

## UNITED STATES PATENT OFFICE

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## FABRIC FINISHING

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This invention relates to fabric finishing, and it is concerned more particularly with the finishing of textile fabrics to produce waterproof material suitable for window shades, book binding cloths, table cloths, etc.

My invention is directed toward securing, in materials of the kind referred to by the use of latex, an improved durable waterproof finish which is characterized by freedom from tackiness and which leaves the cloth amply pliable and flexible for the purposes for which it is intended to be used.

I have found that it is specially advantageous, after treating the fabric of cotton or the like with a latex sizing, to treat the thus sized fabric with soap solution, which may be done after heat-drying the fabric with incidental curative effect on the latex. The fabric can be freed of tackiness due to the rubber by treatment with a suitable anti-tack reagent or solution, and can advantageously be heat-dried (with incidental curative effect on the latex) before as well as after this anti-tack treatment. It is practically easier and more economical to thus eliminate impurities by the soap solution treatment after sizing the fabric with the latex sizing than to attempt to purify the latex entirely before application to the fabric.

In practicing my invention, I apply to suitably woven fabric (after natural waxes and coloring material have been removed therefrom in any one of the many ways common to the art) a sizing solution which I prepare by mixing 15 gals. of casein solution containing 1 lb. of dry casein and 2 oz. tri-sodium phosphate, with 5 gals. of latex solution containing 2% sulphur on the dry rubber, 2% zinc oxide on the dry rubber, and 2% of piperidine pentamethylene dithiocarbamate, the latter being relied upon to act as an accelerator. Such application of the coating may be conveniently accomplished, for example, by running the fabric through a bath of the sizing in a vat which is fitted with a pair of adjustable mangle rollers for dipping the fabric into the solution and at the same time removing the excess coating to the desired extent.

Thereupon I dry the freshly coated fabric preferably by running it through a continuous drying machine such as is ordinarily used in the textile industry, incident to which the latex is vulcanized by the curing ingredients in the sizing under the action of the heat.

I next wash the fabric in a solution of sodium oleate containing 1 lb. of 88% sodium oleate in 100 gals. of water, removing the excess by squeez-

ing the fabric between the rolls of a mangle. If in certain cases, further washing is desirable or advantageous at this stage, I give the fabric another washing with water, preferably warm water, and again run it through a mangle for removal of the excess water.

With this washing accomplished, I dry the fabric a second time by passing it through a suitable drying machine as before; and this second drying step I follow up by treating the fabric with hypochlorite solution of 8° twd. After removal of the excess hypochlorite solution, as by a mangle, I again wash the fabric in sodium oleate solution and afterwards give it as many washings in warm water as may be necessary or desirable. Thereupon, I finally dry the fabric a third time by passing it once more through a suitable drying machine.

Fabrics finished in accordance with the here-indescribed method are flexible, pliable and waterproof, and moreover free from tackiness due to the reaction of the sodium hypochlorite upon the latex.

My improved method is subject to considerable diversification in actual practice depending on the kind of material which is to be produced. For example, to produce relatively light material suitable for book coverings and table cloths, the latex sizing solution is diluted as required to determine application of a thin film thereof to the fabric. On the other hand, to produce heavier and stiffer material suitable for window shades, the sizing solution is used in a more concentrated form, and instead of squeezing out the excess sizing with rollers as elsewhere suggested herein, I may employ a regulatable scraper blade to determine any desired thickness of the coating. These are in themselves very common expedients in the art and are mentioned only for purposes of illustration in the present connection. In instances where extreme flexibility is desired in the finished product, plasticizers such as dibutyl phthalate, tricresyl phthalate and other materials of like nature may be used to soften the film of the latex. Furthermore, mineral pigments such as ferric hydrate, chrome yellow, chrome green, prussian blue can also be added to the sizing solution to predetermine any desired color in the finished product.

Having thus described my invention, I claim:

1. A continuous process of finishing cotton textile fabric waterproof, which process comprises running the cloth through a bath of latex and casein sizing solution containing rubber-curing and accelerating agents, subjecting the travelling

cloth thus sized to curative treatment, effective to cure the latex in the travelling cloth by virtue of the accelerative effect, and running the cloth with the thus cured latex through a bath containing an anti-tack reagent.

5 2. A process as set forth in claim 1 wherein the sized cloth is treated with soap in solution before treatment with the anti-tack reagent.

10 3. A continuous process of finishing cotton textile fabric waterproof, which process comprises running the cloth through a bath of latex and casein sizing solution containing rubber-curing and accelerative agents, and removing excess of the solution from the travelling cloth; running  
15 the cloth with its thus adjusted content of size through a continuous drier, thus concurrently

eliminating water and curing the latex in the travelling cloth by virtue of the accelerative effect; running the thus cured cloth through a bath containing an anti-tack reagent; and running the thus treated moist cloth through a continuous drier. 5

4. An improved process of finishing cotton textile fabric with a cured waterproof rubber finish which comprises treating the fabric with latex and casein sizing solution containing a rubber-curing agent subjecting the cloth thus sized to curative treatment, effective to cure the latex; and treating the sized and cured cloth with soap solution and an anti-tack reagent. 10

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