

May 20, 1952

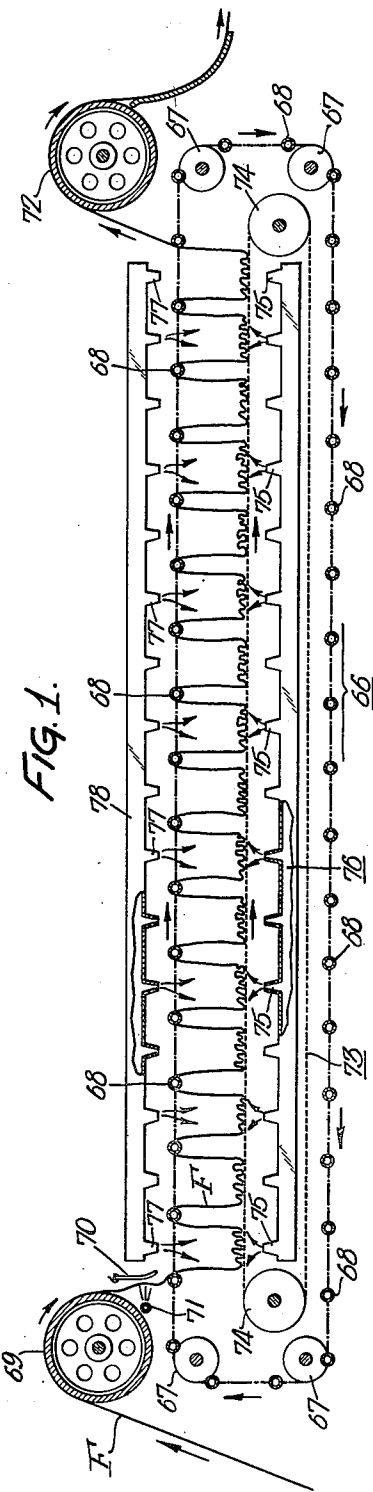
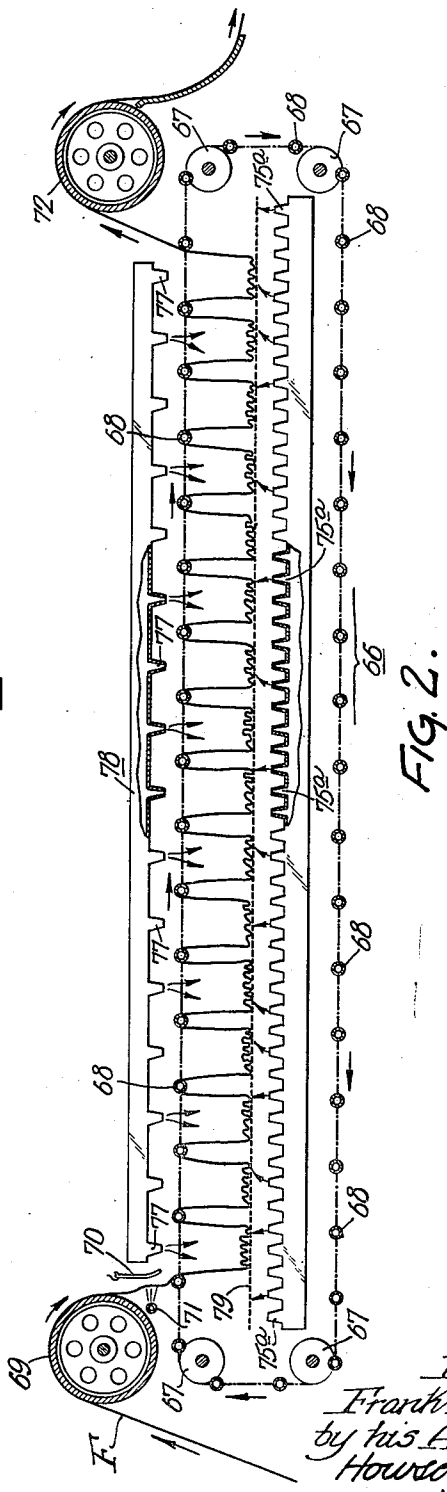
F. R. REDMAN

