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TRACTION FINGER COT

Filed March 25, 1963

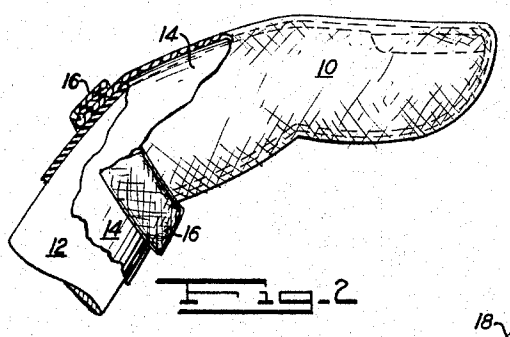

Fig. 2

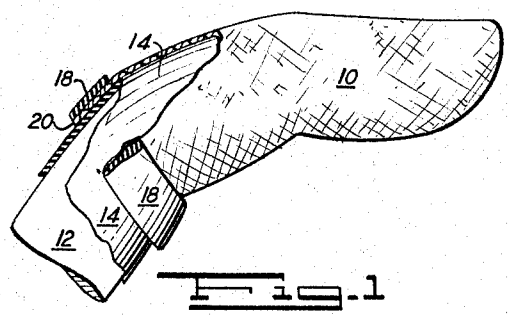

Fig. 1

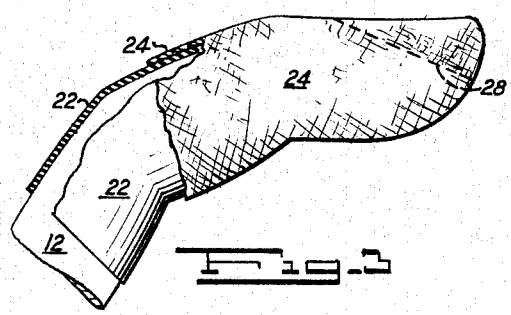

Fig. 3

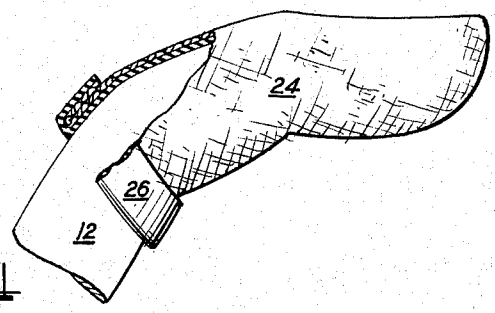

Fig. 4

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TRACTION FINGER COT

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This invention relates to a finger cot adapted to impart traction to the surgeon's finger as a blunt instrument for use both in surgical examination and dissection.

In blunt dissection the surgeon uses rubber gloves or a rubber cot in numerous operations for separation of various body tissues one from another; for instance, to separate loops of a bowel, to examine and/or separate various types of pelvic tumors and inflammatory masses from surrounding and enveloping tissues wherein separation is needed in such types of surgery as vaginal, thyroid, urological, rectal, plastic, and blood vessel, etc. Moreover, such blunt dissection, probing with the surgeon's gloved fingers, is used regularly in preliminary examinations. The great advantage, of course, of the rubber sheath encasing the surgeon's fingers is that it interferes least with the necessary sensitiveness of his feel and touch. However, in probing through such tissues for their separation, the body fluids coating the rubber gloved fingers make them unduly slippery and uncertain, and sometimes it is possible to damage the tissue by application of greatly increased manipulative pressures to prevent possible slipping. Moreover, very delicate surgical procedures such as the suturing of a poorly accessible blood vessel during an operation can be quite hazardous, due to such possible finger slippage.

It has been the practice sometimes, in order to impart traction to the rubber glove fingers to prevent such slippage, to wind a gauze pad temporarily around the finger. This, however, is at the usually unacceptable sacrifice of sensitivity and flexibility of the finger as a blunt instrument. Canvas or fiber-coated rubber gloves have been proposed for surgical use, but these are never so sensitive to the finger as thin rubber sheath surgical gloves for normal use in surgery. Any interruption in a surgical procedure to change from one form of glove to another with danger of contamination by exposure of the surgeon's hands during such exchange is prohibitive.

