

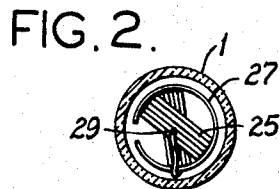
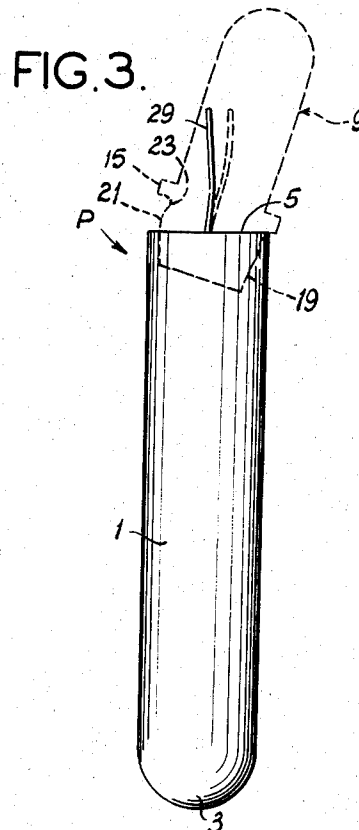
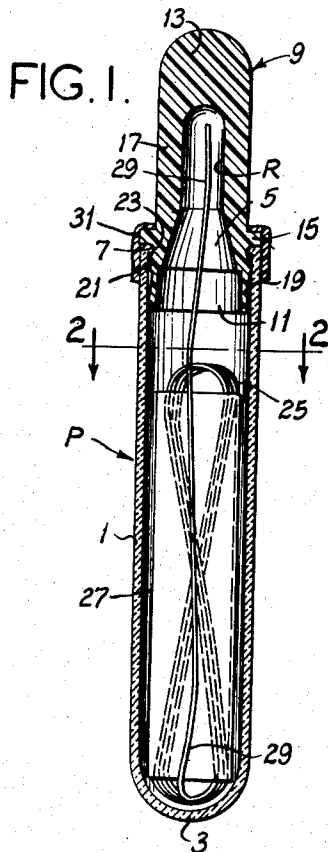
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LIGATURE PACKAGE

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2,870,906

LIGATURE PACKAGE

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2 Claims. (Cl. 206—63.3)

This invention relates to ligature packages, and more particularly to a package containing a wound or coiled sterile ligature.

Among the several objects of the invention may be noted the provision of a novel ligature package containing an individual sterile ligature from which the ligature may be delivered directly to a sterile table without any handling by a nurse and without having to break any glass tube, thereby eliminating the danger of broken glass on the sterile table; the provision of a ligature package of a novel construction comprising a tube having a removable closure which is formed to receive one end of a ligature contained in the tube, the arrangement being such that this end of the ligature projects from the tube when the closure is removed so that this end of the ligature may be readily grasped to remove the ligature from the tube; the provision of a ligature package of the character described wherein the closure is a stopper and wherein the tube and stopper are formed to resist endwise movement of the stopper out of the tube unless the stopper is first tilted relative to the tube, thereby insuring that the package remains sealed and the ligature remains sterile; and the provision of a ligature package having the stated features which is economical to manufacture. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention are illustrated,

Fig. 1 is a longitudinal cross section of a ligature package of this invention;

Fig. 2 is a transverse cross section taken on line 2—2 of Fig. 1; and

Fig. 3 is a view in elevation of the package showing in dotted lines how the stopper thereof is tilted for removal.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, a ligature package P of this invention is shown to comprise a cylindrical tube 1, which is preferably a rigid transparent tube made of glass. This has a closed end 3 and an open end 5. At its open end, the tube is formed with an inwardly directed annular bead 7. This may be formed by flaming the open end of the tube.

At 9 is indicated a removable closure or stopper for the open end 5 of the tube 1. This stopper is preferably molded of plastic material, such as polyethylene. It is of elongate tubular form, open at one end (its inner end) as indicated at 11, and closed at its other end (its outer end) as indicated at 13, having an elongate recess R which opens into the tube and extends beyond the open end of the tube. Intermediate its ends, and nearer its open end than its closed end, the stopper has an integral outwardly projecting flange 15 which engages the tube 1 at its open end. The outer diameter of this flange preferably cor-

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responds to the external diameter of the tube 1. The recess R extends beyond the flange 15.

