Jan. 25, 1955 L. E. DE S. HOOVER 2,700,460

SHOCK RESISTING PACKAGE

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Fig. 1.

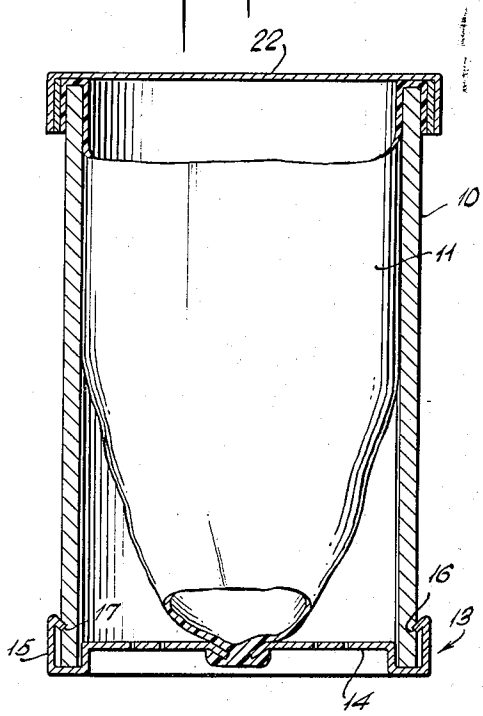


Fig. 2.

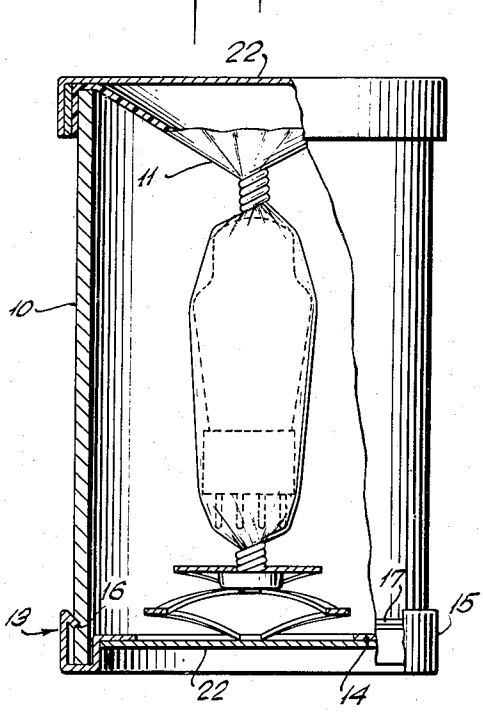
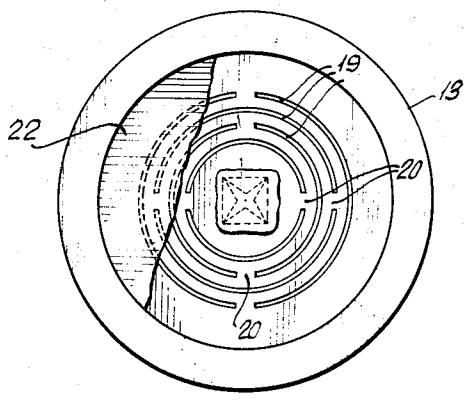


Fig. 3.



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SHOCK RESISTING PACKAGE

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3 Claims. (Cl. 206—46)

This invention relates to a shock resisting package for the handling and storing of frangible articles.

It is an object of this invention to provide a new and improved package of the character described in which the packaging elements will be easy to assemble with the article to form the package, and in which the article will be supported from shock in every direction.

It has been found necessary, in many cases to pack delicate devices such as radio tubes, instruments having fine adjustments and the like in many layers of packing material so that they won't be ruined in the ordinary course of storing and handling. It is an object of this invention to provide a package which will give better results, with greater ease of assembling.

In the following description taken with the accompanying drawings there is shown an embodiment of the invention, in which Fig. 1 is a vertical section of the packaging element from which the package may be made, and Figure 2 is a side elevation thereof, partly in section. Fig. 3 is a bottom view.

