

June 2, 1931.

H. H. WIGGLESWORTH

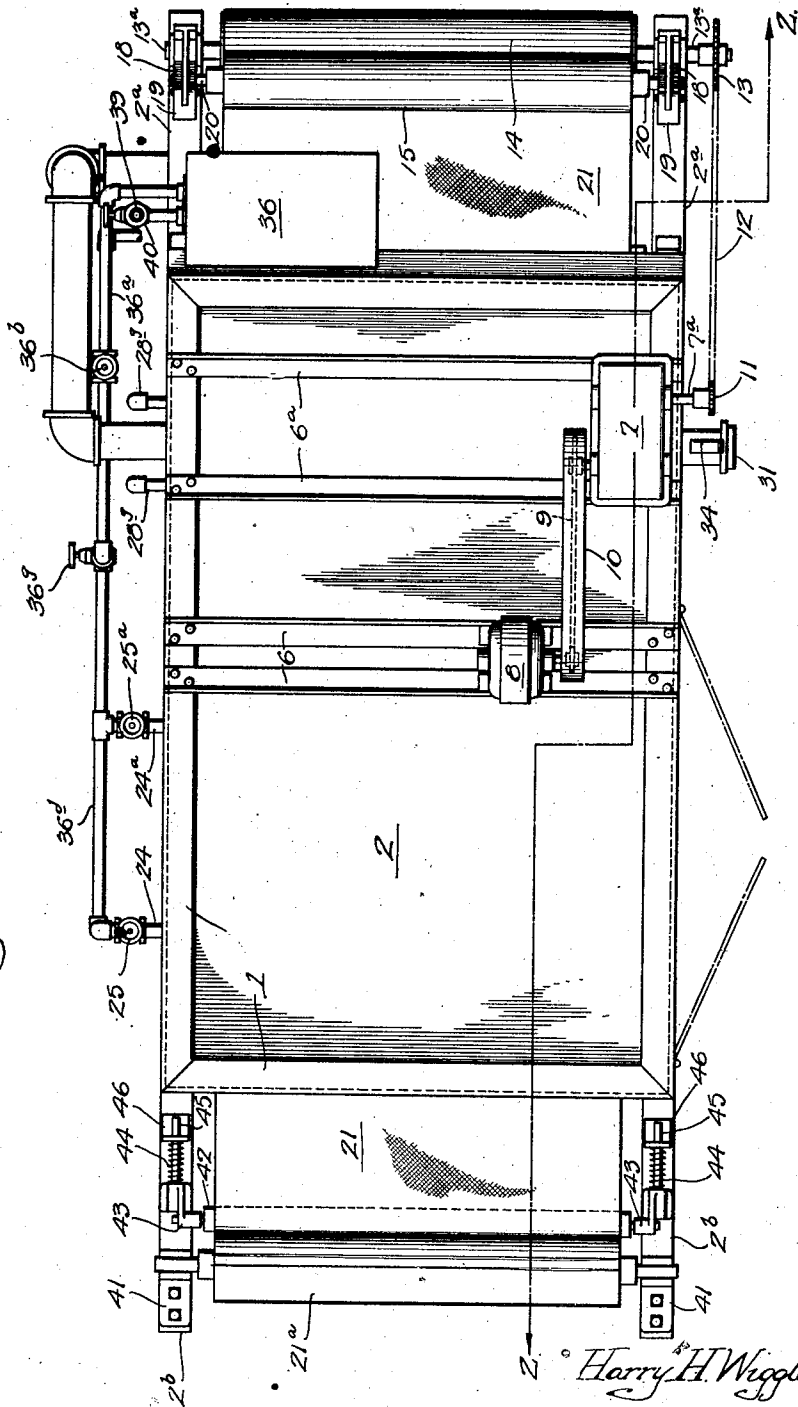
1,808,701

CLOTH CONDITIONING MACHINE

Filed Feb. 19, 1930

4 Sheets-Sheet 1

Fig. 1.



