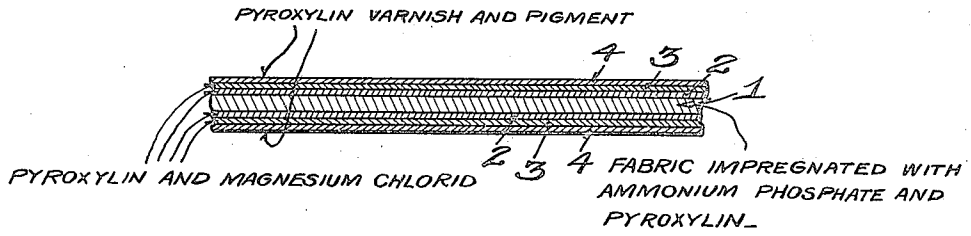
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PROOFED FABRIC AND PROCESS OF MAKING SAME.

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PROOFED FABRIC AND PROCESS OF MAKING SAME.

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To all whom it may concern:

Be it known that I, GUIDO BLENIO, a subject of the King of Italy, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Proofed Fabrics and Processes of Making Same, of which the following is a specification.

This invention relates to proofed fabrics and processes of making same; and it comprises a fabric, such as canvas, linen or the like, containing ammonium phosphate or other fireproofing salt of like nature, and impregnated with pyroxylin or the like, applied in such manner as to waterproof the interior of the fabric as well as particles or crystals of the fireproofing salts therein, such fabric also carrying coatings of pyroxylin or the like applied as a plurality of coatings or layers, some of said layers containing fireproofing materials such as magnesium chlorid, boric acid (boracic acid), zinc chlorid, etc., the outer coating usually carrying pigments, such outer coating being at times of an ordinary spar varnish; and it further comprises a process of producing materials of the character described wherein a suitable fabric is impregnated with a solution of ammonium phosphate, or other mineral fireproofing salt, and is sharply dried, is then impregnated thoroughly with pyroxylin varnish or the like to seal the individual fibers and the individual particles of the fireproofing salt in place against the action of water or air and is finally coated with a plurality of layers of pyroxylin varnish, some of said layers containing a fireprofing material, such as magnesium chlorid or boric acid and is finally given an external coating advantageously containing a pigment of considerable color, the coating layer being of pyroxylin or of a suitable spar varnish, all as more fully hereinafter set forth and as claimed.

For many uses, such as aeroplane wings, automobile tops, etc., it is desirable to have a compound material comprising a fabric which shall be, as nearly as possible, weather and waterproofed and also fireproof. It is also desirable that the fabric so treated be as light as possible. It is one of the objects of the present invention to devise a method of producing such a material.

In the fireproofing of fabrics, whether of vegetable or animal materials, it is in practice necessary to use materials which will evolve vapors on heating, these vapors being incombustible. The evolution of vapors absorbs heat while the vapors themselves seal the fiber against the excess of air. For this purpose very many mineral salts have been proposed, containing either ammonia or water of hydration and losing the ammonia or the water upon heating. Borax, crystallized sulfate of soda, alum, phosphate of ammonia, etc., have been proposed. Of these materials, ammonium phosphate is probably one of the best since on heating it not only evolves ammonia but by its physical properties, it operates, more or less, during decomposition to seal away the fibers from excess of air. However, ammonium phosphate like practically all of the efficient salts proposed for fireproofing is soluble in water and the material fireproofed is susceptible to the action of moisture. For weather and waterproofing fabrics it is customary to use one of the numerous varnish preparations with a base of pyroxylin, cellulose acetate, copals, etc., but all these varnishes without exception are combustible. In the present invention I take advantage of the properties of the two classes of proofing materials, using a fireproofing material incorporated into a fabric and shielding and holding it in place by relatively small amounts of waterproofing material. To this end, I proceed with the application of these materials in a methodical manner.

I shall describe what I regard as the best embodiment of my invention. I first impregnate the fabric which is to form the basis of my new product with a solution of a suitable fireproofing salt. While I may use any one of numerous soluble salts containing water of hydration or ammonia, or both, I regard ammonium phosphate as the best material for my purposes. The ammonium phosphate used may be the commercial crystallized salt or it may be made by simply neutralizing phosphoric acid with ammonia. The method of preparation is not here important except that the preparation should be as nearly as possible neutral to litmus. A solution of about 8 to 10 B. per cent strength is suitable for treating

