Oct. 20, 1953 C. G. HATAY 2,655,711

SHRINKPROOFING OF FABRICS

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Fig. 1.

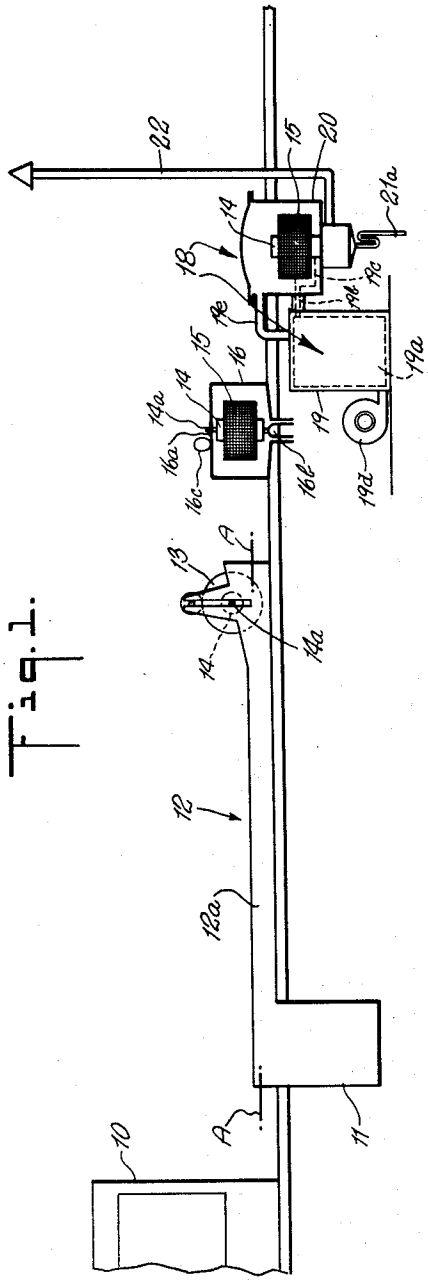
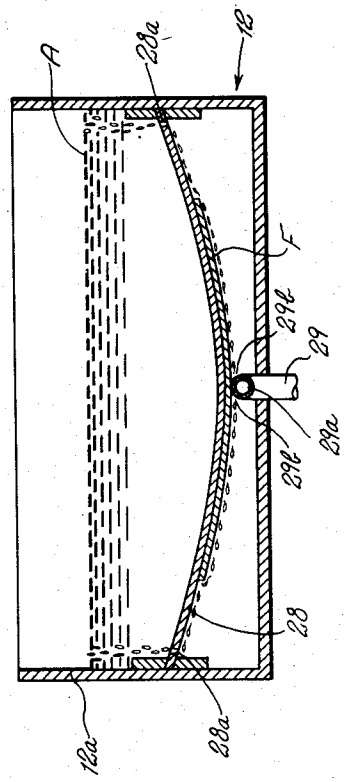


Fig. 4.



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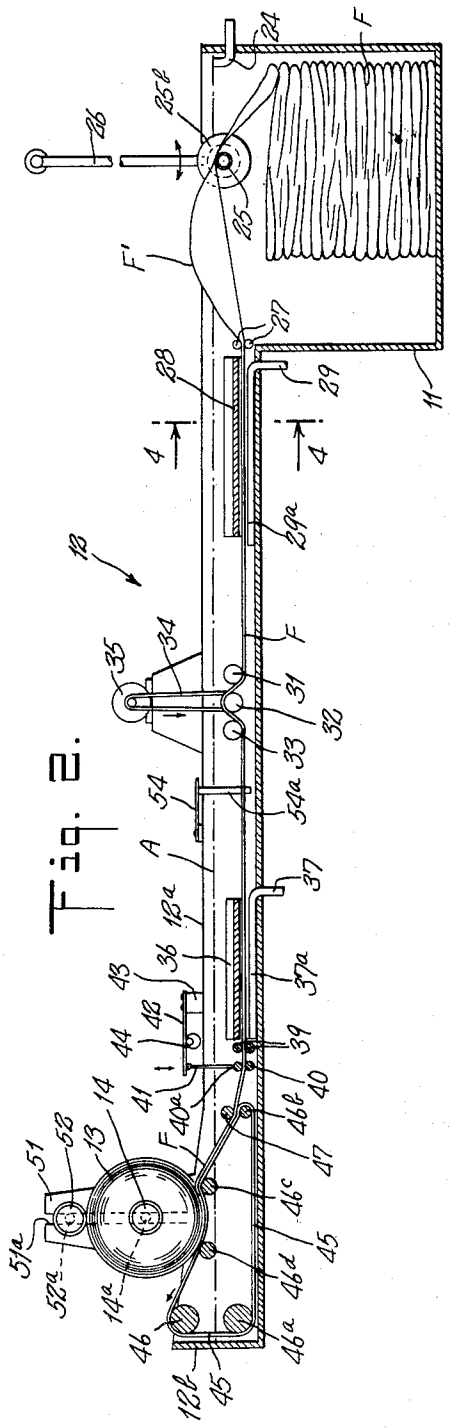


Fig. 2.

