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IMPREGNATED ASBESTOS PRODUCT

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1 Claim. (Cl. 91—68)

This invention relates to an impregnated asbestos article, particularly to an article comprising asbestos fibres in the form of a sheet fabric and a coloring composition impregnated thereinto and coated thereover, the coloring composition having a base medium that is per se incombustible.

There is great need of a fireproof fabric for use on ships, as, for example, as drapery, upholstery, and wall cloth. There has long been need, also, of a fireproof awning cloth to eliminate the fire hazard arising, for instance, from the lodging of burning cigarette stubs thrown from an upper story of an apartment or hotel building.

Numerous attempts to meet these requirements have heretofore been unsuccessful. Thus, there have been made attempts to paint asbestos cloth with a paint composition including, as the base medium, linseed oil, dependence being placed upon the use of a large proportion of inert incombustible filler to overcome the combustibility of the medium. Also, there have been unsuccessful attempts to dye asbestos cloth.

In appraising the difficulties in the coloring of asbestos products, it is to be recalled that asbestos has been known for several hundred years, at least, that there has been the need, for a very long time, of means of coloring it in a fireproof manner, without any universally satisfactory solution of the problem heretofore, that asbestos fibres are of a different physical constitution from conventional animal or vegetable fibres, and that this different nature introduces a problem in connection with the coloring of asbestos that is not encountered with the other fibres.

The asbestos fibres that are visible without magnification are constituted each of a bundle of elongated microscopic crystals which are partly separated from each other, as, for example, at a frayed exterior portion of a fibre produced by usual milling methods applied to asbestos ore. The fibres of a given kind are weaker the more the crystals therethroughout are separated. Also, the crystals do not adsorb or combine readily with a dye and the individual crystals are not readily impregnated by coloring compositions.

It is an object of the present invention to provide a colored asbestos product in which the coloring composition is seated in the fibres of asbestos by impregnation into spaces between the microscopic crystals thereof. Another object is to provide a composition comprising fibres of asbestos and a coloring composition constituted largely of ingredients each of which is per se incombustible. Other objects and advantages will

appear from the detailed description that follows.

An embodiment of the invention that is preferred is illustrated by the following specific example of the method of making asbestos fabric for use as upholstery, drapery, or awning cloth.

There is first fabricated an asbestos cloth, as, for example, by weaving in manner that is conventional in the making of asbestos cloth. Thus, there may be woven strands of yarn consisting largely of asbestos fibres and having reinforcement such as cotton threads or fine brass wires. For the present purposes, asbestos yarns reinforced with cotton thread are especially desirable. With the effective coloring composition and method of the present invention, it is not necessary that the asbestos cloth used should be unusually heavy, closely woven, or otherwise expensive in construction, even when water-tightness of the colored product is desired.

There is provided, also, a coloring composition comprising a base medium that is itself incombustible, as distinguished from paint compositions including as the medium linseed or other combustible paint oils. Thus, the medium may consist of a vinyl resin (as, for example, a thermoplastic polymerized vinyl chloracetate of high chlorine content), a highly chlorinated incombustible rubber product (containing, for instance, about 70 parts by weight of chlorine to 100 parts of the said product).

A suitable pigmentary substance is dispersed in the said medium. The pigmentary substance establishes the desired color. The pigment may consist of one or more common commercial pigments, suitably iron pigments being avoided when the vinyl resin is used.

If desired, various filler materials may be added, as, for example, finely divided diatomaceous earth or other siliceous or finely divided inert material.

Also, there may be used a mildew-proofing agent of which 3-chlor-2-hydroxy-diphenyl is an example.

The materials selected for the coloring composition are dissolved or extended in a suitable volatile solvent mixture. Thus, there may be used a mixture of volatile hydrocarbon, ester, and/or ketone solvents, the ketone component being preferably omitted when the plastic medium selected is chlorinated rubber.

Usual paint technology may be employed in compounding the several ingredients of the coloring composition.

The proportion of solvent used is such as to convert the composition to a slowly flowing,

heavy paste adapted to be forced under pressure, as by a knife, into the asbestos fabric.

Typical coloring compositions that have been used are given below.

5 *Vinyl resin coloring composition*

Ingredient	Parts by weight
10 Vinyl resin.....	8-15
Tricresyl phosphate.....	5-12
Pigments.....	30-40
Volatile solvent mixture.....	38-48

15 *Chlorinated rubber coloring composition*

Ingredient	Parts by weight
20 Chlorinated rubber.....	8-15
Tricresyl phosphate.....	8-20
Pigments.....	30-40
Volatile solvent mixture.....	32-42

In the above formulas tricresyl phosphate is an example of a fireproof plasticizer, that is, an incombustible, non-volatile solvent or softener for the vinyl resin or chlorinated rubber.

The resin and rubber product, either alone or in association with the plasticizer, in turn, are each a flexible base medium as the term is used herein, in that the sheet products made as described and colored by a composition including such a base medium are flexible.

In applying the coloring composition of pasty consistency to the asbestos fabric, the composition is forced into the fabric, as by being buttered thereover under pressure with a knife or the like, so that the composition is impregnated between the microscopic crystals of the asbestos fibres at positions at which the crystals are appreciably separated, as described above. Also, the coloring composition is caused to penetrate the interstices between the visible fibres and to coat the exterior surfaces of the fibres.

After a coating of the composition has been applied, the coated article is subjected to an elevated temperature to cause evaporation of the volatile solvent, as, for instance, to a temperature of about 120° F. for fifteen minutes or so. Preferably, a plurality of coats are applied, one after another, the solvent in each coat being evaporated before the next application of the coloring composition is made.

As a necessary consequence of the method described, the coloring composition buttered over the fabric under pressure, fills the interstices between the fibres and produces a water-tight

product having a generally smooth finish. Such a product is to be distinguished from a fabric having a thin coating composition adhered over the surfaces of the individual strands without filling the mesh space therebetween. This difference is especially important in the case of woven asbestos products, the coarseness of the individual strands of asbestos and their stiffness causing the weave to be relatively open or loose.

When two to four coats of the coloring composition have been applied, as described, the color of the asbestos article is ordinarily established of desired uniformity and depth.

After the application of the final coat and evaporation of the volatile solvent therefrom, the colored article is ready for use. However, the article may be treated to shape the surface, as, by being subjected to calendering or embossing steps.

The finished article made as described is fireproof, waterproof, incombustible, water-tight (when exposed to rain for a substantial period of time), and durable on exposure to the elements. Also, the impregnation with the coloring composition increases greatly the strength of the fabric, the increase in tensile strength of a typical article being about 50 per cent. Finally, the article may be flexed, the flexibility being due in part to the absence of loading with inerts to the high degree that would be necessary to make fire-resistant a coloring composition containing a readily combustible base.

It will be understood that the details given are for the purpose of illustration, not restriction, and that variations within the spirit of the invention are to be included in the scope of the appended claim.

What I claim is:

An article of manufacture comprising reinforced strands of asbestos fibres woven into a cloth and a fireproof coloring composition coating the exterior surfaces of the fibres, penetrating interstices within the individual fibres and closing the mesh spaces between the several strands, the said composition including a base medium selected from the group consisting of a vinyl resin and a chlorinated rubber, each of high chlorine content, a plasticizer for the base medium and a pigmentary substance distributed substantially uniformly throughout the said medium, the proportion of the pigmentary substance being of the order of 30 to 40 parts by weight to 8 to 15 parts of the said medium, and the coloring composition being in the condition of having been deposited in situ from a mixture of pasty consistency.

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