

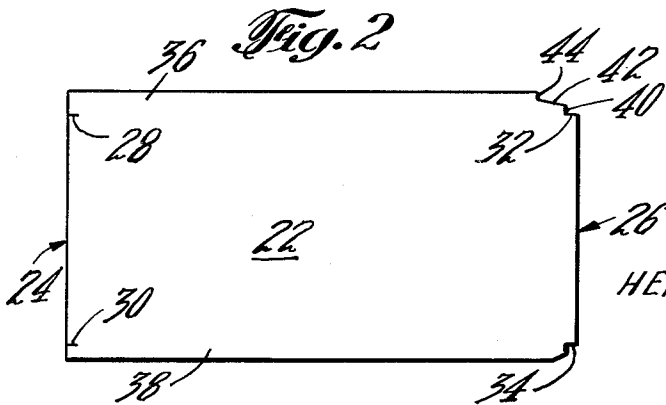
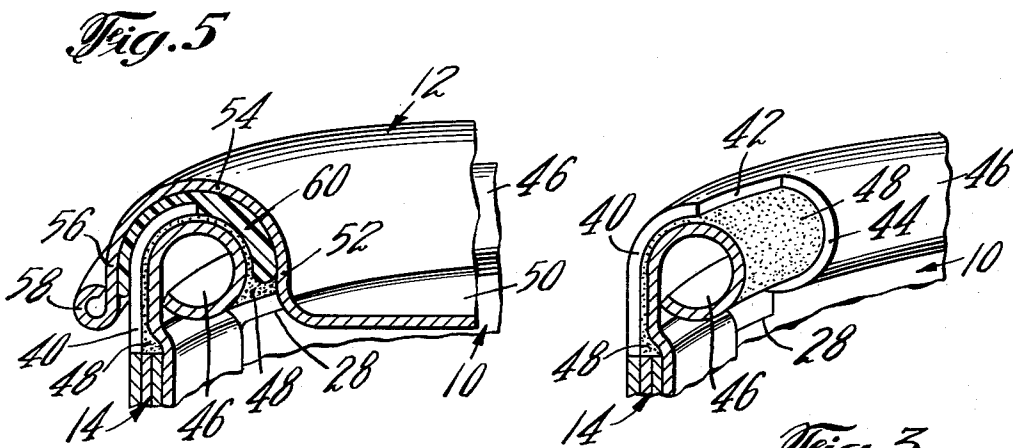
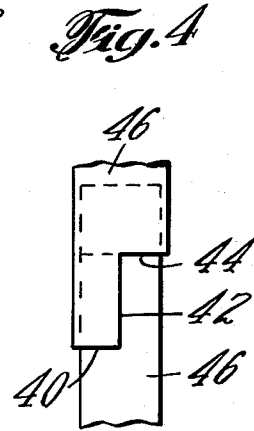
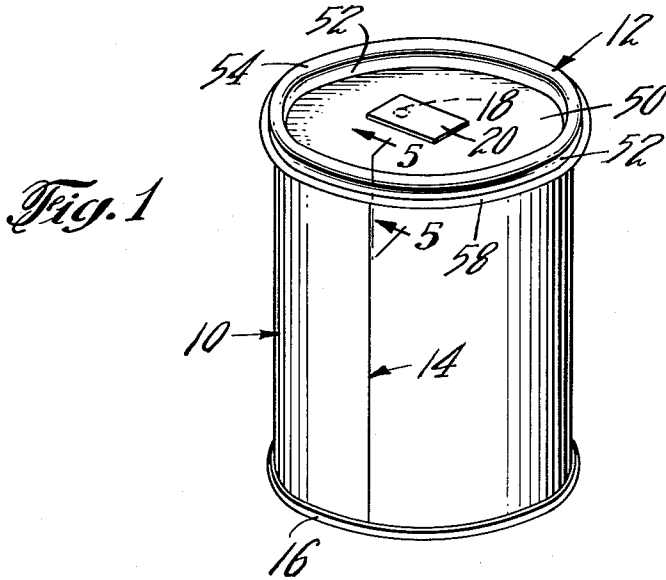
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CONTAINER BODY AND CLOSURE STRUCTURE

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CONTAINER BODY AND CLOSURE STRUCTURE
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This invention relates to vacuum-sealed containers of the type having a reclosable feature and more particularly it relates to a container construction having an improved rim portion whereby a tight and effective seal can be maintained between the container and its associated closure.