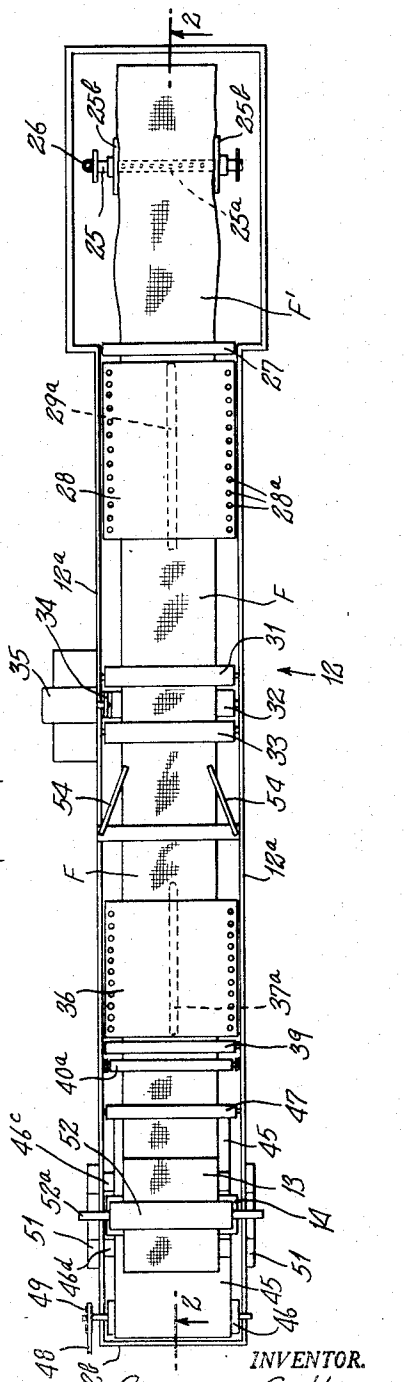


Fig. 3.

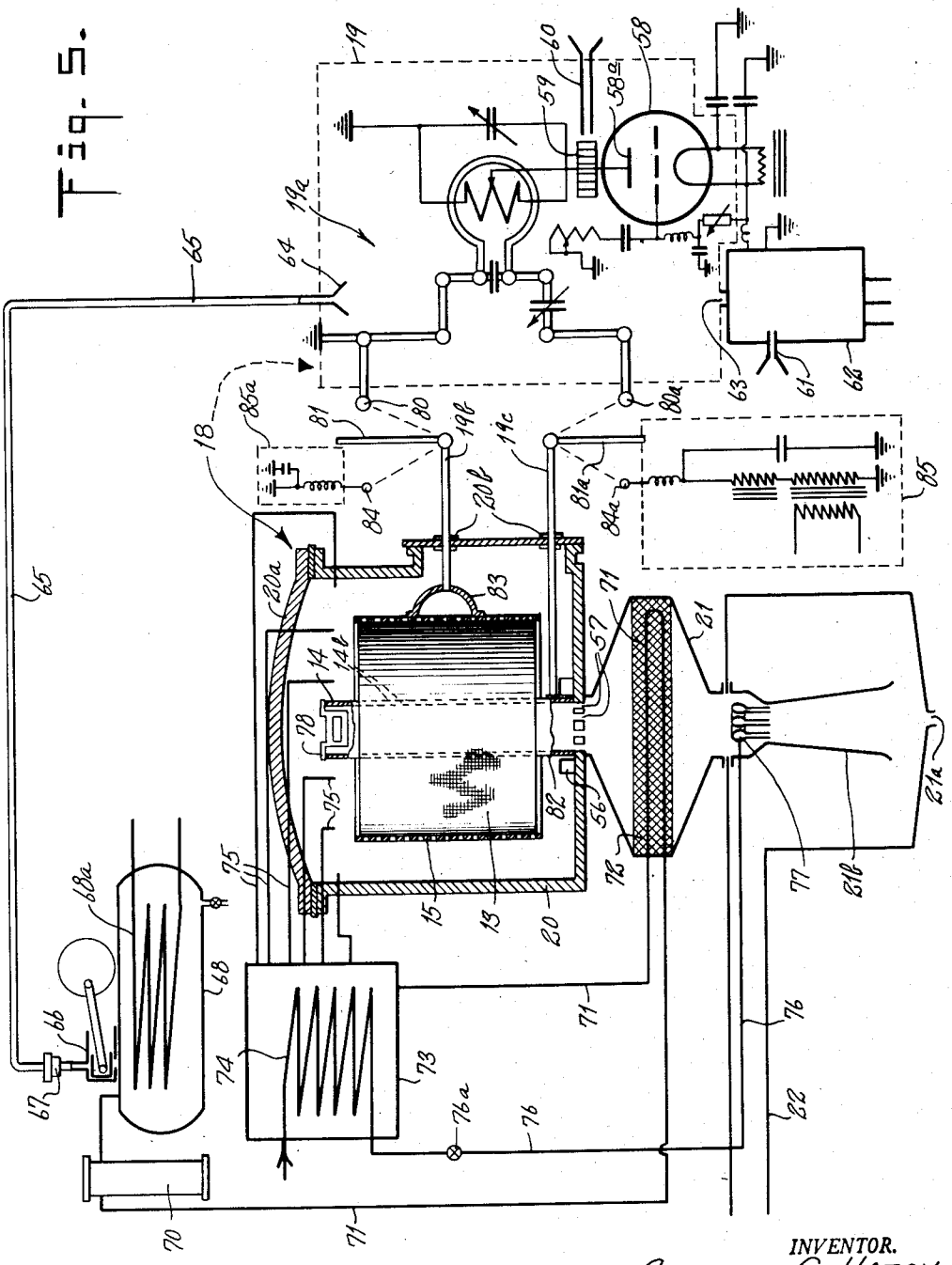
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Fig. 5.



