

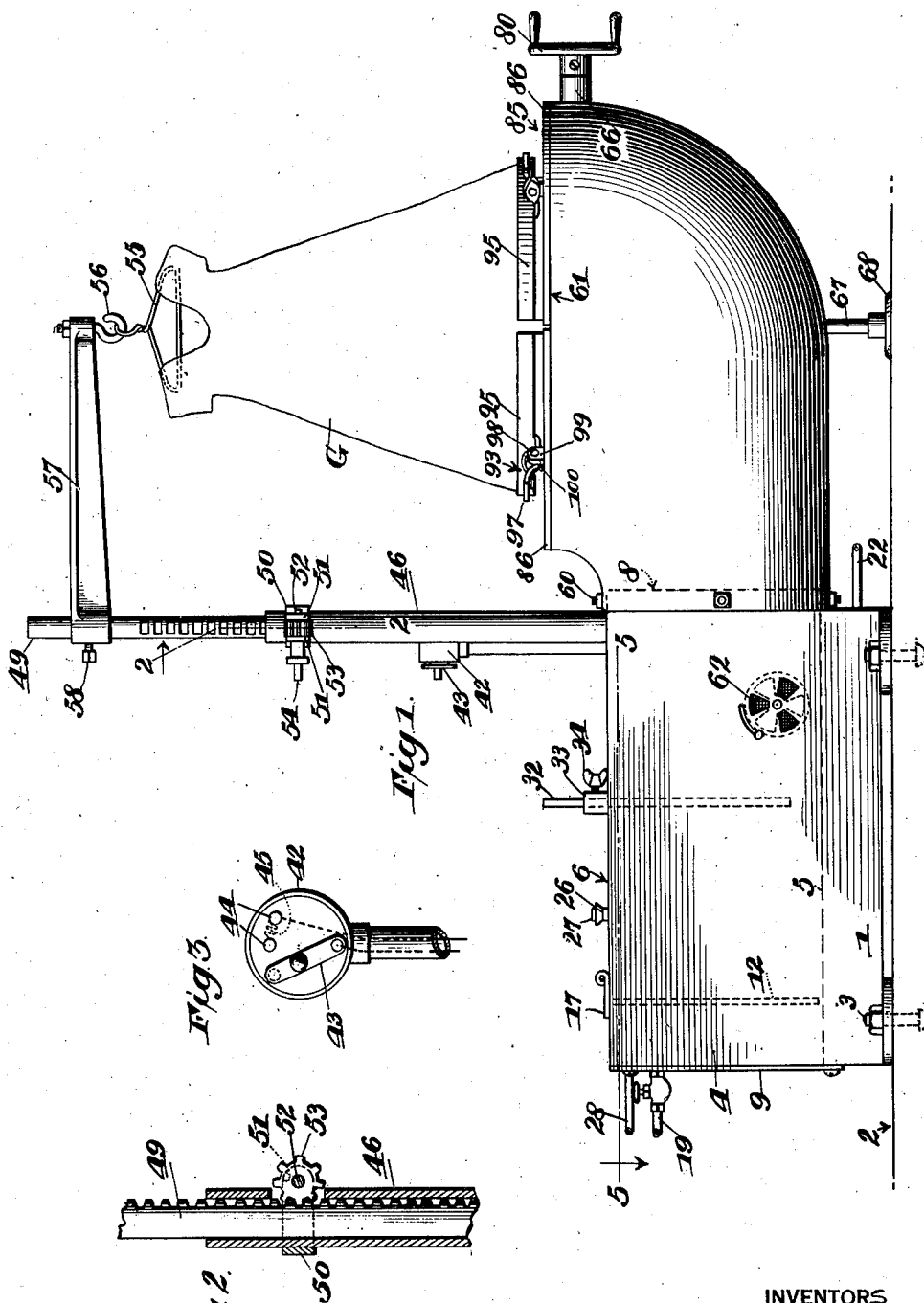
Jan. 14, 1936.

W. ALCORN ET AL
RESIZING AND DRYING MACHINE

2,027,894

Filed Sept. 26, 1934

3 Sheets-Sheet 1



WITNESS
J. F. Schroth

INVENTORS
Walter Alcorn,
BY *Lloyd Hamiter,*
Mumm, Anderson & Liddy
ATTORNEY

Jan. 14, 1936.