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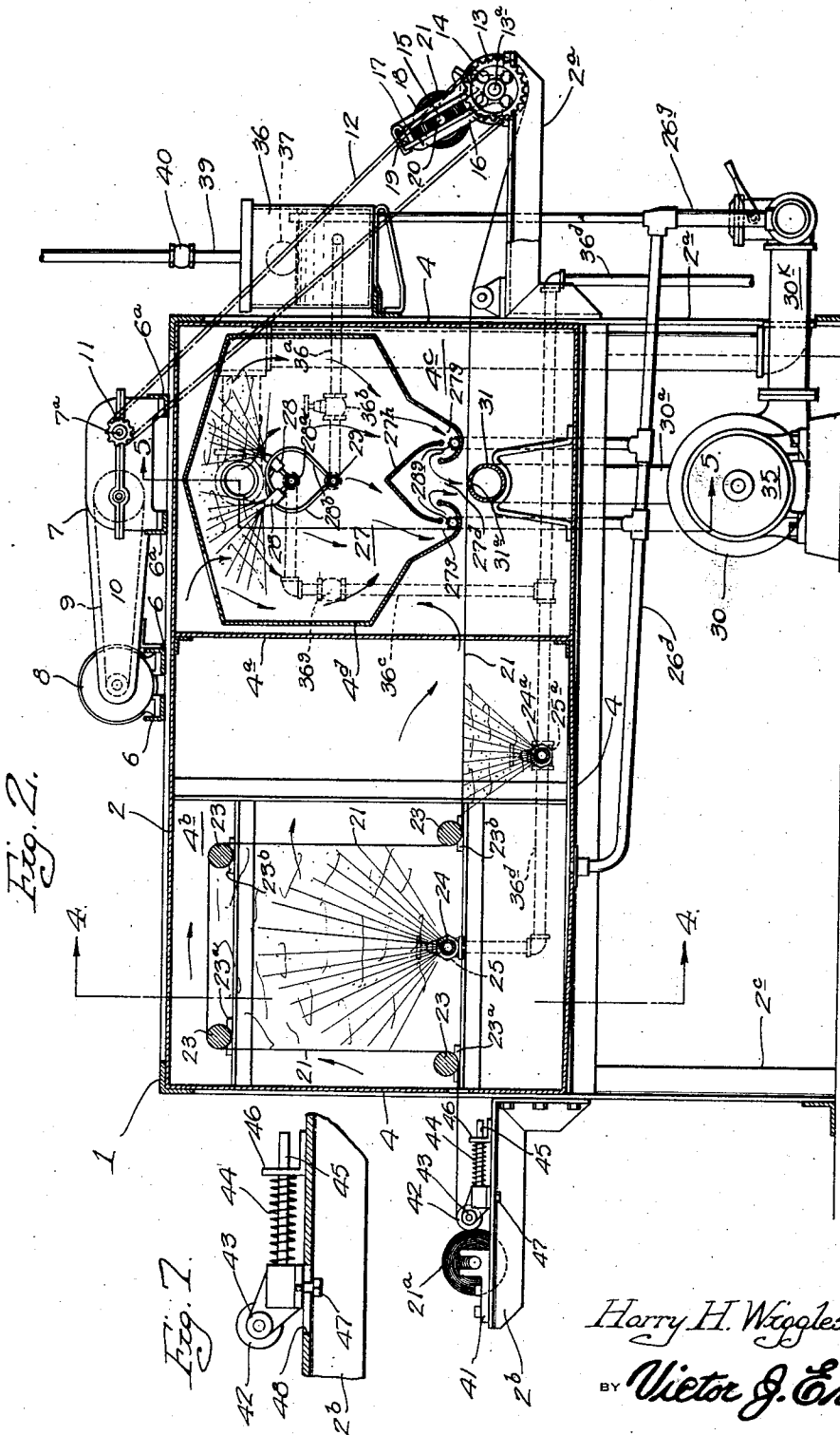
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*Fig. 3.*

