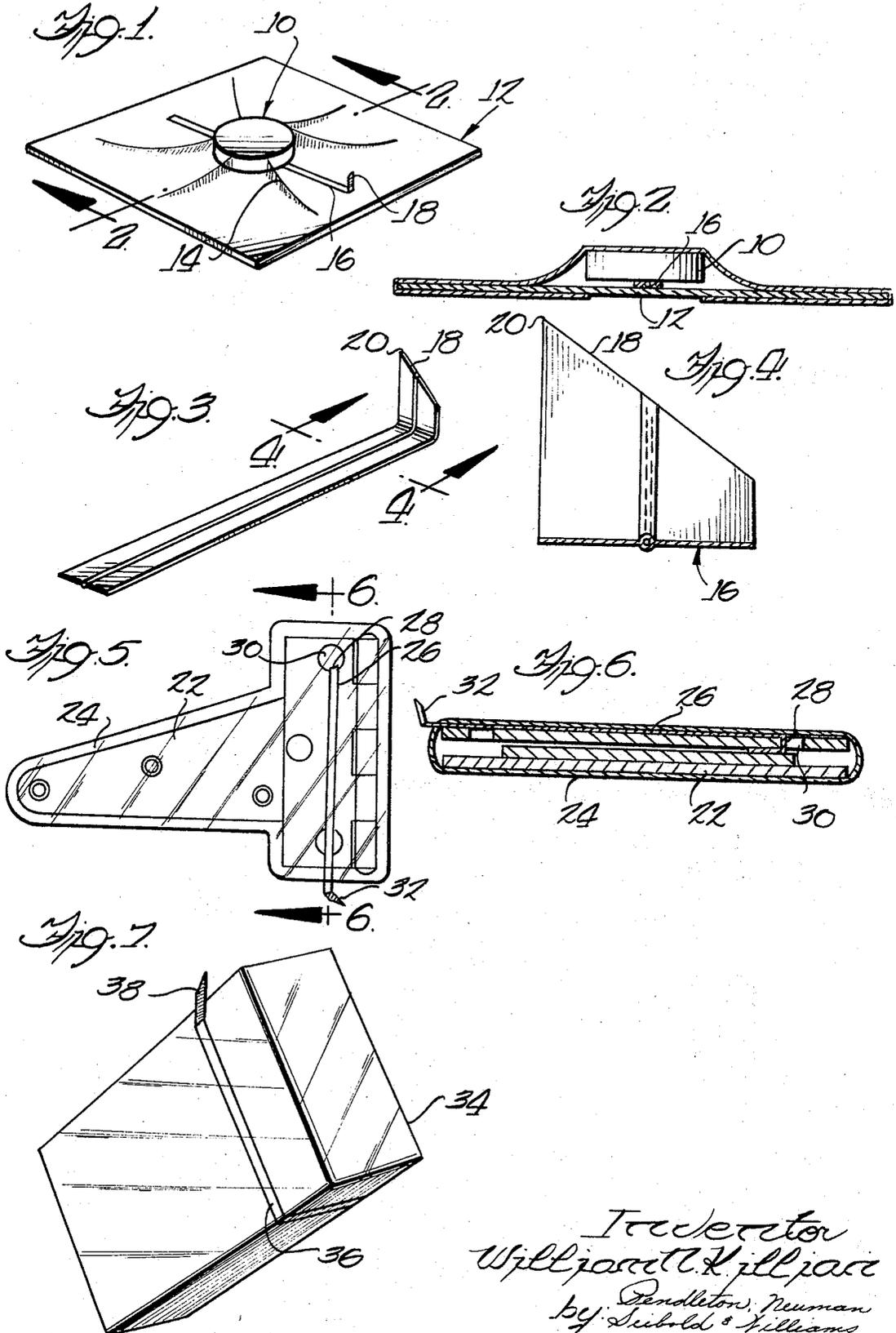


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**PACKAGE AND PROCESS**

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13 Claims

**ABSTRACT OF THE DISCLOSURE**

A relatively rigid tear strip is attached at one end to an article to be packaged in a film and the other end is turned outward so that upon shrinking or drawing in of the film about the article the upwardly projecting end will penetrate the film, thereby providing an exposed tab for the tear strip.

