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2,333,237

SURGICAL DEVICE

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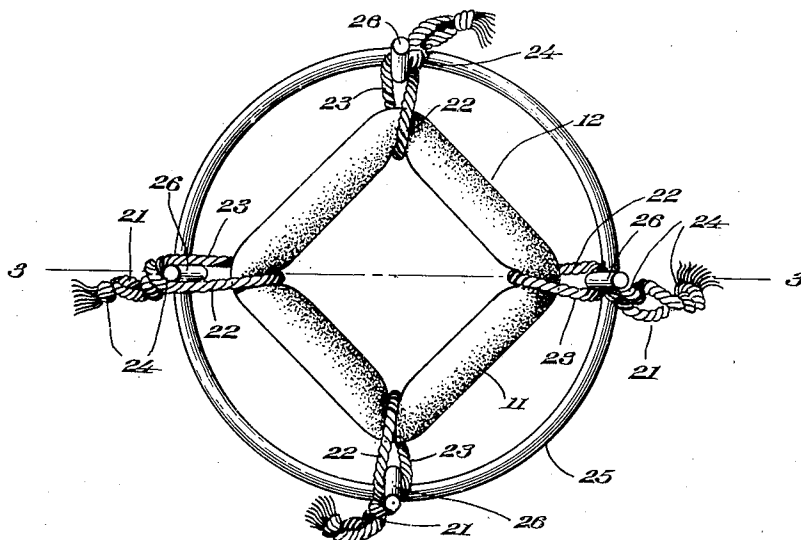


Fig. 1.

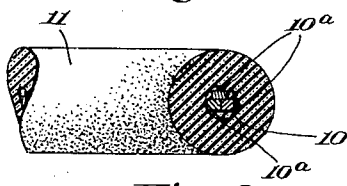


Fig. 2.

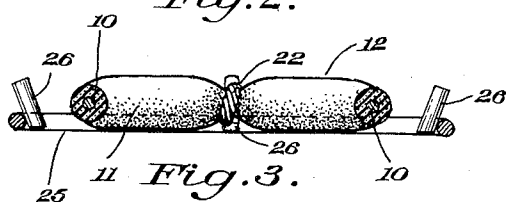


Fig. 3.

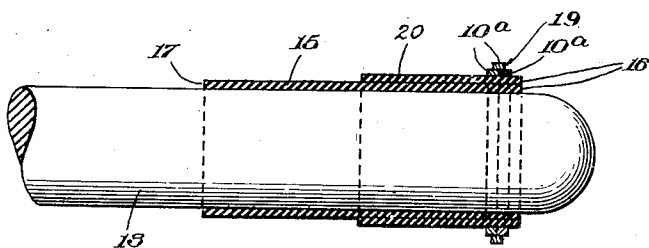
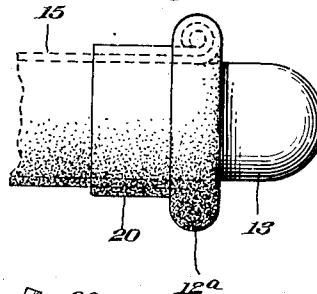


Fig. 4.

Fig. 5.



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SURGICAL DEVICE

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Application June 17, 1942, Serial No. 447,412

2 Claims. (Cl. 128—327)

This invention relates to a surgical device.

An object of the invention is the provision of a device adapted to be expanded and applied to a part of the human body so that when the device contracts because of inherent elasticity it will progressively increase pressure on said part until the device has returned substantially to its normal shape.

Another object of the invention is the provision of a device in the shape of a ring which may be expanded circumferentially but which will return substantially to its normal shape due to the inherent elastic qualities of the materials forming the ring, the automatic contraction of the ring causing a progressive increasing pressure on the part of the body when said ring has circumscribed the part and after it has been expanded.

A further object of the invention is the provision of a surgical device in the shape of an elastic ring formed of materials of such different degrees of elasticity that one material will resist the contraction of the other material for limiting the rate of contraction of the ring after it has been expanded for progressively applying pressure to a part of the human body.

A still further object of the invention is the provision of a surgical device for applying a progressively increasing pressure to a part of the human body in such a manner that the part of the body will be caused to increase in size and be maintained in such state for a predetermined period, said device being in the shape of a ring having a core of highly elastic material which will tend to contract rapidly after expansion but the contraction will be controlled by a sheath formed of material whose index of elasticity is considerably less than that of the material forming the core.

Another object of the invention is the provision of a surgical device in the form of a ring for use on a part of the human body, said ring being manufactured from materials having differential indices of elasticity, one of the materials forming the core being highly elastic, the other material having less elasticity and being wrapped around the core to provide a sheath which will restrain the tendency of the core to contract after expansion.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawing forming a part of the specification; nevertheless, it is to be understood that the invention is not confined to the disclosure, being susceptible of such

changes and modifications as define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a plan view of my device showing it in stretched condition.

Figure 2 is a transverse fragmentary vertical section of the ring.

Figure 3 is a vertical section taken along the line 3—3 of Fig. 1.

Figure 4 is a view in plan partly in section showing the initial stage of the method of manufacturing the ring.

Figure 5 is a side view of the device shown in Fig. 4 disclosing an advanced step in the method.

