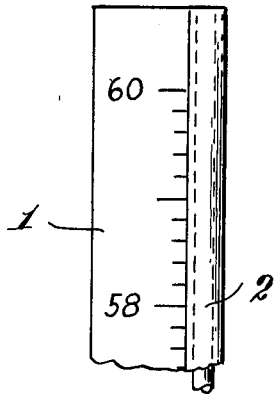
May 8, 1962 W. P. MURPHY, JR 3,033,038

SURGICAL MANOMETER

Filed Jan. 20, 1958



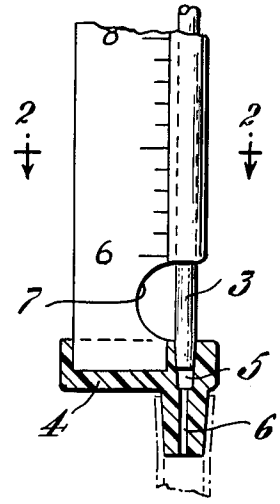
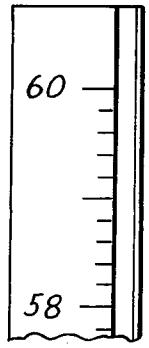


Fig. 1



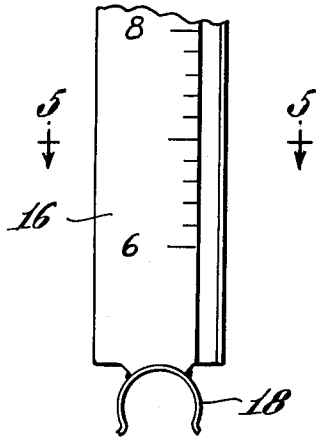


Fig. 4

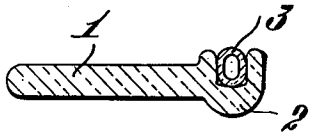


Fig. 2

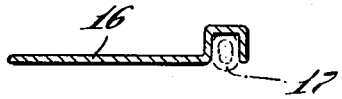


Fig. 5

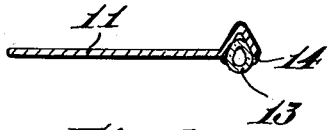


Fig. 3

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3,033,038

SURGICAL MANOMETER

William Perry Murphy, Jr., Miami, Fla., assignor, by direct and mesne assignments, of one-half to Cordis Corporation, Miami, Fla., and one-half to Don Baxter, Inc., Glendale, Calif., a corporation of Nevada

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6 Claims. (Cl. 73—388)

While this invention is applicable to any manometer it is particularly applicable to surgical manometers for measuring pressures of blood, spinal fluid, etc. which must be unquestionably sterile and pyrogen free. Heretofore it has been customary to employ expensive apparatus and to wash and sterilize the apparatus after each use. This resterilization not only requires time and trouble but it may result in incomplete cleaning or sterilization because of the long opening of small diameter in the manometer tube.

The principal object of the present invention is to provide a manometer which is so simple and inexpensive in construction that it may be discarded after use instead of being washed and resterilized, whereby the only sterilization required is at the place of manufacture where sterilization and adequate testing to assure sterility can be effected in mass production and low cost. Other objects are to provide a mannometer in which the parts can be readily assembled and disassembled and which can be read quickly and easily and which is light in weight and facilitates use by the physician.

The manometer of the present invention comprises an elongate support having a longitudinal groove in one face thereof and a tube laid in the groove, the tube being resiliently compressible and larger than the groove so that it may be removably wedged in the groove, whereby the tube may be readily replaced after use. While the groove is preferably shaped so that the tube is held firmly in place by the wedging action, cement may be employed to assist in holding the tube, in which case the cement is preferably rubber cement or the like which permits the tube to be readily peeled out of the groove. In the preferred embodiment the lower end of the tube projects from the groove and a connector is detachably mounted on the lower end of the support with an outlet telescopically connected to the lower end of the tube so that both the tube and the connector may be readily removed for resterilization or replacement. Preferably the support as well as the tube is formed of transparent material so that the liquid level can be read therethrough, and the portion of the support through which the tube is visible is preferably curved transversely to magnify the contents of the tube.

For the purpose of illustration typical embodiments of the invention are shown in the accompanying drawings in which

FIG. 1 is a side elevation of one embodiment with the aforesaid connector in section;

FIG. 2 is a section on line 2—2 of FIG. 1;

FIG. 3 is a similar section showing a modification;

FIG. 4 is a front view of another modification; and

FIG. 5 is a section on line 5—5 of FIG. 4.

