

[54] **RETENTION SLIDE FOR CATHETERS AND OTHER TUBULAR MATERIALS**

[75] Inventors: **Phyllis Riely**, Northport; **John Varga**, Bayville; **Dominic Spinosa**, Wantagh, all of N.Y.

[73] Assignee: **East/West Medical Products, Inc.**, Syosset, N.Y.

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[58] Field of Search 16/2, 108; 128/348, 349 R, 128/350 R, DIG. 26; 248/80, 83, 158, 187

[56] **References Cited**

UNITED STATES PATENTS

2,649,092	8/1953	Wallace	128/349 R
2,820,457	1/1958	Phillips	128/351

3,241,554	3/1966	Coanda	128/350 R
3,682,180	8/1972	McFarlane	128/350 R

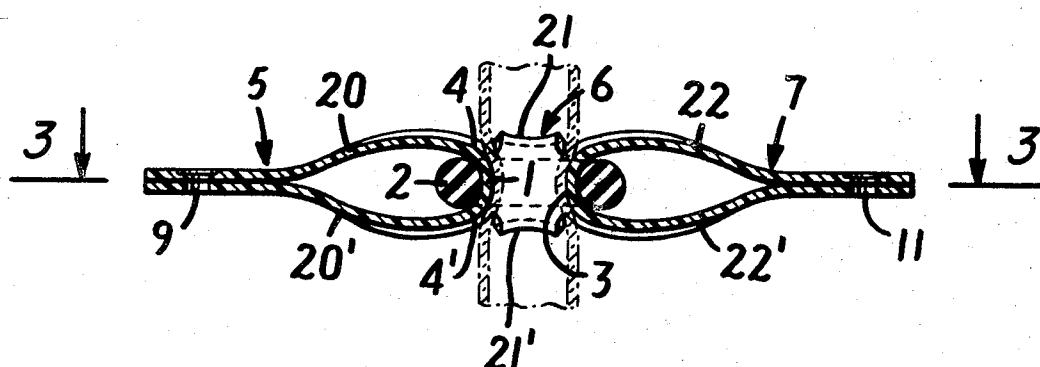
Primary Examiner—Channing L. Pace

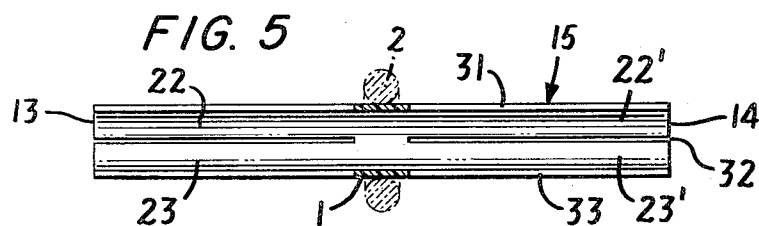
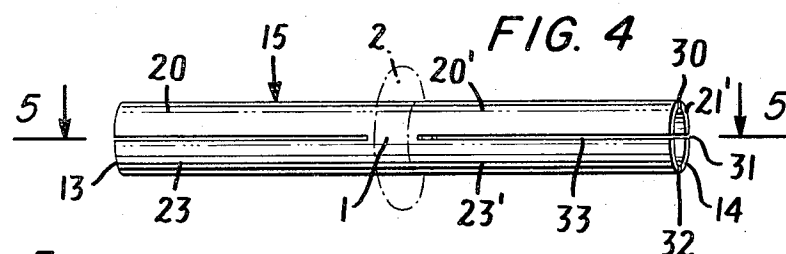
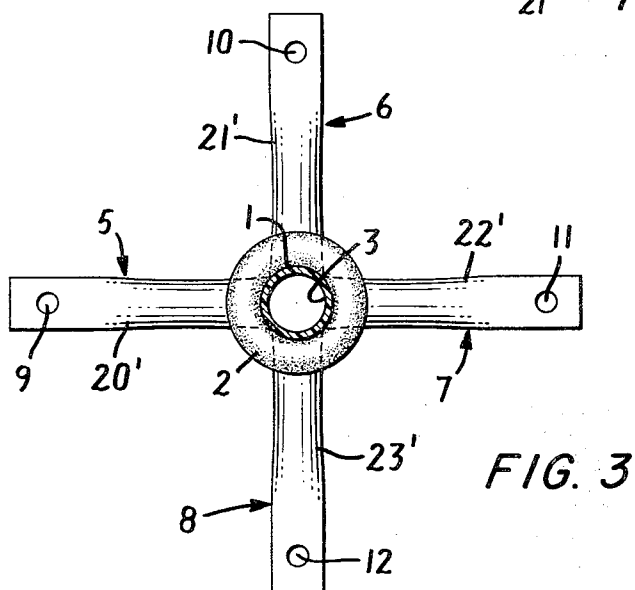
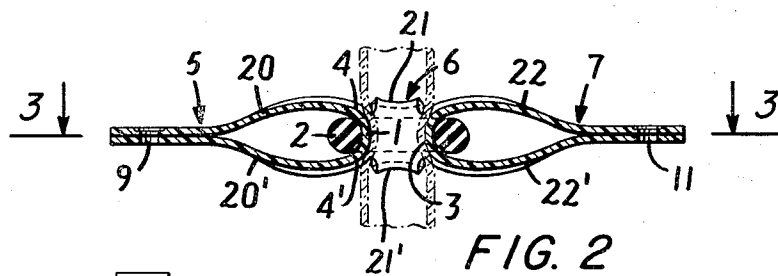
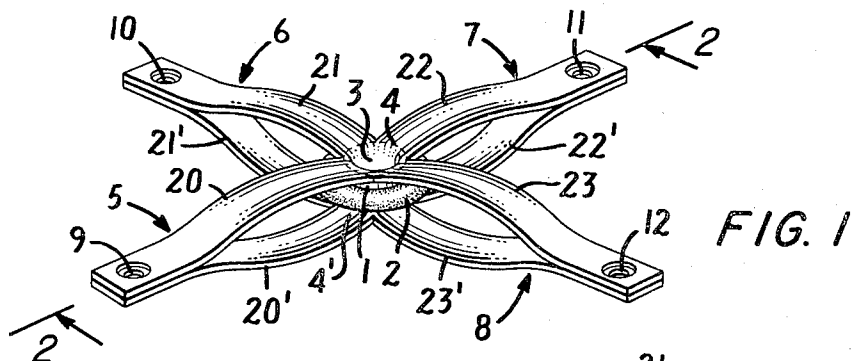
[57] **ABSTRACT**

A retention slide is provided for catheters, tracheotomy tubes and like tubular materials, having a tubular body through which the catheter passes and in which it is engaged in a friction grip, and radially laterally extending retaining lugs for attaching the slide to a fixed location at which the tubular material is to be retained.

A method is also provided for forming such retention slides in one piece from tubular material, slitting the tubular material at both ends to form a plurality of arms, bending the arms at each end radially laterally towards each other in opposed spaced pairs, and joining together the opposed arm pairs thus formed at their lateral extremities, to form the retaining lugs.

12 Claims, 5 Drawing Figures





