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TIP FOR UTERINE CANNULA
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Fig. 1.

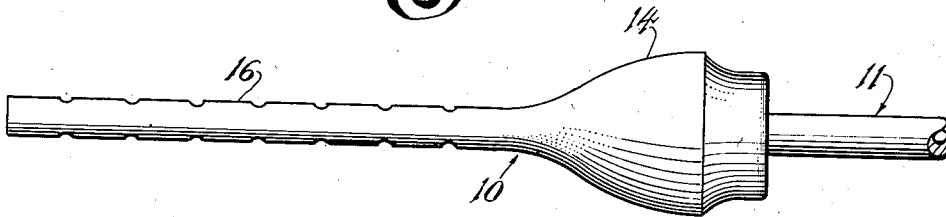


Fig. 2.

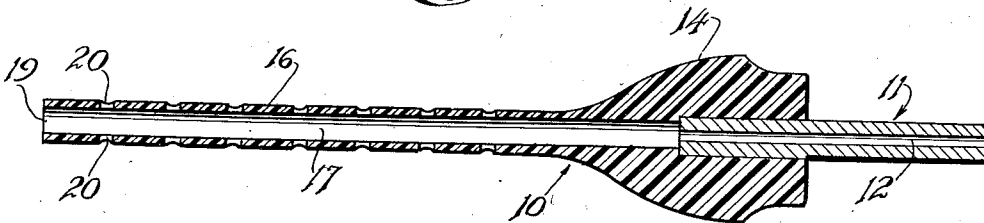


Fig. 3.

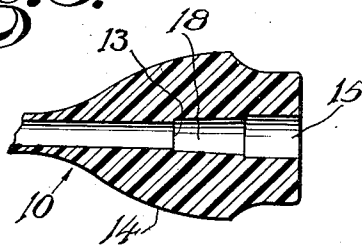
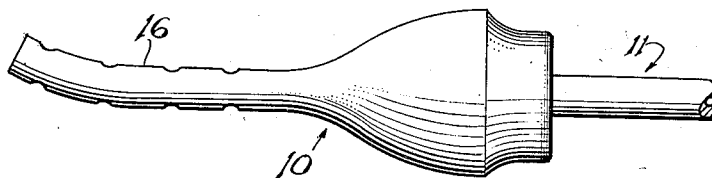


Fig. 4.



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TIP FOR UTERINE CANNULA

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4 Claims. (Cl. 128—348)

The present invention relates to cannulas, and, more particularly, to an improved tip for uterine cannulas and the like used in connection with tubal insufflation apparatus.

Uterine cannulas presently utilized include a tubular metal shaft member having a cannula section at one end thereof formed with a tip portion provided with orifice means at or adjacent its extreme end; and include a rubber plug or acorn member mounted on the cannula section adjacent the tip portion for sealing the opening to the cervical canal after the tip has been introduced therein. Usually, the tip portion is somewhat bendable, and the plug is slidably mounted and frictionally retained on the cannula section, whereby the instrument can be adjusted for various cases. Such a conventional cannula is illustrated in United States Patent No. 2,579,113.

One of the objections to such cannulas is that the tip section requires thorough cleaning after each use. However, this is extremely difficult because the orifice means and the passageway communicating therewith are of very small dimensions and, consequently, are not readily accessible for cleaning. In the event the passageway is slightly obstructed, due to improper cleaning, subsequent use of the cannula may result in false indications by the tubal insufflator and incorrect diagnosis of the patient's condition.

Another objection is that the metallic tip section is relatively stiff whereby considerable difficulty is experienced in bending the same to conform to the patient's requirements in each case.

A further objection is that, upon aging, the plug is adhered to the cannula section, and sliding thereof to adjust its position becomes difficult. In the event, the plug is too freely slidable on the cannula section, it will not remain in its adjusted position when the instrument is applied to the patient.

A still further objection is that the tip portion of the cannula requires special operations to form the orifice means and render the same bendable while maintaining the shaft section rigid.

Accordingly, an object of the present invention is to provide a cannula which overcomes the foregoing difficulties and objections.

Another object is to simplify the construction of the cannula shaft and to reduce the manufacturing cost thereof.

Another object is to eliminate the necessity of cleaning the tip portion after each use by providing an expendable tip which after being used but once is discarded.

Another object is to provide such a tip which is readily adjusted to meet the requirements of each case.

Another object is to provide such a tip which has a self conforming tip section.

Another object is to provide such a tip wherein the plug and tip section are integral.

A further object is to provide such a tip which is simple and economical in construction and can be manu-

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factured in large quantities by automatic machinery at a low cost.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description, and is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is an elevational view of a tip in accordance with the invention mounted on the shaft of a cannula of which only a portion is shown.

Fig. 2 is a longitudinal sectional view of the tip and the cannula shaft portion shown in Fig. 1.

Fig. 3 is a fragmentary sectional view of the bore of the tip with the cannula shaft removed.