The particular embodiment illustrated in FIGS. 1 and 2 comprises a support 1 having along one margin a portion 2 of increased thickness which is provided with a groove to receive the tube 3. Both the support 1 and the tube 3 are preferably formed of relatively transparent plastic material so that the liquid level in the tube may be read through the support, and the portion 2 of the support is preferably shaped like a cylindrical lens to magnify the contents of the tube. The tube may be made in the usual way with translucent polyvinyl chloride and the support is preferably formed of polystyrene, cellulose acetate or methacrylate. Detachably telescoping over the lower end

of the support is a connector 4 having a socket 5 to receive the lower end of the tube and a nozzle 6 over which may be telescoped a tube to connect the manometer with a pump, container, syringe, valve or other suitable device. At its lower end the thickened margin of the support is cut out at 7 to facilitate the insertion of the lower end of the tube into the socket 5. As shown in FIG. 1 the support is calibrated in the usual way but in this case the calibrations are preferably located on the side of the support opposite the tube in order to utilize the magnifying effect of the cylindrical lens 2.

The modifications shown in FIG. 3 is like that shown in FIGS. 1 and 2 except in that the support 11 is formed of aluminum or other opaque material and the groove for the tube 13 is V-shaped instead of U-shaped, in which case the tube is not only wedged in the groove but is preferably held by rubber cement 14 or other cement which permits the tube to be peeled out of the groove after use. In this case the calibrations should be placed on the same side of the support as the tube.

In the modification shown in FIGS. 4 and 5 the support 16 is preferably formed of stainless steel although it may also be formed of transparent sheet plastic such as acetate and the calibrations are placed on the same side as the tube 17. Fastened to the bottom of the support is a spring clip 18 shaped to snap over a valve such as shown for example in my copending application Ser. No. 678,163, filed August 14, 1957.

From the foregoing it will be understood that after use the manometer tube may be readily be removed and replaced with a fresh sterile and pyrogen free tube. When employing a detachable connector such as illustrated at 4 in FIG. 1 it too may be replaced instead of being resterilized.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A disposable manometer comprising: a transparent, elongate support having a longitudinal groove in one face thereof; indicia on a face of said support, said indicia forming a graduated scale; a length of disposable, transparent, resilient tube, larger than said groove and wedged thereinto, said tube being removable and readily replaceable following use; and a transversely curved surface on the support opposite the face in which the groove is formed, said surface providing the support with a center portion thicker than the edge portion, thus forming a convex lens magnifying the contents of the tube.

2. A disposable manometer comprising: an elongate support; a longitudinal groove in one face of said support; a length of disposable, transparent, resilient tube wedged into the groove, said tube having a normal outside diameter greater than the width of the groove; the depth of said groove being approximately equal to the diameter of the tube whereby the front surface of said tube lies approximately in the plane of the face of the support in which the groove is formed; indicia on one face of the support; and an opening in the support face communicating with the groove and extending the entire length thereof, whereby the tube may be easily removed from the groove and replaced through said opening.

3. A disposable manometer as set forth in claim 2 wherein the groove has two opposed side walls and the tube has a normally circular cross section which is resiliently deformed to a generally oval shape by inward pressure of said side walls.

4. A disposable manometer as set forth in claim 2 wherein the lower portion of the support axially aligned with the groove is cut away to provide a lower end of reduced width; a connector is detachably mounted on

said lower support end, said connector having a socket portion spaced transversely from the lower support end and receiving the lower end of the tube; and a nozzle portion on said connector axially aligned with said socket portion and adapted for connection with a tube.

5. A disposable manometer as set forth in claim 4 wherein a portion of the support immediately above the lower support end is cut away to provide a section of further reduced width; and the portion of the tube adjacent said section of further reduced width is spaced from the support, whereby an exposed, unsupported portion of the tube is provided, large enough to permit grasping of the tube and manipulation of the lower end thereof.

6. A disposable manometer comprising: an elongated support having front and rear faces; a groove running longitudinally along one side of one of said faces, said groove having a bottom wall, two side walls, and an unobstructed front opening; a major portion of at least one of the support faces having a flat surface; calibrations extending across said flat surface and terminating in line with one edge of said groove; and a transparent, flexible, resilient tube, having a normally circular cross-section, removably wedged into the groove, the width of said groove being less than the outside diameter of the tube, whereby the normally circular tube is deformed by inward pressure of the groove side walls to a generally oval shape, and the depth of the groove being approximately equal to the outside diameter of the tube, whereby when the tube is seated against the bottom wall of the groove, the front tube surface of the tube lies adjacent the support face in which the groove is formed.

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