Nov. 23, 1954 W. E. WINDSOR 2,695,207

HERMETICALLY SEALED PACKAGE

Filed Aug. 28, 1951

Fig. 1.

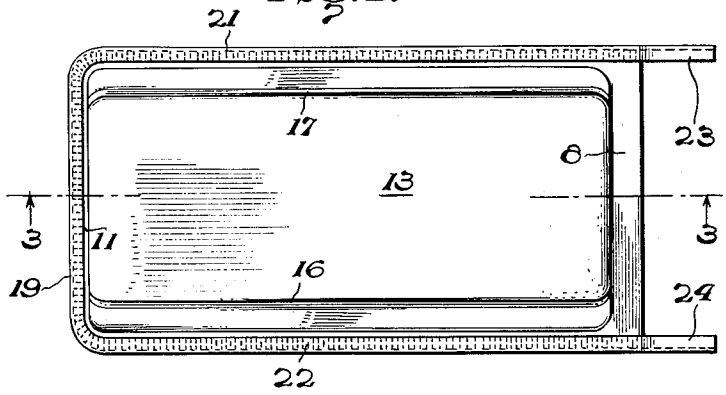


Fig. 2.

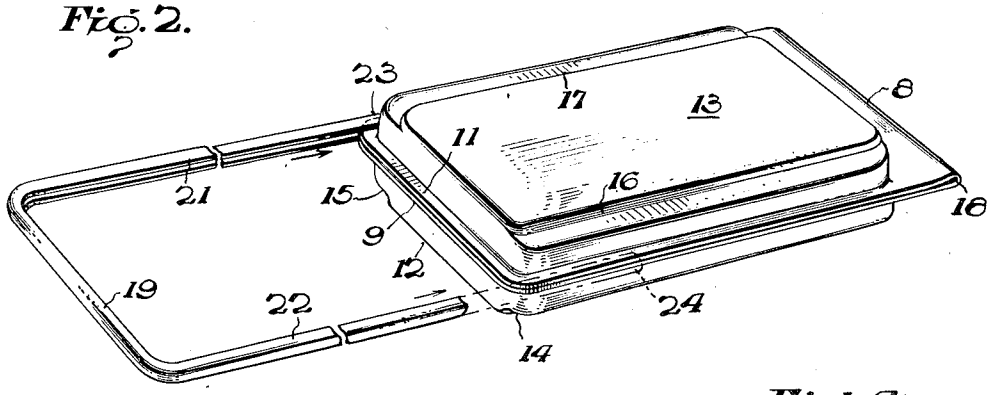


Fig. 3.

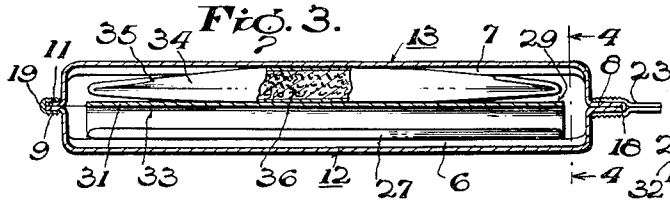
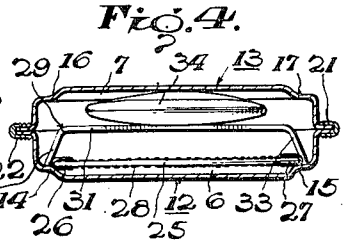


Fig. 4.



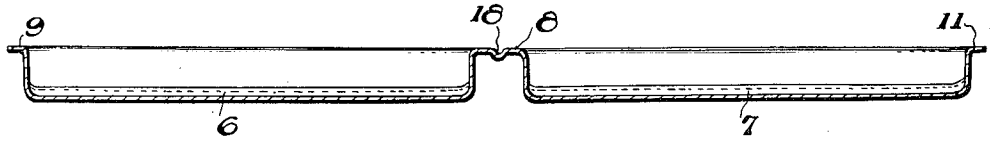


Fig. 5.