Fig. 4 is an elevational view similar to Fig. 1 illustrating the tip with its tip section reduced in length and shaped to conform with the patient's requirements.

Referring to the drawing in detail and more particularly to Figs. 1, 2 and 3 thereof, there is shown a tip 10, and an end portion of a cannula shaft 11 having a central gas conducting passageway 12 extending longitudinally therethrough. This portion of the shaft simply is tubular and is devoid of any structural features requiring special manufacturing operations. The shaft thus can be constructed of tubular stock at a low cost. Since any conventional cannula can be provided with such a shaft, the other portions of the cannula need not be illustrated or described. Also, existing conventional cannulas can be modified to practice the present invention by cutting off the bendable tip portion of the shaft so that a rigid section of the shaft is adapted to support the tip 10.

The tip 10 comprises a substantially conical, plug-shaped body portion 14 formed with a central bore 15 at one end thereof for receiving the free end of the shaft 11 as shown, and an elongate tubular tip section 16 at the opposite end of the body portion having a gas conducting passageway 17 extending therethrough which communicates with the bore 15 and the shaft passageway 12 when the shaft is inserted into the bore.

As shown in Fig. 3, the bore 15 has a section 18 of reduced diameter at its inner end adapted to yield upon the insertion of the shaft and thus provide a good frictional grip on the shaft. Also, the passageway 17 may be of a slightly smaller diameter than the bore section 18 whereby an annular seat or shoulder 13 is provided which serves as a stop for the extreme end of the shaft 11.

In addition to the opening 19 at the extreme free end of the tip section, which constitutes an orifice means, the tip section may be provided with a series of longitudinally or lengthwise spaced, laterally extending orifices 20 which are in communication with the passageway 17. Two or more rows of such orifices may be provided, with the orifices in all the rows at a given cross-section in longitudinal alignment. For example, if two such rows of orifices are provided as shown, the orifices of the respective rows are diametrically opposite each other.

The tip 10 preferably is constructed of a moldable material such as rubber, synthetic rubber or synthetic molding material, and can thus be manufactured by automatic molding machinery in large quantities at a low cost. The most suitable material found so far for this purpose is a polyethylene type molding plastic. This material has a softness to touch and relieves the unnecessary discomfort to which patients were heretofore subjected by hard, cold contacting metallic parts. Also, the tip section 16, by being formed of such material, is readily bendable and cuttable for the purpose about to be described, and the bore

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section 18 is yieldable to establish a good friction grip on the shaft.

The tip section 16 shown in Figs. 1 and 2 is of a length required only in extreme cases and thus usually is longer than actually required. However, the tip section can readily be reduced to the length required in all other cases than an extreme case by simply cutting off from the end as much of the tip section as is not needed, whereby the remaining portion of the tip section will be of the desired length. Preferably, the tip section is cut transversely at a point intermediate adjacently spaced orifices to avoid the formation of recesses or rough edges at the extreme free end which may cause discomfort to the patient.

In Fig. 4, a tip section 16 is shown after being reduced to its proper length and bent into a shape required for a particular case. The tip section is sufficiently bendable or flexible to even more fully conform itself to the contour of the cervical canal upon insertion therein, whereby discomfort to the patient is further alleviated.

By reason of the inexpensiveness of the tip 10, it is possible to use the same only once and to discard it after such use, whereby the physician can very well afford to keep on hand a supply of such expendable tips. Also, by using each tip only once, cleanliness thereof is assured in each case and the difficulty of cleaning cannula tips is completely eliminated.

From the foregoing description, it will be seen that the present invention provides an expendable cannula tip which is economical in construction and can be fitted exactly for each case in a simple and convenient manner, and which enables the cannula shaft to be cleaned more easily.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in any limiting sense.

I claim:

1. A unitary tip for a uterine cannula, comprising an

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acorn-shaped body portion having a central bore for receiving the shaft of the cannula; and an elongate tubular tip section integral with said body portion having a passageway extending from said bore to the free end thereof and terminating in an opening defined by a smooth edge disposed in a plane substantially perpendicular to the longitudinal axis of said tip section, said tip being integrally formed of a unitary mass of polyethylene type plastic material which is bendable and cuttable and said tip section having a uniform hollow cylindrical cross-section throughout its length and having a wall of a thickness to facilitate manually cutting the same to adjust the length of said tip section and to facilitate manually bending the same to adjust the shape of said tip section.

2. A tip according to claim 1, wherein said tip section has a series of longitudinally spaced orifices communicating with said passageway.

3. A tip according to claim 2, wherein said orifices are arranged in a pair of rows opposite each other and each orifice in one row is directly opposite an orifice in the other row.

4. A tip according to claim 1, wherein said bore is greater in cross-section than said passageway to provide a shoulder at the inner end of said bore, and said bore has a portion of reduced cross-section adjacent said shoulder.

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