

United States Patent

Majzlin

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[54] INTRAUTERINE CAUTERIZING DEVICE

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[51] Int. Cl. A61b 17/36

[58] Field of Search 128/303.13, 303.1, 303.17,
128/130, 408, 401

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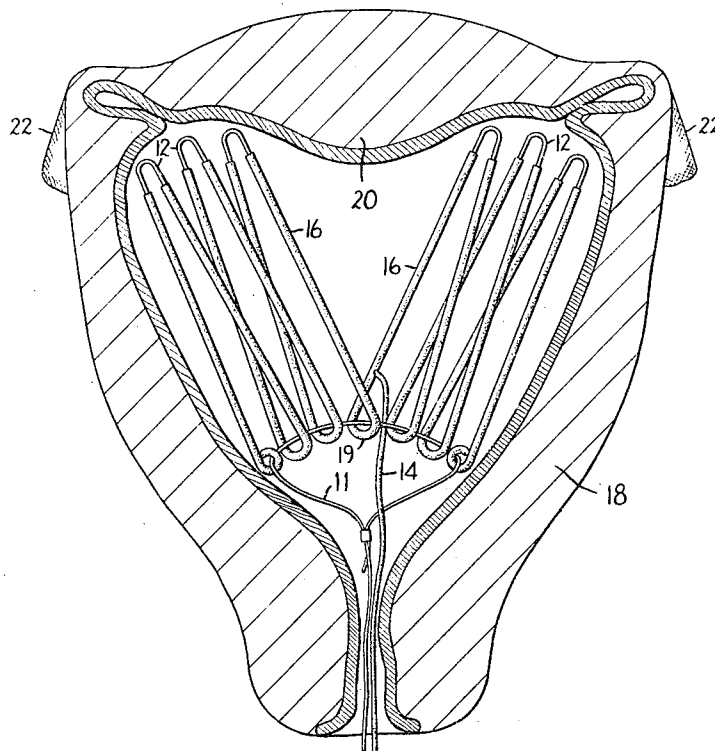
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[57]

ABSTRACT

The present invention relates to a spring member particularly adapted for use in cauterizing the uterus. One potentially large application of this is in cauterization of the openings of the fallopian tubes to prevent pregnancy.