RETENTION SLIDE FOR CATHETERS AND OTHER TUBULAR MATERIALS

It is frequently desirable to attach a catheter, tracheotomy tube or drain to a portion of the body, so as to fix it in position, to serve as a drain for a body cavity or other portion of the body for an extended period of time. It is important that the device hold the tube in place firmly and securely, and at the same time be sufficiently flexible so as not to irritate the body of the patient at the location to which it is attached.

Petersen U.S. Pat. No. 3,487,837 provides a catheter grip or clamp, conical in configuration, and having a body of substantial thickness. The conical body is provided with flanges, which are apertured so that the device can be sewn to the skin to hold it in place, and the central passage is arranged to engage the inserted catheter in a friction fit, to prevent slippage of the catheter except when wetted. The device, however, is expensive to fabricate, since many precisely-fitted parts are required, and because of its bulk it is uncomfortable to the patient after attachment in position.

Kohl U.S. Pat. No. 3,397,699 discloses a catheter having retention means in the form of extendable and retractable wings, which are fixedly attached to the catheter. This device, being a fixed part of the catheter, is not slidable thereon, and this poses difficulty in attachment to the body, since the tip portion of the catheter to be fixed in the body cannot be modified, shortened or extended in any way. Moreover, it is not possible to shift the position of the catheter except by detaching and reattaching the retention means in some other location.