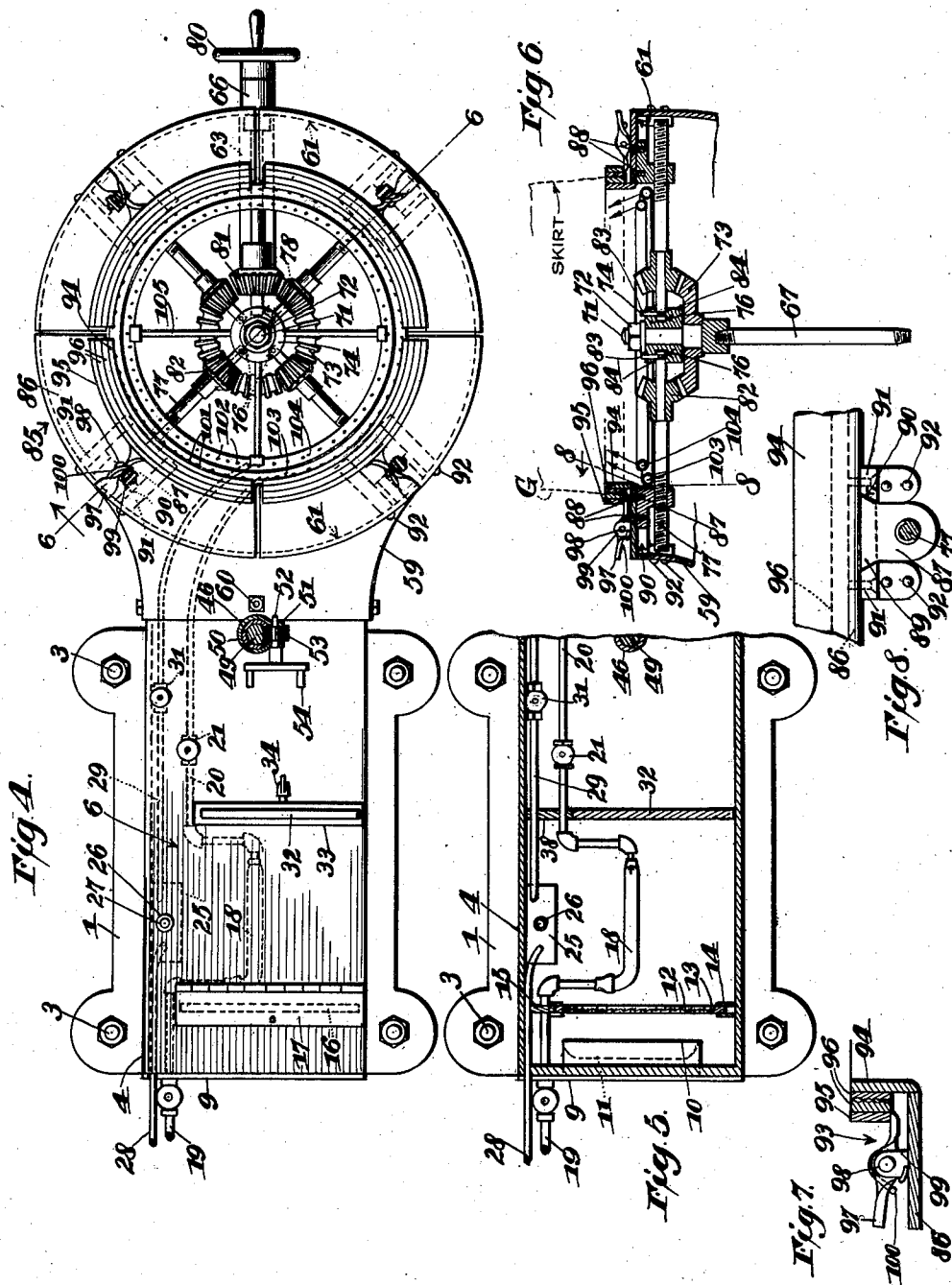
W. ALCORN ET AL

2,027,894

RESIZING AND DRYING MACHINE

Filed Sept. 26, 1934

3 Sheets-Sheet 2



WITNESS
J. T. Schrott

INVENTORS
Walter Alcorn
Lloyd Hamiter
BY
Wm. Anderson & Liddy
ATTORNEY

Jan. 14, 1936.