Referring more particularly to the drawing, it will be seen that the device consists of a core generally designated by the numeral 10 around which is formed a sheath 11 constructed of a material which has less elasticity than the material forming the core. The core consists of a plurality of strips of rubber 10a which has high elasticity while the sheath is constructed of a different type of rubber or the same may be formed of a product known on the market as SealTex. However, the sheath may be formed of any other type of material which has elastic qualities, but which is slower to contract than rubber after it has been expanded.

Referring more particularly to Fig. 4 it will be seen that the ring generally designated by the numeral 12 is formed on one end of a stick 13 which is cylindrical in shape and which has approximately a diameter of seven-eighths of an inch. Instead of the stick 13 being formed of wood it may be formed of any composition material or it may be manufactured from metal.

A strip of SealTex or any other suitable elastic material approximately two and a half inches wide is wound around the mandrel in order to form at least one layer 15. Another strip of the same material which is only one and a fourth inches wide as shown at 20 is wrapped around the outer surface of the strip 15 once so that the outer edges of all of the strips will be in the same plane as shown at 16. When the strips employed are formed of SealTex these strips will adhere due to the fact that this material will readily adhere to itself when placed in contact and a bond is formed between the strips that approximately amounts to an integral formation.

After the single strip 20 is fixed in place a rubber band generally designated by the numeral 19 is wound around the outer surface of the strip 20, a number of times adjacent the upper edge

of said strip. Due to the fact that this rubber band is under expansion it will be held in place on the strip. The width and length of the rubber band will depend upon the pressure required for aiding in causing the sheath 11 to return to its normal size.

After the strips of material which form the sheath 11 are in place and the core in the form of a rubber band has been positioned, the outer edges 16 of the strips are forced rearwardly along the walls of the mandrel 13 and over the rubber band forming the core 10 so that the core will be rolled as shown at 12^a, Fig. 5, to initiate the forming of the ring. The rolling of these strips as integral formation is continued until the ring has been completely formed with the rubber band being located centrally of the ring or of the sheath. The free end 17 of the strip 15 is then pressed firmly against the body of the ring 12 after which the ring can be removed from the mandrel 13.

At spaced points along the ring 12 are provided hand grips generally designated by the numeral 21. These hand grips may be formed by tying a piece of cord 22 in loop formation as shown at 23 around the exterior of the ring, and these hand grips are located approximately 90° apart.

The free ends of the string are then plaited or knotted together a sufficient number of times as shown at 24, in order to provide the projecting hand grip 21 which may be grasped by the fingers of the operator for the removal or application when desired.

By this construction, it will be seen that the core 10 is formed of rubber strips having high elasticity so that they will tend to contract immediately after they have been expanded. However, the sheath 11 contracts rapidly at the instant it has been released from the stretching device generally designated by the numeral 25, but then contracts at a slower rate until the diameter of the opening in the ring is approximately three-fourths of an inch. From then on the sheath contracts very slowly against the contraction of the core and this contraction is so slow that it takes approximately an hour for the sheath to contract to the point where the central opening is a half inch in diameter. In other words, while the central core tends to contract rapidly and to exert a pressure on the inner wall of the sheath, nevertheless the elasticity of the sheath is considerably less than that of the core and the sheath will resist further contraction of the core whereby the ring will slowly but gradually exert a progressively increasing pressure on a part of the body to which it has been applied.

In those cases where the ring is employed as a tourniquet the sheath is made relatively thinner so that the core will have a greater oppor-

tunity for contraction for applying pressure to a severed artery of the body. In such cases, however, it is a well recognized fact that the tourniquet must be released after approximately fifteen minutes for a period of one minute. Therefore the ring may be removed at the end of each period or the same may be expanded during the rest period.

The member 25 is circular and may be formed of metal or some well known composition material of sufficient strength to resist breakage under the pressure of the ring when the same is expanded. It will be noted that the expander 25 is provided with four lugs 26 which are welded to the inner wall and the lugs extend outwardly a short distance sufficiently to provide a crotch between each lug and the member 25 to receive the loops 23.

The ring and the expander 25 are selected which are most suitable for the purpose and then the loops 23 forced over the lugs 26 of the expander in succession. The device is now ready to be applied. The part of the body to receive treatment is passed through the stretched ring 12 and the loops 23 are then removed in succession from the lugs 26 whence the ring will contract until it will exert pressure on the part embraced.

When the ring is no longer required it may be removed by properly positioning the member 25 in association with the ring 12 when the loops 23 are slipped over the lugs 26 and the whole is then removed.

The sheath 11 may be formed by molding the material around the core 10 instead of wrapping the strips of material around the core as previously explained.

Seal-Tex is the trade name for a waterproofing product which is manufactured and sold by the Canvas Proofing and Stripping Company located at 3522 Potomac Ave., Chicago, Ill.

I claim:

1. A surgical device adapted to apply pressure to a part of the human body comprising a ring having a core formed of material having great elasticity, and a relatively thick sheath formed of adhesive strips of material pressed together to form a solid mass and having an elasticity which is less than the elasticity of the material of the core.

2. A surgical device adapted to apply gradually an increasing pressure to a part of the human body, comprising a ring having a rubber core and a relatively thick sheath formed of strips of Seal-tex wrapped around the core and having an elasticity which is less than the elasticity of said core, said sheath being in the form of a solid mass adhesively attached to the core.

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