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HERMETICALLY SEALED PACKAGE

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5 Claims. (Cl. 312—31)

The present invention relates generally to hermetically sealed containers and in particular to a novel container for a coated flat plastic strip having metallized edges.

In the radiosonde art, it is common to measure upper-air humidity with a humidity responsive electrical resistor, the changing value of resistance influencing the radio signal generated by the radiosonde transmitter. Such resistors are usually in the form of flat plastic strips having a metallic coating on a pair of parallel edges and a hygroscopic coating on the strip surfaces between the edges. A typical form of such a resistor is shown in United States Patent No. 2,481,728, issued September 13, 1949. The hygroscopic coating has a relatively short life when exposed to ambient atmospheric conditions, and for this reason must be preserved in dehydrated hermetically sealed containers upon completion of manufacturing and testing operations to prevent any deterioriation of the coating prior to use. The manufacturing and testing operations are carried out under conditions of controlled temperature and humidity and the packaging of the strips is performed under the same conditions.

Large quantities of strips are shipped all over the United States and throughout foreign countries and the strip package must be a rugged unit to withstand handling during shipment and should be of a design compatible with ease of storage and minimum storage space requirements. It is very important that the coated surface of the strip be protected at all times and the strip container should prevent the possibility of any scratching or marking of the surface while the container is being handled.

Furthermore, the strips are used under severe weather conditions whereby personnel opening the hermetically sealed containers must at all times use heavy gloves as a protection from very low temperatures and under these conditions a simple means of opening the containers must be provided. Moreover, there must be space within the container to provide for a package of dehydrating material normally required to absorb any residual moisture resulting from manufacturing operations and to prevent condensation of moisture on the hygroscopic coating in the event of ambient temperature changes below the dew point of the air within the container.

The above factors influencing the design of a strip container have been most satisfactorily resolved by the improved container shown herein wherein a flat metallic container two and one-half inches wide, four and one-half inches long, and one-half inch high, has been provided for the two-by-four inch strip. The container is in the form of a pair of cooperating shells formed from a single sheet of metal, the shells having a common edge formed as a hinge, the remaining three sides on each shell having juxtaposed flanges to allow the shells to be properly clamped together until the strip is ready for use. The hinge formed by the common edge is slightly "sprung" so that the two shells are normally biased apart at an angle of approximately thirty degrees.

A clamping member in the form of a U-shaped channel slides over the juxtaposed flanges of the shells, there being suitable vapor sealing compound on both the clamping member and the flanges, and upon application of "crimping" pressure to the side walls of the channel member, the container is hermetically and vapor sealed. The side-legs of the clamping member extend beyond the hinge and either one can be readily grasped and pulled to free the clamping member and permit the shells to be separated.

The strip rests on a pair of ledges formed in one of the shells, the metallic edges of the strip being the only parts thereof in contact with the container. The ledges space the strip surface from the shell surface and a stiff cardboard spacer member is provided to retain the strip on its ledges. Positioned in the other shell is a package of dehydrating material, and the spacer member also serves to keep this package in place.

The net effect of the arrangement described is an inexpensive hermetically sealed container, conveniently flat for ease of shipping and storage, easily opened without any tools whatever, and so designed that the contents of the container are snugly held in place when the container is sealed. Moreover, the delicate surface of the humidity responsive strip is fully protected at all times after leaving the factory and prior to use.

The invention will best be understood when described in conjunction with the single sheet of drawings annexed hereto, in which:

Figure 1 is a plan view of the improved container in its completed form;

Figure 2 is a perspective view of the container showing clearly how the clamping member fits on the juxtaposed flanges of the shells;

Figure 3 is a sectional view in elevation, taken along the lines **3—3** of Figure 1;

Figure 4 is a sectional view in elevation, taken along the lines **4—4** of Figure 3;

Figure 5 is a view showing how the two shells are formed from a single sheet of metal, the view showing the shells suitably blanked and formed prior to forming the hinge.

