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COMPOSITION FOR COATING FABRICS

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The present invention relates to improvements in fabrics and has particular reference to coated fabrics wherein a composition of matter is applied to the fabric, imparting desirable and markedly improved properties of fire resistance, scuff and weathering resistance, flexibility at extreme temperatures, dimensional stability and the like are attained in the fabric.

Heavy duty fabrics such as cotton ducking and the like are used extensively for tenting, deck covers, camouflage netting, raincoats and the like. While these accepted fabrics are suitable for most purposes, there is a considerable demand for lighter fabrics having all the desirable properties of duck, and in addition the properties mentioned above. For example, a satisfactory camouflage net may be constructed from burlap or duck strips, suitably colored to simulate natural ground cover. However, these nets rapidly accumulate moisture, oil and other materials, increasing in weight to an extent that erection of the nets becomes most difficult. In addition, the strip materials burn readily, mildew, and age rapidly upon exposure, undesirably modifying the original color plan of the net. In cold weather operations, duck treated against water and fire stiffens so as to be unmanageable.

In providing a substitute for these accepted fabrics now available for the general purposes described, it is essential from the commercial standpoint that the product be as inexpensive as for example weatherproofed duck.

It is an object of the invention to provide a composition of matter for coating fabric materials to accomplish the aforementioned objectives at a reasonable cost in terms of the cost of presently available competitive products.

A further object is to provide a coated fabric characterized by flexibility at low temperatures as for example as low as -50°F. to -100°F. , and which is self-extinguishing when ignited, the fabric being dimensionally stable at all conditions of humidity and temperature.

A further object is to provide a fabric coated with a composition providing protection for the fibers, and characterized by low migration and low sticking together of fabric surfaces under conditions of load and elevated temperatures.

Other objects and advantages of the invention will be apparent from the following detailed description thereof.

In its broadest application, the fabric product of the invention comprises a base cloth impregnated with a novel composition of matter which imparts the aforementioned desirable properties to the fabric. It will be noted that the coating composition of the invention preserves or augments the desirable properties already inherent in the base cloth, at the same time imparting additional desired properties thereto without deleterious effect on the inherent properties.

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The base fabric or cloth may consist of fabrics manufactured from natural fibers such as cottons, and from artificial fibers such as nylon, Orlon, polyethylene, and Saran. The preferred base cloth consists of fiber glass cloth. This material has inherent properties of stability against deterioration as a result of chemical action or aging. In addition, glass fiber cloth is mildew proof, has a desirably high tensile strength, is light in weight, and is non-inflammable. These inherent properties of glass fiber cloth are augmented by application of the coating composition of the invention, and additional properties are imparted to the cloth which increase its utility for the purposes described.

The coating composition of the invention comprises a base material referred to hereinafter as the master mix, including as components chlorinated polyethylene, antimony trioxide and a plasticizer.

The chlorinated polyethylene may have a chlorine content of from 5% to 85%, and preferably will contain about 28% chlorine. The master mix may contain from 20% to 85% of this material by weight, 72% being the preferred proportion.

The antimony trioxide component may be present in an amount ranging up to 80% by weight, the preferred proportion being about 20%.

The plasticizer may be present in an amount ranging up to 50% by weight of the master mix, and preferably will be used in the proportion of about 8–10% by weight. A preferred plasticizer comprises tributyl cellosolve phosphate (tributoxyethylphosphate). It has been found that this material is unusually active in accomplishing the purposes described, particularly from the standpoint of retention of flexibility of the coated fabric at low temperatures as for example -70°F. or below.

Another preferred plasticizer is trichlorethyl phosphate.

Other plasticizers which may be employed are tricresyl phosphate, di-2 ethylhexylphthalate, trioctylphosphate, 2-diethylhexyladipate and commercial plasticizers readily available on the market.

These ingredients constitute the master mix. The antimony trioxide component should be employed in cases where it is desired that the coated fabric have self-extinguishing properties contrasting with inertness to combustion, it being particularly desirable to use antimony trioxide as a component in all cases where the base fabric employed is capable of supporting combustion in any degree.

Other ingredients may be added to the master mix such as pigments for purposes of color. For example, pigment may be added to the master mix in the proportion of 5% by weight of the mix.

Carbon black may be added where desired, in

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any form desired, it being preferred to use a channel or a furnace black. The carbon black may be added in a weight range of from 0% to 20% of the master mix by weight, with a preferred composition of about 3% by weight.

