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Perrin

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[54] **INTRALUMINAL VEIN HOLDER**

[76] Inventor: **Richard Perrin,** 45 Coulson Ave., Toronto, Ontario, Canada

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[52] **U.S. Cl.** ..... **128/1 R;** 73/49.1; 138/90

[51] **Int. Cl.**[2] **A61B 19/00**

[58] **Field of Search** ..... 128/1 R, 218 A, 349; 73/38, 40, 49.1, 49.5; 138/90; 431/343; 239/566, DIG. 13; 118/DIG. 10

[56] **References Cited**

UNITED STATES PATENTS

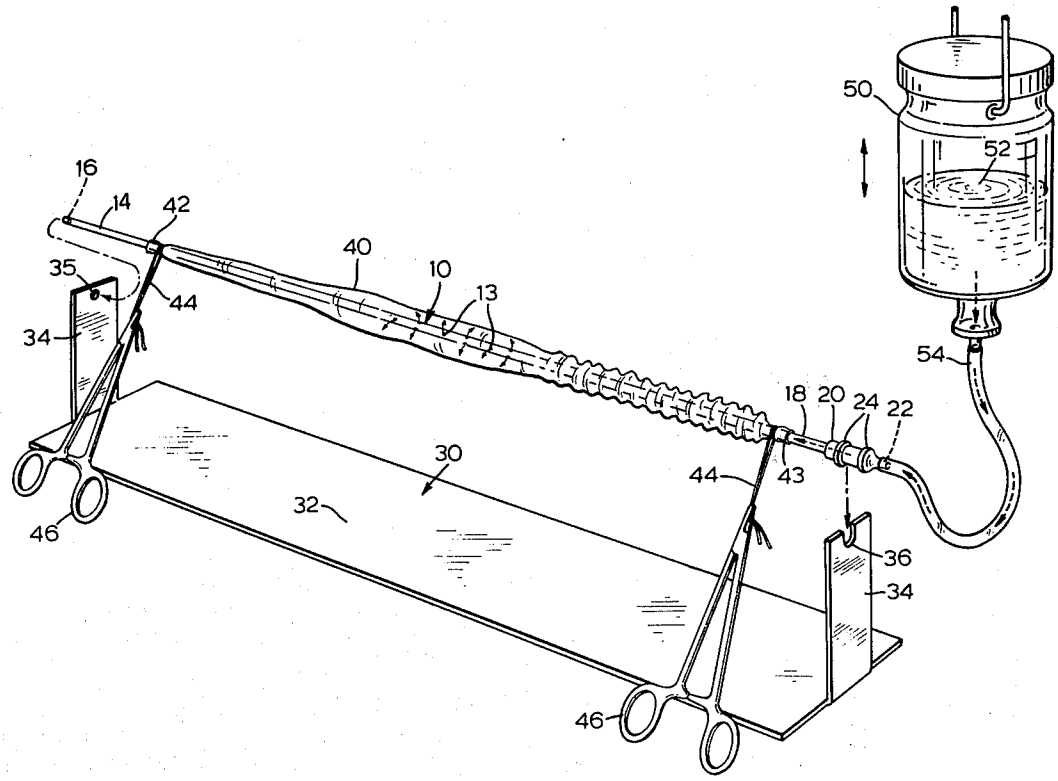
1,990,013	2/1935	Albrecht	73/40
2,193,176	3/1940	Krugler, et al.	431/343
2,885,892	5/1959	Coutts	73/40
3,710,777	1/1973	Sparks	128/1 R
3,712,115	1/1973	Miller	138/90

Primary Examiner—Richard A. Gaudet
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[57] **ABSTRACT**

A device for use in the preparation of a vein for arterial grafting. A tubular core, closed at one end and open at the other end to couple with a source of pressurized fluid, rests removably adjacent each end on a frame. The core wall is perforated in an area intermediate the ends of the core and the outer surface of the core wall is smooth.

