

April 12, 1966

E. W. GRIESE, JR

3,245,576

RE-CLOSABLE HERMETICALLY SEALED CONTAINER

Filed Feb. 12, 1964

2 Sheets-Sheet 1

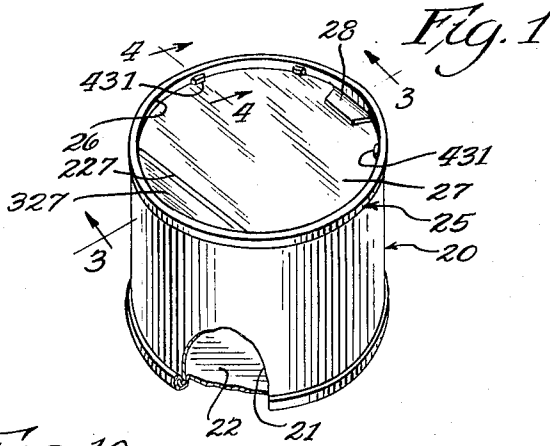


Fig. 2.

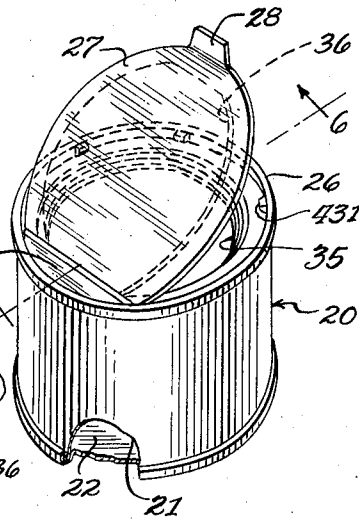


Fig. 10.

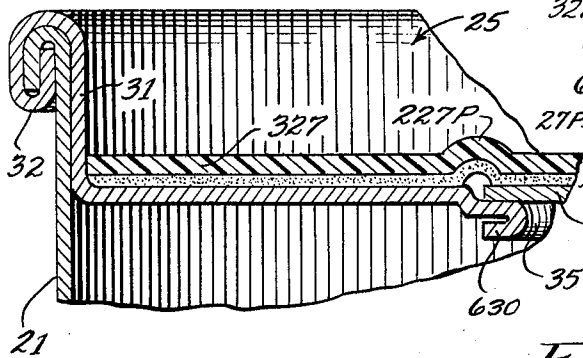


Fig. 3.

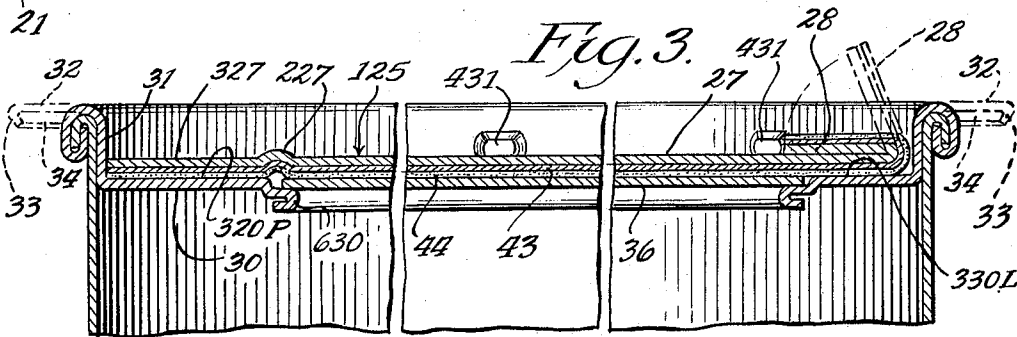
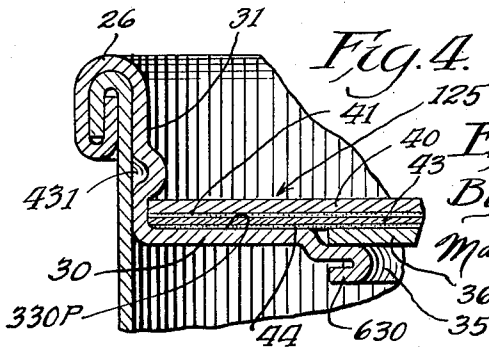


Fig. 4.