Referring now to the drawings, the invention perhaps can best be described by first setting forth the manner in which the container is fabricated. Thus, a single sheet of metal is suitably blanked and formed, resulting in the arrangement shown in Figure 5 comprising a pair of rectangular shells **6** and **7** having a common edge **8** and flanges **9** and **11** extending around the remaining three sides of each shell.

Each shell is recessed along its bottom surface at **12** and **13** respectively, thereby forming the parallel ledges **14, 15** in shells **6** and **16, 17** in shell **7**.

The common edge **8** is formed with a transverse groove **18** and the two shells are folded towards one another about the groove **18** to thereby form a closed container. The common edge **8** acts as a hinge for the two shell members and the presence of groove **18** operates to give the hinge a certain amount of spring whereby the shells are normally biased apart at an angle of approximately thirty degrees.

When the shells have their contents assembled in place, they are squeezed together so that the flanges **9** and **11** are in juxtaposition and the parts are held in this position by means of a U-shaped clamping member **19** having a substantially U-shaped cross-sectional configuration for cooperating with the juxtaposed flanges **9** and **11**. Figure 2 shows the manner in which the clamping member **19** may be applied to the closed shells. When the clamping member is formed, the side legs **21** and **22** are spaced apart at their outer extremities a distance less than the width of the shells measured transversely from flange edge to flange edge. In this way, the side legs **21** and **22** are sprung apart slightly and the clamping member **19** can then be suitably fitted in place. When the member **19** is assembled to the closed shells as shown in Figure 1, the entire assembly is run through a pair of cooperating crimping rollers to press the clamping member in place. Normally, the cooperating surfaces of the juxtaposed flanges **9** and **11** are coated with a suitable vapor sealing compound, as is the inner channel of the clamping member **19**. The sealing compound not only maintains an hermetic seal but also prevents ingress of water vapor. With the sealing compound applied as set forth above, and the clamping member in place, properly crimped, the resulting structure is a dehydrated hermetically sealed container.

It is important to note that the side legs **21** and **22** are long enough to extend beyond the hinge **8**. This arrangement provides two projections **23, 24** which can easily be gripped by one desiring to open the container, and by the simple application of force in a transverse

direction on either projection, the clamping member **19** is easily removed and the shells are then ready for separation to remove the contents. The sealing compound on the flanges **9** and **11** has sufficient self-adhesion to overcome the bias supplied by the spring hinge and thereby hold the shells together after the clamping member **19** has been removed. However, a sharp tap on the flange edges will serve to rupture the adhesive compound, separating the shells sufficiently to permit same to be easily opened for removal of contents.

As previously stated, the container has been designed to enclose a coated flat plastic strip having a metallic coating on a pair of parallel edges and a hygroscopic coating on the strip surfaces between the metallized edges. Figure 4 shows such a strip generally indicated at **25**, having the metallized edges **26, 27** and the hygroscopic coating **28**. It is seen that the metallized edges **26, 27** rest upon the ledges **14, 15** in shell **6**. The hygroscopic surface **28** is spaced from the recessed bottom **12** and also from the remaining parts of the shell.

Cooperating with the shell **6** is a spacer member **29**, formed of relatively stiff cardboard and having a flat section **31** and a pair of turned-down side walls **32, 33**. It is seen that the side-walls **32, 33** form an acute angle with the strip **25** and it is also seen that the ledges **14, 15** have a width sufficient only to accommodate the edges of the turned-down portions **32, 33** and a portion of the metallized edges **26, 27**.