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SHRINKPROOFING OF FABRICS

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Application January 5, 1950, Serial No. 136,958

20 Claims. (Cl. 26—18.5)

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This invention relates to the treatment of textile fabrics, and particularly to an improved process for shrink-proofing such fabrics.

Heretofore, various methods have been devised for shrink-proofing fabrics, that is, for making them substantially non-shrinkable in at least one direction. These methods generally comprise stretching the fabric under heavy tension in the direction of one set of its constituent yarns, such as the wefts, while leaving the fabric free to contract in the direction of the other set of its constituent yarns, such as the warp yarns. Before or during the application of the heavy tension to the fabric, it is moistened or steamed, and after the tensioning treatment it is dried or ironed, or both, to set the yarns. As a result, the weft yarns of the fabric are substantially straight, while the warp yarns are provided with a pronounced crinkle, whereby the fabric is quite resistant to shrinking in the warpwise direction when it is subsequently laundered. In some cases, the process is supplemented by steps involving the application of moisture, heat and pressure, to reduce the shrinkage in the weftwise direction when the fabric is laundered.

Some of these prior methods have enjoyed considerable commercial success in the treatment of woven fabrics. However, the prior methods have been found to be unsatisfactory for knitted fabrics, evidently because the stresses introduced into knitted fabrics by the knitting and other operations incident to their manufacture are of different character than those present in woven fabrics. Consequently, there has been no commercially acceptable process for shrink-proofing knitted fabrics, although there is a great demand for such a process.

One object of the present invention, therefore, is to provide a shrink-proofing process which is applicable especially to knitted fabrics.

Another object is to provide an improved shrink-proofing process which does not require heavy tensioning of the fabric, as is common in the prior processes.

A further object is to provide an improved process for treating textile fabrics, whereby in a few simple operations the fabric is made extremely resistant to shrinking, without impairing the quality of the fabric, and, in fact, with a further improvement in its quality.

The process of the invention comprises essentially the following steps: (1) The fabric, while completely wetted, is placed in a substantially tensionless and compressionless condition to cause displacement of the fabric fibres by the internal stresses therein, so that these stresses are

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relieved or eliminated with the rearrangement of the fibres. In this first or de-stressing operation, the fabric is preferably spread under the surface of a water bath so that the weight of the fabric is compensated by its buoyancy, and the friction of the water is applied to the fabric on a surface which is many times greater than the acting surfaces of the rollers of a conventional spreader. (2) An alternating electric current is passed through the fabric, while thus de-stressed and retaining at least some of the wetting agent, to cause internal heating of the fabric di-electrically until it is substantially freed of the wetting agent by evaporation.

I have found that the combination of these two steps is highly effective for shrink-proofing fabrics, the shrinkage of a test length of knitted cotton fabric, treated by my process, being considerably less than 1% in a subsequent laundering. I believe that the steps of my process operate to shrink-proof the fabric by an action substantially as follows: In the first or de-stressing operation, the water film covering every fibre of the fabric acts as a lubricant to diminish inter-fibre friction and also penetrates the fibres themselves, causing an increase in the diameter of each fibre and tending to shorten it. Thus, when the completely wetted fabric is placed in a near tensionless and compressionless condition, that is, relieved of external stresses, the small forces inside each fibre are released and act to displace the fibre to a position or form wherein these internal forces are substantially eliminated. The subsequent passage of the alternating electric current through the fabric, while the fibres are thus displaced and therefore still de-stressed internally, not only evaporates water in the fabric by internal heating thereof di-electrically, but also acts in some manner to "set" or stabilize the fibres in their de-stressed condition.