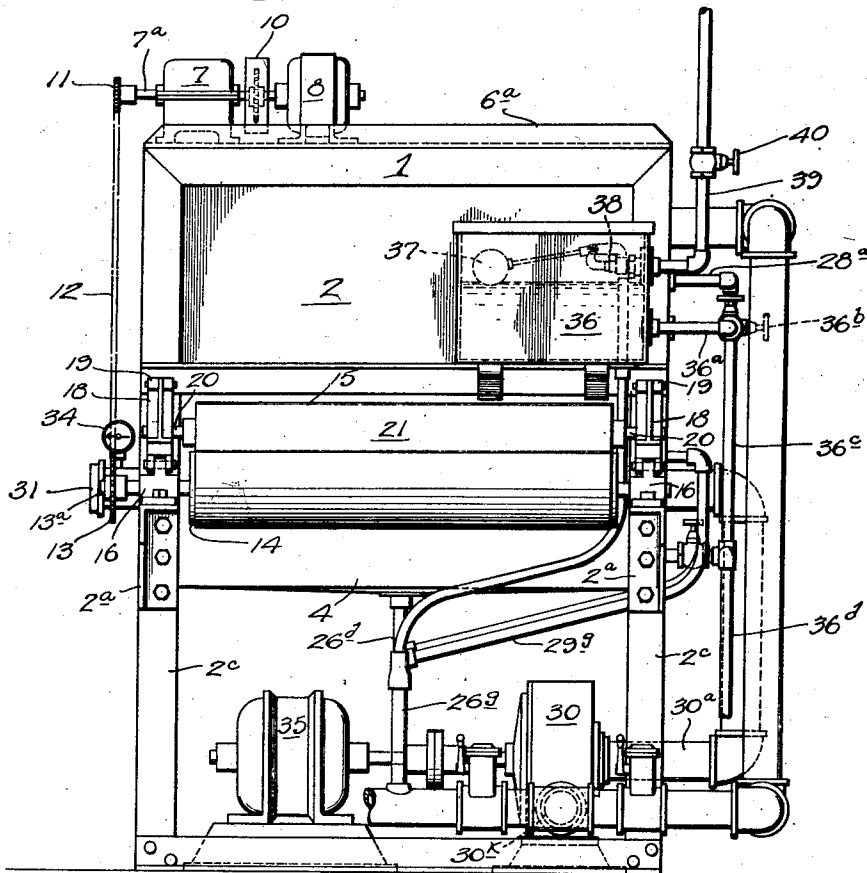
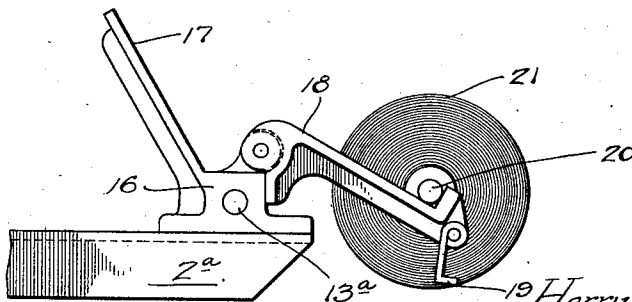


*Fig. 6.*



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Fig. 4.

