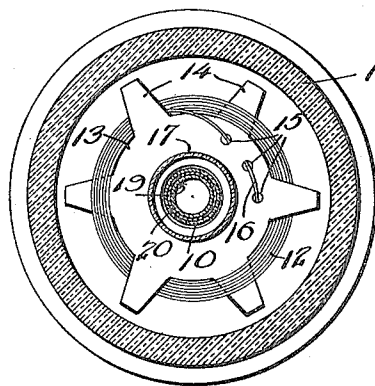
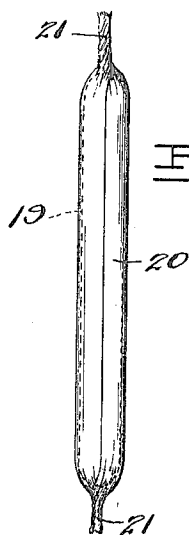
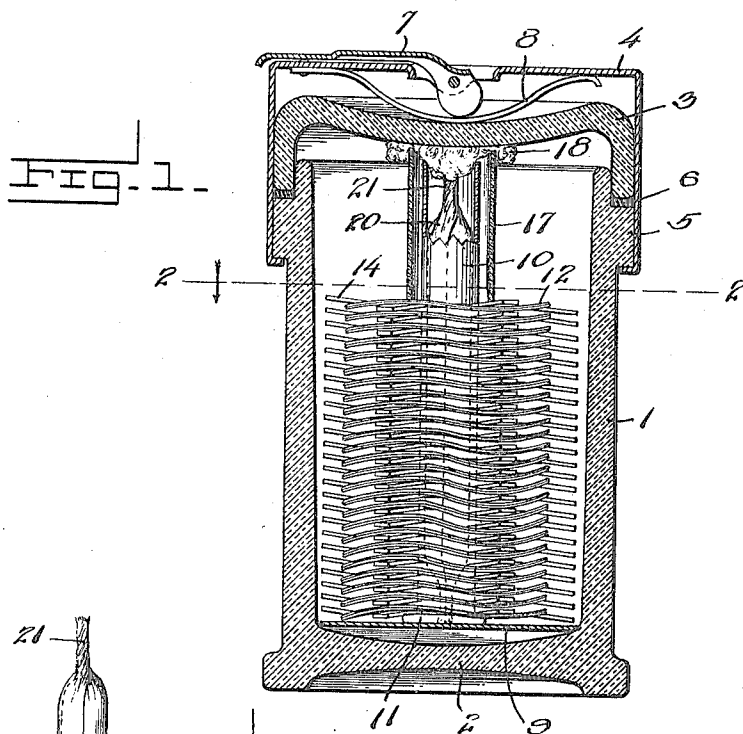


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 MEANS FOR PACKING SURGICAL LIGATURES AND SUTURES.
 APPLICATION FILED FEB. 24, 1914.

1,123,497.

Patented Jan. 5, 1915.

2 SHEETS—SHEET 1.



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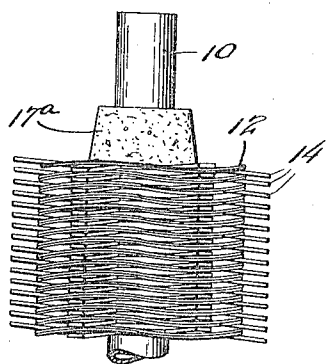


FIG. 4-

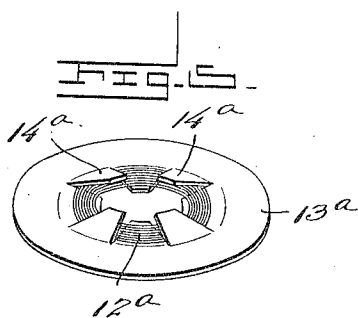


FIG. 5-

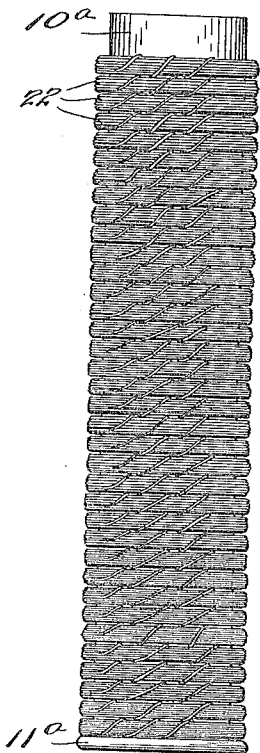


FIG. 6-

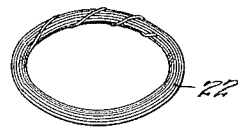


FIG. 7-

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MEANS FOR PACKING SURGICAL LIGATURES AND SUTURES.

1,123,497.

Specification of Letters Patent.

Patented Jan. 5, 1915.

Application filed February 24, 1914. Serial No. 820,713.

