March 18, 1941. H. L. MASON ET AL 2,235,030

SPHYGMOMANOMETER CUFF OR THE LIKE

Filed April 14, 1938

Fig. 1

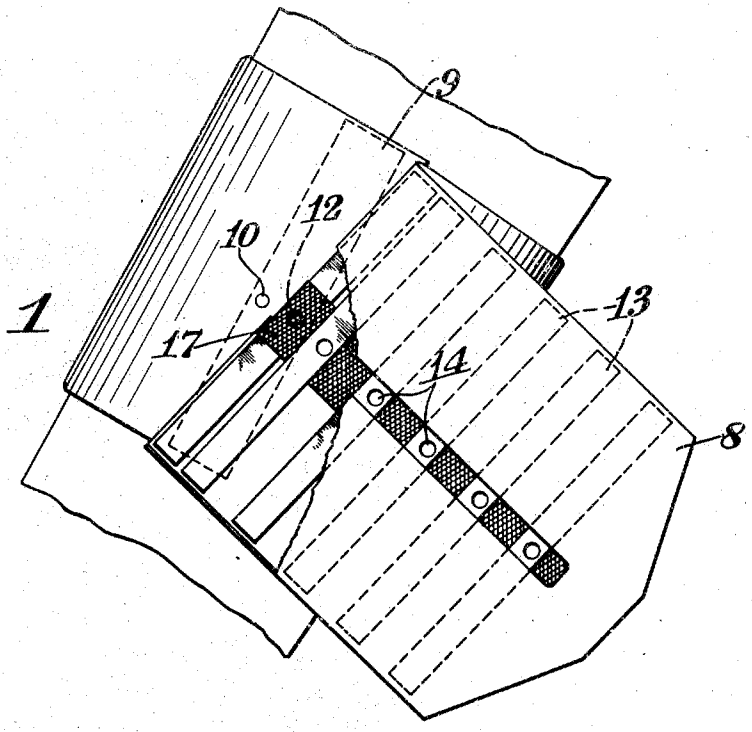


Fig. 2

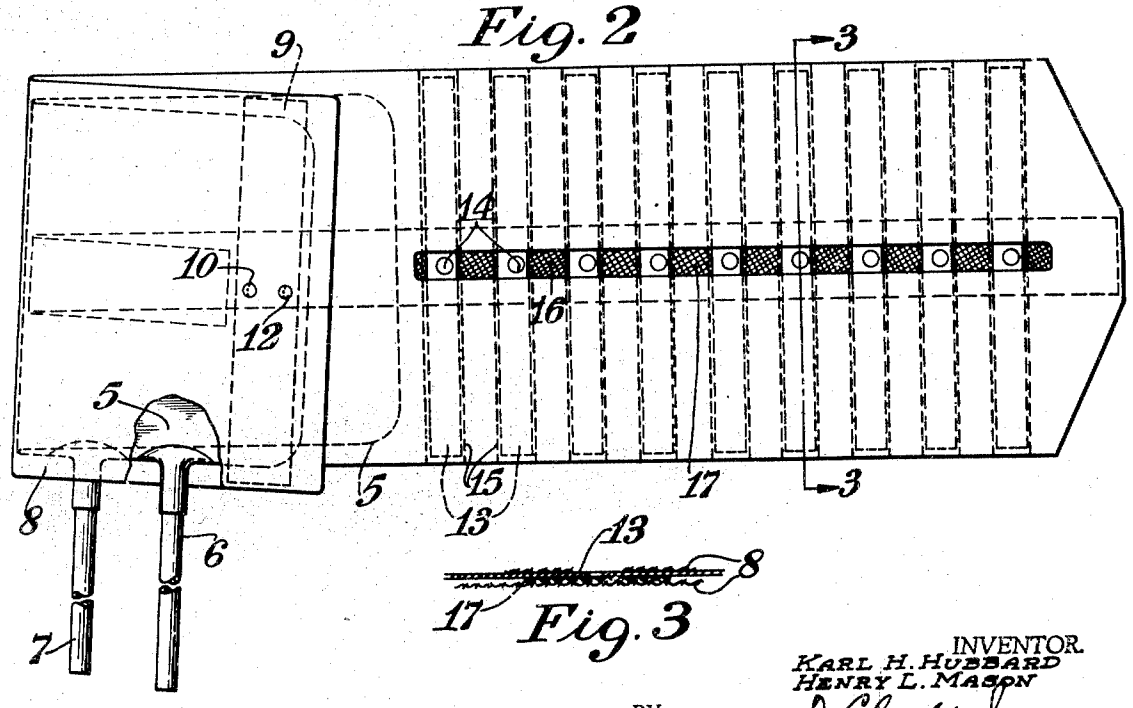


Fig. 3

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SPHYGMOMANOMETER CUFF OR THE LIKE