According to the present invention a surgical cot useful to impart traction to the end of one of the surgeon's fingers, for instance the index finger, is provided, which may be easily and quickly slipped onto the surgeon's gloved finger during the operation and removed after being used for its purpose without exposure of the surgeon's hand and without sacrifice of the finger sensitivity. For this purpose a finger cot is provided, at least the outer surface of which is of fibrous character which may be woven, knitted, netted or matted, to provide the necessary traction. The cot may be further sized and shaped to snugly fit over the gloved finger of the surgeon.

The fibrous cot may have a resilient banding means about the open finger-inserting end so that it will resiliently grip the inserted finger of the surgeon for secure retention of the cot thereon in use.

Alternatively, the fibrous cot may be formed with an inner rubber sheath lamina upon which it is closely fitted or adhered as a laminated construction with the fibrous fabric forming the outer layer for supplying the needed traction. Thus, the inner rubber layer of the laminate may securely cling resiliently to the surgeon's finger to retain substantial touch sensitivity and can also supply sufficient elastic gripping tension upon the surgeon's finger to support the cot thereon without need for further elastic banding at the finger-inserting end.

The same rubber gripping effect can also be obtained by merely dipping the fabric in a rubber latex composition, coagulating the rubber thereon as a continuous laminated film upon one surface, inverting the cot as needed so that the fabric is exposed on the outside for ultimate bond use to impart useful traction.

There are numerous inherent advantages to such construction, but these will be explained in detail with reference to the drawings, wherein:

FIG. 1 shows a cot formed of fabric having a resilient banding element at one end for securement to a finger;

FIG. 2 illustrates a similar construction wherein the banding element itself is a fabric;

FIG. 3 shows a laminated construction comprising a rubber film having fabric secured to the outer surface thereof;

FIG. 4 shows a laminate comprising a rubber film with fabric secured to the outer surface thereof and with a banding element for further securement of the assembly to the finger.

As shown in FIG. 2, the cot consists of a gauze body **10** shaped to fit a finger such as the index finger in a comparatively close fit so as to allow transfer of a feeling sensation from the outer cloth surface to the finger of the user for requisite touch sensitivity of the user. Where the cot, as in FIGS. 1 and 2, is to be worn over the finger **12** being used with an ordinary surgical rubber glove **14**, the gauze cot is merely a sterile single or multiple ply cross woven fabric of cotton gauze, silk or other fibrous material, of natural, synthetic or mixed fiber. It may be of normal porosity which may allow some liquid to be transferred, but preferably is close woven sufficiently to prevent rapid fluid interchange, at least for a while. In any case, the gauze will fit sufficiently snugly and firmly about the gloved finger of the surgeon to allow a sensitivity of feeling and touch perception through the gauze while supplying the rough traction utility of a fibrous cot.

For securing the cot to the finger, any banding element **16** is provided, which may be merely a rolled up or hemmed end of the cot which may be stitched about the open finger-inserting periphery of the cot, such as a folded over double or triple ply hem, or the like. That hem **16**, close fitted about the finger and slightly resilient, is useful to impart a gripping tension about the finger **12** of the user and thereby tends to secure the cot upon the finger during use.

In a modification shown in FIG. 1, the gauze may have a rubber banding element secured by adhesion or stitching to the open finger-inserting end **20** of the cot, serving to secure the cot more resiliently with somewhat better rubbery tension about the finger and thereby more firmly securing the cot to the finger.

