May 29, 1956 J. J. PLASTINO 2,747,345

METHOD OF SEALING CANS

Filed Oct. 3, 1949 2 Sheets-Sheet 1

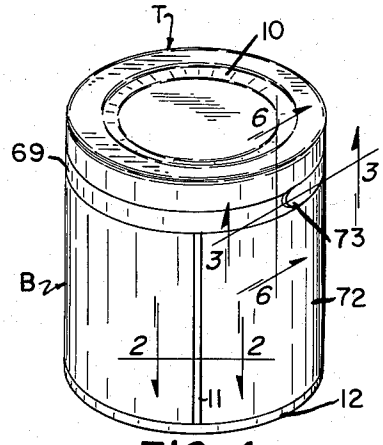


FIG. 1.

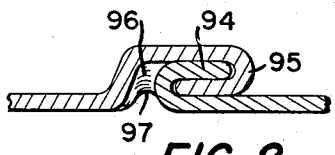


FIG. 2.

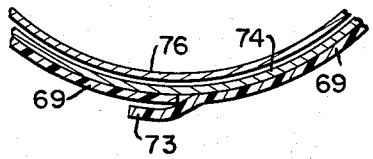


FIG. 3.

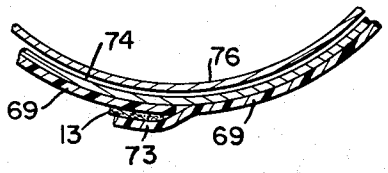


FIG. 4.

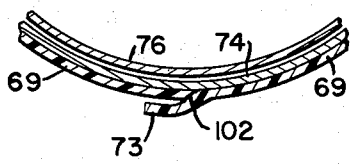


FIG. 5.