7 Claims, 2 Drawing Figures



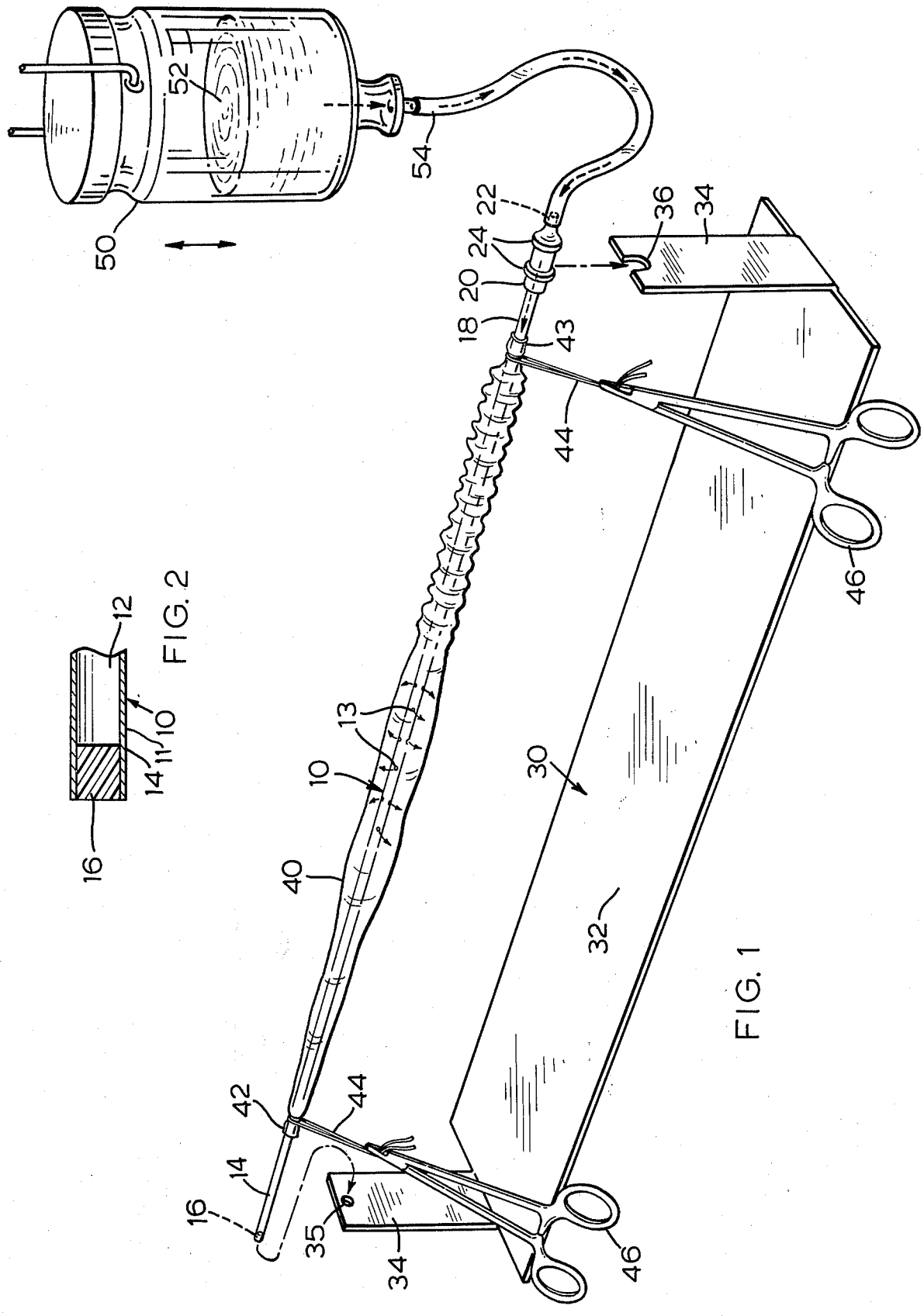

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FIG. 1

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FIG. 2

INTRALUMINAL VEIN HOLDER

This invention relates to the preparation of a vein for arterial grafting.

In peripheral arterial or in aortocoronary bypass surgery it is the practice to implant the great saphenous vein taken from the leg. To prepare the vein for grafting it is distended, leads are identified and repaired, and the ends of the vein are cleared of adventitia. Two persons are required to perform this work, which is costly and cumbersome and often damages the vein.

It is an object of the invention to provide a simple device to hold a vein during its preparation for arterial grafting.

In its broadest aspect the invention consists of a device for use in the preparation of a vein for artificial grafting, comprising a tubular core closed at one end to define a chamber and open at the other end to define an inlet to the chamber, the wall of the core being perforated in an area between its ends, and frame means to receive the core removably and to hold it adjacent its ends. The frame means may comprise a base and two spaced, upstanding brackets which receive the core transversely to rest on the brackets. Also, the wall may carry a connector at its open end to couple the core to a pressurized fluid source such as a resevoir located above the core. Preferably the core is pliable for threading into the vein in situ.

An example embodiment of the invention is shown in the accompanying drawings in which:

FIG. 1 is a perspective view of an intraluminal vein holder; and

FIG. 2 is a longitudinal cross-sectional view of one end of the core of FIG. 1.