2,597,529

METHOD FOR TREATING TEXTILE MATERIALS

Filed Jan. 3, 1949

2 SHEETS—SHEET 1



Inventor:
Frank R. Redman
by his Attorneys
Howson &
Howson

May 20, 1952

F. R. REDMAN

2,597,529

METHOD FOR TREATING TEXTILE MATERIALS

Filed Jan. 3, 1949

2 SHEETS—SHEET 2

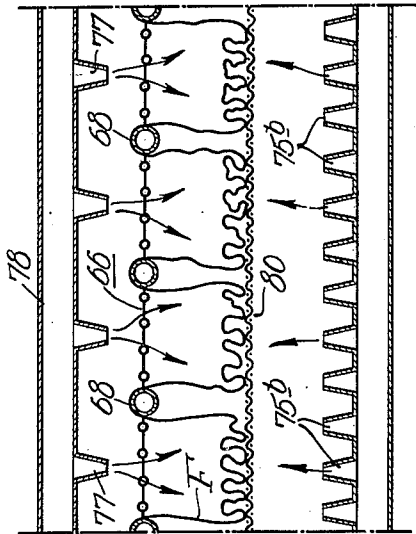


FIG. 4.

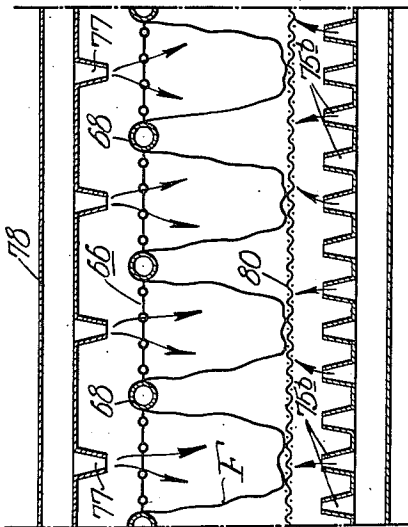


FIG. 3

Inventor:
Frank R. Redman
by his Attorneys
Howson &
Howson

UNITED STATES PATENT OFFICE

2,597,529

METHOD FOR TREATING TEXTILE MATERIALS

Frank R. Redman, Yardley, Pa.

Application January 3, 1949, Serial No. 68,936

7 Claims. (Cl. 26—18.5)

1

This invention relates to treatment of textile fabrics, and more particularly to treatment of such fabrics to substantially eliminate the shrinkage of washable garments made therefrom. The invention is applicable to all types and kinds of textile fabrics, including those made of animal, vegetable and synthetic fibres, and also including both knitted and woven fabrics.

The problem of shrinkage has plagued the textile industry for many years. From the standpoint of the buying public, shrinkage has been responsible for huge loss in unuseable garments rendered so by severe shrinkage, during laundering. Shrinkage of a washable garment upon repeated laundering thereof is due to the fact that the fabric from which the garment was made was subjected to tensional forces, both in the manufacture of the yarn and fabric and in the processing or treatment of the fabric after manufacture and prior to the making of garments. Laundering causes the fabric to return to its untensioned condition, with consequent shrinkage of the garment.

Shrinkage is particularly severe in the case of a knitted fabric, and a brief statement of the causes of shrinkage in such a fabric will serve as an example. A knitted fabric is distorted (a) slightly by the tension to which the constituent fibres are subjected during knitting and during rolling of the fabric after it is knitted, and (b) greatly by the extreme tension to which the fabric is subjected during the wet processing thereof which includes scouring, bleaching, dyeing and extraction of excess water. After a fabric is knitted, it goes through the various steps of wet processing and in doing so, it is subjected to extreme lengthwise tensional forces which impart substantial lengthwise stretch to the fabric. Generally speaking a knitted fabric may be stretched from a minimum of about 8% to a maximum of about 35% of its length depending upon its weight.

Likewise in the case of a woven fabric, the fabric has imparted to it substantial lengthwise stretch as it goes through the necessary processing, although the stretch is not as great as in the case of a knitted fabric, being of the order of 4% to 8%, depending upon the weight and construction.

In any case, if the stretched fabric is dried in the customary manner and garments are then made from it, such garments will shrink very substantially upon laundering thereof and will continue to shrink upon successive launderings until the fibres return substantially to their original untensioned condition.

2

In my prior Patent No. 2,325,544, granted July 27, 1943, there is disclosed and claimed a method of treating textile fabrics which has been very successful. Such method involves complete relaxation of the fabric during drying, and repeated compressive working of the fibres while the fabric is relaxed. The repeated compressive working of the fibres while in completely relaxed condition, as the fabric is dried, causes the fibres to return to their original untensioned state and thus removes substantially all of the stretch which was imparted to the fibres as above mentioned.

