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OPAQUE MATERIAL FOR X-RAY AND RADIUM WORK OR THE LIKE

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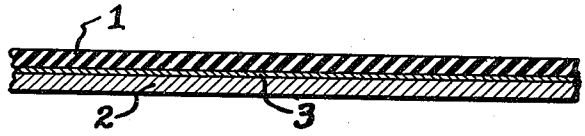

FIG. 1.

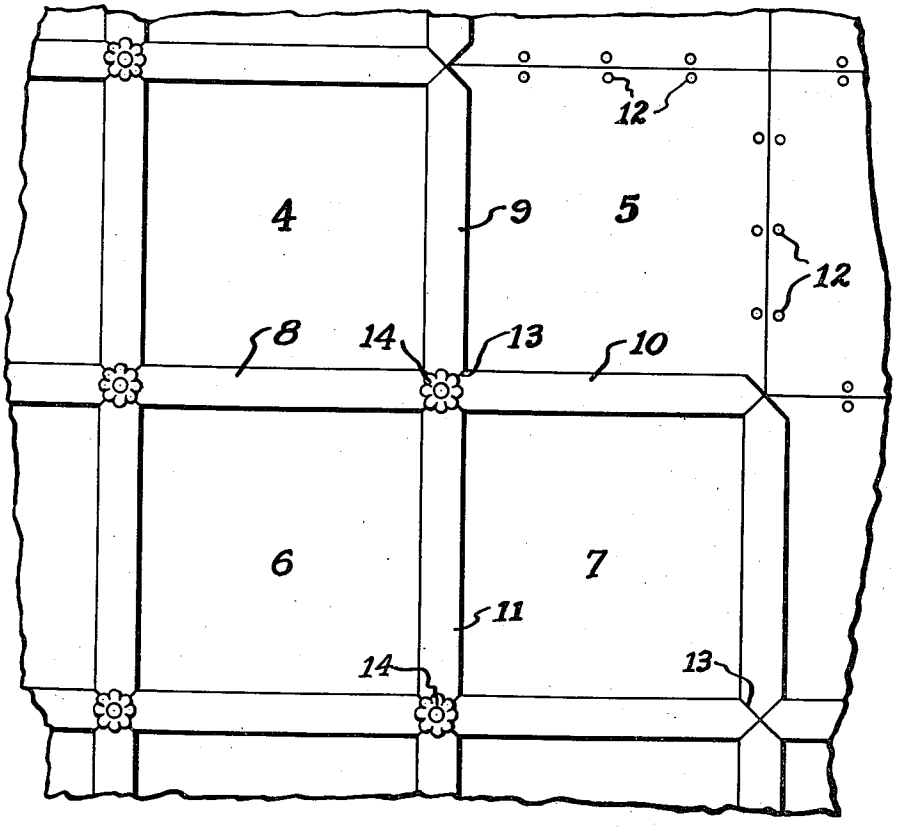

FIG. 2.

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OPAQUE MATERIALS FOR X-RAY AND RADIUM WORK OR THE LIKE

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2 Claims. (Cl. 250—108)

The primary object of our invention is to provide an isolating structure which can be used for X-ray work, or the like. It has long been realized that radium and X-rays have a deleterious effect upon living organisms, as well as sensitized material such as films. It is usual, for example, to line cabinets in which X-ray apparatus is contained, with lead as a medium substantially opaque to the rays, and to leave in a desired position a window for the passage of such rays. It has also been found that where X-ray work is being carried on in a room, deleterious effects may be experienced by persons in adjacent rooms, and considerable pressure from various sources has been brought upon persons working with X-rays to isolate in some way the rooms in which the work is being carried on. It is usual to line these rooms with lead, but this gives to the room an unsightly appearance. An object of our invention, therefore, is to provide an isolating medium which is attractive in appearance, and which may be employed in such a way as not to make the room appear different in its appointments from ordinary rooms, and so as not, for example, to emphasize the dangerous features of the work being carried on in the room. It is an object of our invention to provide a material which will have adequate isolating effect, which may be applied in such a way as to produce complete isolation, and which will be relatively inexpensive and capable of imparting to the room various decorative effects.

