United States Patent [19]

Kenny et al.

[11] **3,866,613**

[45] **Feb. 18, 1975**

[54] **PESSARY RING ELECTRODE SYSTEM**

[75] Inventors: **John Kenny; Alan Wilds,** both of Welwyn Garden City, England

[73] Assignee: **Devices Implants Limited,** Welwyn Garden City, England

[22] Filed: **Mar. 11, 1974**

[21] Appl. No.: **450,244**

[52] **U.S. Cl.** **128/408,** 128/127

[51] **Int. Cl.** **A61n 1/04**

[58] **Field of Search** 128/404, 407, 408, 127, 128/130

[56] **References Cited**

UNITED STATES PATENTS

40,949	12/1863	Scattergood	128/127
3,374,787	3/1968	Hatke	128/130
3,437,091	4/1969	Jerushalmi et al.	128/404
3,800,800	4/1974	Garbe et al.	128/408

Primary Examiner—William E. Kamm

Attorney, Agent, or Firm—Wenderoth, Lind & Ponack

[57] **ABSTRACT**

A pessary ring having electrodes for the application of electric currents to counter urinary incontinence in female patients. The ring is composed of a first flexible part having the electrodes at each end and a second tubular part which may be cut to the desired length by the medical practioner and fitted to the electrodes to form a closed ring to fit a particular patient.

6 Claims, 8 Drawing Figures

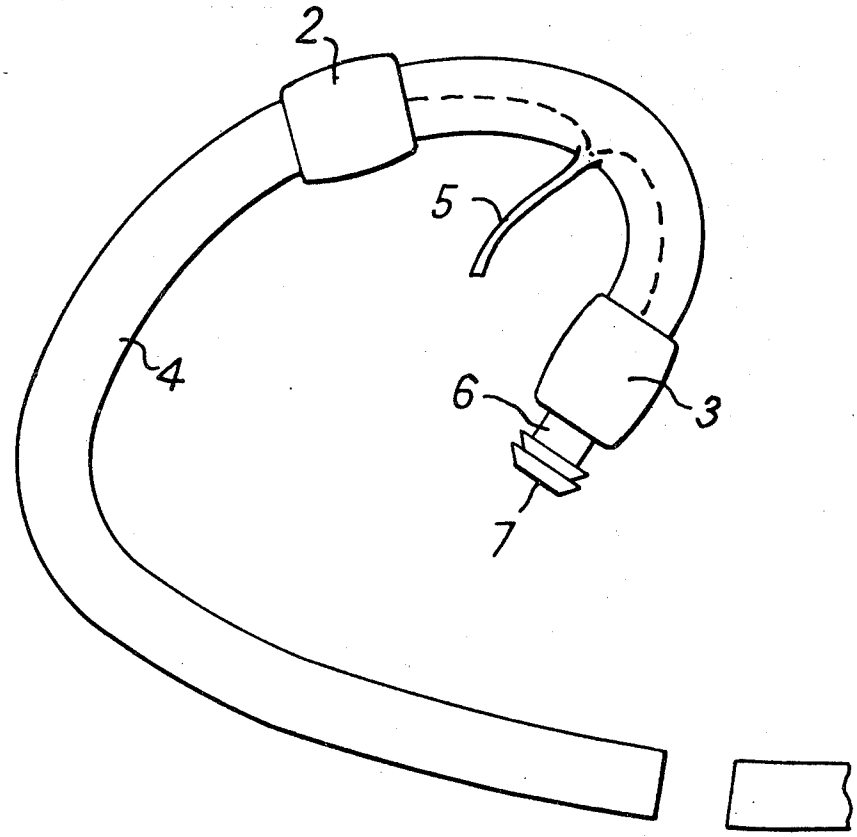


FIG. 1

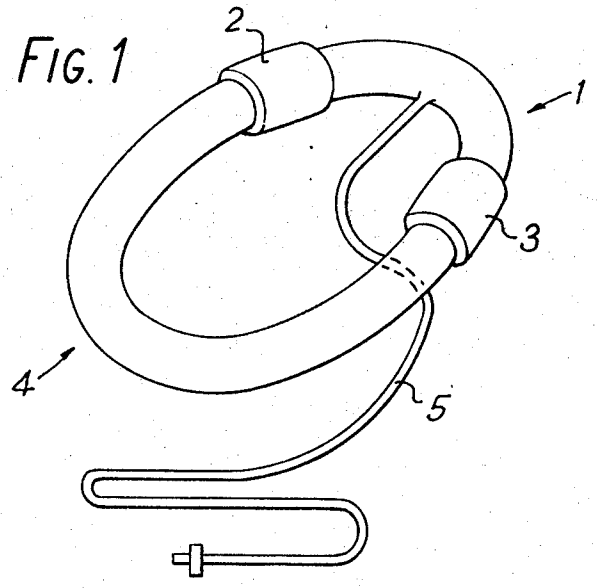
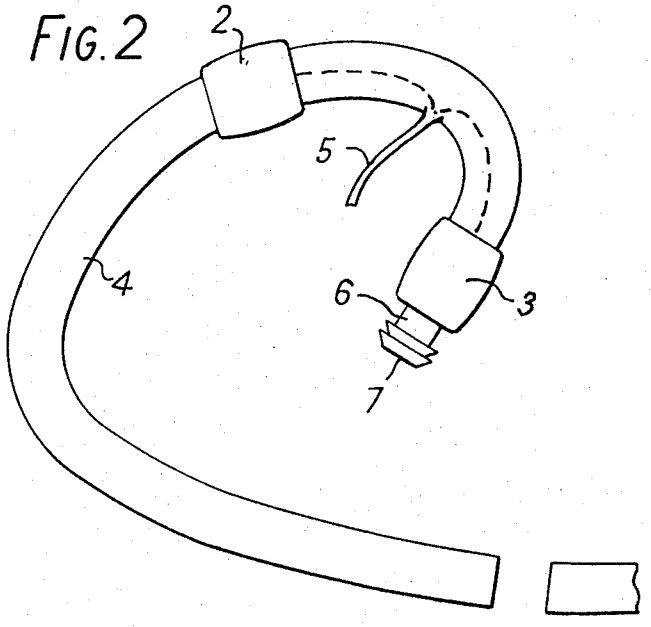