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METHOD OF SEALING CANS

Filed Oct. 3, 1949 2 Sheets-Sheet 2

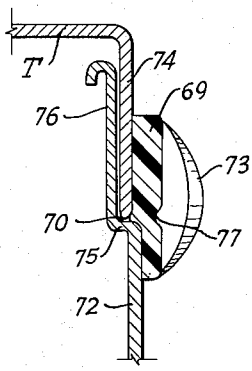


FIG.-6

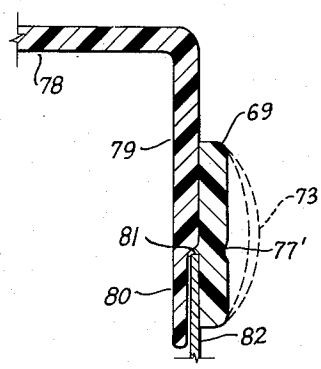


FIG.-7

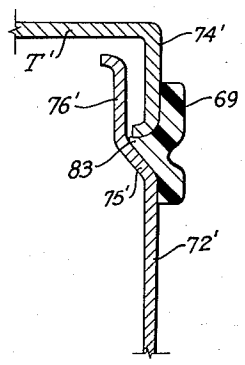


FIG.-8

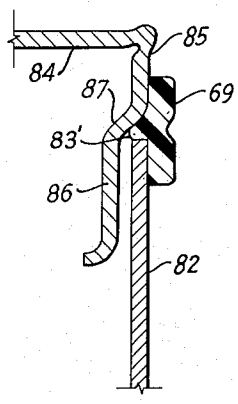


FIG.-9

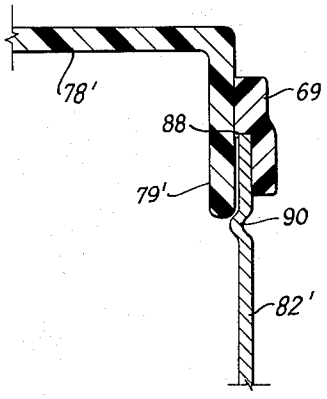


FIG.-10

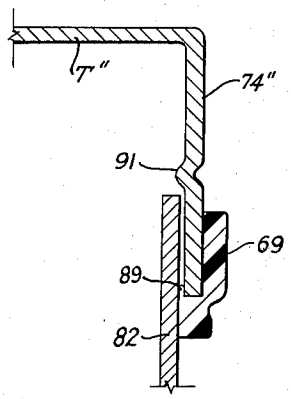


FIG.-11

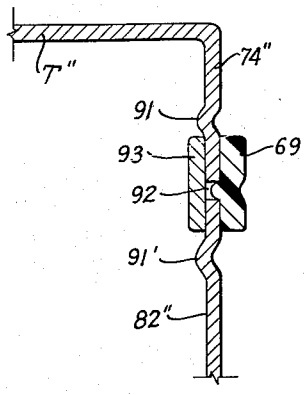


FIG.-12

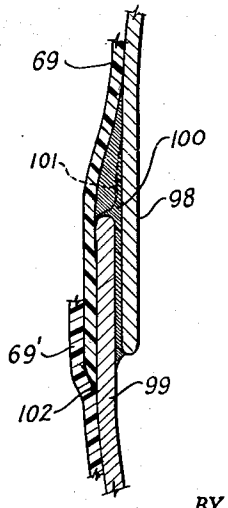


FIG.-14

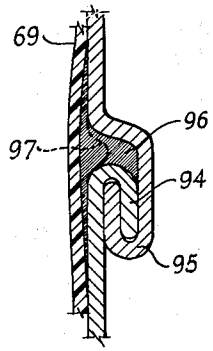


FIG.-13

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METHOD OF SEALING CANS

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Application October 3, 1949, Serial No. 119,363

8 Claims. (Cl. 53—17)

This invention relates to methods of sealing cans, and more particularly to seals for cans adapted to contain foodstuffs, although the can and seal produced by the method of this invention are adapted for use for other purposes. This application is a continuation-in-part of my application Serial No. 99,036, (now abandoned) filed June 14, 1949, entitled "Food Can." As used herein, the term "can" refers not only to cans made of metal, normally tin or galvanized steel or the like, but also to cans made in part of metal and in part or in whole of other materials, such as plastic.

Containers or cans for meats, coffee and similar materials, when made of metal, have been provided with a removable section formed by scoring or partially severing the metal along predetermined lines, so that a strip of metal can be removed by the use of a key. Other cans, comprising perhaps a majority of those in use, do not contain a scored or partly severed section and therefore must be opened by means of a can opener or cutting device adapted to sever a portion, such as the top, from the remainder of the can. Foodstuffs, such as jams, jellies and the like, have also been contained in glass jars having metal tops and a gasket of rubber or the like which is pressed onto the top of the jar. Of course, foodstuffs are also contained in the "Mason" type of jar, but these are usually utilized primarily for home canning purposes.

Among the objects of the present invention are to provide a novel method of producing a removable can seal; to provide such a method which produces a can seal which permits the can to be opened without the necessity of using a separate opener, such as a key or cutter; to provide such a method which is particularly adapted to be utilized for cans, the contents of which are vacuum packed; and to provide such a method which is relatively easily carried out.

Additional objects and the novel features of this invention will become apparent from the description which follows, taken in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of a can which is provided with a removable seal made in accordance with the method of this invention, the can top being made of metal;

Fig. 2 is an enlarged, fragmentary cross section taken along line 2—2 of Fig. 1;

Fig. 3 is an enlarged, fragmentary cross section taken along line 3—3 of Fig. 1;

Fig. 4 is a cross section similar to Fig. 3, illustrating an alternative construction of a sealing strip;

Fig. 5 is a cross section similar to Fig. 3, illustrating a further alternative construction of a sealing strip;

Fig. 6 is an enlarged fragmentary vertical section taken along line 6—6 of Fig. 1, at the upper corner of the can thereof;

Figs. 7 to 12, inclusive, are similar fragmentary vertical sections, illustrating cans provided with a similar seal produced in accordance with this invention but each having metal or plastic top and a metal body alternative to that of Fig. 1;

Fig. 13 is a further enlarged, fragmentary horizontal section, taken along line 13—13 of Fig. 1; and

Fig. 14 is a similar longitudinal section of a can body alternative to that of Fig. 13, wherein the lock seam joint becomes a lap joint adjacent the upper end of the can body.