These and other objects of our invention which will be set forth hereinafter, or will be apparent to one skilled in the art upon reading these specifications, we accomplish by that certain construction and arrangement of parts and in that material of which we shall hereinafter set forth an exemplary embodiment.

Reference may be made to the drawing, wherein:

Figure 1 shows in cross section an embodiment of our invention in the best form known to us, and

Fig. 2 shows a section of a wall paneled with our material.

In the practice of our invention, we take a sheet of lead or other suitable isolating material of the required thickness having in regard the particular form of the rays which are to be cut off, and we associate this with a panel of decorative substance which need not have the isolating effect referred to. Preferably the two panels will be fastened together so that they may be handled, sold, shipped and installed as a unit. In the particular embodiment of our invention we join to a sheet of lead a panel of moulded or laminated composition having the desired decorative effect. The last mentioned panel may advantageously be made of moulded or laminated condensation resin, and may be given any of the decorative effects of which said resins or resinous compositions are capable.

The decorative panel may be made in solid colors or not, as desired, and may have other decorative effects, as we shall hereinafter describe. It is possible, for example, by employing either a moulding composition which is light or white in color, or a laminated structure which will give a similar effect, to produce wall coverings which have the appearance of white or light colored tile, and the suggestion of sanitation which such materials convey. Moulded products of this character can be made with a high surface lustre and are washable, and not subject to attack by acids or alkalies, for which reason they are actually sanitary and very readily kept clean. For most uses, as, for example, in a doctor's office, the tendency of present day decoration is usually in other directions than that of a tiled effect, and consequently in commercial practice we manufacture most of our panels with a decorative effect having the appearance of wood graining.

The decorative panel of our structure is most conveniently made by a laminating procedure, as is well known in the art. Sheets of paper or cloth are passed through a bath or otherwise saturated with the desired resin in an uncured state, and then are laminated in a press, and cured under a high degree of pressure and heat, so as to complete the polymerization of the resin and to give a product which is hard, insoluble and infusible. In the manufacture of wood grained effects, as is also known in the art, it is usual to employ as the top or surface lamination a layer of paper or other web which, by printing or otherwise, has been given a surface marking representative of the grain of a chosen type of wood, such, for example, as oak, walnut, mahogany, or the like, and then to employ this with a resin which will be transparent in thin films, and which may have a coloring appropriate to the particular type of wood which it is intended to imitate. In the curing operation, the surface which is to be exposed is usually placed against a highly polished sheet of metal which gives it the final polish and lustre.

Finished panels of this type may be associated with panels of lead, or the like, in any way desired. They may, for example, merely be pack-

aged and shipped together, but it is preferable to fashion them in a unit by any one of a number of methods. It is possible, for example, to fasten a sheet of lead to a panel of resinous material by means of rivets, which rivets will preferably be of a material such as lead which is impervious to X-rays. It is likewise possible to form a lead sheet with teeth or undercut portions and to cure a moulded panel thereagainst in such a way that a portion of the moulding composition or of the panel is caught and held by or beneath the teeth so as to give a physical bond. We prefer, however, to form the lead and the decorative panel into an inseparable unit without the use of any of these expedients, and we have found that this may be done by any of the following methods:

Example No. 1.—Since lead does not appear to possess a strong adhesion to condensation products, it is preferable to coat the lead after it has been cleaned as by wire brushing, an acid treatment, or the like, with an adhesion promoting metal. There are a number of metals, such, for example, as zinc, which will serve in this connection; but we have secured our best results by coating the lead with copper, or with an alloy containing copper, such as brass. This may and preferably will be done electrolytically. Between the coated lead and either a raw or pre-cured panel containing condensation resin made as hereinabove described, we place a thin calendered sheet of rubber stock, or we coat both the lead and the resinous panel with a rubber cement, or with rubber latex, preferably containing curing agents, such as sulphur and accelerators. If latex or rubber cement is employed, the solvent in the first case or the dispersing medium, such as water, in the second, are allowed to dry out of the surfaces of the coated stock, and the resinous panel is then superposed upon the lead sheet. The combined article, or a number of them, are placed in the ordinary press and given either the normal cure for condensation resins of the type employed, or a heat and pressure treatment sufficient to vulcanize the rubber. Where the resinous panel is of uncured stock, the normal curing treatment will be sufficient to effect a vulcanization of the rubber, and as a consequence it is somewhat cheaper to employ uncured resinous panels or to build up the panel on the surface of the lead, after a manner which will be clear from the foregoing.