FIG. 2



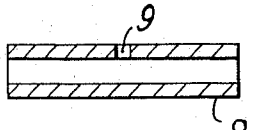


FIG. 3

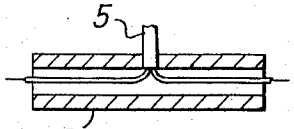


FIG. 4

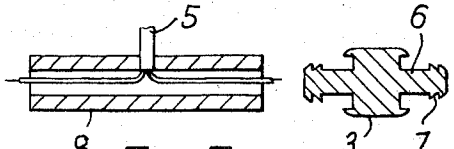


FIG. 5

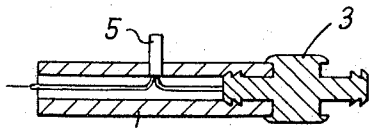


FIG. 6

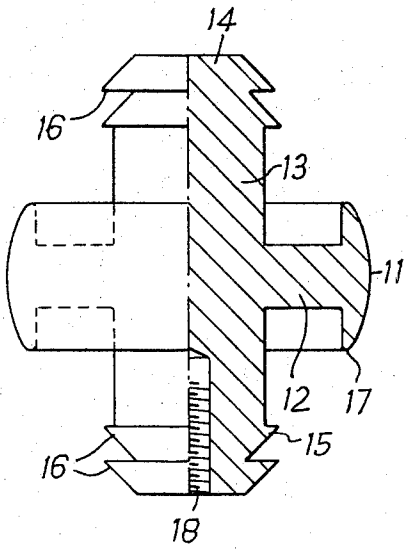


FIG. 8

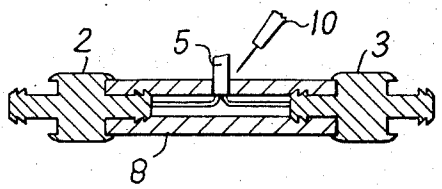


FIG. 7

PESSARY RING ELECTRODE SYSTEM

The invention relates to a pessary ring structure having electrodes whereby stimulating electric potentials may be applied for the control of urinary incontinence. An object of the invention is to provide a pessary ring structure of this kind which may readily be assembled to any size appropriate to fit the particular patient being treated.

According to the invention there is provided a pessary ring structure comprising first and second limbs adapted to fit together to constitute a closed flexible pessary ring, the first limb comprising a flexible arm, a metal electrode at or near each end of the arm and an insulated conductor lead connected to each electrode, the leads extending from the arm for the remote application of stimulating potentials, and the second limb comprising a flexible tube which may be cut to a desired length to make the complete ring fit a particular patient, there being provided coupling means for coupling the ends of the tube to the respective ends of the arm.

The coupling means may comprise a plug for each end of the tube, the plugs fitting the ends of the tube tightly and being fixed or fitted to the ends of the arm. The arm may be tubular, at least at its ends, and the plugs may be pushed or screwed into place in the tubular ends. Preferably the arm is tubular and is filled with a flexible sealing material which assists in holding the plugs in place.

While it is envisaged that the electrodes may be metal elements or rings applied to the outside of the arm and the coupling means may be additional members, perhaps plastics plugs, a preferred embodiment of the invention combines the electrodes and the coupling means and provides electrodes which are fitted to the ends of the arm and which have protruding plug portions for accepting the ends of the tube. The electrodes in this arrangement preferably have an outer cylindrical portion which conforms to the outer cross-section of the arm and tube. The cylindrical portion may be flush with the outer surfaces of the arm and tube. Preferably, however, the cylindrical portion is barrel-shaped and overlaps the ends of the tube and arm. The end edges of the cylindrical portion are preferably rounded to prevent irritation of the vagina.

The invention includes within its scope a pessary ring structure as described above when assembled and the components thereof ready for assembly.