Inventor
Elmer W. Griese, Jr.

By

Mann, Brown & McWilliams

Attys.

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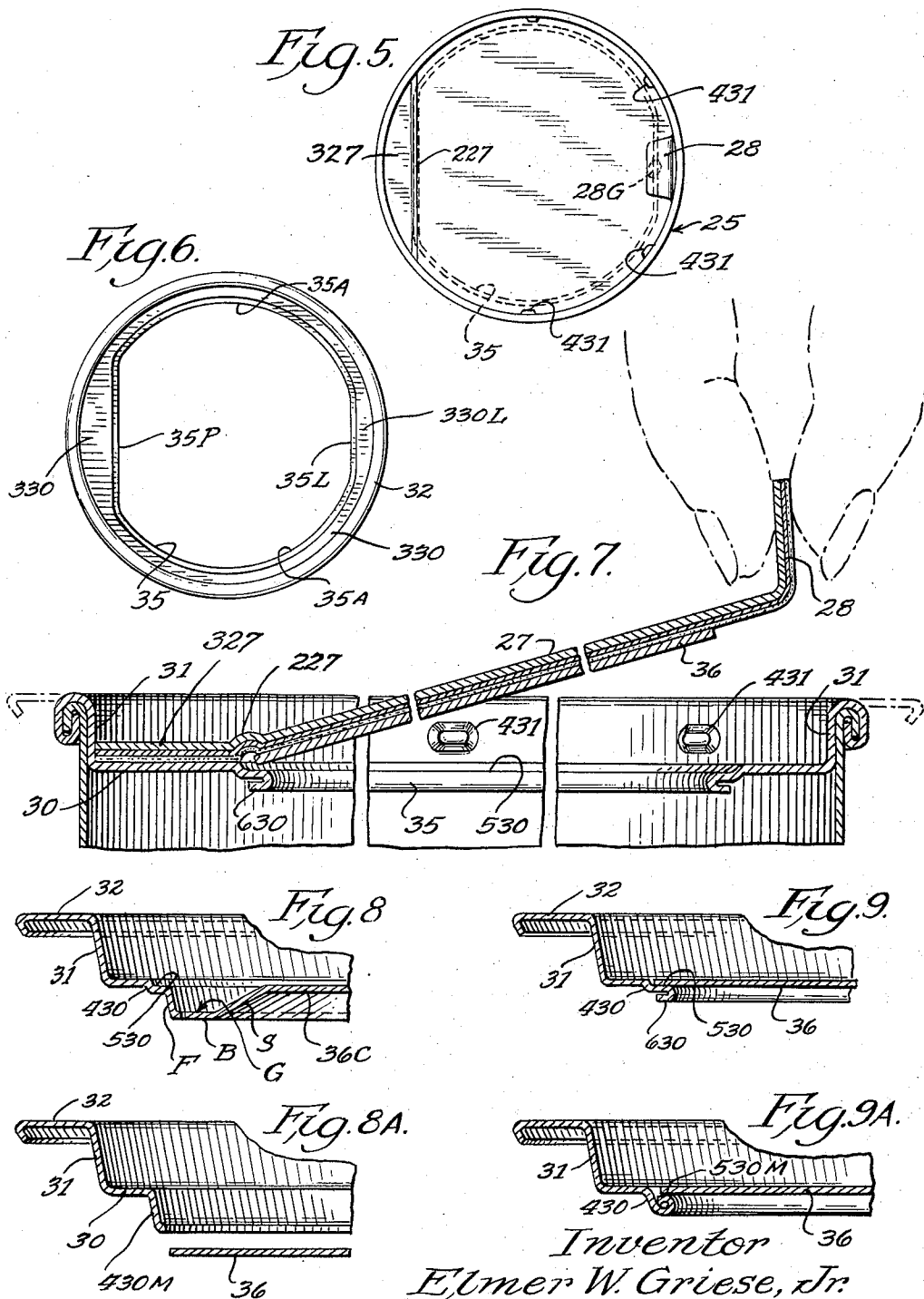
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RE-CLOSABLE HERMETICALLY SEALED CONTAINER

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2 Sheets-Sheet 2



Inventor
Elmer W. Griese, Jr.
 By *Mann, Brown & McWilliams*,
Attys.