2 Claims, 11 Drawing Figures



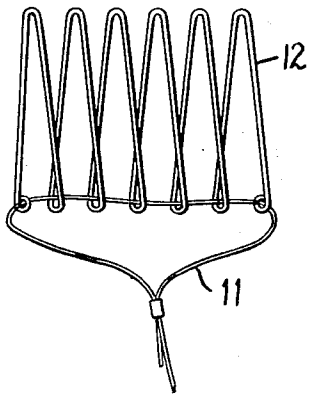


FIG. 1a

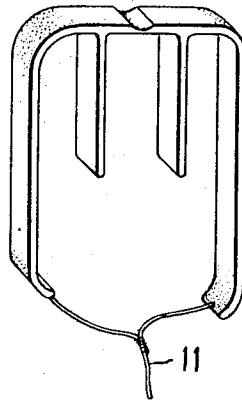


FIG. 1b

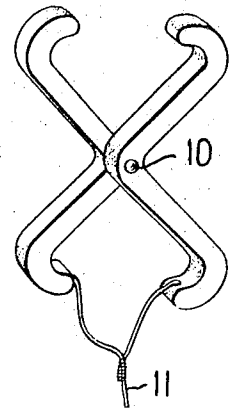


FIG. 1c

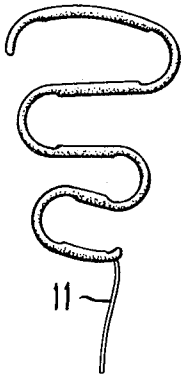


FIG. 1d

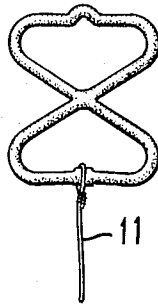


FIG. 1e

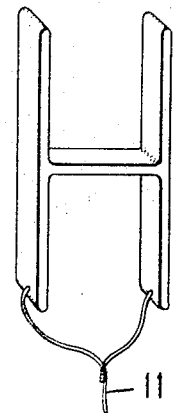


FIG. 1f

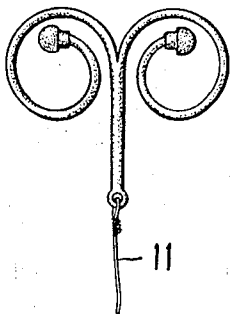


FIG. 1g

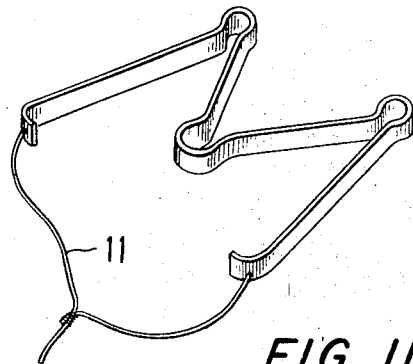


FIG. 1h

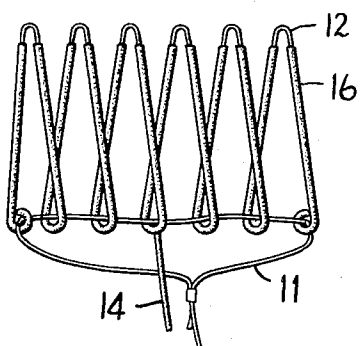


FIG. 2

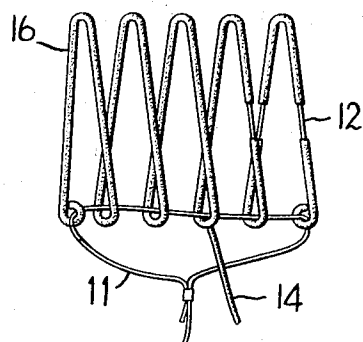


FIG. 3

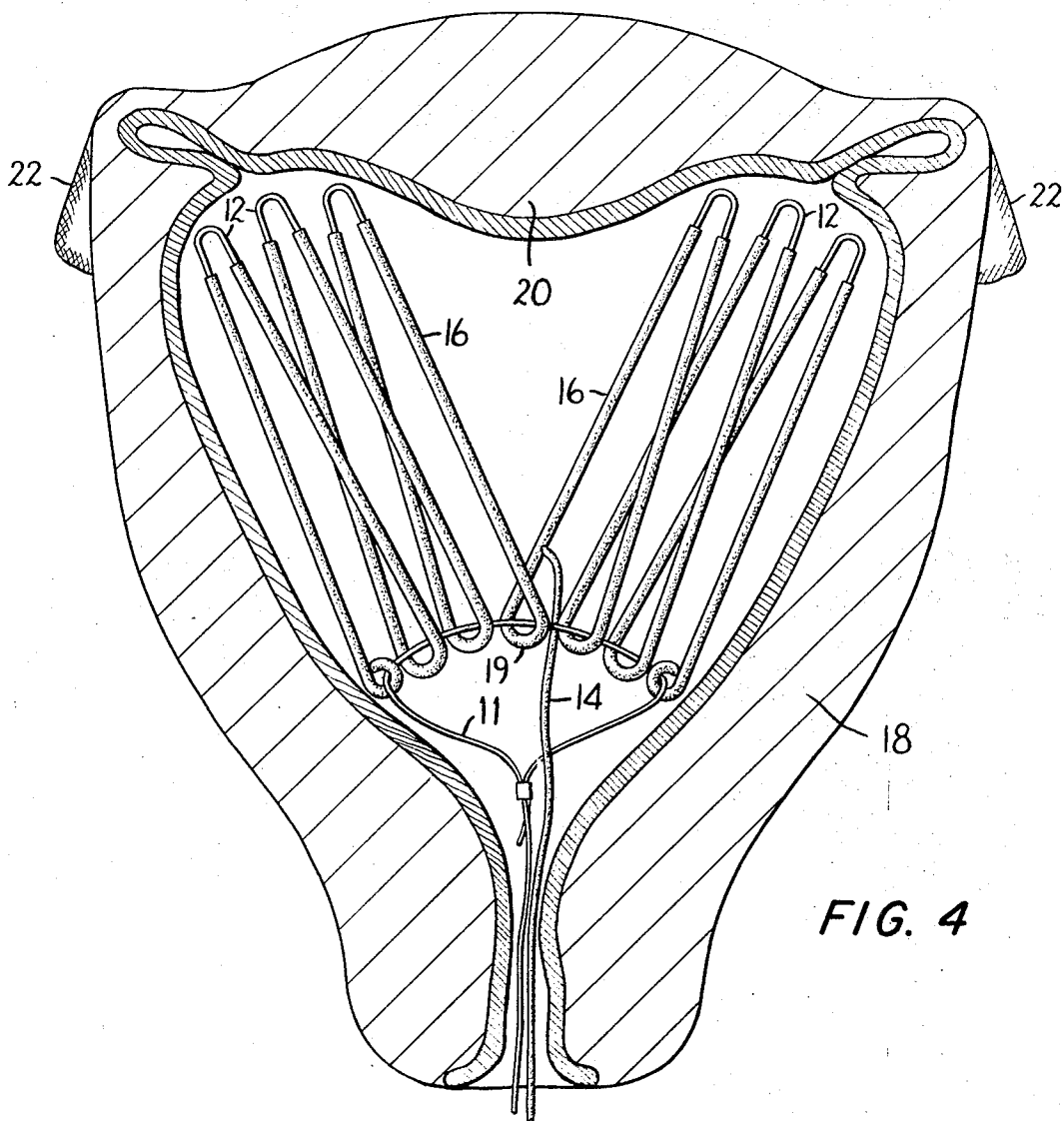


FIG. 4

INTRAUTERINE CAUTERIZING DEVICE

It is known that the uterus may be cauterized by means of a probe which supplies electric current to effect the cauterization. But the process has not been widely used because great skill and precision are required to spot the probe in the specific area that is to be cauterized. This is particularly true in those cases where the fallopian tubes are to be cauterized and thereby sealed off to prevent pregnancy.

In accordance with the present invention the difficulty of spotting the probe has been overcome by means of an intrauterine device which may be readily inserted into the uterus to supply electric current in the area to be cauterized. The intrauterine device of the present invention comprises a spring member that is collapsed for insertion into the uterus and thereafter the spring expands to contact the walls of the uterus throughout a substantial area thereof.