This invention relates to a package and has for an object the provision of a method of forming a package having a tear strip.

In recent years, packaging procedures have been developed in which articles are packaged directly in thin films of transparent plastic materials. Certain of the methods involve surrounding the article to be packaged with the film and then drawing the film snugly or tightly around the package either by heat shrinking or by applying a pneumatic pressure differential between the film and the article. The resulting articles are known to the art as shrink film packages or skin packages and have an advantage in that they are tamper-proof. The plastic films that have been used in the preparation of packages of this type are polyethylene, polypropylene, polystyrene, polyvinyl chloride, polyethylene-terephthalate, polymeric amides and the like. These plastic films, however, are tough and are sometimes difficult to tear open so that it may be difficult to remove the article from the package.

Accordingly, it is a further object of this invention to provide a tamper-proof package which may be readily opened by the consumer.

A further object of this invention is the provision of a process of preparing a package which may be carried out with standard packaging techniques utilizing readily available materials.

A further object of this invention is the provision of a package and process which will be readily acceptable to the industry and which may be used for packaging a wide variety of articles.

Further and additional objects will appear from the following description in the appended claims.

In accordance with one embodiment of this invention, a shrink film package is prepared having incorporated therein a tear strip including a projecting tab which will permit the package to be readily opened when desired. This tear strip underlies the shrink film adjacent the article in the package and is normally anchored or secured to the article at one end in such a way that when the exposed tab end at the other end of the tear strip is pulled the skin film will be ruptured to permit the article to be readily removed from the package. The tear strip is relatively rigid in nature, suitable examples being metal wire reinforced paper strips, metal ribbon reinforced fabric strips, metal wire reinforced plastic strips, unreinforced but relatively stiff metal or plastic wires or ribbons and the like.

In the process of preparing the package, the tear strip is affixed or anchored to the article to be packaged at one end and the other end of the tear strip is arranged to project outwardly from the surface of the article. This other end constitutes a tab for the tear strip and is formed or contoured so that it will readily puncture the plastic shrink film. Thereafter the plastic film is placed around

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the article and is heat shrunk by conventional techniques. This shrink procedure draws the film around the article and the tear strip and at the same time the projecting end or tab of the tear strip punctures the film so that the tab is exposed but film fits closely around the base of the tab. Accordingly, a package results in which the article is encased within the shrink film but the tab projects through the film so that when the package is to be opened the tab may be grasped and pulled, thereby tearing the film to permit the article to be removed.

While the invention finds particular utility in connection with shrink film packages, it is also useful in the formation of packages in which the film is drawn around the article to be packaged and over the pierce point of the tab of the tear strip by pneumatic methods such as by the application of a vacuum to that side of the article opposite to which the film is positioned. The pneumatic technique is also well known in the packaging art.

The invention has applicability in the packaging of a large variety of articles. For example, auto ignition points, miniature batteries, door hinges, drawer handles, camera film, writing implements and apples are examples of articles that can be packaged by this process. In the packaging of certain articles such as auto ignition points, miniature batteries or fruit, which may not provide ready means for anchoring the tear strip at a point remote from the tab, it may be desirable to package them on a mounting board in which event the strip is anchored to the board and the board becomes a part of the article to be packaged. The invention is particularly adaptable to the preparation of packages of this latter type.

For a more complete understanding of this invention, reference will now be made to the accompanying drawings in which:

FIG. 1 is a perspective view of a package containing a miniature battery supported on a mounting board and prepared in accordance with one embodiment of this invention;

FIG. 2 is a sectional view taken along the line 2'-2' of FIG. 1;

FIG. 3 is a perspective view of the tear strip used in the package shown in FIGS. 1 and 2;

FIG. 4 is a sectional view taken along the line 4'-4' of FIG. 3;

FIG. 5 is a top plan view of a door hinge packaged in accordance with one embodiment of this invention;

FIG. 6 is a sectional view taken along the line 6'-6' of FIG. 5; and

FIG. 7 illustrates still a further embodiment of this invention.

