

[54] CHILD-RESISTANT BLISTER PACKAGE

3,380,578 4/1968 Sparks 206/498 X
 3,809,221 5/1974 Compere 206/498 X

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[21] Appl. No.: 432,802

[57] ABSTRACT

A child-resistant blister package with a receptacle formed from a stiff flexible sheet material having a flange extending about it and adhered to a cover sheet. The flange has a transverse arched portion that is spaced in a non-adherent relationship with the cover sheet which in turn has a weakened and rupturable portion in alignment with the arched portion of the flange. The arched portion of the flange is expandable and enables one to rupture the weakened portion of the cover sheet by stretching or pulling the blister package, thereby enabling one to pull off the remainder of the cover sheet.

[52] U.S. Cl. 206/532, 206/469, 206/498, 229/515 C

[51] Int. Cl. B65d 17/24, B65d 85/03, B65d 75/62

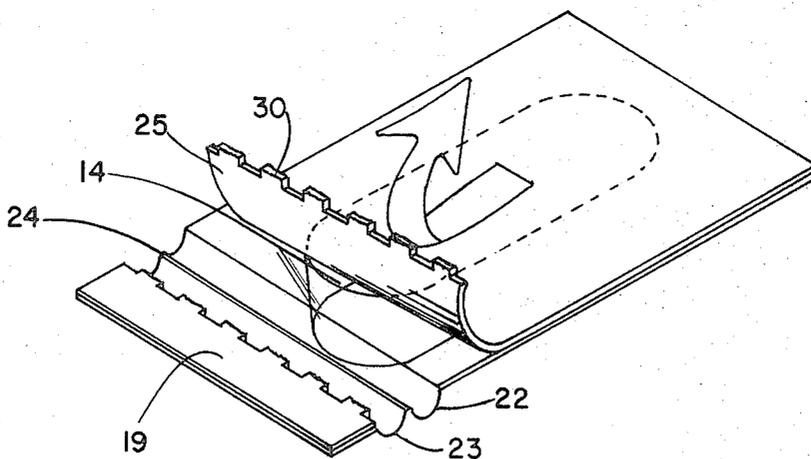
[58] Field of Search 206/42, 469, 498, 437, 206/532; 229/51 SC, 51 TS, 66

[56] References Cited

UNITED STATES PATENTS

3,054,503	9/1962	Hartman, Jr. et al.	206/531
3,207,299	9/1965	Sparks	206/532
3,255,872	6/1966	Long et al.	206/219
3,283,885	11/1966	Grunewald et al.	206/42