In the drawings the numeral **10** is a tubular shell considerably larger than the article to be packaged, so that the latter may be supported in the center of the shell spaced from every side. This shell may be made from any material having the necessary stiffness, for many purposes cardboard being sufficient.

A flexible tube **11** preferably resilient, of only slightly less diameter than the inside of the shell lies within the shell and has its upper end attached to the rim of the upper end of the shell. This may be readily accomplished by drawing the tube down over the outside of the shell, where it may be glued or otherwise held in any convenient way, as for example by a ring.

Rotatably mounted on the bottom end of the shell **10** is a base **13** preferably having its center inset as shown at **14**, to fit into the inside of the end of the shell. It is also preferably provided with a circumferential upturned flange **15** fitting over the outside of the shell, and terminating in an inwardly and downwardly turned lip **16** fitting into a circumferential groove **17** in the shell.

The bottom end of the tube is gathered together at the center, and forced through a non-circular opening in the center of base **13**. This opening may be so cut as to provide teeth to engage the bunched end of the tube without cutting it, and thus assist in causing the tube to rotate with the base.

The twisting of the tube as will be later described, tends to shorten it. To compensate for this tendency, the base is so constructed that its center will yield resiliently, in the direction of the axis, while still maintaining rigidity against twisting strains.

A practical form for such a base is shown in Figure 3 in which the central portion is slotted along the lines of concentric circles in arcs each of which is somewhat

less than an even division of the circle thus leaving between the slots **19** connecting bars **20**, the connecting bars of one circle being opposite to the centers of the slots of adjacent circles.

With the packaging element as above described, the tube because it is gathered together at the bottom, assumes a somewhat conical form. In assembling the package of this invention, it is only necessary to drop the article to be packaged into the tube where it will be supported, spaced from the bottom by the conical shape of the tube. While the article is in this mid position, the base is turned to start twisting the tube into a central rope like core. On continued twisting however the portion of the tube below the article gets twisted as tight as it will go, and the article itself starts to turn, twisting the tube into another rope above the article. This last twisting draws in the material of the tube from the rim of the shell to the top of the rope, forming a conical form which gives a resilient support to the upper rope. Ordinarily after the base is twisted until the whole tube above and below the article is in tension, the pull of the tube in an axial direction creates sufficient friction against the tube to hold the base against unturning. Many methods are available and will readily suggest themselves to prevent turning back, if in any case it be desirable. It should be remembered in this connection that the simplest way of removing the article from the package is deliberately to untwist the base.

I prefer to provide the package with an imperforate cover at both top and bottom in order to prevent foreign matter from falling in, and to prevent damage to the tube. I have indicated these caps by the numeral **22**.

I claim:

1. A shock resisting package comprising a hollow shell, a flexible tube within said tube, an article centrally placed within said tube and shell, said tube being twisted together above and below said article, the tube being attached to the rim of the shell at the top above the upper twist, and being gathered together and attached to the center of the bottom below the bottom twist, said rim and bottom being relatively rotatable and said tube being twisted tight enough to hold the tube under tension, supporting the article out of contact with the sides of the shell.

2. A device according to claim 1 in which the attachment of the tube to the bottom of the shell includes a base rotatable on the bottom of the shell, having a central opening through which the gathered bottom end of the tube is passed and in which it is firmly held.

3. A device according to claim 1 in which the attachment of the tube to the bottom of the shell includes a base rotatable on the bottom of the shell, having its center attached to the gathered end of the tube, and having its center depressed to receive the end of the shell, and a cap member fitting over each end of the package.

References Cited in the file of this patent

UNITED STATES PATENTS

708,654	Montgomery	Sept. 9, 1902
1,074,415	Dieterich	Sept. 30, 1913
2,352,503	Walton	June 27, 1944
2,502,918	Beresford	Apr. 4, 1950

FOREIGN PATENTS

237,322	Great Britain	July 28, 1925