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METHOD OF TREATING FABRIC AND
PRODUCT THEREOFLorin B. Sebrell, Silver Lake, Ohio, assignor to
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This invention relates to a method of treating textile fabrics, particularly silk fabrics so as to improve the wearing qualities of the same and to fabric so treated. More particularly, it relates to a method of treating silk hose to render the same less subject to runs and the effects of general wear and to silk hose so treated.

It is well known that silk hose are very subject to runs and that this results in the stockings being discarded even though they have not been worn out. Failure for this reason is common and means which would lessen the occurrence of runs would greatly increase the durability of ladies' hose. Other knitted silk garments are also subject to this cause of failure. The present invention provides a method of treating such silk fabrics and other fabrics of sheer or delicate nature so as to improve the wearing qualities and greatly reduce premature failure thereof.

As is well known, knitted fabrics are characterized by a loop structure and breaking of a thread at any point starts what is termed a run, resulting in disintegration of the garment. In stockings, which are subjected to constant flexing and stretching, breakage frequently occurs because one loop is sawed against another until a thread is cut through. It has now been found that breaking of the thread can be postponed and the life of the stocking greatly prolonged by coating the threads with a protective material which compacts and strengthens the silk and permits the loops of the knitted fabric to slide smoothly over each other, minimizing the sawing action. Stockings so treated with the composition of the invention withstand the strain of walking and bending for a much longer period than has heretofore been the case.

Compositions comprising paraffin, a higher fatty acid containing at least twelve carbon atoms and an aluminum salt of a lower fatty acid may be used for treating fabrics in accordance with the practice of the invention. Other ingredients serving as emulsion stabilizers, preservatives and the like may also be present in the composition. Among the higher fatty acids which are suitable may be mentioned stearic acid, lauric acid, palmitic acid and myristic acid, as well as others having at least twelve carbon atoms in the molecule. Aluminum acetate is the preferred aluminum salt but aluminum formate, propionate and butyrate may also be used.

The composition which has been found to be most effective for the purpose is made up of paraffin, stearic acid, lanolin, soluble oil, gelatin, acetanilide, glycerine, acetic acid, dextrin, di-

astase, aluminum acetate, and hexamethylene tetramine emulsified in water. These ingredients of the composition are present in various proportions which may be altered to some extent. In general, the proportions used will be approximately as follows: water 70%, aluminum acetate 16%, paraffin 6%, stearic acid, soluble oil, acetanilide, glycerine and dextrin from 1 to 2% of each, lanolin and diastase from 0.2 to 0.4% of each and acetic acid and hexamethylene tetramine about .05% of each. One composition which has been found to be useful to prevent runs in knitted silk fabrics is made up as follows:

Three pounds of paraffin having a melting point of 133-135° F. is melted in a kettle with 8 oz. of triple pressed stearic acid and 3 oz. of lanolin of commercial grade, the melt being brought to a temperature of 170-185° F. or even somewhat higher. To this is added $\frac{3}{4}$ pound of soluble oil base. In another vessel is placed $\frac{1}{2}$ gallon of cold water in which 10 oz. of gelatin is soaked for 5 minutes. Thereafter, $\frac{1}{2}$ gallon of warm water, say 80° F., is poured in and then 8 oz. of acetanilide. One pound of glycerine is next added and finally 10 cc. of glacial acetic acid. The whole is brought into solution by the addition of 3 gallons of water having a temperature of about 170° F. Into another vessel is now poured 5 pints of hot water having a temperature of 170° F. and there is dissolved in this 8 oz. of technical dextrin and 1 $\frac{1}{2}$ tps. of diastase, the solution being kept at a temperature of about 150° F. Another solution contains 8 pounds of 20% aluminum acetate, which should be fresh, and this is brought to a temperature of 170° F. The aluminum acetate is now poured into the dextrin and diastase solution.

The two solutions and the melt are then mixed by means of a turbo mixer, the gelatin-glycerine solution being poured into the paraffin melt, the solution being delivered under the blades of the turbo mixer. The other solution is then added directly to the mix without passing under the blades. The resulting emulsion is allowed to cool to room temperature and then $\frac{1}{2}$ oz. of hexamethylene tetramine is mixed in.

This procedure gives about 6 $\frac{1}{2}$ gallons of a stable emulsion which can be applied to the silk hose or other fabric by dipping the same into the composition or otherwise applying the emulsion to the fabric. After drying, it is found that the silk has much greater resistance to runs and general wear than was the case before treatment.