7 Claims, 6 Drawing Figures



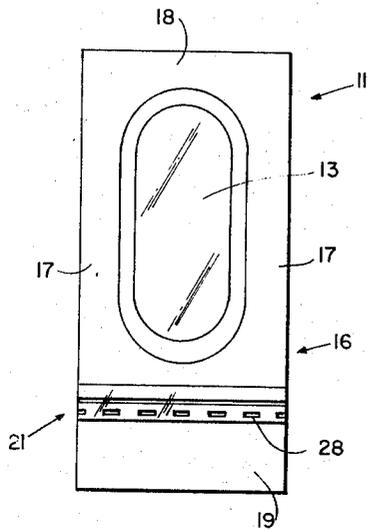


FIG. 1

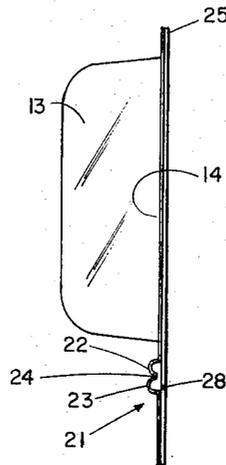


FIG. 2

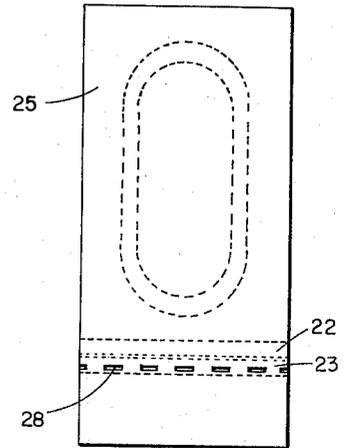


FIG. 3

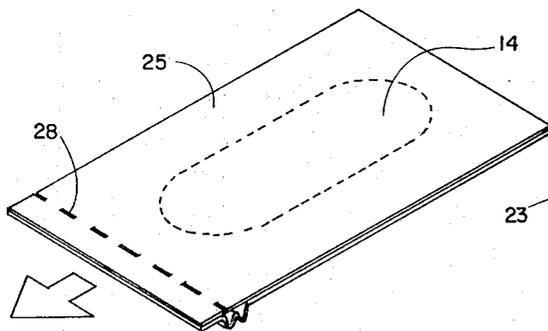


FIG. 4

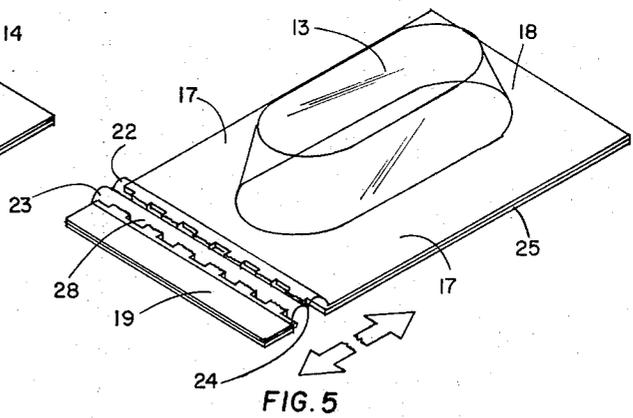


FIG. 5

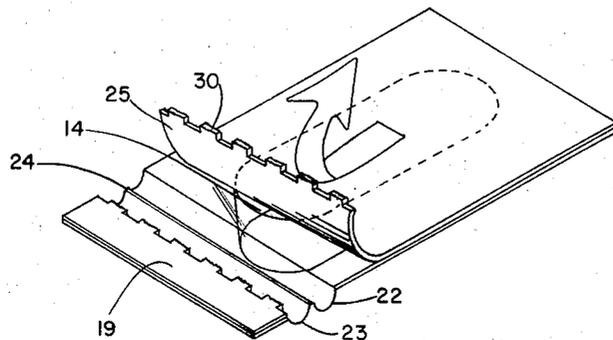


FIG. 6

CHILD-RESISTANT BLISTER PACKAGE

BACKGROUND OF THE INVENTION

Blister packages have been used for a number of years to provide an inexpensive means for packaging numerous small articles. In general, these blister packages comprise two principal layers, one being a plastic sheet having a depression or receptacle for receiving an article, and the other being a cover sheet of paper, polyester film and foil that seals the article within the plastic receptacle. Blister packages have been particularly useful in the pharmaceutical field for packaging unit dosages of capsules and tablets. Structures of this general type are disclosed in U.S. Pat. Nos. 3,054,503, 3,333,393 and 3,207,299. Until recently it has been the intention of the makers of such blister packages to provide easy means for gaining access to the medication therein. This has frequently been done by removing a portion of the relatively stiff plastic material at a corner of the package whereby only the backing or cover sheet remains. Thus, one could readily grip this corner of the cover sheet and peel it from the plastic material providing access to the contents of the receptacle.

However, the relatively easy access to medications in such blister packages has led to problems with respect to the accidental taking of such medication by children. This same problem has been dealt with in the container or bottle field by providing safety closures for the containers whereby young children are generally unable to open them. Thus, whereas the manner of dealing with this problem of easy access to the contents of a bottle has primarily centered on providing a means for making it more difficult to remove the cap from the bottle, it is apparent that a similar approach can be taken with respect to providing a means for making it more difficult to remove the cover sheet from a blister package.

One such effort has been made by Dorsey Laboratories, Division of Sandoz-Wander, Inc., Neb., whereby their unit-dose package utilizes a dual and separable layer cover sheet that seals each tablet within its individual blister package receptacle. Thus, a two-step operation is provided for removing the first or outer polyester film layer of the cover sheet, thereby leaving aluminum foil on the back of the package with no exposed corner portions for peeling it off. The means for removing the medication then calls for the second step of pressing the tablet through the foil which is thereby ruptured.

