

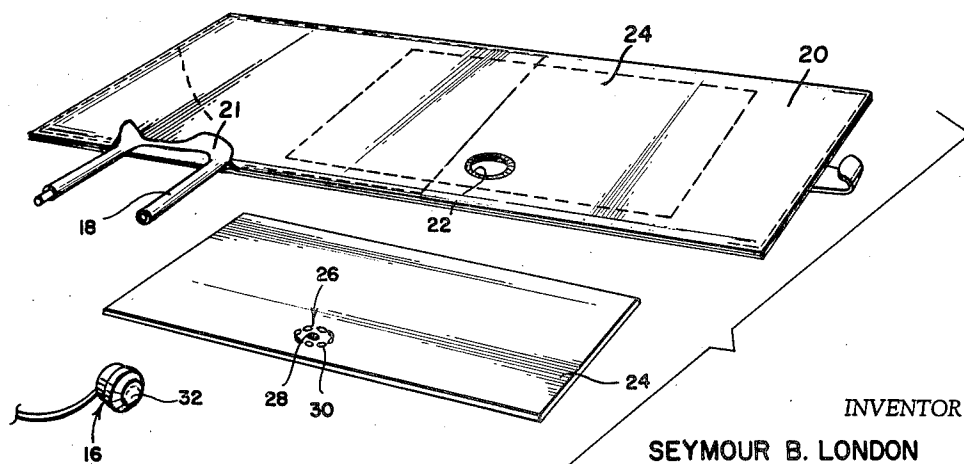
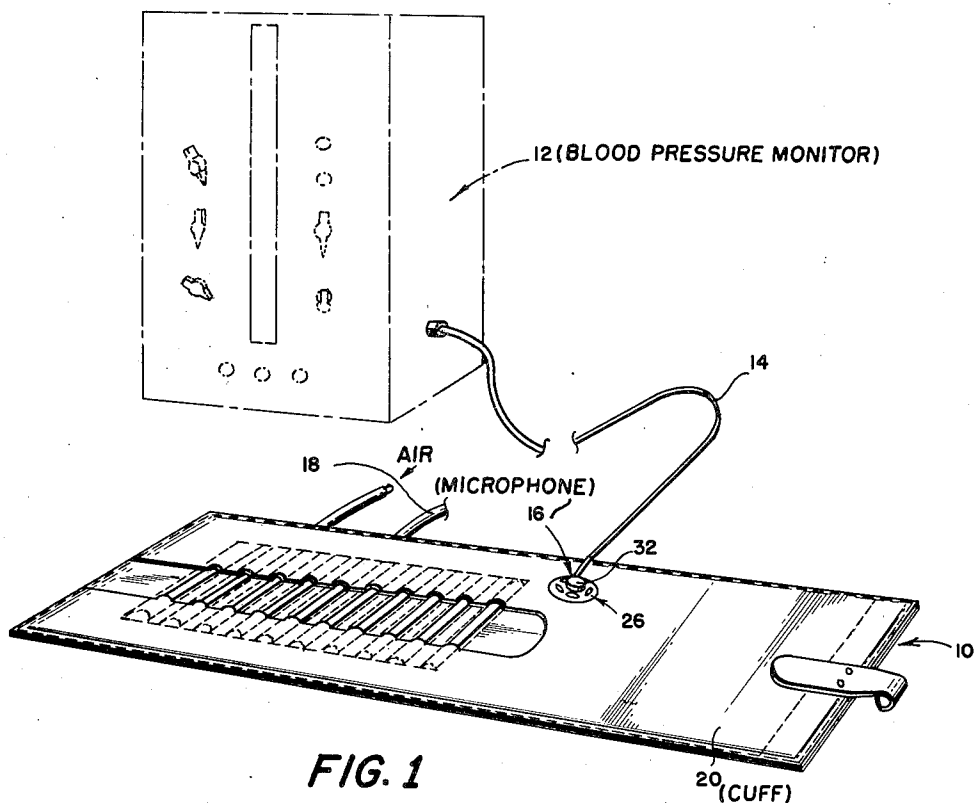
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CUFF WITH MICROPHONE SUPPORT

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CUFF WITH MICROPHONE SUPPORT
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The present application is a continuation-in-part of application Serial No. 240,313, entitled Blood Pressure Monitor which issued on August 24, 1965 as U.S. Patent No. 3,202,148 and application Serial No. 382,255, filed July 13, 1964 and entitled Blood Pressure Monitors.

The present invention relates generally to a microphone supporting cuff for use with blood pressure monitors and in particular to an improved feature of same for providing relatively constant pressure of the contact microphone to the skin over the artery independently of changes in pressure within the cuff.

As set forth in Patent No. 3,202,148 and application Serial No. 382,255, blood pressure monitors of both the "mercury column manometer" and "aneroid manometer" type may be used for determining and visually presenting systolic and diastolic blood pressure readings. By way of summary, the basic operation of these blood pressure monitors is as follows. After the patient has secured his arm in the cuff, which is located on the brachial artery in a position to permit the microphone to detect the Korotkow sounds created by the blood pressure, the cuff is inflated to a pre-selected level sufficient to compress the brachial artery. Thereafter, the cuff is slowly decompressed. The manometer regulator, which may be either of the mercury column or aneroid type, detects the pressure changes within the cuff. Each time the pressure level in the manometer regulator drops a pre-selected interval, such as 5 milliliters for example, a separate electronic circuit is activated, which action is in turn translated to a display panel. When zero (0) pressure is reached, the manometer regulator reverts to its starting condition and the apparatus begins its next cycle. When a Korotkow signal is detected by the microphone at a particular pressure, it is accepted only by the independent circuit corresponding to that pressure. The signal actuates a memory relay system which causes the signal light, numerically equivalent to the pressure in the manometer regulator, to be actuated. The pressure level valve on the display panel remains illuminated until initiation of the next cycle.