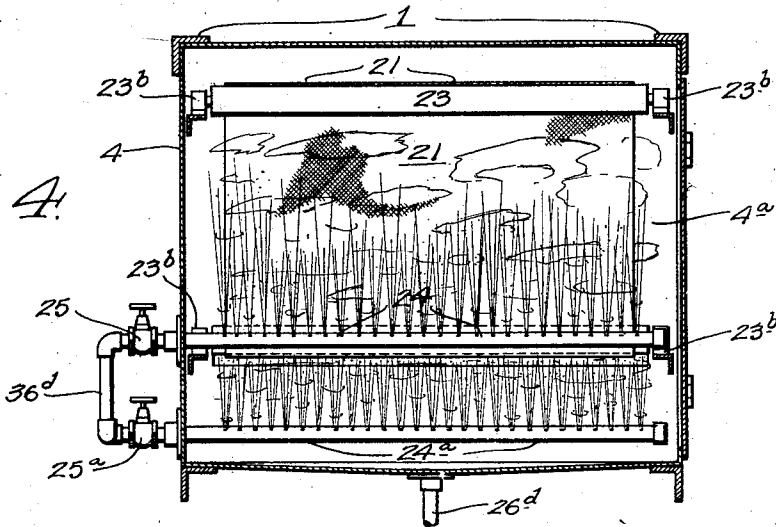
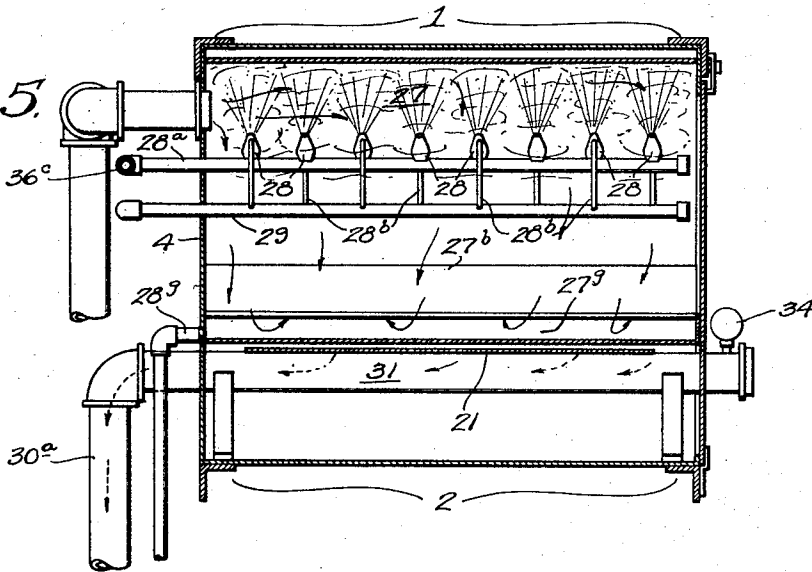


Fig. 5.



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## UNITED STATES PATENT OFFICE

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## CLOTH CONDITIONING MACHINE

Application filed February 19, 1930. Serial No. 429,715.

The present invention relates to an improved cloth conditioning machine, namely a machine of the type for tempering and humidifying, the purpose being to restore the requisite amount of moisture into fabrics, which have been over-dried after washing, during the course of manufacture.

It is well known in the art that in the manufacture of cloth, the cloth is subjected to a washing process and then a drying process, which latter process is over subjected to the material. It is this over-drying process that this present invention aims to correct, that is to restore to the cloth the proper "feel" and at the same time insure the requisite percentage of moisture in the cloth, which no doubt will result in giving the required "feel."

In presenting this invention it is the aim to have in mind the past and present methods of restoring the "feel", therefore taking the past and present methods in consideration, the present invention aims to provide a quicker and more economical way and structure of apparatus for conditioning cloth, that is, restoring the proper temper to the material.

One of the features of the present invention is to provide in a machine of this kind, a tempering means, to which the cloth is first subjected and finally subjecting the cloth to a humidifying treatment, by passing the humidity through the weave of the fabric, with such uniformity as to give the fabric the best possible appearance, and not only give the necessary moisture, but a uniformity of "feel" throughout the entire area of the material.

It is to be understood that the particulars herein given are in no way limitative, and that while still keeping within the scope of the invention, any desired modification of details and proportions may be made in the construction of the appliance according to circumstances.

The invention comprises further features and combination of parts to be hereinafter set forth, shown in the drawings and claimed.

In the drawings:

Figure 1 is a plan view of the improved

fabric conditioning machine constructed in accordance with the invention.

Figure 2 is a vertical longitudinal sectional view on line 2—2 of Figure 1.

Figure 3 is an end view of the machine.

Figure 4 is a sectional view on line 4—4 of Figure 2.

Figure 5 is a sectional view on line 5—5 of Figure 2.