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RE-CLOSABLE HERMETICALLY SEALED CONTAINER

Elmer W. Griesse, Jr., Skokie, Ill., assignor to Ekco Containers, Inc., a corporation of Illinois
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10 Claims. (Cl. 220—53)

This application is a continuation-in-part of my co-pending application Serial No. 252,995, filed January 21, 1963, now Patent No. 3,151,765, granted October 6, 1964.

This invention relates to hermetically sealed containers for use in place of conventional double seamed key-opening cans that are adapted for re-closure after they have been opened.

Containers of the aforesaid character are used for products that require hermetic sealing during shipment and storage and which, after breaking of the hermetic seal, must be capable of being re-closed so that portions of the contents may be removed periodically as required. Containers of the aforesaid character are customarily used in vacuum, gas and processed packaging of food products such as coffee, powdered milk and luncheon meats, and are used for other or non-food products where it is necessary initially to protect the contents from air during long periods of storage.

Re-closable hermetically sealed containers are provided customarily by the use of a tear strip for the top or closure member with the tear strip located in such a relationship that after the hermetic seal has been broken, there is a relationship of the cover and the can that enables the cover to be put back in place to protect the unused portion of the contents of the can. The tear strip is generally removed by a wire key that is usually soldered to one of the walls of the can. In most tear strip or key-opening cans that are intended to be re-closable, the necessary structure for facilitating such re-closure is provided by having a double wall near the upper edge of the side wall of the can, and the outer one of these wall portions is double seamed to the can top and includes the tear strip material. Thus, when the narrow tear strip has been removed in the opening of the package, the cover has a depending flange that will surround the upper edge of the inner wall, thus to enable the cover to be put back in place after a portion of the contents have been removed.

The use of such a tear strip construction has been considered to be objectionable because this construction, which includes a wire key, is relatively costly, and because opening of the can by removal of the tear strip is considered by many users to be hazardous and difficult. A related objection is found because of the sharp edges that are formed on the lower edge of the depending flange that is left in association with the cover.

In view of the foregoing it is the primary object of the present invention to provide a new and improved re-closable hermetically sealed container or can, and a related object is to provide such an improved container that may be readily and easily opened, and which may be readily re-closed after a portion of the contents have been removed.

A further object of this invention is to provide such a hermetically sealed reclosable container wherein the can top embodies a cover assembly sealed across a pre-cut opening in the cover and adapted in the opening of

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the can to be pivoted with a hinge-like action to open position, and a related object is to provide such a structure wherein the pre-cut opening is defined by a curled or hemmed edge to guard against cutting of the user's hand.

Another object is to provide such a can top wherein the pre-cut opening is defined in part by a depressed bordering ledge that serves as a support for a separately formed sheet metal wall which forms a supporting and strengthening element of the cover assembly, and a related object is to utilize the metal that is removed in forming the pre-cut opening to provide the aforesaid sheet metal wall.

Another important object of the present invention is to provide such a re-closable hermetically sealed container that may be used in association with an ordinary or single thickness can-body or wall, and a further and related object is to provide a can top which in itself provides all of the structural means required for enabling the can to be hermetically sealed, and for enabling the can to be easily opened and readily re-closed. A related object is to provide such a can top that may be put in position on an ordinary can wall through the use of ordinary can closing machinery.

Further objects that are basically economical in character are to provide such a can top which when used with a conventional single wall can body, provides a completed re-closable hermetically sealed can which is more economical than the key-opened containers heretofore employed, to provide such a can top which by reason of its novel construction provides not only for ready opening and re-closure but also provides a large unbroken or unobstructed upper surface upon which graphic material, display advertising and the like may be printed so as to enhance the merchandising effectiveness of the package or container, and to accomplish this in such a way that the upper portion of the can side wall which heretofore embodied the tear strip is made available for graphic display.