For best results in shrink-proofing fabrics according to the invention, the mechanical handling of the de-stressed fabric, prior to completion of the stabilizing or "setting" operation, should be carefully controlled to avoid heavy external stresses on the fabric. The application of heavy tension to the fabric during this period tends to reduce the shrink-proofing effect, evidently because it distorts the fibres from their relaxed positions or forms which they assume in the de-stressing operation and thereby creates inter-fibre and intra-fibre stresses which remain in the fabric upon completion of the stabilizing or "setting" operation.

In the preferred practice of the invention, the fabric is subjected to the de-stressing operation

by passing a length of it continuously through a body of the wetting agent where it is spread while submerged, so that it is supported in a relaxed condition by its own buoyancy. It is then subjected to the stabilizing or "setting" operation, either by passing it continuously between the electrodes of a high-frequency dielectric heater or by coiling it on a mandrel which is subsequently utilized as an electrode for passing the alternating electric current through the fabric coil. The mandrel may be made hollow to serve also as a duct for passing an air current through the fabric coil, to remove moisture evaporated by the dielectric heating. The alternating current is first passed through the fabric coil at low frequency, but as the evaporation proceeds and the electrical resistance of the fabric increases, the frequency is increased so that at the end of the operation a high frequency current is passing through the coil. Thus, the fabric is at relatively low temperature except at the final period of the operation, when it reaches a temperature above the boiling point of water. The air current for removing the evaporated moisture is preheated by the heat given off while generating the high frequency current, and also by the moist air current exhausted from the fabric coil.

For a better understanding of the invention, reference may be had to the accompanying drawings, in which,

Fig. 1 is a schematic view of a preferred installation for use in practicing the process;

Fig. 2 is a longitudinal sectional view of the fibre de-stressing apparatus of the installation taken along line **2—2** of Fig. 3;

Fig. 3 is a plan view of the apparatus illustrated in Fig. 2;

Fig. 4 is a sectional view on the line **4—4** in Fig. 2, and

Fig. 5 is a schematic view, partly in vertical section, of the fibre stabilizing or "setting" apparatus of the installation.

For illustrative purposes, the invention will now be described, by reference to the drawings, in connection with the treatment of knitted cotton fabrics, although it will be understood that the invention may also be used for the treatment of other fabrics.

Referring to Fig. 1, the numeral **10** designates a conventional dye booth or bleaching and washing booth which receives the fabric in the form of an elongated tube. From the booth **10**, the fabric tube is delivered to the tank **11** of the de-stressing apparatus **12**, which is illustrated in Figs. 2, 3 and 4 and will be described in greater detail presently. The tank **11** communicates with one end of a trough **12***a* which is filled with a wetting agent, such as water, to the level A. The fabric tube is drawn continuously from the tank **11** and moved slowly along the trough **12***a* under the surface of the water bath. During its longitudinal movement along the trough, the fabric tube is spread under the surface of the bath and placed in a substantially tensionless and compressionless condition, whereby the fabric is relieved of external stresses while completely wetted. After the internal stresses in the fabric fibres have been relieved or eliminated as a result of this treatment, the fabric is wound in a coil **13** on a hollow perforated mandrel **14** of electrically conductive material, the winding being effected in such a manner as to avoid heavy external stresses on the fabric.

When the fabric tubing has been completely wound on the mandrel, the coil **13** is removed from the de-stressing apparatus **12** and, after application of a perforated conducting layer **15** around the outside of the coil, placed in a centrifuge **16**. The latter is provided with upper and lower bearings **16***a* and **16***b*, respectively, which receive removable studs **14***a* projecting from the ends of the mandrel. By means of a motor **16***c*, the mandrel **14** is rotated at high speed on a vertical axis in the centrifuge, so as to extract a substantial part of the water centrifugally from the fabric coil, the water being discharged from the centrifuge in any suitable manner. During the centrifuging of the fabric, the coil is confined by the conductive layer **15** surrounding it.