In order to test the efficacy of the treatment,

silk stockings were subjected to a hosiery flexing test. This test is conducted on a Frasier testing machine, the hosiery being placed on the machine and gripped between the heel and garter clasp. The welt and immediate boot portion of the hose is then distended 21.3 inches for 200 cycles. At the end of the 200th cycle, the tension necessary to extend the hose 19.2 inches is recorded. Ratings were established as follows:

Pounds at 200th cycle	Rating
10, 11 or 12.....	Excellent.
8 or 9 and 13 or 14.....	Good.
6 or 7 and 15 or 16.....	Fair.
Under 6 (too loose).....	Unsatisfactory.
Over 16 (too tight).....	

The hose is then flexed on the machine until failure or 2000 cycles has been reached. Hosiery withstanding 2000 cycles is passed as satisfactory.

The test was applied to hosiery treated in accordance with the terms of the invention as described above and the results obtained were tabulated as follows:

Sample marking	Serviceability factor	Stretch endurance	Rating
Red yarn (original).	10 lbs.—10% solids.....	14,791	Good.
Green yarn (original).	11 lbs.—6% solids.....	13,007	Excellent.
Blue yarn (original).	7 lbs.—Production.....	13,978	Good.
Washed 10 times.....	7 lbs.—Production.....	10,056	Good.

It will be noted that all of the samples gave satisfactory results and that hose which had been washed 10 times were still rated as good. Hose which have not been treated by the method of the invention are considered good if they endure 2000 cycles of the stretch test. The treated hose, as will be noted, did not fail until 13,000 or 14,000 cycles had been reached.

The composition used in the foregoing tests may be said to be made up by the intermixture of the following quantities of the ingredients, expressed in metric units:

Paraffin.....	grams.....	1363
Triple pressed stearic acid.....	do.....	227
Lanolin.....	do.....	85
Soluble oil base.....	do.....	340
Gelatin.....	do.....	283
Acetanilide.....	do.....	227
Glycerine.....	do.....	453
Technical dextrin.....	do.....	227
Aluminum acetate—20%.....	do.....	3620
Hexamethylene tetramine.....	do.....	14.2
Acetic acid.....	cc.....	10
Diastase.....	cc.....	7.4

The whole, in water, gives a stable emulsion amounting in volume to 24.6 liters.

This composition has given excellent results and is preferred in carrying out the method of the invention, but it will be apparent that variations may be made therein.

What I claim is:

1. A method of treating fabric to improve the wearing qualities thereof which comprises applying to the fabric a composition containing paraffin, stearic acid, lanolin, soluble oil, gelatin, acetanilide, glycerine, acetic acid, dextrin, diastase, aluminum acetate, hexamethylene tetramine and water.

2. A method of treating silk hose to increase the resistance to runs which comprises applying to the hose a composition containing paraffin, stearic acid, lanolin, soluble oil, gelatin, acetanilide, glycerine, acetic acid, dextrin, diastase, aluminum acetate, hexamethylene tetramine and water.

3. A method of treating knitted silk fabric to improve the wearing qualities thereof which comprises applying to the fabric a composition containing in 6½ gallons of the composition approximately the following quantities of the ingredients named: 3 pounds of paraffin, 8 oz. of stearic acid, 3 oz. of lanolin, ¾ pound of soluble oil, 10 oz. of gelatin, 8 oz. of acetanilide, 1 lb. of glycerine, 10 cc. of acetic acid, 8 oz. of dextrin, 1½ teaspoons of diastase, 8 pounds of 20% aluminum acetate, ½ oz. of hexamethylene tetramine and 4½ gallons of water.

4. A method of treating silk garments to prevent or minimize runs which comprises applying to the garment a composition containing approximately the following proportion of the ingredients named: water 70%, aluminum acetate 16%, paraffin 6%, stearic acid, soluble oil, acetanilide, glycerine and dextrin from 1 to 2% of each, lanolin and diastase from 0.2 to 0.4% of each and acetic acid and hexamethylene tetramine about .05% of each.

5. Silk hose having increased resistance to runs therein made up substantially of silk threads or fibers coated with the residue from a composition containing paraffin, stearic acid, lanolin, soluble oil, gelatin, acetanilide, glycerine, acetic acid, dextrin, diastase, aluminum acetate, hexamethylene tetramine and water.

6. Run-resisting silk hose made up substantially of silk thread coated with the residue from a composition containing approximately the following proportions of the ingredients named: water 70%, aluminum acetate 16%, paraffin 6%, stearic acid, soluble oil, acetanilide, glycerine and dextrin from 1 to 2% of each, lanolin and diastase from 0.2 to 0.4% of each and acetic acid and hexamethylene tetramine about .05% of each.

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