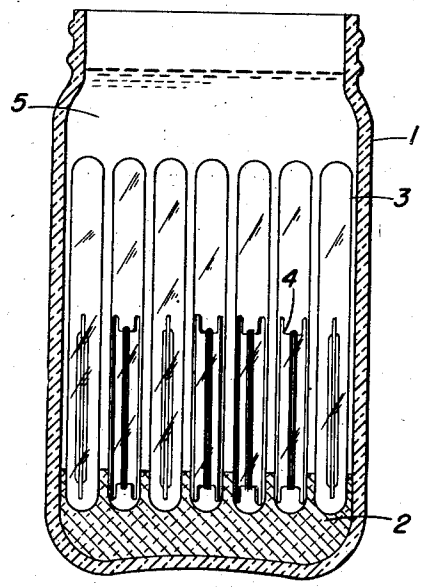
July 9, 1957 C. H. HAAS 2,798,601

SHIPPING PACKAGE FOR SUTURE TUBES

Filed Aug. 14, 1955

Fig. 1.



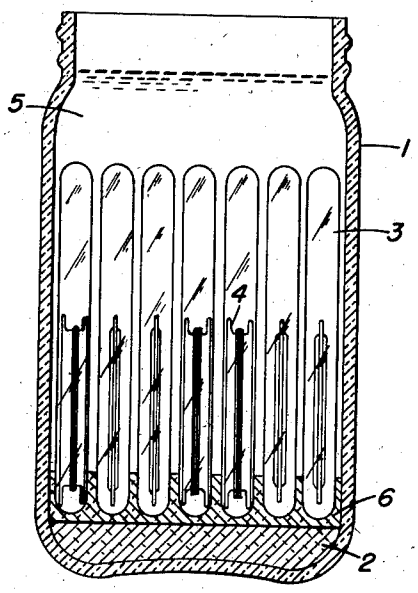


Fig. 2.

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SHIPPING PACKAGE FOR SUTURE TUBES

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4 Claims. (Cl. 206—63.3)

This invention relates to the packaging of sealed suture tubes, and more particularly relates to a package containing sealed suture tubes wherein the tubes are maintained in a sterile condition and breakage of the tubes in transit is minimized.

It has become an accepted practice of the medical profession to use sterilized surgical sutures which have been sealed in glass tubes containing a sterile suture tubing fluid which maintains the suture in a soft and pliable condition.

Suture tubes are commonly shipped in hermetically sealed containers which contain a sterilizing solution for the exterior of the suture tubes. In practice, a container is partially filled with a sterilizing fluid, which ordinarily is a 70% isopropyl alcohol solution containing a small amount of a bactericidal agent such as a formaldehyde solution, and the suture tubes containing the sutures are placed in the container and immersed so far as practicable in the liquid.

Although the containers, which frequently are glass jars or cans, are packaged in heavy corrugated boxes for shipment, the amount of breakage of the suture tubes is high. The suture tubes cannot be packed too tightly together in the container or otherwise the breakage would be even more severe due to the ordinary and normal handling shocks. Some space must be provided between individual suture tubes to keep the breakage loss down. Moreover, it is not practical to fill the container completely with the sterilizing fluid since it has flammable characteristics and some space must be provided at the top of the container to allow for changes in temperature, etc., which cause expansion and contraction of the liquid. Under certain conditions, therefore, the suture tubes tend to float in the sterilizing liquid and some of them come in contact with the head space above the liquid. When this happens, these suture tubes are unacceptable to the surgeon because of the possibility of non-sterility.

In accordance with the present invention, I have discovered a means whereby not only may an effective cushion be provided in the bottom of the container which serves to reduce the breakage of the tubes to a minimum, but my invention also provides a novel means for holding the individual suture tubes in place immersed in the sterilizing liquid and thus they are insured against contamination by contact with the head space above the liquid.

Referring to the accompanying drawing, Fig. 1 is a vertical sectional view of a container showing the suture tubes and sterilizing solution and embodying my invention, and

Fig. 2 is a modification thereof.

Reference numeral **1** designates a suitable container such as a glass jar which may be hermetically sealed and provided with a friction top. In the bottom of the container there is poured a quantity of a gelable material **2** such as hide or bone glue. The glue is allowed to set and then the suture tubes **3** containing surgical sutures wound on a notched strip **4** and a sterile tubing fluid (not shown) are pressed in place in the gel material a sufficient extent so as to hold the tubes in a vertical position. The container is then filled with the sterilizing fluid **5** to the

desired level. It will be seen by this arrangement that the suture tubes are cushioned against shock during handling or shipping by the layer of gelable material in the bottom of the container and the cushioning means also provides an effective means for retaining the suture tubes in place completely immersed in the sterilizing solution so that they cannot become detached and float to the surface so as to become possibly contaminated on contact with the air in the head space above the storage fluid. Thus, the suture tubes packaged in accordance with my invention are acceptable to the surgeon from a sterility standpoint and at the same time breakage of the glass tubes during handling and storage is reduced to a minimum.

In Fig. 2, provision is made for two layers of gelable material. Layer **2** serves as a cushion while layer **6** is more adhesive in nature and thus provides for better retention and proper spacing of the tubes in the jar. In this embodiment the two layers of gelable material are cast separately and may be of the same or of different formulations.

It is also within the scope of the present invention to cast a a preformed body of gelable material and then insert the suture tubes in an upright position into the body before hardening of the gelable material. The embedded tubes and precast material may then be inserted into the outer jar or can as a unit. This alternative arrangement offers some advantage in securing the proper spacing of the suture tubes in the gelable material during the packaging operation. In this situation, of course, the preformed pad is adhesively secured to the bottom of the container so that it is not detached when a suture tube is removed from the container.

The characteristics of the gelable material are such that it must provide the proper cushioning effect for the suture tubes so as to prevent breakage of the tubes during handling and shipping, and in addition the gelable material must be capable of adhering to the tubes sufficiently to retain them in place during transportation and yet permit them to be readily withdrawn therefrom by the surgeon when desired for use. In addition, of course, the gelable material must not be soluble in the storage fluid. I have found that hide glue fulfills these requirements admirably but the invention is in no sense limited to the use of hide glue, as other gelable materials possessing the desirable requirements may obviously be used.

I claim:

1. A shipping package of glass suture tubes, said package comprising in combination: a plurality of sealed glass suture tubes in substantially parallel configuration in an outer container, at least one suture in each tube, a sterilizing liquid surrounding and covering the suture tubes and substantially filling the container, and a layer of gelable material positioned in the bottom of said outer container, the sealed glass suture tubes being embedded in the layer of gelable material a sufficient distance so as to hold the suture tubes in an upright position whereby the tubes are cushioned against shock and are prevented from floating in the sterilizing liquid.

2. A shipping package according to claim 1 in which the gelable material positioned within the container is hide glue.

3. A shipping package according to claim 1 in which the container is a glass jar of substantially uniform horizontal cross-section.

4. A shipping package according to claim 3 in which the gelable material positioned within the jar is hide glue.

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