

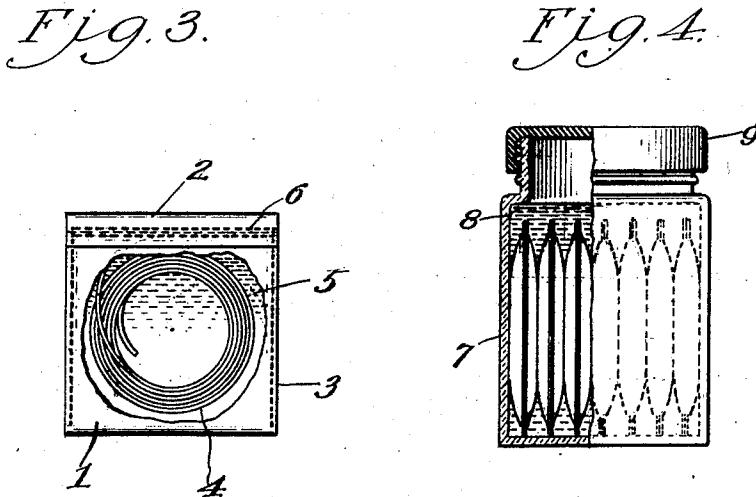
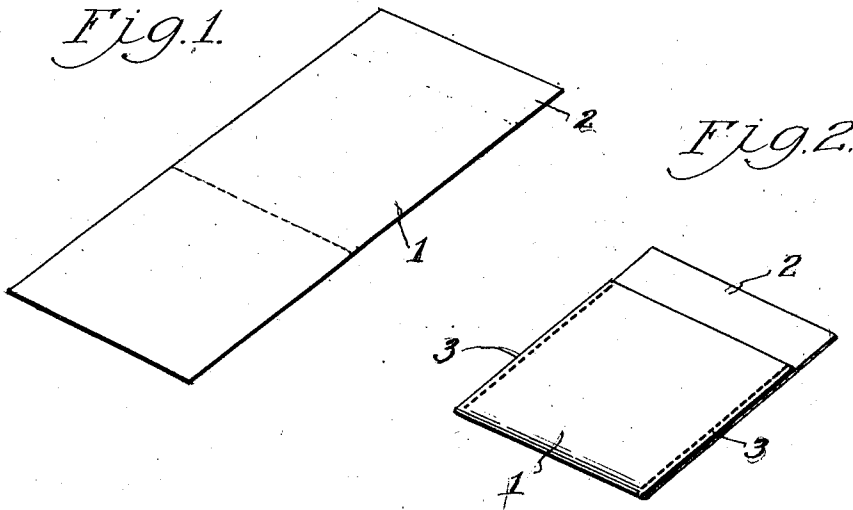
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LIGATURE OR SUTURE PACKAGE

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LIGATURE OR SUTURE PACKAGE

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This invention relates to a new enveloping container and method of packing sterile surgical ligatures or sutures in such condition that they will maintain their strength and pliability over a relatively long period of time without the danger incident to the use of the common and usual glass tube.

In recent years efforts have been made to avoid the use of glass tubes containing surgical sutures and preserving or germicidal liquids because of the breaking of such tubes, spicules of glass have caused slight wounds to operators or adhered to the ligature or suture. As a substitute for glass tubes various forms of fiber, paper, cellulose and similar flexible envelopes or capsules have been employed. It has been proposed to pack such containers either dry like glass tubes, or to wet pack them by immersion in receptacles or jars containing a covering germicidal solution. However, neither method has proved entirely satisfactory in actual use. When dry packed, the flexible envelope rapidly loses its flexibility and soon cracks or splits, and the germicidal preserving solution is lost, or such envelope is ruptured in handling or shipping because of its delicate construction. All of the wet pack envelopes are subject to the objection that the concentration of the solution in which the ligatures or sutures, such as catgut, ligaments, or the like are immersed, can not be held the same for any length of time, because each time the jar or receptacle is opened and an envelope is removed, there is a loss in the volatile portions of the liquid by evaporation or a change in the concentration of water in the liquid due to absorption of water vapor from the air. This destroys the balance of the concentration of the solution, and by osmosis, if the envelopes happen to have been sealed, the water and salt concentration, either or both, of the liquid bathing the ligature or suture is modified, and the surgical cord loses strength or pliability, both of prime importance to the surgeon.

