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APPARATUS FOR TREATING VASCULAR DISEASES

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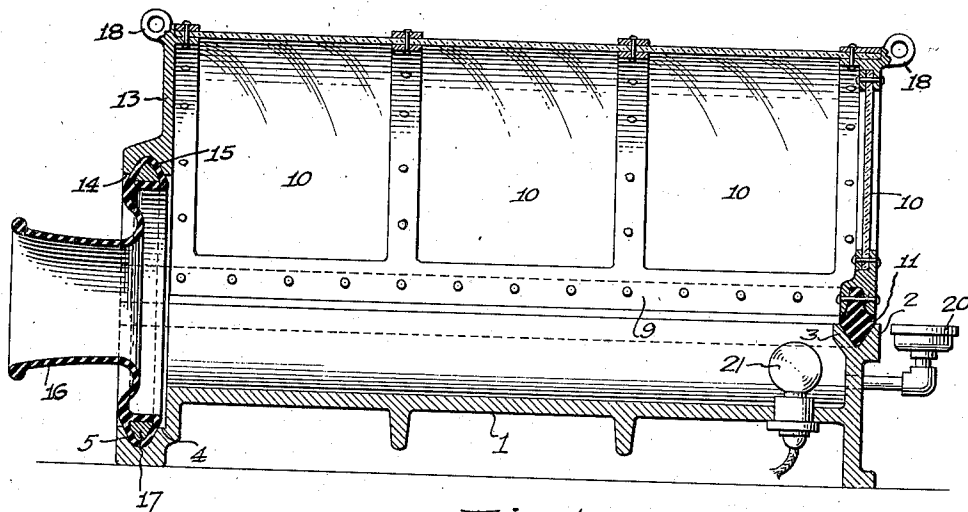


Fig. 1.

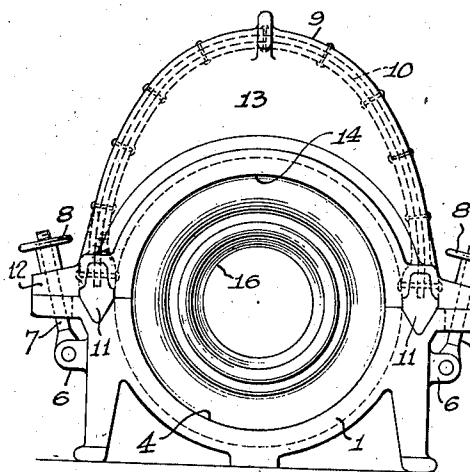


Fig. 2.

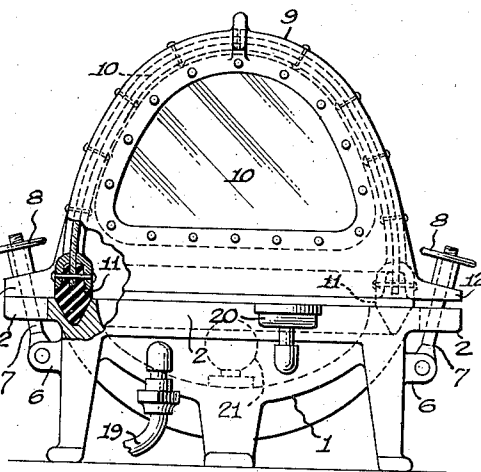


Fig. 3.

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APPARATUS FOR TREATING VASCULAR DISEASES

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2 Claims. (Cl. 128-299)

The present invention relates to apparatus for the treatment of peripheral vascular diseases, and more particularly to a passive form of exerciser for the arms and legs of patients so infected.

It is well known in the medical science and also in the prior art that when the arm or leg of a patient affected by peripheral vascular disease is alternately subjected to negative and positive pressures a passive exercise is given the local blood vessels which materially improves the blood circulation to the affected parts. A form of apparatus which is already known to the prior art and which is available in the medical field comprises a boot-like chamber in which the infected arm or leg of a patient is inserted and in which it is subjected to alternating positive and minus pressures, but the difficulty encountered in sealing the apparatus after the patient's extremity has been placed therein results in considerable pain and inconvenience to the patient. In addition, the devices referred to are unsanitary because their construction does not permit them to be thoroughly cleaned and sterilized. They are ordinarily cleaned with alcohol but because they are comparatively long it is difficult for the operator to reach the entire interior surface thereof to clean the same.

The present invention has as its primary object to provide apparatus for the treatment of peripheral vascular diseases comprising means for enclosing the infected part of the patient and for sealing the infected part therein so that it may be subjected to alternating positive and minus pressures, the said enclosing and sealing means being so constructed that the infected part of the patient may be placed therein with very little inconvenience and practically no pain. In other words, the invention provides for the insertion of the infected arm or leg into the apparatus with no physical exertion on the part of the patient.

Another important object of the present invention is to provide apparatus of the character referred to which is sanitary. This constitutes an important improvement over conventional apparatus in view of the fact that the apparatus now available on the market is not sanitary to any great degree.