Other and further objects of the present invention will be apparent from the following description and claims, and are illustrated in the accompanying drawings, which by way of illustration, show preferred embodiments of the present invention and the principles thereof, and what is now considered to be the best mode in which to apply these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the invention.

In the drawings:

FIG. 1 is a perspective view of a re-closable hermetically sealed container embodying the features of the invention, the cover being illustrated in its original hermetically sealed relationship;

FIG. 2 is a view similar to FIG. 1 and illustrating the cover in an open position;

FIG. 3 is an enlarged transverse sectional view taken in vertical plan substantially along the line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmental vertical sectional view taken substantially along the line 4—4 of FIG. 3;

FIG. 5 is a top plan view of the structure shown in FIGS. 1 to 4;

FIG. 6 is a plan view of a portion of the can top structure;

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FIG. 7 is a view similar to FIG. 3 and showing the cover of the container in an open relationship, the view being taken substantially along the lines 7—7 of FIG. 2;

FIGS. 8 and 9 are sectional views showing the way in which the can top of FIGS. 1 to 7 is formed;

FIGS. 8A and 9A are sectional views showing the way in which an alternative form of can top embodying the invention may be made; and

FIG. 10 is a fragmentary sectional view showing an alternative form of the invention where the cover is made from plastic.

For purposes of disclosure the invention is herein illustrated as embodied in a re-closable hermetically sealed container in the form of a can 20 having the usual impervious side wall 21 and impervious bottom wall 22 double seamed together in an air-tight relationship, and on the upper edge of the conventional single thickness side wall 21, a can top 25 is conventionally seamed to the side wall to define the usual double seam or chine 26 of a sanitary can or packer, the top 25 having a multi-layer cover assembly or cross wall 125 extended between and connected to the lower inner portions of the chine 26, as will be described. The cross wall 125 includes an impervious cover 27 that, in its original relationship, forms a fixed part of the top 25 and is in hermetically sealed relationship to the lower portion of the chine 26, as will be described, and this cover 27 may be readily and easily lifted by means of a tab 28 at one edge thereof so as to pivot about a pivotal axis located near the opposite edge of the cover 27 to break the hermetic seal and thereby open the container 20, as illustrated in FIG. 2 of the drawings. Then, after the desired portion of the contents of the container 20 have been removed, the cover 27 may be pivoted back to its closing position wherein it is releasably held by latching or retaining means as will be described.

The can top 25 of this invention is manufactured independently of the main can body, as is customary, and is put in place and sealed to the side wall 21 of the can body by conventional can closing machinery so that vacuum, gas or other standard systems of packing may be employed in the usual way. Thus the can top 25 is made from the usual can stock which may be tin plated sheet steel, or may be aluminum or other suitable material, and in many of its physical characteristics is identical with the usual can top. Thus, the sheet metal stock of the can top 25 is formed with a cross wall 30 which has certain elements of specialized form which will be described, but this cross wall 30 has an upstanding cylindrical flange 31, and an outwardly extending flange 32 and a narrow downwardly extending flange 33 that are shown in dotted outline in FIG. 3 in their original relation before seaming of the top 25 to a can body. On the lower face of the flange 32 a layer of resilient sealing material 34 is provided in accordance with common practice. The elements 32, 33 and 34 are adapted to be bent downwardly from the dotted line position shown in FIG. 3 and formed into a conventional double seam, and in this operation by conventional equipment, the chine 26 is formed.

The cross wall 30 is, under the present invention, formed with a pre-cut or preformed central opening 35 in association with which a separately formed support panel 36 is mounted and supported in such a position that the impervious cover 27 may be adhered to the panel 36 and to the border portions of the cross wall 30 about the periphery of the opening 35, as will be described in detail hereinafter.

