Aug. 10, 1954 M. L. KELLY 2,685,881

CHEST STRAP FOR HOLDING AN ELECTRODE

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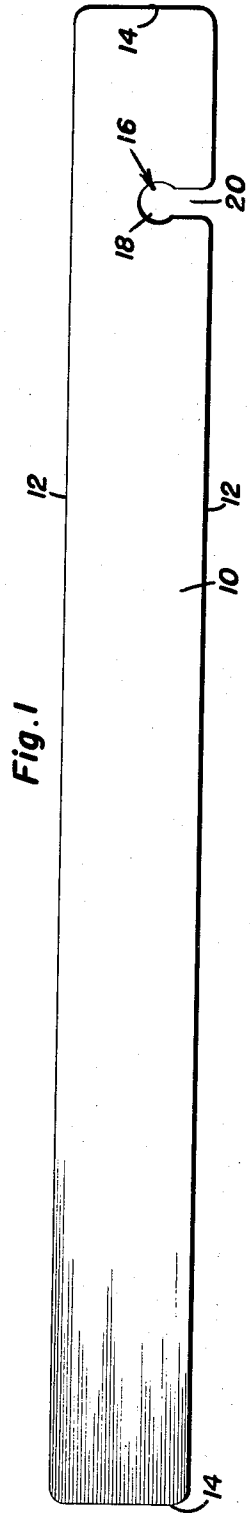



Fig. 1

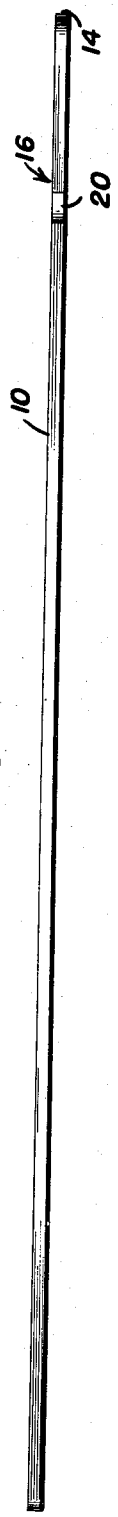



Fig. 2

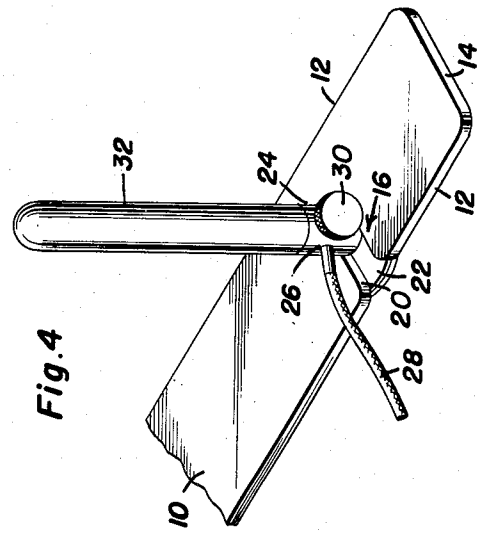



Fig. 4

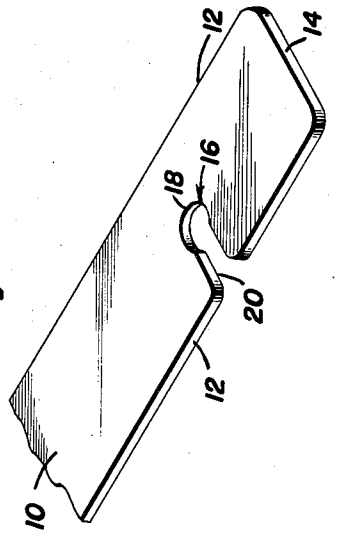



Fig. 3

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## CHEST STRAP FOR HOLDING AN ELECTRODE

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1 Claim. (Cl. 128—418)

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This invention relates generally to chest straps, and more specifically to chest straps which are specifically designed for engaging the chest of a patient having an electro-cardiogram whereby an electrode may be firmly held in position on the chest of the patient.

When a person is having an electro-cardiogram made it is necessary that a metal disk or chest electrode be held against portions of his chest for a period of time while different readings are being made. Since this is a test of the patient's heart vibrations, it is necessary that the metal disk or chest electrode be held firmly against the chest of the patient without any movement with respect to the chest. The normal procedure is to have the patient hold the metal disk or chest electrode in the various positions, seven in all, while the readings are being taken. However, it is well known that a person can hold an object firmly for only a short time before the hand begins to shake. Furthermore, not only is the metal disk or chest electrode apt to move with respect to the chest due to fatigue of the patient's hand, but the average person is generally nervous when having tests made on them by doctors so that it is difficult for them to hold the metal disk or chest electrode steady for even a short period of time. It is therefore desirable to have some means for holding the metal disk or electrode firmly against the chest and in a manner which it may be easily shifted from one position to the other.

The primary object of this invention is to provide an improved hold down device for firmly holding a chest electrode against the chest of a patient having an electro-cardiogram made.