To all whom it may concern:

Be it known that I, CHARLES T. DAVIS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Means for Packing Surgical Ligatures and Sutures, of which the following is a specification.

My invention relates to a special package for surgical sutures and ligatures, such as the twisted cord formed of animal intestinal tissue commonly known as catgut. My invention is also applicable for packing silk, silk worm gut, horsehair, thread, or other similar materials used by surgeons for the ligating of arteries or the stitching of wounds. Such ligatures and sutures have to be prepared with the utmost care to render them sterile, and have to be packed in such manner as to prevent any possibility of their becoming contaminated.

It has heretofore been customary to inclose the ligatures or sutures in hermetically sealed glass tubes containing alcohol, chloroform, or other suitable fluid, in order to preserve them in proper condition for the surgeon. In some cases, a germicidal or antiseptic material, such as iodine, has been dissolved in alcohol, and catgut or other ligating or suturing material is placed in this solution, such material becoming thereby impregnated with the iodine in such manner as to be rendered germicidal. This is known as "iodized catgut." From a commercial standpoint, however, the practice of putting up these ligatures or sutures in alcohol containing iodine has its disadvantages, owing to the rapid deterioration of the ligating or suturing material due to oxidation. This is caused by the action upon the iodine of the water which is always present in alcohol. Also, the cost of the alcohol, the cost of putting up the ligatures or sutures in glass tubes, and the liability of breakage of the latter during shipment, are serious disadvantages. It is very desirable, however, that the suturing or ligating material, even though previously impregnated with iodine, be soaked in an alcohol-iodine bath preparatory to use, in order that it may be softened, or rendered more pliable, by the absorption into the suturing or ligating material of the water always present in alcohol; and in order that the said material may be further impregnated with iodine.

The objects of the present invention are, therefore, to provide a satisfactory package in which ligatures or sutures can be shipped from the manufacturer to the hospitals or other users in dry form, while at the same time the material is preserved in a sterile condition, and the advantages of the iodized alcohol bath may be obtained. By this means the necessity for shipping receptacles containing a liquid is avoided, and the manufacturer relieved of the expense of furnishing the alcohol.

In order that the invention may be readily understood, reference is had to the accompanying drawing forming a part of this specification, and in which,

Figure 1 is a central vertical section through my improved package or receptacle; Fig. 2 is a horizontal section thereof on the line 2—2 of Fig. 1; Fig. 3 is a view showing the cartridge or capsule hereinafter described; Fig. 4 is a fragmentary side elevation showing a slightly modified arrangement; Fig. 5 is a perspective view showing a modified form of bobbin; Fig. 6 is a side elevation on an enlarged scale of a modified form of coil-holder having a number of coils thereon; and, Fig. 7 is a perspective view of one of such coils.

Referring to the drawings in detail, and particularly to Figs. 1 and 2 thereof, the receptacle or container which I propose to employ is in the nature of a jar 1, preferably formed of amber glass. This jar has a concave bottom 2 and a cover 3. This cover is adapted to be held in position on the jar by means of a metallic clamping device 4, of any suitable construction. The intumed ends of such clamping device engage under an annular rib 5 formed around the top of the jar, and a gasket 6 of soft rubber or similar material is interposed between such rib and the edge of the cover. The clamp shown in the drawings is operated by means of a pivoted cam lever 7, which coöperates with a curved leaf spring 8, which rests upon the cover of the jar.

In the bottom of the jar, I preferably place a sheet or disk 9 of hard finish cardboard or similar material. This disk is supported around its edges upon the bottom of the jar, but its middle portion is spaced from the bottom, as clearly shown in Fig. 1. This sheet or disk 9 forms a resilient support for the coil-holder, which is in the

nature of a post 10, having an annular flange 11 at its lower end resting upon the sheet 9. This post preferably consists of a hollow glass tube.

12 represents thin, flat coils of catgut constituting the ligature or the like. Each coil, in the embodiment shown in Figs. 1 and 2, is wound upon a bobbin 13, preferably made of cardboard and consisting of a circular body having radially projecting arms 14. As clearly shown in the drawings, the coil 12 is wound circumferentially, adjacent arms 14 being disposed on opposite sides of the coil. The free end 16 of the coil may be held in position by being laced back and forth through a series of small holes 15, formed in the body of the bobbin. A plurality of these flat bobbins, each of which is provided with a central opening, are threaded upon the post 10 to form a stack, as clearly shown in Fig. 1, the jar 1 being just large enough to contain the bobbins. In order to hold the coils or bobbins firmly in position, they may be compressed axially by means of a sleeve 17, preferably formed of glass and fitting around the upper end of the post 10, one end of such sleeve bearing upon the uppermost coil or bobbin, and the other end of the sleeve abutting against the inside of the cover 3 of the jar. Preferably, a tuft 18 of raw cotton, or the like, is interposed between the end of the sleeve and the cover, to form a cushion.