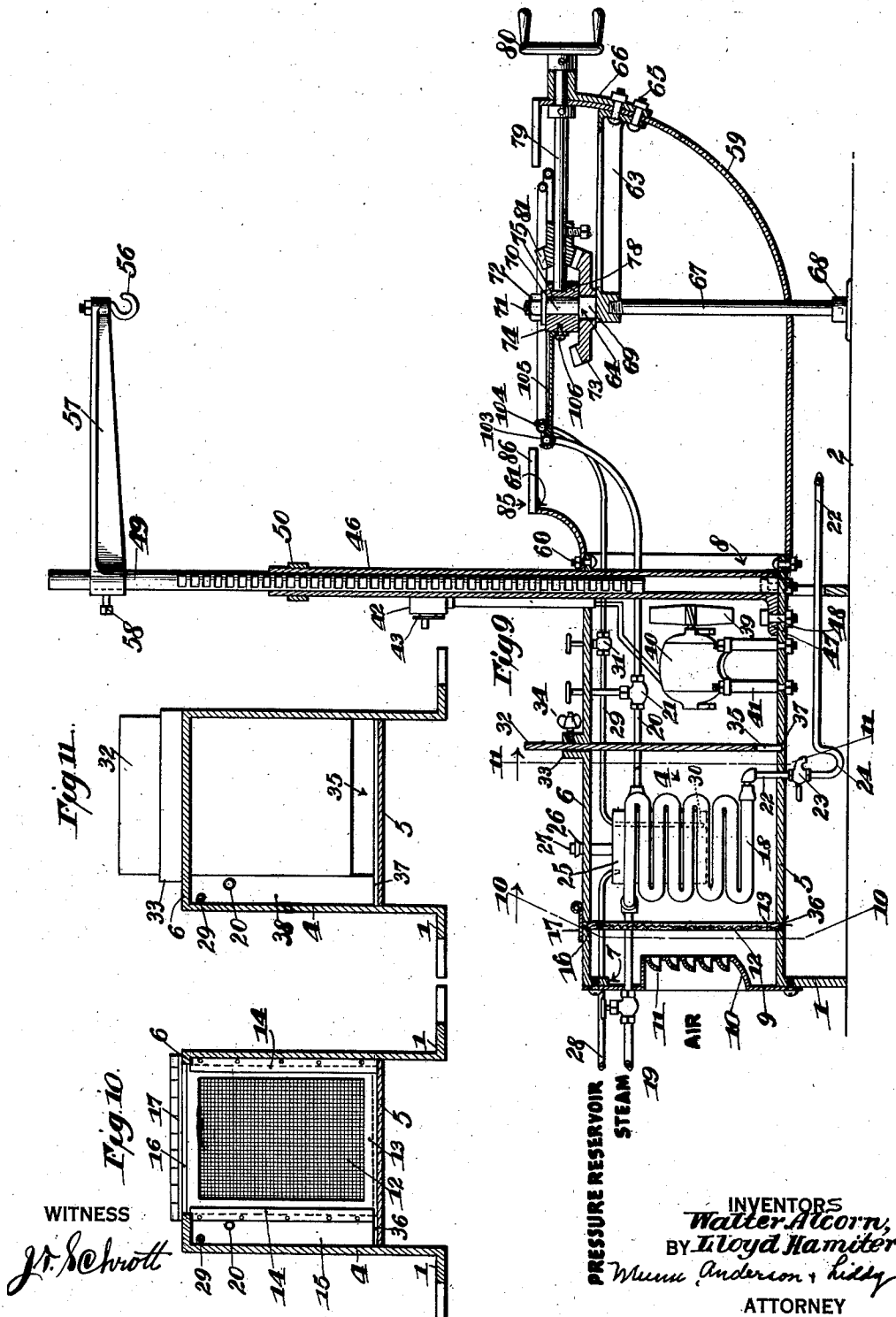
W. ALCORN ET AL

2,027,894

RESIZING AND DRYING MACHINE

Filed Sept. 26, 1934

3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,027,894

RESIZING AND DRYING MACHINE

Walter Alcorn and Lloyd Hamiter, Columbia, S. C.

Application September 26, 1934, Serial No. 745,642

12 Claims. (Cl. 68—28)

This invention relates to improvements in resizing and drying machines, and its objects are as follows:—

First, to provide a machine for stretching certain kinds of garments back to the original size after a dry-cleaning operation.

Second, to simultaneously stretch a garment and resize it after a dry-cleaning operation, thereby to restore the garment to its original size and the cloth to its original luster.