The fabric coil, thus partially dried, is then transferred to the fibre stabilizing or "setting" apparatus **18**, which will be described in greater detail in connection with Fig. 5. The apparatus **18** comprises a housing **19** which encloses an oscillator **19***a* for generating both L. F. and H. F. electric currents, and comprises also a container **20** which receives the fabric coil after removal of the studs **14***a* from the mandrel. At its lower end, the mandrel **14** is seated on the bottom of the container **20** around an opening which communicates with a vapor discharge device **21** below the container, the upper end of the mandrel being closed. The oscillator **19***a* has one terminal **19***b* connected to the conductive layer **15** on the fabric coil, and a second terminal **19***c* connected to the mandrel **14**, whereby the mandrel and the layer **15** serve as electrodes. An alternating electric current generated by the oscillator **19***a* is passed through the fabric coil from the outside to the mandrel electrode **14**, the current being at low frequency at the outset. Accordingly, the fabric coil is internally heated di-electrically by the passage of the alternating current through it, thereby evaporating water in the fabric. As the evaporation proceeds, the resistance of the fabric increases, and subsequently the oscillator **19***a* is adjusted to pass an H. F. current through the fabric. The di-electric heating is continued until the temperature in the fabric becomes above the boiling point, at which time the fabric is completely freed of the water. During the di-electric heating, an air current is forced into and through the oscillator housing **19** by a pump **19***d*, so as to preheat the air by the heat losses from the oscillator incident to generating the alternating current. From the housing **19**, the air current is passed through a pipe **19***e* into the container **20**, where it passes from outside the fabric coil through the fabric, the perforations in the mandrel **14**, and thence through the lower end of the mandrel into the vapor exhausting device **21**, from which the condensate is discharged at **21***a* and the air current is exhausted through pipe **22**. In this way, the heated air current supplements the di-electric heating action and serves to heat-insulate the fabric coil and also to remove the evaporated moisture from the coil so as to prevent recondensation.

The de-stressing apparatus **12**, as shown in Figs. 2, 3 and 4, comprises a trough **12***a* which at one end opens into upper part of the tank **11**. The opposite end of the trough is closed, as shown at **12***b*. The tank **11** and the trough **12***a* are filled with a wetting agent, such as water, to the level A (Figs. 2 and 4), the tank **11** being provided with a level outlet **24**. In the tank **11**, where the

fabric F is placed in a random-twisted condition from the booth 10 (Fig. 1) or other suitable stage in the normal processing of the fabric, the fabric F is in a completely wetted state and tends to float under the surface A of the water bath. One end of the fabric tube passes over a horizontal pipe 25 having holes 25a spaced along the pipe between flanges or guides 25b. The pipe 25 is supported on an oscillating arm or pendulum 26 which is hollow and is connected to a source of compressed air (not shown), whereby air is blown continuously through the holes 25a in the upper surface of the pipe 25. In this way, the fabric tube is inflated, as shown at F', by the air from the oscillating pipe 25, the air being more or less confined between the pipe 25 and a pair of rollers 27 mounted in the opening between trough 12a and tank 11. Thus, the inflated part F' of the fabric tube will float on the surface A of the bath, and this floating action, in combination with the oscillations of the pipe 25, serves to untangle the fabric tube as it is drawn out of the tank 11.

From the rollers 27, the fabric passes to a spreader which comprises a horizontal plate 28 extending across the trough 12a from one side to the other. The plate 28 is disposed below the surface A of the bath but above the bottom of the trough 12a, and it is slightly bowed downward so that the lower face of the plate is convex. The plate 28 is made of a water repellent, highly polished material, preferably a transparent plastic material, and is provided along its sides with openings 28a. A compressed air pipe 29 has a horizontal section 29a extending longitudinally of the trough under the central portion of the curved plate 28, the horizontal pipe section 29a being provided with holes 29b spaced along the length of the pipe. The fabric F passes below the plate 28, so that air bubbles from the pipe 29a rise to the fabric at the central or lowermost portion of the plate and thus urges the fabric against the lower surface of the plate. Since the plate 28 is imperforate except at its sides, the air bubbles from the pipe 29a spread outwardly and upwardly under the plate into the fabric on both sides of the central portion, the bubbles finally escaping through the side openings 28a. In this way, the bubbles act to spread the fabric against the lower face of the plate 28, the highly polished surface of which serves to reduce the friction tending to oppose the spreading of the fabric by the bubble action.

The fabric from the spreader 28—29 passes under a roller 31, over a roller 32, and then under a roller 33, these rollers being transport rollers extending transversely between the sides of the trough and below the surface A of the bath. The intermediate roller 32 is driven by a belt 34 from a squirrel-cage electric motor 35. The belt 34 is arranged to provide a continuous slippage between the belt and the driving motor 35; but as the fabric is pulled along the trough 12a (by a mechanism to be described presently) the transport roller 32 effects an additional pull on the fabric, the force of this pull being substantially constant due to the slippage between the belt 34 and the motor 35.

The fabric F passes from the transport rollers 31, 32, 33 to a second spreader comprising a plate 36 and an underlying perforated air pipe 37a, which are similar to the parts 28 and 29a, respectively of the first air spreader.

From the second air spreader 36, 37a, the fabric passes between a pair of rollers 39 to a shaker device comprising a pair of rollers 40 and 40a mounted on a carriage 41 suspended on one end of a flexible arm 42, the other end of the arm being mounted on a support 43. The arm 42 rests upon an eccentric 44 which is rotated by a suitable power source (not shown). As the fabric passes between the rollers 40 and 40a, it is subjected to a gentle shaking action below the surface of the bath by the vertical reciprocation imparted to the rollers through the eccentric 44. This oscillatory movement of the fabric, against the friction of the water, facilitates release of the internal stresses in the fabric fibres.