The present trend in packaging is directed toward "convenience packaging," and in the container field, such convenience packaging takes the form of containers which are easily openable and readily reclosable. While consumers prefer such containers because they can be opened without the use of tools, such consumers also strongly desire that the containers exhibit the properties of ruggedness and hermeticity which have for many years been characterized in the metal can. Container designers are therefore faced with the problem of creating a container which has the convenience features of easy openability and ready reclosure, yet at the same time has the consumer accepted features of abuse resistance and hermeticity. Since these various features are somewhat counteracting, it has proved difficult to provide a container embodying all of these desired features.

In particular, it has heretofore been impractical to provide a container with a slip-cover type closure if such a container is to be easily openable and hermetically sealed. If a slip cover was to be of the easy-open type which could be manually removed without the use of tools, such a cover could not be readily hermetically sealed to the container body and conversely, a cover which was hermetically sealed to the container body could not be removed without the use of a tool.

One particular problem encountered in trying to form hermetically sealed slip cover containers was leakage at the "cross-over area," which is that area of the container body top curl where the side seam is located. Since the overlapping side seam margin formed an abrupt step with the underlapping side seam margin, leakage tended to occur at that step and even the provision of sealing material between the cover and the body failed to completely eliminate such leakage at the step in the cross-over portion.

It is therefore an object of the present invention to provide a container which overcomes the problems previously confronting container designers and wherein the difficulties encountered in the prior art form of containers are eliminated.

Another object of the present invention is to provide a container which embodies the convenience features of easy opening and ready reclosure, yet still maintains the requisite properties of strength, abuse resistance, and hermeticity.

Another object of the present invention is to provide a container having an improved leakproof cross-over construction at its sealing edge, compatible with a sealing type end closure.

Another object of the present invention is to provide a vacuumized container construction wherein a removable cover may be successfully sealed to a container body by means of the pressure differential existing between a vacuum within the container body and the ambient pressure surrounding the container, and wherein no leakage occurs between the cover and the container body.

Another object of the present invention is to provide an improved construction for a container body having a

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rolled top curl wherein the top curl is adapted to make a complete and perfect sealing contact with a subsequently applied cover.

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

The foregoing objects are accomplished by providing an angled notch or cut in that portion of the body blank which is to form the top curl of the container body. When the body blank is subsequently formed into a cylindrical container body and the top end thereof is subsequently rolled into an inwardly extending hollow curl, the stepped portion of the body blank forms a step at the top curl which extends circumferentially along the apex of the curl for a short distance and subsequently changes direction again to radially extend about the top curl. When an end closure having a periphery groove with sealing compound therein is placed upon the container body and is held thereto by a vacuum drawn through a vacuumizing port in the end closure, the sealing material overlies the top portion of the curl to form an effective seal designed to keep the vacuum within the container. At that portion of the top curl where the sealing material meets the step of the side seam, there is a tendency for leakage to occur; however, this tendency is overcome due to the notch or step which extends circumferentially along the top curl. Along this circumferentially extending notch or step, the sealing material creates a perfect contact to thus prevent leakage which tends to occur at the side seam.

Referring to the drawings:

FIG. 1 is a perspective view of the tubular container with the body thereof formed in accordance with the principles of the present invention and the cover or closure being secured to that body by means of a vacuum;

FIG. 2 is a plan view of the body blank from which the container body of the present invention is formed;

FIG. 3 is an enlarged fragmentary section of the top end of the container body showing the improved side seam construction in the area of the top curl;

FIG. 4 is an enlarged fragmentary top view of the side seam area of the top curl shown in FIG. 3; and

FIG. 5 is an enlarged fragmentary view taken substantially along line 5-5 of FIG. 1.

As a preferred or exemplary form of the present invention, FIG. 1 illustrates a tubular container having a body generally designated 10 and a removable cover or closure generally designated 12. The container body is of the type formed from a body blank whose ends meet at a side seam generally designated 14, and at the end of the container body opposite the cover 12, a bottom end member is affixed to the container body by a conventional double seam 16. The cover 12 is provided with a vacuumizing port 18 and an adhesive patch 20 adapted to sealingly overlie the port 18. When the closure 12 is applied to the container body 10, appropriate apparatus draws a vacuum through the vacuumizing port 18 and the adhesive patch is subsequently applied over the vacuumizing port when the apparatus is removed, thus assuring that the closure 12 is attached to the body 10 and secured thereto by means of a vacuum.

