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(72) Inventor: ROBERT BRUCE WARDLEY



(54) X-RAY PROTECTIVE GARMENT

- (71) We, WARDRAY PRODUCTS (CLERKENWELL) LIMITED a British Company, of 15-19 Bakers Row, London, EC1R 3DT do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-
- This invention relates to protective garments and especially to garments for affording protection against X-rays.
- This invention provides an X-ray protective garment, the garment comprising front and back portions connected together by shoulder straps, the back portion being provided at about waist level of a wearer with two straps one extending outwardly on each side of the back portion and arranged such that they can be brought round in front of the body of the wearer and detachably fastened together.
- Preferably the detachable fastening means comprises a burr-zip fastener such as Velcro (Registered Trade Mark) but it may be any metal or plastics fastener.
- Preferably the protective garment is a protective apron and has a releasable fastening at one or both of the shoulder straps holding together two separable portions of the or each shoulder of the apron. Preferably in order that the apron may be as comfortable as possible in wear the fastening at the shoulder portion(s) is arranged so that it is fastened at the front of the apron below the level of the shoulder. Thus, the front of the apron preferably stops short of the shoulder of the wearer while the shoulder strap on the back portion extends right over the shoulder and overlaps the front. In this arrangement the weight of the apron is suspended on the shoulders by a relatively flexible portion of the material of the apron rather than by a double thickness of material at the fastening region.
- The material of the garment is preferably that described and claimed in Patent specification No. 33789/77 which material comprises an array of at least two superposed sheets prepared from a composition comprising a natural or synthetic polymeric material, optionally in combination with a plasticiser therefore, and, as a filler, a material serving as an X-ray absorber, the, or the two outer, sheets having on their outer surfaces a decorative and/or protective surface covering, for example a layer of unfilled rubber or plastics material, the array of superposed sheets being bonded together round its edges, there being unbonded areas between the sheets in regions away from the edges. The edges of the array may be for example bonded by welding or adhesion of one sheet to another or by stitching. Preferably binding is effected by bonding the edges with a piece of binding material turned round and stitched over the edges.
- One embodiment of the invention will now be described in greater detail by way of example with reference to the drawings accompanying the provisional specification in which:-
- Figure 1* is a rear view of an X-ray protective apron embodying the invention; and
- Figure 2* is a diagrammatic section through the material used to make up the apron shown in *Figure 1*.
- Referring now to the drawings the apron which is made up from the material shown in *Figure 2* comprises a front portion 1 and a back portion 2 connected together by shoulder straps 3. Two belts 14 and 15 are attached to the back portion 2 of the apron one on either side thereof. The free ends of the belts 14 and 15 have portions 16a and 16b bearing Velcro (Registered Trade Mark) fastening material, enabling the belts to be secured together across the front of the wearer of the apron. Alternatively metal or plastics fasteners could be provided. The

other ends of the belts 14 and 15 are detachably secured to the back portion of the apron on each side by metal D-rings 17 that are secured within a loop of leather or stout plastics material 18 fastened by press studs 19 and secured to the back portion 2 of the apron.

Figure 2 shows two sheets 11 of a lead filled P.V.C. composition, each of which is bonded to a sheet 12 of P.V.C. material. The sheets 11 are placed together with their uncovered surfaces in contact and the X-ray apron shown in Figure 1 is made up from the 2-ply material thus formed. The 2-ply material is bound at the edges of the apron by leather (not shown). As shown, the material has an X-ray shielding effect equivalent to a sheet of lead 0.13 mm thick.

In a modified form, the garment may have a releasable fastening at one or both of the shoulder portions 3 thereof holding together two separable portions of the or each shoulder of the apron.

Preferably, in order that the garment may be as comfortable as possible to wear the fastening is fastened at the front of the apron forward of the shoulder. The front of the garment preferably stops short of the shoulder while the shoulder strap of the back portion extends right over the shoulder and overlaps the front, so that the weight of the garment is suspended on the shoulders by the more flexible part of the garment rather than by a more rigid reinforced joint portion.

It will of course be appreciated that the garment could be reversed so that the two straps are fastened together at the back of the wearer. Such a garment is to be regarded as falling within the scope of the invention.

WHAT WE CLAIM IS:-

1. A protective garment comprising front and back portions connected together by shoulder straps, the rear portion being provided at about waist level of a wearer with two straps one extending outwardly on each side and arranged such that they can be brought round in front of the body of the wearer and detachably fastened together.

