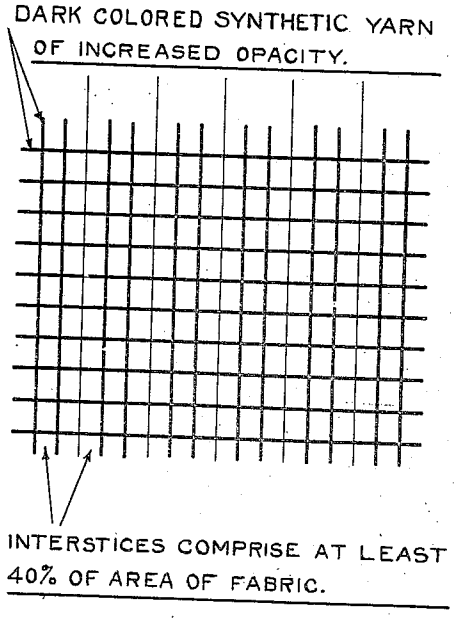
March 16, 1943. H. C. VAN BREDERODE 2,313,904

DIM OUT MATERIAL

Filed June 6, 1942



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Patented Mar. 16, 1943

2,313,904

UNITED STATES PATENT OFFICE

2,313,904

DIM-OUT MATERIAL

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Application June 6, 1942, Serial No. 446,160

5 Claims. (Cl. 139—426)

This invention relates to dim out material, and relates more particularly to fabric adapted to reduce or cut off the glare of light passing through it while still permitting illuminated objects to be seen through it.

An object of my invention is to provide a fabric that may be used as a dim out material.

A further object of my invention is to provide a dim out material made of fabric of such nature and construction that glare is effectively diminished while visibility of illuminated objects behind the same is not destroyed.

Other objects of my invention will appear from the following detailed description.

The figure of the accompanying drawing shows diagrammatically a fabric that may be employed in accordance with my invention.

In order to prevent the glow of light over cities or towns at night it is necessary to prevent the glare of artificial illumination from extending to the exterior of buildings. For such dim out purposes, it is not necessary, however, to cut off all illumination as in the case of a complete blackout. Therefore, if display windows are to be illuminated, it is possible to do so in such a manner that objects within the display windows are still visible without causing objectional glare.

I have found that fabrics of certain construction are eminently suitable for use as dim out material. Such fabric should be made of yarn of increased opacity or decreased luster due to the presence of finely divided pigments. The fabric should be of black or some very dark shade. In order to permit visibility therethrough, the fabric should preferably be of such construction that the area of the interstices should be at least 40% of the area of the fabric.

When fabric made in accordance with my invention is used as dim out material in display windows, the glare of the illumination is effectively destroyed but the objects on display therein are clearly visible and, in some cases, actually more effectively shown than when the dim out material is visible. This invention also includes the use of the fabric for dimming out light not only in the case of display windows but for all other dim out purposes.

The yarns employed in making the fabric used in this invention may be made of any suitable base material, such as polyvinyl resins or other synthetic resins, linear condensation polymers such as polyamides derived from amino acids or derived by the condensation of diamines with dicarboxylic acids, e. g., polyhexamethylene adipamide, or it may be of the reconstituted cellulose type formed by the viscose, Chardonnet or cuprammonium process, but this invention is particularly applicable to yarns containing organic derivatives of cellulose, such as organic esters of cellulose and cellulose ethers. Examples of such organic esters of cellulose are cellulose acetate, cellulose propionate and cellulose butyrate, while examples of cellulose ethers are ethyl cellulose and benzyl cellulose. The filaments or yarns containing the organic derivative of cellulose may be prepared by dissolving the organic derivative of cellulose in a volatile solvent such as acetone and extruding such solution through an evaporative atmosphere, as in dry spinning, or into a precipitating bath as in wet spinning.

As stated, the yarn employed has a reduced luster or increased opacity due to the presence therein of a finely divided pigment having an index of refraction materially different from that of the base material. Examples of such pigments are titanium dioxide, antimony trioxide, stannic oxide, graphite, carbon black, etc. The fine divided material may be either of inorganic or organic nature, provided that it is insoluble in the base material of the products, and is preferably insoluble in and does not react with the spinning solution, or solvent therein or reagents with which the material comes in contact during its formation or in subsequent treatments such as dyeing to form undesired compounds.

The amount of finely divided pigment employed may vary from 1 to 5% or more of the weight of the base material. The insoluble material should be in finely divided form having a diameter of, say, from less than 0.1 to 10 microns. One way of obtaining this fine state of division is to grind the material in water, oil such as diethylene glycol or olive oil, but preferably in a solution of the base material in the solvent used in spinning, e. g., a 10–14% solution of cellulose acetate in acetone. The best results are obtained when the insoluble material is finely divided by subjecting it to a squeezing rubber or kneading action while dispersed in a plastic mass, which preferably comprises the same material as the base of the yarns or filaments to be prepared. This squeezing, rubbing and kneading action may be performed in the kneaders and heated malaxating rolls ordinarily employed for making cellulose derivative plastics.

In order that the desired anti-glare effect be attained, the fabric should be of a very dark color. Preferably, it should be dyed black but may be of navy blue or dark brown color.

To enable desired visibility through the fabric when used as dim out material, the area of the interstices should be at least 40%, preferably 40 to 60% of the total area of the fabric. This effect may be attained by varying the thickness of the yarn used and the number of yarns used per unit length. The thickness of the yarn depends on the denier or weight per unit length of the same, the higher the denier, the greater the thickness. However, the amount of twist also governs the thickness of the yarn, the greater the number of turns per inch the less the thickness of the yarn. Thus a yarn of higher denier but of higher twist may be thinner than a yarn of lower denier and less twist.

In view of the above considerations, a large choice of fabric construction is available. By way of example, it is pointed out that fabrics of the following construction have been found eminently useful as dim out material.

1. A fabric of plain weave dyed black having a warp of 80 ends and a weft of 80 ends, each of 75 denier cellulose acetate yarn having 2.5% by weight of finely divided titanium dioxide incorporated therein, the yarn having a twist of 28 turns per inch.

2. A fabric of plain weave dyed black having a warp of 92 ends and a weft of 86 ends, each of 75 denier cellulose acetate yarn having 2.5% by weight of finely divided titanium dioxide incorporated therein, the yarn having a twist of 28 turns per inch.

It is to be understood that the foregoing detailed description is merely given by way of example and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. A dim out material adapted to diminish the passage of light rays therethrough comprising fabric of dark color made of synthetic yarn of increased opacity and having interstices whose area equals at least 40% of the area of the fabric.

2. A dim out material adapted to diminish the passage of light rays therethrough comprising fabric of dark color made of synthetic yarn of an organic derivative of cellulose of increased opacity due to the presence therein of a finely divided pigment and having interstices whose area equals at least 40% of the area of the fabric.

3. A dim out material adapted to diminish the passage of light rays therethrough comprising fabric of dark color made of synthetic yarn of cellulose acetate of increased opacity due to the presence therein of a finely divided pigment and having interstices whose area equals at least 40% of the area of the fabric.

4. A dim out material adapted to diminish the passage of light rays therethrough comprising a fabric that is dyed black having a warp of 80 ends and a weft of 80 ends, each of 75 denier cellulose acetate yarn having a twist of about 28 turns per inch and having finely divided titanium dioxide incorporated therein.

5. A dim out material adapted to diminish the passage of light rays therethrough comprising a fabric that is dyed black having a warp of 92 ends and a weft of 86 ends, each of 75 denier cellulose acetate yarn having a twist of about 28 turns per inch and having finely divided titanium dioxide incorporated therein.

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