The embodiment shown in the drawings consists of an elongated, tubular core **10** having a wall **11** defining a passage or chamber **12** which is perforated in the area of its midsection by a plurality of apertures **13.** One end **14** of core **10** is sealed by a plug **16** (FIG. 2) while the other end **18** of the core carries a tubular connector **20** which has a nipple **22** at one end for coupling with a flexible tube and a pair of spaced, coaxial locating rings **24.** The outer surface of wall **11** is smooth.

Core **10** removably rests in a frame **30** which has a flat base plate **32** and a pair of spaced, upright supporting brackets **34,** one bracket being located at each end of the base and the brackets being spaced apart slightly less than the length of the core. An aperture **35** adjacent the top edge of one bracket **34** loosely receives end **14** of core **10** and a U-shaped notch or recess **36** at the top edge of the other bracket **34** loosely receives tubular connector **20** between locating rings **24.**

In the operation of the device a vein **40** removed from the body for grafting is slipped onto core **10,** i.e. core **10** is threaded proximally (i.e. in the direction of normal blood flow) through the vein intraluminally, and gathered adjacent connector **20.** Core **10** is placed transversely in aperture **35** and notch **36** of frame **30,** spacer rings **24** serving to locate connector **20** in notch **36.** One end **42** of vein **30** is then sealed on core **10** between apertures **13** and end **14** of the core while the other end **43** of the vein is sealed on the core adjacent connector **20.** Each vein end **42** and **43** is sealed by encircling it with an umbilical tape **44** and weighting the tape with a clamp **46.**

Core **10** is connected with a reservoir **50** of liquid **52** by a flexible tube **54** which fits onto nipple **22** of connector **20.** Reservoir **50** is adjustable vertically to create a column of liquid **52** approximating the level of normal arterial blood pressure. Liquid **52** passes out of core **10** through apertures **13** and distends vein **40** in that area. Any leaks in vein **40** are located by the escape of pressurized liquid **52** and they are repaired in the usual manner. The whole length of vein **40** is distended, tested and repaired in this manner by sequentially drawing gathered sections of the vein over the area of apertures **12.** Also, the ends of vein **40** are readily accessible to be cleaned in preparation for suturing. To remove prepared vein **40** for implantation, core **10** is lifted from frame **30,** and the vein is slipped off the core.

Core **10** is preferably about **12** inches to **14** inches long with an outer diameter less than **4** millimetres. Vein grafts should be greater than 4 mm in diameter; thus a test for a potential vein graft is its accommodation of core **10** of about that diameter. Core **10** may be constructed of any suitable form retaining material such as SILASTIC (a trade mark) which provides a smooth surface and a pliability sufficient to enable the core to be threaded into the vein in situ in order that the vein may be located more easily for cutting.

It will be appreciated that the device of the present invention allows a single person to scrutinize a severed vein and prepare it for implantation. Also, the relationship of the container of liquid used to distend the veing allows it to be adjusted to simulate normal blood pressure and prevent undue stress being applied against the vein wall.

Liquid **52** is preferable to gas for use as a fluid because its escape from the wall of vein **40** is visually identifiable. Tapes **44** and clamps **46** of the example embodiment may be replaced by the hands of the operator who would hold one end of vein **40** on core **10** and distend the vein as described, the undistended end portion of the vein acting as its own seal.

I claim:

1. A device for use in the preparation of a severed length of vein for arterial grafting, comprising:

an elongated core having a tubular wall closed at one end to define a chamber and open at the other end to define an inlet to the chamber, the wall being perforated in an area intermediate the ends thereof, the outer surface of the wall being smooth, the core being receivable proximally in the vein intraluminally whereby the vein extends along the core in each direction beyond the perforated area of the wall; and

frame means constructed and arranged to receive the core removably and to hold the core adjacent the ends of the wall.

2. A device as claimed in claim **1** in which the frame means comprises a base and two spaced, upstanding brackets shaped to receive the core transversely to rest thereon.

3. A device as claimed in claim **2** in which one bracket has an aperture adjacent the upper end thereof to receive axially the closed end of the wall of the core and the other bracket is notched at the upper end thereof to receive transversely the wall of the core adjacent said other end.

4. A device as claimed in claim **2** in which the base comprises a flat plate and the core rests on the brackets parallel to the plate.

5. A device as claimed in claim 1 in which the wall carries a connector at the open end thereof, the connector having means to couple to pressurized fluid source thereto.

6. A device as claimed in claim 5 in which the connector is tubular coaxial with the wall of the core, the connector carrying a pair of spaced circumferential rings, at least one bracket being notched at the upper end thereof to receive the connector therein between the rings.

7. A device as claimed in claim 1 in which the core is pliable.

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