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3 Claims. (Cl. 128—327)

This invention relates to a sphygmomanometer cuff or the like.

As is well-known in the taking of blood pressure readings, it is the practice to encompass a limb of the patient, for example the upper arm, by a cuff which can be inflated to stop the flow of blood in the brachial artery. Such a cuff should be readily attachable to and detachable from the patient's arm and must be of such construction that it will fit large and small arms. It has been found that for greater accuracy in blood pressure readings, the cuff should engage a substantial length of the artery under observation.

In accordance with the main feature of the present invention, there is provided a cuff which has a circumferential restraint that is uniform throughout its complete width.

A further feature of the invention relates to a cuff construction in which the latching means for giving the respective lengths of the cuff are located intermediate of the side edges of the cuff so that it will adjust itself to arms that are conically shaped as well as those that are cylindrically shaped, and yet it provides a cuff that can be collapsed into small compass for packing in a carrying case.

Still another feature of the invention relates to a cuff having simple and rapidly-operable latching means which provide various adjustments of the length of the cuff by a large number of small steps with a minimum number of latching bars.

The various features and advantages of the invention will appear from the detailed description and claims when taken with the drawing in which Fig. 1 is a perspective view of the sphygmomanometer cuff of the present invention shown applied to an arm; Fig. 2 is a plan view of the cuff with a part thereof folded on itself; and Fig. 3 is a cross sectional view of the cuff taken substantially on the line 3—3 of Fig. 2.

The sphygmomanometer cuff of the present invention comprises the usual rectangular flat rubber bag preferably about 5" in width, and of a length convenient for application to an arm. This rubber bag is closed except for rubber tubes 6 and 7 communicating with its interior. A hand pump may be applied to the tube 6 for inflating the bag, and a sphygmomanometer (not shown) of well-known construction may be connected to the tube 7. The rubber bag 5 is encased in a fabric casing 8 which protects the rubber bag from wear and prevents the rubber from contacting the patient's arm. This fabric covering, which has one of its ends registering with an end of the bag, extends a substantial distance beyond the other end of the ruber bag and is of a length to encompass the largest arm or limb that may be encountered in use. At the registering ends of the rubber bag 5 and cloth casing 8, there is in a pocket the casing for a flat metal strip 9, of a length approximately equal to the width of the rubber bag 5. This strip is provided with two hooks 10 and 12 projecting through the casing and having a definite spaced relation, as will be hereinafter set forth. The portion of the fabric casing extending beyond the bag, is provided with a series of spaced parallel metal strips 13, each strip having a hole 14 therein at its intermediate part. These strips are substantially coextensive in length with the width of the bag and are retained in pockets in the fabric casing formed by lines of stitching such as 15. The intermediate portion of each strip is exposed through an opening on one side of the fabric casing so that either the hook 10 or the hook 12 can be inserted into a hole 14 in one of the strips 13. As indicated in Figs. 1 and 2, a reenforcing strip 17 of fabric is placed behind the strips 13 in the region of the holes 14 therein to protect the fabric casing from wear. In order to give the desired degree of adjustability with a minimum number of strips 13 so that the cuff can be applied to arms of all sizes, the space between the hooks 10 and 12 is approximately equal to half the distance between the holes 14 in adjacent strips. Thus if the space between the two adjacent holes 14 is one inch and the space between the hooks 10 and 12 is one-half of an inch, when the hook 12 is inserted in the hole 14 of a given strip the effective length of the cuff will be one-half of an inch greater than if the hook 10 had been inserted in that hole.