With reference to FIGS. 1 through 4, the package comprises a miniature battery 10 supported on a mounting card 12 and encased within a polyethylene shrink film 14. A tear strip 16 is adhesively secured to the mounting board 12 and underlies the shrink film 14. In the embodiment shown, the tear strip also underlies the battery 10. The tear strip 16 is relatively rigid and is provided with a tab end 18 which projects through the shrink film 14. When access is desired to the article 10, the tab 18 is grasped and pulled away from the card. Because of the fact that the tear strip is adhesively secured or otherwise anchored to the card, the strip will not pull out between the film and the card but will rather tear the film as it is stripped away from the card to give access to the article.

In the preparation of the package shown in FIGS. 1 and 2, the tear strip 16 is adhesively secured to the card 12 except for the tab portion 18 which projects away from the surface of the card. Thereafter the battery or other article 10 is placed on the tear strip and the entire assembly is wrapped with a film of a heat shrinkable polyethylene. The assembly is then subjected to a conventional heat shrinking process whereby the film is

drawn snugly around the composite article comprising the card 12 and the battery 10 and at the same time the tab 18, which is provided with a point 20 or other piercing configuration, punctures the film and the film draws down over the surface of the tab leaving the tab exposed.

In the embodiment of the invention shown in FIGS. 5 and 6, there is provided a door hinge 22 encased within a heat shrunk plastic film 24. A tear strip 26 overlays one section of the hinge underneath the film. One end 28 of the tear strip passes through a screw opening 30 in the hinge and is bent back upon itself so that the tear strip is anchored or held against longitudinal displacement toward the opposite tab end 32. The tab end 32 projects from the surface of the hinge and the film so that when the tab is grasped and pulled away from the hinge, the film will rupture thereby freeing the hinge from the package. This package is formed in essentially the same manner as described above in connection with FIGS. 1 and 2. The tear strip 26 is a metal wire reinforced plastic ribbon which is bendable to form the reverse bend 28 but is sufficiently rigid so that in cooperation the pointed contour of the tab 32 the film 24 will be punctured as it is heat shrunk over the surface of the hinge.

FIG. 7 shows a box-like article 34 which is entirely encased within a heat shrunk film and provided with a tear strip 36 having a projecting pull tab 38, also assembled in accordance with this invention. In this instance the tear strip extends partially around the packaged article 34 and may be adhered or otherwise secured thereto at an end remote from the tab 38 so that the tear strip will be sufficiently anchored to permit the film to be ruptured when the tear strip is pulled. However, with certain articles sufficient anchoring may be provided by the several bends of the relatively rigid tear strip around the corners of the article 34.

Film packaging machines such as the Model MAS-1-20 slide pack machine available from Phillips Films Company, Cincinnati, Ohio, may be used to package the article after the tear strip is properly positioned relative to the article. A Model HT-81618 heat shrink tunnel available from Phillips Films Company, Cincinnati, Ohio, may be used to shrink the film above the article and tear strip. One film suitable for practicing this invention is 0.001 thick See-Safe "Contour-S" polyethylene film for shrink wrap packaging available from Phillips Films Company, Cincinnati, Ohio. Generally, the film will range from about 0.0005 to 0.010 inch thick, but preferably it will be in the range of from about 0.001 to 0.003 inch thick. As previously suggested, tear strips suitable for this application include the metal wire reinforced paper strips, metal wire reinforced plastic strips, metal ribbon reinforced strips, and unreinforced but relatively stiff metal or plastic wires or strips. The only requirement is that the strip is attachable to the article or the backing and that a short unsupported end section, approximately ¼ inch long, is sufficiently rigid and sharp that it punctures the warm shrinking film. In certain cases the rigidity and sharpness are provided by the metal reinforcing wire.