ordinary canvas. The fabric may be dipped into the solution, squeezed or wrung out and then hung up to dry or dried by artificial heat, the latter being the better. It is advantageous to dry the impregnated fabric as sharply as possible, that is to get out all the water present as moisture. After thus impregnating and drying the fabric I next impregnate it with a rather thin varnish solution. Various varnishes may be used for my purposes but I regard as the best adapted a solution of ordinary pyroxylin in such a solvent as amyl acetate having about the consistency of a light syrup. The solution may be advantageously thinned down as usual with acetic ether, benzol or the like. The fabric or cloth is thoroughly impregnated with this solution. It may be rubbed in or the cloth may be worked after impregnation to assure that the varnish enters throughout the fabric. The object is to impregnate the individual fibers and also the particles or crystals of ammonium phosphate contained therein. After drying, the fabric is next given a plurality of coatings of pyroxylin varnish. One or more or all of these coatings should contain chemicals adapted to render it slow burning or little inflammable. I consider magnesium chlorid as being the best material for this purpose although boric acid, sometimes called boracic acid, is nearly as good. Any other more or less deliquescent hygroscopic salt or material soluble in alcoholic or other solutions of pyroxylin may be employed. In using magnesium chlorid I prefer to take the commercial article and dry it to free it of all sensible moisture. The dried magnesium chlorid is then immediately dissolved in alcohol. A proportion of about 1 part of magnesium chlorid to 4 parts of alcohol or cologne spirits works very well. This alcohol solution of magnesium chlorid may be incorporated in a pyroxylin varnish, alcohol being miscible with most of the solvents used in these varnishes. Boric acid if used may be employed in the same way and in about the same proportions. Three or four coats of this material may be applied to the fabric on each side, or on one side, as the case may be. The coatings may be applied with the brush or spray. I regard 2 or 3 coats as best although a single coating may, of course, be used. Finally I give an exterior coating of pyroxylin or spar varnish and in this exterior coating I advantageously incorporate a certain amount of pigment to give hardness and stiffness to the surface as well as, in most cases, color. This pigment is also useful in protecting the surface against the sun and against changes of temperature. A mixture of yellow ochre and small amounts of lamp black for the last coating is advantageous for the reason that I can secure the khaki color desired for aeroplane wings, wagon tops and the like and at the same time have a coating which is resistant to the action of the sun's rays in that it will not crack on exposure to the sun.

In a desirable embodiment of my invention in lieu of using a special outer coating of varnish or the like carrying pigment, I may simply mix pigment with one of the described pyroxylin coatings carrying magnesium chlorid or the like. As regards these outer coatings of my fabric much of course depends upon the use which is to be made of the fabric and as to the permissible limits of weight. In the accompanying drawing I have shown more or less diagrammatically fabric such as above described with legends indicating the several materials.

In this showing, element 1 is a central fabric layer impregnated with ammonium phosphate, or another fireproofing salt, and also impregnated with a waterproofing varnish, such as pyroxylin. Element 2 is a coating layer of pyroxylin or the like carrying magnesium chlorid or the like. Element 3 is another coating layer which may be of the same composition or may be of a pyroxylin varnish or the like while the outer layer 4 is a layer of a suitable varnish such as spar varnish or pyroxylin varnish carrying pigment such as ochre, etc. It will be noted that in the drawing the central fabric layer has the described succession of varnish layers on both sides. For some purposes this succession of layers may occur only on one side; or there may be more successive layers on one side than on the other; this is of course depending largely upon whether it is desired to have the material of different thickness on the two sides.

For aeroplane wings, for the last coat or top coat I sometimes use one or two coats of spar varnish or enamel paint. It is often advantageous to use as the last coat a coat of "nitrate dope" (pyroxylin varnish) mixed with a small amount of yellow ochre and enough lamp black to give this coat a khaki color. Where other colors are preferred, any other colored pigment may be used. Yellow ochre has the advantage of giving a good sun-resisting color, protecting the various pyroxylin coatings against actinic rays.

What I claim is:—

1. The process of proofing fabric which comprises impregnating said fabric with a water solution of a fireproofing salt, drying to remove the water, impregnating the fabric with a pyroxylin varnish composition and once more drying.

2. The process of proofing fabric impregnating said fabric with a solution of ammonium phosphate, drying to remove the water from the ammonium phosphate, impregnating with a pyroxylin varnish composition and once more drying.

3. The process of proofing fabric which comprises impregnating a fabric with a water solution of a fireproofing salt, drying, impregnating with a suitable varnish, once more drying and facing the treated fabric with a layer of pyroxylin varnish containing miscible fireproofing material.

4. The process of proofing fabric which comprises impregnating a fabric with ammonium phosphate, drying, impregnating with pyroxylin varnish, drying, coating with pyroxylin varnish containing magnesium chlorid and finally superficially coating with pyroxylin varnish containing a pigment.

5. A proofed fabric comprising a layer of fabric containing a fireproofing salt and also containing an impregnating waterproofing varnish sealing the particles of salt in place in the fiber of said fabric, said fabric being also provided with a coating layer of pyroxylin varnish containing a dissolved fireproofing material.

6. A proofed fabric comprising a layer of fabric containing dried fireproofing salt and also containing an impregnating waterproofing varnish sealing the particles of salt in place in the fiber of said fabric, said fabric being also provided with a coating layer of pyroxylin varnish containing a dissolved fireproofing material and an outer layer of pyroxylin varnish carrying pigment.

7. A proofed fabric comprising a layer of fabric containing a fireproofing salt and also containing an impregnating waterproofing varnish sealing the particles of salt in place in the fiber of said fabric, said fabric being also provided with a coating also of pyroxylin varnish containing yellow ochre and lamp black.

8. A proofed fabric comprising a layer of fabric containing dried particles of ammonium phosphate and also containing an impregnating waterproofing varnish sealing the particles of ammonium phosphate in place in the fiber of said fabric, said fabric being also provided with a coating layer of pyroxylin varnish containing a dissolved fireproofing material.

9. A proofed fabric comprising a layer of textile fabric impregnated with ammonium phosphate and also impregnated with pyroxylin varnish, the said fabric also carrying an outer film layer of pyroxylin containing a miscible fireproofing body.

In testimony whereof, I affix my signature hereto.

GUIDO BLENIO.