Figure 6 is a detailed view of one of the guide bearings for the roll of cloth after it has been conditioned.

Figure 7 is an enlarged detailed view of one of the supports for the roll of cloth to be tempered.

Referring to the drawings 1 identifies a frame work, which may be any size and any shape, and which comprises the corner angle irons, which may be structural rolled material or otherwise, the perpendicular corner angle irons extending below the casing or housing 2, and thereby constituting legs 2c.

This housing or casing may be made up in any suitable manner and consist of panels 4 of plate material, and by means of a partition 4a the housing is divided into two compartments 4b and 4c, the former constituting a tempering compartment, while in the latter an auxiliary casing or housing 4d is arranged in any suitable or convenient manner as shown. This housing or casing constitutes a humidifying compartment 27.

On the top panel are mounted angle iron supports 6a, which in turn support the variable speed transmission 7. A motor 8, for driving the variable speed transmission is mounted upon the supports 6. The motor shaft is operatively connected to the speed transmissions 7 by means of a silent chain 9. Any other suitable method for driving the transmission may be used. A guard or housing 10 enclose the silent chain and the sprockets on which the chain is mounted. On one end of one of the shafts 7a of the variable speed transmission 7 a sprocket 11 is provided. This sprocket 11 is in turn operatively connected to a sprocket 13 by means of a chain belt 12. The sprocket 13 is carried on one end of a shaft 13a of the drag roller 14, with which a roller 15 cooperates.

The drag roll 14 and the roll 15 and the guide bearings 16 are carried by suitable supports 2b on one end of the machine. The roll 15 of which its spindles are supported in the guide bearing 16 so cooperates with the roll 14 as to cause the cloth as it is conditioned to roll tightly on the roll 15. The guide bearings 16 have inclined vertical arms 17, to which are hinged arms 18. When these arms 18 are held in position by hinged dogs 19, guides or run ways are formed for the spindle 20 of the roll 15. As previously stated the cloth 21 rolls on the roller 15, after passing over the drag roll 14 resulting from the revolving motion of the drag roll. When the roll of cloth is completed the dogs 19 are released, permitting the arms 18 to move into positions as shown in Figure 6. This permits the spindle of the roll 15 of cloth to move or drop down until the spindles engage with the stop pieces or abutments. After the roll of cloth reaches this position it can be removed and a new spindle or roll 15 engaged with the arms 17, with the end of cloth having been started around the roll. The full roll of conditioning cloth can then be stored in any convenient place. The arms 18 with the dogs 19 are then replaced in operative positions in conjunction with the arms 17, holding the new spindle or roll 15 in position.

Idler rolls 23 are journaled in suitable bearings on the side panels, and are located in the tempering compartment. The cloth to be conditioned, coming from the roll of cloth 21a pass over the idler rolls 23, which are adapted to rotate in bearings 23a and 23b as the cloth moves in its passage through the machine. As the cloth is passing over the rolls 23, and, as it leaves the rollers it receives a steam bath from the perforated pipes 24 and 24a, there being suitable valves 25 and 25a exteriorly of the housing for controlling the flow of steam emanating from the pipes. These valves are located in the steam lines, but are exterior of the housing.

Adjacent to the tempering compartment, and partitioned therefrom is the humidifying compartment 27. Contained in the compartment 27 are atomizer nozzles 28, and when they are adjusted they are designed to feed a requisite amount of steam or compressed air from the pipe 28a. The nozzles 28 are carried by the pipe 28a, and are connected by tubes 28b to the pipe 29. A water container 36 is located exteriorly of the housing and has a pipe 36a leading into the side of the housing and into and transversely of the humidifying compartment or chamber 27. The pipe 36a has a valve 36b exteriorly of the housing for controlling the supply of water. A pipe 36c arranged exteriorly of the housing connects with the steam supply pipe 36d. The pipe 36c connects with the transverse pipe 28a, which is disposed slightly above the transverse pipe 29. A valve 36g is carried by

the pipe 36c for controlling the flow of steam or air under pressure. By injecting the requisite amount of steam or air and a requisite amount of water into the humidifying compartment a proper humid condition is created in the compartment 27. Such moisture or humidity may be removed from the compartment 27 by means of an exhaustor 30, in other words a suction pump. A relatively heavy pipe 30a extends from the exhaustor or evacuating device and extends into the housing transversely thereof just below the transverse center of the humidifying compartment or chamber.