An endless belt 45 is disposed in the trough 12a in front of the shaker device and receives the fabric after the shaking action. The belt 45 is mounted on a series of rollers 46, 46a, 46b, 46c and 46d. The fabric from the shaker device moves upon the endless belt 45 between the latter and an idler roll 47. The endless belt is driven from a suitable power source (not shown) by a drive belt 48 extending around a pulley 49 on one end of the roller 46.

At opposite sides of the tank 12a are vertical supports 51 having vertical slots 51a which receive the removable studs 14a on the hollow perforated mandrel 14. The fabric from the endless belt 45 is wound around the mandrel 14 to form the coil 13. The mandrel 14 is not driven, but the coil 13 is caused to turn by friction on the endless belt 45, the coil being supported by the underlying rollers 46c and 46d over which the endless belt extends. As the diameter of the coil increases, due to winding of additional fabric on the coil, the studs 14a of the mandrel slide upwardly in the slots 51a of the supports 51. A squeeze roller 52, which is provided with a semi-rigid rubber surface, has studs 52a disposed in the slots 51a and rests upon the upper surface of the fabric coil 13. The squeeze roll 52 rides upwardly in the guide slots 51a as the mandrel 14 rises from the belt 45 and the underlying rollers 46c and 46d, due to enlargement of coil 13 as the winding proceeds. In the embodiment shown the weight of the roller 52 is utilized to maintain proper pressure of this roller against the fabric wound upon the fabric coil 13 and the studs or trunnions 52a are carried in open guide slots 51a, which permit the lifting of the roller for releasing pressure. The invention, however, is not concerned with the details of the arrangement with respect to the specific mounting of the roller or manner of obtaining the desired pressure of the roller against the fabric coil 13.

In the operation of the de-stressing apparatus 12, the fabric tube is moved slowly along the trough 12a due to the pull imparted to the fabric as it passes between the endless belt 45 and the fabric coil 13. Since the mandrel 14 is not positively driven, the apparatus avoids any heavy tension on the fabric as it is drawn through the water bath. The pulling of the fabric by the endless belt 45, acting on the bottom of the coil 13, is supplemented by the transport rolls 31, 32, 33, it being understood that similar transport rolls may be located in other parts of the trough 12a so as to provide a uniform movement of the fabric along the trough under near tensionless conditions. By air-spreading the fabric between the curved plates 28—36 and the compressed air pipes 29a—37a, the fabric is supported in a flattened condition under the surface of the bath by the buoyancy of the fabric in the liquid, whereby the fabric is placed under a substantially compressionless and tensionless condition while com-

pletely wetted. Because of the absence of heavy compression rollers or heavy tensioning of the fabric while it is moved through the bath and then wound on the mandrel 14, the fabric fibres remain in the relaxed positions to which they were displaced by the treatment in the trough 12a, whereby the fabric coil 13 is substantially destressed.

The trough 12a is provided at the sides with adjustable arms 54 which carry depending guides 54a engageable with the side edges of the fabric tube F as it moves along the trough. Similar adjustable guides (not shown) may be arranged at other parts of the trough to guide the fabric in its movement.

Referring now to Fig. 5, the fabric coil 13 with its mandrel 14 is transferred to the container 20 after partial drying of the fabric in the centrifuge 16 (Fig. 1). The container 20 has a removable cover 20a and is provided at the bottom with a central ring 56 which receives and locates the lower end of mandrel 14. The bottom of container 20, where it is surrounded by the ring 56, has openings 57 which lead into the vapor discharge device 21. The perforated conducting layer 15 is retained on the fabric coil when it is placed in the container 20.

The high frequency oscillator 19a may be of any conventional design, and since such oscillators are well known, it is not necessary to describe it in detail. The anode 58a of the oscillating tube 58 is provided with a heat exchanger 59 which receives a current of air sucked into the housing 19 through an inlet 60, whereby the air current is preheated by the heat losses from the anode 58a. Additional air is drawn into the housing 19 from an inlet 61 to the power regulator 62, containing the usual rectifier tubes (not shown), from which the air preheated by the heat losses in the regulator 62 passes through a passage 63 into the housing 19. Similar cold air inlets may be provided at the oscillating tank coil (not shown) and other points where heat is dissipated incident to generating the high frequency current, so that the greatest part of the heat losses are used to preheat air passing into the housing 19. The air thus preheated is drawn through an outlet 64 and a pipe 65 to a compressor 66, a check valve 67 being located in the pipe line between the compressor and the oscillator housing 19. The compressor 66 forces the preheated air into a high pressure container 68 containing a cooling coil 68a, which serves to condense a considerable part of the moisture content of the air entering the oscillator housing 19 from the atmosphere.