The principles of this invention, as illustrated in Figs. 1 to 6, may be applied to a can having a metal body B of substantially conventional construction and provided with a top T formed of metal, although the top may be made of plastic or similar transparent material to permit the contents to be seen, preferably normally not subject to breakage due to impact or sharp blows such as in the case of glass. The top T, as in Fig. 1, may have an annular ridge 10, for reinforcement purposes, and a depending flange 74 which fits over an inner flange 76 of body B, as in Fig. 6, and extends down to a shoulder 75. The body B may be of conventional construction, i. e., having a side wall 72 provided with a longitudinal joint or seam 11, described later. The bottom of body B may be attached to the side wall in a suitable manner, as at a bottom joint 12.

In accordance with this invention, as illustrated in the drawings, a removable seal may be provided by applying a resilient tape, affixed by means of an adhesive or cement such as latex or gum rubber, to a joint formed between the can body and can top. The can top and body may be made of metal and/or plastic as desired, while the tape is preferably a material such as vinyl or polyethylene plastic, which is not brittle and is sufficiently plastic to flow into small spaces, as described hereinafter, and also relatively tough so that it will not tend to tear. In addition, the tape should not be either toxic or odoriferous, to preclude objectionable qualities or odors from being imparted to the food in the can.

In accordance with the method of this invention, such a tape is stretched around a circumferential joint between the top and body of the can, while a vacuum or difference in pressure between the inside and outside of the can is maintained, a portion of the tape being pulled into the joint by the vacuum or difference in pressure. Also, all longitudinal grooves or projections on the can are filled or smoothed, so that the tape will not stretch across the same to produce a possible source of air leakage into the can. Such method is particularly applicable to cans for material packed relatively dry and in granular, lump or particle form, such as coffee and the like, although usable for other types of goods.

It may sometimes occur that the manufacturer of the can will complete the can except for the bottom, which is soldered or otherwise attached to the remainder of the can after the contents are placed therein by the packer or filler, as under vacuum. In such case, the tape of this invention may be placed around the joint, and when the contents, such as coffee, are placed in the can, the tape will be pulled into the joint by the vacuum, in the manner described above. Tests have indicated that a tape may be placed around the joint of an incomplete can and the can left in storage for several months, without destroying the effectiveness of the final seal or reducing the ability of the tape to be sucked into the joint, when the vacuum is finally applied.

The can of Fig. 1 may be sealed in the above manner, as by a tape strip 69, the thickness of which is slightly exaggerated for purposes of illustration, and the inner surface of which is provided with an adhesive, such as latex or gum rubber, so that the tape will adhere to the can wall. The tape is stretched around a joint 70 between top T and side wall 72 of the can body, as in Fig. 6, and

one end of the tape may overlap the other end and be sealed thereto, or a portion of the overlapping end may be left extending slightly from the remainder of the tape to form a removal tab **73** as in Figs. 3 and 6, adapted to be grasped by the fingers of the user. For the latter purpose, the adhesive may be removed from or not applied to the inner surface of the tab **73**, or a thin blocking strip **13** may be applied over the adhesive, as in Fig. 4. The joint **70** may be formed between the lower end of a depending flange **74** of the can top **71** and a shoulder **75** of the can body wall **72**, which shoulder **75** connects with an inner flange **76**. Inner flange **76** assists in placing the can top on the body after the tape strip **69** is removed, and the upper edge of the flange may be curled over, as shown, to provide a smooth surface which will not tend to injure the user. The tape strip **69** is applied to the can under tension and preferably while a vacuum is produced on the inside of the can, and a roller may also press the tape against the can. A portion of the tape, which is sufficiently flexible for the purpose, will be sucked into the joint **70** to form a ridge which not only assists in maintaining a seal but also assists in preventing the tape from becoming dislodged. Opposite the joint **70**, a corresponding groove **77** usually will be formed in the outer surface of the tape.