Referring now to FIG. 2, a body blank 22 is shown having side margins 24 and 26 which are adapted to be interconnected to form a side seam previously designated 14. The body blank is notched along its margin 24, as illustrated at 28 and 30, so that the margin can be folded into a hook. At the opposite margin 26, the body blank is notched at 32 and 34 to provide another hooked portion adapted to be interlocked with the hooked portion formed at the margin 24. The area between the

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height of the notches 28 and 32 and the upper edge of the body blank 22 forms an upper lap portion 36, and a similar lower lap portion 38 is formed at the area between the height of the notches 30 and 34 and the lower edge of the body blank 22. At the edge of the body blank adjacent the notch 32, a short step 40 extends substantially parallel to the edge 26, merges into an angularly extending notch or step 42 angling toward the upper edge of the body blank 22 and subsequently merges into another short step 44 which meets the upper edge of the body blank 22 and is substantially parallel to the margin 26. The steps or notches 40, 42 and 44 define the area which can be termed "cross-over" portion of the container top curl.

When the body blank 22 is formed into a tubular container body configuration as shown in FIG. 3, the hooks at the side margins 24 and 26 have been interlocked and bumped, and the upper lap portion has been rolled to form an inwardly extending hollow curl or bead 46. During formation of the container body 10, the side seam is solder-bonded by means of solder 48 which flows by capillary attraction throughout the entire interlocked hook portion as well as the lapped portions. As can be seen from FIG. 3, and in greater detail in FIG. 4, the steps 40 and 44 extend transversely or radially across the top curl 46 while the step 42 extends longitudinally or circumferentially along said curl thus interconnecting the steps 40 and 44. As shown, the step 42 is located directly at the apex of the curl 46 and while this location is not absolutely critical, it nevertheless is a very important feature in determining the sealing characteristics between the container and its associated closure. Naturally, maximum sealing effect is accomplished when the step 42 is located directly at the apex of the curl 46; however, the step 42 can be located slightly before the apex and toward the outer surface of the container body 10. For effective sealing, the step 42 must be located somewhere along the top portion of the curl 46 between where the curl commences and its apex. The step 42 cannot be located at any point inwardly beyond the apex of the curl 46.

Referring now to FIG. 5, the container body having a cross-over configuration as shown in FIGS. 3 and 4, has a closure 12 connected to it in a manner as shown in FIG. 1. The closure 12 is provided with a central panel 50 adapted to lie within the mouth of the container body as circumscribed by the curl 46, and a vertical wall 52 extending from the outer edges of the central panel and gradually merging into an inverted annular channel 54 which overlies the curl 46 and has a depending skirt 56 terminating in an outwardly curled bead 58. A sealing material 60 is located within the inverted channel 54. The sealing material 60 is a soft cushioning material, such as a foamed plastisol, and when the closure 12 is attached to the container body 10, such as shown in FIG. 5, the sealing material 60 engages the edges of the notched cross-over to prevent any leakage from occurring and thus destroying the vacuum drawn within the container. Because the steps 40 and 44 present a rather abrupt variation in height, it is possible for leakage to occur between the steps and the sealing material 60 which is intended to be in contact with them; however, due to the presence of the step 42 which interconnects the radial steps 40 and 44 and with which the sealing material 60 forms a tight engagement, any leakage which possibly occurs at the cross-over is obviated.

In use, the container body 10 is filled with the desired product and the closure 12 is applied to the container body. Appropriate apparatus is then interconnected with the closure-vacuumizing portion 18 and a vacuum is drawn within the container. When the vacuumizing apparatus is removed from the port 18, the adhesive patch 20 is applied over the port to retain the vacuum within the container. Atmospheric pressure then tends to keep the closure 12 tightly sealed to the container body 10 and the sealing material 60 within the closure channel mates

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with the circumferential step 42 of the notch cross-over to assure that no leakage can occur between the vacuum within the container and the atmospheric pressure without the container. When the consumer desires to open the container, he merely removes the adhesive patch 20 from over the vacuumizing port 18, and the vacuum is thereupon released thus allowing the closure 12 to be easily lifted off of the container body to facilitate removal of the contents from the container body. The container can thereafter be used as a conventional container with the closure 12 merely being a manually reclosable top.

