Nov. 23, 1971 G. J. MAGOVERN 3,621,848

SURGICAL DRAINAGE TUBE HAVING REMOVABLE LINERS

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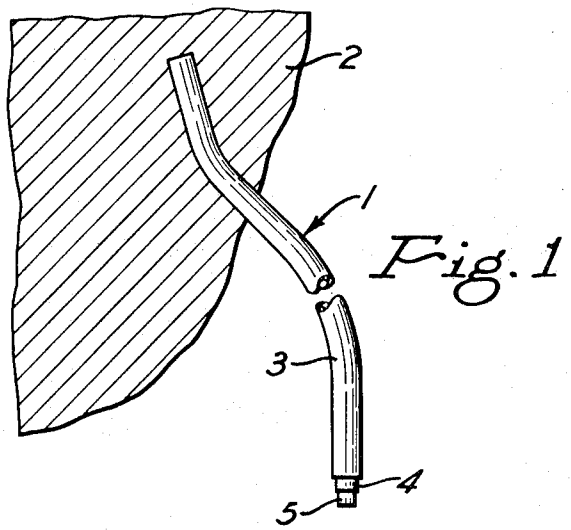

Fig. 1

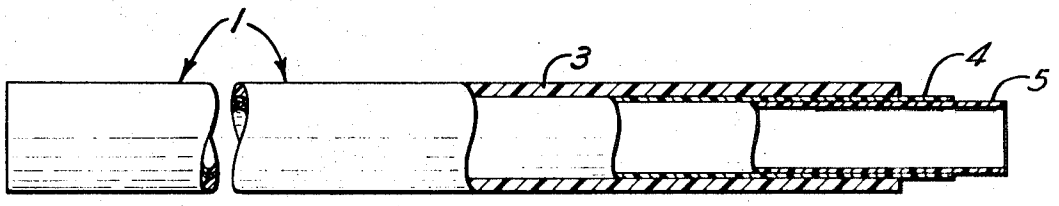

Fig. 2

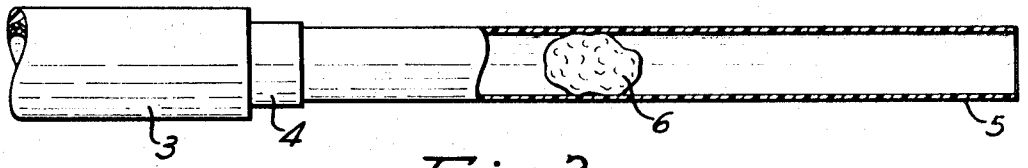

Fig. 3

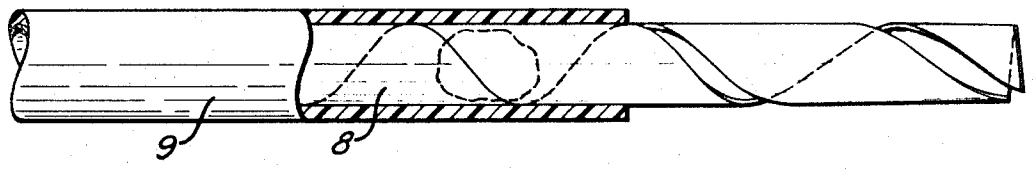

Fig. 4

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SURGICAL DRAINAGE TUBE HAVING REMOVABLE LINERS

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ABSTRACT OF THE DISCLOSURE

A surgical drainage tube has a tubular outer wall and a tubular lining frictionally engaging the inner surface of that wall. If the tube becomes obstructed by blood clots inside the lining, the lining tube can be pulled out of one end of the tubular outer wall to remove the clots.

Surgical operations often require that a drainage tube be inserted in the incision so that blood can drain from it until internal bleeding stops. When blood stops draining from the tube it generally is assumed that the bleeding has stopped, but this may be a false assumption. Actually, drainage may have stopped because blood clots formed in the tube and obstructed it. To make sure of the existing situation, the tube should be removed from the patient and inspected and if found to be obstructed it either should be cleaned out and replaced, or another drainage tube substituted for it. The reinsertion of a drainage tube is something that it is desirable to avoid if possible.

It is among the objects of this invention to provide a surgical drainage tube which can be checked for obstructions without removing it from the patient, and which can be freed of any obstructions quickly and easily in a simple manner.