The coating composition of the invention may be applied to the base fabric in any manner, such as for example by applicator rollers, a squeeze operation, and the like, a preferred manner of application being disclosed and claimed in application Serial Number 158,497, filed April 27, 1950. It is desirable that the base fabric be thoroughly impregnated with the coating composition with evenness and regularity of application, in order to attain standardized properties for the coated fabric.

Fabrics prepared in accordance with the invention have wide application in meeting the requirements for tenting materials, camouflage nets, protective clothing and the like. Perhaps the most important combination of properties attained resides in the self-extinguishing nature of the cloth, its resistance to mildew, lightness in weight, dimensional stability, and flexibility at extremely low temperatures. This is accomplished at a low cost compared with coating compositions presently available, as well as the cost of materials currently employed for the general purposes enumerated such as cotton ducking. A glass fiber cloth coated in accordance with the invention is uniquely suited for use in the manufacture of camouflage materials.

A marked and essential feature of the invention resides in the combination of ingredients employed to attain a fabric having the above-enumerated properties. Not all chlorinated hydrocarbons will have the specific low temperature properties prescribed. The plasticizers enumerated above overcome the natural tendency of the chlorinated hydrocarbons to stiffen at low temperatures. An important element of the invention is that retention of flexibility at low temperatures is attained with the use of moderate amounts of plasticizer, which are also satisfactory at high temperatures in that they do not tend to migrate.

Chlorinated polyethylene has a marked compatibility for the plasticizer and other ingredients which is lacking with other conventionally used materials such as polyethylene, for example. Chlorinated polyethylene also is characterized by self-extinguishing properties, which permits the use of smaller amounts of antimony trioxide. The low chlorine content of chlorinated polyethylene contributes to its stability under extremes of temperature, whereby gradual changes in the physical properties of the fabric due to leaching out of chlorine, are avoided. Prior art uses of chlorinated polyethylene specify a very high chlorine content, in combination with antimony trioxide, the present invention constituting a departure from this known practice.

Other coating compounds such as vinyl compounds, lack the essential low temperature flexibility of the present invention, unless substantial quantities of plasticizer are used, which causes the material to migrate at higher temperatures.

While the invention has been described with reference to specific materials and applications, it is not to be limited save as defined in the appended claims.

I claim:

1. A coating composition comprising chlori-

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nated polyethylene having a chlorine content of from 5% to 85%, and present in an amount of approximately 72% by weight, approximately 20% by weight of antimony trioxide, and approximately 8% by weight of a plasticizer.

2. In the composition set forth in claim 1, the plasticizer consisting of trichlorethylphosphate.

3. A coated fabric comprising a cloth base woven from glass fibers and coated with a composition comprising approximately 72% by weight of chlorinated polyethylene, approximately 20% by weight of antimony trioxide, approximately 8% by weight of tri-chloroethylphosphate, the chlorinated polyethylene having a chlorine content of approximately 28%, the mix having incorporated therein 3% by weight of the total mix of carbon black, and a pigment.

4. A coating composition comprising a mixture of chlorinated polyethylene having a chlorine content of from 5% to 85%, and present in an amount of approximately 72% by weight, approximately 20% by weight of antimony trioxide, approximately 8% by weight of a plasticizer, and approximately 3% by weight of the total mix of carbon black.

5. A fire resistant coated fabric comprising a fabric base woven from glass fibers and coated with a composition comprising chlorinated polyethylene having a chlorine content of from 5% to 85%, and present in an amount of approximately 72% by weight, approximately 20% by weight of antimony trioxide, and approximately 8% by weight of a plasticizer.

6. A coating composition comprising chlorinated polyethylene having a chlorine content of about 28%, and present in an amount of approximately 72% by weight, approximately 20% by weight of antimony trioxide, and approximately 8% by weight of a plasticizer.

7. A coating composition comprising chlorinated polyethylene having a chlorine content of 5-85%, and present in an amount of approximately 72% by weight, approximately 20% by weight of antimony trioxide, and approximately 8% by weight of tributoxyethyl phosphate.

8. A coated fabric comprising a cloth base woven from glass fibers and coated with a composition comprising approximately 72% by weight of chlorinated polyethylene, approximately 20% by weight of antimony trioxide, approximately 8% by weight of tributoxyethyl phosphate, the chlorinated polyethylene having a chlorine content of approximately 28%, the mix having incorporated therein 3% by weight of the total mix of carbon black, and a pigment.

9. A coating composition consisting essentially of chlorinated polyethylene having a chlorine content of from 5% to 85%, and present in an amount of approximately 72% by weight, approximately 20% by weight of antimony trioxide, and approximately 8% by weight of a plasticizer.

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