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

I claim:

1. A container comprising:

a tubular container body having a side seam and a top curl; and

a cover having a peripheral groove therein adapted to overlie said top curl;

the side seam area of said top curl having a stepped portion extending peripherally along said top curl within a narrow margin outwardly of and contiguous to the apex of said curl;

said cover having a sealing material within said peripheral groove;

said sealing material adapted to sealingly engage said stepped portion when said cover is applied to said container body, and to thus prevent leakage at the side seam area of said top curl.

2. In a tubular container body having a side seam formed by a conventional lock and lap construction and having a top curl, an improvement in the cross-over portion of the top curl, said improvement comprising:

a first step formed by the overlapping portion of the side seam;

said first step extending transversely across said top curl and terminating at a point located at about the apex of said curl;

a second step offset from said first step and commencing at about the apex of said curl and extending therefrom transversely across the curl to the terminus of said curl; and

a third step which interconnects the terminal point of said first step with the commencement point of said second step;

said third step extending along the top of said curl substantially parallel to the apex thereof.

3. An improved cross-over portion as defined in claim 2 wherein the top curl is an inwardly rolled hollow bead.

4. A hermetically sealed container comprising:

a tubular container body having a side seam and an inwardly rolled hollow bead forming a top curl;

that portion of the container side seam which extends into the top curl defining a cross-over portion; and a container closure adapted to overlie the container body and to hermetically seal the same;

said container closure including a depressed central panel adapted to lie within the mouth of the container as circumscribed by the top curl, and an inverted peripheral channel interconnected to said central panel and adapted to overlie said top curl;

said peripheral channel having a deformable sealing material contained therein;

said cross-over portion including a notched portion which extends circumferentially along and substantially parallel to the apex of said top curl for a short distance;

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said sealing material being adapted to firmly engage said notched portion and the rest of said top curl to thus hermetically seal the container and to prevent any leakage at the cross-over portion thereof.

5. A container as defined in claim 4 wherein said cross-over portion further includes:

a first step forming the upper portion of the container side seam and terminating at about the apex of said top curl; and

a second step offset from said first step and commencing at the apex of said top curl and terminating at the terminus of said top curl;

said notched portion defining a third step which extends between the terminal point of said first step and the commencement point of said second step.

6. A container as defined in claim 5 wherein said sealing material is a foamed plastisol.

7. A container as defined in claim 4 but further characterized by an aperture formed in the central panel of said closure and an adhesive patch adapted to seal said aperture; said aperture defining a vacuumizing port through which a vacuum may be drawn within the container body and said adhesive patch adapted to seal said port to maintain said vacuum as long as said port remains sealed.

8. A hermetically sealed package comprising:

a tubular container body having a bottom and a side seam and an inwardly rolled top curl at the upper end thereof;

said side seam having an overlapped and an underlapped margin;

that portion of the side seam which crosses the top curl defining a cross-over portion;

a product within said container body;

an upper end closure in the form of a removable cover overlying said container body top curl;

said cover including a depressed central panel mounted within said top curl and an inverted peripheral channel overlying said top curl in spaced juxtaposition thereto;

said cross-over portion including a pair of spaced radially extending steps on the overlapped margin of said side seam, and a longitudinally extending step interconnecting said pair of radially extending steps;

said pair of radially extending steps including a first

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step which is a continuation of the container body side seam edge and which terminates at about the apex of said top curl and a second step which is offset from the first step and which commences at about the top curl apex and terminates at the terminus of said top curl;

said longitudinally extending step being a step which is disposed between said pair of radially extending steps and interconnects the terminal end of said first step with the commencement end of said second step, and which thus extends circumferentially along the apex of said top curl for a distance corresponding to the spacing of said radially extending steps;

a sealing material interposed between said top curl and said cover channel;

a vacuumizing port in said cover central panel through which said product is vacuumized;

an adhesive patch sealingly overlying said vacuumizing port to retain the vacuum within said container;

the pressure differential between the ambient pressure surrounding said container and the vacuum within said container causing said cover to draw down tightly upon said container body thus causing said sealing material to seal upon said top curl and upon the step extending circumferentially therealong;

said container being manually openable by removal of said adhesive patch which breaks the vacuum in said container and allows said container cover to be easily manually removed.

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