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S. T. GREEN

2,404,225

PROTECTIVE APRON

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FIG. 1.

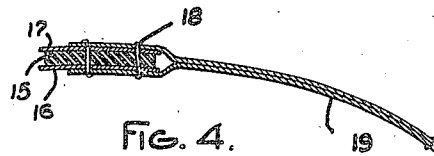
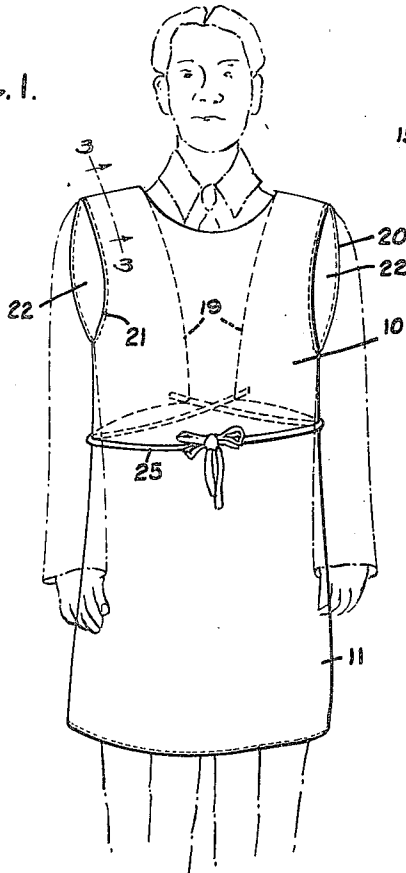


FIG. 4.

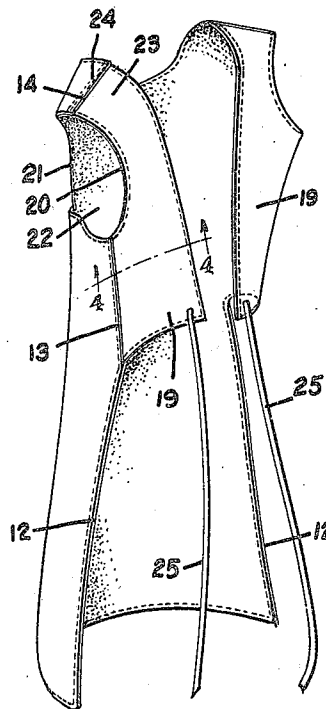


FIG. 2.

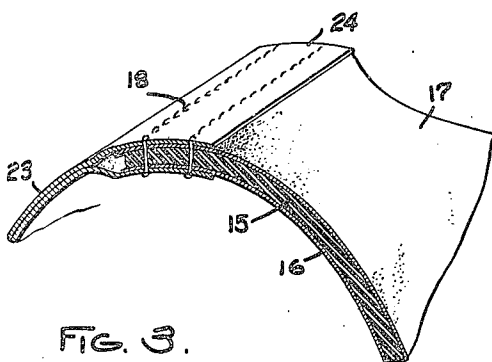


FIG. 3.

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PROTECTIVE APRON

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2 Claims. (Cl. 250-108)

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This invention relates to protective aprons, such as are worn by operatives of X-ray apparatus for shielding the body against undesirable, harmful effect of X-rays.

One object of the invention is to provide an improved protective shield or apron, of the character described, which is of simple construction and of pleasing appearance; which provides maximum X-ray protection and avoids leakage paths for stray ray effects; which is easy to apply to and remove from the body; which offers increased support for and distribution of the load; and which tends to hang close to the body when in use.

Further objects of the invention in part are obvious and in part will appear more in detail hereinafter.

In the drawing, which represents one suitable embodiment of the invention, Fig. 1 is a front elevation, illustrating the apron or shield in position on the wearer;

Fig. 2 is a rear perspective view of the apron;

Fig. 3 is an enlarged perspective view, partly in section on the line 3-3, Fig. 1; and

Fig. 4 is a detail sectional view on the line 4-4, Fig. 2.

Protective aprons or shields of the kind here involved frequently are quite heavy, due to the lead content, sometimes weighing as much as fifteen pounds or more. As a general rule they are supported on and fastened to the person with straps, being difficult of application and removal and offering paths for stray X-rays through the rivets or stitching where the straps are attached to the rubber, and unnecessarily fatiguing the wearer by the concentration of a heavy weight upon the narrow width of the supporting straps.

In the present shield or apron some of the objections to prior constructions for the purpose have been overcome by an arrangement as follows:

The apron illustrated shields the person wearing it from the neckline across the entire front of the body and downwardly to any desired extent, such as to a level below the knees. It consists, therefore, of an upper body portion, marked generally 10, and a lower skirt portion 11, the latter of generally rectangular form, low enough to extend below the knees and wide enough so that its vertical side edges 12 are at or a little behind the outside trouser seams.