The special form that is given to the border portions of the cross wall 30 is generally symmetrical about the center of the can top, and this form is shown to good advantage in FIGS. 5 and 6. Specifically, the central opening 35 is generally circular in form, as shown in FIG. 6, and is defined by a pair of concentric arcuate edges 35A joined at their opposite ends by parallel straight edges

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35P and 35L that are of slightly different lengths and are arranged in the relationship of chords with respect to the arcuate edges 35A. Thus the cross wall 30 provides a continuous annular upper ledge 330 which has widened portions 330P and 330L of generally D-shaped form opposite the edges 35P and 35L of the opening 35. At the inner edge of the upper ledge portions 330, 330P and 330L, a downwardly extending wall or flange 430 is formed, and at its lower edge the flange 430 is formed so as to project inwardly to provide a lower horizontal ledge 530, while the inner edge of the lower ledge 530 is bent downwardly and then outwardly to form a curl 630 and this curl 630 serves to define the central opening 35 of the cross wall 30.

The support panel 36 conforms in outline with the shape of the opening 35, but is slightly larger, and the panel 36 is positioned within the flange 430 and rests freely on the lower ledge 530. The relationship of the ledges 330 and 530 is such that the upper surface of the support panel 36 is disposed in the plane of the upper ledge 330.

The cover 27 is put in place on and is adhesively attached and sealed to opposed portions of the ledge 330 and the upper face of the support panel 36 in a particular manner and relationship, as will be described. Thus, under the present invention the cover 27 is so constructed as to provide a moisture and air barrier, and the adhesive attachment of the cover 27 to the continuous bordering upper ledge 330 of the cross wall 30 provides a complete hermetic barrier against moisture and air across the top 25.

In accomplishing the foregoing, the desired impervious characteristic of the cover 27 may be attained through the use of different materials or combinations thereof, and the adhesive required to seal and secure the cover 27 in place may be applied to and carried by either the cover 27 or the opposed portions of the cross wall 30. Moreover, the adhesive may be applied either as continuous coating or in a pattern, as will become apparent, and where the adhesive is pattern printed on the cover 27, the pattern should be such that the adhesive will extend continuously about the ledge 330 to form the desired hermetic seal so that such adhesive will engage and adhere to substantially the entire area of the support panel 36 so as to integrate the panel and the cover for movement together when the cover is opened.

Thus in the specific form of the invention illustrated in FIGS. 1 to 7 the cover 27 is made from a cardboard-metal foil laminate and on the foil side of the laminate material an adhesive coating is provided whereby the cover material may be hermetically sealed and adhered to the wall 36 and the ledge 330 of the cross wall 30. As will be evident in FIGS. 5 and 7, the cover stock is provided in this instance by a relatively dense and stiff cardboard layer 40 that is adhered by means of an adhesive layer 41 to a metal foil layer 43, and on the lower side of the foil layer, an adhesive layer 44 is applied as a coating. This adhesive 44 may be of the hot melt type that is activated by heat and pressure.

The cardboard-metal foil laminate stock that is employed in this embodiment of the invention is cut to an outside shape and diameter such that it will fit into the space over the cross wall 30, and the preferred arrangement is such that the edges of the cover will fit snugly against the side wall 31. The cover 27 of course has the tab 28 formed at one edge thereof, and preferably this tab 28 is bent back so as to lie flat against the upper surface of the cover, in which position it may be held by suitable adhesive such as a glue spot 28G.

The cover 27 has a fold line 227 formed therein by the usual scoring process so as to facilitate pivotal movement of the cover 27 to and from its open position of FIG. 2, and this fold line is arranged so that in mounting the cover 27, the fold line 227 may be disposed substantially over, and parallel to, the edge 35P. The tab 28 is located

directly opposite the fold line 227. When the seal of the container 20 is broken by lifting the tab 28, the hermetic seal is first broken between the cover 27 and the ledge portion 330L directly beneath the tab 28, and the adhesive bond is then progressively broken about the edge of the cover until the cover 27 is released up to the fold line 227. During this release of the cover 27, the support panel 36 moves with the cover 27, and the cover 27 is thus opened while allowing an anchoring portion 327 of the cover to remain in its adhesively secured relationship with respect to the ledge portion 330L. Thus the way in which the seal is broken serves to assure that the cover 27 will be left in a pivotal relationship on and with respect to the container 20. With the cover 27 in its open position, the straight edge 35L of the opening 35 is exposed in a convenient location for use as a leveling edge in the known manner.

