to strengthen the rip strip against cross tearing.

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