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PROTECTING BLANKET FOR X-RAY PATIENTS

Filed Sept. 16, 1921

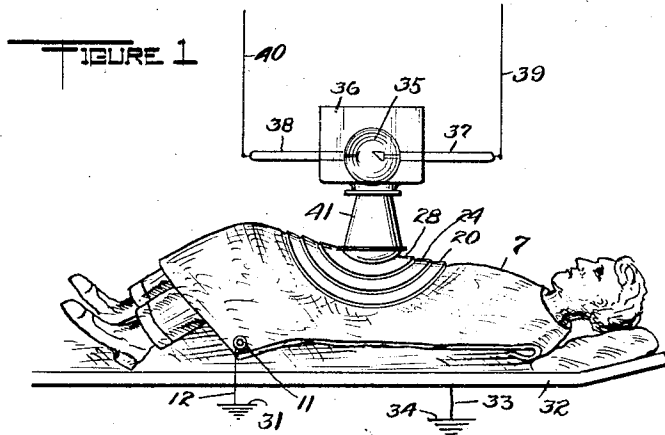


FIGURE 2

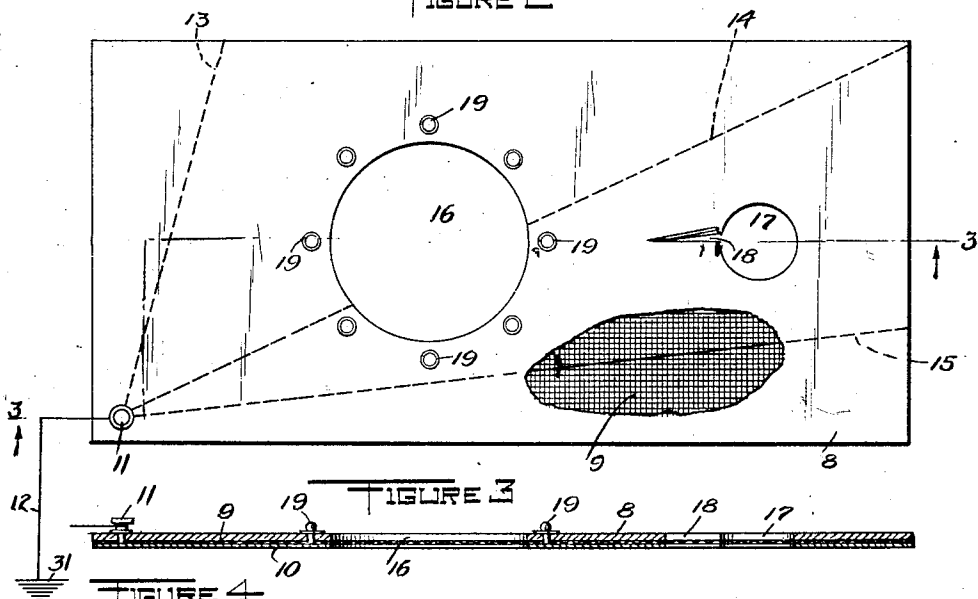


FIGURE 3

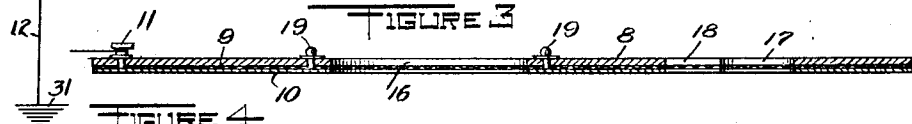


FIGURE 4

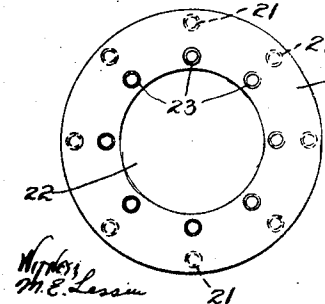


FIGURE 5

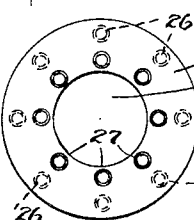
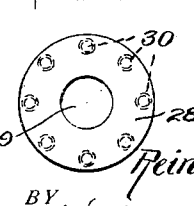


FIGURE 6



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PROTECTING BLANKET FOR X-RAY PATIENTS.

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My invention relates to X-ray work, my more particular purpose being to provide means for protecting a patient from the danger of a static discharge accidentally taking place from an X-ray tube or conducting part connected therewith, while the X-ray tube is in action for the purpose of exposing the patient's body or some portion thereof to the action of X-rays.

In this connection it may be noted that incidental to the use of X-rays upon a patient's body, it occasionally happens that the patient may be burned or even severely injured by receiving a shock from the cause here contemplated, and there are exceptional instances where the patient has been killed. While as a general rule the danger is slight, it oftentimes deters the patient from submitting to the action of the X-rays, and even this is very objectionable, for obvious reasons.

What I seek by my invention to do, therefore, is to produce a protecting device, having in this particular instance the general form of a blanket, made of cheap materials easily obtained and easily assembled, and yet so made as to render the patient practically immune from injuries of the kind mentioned.