As above pointed out, the cover 27 may be returned to its closed relationship, and means are provided for releasably retaining the cover in its closed position. Thus, in the embodiment shown in FIGS. 1 to 7 of the drawings, the vertical wall 31 is bent inwardly at selected points to provide inwardly projecting retaining lugs 431. These lugs 431 in the present instance are provided at four locations as will be evident in FIG. 6 of the drawings, and these locations are spaced considerably from the pivotal axis of the fold line 227.

It will be noted that the two lugs 431 that are closest to the tab 28 face generally toward the pivotal axis of the cover 27, and this relationship causes the lugs to be particularly effective. This result arises from the fact that after the cover 27 has been opened and is being re-closed, there is an inherent tendency of the cover to be moved for a slight distance in the direction of the tab 28. It is not clear just why this tendency is created, and it may possibly be due to the action of the fold line structure 227. Nevertheless this tendency has been noted, and the location of the lugs 431 facing toward the fold line enables the inherent forward displacement of the cover structure to assure a better holding action with respect to the cover upon re-closure thereof.

Hence, when the cover 27 is returned to its closed position, the projecting border portions of the cover stock move into position above the ledge 330 and the edges of the cover 27 move down past and beneath the several retaining lugs 431, the cardboard material of the cover 27 being sufficiently resilient to allow this action to take place for a substantial number of times without impairing the retaining relationship that is established between the cover 27 and the several retaining lugs 431. The top 25, as well as the support panel 36 are being made from conventional can stock material, and since the panel 36 and the cover 27 are adhesively secured together up to the edges of the panel 36, the strength and rigidity of the panel 36 contributes to the strength of the cover 27 so that many opening and closing operations may be performed with respect to the cover.

It has been pointed out that the cover 27 is imperforate, and in the embodiment of the invention shown in FIGS. 1 to 7, this imperforate characteristic has been provided by a lower metal foil layer 43 that forms a part of a cardboard-foil laminate. Such an imperforate characteristic may, however, be provided by other materials, and in FIG. 10, of the drawings, an alternative embodiment of the invention is shown wherein the cover stock is provided by an imperforate sheet of plastic material that is identified as a cover 27P and which has a fold line 227P in position to provide a hinge for the cover 27P. In this embodiment of the invention the adhesive 44 secures the support wall 36 to the cover and seals the cover 27P hermetically to the upper ledge of the can top.

In all other respects the embodiment of the invention shown in FIG. 10 is the same as in the embodiment hereinbefore described, it being noted of course that in the final assembly of the can top, the impervious plastic

cover 227P is pressed downwardly so that the adhesive layer 44 secures the support wall 36 to the cover and seals the cover 27P hermetically to the upper ledge of the can top.

In all other respects the embodiment of the invention shown in FIG. 10 is the same as in the embodiment hereinbefore described, it being noted of course that in the final assembly of the can top, the impervious plastic cover 227P is pressed downwardly so that the adhesive layer 44 adheres to the cross wall in the sealed relationship hereinbefore described.

Under the present invention the support panel 36 is produced from the metal of the can top as an incident to the formation of the central opening 35. Thus, as shown in FIG. 8, the can top with its wall 31 and flange 32 and the cross wall 30 is subjected to a drawing and punching operation to depress a generally annular portion of the wall 30 and form the lower ledge 530 and its connecting flange 430, and at the inner edge of the lower ledge 530 a downward flange F is produced that conforms with the shape or plan-form of the ledge 530. The flange F, during the drawing operation, constitutes the outer side of a depressed groove G, FIG. 8, this groove having a bottom B and a sloping side S that extend to the central portion 36C of the wall 30. The portion 36C remains in the plane of the ledge 530. At the end of this drawing operation, the bottom wall B is punched free from the flange F so that the portion formed by elements B, S, and 36C may subsequently be flattened and used as the support panel 36 which ultimately is put into position over the ledge 530. After this drawing and punching operation, the can top has the form shown particularly in FIG. 8 of the drawings. The flange F is then subjected to an outward curling operation so as to thereby define the central opening 35 as a smooth edge that avoids cutting or scratching of the user of the package.

