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PACKAGE AND METHOD OF MAKING SAME

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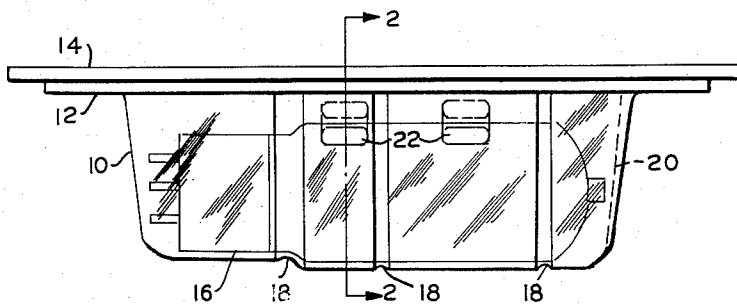


FIG. 1

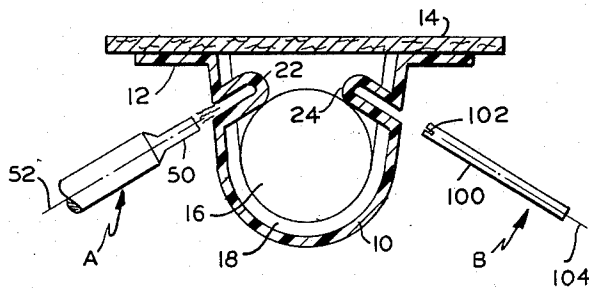


FIG. 2

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PACKAGE AND METHOD OF MAKING SAME

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2 Claims. (Cl. 206—1)

It is an object of this invention to provide an improved package of the shell or "blister" type in which the contents will be protected against impact regardless of the direction of impact relative to the package.

It is a further object of this invention to provide a method of making a package as aforesaid.

The above and other objects will be made clear from the following detailed description taken in connection with the annexed drawings in which:

Figure 1 is a side elevation of the improved package; and

Figure 2 is a section on the line 2—2 of Figure 1.

Shell or blister packaging in a very short time has become of real importance and this importance is increasing rapidly. Briefly, the blister pack consists of a thermoformed shell of transparent plastic mounted on a paperboard or other suitable card. The contents is placed in the shell and is held there by the card. While frequently the shell is molded to rough conformation with the shape of the contents, e.g.: flashlight bulbs, spark plugs, radio tubes, etc., there is not a tight fit. The present invention is intended to provide, for the first time, true three dimensional protection for the contents.

The shells are formed by a variety of methods all of which involve heating a sheet of plastic and bringing the heated sheet into conformity with a mold, cooling the sheet in contact with the mold and thereupon separating the sheet and the mold. The various methods used as well as the various suitable materials are thoroughly discussed in the 1958 edition of "Modern Packaging Encyclopedia," pages 434 through 437, for which reason they will not be dealt with in detail here.

Protection of the contents against shock in directions normal to the walls of the shell is provided by the formation of ribs or grooves in the sides, bottom and ends of the shell. These may be formed without reentrances, hence may be formed during the original molding operation. Such ribs or grooves, however, afford no protection against shock in a direction normal to the paperboard or the open mouth of the shell. In order to provide such protection, inwardly directed (reentrant) projections or protuberances are formed adjacent the mouth or open side of the shell. These projections are sized to keep the contents from making contact with the paperboard mounting, or from leaving the shell if no mounting is provided. In conjunction with the protection afforded by the ribs or grooves above discussed, complete three dimensional protection is afforded.

Referring now to Figure 1 there is shown a thermoformed plastic shell 10 having a lateral flange 12 surrounding its open side. The flange 12 is heat sealed to a sheet of paperboard 14. For purposes of illustration the contents is a radio tube 16. The shell 10 has been molded to rough conformity with the shape of the tube 16 and has formed in it grooves 18 for side and bottom protection and an end groove 20 for the same purpose. Neither the grooves 18 nor the groove 20 present reentrant surfaces such as would interfere with

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the draft of the mold in the forming of the shell. Therefore, were nothing else provided, and the package were dropped so as to land flatly on the paperboard 14, the only protection afforded the tube 16 would be the paperboard 14 itself, which, being virtually non resilient normal to its surface, is virtually no protection at all. To avoid this, in each side of the shell 10 there are formed a pair of projections 22 and 24 extending inwardly and overlying the tube 16 and providing cushions against impact normal to the paperboard 14. The size, shape and number of projections are immaterial. It is only necessary that these extend far enough inwardly to offer a construction barring access by the contents, in this case the tube 16, to the paperboard 14. In some cases, it is possible to form these projections prior to the insertion of the contents, where, due to the thinness of the shell or its inherent resiliency (for example polyethylene) or the structural design of the shell itself, sufficient yield is permitted so that the contents may be "snapped" into place. Usually, however, the projections will be formed after the contents is in the shell and, as may be convenient, either before or after the flange 12 is heat sealed to the paperboard 14.

At the lefthand side of Figure 2, designated generally as A, is illustrated one method of forming projections such as 22, while on the righthand side of Figure 2, designated generally as B, is illustrated an alternative method for forming projections such as 24.

In method A, a nozzle 50 is profiled to conform to a projection 22 and is reciprocable by means not shown, toward and from the shell 10 along a line 52. A valve not shown, serves to connect the nozzle 50 alternately to a source of hot and of cold air. In operation, the nozzle 50 is first connected to the hot air supply and then advanced along the line 52 toward the shell 10. The hot air softens the shell 10 and permits the nozzle 50 to deform the material of the shell into the projection 22. When the projection 22 is almost complete, the nozzle 50 is shifted to the cold air supply which serves to chill and harden the material of the shell and facilitate withdrawal of the nozzle 50 while leaving the projection 22 in the form shown. In practice, of course, this would be done individually and simultaneously for as many projections as may be desired.

In method B, a rod 100 is provided having a cross-section equivalent to the internal cross-section of a projection 24. The rod 100 has at its forward end a metallic heating element 102 and is reciprocable by means not shown along a line 104. The heating element 102 is connected into an "impulse sealing" circuit of the type shown in Patent 2,460,460 dated February 1, 1949. The rod 100 advances along the line 104 toward the shell 10. At the moment the forward end of the rod 100 touches the shell 10, the element 102 is abruptly heated to above the softening point of the shell 10. Continued advance of the rod 100 with the element 102 hot-draws the material of the shell into a projection 24. When the rod 100 reaches the end of its forward movement, the element 102 is disconnected and being of small mass, cools immediately, thus facilitating withdrawal of the rod 100 and leaving fully formed projection 24.

Methods A and B have the following in common: localized heating of a predetermined area of the shell, accompanied by inward pressure on a predetermined area to deform the shell, followed by cooling and relief of the pressure.

I claim:

1. A method of packaging comprising: placing an object in a shell moulded from plastic material; heat-sealing said shell to a sheet of paperboard whereby to close said shell with said object contained therein, and thermally deforming said shell to provide a constricted pas-

sage between said object and said sheet of paperboard.

2. A package comprising a blister drawn from a sheet of plastic material, said blister having an open mouth lying substantially in a single plane, said blister having formed therein at least one inwardly projecting rib lying in part, at least, opposite said open mouth said rib extending around the blister from one side of the open mouth to the other, said blister having also formed there-

in at least one inwardly extending projection adjacent said open mouth but lying wholly below the plane of said mouth.

References Cited in the file of this patent

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