June 5, 1951 C. E. SLAUGHTER 2,555,863

AMPOULE PACKAGE

Filed Sept. 23, 1947

Fig. 1.

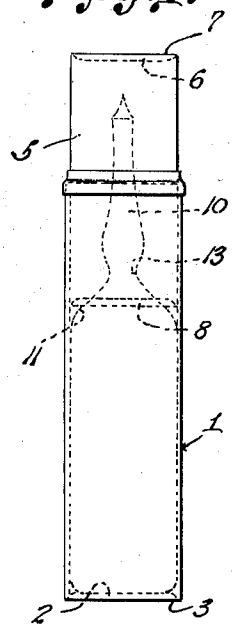


Fig. 3.

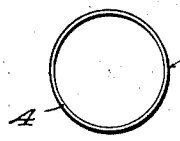


Fig. 2.

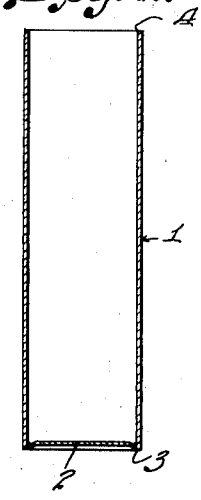


Fig. 4.

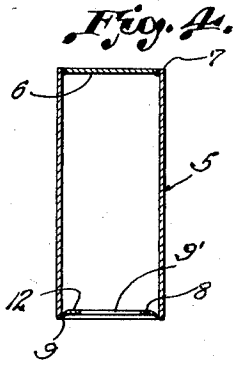


Fig. 5.

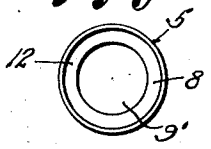


Fig. 6.

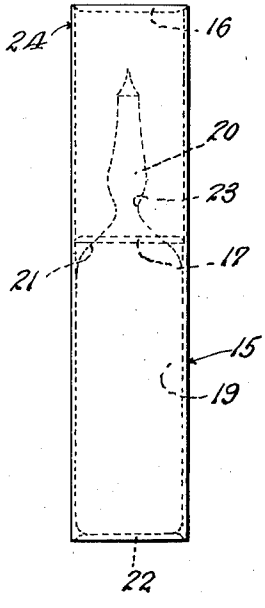
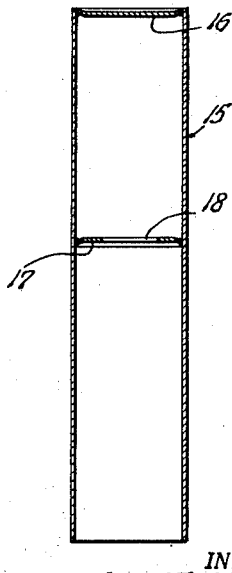


Fig. 7.



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Patented June 5, 1951 2,555,863

UNITED STATES PATENT OFFICE

2,555,863

AMPOULE PACKAGE

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Application September 23, 1947, Serial No. 775,630

2 Claims. (Cl. 206—46)

1

This invention relates to ampule packages and particularly containers for ampules and related articles.

Ampules containing substances to be protected such as pharmaceuticals, medicinals, chemicals, etc., are of frangible character, usually being made of glass or similar material which is quite fragile. Containers of this character are necessary when used for ampules because the neck or long stem of the ampule must be capable of being readily broken to permit access to the contents thereof. Because of the fragile character of these ampules, particularly when made from glass, packaging has always been a problem. In the prior art containers for ampules have usually been made of cardboard with various devices for maintaining the ampules in position to avoid vibration in shipment or use which is likely to break the ampule. But such prior art packaging has not been satisfactory for a number of reasons.

Among the objects of the present invention is the production of a container for a frangible ampule which is economical to produce, which relieves the ampule from any possible strain in shipment or use and fully protects it.

Other objects include containers which enable the ampule to be reached readily for removal of the contents.

Still further objects and advantages of the present invention will appear from the more detailed description set forth below, it being understood that such more detailed description is given by way of illustration and explanation only, and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In connection with that more detailed description, there is shown in the accompanying drawing, in

Figure 1, one form of package produced in accordance with the present invention including the container and the ampule therein; in

Figure 2, a vertical cross-section through the outer telescoping section of the container of Figure 1; in

Figure 3, a plan view of the section of Figure 2; in

Figure 4, a vertical section through the inner telescoping section of Figure 1; in

Figure 5, a bottom plan view of the inner section of Figure 4; in

Figure 6, a modified form of package showing container and ampule therein; and in

2

Figure 7, a vertical section through the container of Figure 6 with one of the end closures removed.

