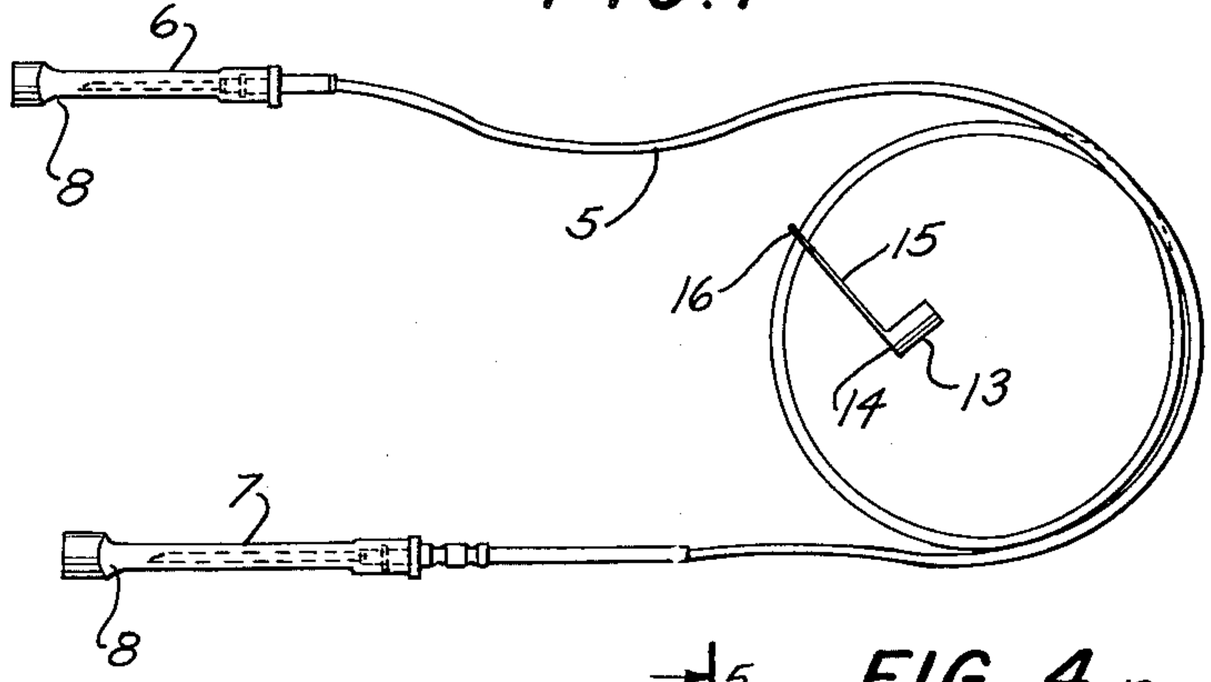
Aug. 8, 1961 J. A. HENDERSON ET AL 2,995,334