It will be understood that after being properly prepared, sterilized and impregnated with iodine, the coils of catgut are packed in the jar as above described, and the entire jar and its contents are then subjected to a dehydrating process in a heated vacuum chamber, or by other suitable process of desiccation. The cover is then clamped on and the jar securely sealed by means of the gasket 6. As no oxidizing action of the iodine can take place without the presence of water, and as the latter always occurs in alcohol as commercially used, this method of putting up the iodized ligatures or sutures prevents the deterioration above referred to.

In order to insure the proper preservation and absolute sterility of the ligatures and sutures, I propose to include in each jar a quantity of iodine just sufficient to make a solution in which the coils of said material in the jar can be immersed. This iodine is preferably sealed in a glass tube or ampul 19, and which is of such a size as to be conveniently contained inside the hollow post 10. The ampul is wrapped in paper 20, the ends of which are twisted, as indicated at 21, and serve to form a cushion to prevent contact between the glass ampul and the other glass parts.

A few days before the material is required for use, the customer removes the

cover of the jar and extracts the tube of iodine from the post. The tube is gently agitated so that all of the iodine will gravitate to one end, is then broken in two and the inverted half containing the iodine, open end uppermost, is dropped into the hollow post 10. The jar is then filled with alcohol, which rises in the hollow post through its open bottom. This makes a solution of the proper strength and the advantage is attained that the beginning of the oxidizing action of the iodine and the consequent gradual deterioration of the suturing or ligating material has been delayed until the time of mixing the solution, which, as above stated, does not take place until a short while before the material is to be used.

It will be observed that the bobbins rest upon the flange 11 at the bottom of the post, and it is therefore apparent that by grasping the top of the post with suitable forceps, the stack of coils may be lifted from the jar and a single coil removed as needed. The uppermost coil or bobbin can be grasped by a second pair of forceps and then upon lowering the post again the bobbin may be readily slipped off. The central opening in the disk permits the bobbin to be rotatably held between the thumb and finger, and the material reeled off.

Instead of the sleeve 17, for producing an axial compression of the stack of coils, I may employ a collar 17^a of cork or similar material which frictionally engages the post 10, as shown in Fig. 4.

Instead of the bobbin shown in Fig. 2, I may employ that illustrated in Fig. 5, by reference to which it will be seen that the arms 14^a project inwardly from the body 13^a instead of outwardly, as in Fig. 2.

In some cases I may dispense with the cardboard disks or bobbins altogether and put up the ligatures in the form of flat open coils 22, as illustrated in Fig. 7. For shipment, these coils may be assembled on a somewhat larger post 10^a (see Fig. 6) provided at its bottom with an annular flange 11^a, upon which the coils rest. The same method of producing axial compression of the stack of coils may be used as in the other figures.

In all of the modifications shown, it will be observed, that there is provided a post loosely encircled by a stack of independent flat coils, the post and coils being contained in a jar or receptacle, and it is thought that the many advantages of my improved "dry" method of packing and shipping ligatures will be appreciated without further discussion.

What I claim is:

1. A package for catgut and the like, comprising a jar or container, a vertical post in said jar, a plurality of independent thin flat coils of catgut loosely encircling

said post, and means for compressing said coils axially of said post so as to force them into contact with each other.

2. A package for catgut and the like, comprising a jar or container having a concave bottom, a sheet of resilient material resting at its edges against such bottom, a post supported at its lower end upon the central portion of said sheet, and coils of catgut carried by said post.

3. A package for catgut and the like, comprising a jar or container having a concave bottom, a sheet of resilient material resting at its edges against such bottom, a post supported at its lower end upon the central portion of said sheet, coils of catgut loosely surrounding said post, a cover for the jar, and means for resiliently compressing said coils between said sheet and cover.

4. The combination with a jar or container, of a vertical post therein, a stack of independent flat coils of catgut loosely encircling said post, a cover for said jar, and a sleeve surrounding the upper end of said post, and bearing at one end against said stack of coils, and at the other end against said cover, whereby said coils are held in position.

5. A suture or ligature package compris-

ing a jar or container, a post therein, and a stack of superposed coils of catgut carried by said post in contact with each other, each coil comprising a bobbin formed of a thin flat disk of sheet material perforated to fit over the post, and on which the catgut is circumferentially wound.

6. A package for catgut and the like, comprising a container, a hollow post in said container, coils of catgut encircling said post, and a cartridge inside of said hollow post containing a chemical substance with which the catgut is to be treated.

7. A package for catgut and the like, comprising a container, a hollow post in said container, coils of catgut encircling said post, said post and container being made of glass, or other suitable material, a fragile tube within said hollow post and containing a chemical substance, and a paper wrapper around said fragile tube, the ends of said wrapper being twisted to form cushions for preventing dangerous impact between the several fragile parts.

In testimony whereof I have affixed my signature, in presence of two witnesses.

CHARLES T. DAVIS.

Witnesses:

E. C. PIERSON,

I. G. FAIRHURST.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."