It is essential that a relatively constant pressure of the contact microphone to the skin over the artery be maintained which is independent of the height of pressure in the cuff. That is, while the cuff must hold the microphone securely in place, it is desired that increasing cuff pressure not be accompanied by appreciable increased contact pressure, it being essential that the contact pressure relationship throughout the blood pressure determination be constant.

Accordingly, it is an object of the present invention to provide a cuff for use with blood pressure monitors capable of providing relatively constant pressure between the microphone and the skin over the artery.

Another object of the present invention is to provide a cuff for supporting a contact microphone at relatively constant pressure to the skin over the artery independently of changes of pressure within the cuff.

Still a further object of the present invention is to provide a cuff capable of eliminating the changing of sensitivity of the microphone of a blood pressure monitor relative to the applied pressure so that the whole range of Korotkow sounds in a room of varying noise may be selectively detected.

Still another object of the present invention is to pro-

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vide a cuff for use with blood pressure monitors capable of holding a microphone securely in place against the skin over the artery such that increasing cuff pressure is not accompanied by appreciable increased contact pressure between the skin and microphone.

Yet additional objects of the present invention will become apparent from the ensuing specification and attached drawings wherein:

FIG. 1 is a perspective view of the cuff assembly and associated blood pressure monitor shown in phantom; and

FIG. 2 is a perspective view of the components of the cuff assembly including the cuff aperture, microphone, and insert with web-like sling.

As seen in FIG. 1, the cuff assembly 10 is designed for use with blood pressure monitor 12 wherein line 14 leads from microphone 16 to a low frequency, sensitive transistorized amplifier (not shown) while line 18 transmits air to cuff assembly 10.

Cuff assembly 10 includes a commercially available standard canvas adult arm cuff 20 having dimensions of 40 x 13 centimeters modified in accordance with the present invention by providing a circular aperture 1.5 inches in diameter which is generally designated by the reference numeral 22. Aperture 22 is centered approximately 25 centimeters from the beginning of cuff 20 and 4 centimeters from the lower margin thereof. Located within cuff 20 is a standard inflatable rubber bag 21 being approximately 13 x 22 centimeters to which lines 18 are attached. As such inflatable bags are conventional, this feature is not described in detail.

The essence of the present invention, as seen in FIG. 2, is rubber insert 24 being approximately 13 x 23 centimeters in size and having a sling 26 centered 4 centimeters from the lower margin and approximately 10 centimeters from the leading edge thereof. When insert 24 is in position within cuff 20, as seen in FIG. 1, web-like sling 26 lies in juxtaposition with respect to aperture 22 of cuff 20. Sling 26 is formed by a central one-quarter (1/4) inch punched opening 28 and a circumferential series of 9 one-quarter (1/4) inch openings 30 spaced evenly on a one inch radius from the center of opening 28. Insert 24, when located within cuff 20, extends from the end of cuff 20 and underlies the inflatable bag for about 10 centimeters.

FIG. 1 shows the inside of cuff 20 with microphone 16 held in position for use. In operation, when cuff 20 is inflated, the slight protrusion of contact button 32 insures relatively constant pressure between the microphone 16 and the skin overlying the artery. As a result of the elastic qualities of rubber sling 26, microphone 16, while being held securely in place, is not subjected to increased contact pressure as the pressure within cuff 20 increases, the presence of aperture 22 in cuff 20 permitting microphone 16 to progressively protrude through aperture 22. That is, when microphone 16, whose circumference is larger than central opening 28 of sling 26, is forced into opening 22 of cuff 20, a funnel or cup-like effect is created in the rubber sling 26. The plurality of second openings 30 surrounding opening 28 allow this funnel shape to form a spring-like support for microphone 16. This suspension maintains an appropriate contact portion of microphone 16 on the skin without forcing same into the tissues of the arm. In this manner, substantially the same contact pressure relationship throughout the blood pressure determination is maintained.

Manifestly, various modifications of the cuff assembly and particularly the rubber insert can be adopted without departing from the spirit and scope of invention as defined in the sub-joined claims.

I claim:

1. A supporting cuff assembly for use with a microphone and blood pressure monitor, comprising:

(A) a cuff containing an aperture therein;

(B) means for inflating said cuff; and

(C) an insert member located within said cuff, said insert member comprising a flexible sling located in juxtaposition with respect to said aperture for providing relatively constant pressure between said microphone and the skin over the artery independently of changes in pressure within said cuff.

2. A microphone and supporting cuff assembly as in claim 1, wherein said sling includes a first opening within said insert member surrounded by a plurality of second openings, said second openings being spaced equidistantly from the center of said first opening.

3. A microphone and supporting cuff assembly as in claim 2, wherein said first and second openings are one-quarter ($\frac{1}{4}$) inch in diameter while the centers of said openings are spaced one (1) inch from the center of said first opening along said insert member.

4. A microphone and supporting cuff assembly as in claim 3, wherein said insert member is rubber.

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