CLYSIS ASSEMBLY

Filed June 8, 1959

FIG. 1



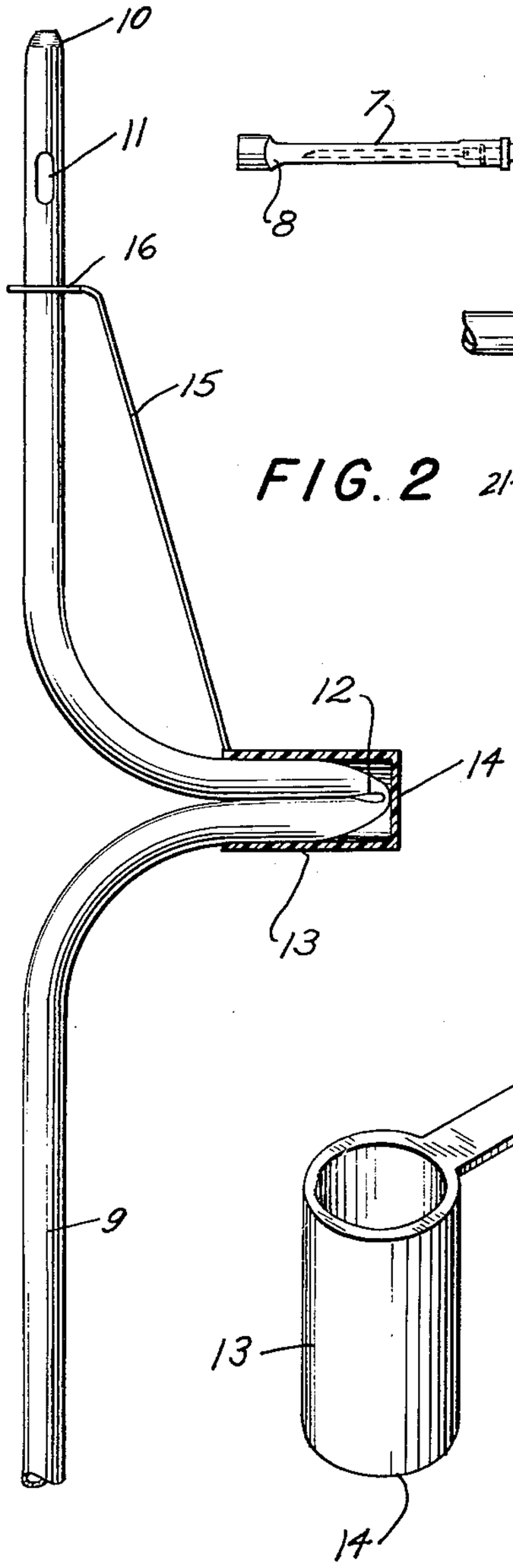


FIG. 2

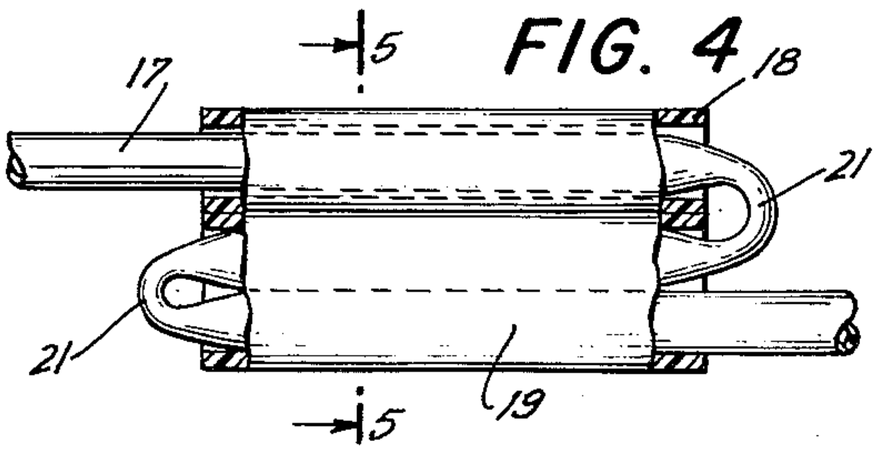


FIG. 4

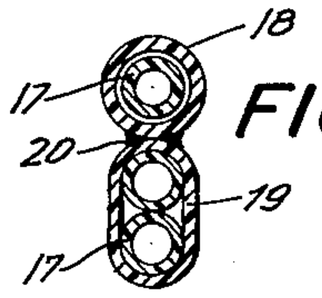


FIG. 5

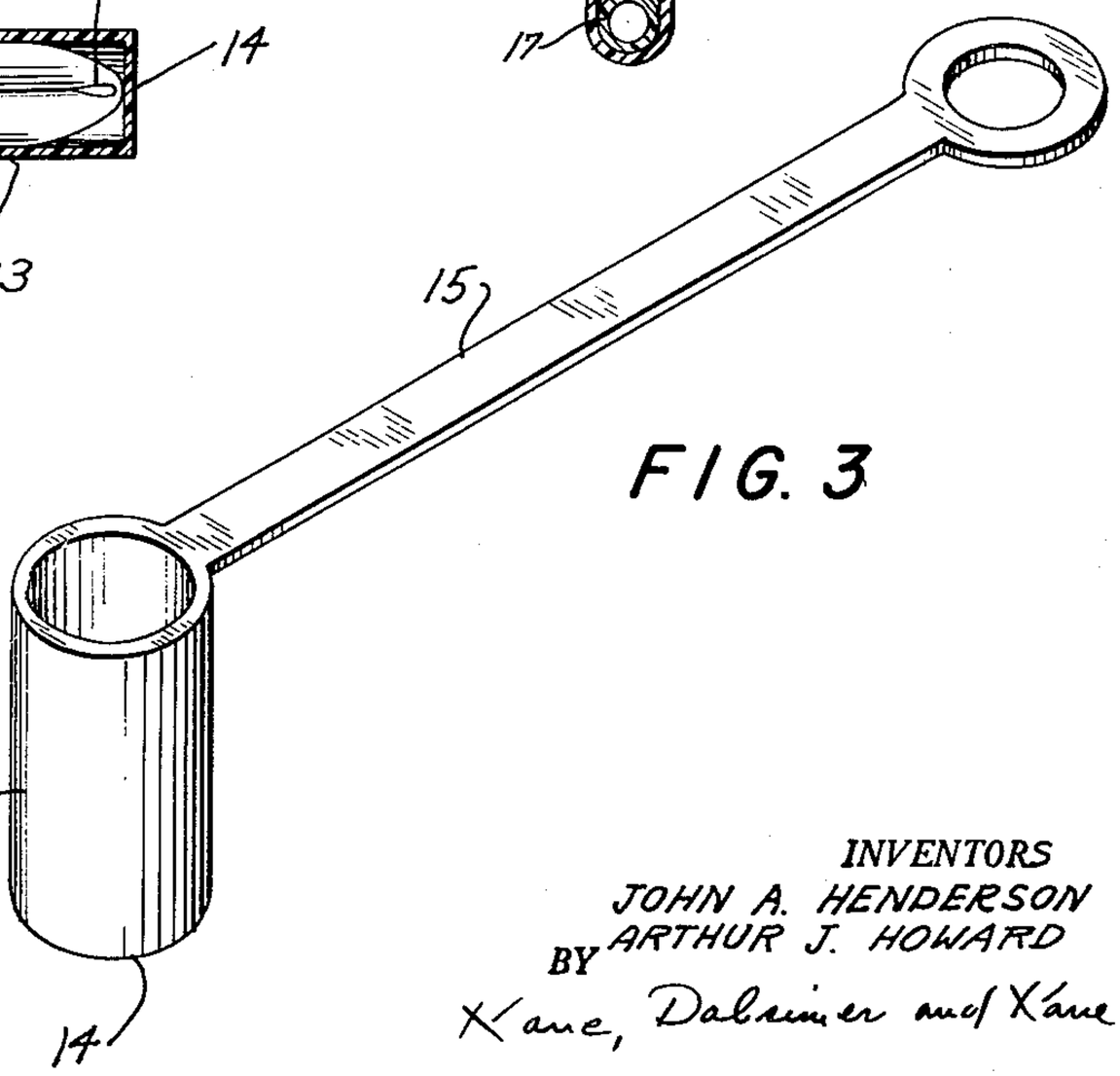


FIG. 3

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CLYSIS ASSEMBLY

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This invention relates to a structurally and functionally improved assembly of the venoclysis, blood donor enema or similar type, and by means of which the flow of fluid through that assembly may be accurately and instantaneously controlled.

It is a primary object of the invention to furnish as part of such an assembly a structure which will function as a valve and be capable of ready use by unskilled persons to control the flow of blood or other liquid through the tubing of the assembly, and in an improved manner such that a full volume flow will occur, or else the flow will be completely interrupted.