The portion of the stopper between the flange 15 and the closed end of the stopper is preferably relatively thick-walled as indicated at 17, so that this portion of the stopper is relatively rigid. The portion of the stopper between the flange 15 and the open end of the stopper is relatively thin-walled so as to be resilient and constitutes an annular resilient skirt 19 which fits into the open end of the tube 1. This skirt has an external annular convex ridge 21 adjacent the flange 15 providing a shallow annular groove 23 immediately adjacent the flange 15 for receiving the bead 7 at the open end of the tube 1.

The external diameter of the ridge 21 of the stopper is larger than the internal diameter of the annular bead 7, and slightly larger than the internal diameter of the tube 1 below the bead. Upon entry of the skirt 19 of the stopper in the open end of the tube, the skirt is somewhat compressed as the ridge 21 slides past the bead 7. Then the skirt expands to provide for a tight fit of the ridge within the tube, and locking of the bead 7 in the groove 23.

There is indicated at 25 in the tube 1 a wound or coiled ligature. The coil 25 is surrounded by a wrapper 27, which may be a paper label printed to designate the type of ligature. An end portion 29 of the ligature extends around the bottom edge of the wrapper label and up on the outside of the wrapper or label and reaches into the recess R in the stopper, extending beyond the open end of the tube 1. A seal of wax or any other suitable material may be applied as indicated at 31 hermetically to seal the stopper to the tube. It will be understood that the ligature is sealed in the package P in sterile condition. The package P may or may not contain an asepticizing liquid. The tight fit of the stopper and locking of the stopper in the tube with the flange 15 engaging the end of the tube and the provision of the seal 31 is most effective to maintain the ligature sterile.

It will be understood that the package P may be used in a container such as is shown in our copending application entitled Ligature Package, Serial No. 356,762, filed May 22, 1953, issued as Patent No. 2,788,893, April 16, 1957, in place of the glass ligature tube shown therein. Such containers, in the course of shipping and handling, are subjected to jostling which would tend to make the stopper 9 move endwise out of the tube 1 and break the seal 31 were it not for the interlock between the stopper and tube provided by the engagement of the bead 7 in the groove 23. While this interlocking makes the stopper difficult to remove by a direct endwise pull, the stopper is easy to remove by tilting it relative to the tube as shown in dotted lines in Fig. 3 to disengage the groove and bead (and break the seal). In the case of a package P containing asepticizing liquid, it is also desirable that removal of the stopper by a direct pull be made difficult to induce its removal by tilting thereby to avoid splashing the liquid, if any.

Upon removal of the stopper, the end of portion 29 of the ligature projects from the tube 1 and may be readily grasped to pull out the coiled ligature (and the wrapper or label) from the tube. The arrangement with portion 29 of the ligature extending up on the outside of the wrapper or label, as distinguished from having the wrapper or label surround portion 29, is important to insure that the coil comes out without unwinding.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying draw-

ings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. A ligature package comprising an elongate cylindrical tube having a closed end and an open end, said tube having an inwardly directed annular bead at its open end, an elongate stopper for the open end of the tube, said stopper having an outwardly projecting flange intermediate its ends engaging the tube at its open end, said stopper having a recess opening into the tube and extending outward beyond the flange, the portion of the stopper inward of the flange comprising an annular resilient skirt fitting in the open end of the tube, said skirt adjacent the flange having an external annular ridge providing a groove adjacent the flange for receiving the bead, and a ligature in the tube having at least one end projecting into the recess, said end of the ligature projecting from the tube when the stopper is removed.

2. A ligature package comprising an elongate cylindrical glass tube having a closed end and an open end, said tube having an inwardly directed annular bead at its open end, an elongate plastic stopper for the open end of the tube, said stopper having an outwardly project-

ing flange intermediate its ends engaging the tube at its open end, said stopper having a recess opening into the tube and extending outward beyond the flange, the portion of the stopper outward of the flange being relatively thick-walled and hence relatively rigid, the portion of the stopper inward of the flange being relatively thin-walled and hence comprising an annular resilient skirt fitting in the open end of the tube, said skirt adjacent the flange having an external annular ridge providing a groove adjacent the flange for receiving the bead, a coiled ligature in the tube, and a paper label wrapped around the coil, an end portion of the ligature extending from within the label down and around to the outside of the label and thence up into the recess, the end of said portion of the ligature projecting from the tube when the stopper is removed.

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