The can top **78** of Fig. 7 may be made of transparent material, such as plastic, while a flange **79** depending therefrom may be provided with a thinner section **80** at the lower end, so as to form at joint **81** a shoulder which will rest on the top of the metal can body **82**. As before, the tape strip **69** is applied to the joint between the top and body of the can, preferably under vacuum, so that the strip will flow into the joint to form a ridge, with a corresponding groove **77'** in the tape opposite the joint. Tape **69** may be provided with a tab **73**, as before, or the overlapping end of the tape may merely be sealed to the other end of the tape underneath the same.

Both the top and body of the can of Figs. 8 and 9 are of metal, a slightly different configuration being used at the joint **83** or **83'**, but the strip **69** is applied in the same manner, i. e., under tension and preferably under vacuum, so that a portion of the strip will flow into the joint to provide a better seal and also to resist any tendency for displacement of the tape. The metal top T' of the can of Fig. 21 is provided with a depending flange **74'** having an inwardly turned lower edge as shown, and the upper end of the can body wall **72'** is provided with an inwardly spaced flange **76'**, connected thereto by a sloping shoulder **75'**, upon which the top may rest.

In the can of Fig. 9, the metal can body **82** has a straight upper edge, while the top **84** is provided with a depending flange **85**, the lower section **86** of which is offset inwardly, to provide a sloping shoulder **87** to rest on the top of the can body wall. As before, the tape **69**, when applied under vacuum, will flow into the space formed at joint **83'** between the can top and can body.

In the cans of Figs. 10 and 11, the can top and body are slightly offset at the joint, but the tape will follow the contour and also flow into the joint **88** or **89**, when applied under vacuum. Thus, the top **78'** of the can of Fig. 10 may be made of plastic and be provided with a simple depending flange **79'**, adapted to fit within the upper end of the body **82'**, which is provided with an inwardly extending ridge or indentation **90** which forms a stop or shoulder for the top. In the can of Fig. 11, both the body **82** and top T'' are made of metal, the top flange **74''** being provided with an indentation **91** forming a shoulder or stop for the top edge of the can body **82**. As will be evident, the top of the can of Fig. 10 fits within the body, while the top of the can of Fig. 11 fits over the body, but in either event the tape **69** extends into the joint **88** of Fig. 10 or the joint **89** of Fig. 11.

In the can of Fig. 12, a flush joint **92** is formed between the top T'' and the body **82''**, the tape **69** flowing into the space at the joint, when vacuum is applied. The can top T'' is provided with a depending flange **74''** having a spacing or positioning ridge or indentation **91**, while a guide ring **93** may be secured to the top, or preferably to the can body **82''**, in a suitable manner, such as by soldering. The body **82''** may be provided with an indentation or ridge **91'** to facilitate positioning and attachment of the guide ring **93**, while ridge **91** of top flange **74''** may act as a stop for the ring **93**.