The removed portion B, S, 36C is then flattened and in this process the sloping wall S, and the wall B are brought into the plane of the central portion 36C, and this imparts a slightly larger size to the removed portion whereby the removed portion may serve as the support panel 36.

After the parts have been formed as illustrated in FIGS. 8 and 9, the retaining lugs 431 may be formed, and after this, the support panel 36 is put in place and the cover 27 or 27P is sealed to the ledge 330 and to the support wall 36 as described.

In FIG. 9A of the drawing an alternative construction is shown for the lower ledge portion of the can top, and FIGS. 8A and 9A serve to illustrate the method of producing this alternative construction. Thus, in this instance the basic can top is subjected to a combined drawing and punching operation in which a downward flange 430M is produced that corresponds in plan form with the flange 430 hereinbefore described, the flange 430M being originally connected to a central or bottom wall portion which at the end of the drawing operation is punched free so that it may subsequently serve as the support panel 36. The flange 430M is then subjected to an inward curling operation wherein the edge portion of the flange 430M is bent inwardly, upwardly and then outwardly into contact with the flange 430M at a level below that of the ledge 330. The upper surface of the curl thus provides a lower ledge 530M having the same positional relationship as the ledge 530 previously described. The lugs 431 may then be formed, and the cover 27 or 27P put in place as previously described.

It will be apparent from the foregoing description that the support wall or panel 36, by reason of its location and manner of association with the cover and bordering ledges, contributes to the structural strength and ruggedness of the cover and the can while the can remains in its hermetically sealed condition, and contributes also to the attainment of satisfactory functioning of the cover during initially opening thereof and during the subsequent

opening and reclosing of the cover. More specifically, it will be observed that the adhesive attachment of the cover to the support panel 36 and to the bordering ledges produces a unitary cross wall structure in which the strength or rigidity of the panel 36 acts through the particular adhesive bond and the relationship of the wall 36 and the upper ledge 330 to cooperate with the cover 27 in resisting inward or outward distention that tends to be induced in some instances by vacuum or pressure packing. This same cooperative action serves to distribute and resist blows or loads that may be applied in various ways to the can and the can top. Furthermore, the support panel 36 serves during opening of the can to prevent bending or other distortion of the cover 27, and after such opening, the panel 36 protects and prevents warping of the cover 27 so that the cover is maintained in the desired flat condition for convenience and effectiveness in reclosure.

It will also be evident that the present invention provides a new and improved re-closable hermetically sealed container or can, and it will be apparent that the improved can that is thus provided may be easily opened, and may be readily re-closed.

It will also be apparent that the can of the present invention eliminates the use of the key-opened tear strip that is conventionally used so as to thereby avoid sharp and dangerous torn metal edges, and that in addition to the convenience and safety thus attained, the can of this invention is also more economical than the tear-strip cans heretofore used.

Over and above the advantages thus set forth, the can of this invention provides a large unbroken area on the cover thereof that is of particular value for printed or graphic material, display advertising and the like. Further space for graphic material is also provided about the upper portion of the side wall in the area usually occupied by the tear strip structure.

Thus, while preferred embodiments of the invention have been illustrated herein, it is to be understood that changes and variations may be made by those skilled in the art without departing from the spirit and scope of the appended claims.

I claim:

1. In a re-closable hermetically sealed package, a can body having an impervious side wall and an impervious top and bottom formed from sheet metal can stock and hermetically seamed together, said impervious top being seamed to the top of said side wall by a hermetically sealed joint providing a chine with an inner wall, and said top having continuous first ledge extending inwardly in a common plane from the lower edge of said inner wall of the chine to provide a sealing face, said first ledge having a continuous stepped down inner border defining a second ledge having a curled inner edge defining a central opening in said can top, a supporting member supported in position on said second ledge with its upper surface in the plane of said first ledge, and an impervious relatively stiff cover fitted snugly into the space bordered by said chine and having said lower face thereof secured to said supporting member and adhesively secured to said first ledge in a hermetically sealed relation continuously throughout the entire area of said first ledge, and a tab formed on one edge of said cover for breaking the seal of the package and lifting the cover and said supporting member to an open position.

