June 26, 1956 J. E. HELD 2,751,911

SURGICAL INSTRUMENT AND COUPLING THEREFOR

Filed Jan. 23, 1953

FIG. 1

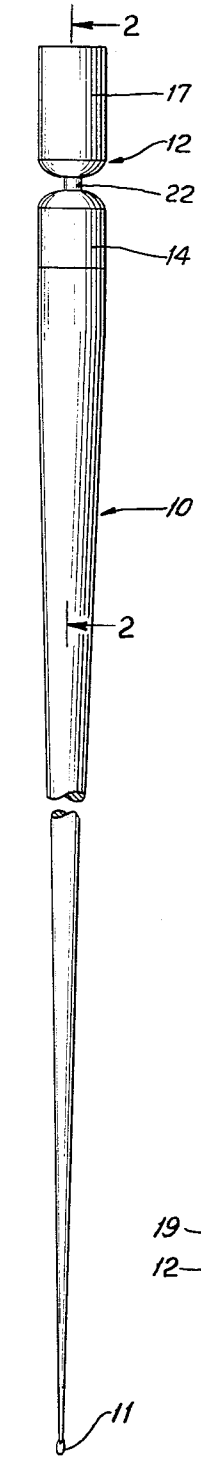


FIG. 2

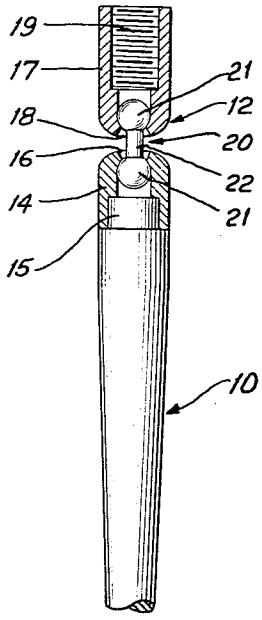


FIG. 3

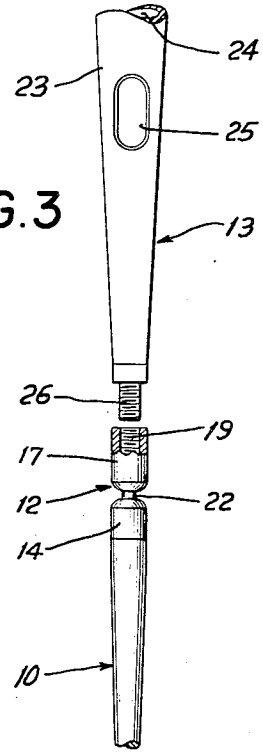
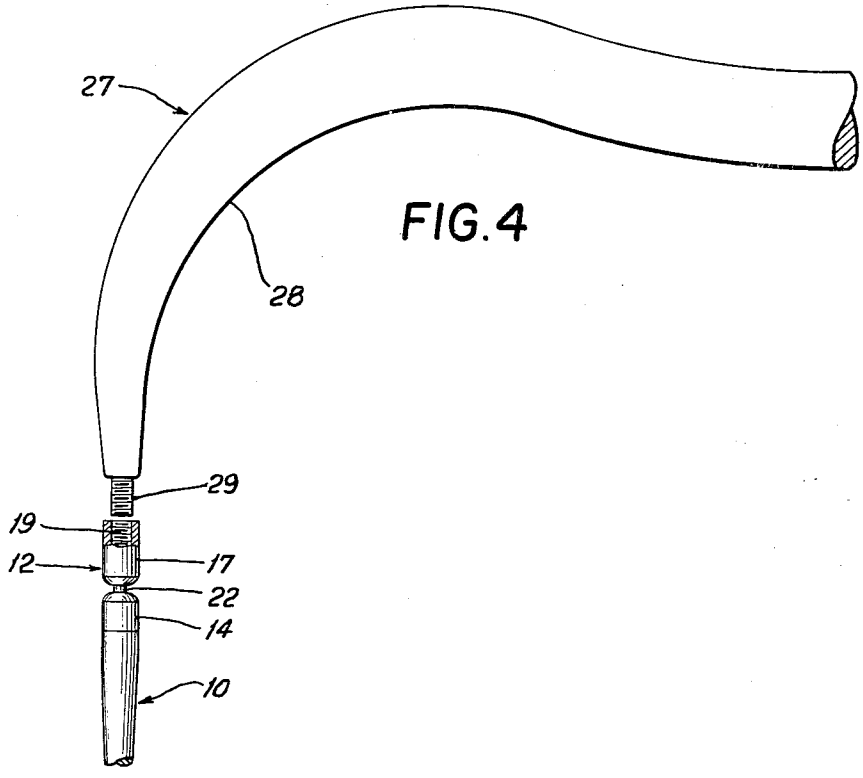