H'Doubler U.S. Pat. No. 3,176,690 describes another form of anchoring device, which is fixedly attached to a catheter and in effect constitutes a flange on the catheter. Thus, this device is not slidable, either.

Wallace U.S. Pat. No. 2,898,917 discloses a disc-capped tube which can be attached to the body of a patient to retain a catheter. The catheter passes through the tube, and the disc-capped tube is slidable on the catheter. The disc-capped tube is inflated to frictionally engage the catheter to hold it in place. However, because it is difficult to keep the device inflated over a long period of time, and the device has to be reinflated as air is lost from it, the device is unsatisfactory, and hard to maintain in a fixed position.

Schulte U.S. Pat. No. 3,444,861 and Hargest U.S. Pat. No. 3,461,869 disclose other forms of anchoring devices.

In accordance with the instant invention, a retention slide for catheters, tracheotomy tubes and drains, and like tubular material is provided, comprising a tubular body having a passage therethrough whose internal diameter is selected to slidably receive and frictionally engage tubular material to be retained thereby, and a plurality of retaining lugs integral with the tubular body, each lug being formed from a pair of opposed arms, one arm of each pair extending radially laterally from one end of the tubular body, and the other arm of each pair extending radially laterally from the other end of the tubular body, the pairs of arms being joined together at their lateral extremities, at least one lug having means for attaching the slide to a fixed location at which the tubular material is to be retained. The slide preferably includes means for constraining the tubular body, to hold the walls of the passage in a friction fit to the tubular material. This device, since it is slid-

able on the tubular material, can be placed at any location on the tube with respect to the tip thereof.

A preferred embodiment of this retention slide is shown in the drawings, in which:

FIG. 1 represents a perspective view of the retention slide;

FIG. 2 represents a view in longitudinal section, taken along the line 2—2 of FIG. 1;

FIG. 3 represents a view in cross-section, taken along the line 3—3 of FIG. 2;

FIG. 4 shows a slit tube which can be formed into the retention slide of FIGS. 1 to 3; and

FIG. 5 is a longitudinal section taken along the line 5—5 of FIG. 4.

The retention slide shown in FIGS. 1 to 3 has a flexible tubular body portion 1 constrained by an O-ring 2 of flexible resilient material, such as rubber. Integral with the body 1, and extending radially laterally therefrom, are four flexible retaining lugs 5, 6, 7 and 8, each of which bears an aperture 9, 10, 11, 12 at its lateral extremity, for the reception of a suture to attach the retention slide to the body of a patient.

As is best seen in FIG. 2, each lug is formed of a pair of arms 20, 20', 21, 21', 22, 22', 23, 23', joined together at their lateral extremities extending radially laterally from the tubular body 1. Arms 20, 21, 22, 23 extend from end 4 of the body 1, and arms 20', 21', 22', 23' extend from end 4' of the body 1. The retention slide shown is made of flexible plastic tubing such as polytetrafluoroethylene tubing, and the arms are joined by welding or thermal bonding. Metal can also be used, and the arms joined together in the same way.

The tubular body 1 has a central passage 3 for reception of the tubular material such as a catheter or tracheotomy or other drain tube to be retained thereby. The internal diameter of this passage is selected to slidably receive and engage the tubular material in the friction grip, and the friction grip is ensured by the O-ring 2, which restrains the body 1 against excess expansion or distension.

The retention slide shown in FIGS. 1 to 3 is readily manufactured from slit, extruded or rolled (from sheet stock) one-piece flexible tubular material, a blank 15 of which is shown in FIGS. 4 and 5. The piece of tubular material is selected to a total length to equal the sum of the radial lengths of the arms, and the length of the tubular body excluding the arms. The tube 15 is provided at each end 13, 14 with four slits 30, 31, 32, 33 uniformly spaced 90° apart, and extending lengthwise from the ends 13, 14 of the tube 15 to the start of the tubular body portion 1 of the slide. These slits define the arms 20, 20', 21, 21', 22, 22', 23, 23'. An O-ring 2 is slipped over one end of the slitted tube to the position shown in FIG. 1. The pairs of arms are then bent over towards each other, radially and laterally, to the positions shown in FIGS. 1 and 2. The lateral extremities of the arms are then brought into abutment, and joined together, as by thermal bonding, forming the retaining lugs 5, 6, 7, 8. The lugs can be punched or drilled to provide the apertures 9, 10, 11, 12, and the retention slide is then complete.