The upper body portion 10, generally speaking, resembles a sleeveless woman's jumper open at the back and with the back yoke omitted. The front part of this jumper-like body serves, with the skirt, as part of the X-ray shield, while the

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back portions, later to be described, provide means of support on and attachment to the wearer.

The entire front of the garment, including the skirt 11 and the front of the upper part 10 out to the side seams 13 and up to the shoulder seams 14, is of the construction illustrated in Fig. 3. It includes a shielding member 15, in the form of a single sheet or panel made of plastic material, such as rubber, either natural or synthetic, or any suitable rubber substitute, impregnated with or containing a material opaque to X-rays, such as lead or lead oxides or other compounds of lead. The thickness of said sheet and the proportion of opaquing agent which it contains determine the amount of protection against the undesirable X-rays, as will be readily understood, and may be whatever is desired. Said sheet is covered with or is enclosed in a bag or envelope made of any suitable material such as textile fabric. For example the bag or cover may consist of inner and outer layers 16, 17 made of stockinette material or a suitable plastic fabric or material, such as Beutonal. Around the edges of the rubber sheet, the inner and outer cover plies may be secured together, as by stitching 18, the rows of which may lie either outside the edges of the rubber sheet, or close together just inside its edges to reduce the possibility of open paths for stray X-rays, or at least to place them where such rays become of little or no importance. Fig. 3 illustrates the latter arrangement, but exaggerated in proportions for purposes of illustration. The enclosing bag plies may be either loose or attached to the rubber sheet, as by cement or a vulcanizing operation.

The upper or body portion 10 of the garment also includes two back wings 19, shown in Figs. 2 and 4, each of which may include one, two or more plies of textile fabric suitably secured to the garment such as by the same stitches 18 which fasten the cover to the rubber sheet. The edges 20 of these wings, and the adjacent edges 21 of the body front provide arm holes, marked generally 22. This arrangement also provides relatively wide upwardly extending rear portions 23 joined to the front body portions along relatively long shoulder seams 24, which assists in distributing the weight of the garment over relatively wide areas at the shoulders and avoids concentrating it in narrow regions, as when narrow supporting straps or cords are employed. The back wings 19, when the garment is in place on the wearer, diverge upwardly, the usual back yoke portion being omitted, and the lower portions of the wings may be connected by tie bands 25,

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which usually are made long enough to bring around the waist, like a belt, for tying in the front.

The garment described is quite simple to apply to and remove from the wearer. In putting it on the arms are passed through the arm holes and the weight of the garment is immediately supported upon and distributed over the shoulders, and is not hung around the neck. Indeed, because the shielding portion of the garment has extra width and has the wings 19 fastened to it, the garment hangs fairly close to the wearer when he bends over, even without the tie straps 25, but when the latter are employed the garment hugs the wearer closely and distributes the weight so that any of the usual working operations may be performed without undue fatigue.

All stitches are close to the edges of the various parts, and not considerably inwardly therefrom, as when straps are employed, necessitating rivets or strong stitches through the body of the sheet and far enough in to prevent tearing out.

The arrangement described also avoids X-ray leakage through such openings.

Further advantages of the invention will be apparent to those skilled in the art.

What I claim is:

1. A sleeveless X-ray shield of generally apron form for use by X-ray operatives, including a single sheet of rubber-like material loaded with heavy material opaque to X-rays, said sheet being of generally rectangular shape with vertical side edges and of a size to completely shield the body

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vertically from the neckline to approximately the knees and horizontally outwardly to vertical lines beneath the arms, a textile fabric bag-like cover shaped to correspond with and enclosing said sheet, said sheet and cover having laterally spaced top portions one over each shoulder and each of substantially full shoulder width, and back wing members made of textile fabric having upper portions joined to the spaced shoulder portions of the cover along relatively long horizontal shoulder lines and lower portions joined to the vertical edges of the cover along the under-arm lines, the said back wing members having generally horizontal bottom edges and vertical edges which extend diagonally downwardly and converge from the neck ends of the spaced shoulder portions of the cover to the ends of said bottom edges, where said wings closely neighbor each other when the shield is in use, said lower portions being provided with connecting means and lying entirely beyond the area of the cover and sheet and being free to conform to and hug the body, whereby the heavy weight of the shield is distributed over the full width of both shoulders and a substantial area of the lower back.

2. A sleeveless X-ray shield of the character described in claim 1, in which said fabric cover and back wing members are secured to each other and to said sheet by rows of stitches extending through said sheet, the cover therefor and the back wing members.

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