The bottom wall of the compartment or chamber 27 is shaped as shown in Figure 2 and is provided with an outlet opening 27d. However on opposite sides of the opening 27d the bottom wall is formed with traps 27g, in which a certain amount of the moisture collects and overflows out through the opening 27d. A deflector 27h arches over the opening 27d, thereby preventing too great a flow of the moisture. Drain pipes 28g extend from the bottom of the traps 27g and are connected to the drain pipe 26d, which in turn connects with the drain line 26g, so as to carry off a certain percentage of the moisture which condenses.

The cloth passes just below the traps and in direct contact with the pipe 30a, that is, where it passes transversely through the housing. This pipe where it passes transversely of the housing constitutes a suction pipe 31 provided with a slot 31a over which the cloth passes. As the cloth passes over the suction pipe 31 the humidity in the humidifying chamber 27, or rather the moisture laden air is drawn through the cloth as it passes over the slot, said moisture laden air being drawn out by the vacuum created by the exhaustor.

To ascertain the amount of vacuum created by the exhaustor 30 a gauge 34 is located in the suction pipe close to the extreme end. The exhaustor 30 is driven by direct connection with the motor 35. This mechanism located as shown does not require any additional floor space, and the discharge from the exhaustor 30 can be returned to the compartment, or might otherwise be suitably taken care of in any convenient manner as shown. In order to return this moisture laden air to the compartment 27, a pipe 30h may be connected with the outlet pipe 30k of the exhaustor, and in turn extended through the wall of the humidifying compartment 27.

The atomizer nozzles 28 are of the automatic type and receive their supply of water from the container 36, in which is located the float member or ball 37 for actuating the stop cock or valve 38, which is in association with the water supply pipe 39, for controlling the supply of water. The water supply pipe 39 has a valve 40 preferably of the globe type.

The adjustment of the valve 40 acts to regulate the flow of water into the container or reservoir 36, while the outflow of the water from the container or reservoir may be governed by the ball float and stop cock 37 and 38 respectively. The water entering the lower run or section of pipe of the atomizer system is siphoned into the heads by the action of steam or compressed air passing through the heads from the upper pipe of the system.

At one end of the machine and positioned on supports 26 are half bearings 41, which in turn support the spindle of the roll of cloth 21a, which is to be tempered and humidified in order to give the cloth an even tension while passing through the tempering machine. The speed of the cloth is retarded to an extent by the application of pressure against the roll of cloth, through the medium of the roller 42, which is mounted in bearings 43 kept in position by the springs 44. These springs surround stems 45, which are carried by the bearings 43 and guided in the angle plates 46. The bearings 43 are guided by means of stud bolts 47 passing through slots 48, said bearings 43 being free to operate and move on the supports 26.

By the above description of the apparatus at hand, it is believed a complete summary of the tempering and humidifying or in fact a reconditioning of the cloth is apparent, and particularly understandable by those versed in the art of cloth manufacturing. It is obvious that by adjusting the speed of the travel of cloth through both compartments with the steam bath and the atomizer in the humidifying compartment properly adjusted, it is possible to obtain a re-gain of moisture of the desired percentage.

To those manufacturers who desire to extract excessive moisture from the cloth as it leaves the washing and drying process, this machine when equipped with a larger exhaustor can be employed as a vacuum extractor by passing the cloth over the slotted suction pipe, without using either the steam bath or atomizers, and such method of extraction would have a decided advantage over the method of extraction by centrifugal extractors commonly known as wizzers.