Still another object is that of designing a structure which will be extremely simple and capable of ready manufacture at a nominal figure; that structure being preferably combined with the tubing in a manner such that such structure will be instantly available to the user.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating practical embodiments of the invention, and in which:

FIG. 1 is a perspective view of a venoclysis or blood donor set;

FIG. 2 is a fragmentary side elevation of a Harris type flush tube and showing the structure of the present invention in section and applied thereto;

FIG. 3 is a perspective view of a complete control member as especially illustrated in FIG. 2;

FIG. 4 is a partly sectional and fragmentary side view of an alternative form of assembly; and

FIG. 5 is a transverse sectional view taken along the line 5—5 in the direction of the arrows as indicated in FIG. 4.

Referring primarily to FIG. 1, the numeral 5 indicates a length of tubing of flexible and plastic material. That material may be a synthetic resin, such as a vinyl chloride polymer. To one end of the tubing there is connected a flask type needle, as indicated at 6. To the other end, a donor needle 7 is coupled. Both these needles, in accordance with conventional techniques, may be initially enclosed in sheaths 8 capable of being readily detached from the assembly. The character of the tubing 5 will be such that it may be folded upon itself. When so disposed, its bore will be constricted to interrupt the flow of fluid therethrough.

In FIG. 2, a length of tubing 9 of larger diameter than the tubing 5 has been illustrated. This tubing is again formed of a suitable plastic and has one of its ends 10 reduced to somewhat constrict the bore exit at that point. Also, a lateral opening 11 may be formed in its side wall, spaced rearwardly of its outer end. This form of unit provides a part of an enema assembly and is known in the profession as a "Harris flush." In common with tubing 5, tube 9 may be folded upon itself, as illustrated in FIG. 2, to prevent any flow of fluid through its bore.

This folded zone, which has been indicated at 12, is receivable within a sleeve 13 of a larger internal diameter than the external diameter of tube 9. So received, that zone will be maintained in folded condition, to thus prevent fluid flow through the bore of the tube. Preferably, sleeve 13 is furnished with an end wall 14 to provide a cup structure limiting the length of the zone which may be introduced into the bore of the sleeve.

It is preferred that the sleeve be retained by an attaching member in association with the tubing even when the former is not maintaining the latter in a folded position. To this end, a strap 15 may conveniently have one end attached to or integral with the sleeve. Its opposite end defines a loop 16. The inner edge of that loop should have a diameter in excess of that of the tubing to which it is applied. Accordingly, it may be slid axially of that tubing to any desired location. However, due to the loop being only slightly in excess of the external diameter of the tubing, when it is once shifted to a desired zone of that tubing, it will tend to maintain that position. Also, it will be understood that, while the internal diameter of sleeve 13 is in excess of the external diameter of the tubing, it should not be so greatly in excess thereof that the tubing will tend to ride free of the socket furnished by the sleeve when subjected to ordinary strains of low value.

The sleeve, its end wall and the strap 15 (if employed) are conveniently formed of polyethylene. As afore brought out, the tubing of the assembly is preferably formed of a plastic. Thus, the surfaces of these two elements will not tend to grip so intimately that they will be incapable of sliding movements with respect to each other except under severe strain or tension. Rather, a free sliding fit should be achieved, as the folded zone of the tube is introduced into the bore of the sleeve. This would be true even if the tubing were formed of material such as rubber.

As will be appreciated, in the use of the assembly, an operator desiring to interrupt all fluid flow through the bore of the tube will simply fold the tube upon itself, as shown in FIG. 2. Thereupon, this zone of the tube will be introduced into the sleeve, and if an end wall such as 14 is employed, it will act to limit such introduction. Now, if fluid flow is to be established, all that the operator will have to do is to grasp the tubing at points at opposite sides of the cup and exert tension on that tubing. Under these circumstances, the tubing will cam against the surface of the sleeve to cause the folded part of the tube to emerge from the bore of the sleeve. Thereupon, the tube will straighten out, and a free and maximum flow of fluid will occur through the bore.

As will be understood, the sleeve or cup exerts no constricting force on the tubing while flow is taking place. Thus, the difficulties heretofore encountered in connection with metal and similar clamps applied to tubing are avoided, in that the friction fit commonly characterizing accessories of those types does not exist in the case of the present assembly. Therefore, the bore surface of the tubing is not constantly deformed. Instead, with the sleeve removed, the tubing opens up fully to afford an unrestricted flow of fluid therethrough.