2. In a re-closable hermetically sealed package, a can body having an impervious side wall and an impervious top and bottom formed from sheet metal can stock and hermetically seamed together, said impervious top being seamed to the top of said side wall by a hermetically sealed joint providing a chine with an inner wall, and said top having continuous first ledge extending inwardly in a common plane from the lower edges of said inner wall of the chine to provide a sealing face, said first ledge having a continuous stepped down inner border defining a

second ledge defining a central opening in said can top, a supporting member supported in position on said second ledge with its upper surface in the plane of said first ledge, and an impervious relatively stiff cover fitted snugly into the space bordered by said chine and having said lower face thereof secured to said supporting member and adhesively secured to said first ledge in a hermetically sealed relation continuously throughout the entire area of said first ledge, and a tab formed on one edge of said cover for breaking the seal of the package and lifting the cover and said supporting member to an open position.

3. A package according to claim 2 wherein the inner wall of the chine has projecting retaining members at spaced points to releasably hold the cover in closed position after the cover has been reclosed and returned to closed position.

4. In a re-closable hermetically sealed package, can body having a side wall and a top and bottom formed from sheet metal can stock, said side wall and bottom being imperforate and being hermetically sealed together, said top being secured across the upper end of said side wall by a hermetically seamed joint providing a chine with an inner wall, and said top having an inwardly projecting wall member at the lower edges of said inner wall of the chine, said wall member having upper and lower edges formed therein with said upper ledge defining a continuous sealing and supporting surface rigid with the inner wall of said chine, and said lower ledge providing a supporting surface with its inner edge formed as a smooth curl about and defining a central opening in said wall structure, a metal cross wall resting loosely on said second ledge with its upper surface, in the plane of said upper ledge, and a cover that is relatively stiff and impervious and which is fitted snugly into the space bordered by said chine and having its lower face adhesively secured to said cross wall and adhesively secured to said upper ledge in a hermetically sealed relation continuously throughout the entire area of said upper ledge, said cover having a straight fold line disposed in the relation of a chord near one edge of the cover to provide a pivot line when the cover is opened, and a tab connected to the edge of said cover remote from said fold line for breaking the seal of the package and lifting and pivoting said cover and said cross wall to an open position.

5. A package according to claim 4 wherein means are provided for releasably holding the cover in its closed position upon re-closure of the package.

6. In a top for application to a can body to form a re-closable hermetically sealed package, said top being formed from sheet metal can stock to provide a cross wall with attaching structures about the periphery thereof including an upstanding continuous inner chine wall and an outwardly projecting flange on said chine wall for seaming the top into position on a can body, said cross wall providing a continuous sealing and supporting upper ledge rigid with and adjacent to said chine wall, said upper ledge being formed at its inner edge with a downwardly stepped portion providing a continuous lower ledge, the inner edge of which is formed as a curl to define a relatively large pre-cut opening in the cross wall, a metal wall member rested freely on the lower ledge, and a relatively impervious stiff cover fitted snugly into the space bordered by said chine wall and being adhesively secured to said metal wall member and adhesively secured to said upper ledge in a hermetically sealed relation continuously and throughout the entire periphery of said upper ledge, and a tab formed on one edge of said cover for breaking the seal and lifting the cover and said metal wall member section to an open position.

7. A can top according to claim 6 wherein the cover is formed from a cardboard-metal foil laminate.

8. A can top according to claim 6 in which the cover is formed from an imperforate and impervious plastic sheet.

9. A can top according to claim 6 wherein said lower ledge extends inwardly and at its inner edge is bent downwardly and then outwardly to form said curl.

10. A can top according to claim 6 wherein said upper ledge has a downwardly extended flange at its inner edge and said flange has its lower portion formed inwardly, upwardly and then outwardly to form said curl with said outwardly formed portion of the flange constituting said lower ledge. 5

References Cited by the Examiner

UNITED STATES PATENTS

2,304,833	12/1942	Korwan	113—121
3,146,749	9/1964	Heinle	113—121
3,151,765	10/1964	Griese	220—53
3,182,851	5/1965	Taylor	220—53

THERON E. CONDON, *Primary Examiner.*