In treating an affected part by alternating positive and minus pressures the patient's arm or leg remains in the apparatus for a considerable length of time and in hospitals where the conventional apparatus may be found one of such devices is ordinarily in use almost continuously in treating patient after patient and day after day. The practice is to clean the apparatus be-

tween the treatments of different patients with alcohol, but the conventional devices are so constructed that it is difficult to get at the interior thereof and the cleansing operations are not thorough. The present apparatus is formed whereby it may be opened to permit access to be had to all parts of the interior surfaces and this feature is especially important because the arms and legs of patients treated are in some cases gangrenous or ulcerous or subject to other forms of infections which might be transmitted to other patients if the sanitary conditions are not perfect.

Another object of the present invention is to provide apparatus for the treatment of vascular diseases which comprises a housing formed of two sections removably secured together and having complemental openings in one end thereof for receiving a metal reinforced end of an elastic sleeve. The elastic sleeve is ordinarily placed on the patient's extremity and the extremity is then rested upon the base with the reinforced end in the opening therein after which the second part of the housing is put in place and secured in sealing engagement with the base part and with the reinforced end of the sleeve secured with respect to the complemental openings.

Another object of the invention is to provide apparatus of the character described embodying transparencies through which the condition of the part being treated may be observed.

With the above and other ends in view the invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims, reference being had to the accompanying drawing, in which

Figure 1 is a vertical section;

Fig. 2 is an end view, and

Fig. 3 is an end view partly in elevation and partly in section.

Like characters of reference are employed throughout to designate corresponding parts.

The numeral 1 designates a base of hollow construction and having an outwardly directed flange 2 extending around the side walls and one of the end walls thereof. The top surface of the flange 2 has a V-shaped groove 3 formed therein. One end of the base 1 has a semi-circular opening 4 formed therein and the surface of this opening has a groove 5 therein. Extending outwardly from the sides of the base 1 are ears 6 pivotally supporting bolts 7 receiving hand operated nuts 8.

Received on the base 1 is a casing 9 which is substantially U-shape in cross section. The cas-

ing 9 has a plurality of transparencies 10 mounted therein and has a soft rubber gasket 11 extending around three sides thereof and adapted to project into the grooves 3 in the flanges 2 of the base. The casing 9 has a plurality of lugs 12 disposed with a pair adjacent each bolt 7 and adapted to receive the nuts 8 on the adjacent bolts. By tightening the nuts 8 into engagement with the lugs 12 the sealing member 11 on the casing is tightly pressed into the groove 3.

The end wall 13 of the casing has a semi-circular opening 14 formed with a groove 15 in the surface thereof, the opening 14 being complementary with the opening 4. An elastic sleeve 16 has a metal reinforcing member 17 imbedded in one end thereof adapted to be received in the complementary openings 4 and 14. When the casing is secured on the base while the reinforced part of the sleeve 16 is in the complementary openings, the annular reinforcing member 17 presses the rubber of the sleeve 16 firmly into the grooves 5 and 15.

In treating the leg of a patient affected by a peripheral vascular disease the nuts 8 are loosened and removed from the lugs 12 and the casing 9 is removed from the base 1. For convenience in removing the casing 9 it is provided with loops 18 for the reception of a hoisting mechanism. The sleeve 16 is then drawn over the patient's limb and the base 1 is slipped along the surface of the bed supporting the patient so that the leg of the patient may be placed upon the base with very little inconvenience to the patient and without any pain. The base 1 is moved until the metal reinforced part of the sleeve 16 rests in the groove 5 at which time the casing 9 is placed on the base with the sealing member 11 extending into the groove 3 and with the walls of the groove 15 engaging the upper portion of the reinforced part of the sleeve 15. The nuts 8 are then screwed into tight engagement with the lugs 12 and the casing 9 is thus drawn down into the sealing engagement with the base, at which time the apparatus is air tight. Alternately positive and minus pressures may be then supplied to the interior of the apparatus through the means designated at

19. No particular apparatus for supplying the high and low pressures has been shown here because it forms no part of the present invention. The numeral 20 designates a gauge for indicating the pressure conditions within the apparatus.

The invention also contemplates means for controlling the temperature within the apparatus and to accomplish this end provides an electric heating element 21.

Although a specific embodiment of the invention has been illustrated and described it will be understood that various changes may be made in the details of construction without departing from the spirit of the invention as defined by the appended claims and such changes are contemplated.

What I claim is:—

1. In apparatus for the treatment of vascular diseases, a base, a hollow casing, sealing means between said base and casing, removable means for securing said casing on said base and for maintaining said sealing means in a position providing an air tight chamber, an elastic sleeve having an annular metal reinforce in one end thereof received in an opening in said apparatus, said opening being formed of complementary parts in said base and casing whereby securement of the casing on the base clamps the reinforce in the opening.

2. In apparatus for the treatment of vascular diseases, a hollow housing adapted to be connected to means for supplying alternate positive and negative pressures thereto, said housing being formed of demountable sections whereby access may be had thereto for cleaning purposes, said housing having an opening through which a patient's extremity may be inserted therein, means for sealing the opening around the patient's extremity comprising an elastic sleeve adapted to encircle the patient's extremity, and means for securing the end of said sleeve in the opening in said housing, said securing means comprising portions of said base and casing whereby it is rendered operative by securement of the casing on the base.

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