In accordance with the present invention, packaged ampules of frangible character containing substances to be protected whether pharmaceuticals, medicinals, corrosive chemicals, etc., utilizing containers for such ampules, which containers are made in their entirety desirably, from thin flexible thermoplastic stock, which desirably may be transparent, the container being of such character as to protect the entire ampule against breakage but permitting ready access thereto when the contents of the ampule are to be removed therefrom.

Containers for packaging such frangible ampules are desirably made in accordance with the present invention from thin walled extruded thermoplastic tubing producing a thin walled thermoplastic cylindrical cartridge having a thin flexible thermoplastic closure at one end of the cartridge against which the base of the ampule abuts and a thin flexible perforated thermoplastic disc positioned in said cartridge at some distance from the closure so that the neck of the ampule may extend through said perforation with the shoulder of the ampule engaging against the perforated disc. In this way the ampule is locked in position securely between the thin flexible thermoplastic closure at one end of the cartridge and the thin flexible perforated thermoplastic disc in said cartridge whereby the cartridge protects the ampule in its entirety locking the ampule in place safely and free from any vibration.

In the most desirable form of containers produced in accordance with the present invention, the packaging of the ampule as well as access to the ampule to remove the contents thereof is facilitated by making the container in the form of telescoping sections, the outer section having a closure at one end against which the base of the ampule may abut while the inner section carries a perforated disc closure at one end thereof through which the neck of the ampule may extend with the shoulder of the ampule engaging against the perforated disc. In such telescoping arrangement, the telescoping sections may be moved into position while the ampule has been placed within them as further described below in order to adapt the container to the exact ampule being packaged regardless of variation in the length or contour of such ampule.

Considering the form of invention shown in Figures 1 to 5 of the drawing, illustrating the

container produced with telescoping sections, an outer section 1 of cylindrical contour and produced from thin walled flexible thermoplastic material is produced by any desired extruding operation or in any other way, one end of such section 1 having a closure 2 consisting of a thin flexible thermoplastic disc cemented or otherwise positioned in the end 3 of the section 1, the other end 4 of the section 1 being open. The inner telescoping section 5 is also desirably of a thin walled flexible thermoplastic material desirably of the same material as that of section 1 and also is desirably produced from extruded thermoplastic stock in any desired way but may be made in any other manner. Such inner section 5 has an outer diameter of a size to engage frictionally with the inner walls of the outer section 1 so that the diameter of section 5 is only slighly less than the inner diameter of section 1 in order to permit the frictional contact of the two sections but enables section 5 to telescope within section 1. Section 5 is provided with any type of end closure 6 desired, but also is desirably of a thin-walled flexible thermoplastic disc cemented or otherwise secured in the end 7 of section 5. The other end of section 5 carries a thin flexible perforated thermoplastic disc 8 which desirably is cemented at the other end of section 5 as at 9, the disc 8 carrying a perforation 9' centrally located therein and of a size so that the neck 10 of the ampule may extend through the perforation 9' while the shoulder 11 will engage against the solid portion 12 of the disc 8.

In use, the ampule is placed within section 1 in the position shown in Figure 1, and then the inner telescoping section 5 is moved into section 1 with the neck 10 of the ampule extending through the perforation 9' of the disc 8, section 5 being moved into section 1 until the solid wall 12 of the disc 8 engages against the shoulder 11 of the ampule and locks it securely in position. Since the ampule is held between the thin flexible discs 2 and 8, it is kept free from any vibration. The ampule is locked securely in position and where the plastic employed is transparent or at least translucent, the ampule is readily available for inspection of its contents.

Furthermore the telescoping sections permit the package to be adjusted to the ampules regardless of their variation in length. There is variation in all such products and they are not standard as to length. For example, an ampule having at its wider portion a ¾ inch diameter will have a tolerance generally of about $\frac{1}{16}$ inch variation in length. It is important that the ampule be securely locked in place. The telescoping sections, and particularly the intermediate disc 8 enables adjustment of the position of the sections regardless of any variation in the length of the ampule. The intermediate disc 8 being forced into place under slight pressure causes the ampule to be locked securely between the discs 2 and 8 and prevents any possibility of vibration reaching the ampule.

Furthermore since the ampule is locked securely in a position free from vibration, it is possible to nick the neck of the ampule as at 13 with a diamond cut for example, in order to indicate the point at which the neck is to be broken. This will not weaken the ampule sufficiently in the container referred to because of the secure protection which is obtained for the ampule in such a package. Heretofore, in packaged ampules, it has been necessary to include

a small file with each ampule or carton of ampules to enable the user to scratch or notch the neck of the ampule. The present invention eliminates the necessity for packaging files with the ampules, and also avoids the danger of breakage through lack of skill which frequently resulted from improper attempts to scratch or nick the glass.