SUMMARY OF THE INVENTION

Applicant has dealt with the above-mentioned matter by making modifications in the plastic receptacle as well as in the protective backing and yet enabling one to mass-produce such packages on conventional filling equipment presently in use for unit-dose packages. A blister receptacle is formed from a stiff, flexible sheet material with a flange extending about all sides of the opening in the receptacle. In an area between the receptacle and a leading edge of the flange, a transverse arched portion is provided which may be in the form of a pair of flutes. A cover sheet of conventional material such as light-weight and tearable plastic, paper and foil is affixed over the opening of the receptacle and is congruent with the perimeter of the flanges in a sealing relationship. This backing or cover sheet has a weakened and rupturable portion that is in spaced juxtaposition with the flanges' leading flute. This weakened portion may comprise conventional perforations. In order to obtain a medication that is sealed within the receptacle

one need merely grip both flange ends of the blister package. This does not differ from the normal means of handling such a package. However, whereas in other cases one grabs an exposed portion of the cover sheet or would tend to flex the entire package, in this instance opening of the package is achieved by pulling opposite ends until the weakened or perforated portion of the cover sheet ruptures. Once this rupturing occurs one can readily grasp the exposed torn edge of the cover sheet that was directly in alignment with the leading flute and, consequently, not glued to the flange. The cover sheet may now be pulled off to obtain the medication.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top elevational view of an embodiment of the present invention;

FIG. 2 is a side elevational view thereof prior to opening the package;

FIG. 3 is a bottom elevational view;

FIG. 4 is a perspective view from the bottom of the package;

FIG. 5 is a perspective top view of the package after its cover sheet has been perforated; and

FIG. 6 is a perspective view as seen from the bottom of the package after rupture of the cover sheet and partial removal of it from the blister receptacle.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, the illustrated blister package 11 comprises the preferred embodiment of my invention and includes a blister receptacle 13 formed from a stiff, flexible sheet material having an open side 14. The material used is normally a transparent one which will reveal the contents therein and is generally of a plastic material that is sufficiently stiff to prevent tearing. Ten mil polyvinyl chloride sheet material is suitable. The receptacle 13 may be made by normal thermoforming methods. An integral flange 16 extends about the perimeter of the open side 14 of the blister receptacle. Flange 16 is shown in a rectangular form having sides 17, a back edge 18 and a front or leading edge 19. This particular configuration is not a limiting feature of my invention inasmuch as other configurations such as circular flanges or oval flanges may be used.

Between the leading edge 19 of the flange and the blister receptacle, a transverse arched portion 21 is provided which may be best seen in FIG. 2. This arched portion in the preferred embodiment comprises a pair of parallel flutes 22 and 23 extending across the entire width of the flange. Flutes 22 and 23 may be of substantially hemispherical configuration and are formed again from conventional thermoforming techniques simultaneous with the forming of the blister receptacle 13. These flutes are separated by a thin ridge 24 which likewise extends along the full width of the flange.

Cover sheet 25 may be of a thin sheet material which is preferably difficult to tear and resistant to puncturing. Thus, cover sheet 25 may comprise three layers of paper, polyester film and foil with the foil side being adjacent the blister receptacle and having a thin coating of an adhesive material for subsequent thermosealing to the flange 16. This type of lamination makes the resulting cover sheet extremely resistant to puncturing or tearing and has been highly received in other types of

conventional blister packages in views of its excellent vapor barrier which preserves the medication therein. As shown in FIGS. 1 and 3, this cover sheet has a weakened and rupturable portion which may comprise a series of spaced cuts 28 or perforations. It is noted that this weakened area is in spaced juxtaposition with the flange's transversely positioned arched portion 21, and preferably is enveloped by the leading flute 23.

Protective cover sheet 25 may be heat sealed to the plastic flange surrounding the blister receptacle by conventional heat pressure means. However, in performing this step one should take care to avoid the flattening of flutes 22 and 23. Thus, the female heat seal fixture, in addition to having a cavity for receiving the receptacle, may have a transverse cavity for receiving the arched portion 21. The second die is of standard design and has a flat surface which presses the cover sheet to flange 16. The net result of such a heat-pressure technique is the adherence by a thermoadhesive of the flange surrounding the blister package to substantially all of the cover sheet. The one portion of the cover sheet that is not in adhesion with the flange is that which is directly spaced from the pair of raised flutes. The weakened portion is spaced from the leading flute 23. Ridge 24 between the flutes may be minimally adhered to the flange. Depending on the nature of the equipment that is available for adhering the cover sheet to flange 16, registry of perforations 28 with flute 23 may be difficult. Thus, the perforations may be made after adhesion to flange 16 by the use of a perforating roll that passes over the cover sheet spaced from flute 23.