Now referring to the alternative structure shown in FIGS. 4 and 5, the tubing has been indicated in these views by the numeral 17. This tubing will correspond to the tubing 5 and 9 as afore indicated. Slidably associated with tube 17 is a member presenting longitudinally extending sleeve portions 18 and 19 defining bores of different areas. These parts may be integrally connected at 20. Preferably, the bore defined by portion 18 should be slightly in excess of the external diameter of tubing 17. The height of the bore defined by portion 19 may be equal to twice the external diameter of tubing 17. Thus, portion 18 will freely slide along the tubing. Portion 19 will snugly accommodate two courses of the tubing when fully distended. The area of this portion 19 might, of course, be slightly less, so as to constrict the tubing to a very small extent. Otherwise, its height might be slightly greater than the dimension aforenoted. It is definitely preferred, however, that the height be as stated.

In any event, it will be understood that the tubing is

threaded through the bore defined by the attaching member or portion **18**. The unit may therefore be adjusted to any desired position along the length of the tubing. When it is desired to interrupt the fluid flow through the tubing, a portion of the latter may be folded upon itself, as shown especially in FIG. 4, and introduced into part **19**. So disposed, it will remain in position until deliberately released. With the parts thus retained, the tubing will be folded sharply upon itself, as indicated at **21**.

This will constrict the tubing bore, so that no fluid will flow through the same. When it is desired to establish that flow, by simply gripping free portions of tubing **17** at points beyond the unit and exerting a tension thereon, the parts of the tubing within portion **19** will be drawn free of that compartment and the folded or kinked portions **21** will be straightened, so that fluid will again be free to flow. As is obvious, with a unit of this type, the sleeve unit can conveniently be fabricated of two pieces of tubing suitably secured together. Otherwise, it may be molded or extruded, as convenient. It will be extremely economical to manufacture and will provide for a double seal. In common with the structure shown in FIG. 2, the tubing will be retained in the fluid-interrupting position until the operator deliberately shifts it from that position.

The invention may be applied to various assemblies included within the medical art. So applied, it may be advantageously used by an unskilled person to completely control the flow of liquid. If—as preferred—the unit is slidable on the tube, it will always be available as part of the assembly. The mounting portion will not constrict the tubing to which it is applied. The sleeve or cup obviously may be stained to provide desired color coding, or to designate the origin of the assembly.

Thus, among others, the several objects of the invention as specifically aforenoted are achieved. Obviously, numerous changes in construction and rearrangements of the parts may be resorted to without departing from the spirit of the invention as defined by the claims.

We claim:

1. For use in a clysis or similar assembly, a tube, a sleeve unit comprising a pair of connected portions extending adjacent and parallel to each other, said portions each presenting a bore to receive said tube, one of said bores having a diameter in excess of the external diameter of said tube, and the latter being slidable therein and the other bore having a diameter substantially equal to twice the external diameter of such tubing.

2. In a clysis or similar assembly, in combination, a sleeve, an attaching member secured thereto, a fluid-conducting tube having a zone folded upon itself to constrict it and thus interrupt fluid flow therethrough, said sleeve presenting a bore portion to receive and retain such tube zone and said attaching member having a portion thereof slidably encircling said fluid-conducting tube.

3. In an assembly as defined in claim 2, said sleeve having a bore of a diameter to accommodate two courses of said tube, said attaching member comprising a sleeve having a bore diameter greater than that of the tube and said sleeves being fixedly connected to dispose their bores parallel and adjacent to each other.

4. In a clysis or similar assembly, in combination, a flexible tube having a zone of its body folded upon itself to interrupt fluid flow through the bore of the tube, a sleeve, said sleeve having an internal diameter larger than the external diameter of said tube, said sleeve encircling the folded zone of said tube, said sleeve having an end wall providing a cup structure to limit the introduction of the folded tube zone into said sleeve, a supporting strap having one end secured to said sleeve and a loop slidably encircling said tube at the opposite end of said strap to provide an attachment between said strap and tube.

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