Resting on the flat surface of spacer member **31** is a package **34** of dehydrating material. As is shown in Figure 3, the package **34** is a rectangular envelope made of paper or the like, suitably vented, having a transparent window **35** on one of its sides and enclosing a quantity of dehydrating pellets **36**. The dehydrating pellets may consist of one of the commercially available silica materials having the characteristic property of undergoing changes in color depending upon the amount of moisture absorbed. The amount of moisture absorbed is dependent upon the relative humidity within the container, and for the particular material used, a blue color indicates about twenty percent relative humidity, whereas a pink color indicates about forty percent relative humidity. A suitable color scale is printed on the outer surface of the package contiguous to the window so that the color of the dehydrating material can be readily compared with the color scale. Thus the package **34** serves as an indicator of relative humidity within the container and enables the user of the hygroscopic strips to tell at a glance the condition of humidity prevailing within the container prior to opening same. If the pellets **36** have assumed a pink color, the user will know that the hygroscopic strips have been exposed to a value of a relative humidity sufficiently high to cause the hygroscopic coating to deteriorate.

The dehydrating package **34** absorbs any residual moisture in the air resulting from manufacturing and packaging operations and also indicates the value of relative humidity within the container during storage. The use of the dehydrating material is a precautionary measure insisted upon by the weather forecasting services procuring the hygroscopic strips to enable them to tell at a glance the relative humidity prevailing within the container during storage and thereby indicate whether or not the hygroscopic strips are suitable for use.

It is to be noted that the spacer member **31** is so dimensioned that the package **34** is snugly secured in place within the confines of shell **7**, the package in turn holding the spacer member **31** securely in place on the ledges **14, 15**. With such an arrangement, the turned-down edges **32, 33** prevent any tendency of the strip **25** to rattle around within the container.

From the above, it is seen that the strip **25** is provided with a dehydrated hermetically sealed container so designed that the hygroscopic surface **28** is at all times protected while the strip is within the container. The container itself is fabricated by simple sheet metal operations and is conveniently flat for ease of shipping and storage. The clamping member locks the shells together and the projecting ends **23, 24** of the clamping member's side legs serve as convenient means for grasping the clamping member and easily removing same from the container. A simple tap of the container, on its flanged edges will rupture the sealing compound and permit the spring hinge to separate the shells, thereby exposing the strip for removal and use.

What is claimed and desired to be secured by United States Letters Patent is:

1. An improved hermetically sealed assembly, comprising, in combination: a flat plastic strip characterized by a metallic coating along a pair of parallel edges and a hygroscopic coating on the strip surfaces between the coated edges, a package of dehydrating material, and a container for enclosing and hermetically sealing said strip and said package, said container comprising a single sheet of metal formed into a pair of cooperating rectangular shells folded toward each other along a common edge to thereby form a hinge, said shells having juxtaposed cooperating flanges about the open sides thereof, said hinge being formed with a transverse groove along the line of folding whereby said shells will be normally sprung open, a ledge running along the base of a pair of parallel side walls of one of said shells, said strip being supported by said ledge by contact of a portion of said metallic coated edges with a portion of said ledges, a rectangular channel-shaped spacer member, said spacer member being supported by said ledge by having the edges of its side walls in contact with a portion of said ledge, said package of dehydrating material being supported on said spacer member, and a U-shaped clamping member for holding said shells together, said clamping member having a substantially U-shaped cross-sectional configuration cooperating with the juxatposed flanges of said shells and having its side legs extending beyond said hinge, said juxtaposed flanges and parts of said clamping member cooperating therewith being coated with a sealing compound.

2. The combination defined in claim 1 wherein the edges of said spacer side-walls are clampingly engaged between said metallic coated edges and the side walls of said one of said shells.

3. The combination defined in claim 2 wherein the flat section of said spacer member has a width less than the width of said plastic strip and the spacer side-walls form an acute angle with said plastic strip.

4. The combination defined in claim 3 wherein said package of dehydrating material is clampingly engaged between the flat section of said spacer member and the flat section of the other of said shells.

5. The combination defined by claim 4 wherein the flat section of said one of said shells is recessed throughout its length whereby said ledges are formed along a pair of parallel edges.

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