The method of using this blanket is to place it over the patient and connect it to the ground, so that if the patient moves a limb into proximity to either one of the electrodes, or for any reason an exceptionally high voltage appears at the terminals of the X-ray tube there is no chance for a spark to jump to the patient's body and from there to the table upon which he rests; but instead, a discharge would pass out through the metal component of the blanket, and thence would go through a wire to the ground.

Reference is made to the accompanying drawing forming a part of this specification, and in which like reference numerals indicate like parts throughout the several figures.

Figure 1 is a side elevation showing my device in actual use upon a patient.

Figure 2 is a fragmentary plan of the blanket.

Figure 3 is a section on the line 3—3 of Figure 2, looking in the direction indicated by the arrows.

Figure 4 is a plan view of a blanket ring,

to be detachably connected with the blanket, in order to virtually vary the size of the opening through which the X-ray exposure is made.

Figure 5 is a plan view of another blanket ring, to be detachably connected with the blanket ring shown in Figure 4.

Figure 6 is a plan view of still another blanket ring, somewhat smaller than the one shown in Figure 5.

The blanket appears in Figure 2, and as a whole is designated by the numeral 7. It comprises a textile member 8, having the general form of a layer of blanketing and made of cotton or woolen material, and thus an insulator. Connected with the member 8 is a netting 9 made of tinsel, metallic gauze or woven wire, and thus a conductor. Secured to the member 9 is a layer 10 of textile gauze, cheese cloth, mosquito netting or the like, or simply a layer of cloth. A binding post 11, having preferably the form of a button, is mounted upon the blanket and in metallic communication with the metallic netting 9. Three wires 13, 14, 15, are connected with the binding post 11, and extend radially therefrom, out to the edges of the blanket. These wires are throughout their length in contact with the metallic netting 9.

The blanket is provided with a large hole 16, in this instance of circular form, and with a smaller opening 17, also circular; and also with a slit 18 merging into the hole 17. The hole 16 is used as hereinafter described. The hole 17 is used for enabling the patient's head to be thrust through the blanket, the slit 18 contributing to this end, the slit being closed over the patient's breast.

The hole 16 serves as an opening through which the X-ray exposure is made, so as to avoid the possibility of any shadow being cast by the metallic netting or any portion thereof.

Adjacent the hole 16 and preferably arranged in the proximate form of a circle as shown are a number of fastening members 19. These are adapted to coact with an equal number of fastening members 21, carried by the blanket ring 20. The blanket ring 20 is made of the same materials as the blanket 7. It carries a number of fastening members 23, disposed in the proximate form of a circle, and located upon the face of the ring opposite the one on which the fastening members 21 are secured. All of the fasten-

ing members 21 and 23 are in metallic engagement with the metallic netting carried by the blanket ring.

The blanket ring 20 may be secured upon the blanket 7 by bringing the fastening members 21 of the blanket ring into operative engagement with the fastening members 19 of the blanket. For this purpose, one fastening member 19 and one fastening member 21 constitute together a snap fastener, which may be of the type used upon gloves, or embodied in a two-part cuff button.

With the blanket ring 20 in position upon the blanket, the hole 22 is used instead of the hole 16, for the purpose of exposing the part to be subjected to the X-rays.

A blanket ring 24 is similar to the blanket ring 20, but is of smaller diameter. It is provided with a hole 25, corresponding to the hole 22, and with two sets of fastening members 26, 27, arranged after the manner of the fastening members 21, 23 of the blanket ring 20. The blanket ring 24 is connected with and disconnected from the blanket ring 20 by means of the fasteners. When the blanket rings 20 and 24 are in position, the hole 25 is the one used for purposes of the X-ray exposure.

A blanket ring 28, still smaller than the two blanket rings just described, is provided with a hole 29 and with only a single set of fasteners, shown at 30. These are adapted to coact with the fastening members 27. The blanket ring 28 may thus be detachably connected with the blanket ring 24, and thus virtually placed upon the blanket 7, from which it is removable in a manner which is obvious.

The binding post 11 is connected with a wire 12, which leads to the ground at 31, as shown.

In Figure 1 is shown the blanket 7 as spread over the body of a patient resting upon an X-ray table 32, this table being connected by a wire or other suitable conductor 33 with the ground at 34. An X-ray tube appears at 35, and in this instance is surrounded by a bowl 36. The tube terminals are shown at 37, 38, and are connected with conductors 39, 40. Fitted upon the bowl 36 is a cone 41, which may if desired be of the kind used for compression. Where a cone 41 is thus used, the blanket or blanket and blanket rings is so arranged as to provide an opening of suitable size to allow the X-rays to pass through without any shadow being cast by the metallic component of the blanket or blanket rings.

As may be understood from Figure 1, the patient is safe from spark discharges. If the patient should happen to move a limb so as to bring some part of the body into close proximity to the X-ray tube or either terminal thereof, so as to cause a spark discharge to take place, the discharge would be

to the blanket and thence to the ground, so that the patient could not be injured thereby.

