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Patented June 1, 1926.

1,587,094

UNITED STATES PATENT OFFICE.

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TREATMENT OF COTTON FABRICS.

No Drawing.

Application filed October 16, 1924. Serial No. 744,093.

117-90

In paper-making machines cotton drier canvases are usually used to assist in conveying the paper to the metal cylinders containing steam under pressure to press the paper against these cylinders thus providing more effective drying. The cotton canvas is usually in the form of an endless belt held in position against the cylinder by means of metal rolls. The cylinders themselves rotate and there are usually two or more canvas belts used on each machine.

It has been found that paper which has been made from wood pulp or other similar matter as it comes from the driers contains appreciable traces of sulphuric acid and other compounds of sulphur which are well known to be injurious to cotton fibre. This acid is formed in the chemical treatment of the wood in the paper-making process and traces of it as well as of other sulphur compounds remain in the paper. In carrying and pressing the moist paper against the hot cylinders more or less moisture containing acid traces is absorbed by the canvas and then becomes concentrated in it owing to the evaporation of more or less of its liquid contents. The constant exposure of the canvas to this treatment tends to oxidize the cotton fibre and ultimately to cause the rupture of the canvas.

It has also been found that fabrics of this kind are frequently stiff and have a tendency to wrinkle on the machine so that the fabric becomes useless because it impresses this wrinkle into the paper and so injures it.

The canvas in itself is expensive and there has long been sought some remedy for these troubles which will give to the canvas a longer life.

My invention has for its purpose the prolonging of the life of canvas drier fabrics and overcoming the wrinkling referred to above and for this purpose I have discovered that, if the canvas be treated with a water solution containing a small quantity of alkali mixed with soluble oil to act as a conveyor as well as a lubricant to the fabric structure, its life will be prolonged. It is well known that many kinds of oil may be treated with other chemicals to make them soluble in water or capable of being easily mixed with water forming an emulsion. Some of these oils might be called

liquid soaps. As an example of such an oil, attention is called to the well known commercial sulphonated castor oil, but this is but one of a number of these so called soluble oils, and I do not mean to limit myself to the use of this specific soluble oil. It has been found that the oil serves to penetrate and soften the fabric, dissolving the wax and oil which are naturally present in the fibre and tending to repel water, and carries with it the alkaline solution which will surround the fibres and strands of the fabric and protect them from any acid which the fabric may tend to absorb, neutralizing that acid.

An alkali which I have found to be well suited to this purpose, and to accomplish the desired results, is sodium silicate, commonly known as water glass. The proportions which I have found most effective have been approximately four parts of sodium silicate to three parts of oil. This mixture is then dissolved in say 18 parts of water so that the canvas may be more readily treated, but I do not mean to confine myself, for it has been found possible to use from 1 to 10 parts of silicate and from 1 to 7 parts of oil, to 18 parts of water and yet accomplish the desired purpose,—that is, the penetration of the fabric by a liquid, alkaline in nature, and of such a character that it will penetrate and lubricate the fibres more or less, thus reducing the friction between them, while it will also protect them from acid attack. To secure the best results the proportion of silicate in the solution should be more or less according as the acid traces in the paper are more or less noticeable.

A convenient method of applying this solution to the canvas is to pass the canvas from one roll to another through the solution contained in a vessel or tank. It is also possible to apply the solution to the yarns before weaving, though this is less satisfactory. It has been found most satisfactory to heat the solution to a temperature of 100 degrees F. before the treatment of the canvas, but the temperature may be varied considerably and it has been found possible to effect a treatment with the solution unheated. It has been found that the heat tends to make the oil in the mixture

more liquid and hence enables it to be more thoroughly absorbed by the fabric. The canvas may then be dried in any convenient way, for example, by passing it through an ordinary drying chamber containing hot air, or over steam cylinders.

It is well known that oil will penetrate a given mass of cotton fibre more readily than water. Hence it is desirable to use soluble oil in the solution as a means of securing thorough impregnation of the canvas by the alkali without impairing absorption of water. The nature of the silicate and the requirements of the paper-making process are such that it is not desirable to use an insoluble oil which repels water. Soluble oil serves the purpose of hastening this impregnation of the fabric, dissolving the wax and oil which the fibre contains and carrying with it the silicate solution, and also has the desired effect of lubricating the internal structure of the canvas preventing stiffening and wrinkling. By the use of soluble oil alone the fabric is made less stiff and the tendency to wrinkle is overcome, and if desired the silicate solution may thus be applied.

When the canvas has been thoroughly penetrated by the silicate solution it is found that, after drying, the fibres throughout the canvas are coated with a fine silicate dust and the testing of the fabric which has been treated in this way discloses a definite alkali reaction. It has also been found that a canvas which has been treated by this method shows no indication of the presence of acid after having been used on the paper-making machines for a considerable time, whereas canvas which has not been treated has shown unmistakable traces of acid after a similar period. Thus canvas belts treated by my solution have been found to out-last by a considerable period

of time similar canvases which have been untreated. Moreover, in my process the fabric is maintained more pliable and with less liability to wrinkle, owing to the soluble oil used in the compound; the oil and wax naturally occurring in cotton fibre and repellent to water is dissolved and the fabric will more readily absorb water, making it more effective in the drying process.

The treatment described above has the additional advantage of shrinking the canvas, which has been found to reduce the stretching which frequently occurs while it is in use. This shrinking has also the effect of drawing the fibres and yarns more closely together, increasing the weight per square inch and giving a stronger canvas.

What I claim as my invention is:—

1. A new composition of matter comprising approximately four parts of sodium silicate, three parts of soluble oil and eighteen parts of water.

2. A fabric for use in a paper-making machine the fibres of which are coated with an alkali silicate and are impregnated with moisture comprising a soluble oil.

3. A fabric adapted to support paper in the process of manufacture, said fabric having dissolved therefrom the wax and oil naturally inherent in its fibres and containing alkali whereby any acid in said paper contacting with said fabric may be resisted and neutralized and said fabric may be preserved from attack therefrom.

4. A fabric adapted to assist in the drying of paper in the process of manufacture, said fabric containing soluble oil whereby wax and oil which is naturally present in cotton fibre and which repels water is dissolved, making the fabric more absorbent and increasing its efficiency as a drier.

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