FIG. 4



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SURGICAL INSTRUMENT AND COUPLING THEREFOR

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7 Claims. (Cl. 128—349)

This invention relates to surgical instruments and to improved couplings for effecting ready connection between parts of such instruments.

The invention pertains, in one of its more specific aspects, to a surgical instrument comprising a filiform or the like, a catheter or other instrumentality for connection to the proximal end of the filiform, and a coupling for effecting such connection in a manner to permit of angular movement of the catheter with respect to the filiform in the course of assembling the instrument, whether before or subsequent to insertion of the filiform into a body passage.

For the purpose of conducting certain urological procedures, such as examination or treatment of the bladder, surgical instrumentalities are frequently inserted into the bladder by way of the urethra. Cystoscopes and catheters are among such instrumentalities. Inasmuch as the urethra is a restricted passage, it is customary to first insert a filiform therein and then advance the filiform into the bladder. The filiform serves as a guide for the surgical instrumentality that is connected to its proximal end and that is then advanced until it reaches the desired location in the bladder. The filiform, in addition to serving as a guide, also dilates the urethra and minimizes the possibility of damage to tissue of the urethra in the course of advancing the surgical instrumentality therethrough.

It has been the practice heretofore to provide a rigid threaded connector at the proximal end of the filiform. When the major portion of the filiform has been advanced through the urethra, the surgeon grasps the proximal end portion of the filiform in one hand and the surgical instrumentality in his other hand. He then turns the instrumentality to effect threaded connection between the filiform and the instrumentality. Due to the presence of the filiform in the urethra and bladder, axial and/or angular movement of the filiform, in the course of effecting such connection, frequently causes considerable pain to the patient. Also, due to the awkwardness of his position at the time of making such connection, the surgeon has difficulty in joining the instrumentality to the filiform. Such difficulty is increased since the surgeon is using utmost care to prevent pain to the patient.

The difficulties outlined above are obviated by the present invention, for the reason that surgical instruments provided with couplings of this invention, facilitate connection of filiforms or the like to surgical instrumentalities with which they are generally used. Further, surgical instruments, constructed in accordance with this invention, may be used with a minimum of pain to the patient when connection between the filiform and the instrumentality is made after the filiform has been advanced through the urethra.

It is the principal object of this invention to provide a surgical instrument of the character indicated, having improved features of construction.

Another object of the invention is to provide a coupling for facilitating connection between a filiform and a surgical instrumentality for use therewith, whether such connection is made prior or subsequent to introduction of the filiform in a body passage.

The invention has for a further object the provision of a filiform coupler that is reasonable in cost, capable of being readily sterilized, and adapted to perform its intended functions in a satisfactory and trouble-free manner.

The foregoing objects, as well as other objects, together with the advantages attainable by the practice of this invention, will be readily understood by persons skilled in the art upon reference to the following detailed description taken in conjunction with the annexed drawing, which respectively describe and illustrate surgical instruments constructed in accordance with the invention.

Figure 1 is an elevation view of a filiform having incorporated therewith a coupler constructed in accordance with this invention;

Figure 2 is a view taken along line 2—2 of Figure 1;

Figure 3 is an exploded view of the upper portion of the filiform of Figure 1, on a reduced scale, and the lower portion of a catheter that is adaped to be used therewith, certain parts being broken away for better illustration; and

Figure 4 is a view corresponding to Figure 3 and illustrates a portion of a surgical sound in place of the catheter of Figure 3.