Since can bodies are generally made by bending a flat strip of metal into a circle, and then forming a seam or a joint at the meeting edges, in further accordance with this invention, special provision is preferably made to insure a smooth surface at the joint. Generally, such joint is a lock seam joint, such as that shown in Figs. 2 and 13, wherein one end of the strip, along the longitudinal seam, is provided with a bent or U section **94** which interfits with an offset U or bent section **95** of the other end of the strip. A more complete seal at the joint is generally made by heating the interlocked ends of the strip and flowing solder **96** into the joint. Such solder may be simultaneously brushed into the seam, as by a brush rotating along the seam, but the solder normally does not completely fill the space at the seam, and a transverse groove or depression **97**, indicated by a solid line in Fig. 2 and a dotted line in Fig. 13, is thereby formed. When the tape is stretched across such a transverse groove, it does not tend to flow into the groove, as it does in the case of the circumferential joint, but rather to bridge the groove, so that a point of entrance for air is produced. Thus, in accordance with the present invention, the groove **97** is filled with a solder or similar material, to form a flush, flat surface, as indicated in full lines in Fig. 13, so that tape **69** will stretch thereover without forming an air entrance space. Such additional solder may be placed in the groove **97** after the can body is made, but preferably is swept therein by a brush extending transversely to the seam, and adapted to fill the groove with excess solder from the side during the soldering of each steam. Such a brush is preferably at least as wide as the portion of the groove which will lie under the tape, but need contact the can body only at the area on which the tape is to be placed.

In some cans, the lock seam is changed to a lap seam adjacent one or both ends of the cam body, as to facilitate attachment of the ends, or to permit the upper end of the can body to be curled inwardly. In such a case, solder or similar material is preferably utilized in filling in any longitudinal grooves so that a smooth even surface will be produced across which the tape strip may pass. Thus, as in Fig. 14, after the edges **98** and **99** are lapped, then heated and the solder flowed into the joint, the solder **100** will generally extend only out to the dotted line **101**, on the outside of the can body. An additional amount of solder may be added and smoothed over so that there will be no sharp groove or projection extending longitudinally, such as out to the full line, or preferably sufficient solder flowed onto the joint, and a cross brush utilized to force the solder into any sharp longitudinal grooves or the like. In some instances, the ends **98** and **99** of the can body strip are offset slightly, in which case, after soldering, a buffing wheel or the like may be brought into engagement with the exposed edge of the end **99**, so that the end of the strip will be buffed down and thereby provide a smooth surface over which the tape will fit.

In further accordance with this invention, when the tape **69** is applied to the joint, the initial end of the tape may be cut off at an angle or bevel, such as 30°, to form a beveled end **102**, as in Figs. 5 and 14, so that adhesive will be exposed and unite with the adhesive of the overlapping end **69'** of the tape. Thus, an unbroken layer of adhesive will surround the joint. The end **69'** of the tape may be sealed to the end **69**, as in Fig. 14, or special provision taken as indicated previously, to form a tab to be grasped by the user in removing

the tape, as in Fig. 5. It will be understood, of course, that instead of providing the inner surface of the tape with an adhesive such as latex or gum rubber, the tape may itself have a composition which upon special treatment, such as heating the inner surface, will become sticky or adhesive.

In general, the thickness of the sealing strip or tape of this invention, and the proportions or dimensions of certain parts thereof, will depend primarily upon the material to be contained in the can, the material of which the strip or tape is made, and the conditions to which the contents of and the can are to be subjected. For instance, when the contents of the can are to be cooked, then a strip resistant to the cooking temperature will be necessary. Also, the thickness of the strip may be determined in part by the width thereof. Thus, the tape or strip **69** may be between 0.010 and 0.020 in. thick. It will be understood, of course, that all of the dimensions given above are merely suggestive, and that other dimensions may be utilized.

From the foregoing, it will be evident that the method of sealing cans of this invention fulfill to a marked degree the requirements and objects hereinbefore set forth. As a result of applicant's invention, it will be noted that a removable sealing strip is placed at a point of juncture between two enclosing wall portions of a can. The strip is readily applied to a can, as in the manner described, and is also readily removed, although maintained in place not only by the adhesive inner surface of the strip but also by the entrance of the strip into a joint or groove in the can. The method of sealing "slip cover" type cans, particularly as shown and described, is readily carried out. All that is necessary is merely to pass the strip around the joint, preferably under tension, and then utilize a vacuum or differential pressure inside the can to suck a small portion of the strip into the joint or groove. The filling of longitudinal grooves of the can body is particularly desirable, since a tape strip, when applied under circumferential tension, will readily flow into the circumferential grooves but will tend to bridge longitudinal groves. By filling all longitudinal grooves, any spaces which might admit air will be obviated.