The invention will further be described hereinafter with reference to the accompanying drawings, of which:

FIG. 1 is a perspective view of an assembled pessary ring structure in accordance with the invention;

FIG. 2 is a perspective view illustrating the assembly of the structure of FIG. 1;

FIGS. 3 to 7 are cross-sectional views showing successive stages in the manufacture of the first limb of the structure of FIGS. 1 and 2; and

FIG. 8 is an elevation, cross-sectioned in part, of one of the electrode members of the structure.

Referring to FIG. 1 the pessary ring structure comprises a first limb 1 terminating in electrode members 2 and 3 and a second limb 4 coupled at its ends to the electrode members. The whole constitutes a flexible ring which may be fitted to a female patient so that the electrodes 2 and 3 make contact with spaced parts of the vaginal region. A pair 5 of insulated electrical conductor leads passes through the wall of limb 1 and terminates in an electrical plug whereby stimulating potentials may be applied. The members of the pair are connected respectively to the electrodes 2 and 3 and application of appropriate stimulating potentials activate the patient's muscles to overcome urinary incontinence.

A difficulty with a pessary ring structure of the kind described is that it requires to be appropriate size for the individual patient. The structure shown in the drawings overcomes this difficulty by allowing the patient's doctor to adjust the ring size as appropriate. This is possible by providing initially the limb 4 as a long tube so that the doctor may tailor the ring to size by cutting off an appropriate length. FIG. 2 shows one end of the tube of limb 4 detached from its electrode 3 so as to be cut before coupling to the electrode. Electrode 3 has a plug portion 6 with backwardly facing annular teeth 7 which allow the tube 4, which is a vinyl tube, to be pushed on the plug portion but which impede withdrawal of the tube.

Referring now to FIGS. 3 to 7 there are shown successive stages in the manufacture of limb 1. Firstly (FIG. 3) a length 8 of vinyl tubing is taken which has a length of 2½ inches, an outside diameter of one-half inch, an inside diameter of one-fourth inch and a hardness of 70. The tube is cut with square ends and a ⅛ inch hole 9 is drilled in the middle.

The two-core lead 5 is passed through hole 9 and the individual wires taken out through opposite ends of the tube (FIG. 4).

Each wire is welded on to a respective electrode member 2, 3 (to be described in detail with reference to FIG. 8) and the electrode members are pushed home into the ends of the tube (FIGS. 5 and 6). Finally, referring now to FIG. 7, the interior of the tube is filled by means of a syringe 10 applied to hole 9 with a resin which sets in a flexible condition, the resin used in this case being Scotchcast 221 resin manufactured by the 3 M's Company. This is a flexible, transparent polyurethane. After mixing and degassing the resin constituents the resin is injected until all the trapped air is removed. The resin is then cured at 70°C for 7 hours.

The ring is finished by providing the vinyl tube 4, cutting to length and inserting the ends on to the projecting plug portions of the electrode members.

Referring now to FIG. 8 there is shown one of the electrode members in greater detail. The member is made of titanium. Alternative metals include stainless steel, palladium, platinum, gold, alloys of the inert metals and platinised titanium. The outer surface of the electrode may be plated with a suitable metal from the group described above if the body of the electrode is of some other metal.

The electrode member has an annular ring portion 11 supported by a web 12 on a central body 13. The body has opposed plug portions 14 and 15 for fitting the tubes of the arm 1 and the limb 4. The plug portions have annular teeth 16 which are backwardly facing so as to engage the inner walls of the tubes to obstruct withdrawal. The rims of the tubes are accommodated behind ring portion 11 which has its ends 17 rounded to prevent irritation of the vagina. A threaded hole 18 may be used for securing the lead in conjunction with a screw and tab (not shown).

We claim:

1. A pessary ring structure comprising first and second limbs adapted to fit together to constitute a closed flexible pessary ring, the first limb comprising a flexible arm, a metal electrode at or near each end of the arm and an insulated conductor lead connected to each electrode, the leads extending from the arm for the remote application of stimulating potentials, and the second limb comprising a flexible tube which may be cut to a desired length to make the complete ring fit a particular patient, there being provided coupling means for coupling the ends of the tube to the respective ends of the arm.

2. A pessary ring structure as claimed in claim 1 wherein the coupling means comprises a plug for each end of the tube, the plugs fitting the ends of the tube tightly and being attached to the ends of the arm.

3. A pessary ring structure as claimed in claim 2 wherein the arm is tubular, at least at its ends and the plugs are inserted in place in the tubular ends.

4. A pessary ring structure as claimed in claim 3 wherein the arm is tubular and is filled with a flexible sealing material which assists in holding the plugs in place.

5. A pessary ring structure as claimed in claim 1 wherein the coupling means are the electrodes, which are fitted to the ends of the arm which have protruding plug portions for accepting the ends of the tube.

6. A pessary ring structure as claimed in claim 5 wherein each electrode has a barrel-shaped cylindrical portion which overlaps the ends of the tube and arm.

* * * * *