The operation of my device is as follows:

The various parts being assembled and arranged as above described, the blanket is placed in position as shown, and the wire 12 is grounded. One or more of the blanket rings are now placed in position and secured, as above stated. Thus there is left a hole 16, 22, 25 or 29 as the case may be, through which the X-ray exposure is to be made.

Suppose, now, that for any reason the X-ray tube is subjected to such conditions, accidental or otherwise, as may tend to invite a static discharge from the X-ray tube toward the patient's body. In such event the discharge gets no further than the metallic netting 9, any resulting current thus set up in the metallic netting being conducted to the earth.

The metallic netting of the blanket 7 is in metallic communication with the metallic netting of each blanket ring, through the medium of the various fastening members. Thus with the blanket rings in position there is to all intents and purposes merely a single metallic netting, of composite form.

My device can be made on any scale, and adapted for use in connection with many kinds of X-ray work. The blanket need not be of the precise shape here shown, as its shape may be changed in accordance with the particular use to which the blanket is applied.

I do not limit myself to the mechanism shown and described, as variations may be made therein without departing from the spirit of my invention, the inventive thought being commensurate with my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. A device of the character described, comprising a flexible cloth member and a flexible metallic netting carried thereby, said flexible cloth member and said netting being as a unit provided with an opening, and mechanically coacting with said cloth member and disposed adjacent said opening for the purpose of making X-ray exposures through said opening.

2. A device of the character described, comprising a flexible cloth member and a flexible metallic netting carried thereby, said flexible cloth member and said netting being as a unit provided with an opening through which a patient's head may be thrust, said cloth member being provided with a second opening, and X-ray mechanism coacting with said cloth member and disposed adjacent said second mentioned opening therein for the purpose of making X-ray exposures through said second mentioned opening.

3. A device of the character described comprising a flexible member of non-con-

ducting material and a flexible metallic netting carried thereby, said flexible member of non-conducting material and said flexible metallic netting being as a unit provided
5 with an opening through which a patient's head may be thrust, said flexible member of non-conducting material being further provided with a second opening, means for virtually controlling the size of said second
10 mentioned opening, and an X-ray apparatus coacting with said flexible member of non-conducting material, and located in immediate proximity to said second mentioned opening.

15 4. A device of the character described, comprising a flexible metallic netting and a flexible cloth member having the general form of a blanket and to which said flexible metallic netting is secured, said flexible
20 metallic netting and said cloth member being as a unit provided with an opening through which a patient's head is to be thrust, and further provided with an opening through which X-ray exposures are to be made, and means for grounding said metallic netting.

5 5. A device of the character described, comprising a flexible cloth member and a flexible metallic netting carried thereby,
30 said flexible cloth member and said netting being as a unit provided with an opening through which X-ray exposures are to be made, and means for virtually controlling the size of said opening.

35 6. A device of the character described, comprising a cloth member and a flexible metallic netting carried thereby, said cloth member and said netting together as a unit being provided with an opening suitable
40 for making X-ray exposures therethrough, and a blanket ring comprising a flexible member of insulating material and a metallic netting carried by said flexible member, said blanket ring being provided with
45 an opening smaller than said first-mentioned opening, and means for detachably connecting said blanket ring with said cloth member.

50 7. A protecting blanket for X-ray patients, comprising a blanket and a blanket ring, each provided with an opening, said blanket and blanket ring each having a flexible member of insulating material and a flexible member of conducting material
55 carried thereby, and two-part snap fasteners for detachably holding together said blanket and said blanket ring.

8. A device of the character described, comprising a blanket provided with a flexible member of insulating material and with
60 a flexible netting of conducting material, said blanket being provided with an opening common to said insulating material and said conducting material, a plurality of blanket rings each having a flexible member of insulating material and a flexible
65 netting of conducting material and being provided with an opening, means for connecting the blanket rings together and securing one of them over the opening in said
70 blanket, and means for grounding all of said flexible nettings.

9. A device of the character described, comprising a flexible insulating member and a flexible conducting member united in
75 the form of a blanket, said blanket having an opening common to said insulating member and said conducting member, a number of other members for patching said blanket so as to virtually vary the size of said opening,
80 said other members each having a netting of conducting material, and means common to said blanket and said other members for grounding said netting of said blanket and said nettings of said other
85 members.

10. A device of the character described, comprising a blanket provided with a flexible member of insulating material and with
90 a flexible member of netting connected with said flexible member of insulating material and made of conducting material, said blanket being provided with an opening for facilitating the exposure of a part to X-rays, a blanket ring provided with a flexible
95 member of conducting material having the form of a netting and further provided with a flexible member of insulating material, and a number of snap fasteners for detachably connecting said blanket ring with
100 said blanket, each snap fastener being in two parts, one carried by the blanket and connected with the member thereof made of conducting material, and the other carried by said blanket ring and connected with
105 said member thereof made of conducting material, so that when said two parts of each snap fastener are secured together there is a complete metallic connection from the member of conducting material of said
110 blanket ring to the member of conducting material of said blanket.

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