The principal object of the present invention is to provide an improvement in the broad method of the above-mentioned patent, and to provide a simple and inexpensive apparatus for performing the improved method.

I have discovered that the broad principles of the method disclosed and claimed in my above-mentioned patent may be applied, and the advantageous result thereof may be obtained, by supporting a moist fabric so as to provide projecting or protuberant loop areas thereof, with the fabric completely relaxed, and by applying working force repeatedly to the protuberant areas of the relaxed fabric so as to compress the constituent fibres during drying of the moist fabric. Preferably, such working of the fabric is performed by impinging heated air under pressure repeatedly against the protuberant areas of the fabric, the heated air also serving to dry the fabric. However, as will be apparent from the following description, the method contemplated by the present invention may be performed in various ways.

According to the invention, the fabric is arranged horizontally in successive loops which are supported so as to eliminate tension therein and to completely relax the fibres during drying, and agitating force is applied to the loops to effect rippling of the fabric in each loop. The supported loops are of relatively short length, their length preferably being not in excess of fifteen inches and usually not in excess of ten inches. Such loops are to be distinguished from those of the conventional loop drier in which the loops are relatively long, e. g. forty to fifty inches, and are freely suspended and therefore subject to tension. The arrangement of the fabric in supported loops enables simplification of the apparatus, it being possible to employ a single conveyor which is able to accommodate a much greater length of fabric due to multiple loop arrangement of the fabric.

The invention may be fully understood by reference to the accompanying drawings, wherein:

3

Fig. 1 is a longitudinal illustration of an apparatus embodying the invention and adapted to perform the novel method; and

Figs. 2 to 4 are illustrations of other forms of apparatus for performing the method.

Referring first to Fig. 1, there is shown a power driven conveyor 66 which moves in the direction indicated about supporting sprockets 67, and which comprises spaced transverse elements 68 adapted to support the moist fabric F in successive loops as illustrated. The fabric may be supplied to the conveyor 66 by means of the roll or drum 69 driven at a peripheral speed sufficiently in excess of the linear speed of the conveyor 66 to enable the deposition of the fabric on the conveyor in successive loops. A baffle 70 and an air nozzle 71 serve cooperatively to effect such deposition of the fabric. A take-off roll or drum 72 is driven at a lower peripheral speed than the feed drum 69, because of the shrinkage of the fabric that takes place in the machine.

A second power-driven conveyor 73, moving about supporting sprockets 74, serves to support the suspended areas of the fabric loops. This conveyor is driven at the same linear speed as is the conveyor 66. By this arrangement, the fabric loops are carried, in a supported and relaxed condition, between the feed roll 69 and the take-off roll 72.

Below the upper run of the conveyor 73, there are provided transverse air nozzles 75 which emit heated air under pressure from an air duct 76. The air emitted from nozzles 75 dries the fabric and serves to work repeatedly the fabric of the supported loops, causing rippling of the fabric at the bottoms and sides of the loops and lifting the fabric slightly from elements 68 of conveyor 66, thus removing any slight tension which may be caused by the weight of the looped fabric. It will be understood that the conveyor 73 is of a foraminous nature to enable impingement of the air against the bottoms of the supported loops. Above the conveyor 66, there are provided air nozzles 77 fed from an air duct 78, which emit air under sufficient pressure merely to preserve the fabric loops and to prevent any of the loops from being blown too far upward or out of control. The air from nozzles 77 also helps to dry the top side of the fabric.

The fabric loops should be of fairly short depth or length to avoid any significant tensioning of the fabric, as hereinbefore mentioned.

In Fig. 2, there is shown an arrangement similar to that of Fig. 1, and in which the elements are similarly designated. In this instance, however, the conveyor 73 of Fig. 1 is replaced by a stationary foraminous support 79, and the air nozzles 75a are closely arranged so that the air emitted from said nozzles serves to buoy up the fabric loops and prevent them from dragging on support 79, as well as to work the fabric of said loops and to help dry the fabric. The upper nozzles are the same as in Fig. 1, and serve the same purposes.