As will be evident from Fig. 1, after the cuff has been wrapped around the arm, one or the other of the hooks 10 and 12 is engaged in a hole 14 in one of the cross strips 13. Since the hooks 10 and 12, as well as the holes 14 in the strips 13, are located midway between the side edges of the cuff, the effective ends of the cuff will turn about the engaged hook and hole 13 to adjust the cuff both to arms of conical shape and to those of cylindrical shape. Inasmuch as the length of the strip 9 and the strips 13 are coextensive with the width of the cuff, there will be complete restraint over the entire width of the cuff, thereby improving the accuracy of the blood pressure readings, because a substantial length of the brachial artery is engaged by the inflated

rubber bag. It will be appreciated that since the space between the hooks 10 and 12 is approximately one-half of the distance between the centers of the holes 14 in adjacent strips 13, the effective length of the cuff can be changed by amounts equal to one-half of the distance between adjacent holes 14. This is effective to provide a large number of adjusting steps without providing an equal number of strips 13. It should be noted that the right-hand portion of the cuff as illustrated in Fig. 2 can be folded between each of the strips 13 and therefore the cuff will collapse to a very small size for packing in a carrying case.

While the strip 9 with two hooks 10 and 12 thereon, has been provided at one end of the cuff, it will be understood that it may be replaced by two narrow strips each carrying a hook, the two hooks having the same spacing as that previously mentioned. Although two such hooks in the combination as described, usually provide all necessary adjusting steps, it will be appreciated that a greater number of adjusting steps can be effected, without increasing the number of strips 13, merely by providing the strip 9 with three hooks spaced apart a distance approximately equal to one-third of the spacing between adjacent strips 13.

From Fig. 1 it will be seen that the cuff need encircle the arm only once, which facilitates its application to the patient's arm.

While the cuff has been disclosed in connection with a sphygmomanometer, it is also adapted for use as a venous constriction treatment cuff or tourniquet.

We claim:

1. A sphygmomanometer cuff or similar blood flow restricting device comprising a casing, an inflatable bag disposed in said casing adjacent one end thereof, an extension on one end of said casing projecting beyond said inflatable bag, a plurality of stiffening members substantially coextensive in length with the width of said extension and secured in spaced, substantially parallel relation on said extension, each stiffening member having an aperture formed in the intermediate part thereof, and a transversely extending stiffening member substantially coextensive in length with the width of said casing and secured to said casing adjacent one end of said bag, said last-mentioned member having a pair of spaced hooks secured to the intermediate part thereof, the spacing of said hooks being less than the spacing between the apertures of adjacent stiffening members on said extension, each of said hooks being selectively engageable in any of said apertures whereby the stiffening member secured to said casing adjacent one end of said bag may be connected to any one of said stiffening members on said extension enabling the cuff to adjust itself to the taper of the arm or other part of the body while providing circumferential restraint for the bag over substantially the entire width of the cuff.

2. In an arrangement of the class described, an elongated fabric casing, a plurality of spaced parallel stiffening members carried by said casing adjacent one end thereof, stiffening means carried by said casing adjacent the other end thereof, said members and said means extending transversely of said casing and being substantially coextensive in length with the width of said casing, the ends of said members and said means being enclosed in said casing, said members and said means each having at a part intermediate the ends thereof interengaging elements thereon whereby said means may be connected to any of said members enabling the casing to adjust itself to the taper of the arm or other part of the body to which it is applied, at least two of said elements being located on said stiffening means, said last-mentioned elements being spaced apart a distance materially less than the spacing between said members, and each being selectively engageable with the elements on said members.

3. In a sphygmomanometer cuff or similar blood flow restricting device comprising a substantially flat rectangular inflatable bag, a flexible casing enclosing said bag, said casing being substantially longer than said bag to provide an extension projecting beyond one end of said bag, a plurality of spaced, substantially rigid parallel strips extending transversely of and secured to said extension, an additional strip of substantially rigid material secured to said casing adjacent one end of said bag, each of said rigid strips being substantially coextensive in length with the width of said casing, the ends of said strips being retained in engagement with said casing, and substantially point interengaging means on an intermediate part of said additional strip and on an intermediate part of each of said other strips whereby said additional strip may be latched with any of said first-mentioned strips enabling the cuff to adjust itself to the taper of the arm or other part of the body to which it is applied while providing circumferential restraint for the bag over substantially the entire width of the cuff.

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