The spring member is made of metal, or other material that will conduct electric current, and it is covered with an insulating material. The insulating material is scraped off to bare the metal in that area which will correspond to the area where cauterization is to be effected in the uterus. Electric current is passed through the spring member after it has been inserted into the uterus, with a resulting cauterization in that area where the spring member is bared. Since the spring member will quite uniformly orient itself in contact throughout a substantial area of the uterus, little, if any, skill is required to place the bared metal in the particular area that is to be cauterized. This is of great advantage since the cauterization may be performed by a midwife, nurse or other semiskilled person and there is no requirement that a physician be present.

The collapsible spring member of the present invention may be constructed in a number of different ways. For example, the intrauterine spring members described in U.S. Pat. Nos. 3,397,691, 3,410,265 and 3,397,690 may be coated with insulated material and used for carrying out the present invention even though some of these spring members are in contact with only a limited selected area of the walls of the uterus. Best results are achieved, however, when the spring member is in contact throughout a substantial area of the walls of the uterus, and, for this reason, the spring member described in U.S. Pat. No. 3,397,691 is a preferred structure.

These and other advantages of the present invention may be best understood by reference to the drawings which illustrate preferred embodiments of the present invention and in which:

FIGS. 1a-1h show a number of spring members which are suitable for use in accordance with the present invention.

FIGS. 2 and 3 illustrate the way in which electric insulation may be applied to the spring member.