The invention is illustrated in the accompanying drawing, in which

FIG. 1 represents a side view of a drainage tube extending out of a surgical patient's body;

FIG. 2 is an enlarged fragmentary side view of the tube broken away in section to show its internal construction;

FIG. 3 is a fragmentary side view, partly in section, showing an obstruction being removed; and

FIG. 4 is a similar view of a modification.

Referring to FIGS. 1 and 2 of the drawing, after a patient undergoes an operation, such as chest surgery for example, a drainage tube **1** may be inserted in the operated area **2** and extend out of the patient's body through the incision. Any internal bleeding will be carried away through the drainage tube, which usually is flexible. It is a feature of this invention that if the tube becomes obstructed by a blood clot, the clot can be removed quickly without pulling the tube out of the incision.

Accordingly, the drainage tube has a tubular outer wall **3** that may be made in the usual way from any suitable material. Usually it will be rubber or a synthetic plastic. Instead of using such a tubular member alone as has been the practice heretofore, it is lined with one or more tubular linings. Two linings **4** and **5** are shown in the drawing, but there could be more. They snugly engage each other and the inner surface of the tubular wall to form the drainage tube, with which all drainage will be confined to the inside of the inner lining **5**. The linings are made as thin as possible, paper thin for example, so that the tube can be provided with a passage of the desired size without having to make the tube too large. Here again rubber or a plastic can be used for the linings.

The linings project from at least the outer end of the tubular outer wall **3**. If they project from both ends, then

it is immaterial which end of the tube is implanted in the patient. The inner lining **5** also projects from the outer lining. The length of each projection is such that the ends of the tubular linings can be gripped by tweezers or forceps to pull them.

Assuming that blood stops draining from the tube shown in FIG. 1, the surgeon will not know for sure whether bleeding has stopped or whether the tube has been obstructed. With this invention, he will grip the projecting outer end of the inner lining **5** and pull it out of the encircling lining **4**, as shown in FIG. 3, and discard it. During this operation the projecting end of the outer lining can be held in the fingers lightly so that it will not move out with the inner lining, if it might otherwise tend to do so. Any blood clot **6** or other obstruction in the drainage tube will be inside the inner lining and therefore will be removed with it, leaving the drainage tube open again so that draining can resume through the passage in the remaining lining **4**. If the surgeon should find no obstruction in the removed lining, he will know that bleeding had stopped and he then can remove the drainage tube from the patient.

On the other hand, if the tube had been obstructed by a blood clot which, when removed, permitted the tube to start draining again, and if later on draining stops again, outer lining **4** can be pulled out of tubular member **3** to again check on the tube and to remove any blood clot that may be obstructing it. Removal of both linings is accomplished without disturbing the outer wall **3** of the drainage tube, so the patient is not subjected to the discomfort of having the tube removed and then reinserted.

The tubular linings shown in FIGS. 2 and 3 are seamless tubes but, as shown in FIG. 4, a lining can be made in a different way. This particular lining **8** is formed like a soda straw, from a helically wound strip, the edges of the convolutions of which engage one another and are joined together. When the projecting end of the lining is pulled to remove the lining from the outer tubular member **9**, the convolutions separate from one another progressively so that the lining is removed more as a strip than as a tube. This drainage tube may include two or more concentric linings if desired.

I claim:

1. A surgical drainage tube having a tubular outer wall and a snugly fitting tubular lining frictionally engaging the inner surface of said wall, said lining being formed from a helically wound strip forming convolutions joined together at their edges, and the lining being removable lengthwise from one end of said tubular outer wall by pulling on the end of said strip to cause the convolutions to separate from one another progressively, whereby to remove from the tube any blood clots obstructing the tube.

References Cited

UNITED STATES PATENTS

1,531,213	3/1925	Nimmer	128—239
2,290,571	7/1942	Peyton	128—348 X
3,089,493	5/1963	Galindo	128—283
3,263,684	8/1966	Bolton	128—351
3,384,089	5/1968	Shriner	128—350
3,457,920	7/1969	Thompson	128—188

FOREIGN PATENTS

258,116	3/1913	Germany	128—350 R

DALTON L. TRULUCK, Primary Examiner

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128—239