Referring now to the drawing, wherein like reference numerals denote corresponding parts throughout the several views, and more particularly to Figures 1 to 3, a first unit or filiform **10** consists of a tapered elongated flexible member, having, at its distal end, an olive tip **11** to facilitate introduction and advancement of the filiform into and through the urethra and thence into the bladder.

Secured to the proximal end of the filiform is a coupling unit **12**, best shown in Figure 2, for effecting ready connection between the filiform and another surgical instrumentality, such as catheter unit **13** shown in Figure 3. The coupling unit is in the nature of a universal connection of the ball and socket type and preferably comprises a first hollow member **14**, permanently secured at one end to the proximal end **15** of the filiform and having a restricted opening **16** at its opposite end, and a second hollow member **17** having a restricted opening **18** at its lower end and internally threaded at its upper end as indicated at **19**. Members **14** and **17** are joined together by a generally dumb-bell shaped member **20** consisting of a pair of arcuately configured, preferably ball-shaped, members **21**, each of which is disposed and adapted to seat in a corresponding hollow member; and an arm **22** that extends freely through restricted openings **16** and **18** and is affixed at its ends to a corresponding member **21**. It will be apparent, from an examination of Figure 2, that the parts of coupling unit **12** are so constructed and arranged as to permit of combined axial and angular movement of member **17** with respect to member **14** and therefore to filiform **10**.

Catheter unit **13**, shown in Figure 3, comprises a tapered flexible tubular member **23** that defines a longitudinal passage or lumen **24**. One or more ducts **25** establish communication between lumen **24** and the exterior of the catheter. Unit **13** terminates at its distal end in a threaded male member **26** that is adapted to engage the internal threads **19** of the coupler. The manner of connecting the catheter unit to the coupler will be apparent from an examination of Figure 3.

Surgical instrumentalities other than a catheter unit may be used with the device of Figure 1. For example, a surgical sound **27** (Figure 4) may be substituted for the catheter unit, where such substitution is indicated by

the patient's condition. Sound **27** includes a curved body or shank **28** that terminates at its distal end in an extension or male member **29** that is threaded for engagement with the internal threads **19** of hollow member **17**.

Other instrumentalities that may be used in lieu of the catheter unit include bougies and cystoscopes having threaded male members at their distal ends, corresponding to member **26** of Figure 3, for threaded connection to hollow member **17** of the coupling unit.

In the forms of the invention described herein and illustrated in the drawing, one of the hollow members of the coupling unit is shown as being permanently affixed to the filiform, while the other hollow member is adapted to be detachably connected to a surgical instrumentality, such as catheter unit **13** of Figure 3 or sound **27** of Figure 4. If desired, coupling unit **12** may be permanently attached to the surgical instrumentality and detachably connected to the filiform by reversal of the parts shown in the drawing.

From the foregoing, it is believed that the constructive operation and advantages of this invention will be readily comprehended by persons skilled in the art, without further description. It is to be clearly understood, however, that various changes in the shape, size and arrangement of parts may be resorted to without departure from the spirit, or sacrificing any of the advantages of the invention.

I claim:

1. In a surgical instrument of the character described, a first unit comprising an elongated flexible member that is adapted to be inserted in a body passage, a second unit comprising a surgical instrumentality for insertion in the body passage after the first unit, and a coupling permanently secured to one of the units and detachably secured to the other unit, said coupling comprising a universal connection permitting angular movement of one unit with respect to the other unit in the course of and subsequent to assembly of the instrument.

2. A surgical instrument in accordance with claim 1, wherein the universal connection comprises a ball and socket joint.

3. A surgical instrument in accordance with claim 1, wherein the elongated flexible member comprises a filiform and the universal connection comprises a ball and socket joint.

4. A surgical instrument in accordance with claim 3 wherein the surgical instrumentality comprises a catheter.

5. A surgical instrument in accordance with claim 3 wherein the surgical instrumentality comprises a bougie.

6. A surgical instrument in accordance with claim 3 wherein the surgical instrumentality comprises a sound.

7. A surgical instrument in accordance with claim 3 wherein the surgical instrumentality comprises a cystoscope.

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