Another object of this invention is to provide an improved hold down device for holding a chest electrode against portions of a patient's chest, said hold down device being flexible so as to conform generally to the configurations of the patient's chest.

Another object of this invention is to provide an improved hold down device for holding a chest electrode against portions of a patient's chest, said device maintained in place due to its weight and the friction between its lower surface and the chest of the patient.

Another object of this invention is to provide an improved hold down device for chest electrodes which is of an extremely simple construction and economically manufactured.

Another object of this invention is to provide a hold down device for chest electrodes to which the chest electrode may be quickly and easily secured and removed from.

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A still further object of this invention is to provide an improved hold down device for chest electrodes which will firmly hold the electrode in place but may be easily shifted as desired and is comfortable and steady.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in detail in the specification, particularly pointed out in the appended claim, and illustrated in the accompanying drawings which form a material part of this specification, and in which:

Figure 1 is a top plan view of the hold down device for chest electrode which is the subject of this invention and shows the shape of the device and position of a keyhole slot for receiving a chest electrode and securing the same to the hold down device;

Figure 2 is a side elevational view of the hold down device of Figure 1 and shows the upper and lower surfaces thereof as being flat and plain;

Figure 3 is a partial perspective view of the end portion of the hold down device having the key hole slot therein and shows the exact figuration thereof; and,

Figure 4 is a partial perspective view of one end of the hold down device of Figure 1 and is similar to Figure 3, the chest electrode being illustrated as secured within the keyhole slot.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the different views of the drawings.

Referring now to the drawings in particular, it will be seen that the hold down device is in the form of an elongated strap 10 having sides 12 and ends 14. As is best illustrated in Figure 2, the strap 10 has perfectly smooth upper and lower surfaces and is of a constant thickness.

In order that a chest electrode may be visibly secured with respect to the strap 10, the strap is provided with a keyhole slot 16 opening through one of its sides 12 adjacent one of the ends 14. The keyhole slot 16 includes a substantially circular opening 18 which is communicated to the exterior of the strap 10 by a relatively narrow opening 20.

Referring now to Figure 4 particularly, it will be seen that the chest electrode includes a flat metal disk 22 which has at right angles thereto a circular stem portion 24. The stem portion 24 has a transverse bore 26 thereto and in which is received one end of an electrical conductor 28. Carried by the stem portion 24 is a locking screw 30 which extends into the bore 26 and

clamps the end of the electrical conductor 28 therein.

In order that the chest electrode may be easily handled and held by a person during the making of an electro-cardiogram, it is provided with a plastic non-conductive handle portion 32 which is mounted within the stem portion 24 and extends outwardly therefrom.

When it is desired to mount the chest electrode in the keyhole slot 16 of the strap 10, the metal disk 22 is moved to a position underlying the opening 20 of the keyhole slot and the stem portion 24 is moved towards the substantially circular opening 18. Due to the resiliency of the strap 10, the stem portion 24 may be jammed through the opening 20 and engages within the substantially circular opening 18 which is of substantially the same diameter as the stem portion 24.

It has been found that the strap 10, when made of a heavy rubber, is quite satisfactory and that the rubber has a surface which has a high coefficient friction and is not prone to sliding with respect to the chest of the patient. Furthermore, the flexible rubber permits the strap to conform to the general contours of the chest of the patient and therefore provides a greater holding surface. It has been found that a heavy rubber stray about 16 inches long, one and one half inches wide, and about one-eighth of an inch thick has sufficient weight and chest engaging surface whereby the chest electrode will be firmly held on the chest of the patient having an electro-cardiogram made.

A primary advantage of forming the strap of rubber is that the rubber does not present a cold surface to be placed on the bare chest of the patient and since the rubber assumes the general contour of the patient's chest the weight thereof is distributed evenly over the entire underside of the strap.

It has been found that a rubber strap of the type illustrated in the drawings and described above is very suitable and may be quickly and easily moved from one position to another during



the course of making the electro-cardiogram and due to the resiliency thereof the chest electrode may be easily and quickly engaged with or removed from the keyhole slot 16 therein. Furthermore, the rubber strap may be easily rolled up or folded up for storing same.

The operation of this device will be understood from the foregoing description of the details thereof, taken in connection with the above recited objects and drawings. Further description will appear to be unnecessary.

Minor modifications of the device, varying in minor details from the embodiment of the device illustrated and described here, may be resorted to without departure from the spirit and scope of this invention, as defined in the appended claim.

Having described the invention, what is claimed as new is:

As a new article of manufacture, a holddown for electro-cardiogram electrodes of the type including an elongated handle and a metallic disc on one end of said handle, said holddown comprising; a flexible resilient rubber chest strap of substantial thickness adapted to rest on the chest of the patient and conform to the contours thereof by reason of its flexibility and weight for frictionally retaining said strap against relative movement, said strap having an open keyhole slot in one end portion thereof for the reception of the electrode for removably mounting same on the strap, the restricted portion of the keyhole slot being of a width less than the diameter of the handle.

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