The invention having been set forth, what is claimed is:

1. In a cloth conditioning machine including a housing having a tempering compartment and a humidifying compartment, means in the tempering compartment for subjecting the cloth to a steam bath by means of sprays, the humidifying compartment having a trap controlled outlet for the humidity therein and under which the cloth passes, and means including a suction pipe for drawing the humidity through the cloth.

2. In a cloth conditioning machine including a housing having a tempering compartment and a humidifying compartment, means

in the tempering compartment for subjecting the cloth to a steam bath by means of sprays, the humidifying compartment having a trap controlled outlet for the humidity therein and under which the cloth passes, and means including a suction pipe for drawing the humidity through the cloth, and means for returning the humidity to the humidifying compartment.

3. In a cloth conditioning machine including a housing having a tempering compartment including sprays for subjecting the cloth to a steam bath, a humidifying compartment having a trap controlled outlet for the humidity, and means for extracting the humidity from the humidifying compartment and drawing it through the cloth.

4. In a cloth conditioning machine including a housing having a tempering compartment including sprays for subjecting the cloth to a steam bath, a humidifying compartment having a trap controlled outlet for the humidity, and means for extracting the humidity from the humidifying compartment and drawing it through the cloth, said humidity extracting means including a suction element having a slot over which the cloth passes to insure uniformity of extraction of the humidity through the entire area of the cloth.

5. In a cloth conditioning machine including a housing having a tempering compartment including sprays for subjecting the cloth to a steam bath, a humidifying compartment having a trap controlled outlet for the humidity, and means for extracting the humidity from the humidifying compartment and drawing it through the cloth, said humidity extracting means including a suction element having a slot over which the cloth passes to insure uniformity of extraction of the humidity through the entire area of the cloth, and means operatively connected with the suction pipe for extracting the humidity including means for returning the humidity to the humidifying compartment.

6. In a cloth conditioning machine including a housing provided with means for subjecting the cloth to a steam bath, a humidifying compartment in the housing having atomizers located therein, said compartment having a humidity trap controlled outlet under which and in close proximity thereto the cloth passes, and means including a slotted suction pipe immediately under the cloth and in contact therewith for drawing the humidity through the cloth.

7. In a cloth conditioning machine including a housing provided with means for subjecting the cloth to a steam bath, a humidifying compartment in the housing having atomizers located therein, said compartment having a humidity outlet under which and in close proximity thereto the cloth passes, and means including a slotted suction pipe im-

mediately under the cloth and in contact therewith for drawing the humidity through the cloth, means connected to the last named means for returning the humidity to the humidifying compartment.

8. In a cloth conditioning machine, a housing having means at one end for the support of a roll of cloth to be conditioned, said supporting means having tensioning devices for retarding and tensioning the cloth as it pays out on its passage through the machine, said housing having a humidifying compartment provided with air and water atomizing means and including a humidity outlet, under which and in close proximity thereto the cloth passes, and means including a suction element for extracting the humidity from the compartment and thereby drawing it through the cloth.

9. In a cloth conditioning machine, a housing having means at one end for the support of a roll of cloth to be conditioned, said supporting means having tensioning devices for retarding and tensioning the cloth as it pays out on its passage through the machine, said housing having a humidifying compartment provided with air and water atomizing means and including a humidity outlet, under which and in close position thereto the cloth passes, and means including a suction element for extracting the humidity from the compartment and thereby drawing it through the cloth, and means at the other end of the housing including a cloth drag device for pulling the cloth through the machine, whereby it may pass over the suction element.

10. In a cloth conditioning machine, a housing having means at one end for the support of a roll of cloth to be conditioned, said supporting means having tensioning devices for retarding and tensioning the cloth as it pays out on its passage through the machine, said housing having a humidifying compartment provided with air and water atomizing means and including a humidity outlet, under which and in close position thereto the cloth passes, and means including a suction element for extracting the humidity from the compartment and thereby drawing it through the cloth, and means at the other end of the housing including a cloth drag device for pulling the cloth through the machine, whereby it may pass over the suction element, variable speed mechanism operatively connected to the cloth pulling and drag means for transmitting power thereto variably, and means for operating said variable speed mechanism.