Third, to provide a machine for simultaneously stretching and steaming the garment as well as impregnating the cloth with sizing thereby to carry out the purpose already described.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings in which,

Figure 1 is a side elevation of the improved machine, a garment being shown in place.

Figure 2 is a detail section taken substantially on the line 2—2 of Figure 1, particularly illustrating the rack adjustment.

Figure 3 is a detail elevation of the switch for controlling the fan motor.

Figure 4 is a plan view of the machine, a part being shown in section.

Figure 5 is a horizontal section taken substantially on the line 5—5 of Figure 1.

Figure 6 is a cross section taken on the line 6—6 of Figure 1, particularly illustrating the driving connection of the radial shafts with the radially movable stretching sections.

Figure 7 is a detail sectional view of one of the clamps.

Figure 8 is a detail cross section taken on the line 8—8 of Figure 6.

Figure 9 is a vertical longitudinal section of the machine.

Figure 10 is a cross section taken on the line 10—10 of Figure 9, particularly illustrating the dust screen.

Figure 11 is a cross section taken substantially on the line 11—11 of Figure 9, particularly illustrating the shutter for regulating the hot air flow.

The instant machine is particularly intended for use in dry-cleaning establishments for the purposes briefly outlined above. There are on the market, at the present time, a number of materials which contain a quantity of sizing to give them a lustrous finish. These materials depend upon the presence of the sizing for their keeping a given dimension.

When a garment undergoes a cleaning process, some of the sizing is lost, this resulting in the shrinking of the garment. This effect is better

understood when it is considered that in the original manufacture a piece of cloth, say 20" long will be stretched and impregnated with sizing to such an extent that it will assume and keep a 36" dimension. When cloth so treated is subjected to cleaning so that some of the sizing is lost, it stands to reason that it will tend to shrink toward its original dimension, and if the garment is cleaned a sufficient number of times it will shrink so much as to be useless to the wearer.

The machine herein disclosed is so arranged that a garment made of cloth of the foregoing character can be stretched to its original size, and impregnated with sizing so that it will go from the cleaners in a condition closely approximating the original manufacture. The obvious result is satisfaction on the part of the patron because of the more or less new appearance of the garment, and also on the part of the dry-cleaner because of his ability to turn out a practically perfect piece of work.

Attention is directed to the drawings. The machine stands mainly on a base 1 which rests on the floor 2 to which it is secured by bolts 3 or the like, or, if desired, the machine may merely be stood on the floor without being secured. The base 1 is part of a hollow body 4 which includes a floor 5 and top 6. Each end of the body has an opening, the respective openings being designated 7, 8.

A plate 9 is attached to the body over the opening 7. This plate has an indented portion 10 having its upright wall pressed out with louvers 11 (Fig. 9) for the intake of air. A screen 12, situated a short distance away from the louvers, 35 is intended to exclude dust. The frame 13 of this screen (Fig. 10) is slidable in guides 14. One of the pair of guides is carried by a narrow vane 15. The other pair of guides is mounted adjacent to the opposite wall of the body (Figs. 5 and 10). 40 An opening 16 in the top 6 so registers with the guides as to enable withdrawal of the screen frame when a narrow hinged door 17 (Fig. 4) is lifted.

A heating coil 18 constitutes the means for heating the air passing through the louvers 11 and screen 12. This air may, in practice, be heated by means other than steam which is intended to be used in the coil 18. The latter is supplied with steam by a valved pipe 19. One of the top coils has a branch pipe 20. This pipe contains a valve 21, the handle of which extends to a point above the top 6. The lowermost coil has a discharge pipe 22 which includes a drain valve 23 and water trap 24.

A sizing tank 25 is situated close enough to the coil 18 to obtain some of the heat. This renders the sizing more fluent and facilitates its being sprayed onto the cloth from the inside of the garment (Fig. 1). The tank 25 is filled through a spout 26 which is accessible at a point above the top 6. The spout has a stopper 27 which holds in pressure.

The sizing in the tank is subjected to fluid pressure which is conducted into the tank through a pipe 28 from a reservoir (not shown). This reservoir may comprise an air pressure tank such as is not uncommon in dry-cleaning establishments. The sizing is conducted from the tank by an outlet pipe 29 (Fig. 9) which has an end 30 extending close to the bottom of the tank 25. The pipe 29 contains a valve 31, the handle of which extends to a point above the top 6.