Although several embodiments of this invention and a number of variations of each have been illustrated and described with particularity, it will be understood that other embodiments and variations thereof may exist, all without departing from the spirit and scope of this invention.

What is claimed is:

1. A method of providing a removable seal for a can adapted to contain a foodstuff, which comprises forming a can body by bending a metal strip into a generally circular shape and locking the longitudinal edges together to form a seam, heating said metal at said seam and flowing solder into said seam, and filling with solder at least a portion of said seam adjacent one end of said can body to prevent the formation of a groove which will be bridged by a resilient strip of tape, stretched thereover; attaching a can bottom to the opposite end of said can body; forming a top for said can having a peripheral depending flange adapted to interfit with the upper end of said can body; placing footstuff or the like in said can; placing said top on said can; applying under tension a resilient, non-metallic strip having an adhesive under-surface circumferentially around the joint between said top flange and said can body, the ends of said strip being overlapped; and producing a differential in pressure between the inside and outside of said can so that the vacuum effect thereby produced will cause a portion of said strip to flow into said joint.

2. A method of providing a removable seal for a can adapted to contain a foodstuff which comprises forming a can body by bending a metal strip into a generally circular shape and locking the longitudinal edges together to form a seam, heating said metal at said seam

and flowing solder into said seam, and filling with solder at least a portion of said seam at the upper end of said can body to prevent the formation of a longitudinal groove which will be bridged by a resilient strip of tape, stretched thereover; forming a top for said can having a peripheral depending flange adapted to interfit with the upper end of said can body; placing said top on said can; applying under tension a resilient non-metallic strip having an adhesive under-surface circumferentially around the joint between said top flange and said can body, the ends of said strip being overlapped; placing foodstuff or the like in said can through the open bottom of said can body; attaching a can bottom to said can body; and producing a differential in pressure between the inside and outside of said can so that the vacuum effect thereby produced will cause a portion of said strip to flow into said joint.

3. A method of providing a removable seal for a can adapted to contain a foodstuff, which comprises forming a can body by bending a metal strip into a generally circular shape and forming a seam along the longitudinal edges thereof, heating said metal at said seam and flowing solder into said seam, and flowing solder in said seam and on said can body along at least a portion of said seam adjacent one end of said can body to prevent the formation of a groove which will be bridged by a resilient strip of tape, stretched thereover; attaching a can bottom to the opposite end of said can body; forming a top for said can having a peripheral depending flange adapted to interfit with the upper end of said can body; placing foodstuff or the like in said can; placing said top on said can; applying under tension a resilient, non-metallic strip, having an adhesive under-surface, circumferentially around the joint between said top flange and said can body; and producing a differential in pressure between the inside and outside of said can so that the vacuum effect thereby produced will cause a portion of said strip to flow into said joint.

4. A method of providing a removable seal for a can adapted to contain a food stuff, as defined in claim 3, wherein said longitudinal edges of said metal strip are interlocked from one end of the can body to the opposite end.

5. A method of providing a removable seal for a can adapted to contain a food stuff, as defined in claim 3, which includes bending the longitudinal edges of said strip which forms said can body to form an interlocked seam, except at least adjacent the end to which said non-metallic strip is applied; and lapping said edges at said end.

6. A method of providing a removable seal for a can adapted to contain a food stuff, as defined in claim 3, which includes forming said can top of metal.

7. A method of providing a removable seal for a can adapted to contain a food stuff, as defined in claim 3, which includes forming said can top of non-metallic material.

8. A method of providing a removable seal for a can adapted to contain a food stuff as defined in claim 3, which includes beveling the initial end of said non-metallic strip across the width thereof from the inside to the outside; and overlapping the opposite end of said non-metallic strip onto said bevelled end.

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