Figs. 3 and 4 show a section of a similar arrangement in which a vertically reciprocating foraminous support 80 is provided to mechanically work the fabric loops. Fig. 3 shows the support 80 in its lowermost position, while Fig. 4 shows said member in its uppermost position. In the position of Fig. 3, the support 80 furnishes support for the bottoms of the loops in their extended condition, thus eliminating any slight tension that might be caused by the weight of the fabric. As the support 80 moves upward to

4

the position of Fig. 4, the loops are shortened and the bottoms of the shortened loops are caused to assume an undulate form and are rippled both by the moving support and by the air emitted from the nozzles 75b, the air also serving to dry the fabric. The upper air nozzles serve the same purposes as in Fig. 1.

It will be seen from the foregoing description that in each of the various embodiments illustrated, the fabric is supported so as to provide projecting or protuberant loop areas, and working force is applied repeatedly to said areas as the fabric is being dried.

The method of treating fabric according to the present invention has been found to be very efficient. An apparatus constructed according to the invention has been employed experimentally over a substantial period of time and has fully demonstrated the efficiency of this method.

It will be apparent from the foregoing description that the invention is susceptible to considerable modification and various embodiments, a number of which have been illustrated and described.

I claim:

1. A method of treating moistened textile fabric, which comprises arranging the moistened fabric horizontally in successive loops and supporting the loops both at their upper and lower portions, thus providing discrete loop sections of the fabric free of any appreciable tension, applying agitating force to the loops to effect rippling of the fabric in each loop, and drying the fabric while the loops are being agitated by the applied force.

2. A method of treating moistened textile fabric, which comprises arranging the moistened fabric horizontally in successive loops and supporting both the tops and suspended areas of the loops, thus providing discrete loop sections of the fabric free of any appreciable tension, applying agitating force to the loops to effect rippling of the fabric in each loop, and drying the fabric while the loops are being agitated by the applied force.

3. A method of treating moistened textile fabric, which comprises arranging the moistened fabric horizontally in successive loops and supporting both the tops and suspended areas of the loops, thus providing discrete loop sections of the fabric free of any appreciable tension, and impinging heated pressurized air against the loops to effect rippling of the fabric in each loop and to dry the fabric while the loops are being agitated.

4. A method of treating moistened textile fabric, which comprises arranging the moistened fabric horizontally in successive loops and supporting both the tops and suspended areas of the loops, thus providing discrete loop sections of the fabric free of any appreciable tension, impinging heated pressurized air against the bottoms of the loops to effect rippling of the fabric in each loop and to promote drying of the fabric, and simultaneously applying air at lower pressure from above the loops to preserve the loops and to further promote drying of the fabric.

5. A method of treating moistened textile fabric, which comprises moving the fabric through a horizontal run, arranging the fabric in successive loops and supporting both the tops and suspended areas of the loops as the fabric moves through said run, thus providing discrete loop sections of the fabric free of any appreciable

5

tension, applying agitating force to the loops as they move through said run to effect rippling of the fabric in each loop, and drying the fabric while the loops are being agitated by the applied force.

6. A method of treating moistened textile fabric, which comprises moving the fabric through a horizontal run, arranging the fabric in successive loops and supporting both the tops and suspended areas of the loops as the fabric moves through said run, thus providing discrete loop sections of the fabric free of any appreciable tension, and impinging heated pressurized air against the loops as they move through said run to effect rippling of the fabric in each loop and to dry the fabric while the loops are being agitated.

7. A method of treating moistened textile fabric, which comprises moving the fabric through a horizontal run, arranging the fabric in successive loops and supporting both the tops and suspended areas of the loops as the fabric moves through said run, thus providing discrete loop sections of the fabric free of any appreciable tension, impinging heated pressurized air against

6

the bottoms of the loops as they move through said run to effect rippling of the fabric in each loop and to promote drying of the fabric, and simultaneously applying air at lower pressure from above the loops to preserve the loops and to further promote drying of the fabric.

FRANK R. REDMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,951,004	Willis -----	Mar. 13, 1934
1,978,341	Coleman -----	Oct. 23, 1934
2,052,948	Simpson -----	Sept. 1, 1936
2,133,424	Buckwalter -----	Oct. 18, 1938
2,270,125	Hurxthal -----	Jan. 13, 1942
2,303,476	Kornegg -----	Dec. 1, 1942
2,325,544	Redman -----	July 27, 1943
2,325,545	Redman -----	July 27, 1943
2,409,543	Chatfield -----	Oct. 15, 1946
2,439,722	Dreiser -----	Apr. 13, 1948