FIG. 4 shows a modified form of the spring member of FIG. 2 inserted in the uterus.

In the drawings the same number is employed for identical parts of the described structures. FIG. 1 illustrates a number of collapsible spring members a through h made of flexible metal or other flexible material that will conduct electricity. In each case the member is resilient due to the configuration of the flexible metal and, as a result, the member may be collapsed for insertion into the uterus. Once inserted the resilient member will return to its original configuration and automatically orient itself in the uterus. The spring member shown in FIG. 1c may be provided with a pivot as at 10 to increase the flexibility of the member. Each of the spring members is preferably provided with a draw string 11 for removal of the member from the uterus.

The preferred form of structure shown in FIG. 1a comprises a plurality of windings of a stainless steel wire 12 which trace out a three-dimensional volume analogous to that of a flattened spiral spring. In the example shown, the wire is stainless steel of 0.018 inch and six windings are employed to give an overall width of about 1.5 inches. The gauge of the wire, the

number of windings and the width of the member may of course be varied. A metal wire is preferably employed in the structure of the spring members of FIGS. 1a, 1d, 1e, and 1g while a metal leaf spring is used in the structures of FIGS. 1b, 1c, 1f and 1h.

As best shown in FIG. 2 an electrically insulated metal wire 14 is attached to the selected spring member (in this case the member of FIG. 1a) and the assembly is provided with a coating of suitable electric insulation 16 which is thereafter removed to expose the bare wire 12 in a selected area as illustrated in FIGS. 2 and 3. After the spring member is inserted into the uterus, wire 14 is connected to a source of electricity conventionally used for cauterization of skin tissue. The patient then takes hold of a suitable ground while electric current flows through the assembly to cauterize the uterus in the area of the bared wire 12. Cauterization may be carried out, for example, by feeding a current of 0.25 ampere at 200 volts through the device for a period of about 5 to 7 seconds. After cauterization is complete, the spring member is removed.

FIG. 4 shows the spring member of FIG. 2 inserted in the uterus 18. In this case the spring member was permanently bent at the midpoint 19 before insertion so that the bared wire loops are positioned on opposite sides of the fundus 20 in the area of the fallopian tubes 22. The permanent bend insures a selective orientation of the bared wire for cauterization of the fallopian tubes to seal them off and prevent pregnancy. After the cauterization is complete, the spring member is removed. The patient is examined 2 to 3 weeks later to make sure that the fallopian tubes are indeed closed and, if they are not, the cauterization procedure is repeated. It can be readily seen that the spring member has vast advantages over a normal electric probe. It orients itself in the uterus and there is no need for the extreme skill and precision required to properly spot an electric probe in the area to be cauterized.

The invention is not limited to the embodiments shown, which were chosen solely for the purpose of illustration; it is intended to cover all changes and modifications which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A spring member for use as an electrode in an apparatus for cauterization of the uterus of flexible material that will conduct electricity and is collapsible along a longitudinal axis to a size adapted to be passed through the cervical canal for insertion into the uterus, and is expandable in the uterus in a direction transverse to said longitudinal axis whereby it is self-orienting in the uterus, an electric insulating coating except on selected portions of said spring member said selected portions corresponding to the area of the uterus to be cauterized and being automatically aligned with said area by means of the self-orientation of the spring member upon expansion of the spring member in the uterus and an insulated electric conductor attached to said member for feeding an electric current through said member, said conductor being adapted to extend outside the uterus when the member is in place therein.

2. The device of claim 1 wherein the spring member comprises a flattened spiral spring member of resilient material having a plurality of windings which are capable of expanding and contracting, said windings tracing a three-dimensional volume of a generally rectangular shape which contains a central axis of expansion and contraction, said windings being expandable and contractable along axes which are generally parallel to said central axis, the distance between opposite windings measured perpendicularly to said central axis and the distance between the ends of said windings when contracted being such that said spring member when so contracted may be passed through the cervical canal of the user of the device for emplacement and subsequent expansion within the uterus.

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