In another modification shown in FIG. 3, a short finger-cot length rubber sheath **22** may have all or a large portion of its surface covered by an outer laminated layer **24** of gauze secured thereon in any suitable manner. For instance, the inner rubber sheath **22** may be resiliently distended upon the finger of the wearer sufficiently to also grip the closely sized outer gauze layer **24** with enough distending pressure to securely retain the laminated assembly upon the finger, as shown in FIG. 3. The assembly thereby is retained by the distending tension of the inner rubber layer **22** both upon the finger of the wearer and, as expanded, against the outer confining fabric sheath **24**. In use of this modification the passage of body fluids through the cot is inhibited by the inner rubber sheath so that no rubber glove is otherwise commonly needed by the surgeon using this modified form. It may be desirable, when both the rubber and gauze layers are of about equal length, as shown in FIG. 4, to fold the outer finger-inserting end **26** of the cot as by folding it or rolling it back a short distance to provide a rubbery securing

ring **26** which operates as a rubbery flexible banding element for more securely anchoring the cot upon the finger.

As shown in FIG. 3 by the dotted line portion at the cot's tip end, the gauze alone or the thin inner rubber membrane **22** alone, or both together may be slightly reinforced at **28** to impart a greater strength to the combination whereby in ultimate use there is less likelihood of either being broken through by the finger tip. However, that kind of reinforcing section **28** is not essential to the operation of the device hereof for the purposes described.

As thus described, a fabric sleeve-like finger cot, shaped and close fitted to the form of a finger, preferably an index finger, and sized to fit snugly thereabout as a blunt traction instrument for surgery or surgical examination, is provided. The fabric may be woven or it may be formed of knitted, netted or matted fiber as desired. The cot in use provides a desired surgical traction to the finger tip upon which it is mounted. It is thin enough and grips the finger firmly enough to allow substantial touch sensitivity therethrough while still imparting necessary traction for using the finger in blunt dissection.

It may be reinforced at the tip. It may also be waterproofed on one surface and then reversed so that the fabric is the outer layer of the laminate. The gauze fabric alone may be provided with a hem, or it may have resilient rubber reinforcement about the finger-inserting end for securing the cot to the finger as a flexible banding element. An inner rubber lamina may flexibly grip the finger per se so that the rubber layer provides additional securement for flexibly gripping the finger to prevent the cot from being displaced from the finger while in use. Finally, the cot may be provided with a rubber banding element alone, or the cot may include an inner rubberized layer, and such banding element may be formed by rolling down the finger-inserting end to provide the flexible rubber banding ring.

In use as thus described during surgery, or for surgical examination, the rubber gloved finger will have the cot drawn over it at the moment of any surgical procedure when blunt dissection, as well as traction, is needed by the surgeon. While the device is adapted for quick mounting upon the gloved hand of the surgeon when needed without need for removing it, it could also be used upon the finger per se without the glove, whereby the rubber layer serves to protect the finger from direct contact with body fluids.

While in some use the cot may be inserted only upon the index finger, it will be apparent that sufficient flexibility may be present to allow the cot to fit upon any finger, although it may be specially sized to fit upon the thumb or other particular finger of the surgeon, as may be desired. It will be understood that where the cot consists of a laminate of an inner rubber sheath upon which an outer fabric layer is superimposed, the two layers are closely contiguous in finger-mounted position and, preferably, the layers are adhered one to the other firmly, so that the sensitivity to touch is maintained through both layers.

Various modifications will occur to those skilled in the art and, accordingly, it is intended that the previous description be regarded as exemplary and not limiting except as defined in the claims appended hereto.

We claim:

1. A surgical finger cot consisting essentially of a multilayer laminate of which the inner layer is a thin-walled, waterproof, flexible, rubber tube closed at one end and open at the opposite end to resiliently encase the end of the index finger as a sheath, and an outer layer adhesively secured to said inner layer consisting of a fibrous open pore unimpregnated dry woven fabric, said layers being adhesively assembled together as a laminate, and sized and shaped to be mounted upon and to fit resiliently over the end of the index finger, said thin rubber inner layer being flexibly distended to securely retain the open pore fabric layer in touch-sensitive contact with the finger through the thin rubber layer.

2. The finger cot as defined in claim **1** wherein the open pore outer fabric is gauze mounted in a plurality of unimpregnated plies upon the single inner flexible rubber layer.

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