#### EXAMPLE I

A 4 inch x 4 inch corrugated cardboard sheet had a ¼ inch wide single steel wire reinforced paper tear strip adhesively bonded to the surface near one edge of the sheet. The strip extended across the face of the sheet to near the opposite edge where the end was turned perpendicularly away from the face of the sheet. An auto ignition points assembly was placed on the face of the card and the point assembly and card were sealed in 0.001 inch thick heat shrinkable polyethylene film with a Phillips Films Model BM #3 Bench Model heat sealer. Next, the package was passed through a Phillips Films Model HT-81618 heat shrink tunnel.

On shrinking against the end of the wire reinforced paper tear strip, the strip punctured the film and on

completion of the shrinking step, the end of the strip projected about ¼ inch through the film and the film fit snugly against the strip leaving no apparent opening in the package. Several days after packaging this article the end of the tear strip was grasped with the thumb and forefinger and pulled away from the face of the package. The strip tore open the film exposing the point assembly for easy removal.

#### EXAMPLE II

A large decorative strap-type door hinge approximately 4 inches wide and 9 inches long has a wire reinforced plastic strip about ¼ inch wide and 9½ inches long attached to one end of the hinge by inserting about ½ inch of the end of the strip through one of the screw holes located about ½ inch from the hinge end and then folding it flat against the hinge on the other side. The remainder of the strip is laid flat along the face of the hinge leaving about ½ inch projecting beyond the end of the hinge. The hinge is then heat sealed in 0.002 inch thick heat shrinkable polyethylene film by a Phillips Films Model MA-1-20 packaging machine and then heat shrunk in a Phillips Films Model HT-81618 heat shrink tunnel. The strip penetrates the film as it shrinks against the hinge leaving about ½ inch of the strip exposed. In the area of the penetration no apparent space is evident between the hole in the film and the strip. The film is conveniently removed from the hinge by grasping the exposed strip and pulling it away from the face of the hinge thus tearing open the film.

While several particular embodiments of this invention are described above, it will be apparent that many modifications may be made without departing from the spirit and scope of the appended claims.

What is claimed is:

1. A package including a film of plastic drawn snugly over a packaged article and an elongated tear strip affixed to said article and underlying said film, said tear strip comprising a relatively stiff longitudinal filament and having one end passing through a punctured opening in said film whereby to provide an exposed tab for manually pulling said tear strip away from said article to rupture said film.

2. The package recited in claim 1 in which said film is heat shrunk around said article.

3. The package recited in claim 1 wherein said tear strip is anchored to said article at an end remote from said tab independently of said overlying film.

4. The package recited in claim 1 wherein said strip is adhesively secured to such article but separable therefrom when the tear strip is pulled to rupture said film.

5. The package recited in claim 4 wherein said strip comprises a wire reinforced ribbon.

6. The package recited in claim 1 wherein the film completely encases the article except for the punctured opening embracing said tab.

7. The package recited in claim 1 wherein the article includes a mounting element at least partially covered by said film.

8. The package recited in claim 7 wherein the tear strip is adhesively secured to the mounting element.

9. The package recited in claim 8 wherein a portion of the tear strip is interposed between the mounting element and the article packaged.

10. A method of forming a package which comprises affixing a tear strip to an article to be packaged with one end portion of the tear strip extending away from the surface of said article, said end portion of said strip being sufficiently rigid and formed to provide a film puncturing means, covering said article with a plastic film, and drawing said film tightly around said article to package same whereby said film is simultaneously punctured by said end portion to expose a tab for said tear strip.

11. The method of claim 10 wherein said tear strip comprises a metal filament reinforced plastic tape.

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12. The method of claim 10 said tear strip comprises a wire reinforced fabric tape.

13. A method of forming a package which comprises affixing a relatively rigid tear strip to an article to be packaged with one end of the tear strip extending away from the surface of the article for a short distance, covering said article with a heat shrinkable plastic film, and then heat shrinking said film around said article to package same whereby said film is simultaneously punctured by said end portion thereby exposing a tab for said tear strip.

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