2. A protective garment as claimed in claim 1, made from an X-ray screening material comprising an array of at least two superposed sheets prepared from a composition comprising a natural or synthetic polymeric material, optionally in combination with a plasticiser therefor, and as a filler, a material serving as an X-ray absorber, the two outer sheets having bonded to their outer surfaces a decorative and/or protective surface covering, the array of superposed sheets being bonded together round its edges, there being unbonded areas between the various layers in portions of the sheets away from the edges.

3. A garment as claimed in claim 2, wherein the surface covering material is a layer of flexible unfilled rubber plastics material.

4. A garment as claimed in claim 2 or claim 3, wherein the polymeric material, which serves as a binder for the X-ray absorber, is P.V.C.

5. A garment as claimed in any one of claims 2 to 4, wherein the X-ray absorbing material is metallic lead.

6. A garment as claimed in any one of claims 2 to 5, wherein the inside surface of the outer layers is uncoated.

7. A garment as claimed in any one of claims 2 to 6, wherein the array comprises only two X-ray absorbing sheets.

8. A garment as claimed in any one of claims 2 to 6, wherein the array includes one or more additional X-ray absorbing sheets sandwiched between the outer sheets.

9. A garment as claimed in any one of claims 2 to 8, wherein bonding of the edges of the array is effected by welding or adhesion of one sheet to another or by stitching.

10. A garment as claimed in any one of claims 2 to 9, wherein bonding of the edges of the array is effected by binding the edges with a piece of binding material turned round and stitched over the edges.

11. A garment as claimed in claim 1, made from an X-ray protective material substantially as described herein with reference to Figure 2 of the drawing accompanying the provisional specification.

12. A garment as claimed in any one of claims 1 to 11, in the form of an apron.

13. A garment as claimed in any one of claims 1 to 12, wherein the garment has a releasable fastening at one or both shoulder portions.

14. A garment as claimed in claim 13, wherein on at least one shoulder the front of the garment stops short of the shoulder level and a shoulder strap on the back portion of the garment extends right over the shoulder of the wearer to overlap the front portion and be releasably attached thereto.

15. A garment as claimed in claim 1 substantially as described herein with reference to and as shown in Figure 1 of the drawings accompanying the provisional specification.

REDDIE AND GROSE,
Agents for the Applicants,
16 Theobalds Road,
London, WC1X 8PL.

FIG. 1

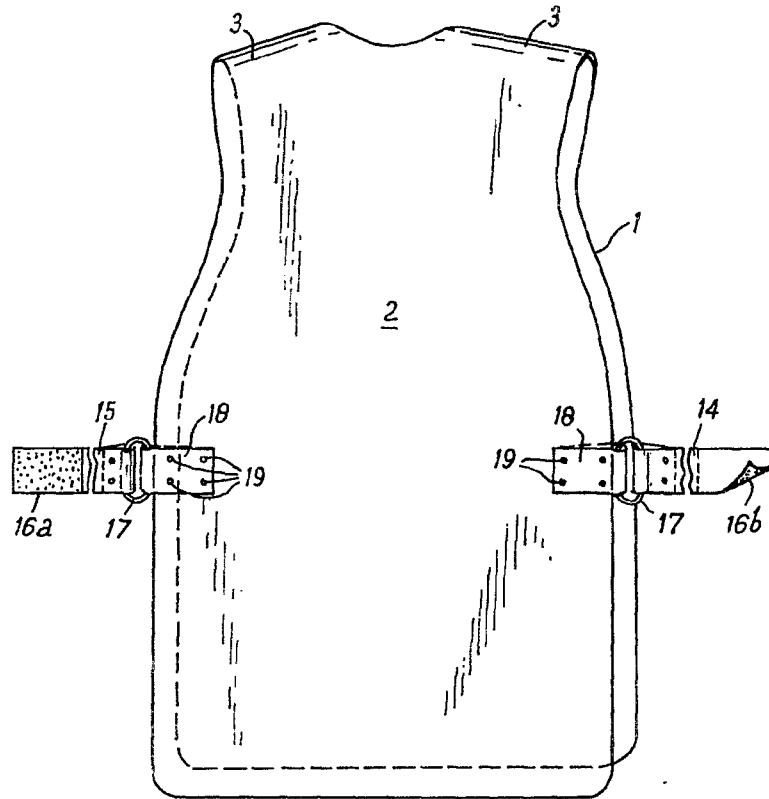


FIG. 2