One of the objects of my invention is to produce a ligature or suture package which, by preference, includes a receptacle containing any suitable germicidal preserving solution, and immersed in said solution are a plurality of flexible containers each containing a length of suture and a balanced germicidal preserving solution. I have found that, to prevent osmotic phenomena bringing about a change in the concentration of the suture bathing solution, the envelope or container must be non-permeable to water and ionized preserving solutions, such as the usual alco-

holic preserving solutions of potassium mercuric iodide, phenyl mercuric acetate or nitrate, and the like, such solutions usually containing from 2% to 5% water. I have also found that the only practical method of sealing such envelopes or containers is by some means whereby the seal becomes homogeneous with the body of the envelope or container, since if adhesives are used, or if clamps are employed, there is no assurance that the joint is tight and the seal will be found to have lost its flexibility and can not be relied upon to resist osmotic pressure.

The most desirable material possessing the desired characteristics has been discovered to be rubber hydrochloride or similar material, which is impervious to water and ionizable solutions. It also possesses the desirable property of lending itself to the formation of a homogeneous non-penetrable seal, which preserves the flexibility of the envelope or container.

In order that the invention may be fully understood, reference is to be had to the accompanying drawing, where one form of flexible container is illustrated, in which:—

Figure 1 is a perspective view of a blank of heat-sealable material, such as rubber hydrochloride.

Figure 2 is a view of the blank folded to form an envelope or container, the side edges of the blank being sealed to the body to form a homogeneous nonpenetrable seal.

Figure 3 is a view of the envelope after it has been charged with a coil of ligature or suture and filled with a germicidal preserving solution of desired concentration and water content, depending upon the nature of the suture.

Figure 4 is a side elevation of a jar or receptacle containing a plurality of the filled envelopes immersed in a suitable solution.

Referring to the drawing in detail, 1 is a blank of flexible, preferably transparent, heat sealing sheet material, impenetrable to ionized germicidal preserving solutions, having a tongue or flap portion 2. In order to make a seal which is impenetrable to ionized solutions, the lower portion of the blank is folded as shown in Figure 2 until the bottom edge coincides with the bottom edge of the flap 2, and the side edges of the folded blank are subjected to heat and pressure to form an impenetrable homogeneous joint as at 3.

A sterile ligature or suture 4, either loosely coiled as shown, or wound on a spool if desired, is now placed in the envelope and the envelope is filled with a measured quantity of solution of desired concentration and water content.

While the envelope is held in upright position, the flap 2 is folded over the open mouth and is sealed closed by the application of heat and pressure along its edge as at 6, the result being a hermetically sealed homogeneous joint.

The envelopes or containers thus filled, are now immersed in a jar or receptacle 7 in which any suitable liquid germicidal solution 8 is poured to cover the flexible containers, the jar preferably having a suitable cover 9 to preserve the solution against evaporation. It will be noted that with the container of the invention, evaporation or other losses of liquid from the jar may be replaced with ordinary alcohol, regardless of its water content, with no danger that the strength or pliability of the ligatures or sutures will be adversely affected. The immersion of the envelopes preserves their flexible non-splitting characteristics for a much longer period of time than if they are subjected to contact with the air. The solution 8 outside the containers or envelopes may be of entirely different concentration and nature than the solution 5 inside the flexible containers, but since the containers are hermetically sealed and are not subject to osmosis by the usual ionizable preserving solutions, the sutures or ligatures are preserved in usable condition.

From the above description and drawing, it will be apparent that I have produced a ligature or suture package which possesses all of the features of advantage set forth as desirable, and while I have described and illustrated the preferred em-

bodiment, it is to be understood that I reserve the right to do all changes within the spirit of the invention and without the ambit of the prior art.

I claim:—

1. A suture package comprising a receptacle, a preserving solution in said receptacle and subject to evaporation by exposure to the air, a hermetically sealed container of rubber hydrochloride immersed in said preserving solution, and a suture and a second preserving solution therefor within the container; said container being resistant to osmotic action by said preserving solutions.

2. A suture package comprising a receptacle, an aqueous-alcoholic preserving solution in said receptacle and subject to evaporation by exposure to the air, a hermetically sealed flexible suture container immersed in said preserving solution, and a suture and a second preserving solution therefor within the container; said container being resistant to osmotic action by said preserving solutions.

3. A suture package comprising a receptacle, a preserving solution in said receptacle and subject to evaporation by exposure to the air, a hermetically sealed flexible suture container immersed in said preserving solution, and a suture and a second preserving solution therefor within the container; said container being resistant to osmotic action by said preserving solutions.

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