It is thus evident that the one-piece retention slide in accordance with the invention is easily manufactured in quantity, using mass production techniques, is quite inexpensive, and can be discarded after one use, thus avoiding cleaning and sterilization problems.

The retention slide of the invention can be made of any flexible material, such as metal or plastic, which is inert to the body.

Suitable metals are aluminum, aluminum alloys, tin copper and brass.

The plastic material is preferably thermoplastic, and it is, of course, sufficiently flexible or can be made so by heating to a softened pliable condition that narrow strips 1 can be bent over laterally when forming the lateral retaining lugs of the retention slide from tubular material, in the manner illustrated in FIGS. 4 and 5. Suitable thermoplastic materials include polyamides, polytetrafluoroethylene, polyethylene, polypropylene, neoprene, polyvinyl chloride, polyvinylidene chloride, polyisobutylene, polymethylpentene, polymethyl methacrylate, polyvinyl butyral and copolymers of terephthalic acid and ethylene glycol. Also useful are rubbery materials such as natural rubber, synthetic rubbers such as neoprene, polyisoprene, polyisobutylene, copolymers of butadiene and styrene and copolymers of butadiene and acrylonitrile. To increase strength, a plastic material can be reinforced by filamentary material, such as netting, or textile material, either woven or non-woven, in tubular form. Thus, the tubular material can, for example, be a thermoplastic resin-impregnated tubular or knitted textile material.

A thin-walled tube of flexible material may not engage the tubular material passing through its central passage in a sufficient friction grip to hold it against slippage. To ensure a strong friction grip, the tubular body can be constrained against expansion by an encircling band, sleeve or ring. The sleeve or ring can be of resilient material, such as rubber tube or O-ring, or of relatively rigid material, such as a thermosetting resin, such as a phenol-formaldehyde resin or polystyrene or a metal such as iron, steel, or stainless steel.

The retention slide is useful with catheters, tracheotomy tubes and other drain tubes of all sizes and types. The material of which the retention slide is made is selected so as to provide a friction grip with the material of which the tube is made. The retention slide can also be used with other tubular materials and is not limited to medical uses, although it is particularly designed for such uses.

Having regard to the foregoing disclosure, the following is claimed as the inventive and patentable embodiments thereof:

1. A retention slide for tubular material, comprising a tubular body having a passage therethrough whose

internal diameter is selected to slidably receive and frictionally engage tubular material to be retained thereby, and a plurality of retaining lugs integral with the tubular body, each lug being formed from a pair of arms, one arm extending radially laterally from one end of the tubular body, and the other arm extending radially laterally from the other end of the tubular body, the arm pairs being joined together at their lateral extremities, at least one lug having means for attaching the slide to a fixed location at which the tubular material is to be retained.

2. A retention slide in accordance with claim 1, including means for constraining the tubular body to hold the walls of the passage in a friction fit to the tubular material.

3. A retention slide in accordance with claim 2, in which the means for constraining the tubular body is an O-ring of resilient material.

4. A retention slide in accordance with claim 1, in which there are four lugs disposed at 90° intervals about the tubular body.

5. A retention slide in accordance with claim 1, formed in one piece from a tubular material slit at both ends to form arms, and the arms bent radially laterally and joined together at their lateral extremities to form the lugs.

6. A retention slide in accordance with claim 1, formed of thermoplastic resinous material.

7. A retention slide in accordance with claim 6, formed of polytetrafluoroethylene.

8. A retention slide in accordance with claim 1, formed of metallic material.

9. A retention slide in accordance with claim 1, having apertures at the terminal extremity of each lug.

10. A method for forming a retention slide from tubular material, comprising slitting the tubular material at both ends, bending aligned slitted portions radially laterally into abutment with each other at their lateral extremities, and then joining them together at such extremities.

11. A method in accordance with claim 10, which includes providing apertures at the lateral extremities of at least one lug.

12. A method in accordance with claim 10, which comprises applying an O-ring about the tubular body portion of the tube prior to bending the slitted portions radially laterally to form the lugs.

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