With the package now sealed and containing a tablet or capsule it is relatively difficult for a young child to remove the medication therein. If the child has become acquainted with conventional blister packages, he will attempt to peel off the protective cover, but inasmuch as no free corner portion is exposed for gripping he will be unable to accomplish this. The strength of the blister receptacle and the protective cover sheet that is attained from a proper selection of materials that are conventional in the art will prevent the child from readily smashing or puncturing the package. Likewise, he will have considerable difficulty in attempting to tear one of these materials.

The above-described construction is such that even an uninformed adult could initially have a difficult time in removing the medication from the blister package. However, this can be achieved by a simple two-step, pull-peel method once the individual is able to comprehend the proper techniques. For the first step (FIGS. 4 and 5) the flange's leading edge 19 is pulled by gripping it and the back edge 18. Thus, as shown in FIG. 5, the weakened area of the protective cover sheet is severed along a line falling through the cuts or perforations 28. Simultaneous with this rupturing, ridge 24 will be separated from the cover sheet. This rupturing is caused by the accordian-like action of the pair of flutes which will expand as the appropriate tensile force is applied in opposite directions on the two ends 18 and 19 of flange 16. As shown in FIG. 5, these flutes are in a temporarily depressed and lengthened condition and the cover sheet thereunder is fully separated along its width. Without these flutes or other type of arched portion the tensile strength of flange 16 would prevent por-

tion 28 of the cover sheet from rupturing.

The second step for removing a pill is to grasp the now exposed torn edge 30 of the cover sheet as shown in FIG. 6 and peel it off of the blister receptacle, thereby exposing open side 14 of the receptacle and permitting access to the tablet or capsule therein. Although perforations 28 could be positioned under flute 22 instead of flute 23, it would be more difficult to peel off the cover sheet since torn edge 30 would barely be extending from the flange. The exact dimensioning of the arched portion 21 and weakened area 28 of the cover sheet may vary depending upon the type of materials used. A primary consideration that is to be followed is to ascertain the appropriate amount of cover sheet that is to be removed or cut along the weakened area 28 in order to assure separation without requiring excessive force and yet resist separation by the small amount of force that a child might apply should he tend to pull at each end of the flange. Arched portion 21 must be of a configuration that will permit it to expand when tensile force is applied to the flange's two ends. It has been found that although this requirement can be met by a single arc, or a rectangular or triangular portion, least resistant to expansion occurs with two or more flutes.

I claim:

1. A child-resistant blister package comprising: a blister receptacle formed from a stiff flexible sheet material and having an open side for receiving articles therein; a flange integrally extending about the open side of said blister receptacle; said flange having a transverse expandable portion spaced between a leading edge of said flange and said blister receptacle; and a cover sheet extending across the open side of said blister receptacle and adhering to said flange; said cover sheet having a weakened and rupturable portion in juxtaposition with said flange's transverse expandable portion serving to rupture upon pulling said flange's leading edge to stretch said flange's expandable portion to expose a ruptured edge of said cover sheet for peeling from said blister receptacle.
2. A child-resistant blister package in accordance with claim 1 in which said cover sheet coincides with the perimeter of said flange.
3. A child-resistant blister package in accordance with claim 1 in which said expandable portion extends across the entire width of said flange.
4. A child-resistant blister package in accordance with claim 3 in which said cover sheet's rupturable portion is spaced from said flange's transverse expandable portion.
5. A child-resistant blister package in accordance with claim 4 in which said flange's expandable portion is an arched configuration.
6. A child-resistant blister package in accordance with claim 5 in which said flange's expandable portion is a pair of parallel flutes.
7. A child-resistant blister package in accordance with claim 6 in which said cover sheet's rupturable portion is a line of spaced cuts in alignment with the leading flute of said parallel flutes.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,872,970
DATED : March 25, 1975
INVENTOR(S) : Jack Roger Edison

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 3, line 2, change the numeral "1" to --- 2 ---.

Signed and sealed this 17th day of June 1975.

(SEAL)

Attest:

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Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
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