A shutter 32 (Fig. 9) is intended to regulate the flow of hot air passing from around the coil 18. The shutter is slidable in the slot of an elongated boss 33 on the top 6. A thumb screw 34 is used to adjust the size of the aperture 35 through which the hot air flows. Both the screen frame 13 and shutter 32 can be seated in a groove in the floor 5, the respective grooves being designated 36, 37 (Fig. 9). One side of the shutter 32 slidably abuts a narrow vane 38 (Fig. 11), similar to the vane 15.

Hot air is drawn through the aperture 35 by a fan 39 (Fig. 9). This fan is operated by a motor 40. The motor is mounted on the body 4 in any suitable manner, for example on stud bolts 41 which support it in a substantially centered position. The motor is electrically operated, and the current is controlled in any preferred way, for example by a switch 42 (Fig. 3) which includes a movable arm 43 and contacts 44. These have a resistance wire 45 between them, the purpose being to provide a variable rate of speed.

An upright tubular standard 46 is fixedly mounted on the body 4 by means of a foot plate 47 which is bolted down to the floor 5 as at 48 (Fig. 9). The standard goes through an opening in the top 6 and extends an appreciable distance above the top. It slidably contains a cylindrical rack 49. The rack comprises a cylindrical bar with spur teeth cut in one side (Figs. 4 and 9).

A collar 50, secured to the standard 46 in any ordinary way, has parallel ears 51 which provide bearings for a shaft 52. The shaft has a spur pinion 53 in mesh with the rack teeth, and a crank handle 54 for turning. As the shaft 52 is turned in one direction or the other, the rack 49 is raised or lowered with respect to the top 6, and thereby adjusted to the approximate length of the garment to be resized and dried. The garment G (Fig. 1) may be carried by an ordinary coat hanger 55, or some appropriate equivalent, which is hung on a hook 56 on the free end of an arm 57 adjustably clamped at 58 to the rack 49.

A head 59, providing an air chamber, is fixedly secured at one of its open ends to the body 4 around the opening 8 as at 60. The other opening of the head designated 61, is directed upwardly. Air is blown into the chamber 59 by the fan 39. The air will be hot when the coil 18 is in operation and the shutter 32 is open. Cold air may be blown into the chamber 59 although the coil 18 is in operation, but at that time the shutter 32 must be closed. A ventilator 62 (Fig. 1) is situated in the side of the body 4, or in some other convenient place, this being adapted to be opened to admit air directly from the outside.

An arm 63 (Fig. 9) carries an upstanding shaft

64 in a central position with respect to the opening 61. The shaft is made rigid on the arm. The arm is firmly secured to the head 59 by bolts 65 or their equivalents, these also securing a bracket bearing 66. The arm 63 is braced by a stand pipe 67 which at one end screws into the arm under the shaft 64 and at the other end into a floor flange 68. The shaft 64 has three diameters 69, 70, 71. These are progressively smaller in the order given. The first two are smooth but the last is threaded to receive a nut 72 by means of which the assemblage is held together.

This assemblage comprises a central gear 73 which is revoluble on the largest diameter 69. A center bearing block 74 is fitted upon the intermediate diameter 70, and is locked with a spline 75 (Fig. 9) so that it cannot turn. This block rests on the shoulder formed by the first diameter 69, there being a sufficient clearance for the free revolution of the gear 73. When the nut 72 is screwed home the foregoing assemblage is held in proper position on the shaft 64, as previously stated.

Four sockets 76 (Fig. 4) in the block 74 provide bearings for the inner ends of as many radial screw shafts 77. Another socket 78 (Fig. 4), also in the block 74 and between a pair of the sockets 76, provides the inner bearing for an operating shaft 79. The bracket 66 provides the outer bearing for this shaft (Fig. 9). The shaft 79 has a handle 80 for its operation. A drive pinion 81 is secured to the shaft in mesh with the sun gear 73. Revolution of the gear 73 results from the turning of the shaft 79 and pinion 81 by means of the handle.

Turning motion is transmitted from the central gear to pinions 82 which are fixed on the respective radial screw shafts 77. The shafts are prevented from slipping out of their sockets by pins 83 (Fig. 6) which are driven far enough into the block 74 so that their points enter grooves 84 in the inner ends of the shafts. The pins and grooves comprise a swivel. The screw shafts operate a plurality of stretching sections emplaced in annular formation upon the rim of the opening 61, and inasmuch as each of the sections is alike the immediate description is confined to one of the sections, but corresponding reference characters have similar parts which are later applied to companion sections.