From the compressed air container 68, the air passes through an oil filter 70 and a pipe line 71 to a heat exchanger 72 located in the discharge device 21 below the openings 57. The pipe 71 extends from the heat exchanger 72 to a second heat exchanger 73 containing a coil 74 through which steam is circulated under pressure to heat the air to a temperature between 230–270° F. From the heat exchanger 73, the compressed air passes through distributing pipes 75 into the container 20 for the fabric coil.

The steam from the heating coil 74 passes through a pipe 76, which is provided with a pressure regulating valve 76a, to a jet-suction ejector 77 located in a discharge nozzle 21b projecting from the bottom of the discharge device 21. Accordingly, the preheated air from pipes 75 reaches the interior of container 20 at high pressure and expands in the container so that it is capable of taking up a substantial amount of moisture from the fabric, and the pressure differential is accentuated by the ejector 77 to cause a further expansion of the air-stream mixture in container 20 and thereby allow a higher degree of saturation. From the pipes 75, the expanding air passes through the perforated conducting layer 15 and then radially inward through the fabric coil 13 and through the perforations 14b in the mandrel to the interior of the latter, the upper end of the mandrel being closed by a plug 78. The hot and wet air is discharged from the mandrel 14 through the openings 57 into the discharge device 21, where the air passes around the heat exchanger 72 so as to preheat further the air passing through pipe 71 to the distributing pipes 75. From the ejector 77 the steam and wet air is exhausted through the pipe 22, and the condensation is discharged through the bottom outlet 21a.

The high frequency oscillator 19a has terminals 80 and 80a engageable by switch arms 81 and 81a connected to the conductors 19b and 19c, respectively. These conductors extend through insulated openings 20b in the container wall and into the interior of the container 20, where the conductor 19c is connected to a conducting ring 82 surrounding the lower part of mandrel 14. The other conductor 19b is connected through a flexible conductor 83 to the perforated conductive layer 15 extending around the outside of the fabric coil.

At the beginning of the stabilizing or "setting" operation, when the fabric coil 13 is still very wet, the switch arms 81 and 81a are connected to the terminals 84 and 84a, respectively, of a low frequency oscillator 85—85a, which may be of any conventional design. The L. F. oscillator 85—85a provides an alternating current of sufficient voltage to cause an electrical current to pass through the fabric coil 13 between the outside electrode 15 and the internal electrode or mandrel 14. The resultant internal heating of the fabric di-electrically increases the temperature of the fabric and causes water therein to evaporate. The hot and dry air passing through the fabric, as indicated by the arrows in Fig. 5, supplements the di-electric heating effect and also becomes saturated with the evaporated moisture and carries this moisture into the interior of mandrel 14, the air-steam moisture then passing around the heat exchanger 72 where it loses most of its heat content to the colder air in pipe 71. Most of the moisture in the discharging air will be condensed by the heat exchanger 72 and exhausted through the ejector 77.

After the moisture content of the fabric has been lowered by the L. F. di-electric heating, the electrical resistance of the fabric will increase to the point where no appreciable current will pass between the electrodes 15 and 14. At this time the switch arms 81 and 81a are moved to disconnect the L. F. oscillator and connect the H. F. oscillator 19a to the fabric coil through the terminals 80 and 80a, respectively. This H. F. current acts to ionize the moisture remaining in the fabric, so that the electrical resistance of the fabric apparently decreases. The frequency of the current generated by the H. F. oscillator 19a is gradually increased as the cloth becomes drier due to the di-electric heating and the removal of the moisture by the heated air current. When the fabric coil 13 has been substantially freed of its moisture content, the switch arms 81—81a are moved to disconnect the fabric coil

from the current source and the operation is terminated.

During the entire period when the L. F. and H. F. currents are passing through the fabric coil **13**, the pre-heated air is passed through the fabric coil from the high pressure pipes **15** to the steam ejector **17**, so that the air current acts as a heat insulator to prevent radiation from the surface of the cloth and also prevents recondensation of the evaporated moisture. Due to the di-electric heating of the fabric, the fabric temperature remains below 100° C. until near the end of the operation, when the temperature exceeds 100° C., and the heating is preferably continued until the fabric reaches a temperature of about 110° C.

While I have described and illustrated a preferred installation for practicing the process, it will be understood that the fibre de-stressing and stabilizing or "setting" operations of the invention may be performed by installations of different design.

I claim:

1. A process for treating textile fabrics, which comprises floating the fabric, while completely wetted with a wetting agent, in a substantially tensionless and compressionless condition to cause displacement of the fabric fibres by the internal stresses therein, thereby relieving said stresses, maintaining the fabric substantially free of internal tension after said relieving of the internal stresses and until passage therethrough of the alternating current hereinafter specified, and passing an alternating electric current through the de-stressed fabric to cause internal heating of the fabric di-electrically until it is substantially freed of the wetting agent by evaporation.

