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(54) **Protective articles**

(57) An article affording protection against radiation, and especially against X-Rays comprises at least one flexible layer of lead filled material in an envelope of, or sandwiched between two layers of a knitted, woven or non-woven fabric preferably of synthetic fibrous material, carrying on its outer surface a coating of flexible polyurethane. The outer fabric provides a resilient an extremely tough and cut resistant covering for the relatively soft lead filled material.

GB 2 118 410 A

SPECIFICATION

Protective articles

This invention relates to articles affording protection against radiation and especially to articles affording protection against X-rays.

Flexible articles such as aprons, screens, gloves, curtains and the like affording protection against X-rays generally comprise at least one layer of a lead filled rubber or synthetic polymer such as PVC. These lead filled materials are relatively soft and are very easily cut or split for example by contact with sharp edges on X-ray equipment and the like. It has been proposed to provide articles made of such X-ray protective materials covered with an outer layer affording protection against cutting and/or splitting of the X-ray protective material. As such coating layers there have been proposed PVC and nylon sheeting but neither of these two materials is sufficiently tough to withstand the normal wear and tear in a modern X-ray department and the covering layers frequently split as readily as the underlying X-ray protective materials.

This invention is based on the observation that polyurethane coated fabrics provide a resilient and extremely tough and cut resistant covering for X-ray protective materials and accordingly, the invention provides an article affording protection against radiation comprising at least one flexible layer of a lead filled material in an envelope of or sandwiched between two layers of a knitted, woven or non-woven fabric, preferably of synthetic fibrous material, carrying on its outer surface a coating of flexible polyurethane.

The fabric is preferably a warp knitted fabric and is preferably a nylon fabric although fabrics made of other synthetic fibres such as polyethylene terephthalate may be used.

The fabric is preferably coated only on one surface with a polyurethane coating but it may if desired be coated on both surfaces.

The article which may be of any desired shape or configuration may, for example, be produced by assembling sequentially a layer of polyurethane coated fabric, one or more layers of lead filled material and a second layer of polyurethane coated fabric, the polyurethane coatings on the two fabric layers being outermost, and taken simultaneously cutting the article to the desired shape and sealing the edges of the article, for example, by high frequency radiation.

Alternatively, of course, the various layers can be cut to shape before assembly by sealing the edges of the article.

Although it may be possible using a sealing technique to form an article in which the welds are sufficiently strong to withstand normal useage, it is desirable and frequently necessary to bind the edges of the article with a binding tape or to stitch them to give added support and to prevent separation of the layers.

CLAIMS (filed on 25.1.83)

1. An article affording protection against radiation comprising at least one flexible layer of a lead filled material in an envelope of, or sandwiched between two layers of a knitted, woven or non-woven fabric, carrying on its outer surface a coating of flexible polyurethane.

2. An article according to Claim 1, wherein the fabric is a warp knitted fabric.

3. An article according to Claim 1 or Claim 2, wherein the fabric is a fabric made of synthetic fibres.

4. An article according to Claim 3, wherein the fabric is a nylon fabric.

5. An article according to any one of Claims 1 to 4, wherein the fabric is coated only on one surface with the polyurethane coating.

6. A method of producing an article according to any one of Claims 1 to 5, which comprises assembling sequentially a layer of polyurethane coated fabric, one or more layers of lead filled material and a second layer of polyurethane coated fabric, the polyurethane coatings on the two fabric layers being outermost, and then simultaneously cutting the article to the desired shape and sealing the edges of the article to bond the layers together.

7. A method of producing an article according to Claim 1, wherein the various layers of material forming the article are cut to shape and assembled, and the edges of the article are sealed to bond the various layers together.

8. A method according to Claim 6 or Claim 7, wherein the edges of the article are bound with a binding tape or are stitched through.

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