The combined article is an integral article, one surface of which is of lead, and the other surface of which is of moulded resinous compound, the two being joined together with a good bond and being substantially inseparable. We have not found that differences in temperature ordinarily to be encountered by such products in use have any effect on the compound, nor have we noted in our products in use any tendency toward warpage.

Example No. 2.—A sheet of lead, or the like, of required thickness, may be cleaned and coated with a Bakelite varnish or cement. Preferably, though not necessarily, the lead will have been plated as described above. A panel of the resinous composition, either in a cured or uncured stage, will also be coated with a Bakelite or resinous cement. It will be understood that the resinous cement referred to is a condensation resin in an incompletely cured condition, softened with an appropriate solvent. The coated panels are superposed, and one or more of the assemblies described are placed in a press and treated under heat and pressure sufficient at least for curing the cement. Where the resinous panel has been built up upon the lead, or where an uncured panel is employed, the treatment will, of course, be sufficient to cure the resinous compound.

Example No. 3.—The cleaned lead or other isolating panel, treated or not with adhesion promoting substance, is coated with a nitro-cellulose or cellulose acetate base cement, or other cellulosic cementitious substance, and the resinous panel is likewise so coated. The coatings may be allowed partially to dry, but not so as to lose their entire adhesiveness. Then the panels are pressed together and allowed to become thoroughly dry, with or without the use of heat. This procedure likewise has been found to give a good bond.

In the drawing:

Figure 1 is a sectional view of an exemplary article made in accordance with our invention, in which 1 indicates the resinous panel; 2 is a panel of isolating substance such as lead, and 3 an intermediate layer of bonding material.

In Fig. 2 we have shown a section of wall paneled with this material, and an exemplary joining structure. Adjacent sheets of our material are indicated respectively at 4, 5, 6 and 7. Overlying joint seal strips are indicated at 8, 9, 10 and 11. These strips may be cemented, or otherwise held in place, or they may be held in place by metallic fastening devices indicated at 12. These may be in the nature of screws, such as screw members with self-cutting threads, and they may fasten the panel strips to the body panels without complete penetration through the isolating layer of the body panels. Where complete penetration is desirable or necessary, the fastening means may be made of, or may comprise the desired isolating substance, such as lead. If the panels are relatively small, it may not be necessary to fasten the joining strips otherwise than at their ends. We have shown their ends beveled, as at 13, and meeting over the point of juncture of the panels. At this point a lead covered screw or bolt 14 may be employed simultaneously to hold the main isolating panels and the joining strips as shown.

It will be understood that our materials are not restricted in their use to the lining of the walls of X-ray rooms or rooms in which X-ray and radium work is carried on. Our materials have utility in the construction of cabinets or housings for X-ray apparatus, in the construction of shields for the protection of the operator's body, which shields or screens may be movable or not as desired, also in the construction of boxes or containers for radium, or for sensitized materials stored adjacent to sources of destructive radiation, or for any other isolative uses. Decorative panels may, of course, be placed upon both sides of the isolative panel if desired.

Ordinarily, in the manufacture of our materials we employ commercial sheet lead, or commercial sheets of other isolative materials. The words "sheet" and "layer" in the appended claims are not intended as implying a limitation to commercially formed sheets. For example, a layer of lead may be formed by spraying the metal upon a suitable base, which may be the decorative panel, if desired, preferably coated with the selected adhesive substance. The selection of a suitable thickness of the layer of isolative substance per se, for any particular isola-

tive use, will be within the skill of the worker in the art in accordance with known principles.

Modifications may be made in our invention without departing from the spirit thereof.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In combination, a layer of lead and a decorative panel of condensation resinous composition, said lead being coated with an adhesion promoting metal and bonded to said panel by a bonding substance.

2. A process of manufacturing isolating panels, which comprises cleaning a sheet of lead, coating said lead with an adhesion promoting metal, and with an adhesive substance, forming a resinous panel and coating said panel with an adhesive substance, afterward superposing said sheet and said panel and pressing and curing the combined structure.

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