Consider the stretching section in the upper left quarter of Figure 4. The section is generally designated 85. It comprises an arcuate plate 86 which is approximately one-fourth of a circle in length. It has a threaded bracket 87 (Figs. 6 and 9) secured to its nether side by screws 88 or their equivalents. The threaded part of the bracket contains the screw shaft 77. As the screw shaft is turned the plate 86 is moved back and forth in a radial direction. The upper part of the bracket is dovetailed at 89 (Fig. 8). The dovetailed sides rest on the confronting beveled sides 90 of guides 91 which are fixedly secured to the head 59 by rivets 92 or the like. The bracket 87 slides upon the guides 91 in the radial movement of the arcuate plate 86.

A clamp 93 (Fig. 7) grips a portion of the garment so as to spread the latter over the head opening 61. This clamp has arcuate bands 94, 95. Each has applied to it a strip 96 of rubber, felt or some other suitable material which will improve the gripping quality. The strips are applied to the bands in confronting positions (Fig. 7), and their surfaces can be serrated if the nature of the material used makes that preferable.

The bands 94, 95 are, respectively, an upstanding part of the plate 86 and of a lever 97 which is pivoted at 98 to a bracket 99. The bracket is suitably secured to the plate 86. A spring 100, of sufficient strength and of proper form, is applied to the lever and bracket in such a way that its tension tends to close the clamp and so tightly grip the garment. The clamp is opened by pressing on the free end of the lever 97.

Now reverting to the plurality of stretching sections 85, it is readily seen that a garment suspended from the hook 56 at the top (Fig. 1) and gripped at the bottom will stand in position for treatment according to the principle of the machine. If the garment G is a dress as shown, the upper part will be held by the coat hanger 55 and the hem of the skirt will be gripped by the clamps 93. The stretching sections 85 are simultaneously moved in their respective radial directions to suit the diameter of the skirt by turning the handle 80 in one or the other direction.

The sizing and drying operations then follow. Steam and sizing are discharged into the skirt through minute holes 101, 102 in the ring pipes 103, 104 which, respectively, are connected with the branch steam pipe 20 and sizing outlet pipe 29. These pipes are horizontally centered in the head opening 61. They are held in place by supports 105 which extend inwardly and are secured to the block 74 by screws 106 (Fig. 9) or their equivalents.

The two pipes are banked substantially on the order illustrated in Figures 6 and 9. The steam ring pipe 103 is close enough to the sizing ring pipe 104 to keep the sizing warm and facilitate its atomization. The holes 101, 102 are so close together that the steam and sizing are commingled, and as the steam tends to escape through the interstices of the cloth it carries the sizing with it but leaves the latter in the form of a deposit in the cloth. During this part of the operation the motor 40 will be operated at low speed. Afterward, the steam and sizing are turned off at the valves 30, 31 (Fig. 9), whereupon the motor 40 is turned on at top speed. The hot air dries the dress.

The operation is readily understood. Cloth from which large numbers of women's garments are made is, to a large extent, of the foregoing type which has a filling of sizing to give it luster. Taking such a garment to be the skirt G (Fig. 1), and assuming that the skirt has been put through a cleaning process, the machine is set to stretch the garment and resize it so that it will be returned to the owner in true form and appearance.

The garment is first hung on the coat hanger 55 and suspended from the hook 56. The stretching sections 85 are expanded to a diameter to suit the diameter of the hem of the skirt. The hem is then gripped by the clamps 93. Turning of the crank handle 55 (Fig. 4) raises the rack 49 so as to stretch the garment. The steam and sizing are then turned on. As these elements escape at the holes 101, 102 (Fig. 4) they commingle and resize the cloth as the mixture passes through.

The impregnation will be assisted by running the motor 40 at low speed. The fan 39 then charges a moderate current of air into the head 59 and through the opening 61. The air may either be hot or cool as required. When the shutter 32 is open (Fig. 9) hot air will escape at the aperture 35. Upon opening the ventilator 62 (Fig. 1) the cool air will be admitted, but then the shutter 32 must be closed. As previously stated,

the motor 40 will be run at top speed after the resizing operation has been completed, thereby causing the fan 39 to drive a more powerful air current through the garment for the purpose of drying.