Furthermore when the ampule is to be used or the contents removed therefrom, removal of the section 5 leaves the ampule in position in the outer section 1 and protects the user when the neck of the ampule is being broken for removal of the contents.

Desirably the package as shown in Figure 1 with the ampule positioned in place between the telescoping sections 1 and 5, are locked together by placing a band or tape of adhesive character such as "Scotch" tape around the sections 1 and 5 as shown to hold the sections in position. The tape is readily removed when it is desired to gain access to the ampule.

A modified form of the invention is shown in Figures 6 and 7 obtaining most of the advantages set forth above without the use of telescoping sections. In this instance the container may take the form of a thin walled flexible thermoplastic tube 15 desirably extruded and provided with a closure 16 desirably also of thin flexible thermoplastic disc-like character, cemented or otherwise sealed in position in the end of the tube 15. Intermediate the ends of the tube 15 and at a point a sufficient distance from the open end of the tube 15 as shown in Figure 7 to engage against the shoulder of the ampule, the intermediate thin-walled flexible thermoplastic disc 17 is cemented or otherwise secured in place in the tube 15 intermediate the ends thereof at the position indicated, the disc 17 having a perforation 18 through which the neck of the ampule may extend while the solid portion of the disc 17 engages against the shoulder of the ampule. In the use of this form of device, the tube 15 carrying end closures 16 and intermediate flexible disc 17 as shown in Figure 7 is utilized, the ampule 19 is inserted into the tube 15 with the neck 20 of the ampule extending through the perforation 18 while the shoulder 21 engages against the solid portion of the disc 17. An end closure 22 desirably of thin-walled flexible thermoplastic disc like material is then positioned in the end of the tube 15 as shown in Figure 6 abutting against the base of the ampule 19 with sufficient force to lock the ampule in position between the discs 17 and 22 and hold it securely there free from vibration. The disc 22 is sealed in position by cement or in any other way in the end of the tube 15. In the type of package shown in Figure 6, the neck of the ampule may be nicked or scratched as indicated at 23 for purposes analogous to those in connection with the scratch 13 of Figure 1. The package of Figures 6 and 7 utilizing a single tube of the character set forth without telescoping sections enables many of the advantages of the device of Figure 1 to be obtained but is not used as readily for removal of the ampule contents. Thus in the use of the package of Figure 6, the tube 15 must be cut through at a point such as 24 above the ampule. In use, therefore, the telescoping sections and package of Figure 1 offer some advantages over that of Figure 6 but both forms of the invention enable packaging of ampules to be readily produced economically, in containers that prevent breakage, enable ready adjustment to variation

in the length of the ampules, eliminate the necessity for packaging of files with the ampules, and secure a number of advantages as pointed out above.

The cross-sectional configuration of the containers may be of any desired character. It has been illustrated as circular but any other contour may be employed such as square, hexagonal, oval, etc., and adapted to any desired type of ampule or similar type of article. While transparent thermoplastics are desirably employed for the containers, they may be translucent or even opaque if visibility is not desired and the plastics may be dyed, pigmented, or otherwise colored.

Any desired type of thermoplastic material may be utilized particularly those that are available for extrusion purposes since the tubes and tubing employed in producing the containers are desirably those obtained by extrusion processes. As exemplary of such thermoplastic materials that may be employed there may be mentioned thermoplastic synthetic resinous materials including cellulose derivatives such as the esters and ethers, for example, cellulose acetate, cellulose nitrate, cellulose acetate butyrate, ethyl cellulose, benzyl cellulose, etc.; vinyl polymers and copolymers including polymerized vinyl acetate, polymerized vinylidene chloride, and copolymers of vinyl chloride and vinyl acetate; polymerized styrenes; methacrylate and methyl methacrylate resins, acrylate and ethyl acrylate resins, polyethylenes, nylon type resins, etc.

Having thus set forth my invention, I claim:

1. In a package, a frangible ampule containing a substance to be protected and a container therefor, said container comprising outer and inner telescoping sections, the outer section having a closure at one end against which the base of the ampule abuts the other end of the section being open, and the inner section movably telescoping within the open end of the outer section and having an end provided with a perforated disc closure, the neck of the ampule extending through said perforation with the shoulder of the ampule engaging against the perforated disc, the other end of the inner section extending beyond the outer section and having a closure at its outer end.

2. In a package, a frangible ampule containing a substance to be protected and a container therefor, said container comprising outer and inner telescoping sections, the outer section having a thin flexible thermoplastic closure at one end against which the base of the ampule abuts the other end of the section being open, and the inner section movably telescoping within the open end of the outer section and having an end provided with a thin flexible perforated thermoplastic disc closure, the neck of the ampule extending through said perforation with the shoulder of the ampule engaging against the perforated disc, the other end of the inner section extending beyond the outer section and having a closure at its outer end.

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