2. A process according to claim 1, comprising also the step of passing an air current through the de-stressed fabric to remove the evaporated wetting agent.

3. A process according to claim 1, comprising also the step of enclosing the de-stressed fabric in a current of heated air during the passage of said current through the fabric.

4. A process according to claim 1, comprising also the step of changing the frequency of said alternating current from a low frequency to a high frequency as the evaporation proceeds.

5. A process according to claim 1, comprising also the step of mechanically extracting part of the wetting agent from the de-stressed fabric prior to passage of the alternating current through the fabric.

6. A process according to claim 1, in which the fabric is spread freely under the surface of a body of said wetting agent to place the fabric in said tensionless and compressionless condition.

7. A process according to claim 1, comprising also the step of winding the de-stressed fabric in a coil before passing said alternating current through the fabric, and in which said current is passed through the coil between the coil axis and the outside of the coil.

8. A process according to claim 1, comprising also the steps of winding the de-stressed fabric in a coil and spinning the coil on its axis to extract part of the wetting agent centrifugally from the fabric before passing the alternating current through the fabric, and in which said current is then passed through the coil between the coil axis and the outside of the coil.

9. A process according to claim 1, in which the passage of said alternating electric current through the de-stressed fabric is continued until the fabric reaches a temperature of about 110° C.

10. A process according to claim 1, comprising also the step of subjecting the wetted fabric to a gentle shaking action while it is in said tensionless and compressionless condition, to facilitate relieving of said internal stresses.

11. A process for treating textile fabrics, which comprises placing the fabric, while completely wetted with a wetting agent, in a substantially tensionless and compressionless condition to cause displacement of the fabric fibres by the internal stresses therein, thereby relieving said stresses, winding a length of the de-stressed fabric into a coil on an electrically conductive mandrel, and passing an alternating electric current through the coil of de-stressed fabric from outside the coil to the mandrel as an electrode, to cause internal heating of the coil di-electrically until it is substantially freed of the wetting agent by evaporation.

12. A process according to claim 11, comprising also the step of applying an electrically conductive layer to the outside of the coil, and in which said layer is used as a second electrode for passing the alternating current through the fabric coil.

13. A process according to claim 11, comprising also the step of spinning the fabric coil on said mandrel to extract part of the wetting agent centrifugally from the fabric before passing said alternating current through the coil.

14. A process for treating textile fabrics, which comprises placing the fabric, while completely wetted with a wetting agent, in a substantially tensionless and compressionless condition to cause displacement of the fabric fibres by the internal stresses therein, thereby relieving said stresses, winding a length of the de-stressed fabric into a coil on a hollow perforated mandrel of electrically conducting material, passing an alternating electric current through the coil of de-stressed fabric from outside of the coil to the mandrel as an electrode, to cause internal heating of the coil di-electrically until it is substantially freed of the wetting agent by evaporation, and passing an air current through the fabric coil between the interior of the mandrel and the outside of the coil to remove the evaporated wetting agent.

15. A process for treating textile fabrics, which comprises feeding a length of the fabric into a bath of a wetting agent, spreading the fabric below the surface of the bath and there supporting the fabric by its buoyancy in the bath to place the fabric in a substantially tensionless and compressionless condition while completely wetted and thereby cause displacement of the fabric fibres by the internal stresses therein, whereby said stresses are relieved, moving the fabric through the bath while so supported therein and then out of the bath, while maintaining the fabric substantially free of tension, and passing an alternating electric current through the de-stressed fabric immediately after it leaves the bath and as it is withdrawn from the bath, to cause internal heating of the fabric di-electrically until it is substantially freed of the wetting agent by evaporation.

16. A process according to claim 15, in which the fabric is spread below the surface of the bath by blowing air into the bath below the fabric.

17. A process according to claim 15, in which the fabric is spread below the surface of the bath by blowing air into the bath below the fabric, and

confining the upper surface of the fabric against the buoyancy imparted thereto by the air.

18. A process according to claim 15, comprising also the step of subjecting the fabric, while moving through the bath, to a gentle shaking action to facilitate relieving of said internal stresses.

19. A process according to claim 15, comprising also the steps of passing the fabric from the bath around a rotatable mandrel to form a coil, and winding the fabric on the mandrel by rotating the coil from the outside at a peripheral speed equal to the linear speed at which the fabric moves through the bath, to maintain the fabric substantially free of tension, said alternating electric current being passed through the fabric coil from the outside of the coil to said mandrel as an electrode.

20. In the treatment of textile fabrics, the process which comprises generating a high-frequency alternating electric current, passing said current through the fabric while in a wetted condition to cause internal heating of the fabric dielectrically, thereby evaporating moisture in the fabric, passing an air current through the generating locus of said current, to preheat the air by heat produced in said generating, and blowing the pre-heated air through the fabric to remove evaporated moisture therefrom.

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