11. In a cloth conditioning machine, a housing including a humidifying chamber provided with atomizing means and having a humidity outlet, means for supplying air and water to the atomizing means, means including a slotted suction element over and in contact with which and under the outlet

and immediately over the slot the cloth passes for drawing the humidity from the chamber.

12. In a cloth conditioning machine, a housing including a humidifying chamber provided with atomizing means and having a humidity outlet, means for supplying air and water to the atomizing means, means including a slotted suction element over and in contact with which and under the outlet and immediately over the slot the cloth passes for drawing the humidity from the chamber, and means associated with the last named means for returning the humidity to the chamber.

13. In a cloth conditioning machine, a housing having a humidifying chamber including atomizing means therein and provided with a trap controlled outlet under which and in close position thereto the cloth passes, a baffle over the outlet to prevent excessive extraction of the humidity, and means including a suction pipe having a slot over which the cloth passes for drawing the humidity from the outlet.

14. In a cloth conditioning machine, a housing having a humidifying chamber including atomizing means therein and provided with a trap controlled outlet under which and in close position thereto the cloth passes, a baffle over the outlet to prevent excessive extraction of the humidity, and means including a suction pipe having a slot over which the cloth passes for drawing the humidity from the outlet, and means associated with the last named means for returning the humidity to the chamber.

15. In a cloth conditioning machine including a housing having means at one end for subjecting the cloth to a steam bath as the cloth passes through the housing, and a humidifying compartment at the other end of the housing provided with a trap controlled outlet for the humidity, and under which the cloth passes, a suction pipe over an opening of which the cloth passes at a point immediately under the outlet for drawing the humidity through the cloth.

16. In a cloth conditioning machine including a housing having means at one end for subjecting the cloth to a steam bath as the cloth passes through the housing, and a humidifying compartment at the other end of the housing provided with a trap controlled outlet for the humidity, and under which the cloth passes, a suction pipe over an opening of which the cloth passes at a point immediately under the outlet for drawing the humidity through the cloth, and means for returning the humidity to the humidifying compartment.

17. In a cloth conditioning machine including a housing provided with a humidifying compartment having a humidity outlet under which the cloth passes, traps at opposite sides of the outlet for controlling the humidity, a deflector over the outlet and

so associated with the traps as to complete their functions and direct the humidity through the traps, a suction pipe over an opening of which the cloth passes at a point immediately under the outlet for drawing the humidity through the cloth.

18. In a cloth conditioning machine including a housing provided with a humidifying compartment having a humidity outlet under which the cloth passes, traps at opposite sides of the outlet for controlling the humidity, a deflector over the outlet and so associated with the traps as to complete their functions and direct the humidity through the traps, a suction pipe over an opening of which the cloth passes at a point immediately under the outlet for drawing the humidity through the cloth, and means for returning the humidity to the humidifying compartment.

19. In a cloth conditioning machine including a housing provided with a humidifying compartment having a humidity outlet under which the cloth passes, traps at opposite sides of the outlet for controlling the humidity, a deflector over the outlet and so associated with the traps as to complete their functions and direct the humidity through the traps, a suction pipe over an opening of which the cloth passes at a point immediately under the outlet for drawing the humidity through the cloth, and drawing pipes in the traps to carry off the excessive moisture collected in the traps.

20. In a cloth conditioning machine including a housing provided with a humidifying compartment having a humidity outlet under which the cloth passes, traps at opposite sides of the outlet for controlling the humidity, a deflector over the outlet and so associated with the traps as to complete their functions and direct the humidity through the traps, a suction pipe over an opening of which the cloth passes at a point immediately under the outlet for drawing the humidity through the cloth, and drawing pipe in the traps to carry off the excessive moisture collected in the traps, and means for returning the humidity to the humidifying compartment.

In testimony whereof he affixes his signature.

HARRY H. WIGGLESWORTH.