I claim:—

1. A machine of the character described comprising means for holding a garment in an open position, means for discharging sizing into the open garment, and a fan for driving a current of air into the garment, first to aid in depositing the sizing in the interstices of the cloth, second to dry the cloth.

2. A machine of the character described comprising means for holding a garment in an open position, a sizing tank and means at which sizing from the tank is discharged into an open end of the garment, a steam coil located adjacently to the tank so that the heat of the steam will render the sizing more fluent preparatory to its discharge, and means at which steam from the coil is discharged into said open end of the garment to commingle with the sizing and insure its deposition in the interstices of the cloth as the steam passes through the garment.

3. A machine of the character described comprising means for holding a garment in an open position, a sizing tank and means at which sizing from the tank is discharged into an open end of the garment, a steam coil located adjacently to the tank so that the heat of the steam will render the sizing more fluent preparatory to its discharge, means at which steam from the coil is discharged into said open end of the garment to commingle with the sizing and insure its deposition in the interstices of the cloth as the steam passes through the garment, and a fan for blowing a current of air into said open end of the garment to aid the action of the steam and subsequently to dry the garment.

4. A machine of the character described comprising a head providing an air chamber and having inlet and outlet openings, a fan to blow air into the inlet opening, clamping means to grip a garment in an open position over the outlet opening so that the air blows into the garment and through the cloth, and a perforated sizing ring pipe centered with respect to the outlet opening, at which pipe sizing is dischargeable to be picked up by the air current.

5. A machine of the character described comprising a head forming an air chamber and having inlet and outlet openings, a fan to blow air into the inlet opening, stretching sections in annular position around the outlet opening, clamping sections to grip one end of a garment, said sections being carried by the stretching sections, a turnable gear centered in the outlet opening, means operable by said gear to move the sections in radial directions thereby to open said end of the garment, and at least one perforated ring pipe centered with respect to the stretching sections, said pipe being adapted to discharge a fluid at its perforations to be picked up by the air current.

6. A machine of the character described comprising a head providing an air chamber and having inlet and outlet openings, a fan to blow air into the inlet opening, stretching sections arranged in annular form with respect to the outlet opening, said sections including arcuate plates overlying the open end, means to adjust said sections in radial directions from a common center, clamping means carried by the sections to grip one end of a garment and hold said end

in a fully open position by virtue of said adjustment, at least one perforated ring pipe to discharge a fluid at its perforations at the outlet openings, and means to fixedly hold said pipe centered with respect to the stretching sections and opening.

7. In a machine of the character described, a head having an outlet opening, a plurality of arcuate plates emplaced in annular formation upon the rim of said opening, garment clamping means carried by said plates, a bearing block centered with respect to said plates and opening, a central gear, means supporting the central gear and bearing block, screw shafts having bearing in said block and means on the undersides of said plates with which the screw shafts are connected, and pinions carried by the screw shafts in mesh with the central gear.

8. In a machine of the character described, a head having an outlet opening, a shaft centered in the opening and having at least two diameters, means fixedly supporting the shaft with respect to the head, a central gear revoluble on one of the diameters and means for revolving said gear, a bearing block fitted on the other diameter and means for fixing the block thereon, said block having radial sockets, screw shafts having bearing at their inner ends in said sockets and having pinions in mesh with the central gear, plates at the outlet opening each having means to grip a garment, a bracket carried by each plate having threaded engagement with one of the screw shafts, and means carried by the head adjacent to the outlet opening to slidably receive the brackets.

9. In a machine of the character described, a head having an outlet opening located in a horizontal plane, stretching sections located in the substantial plane of the opening, each section including clamping means to grip one end of the garment, operating means to simultaneously move said sections on radial lines with respect to a common center thereby to change the effective size of the opening and to change the positions of the clamping means, means also in the substantial plane of the opening at which a

fluid is dischargeable into said open end of the garment, hanging means from which the other end of the garment is suspended, a standard which is fixed with respect to the head, a rack slidable in the standard and carrying the hanging means, and means on the standard in engagement with the rack to slide the rack in the standard to vertically adjust the hanging means with respect to the opening.

10. In a machine of the character described, a hollow body having at least one opening, a head and means by which it is secured to the body over said opening, said head having an outlet opening, garment clamping and opening means situated substantially in the plane of said outlet opening, a fan for blowing an air current through the head, said fan having a motor situated in the body, a hollow standard carried by the body, a rack slidable in the standard, and a pinion in mesh with the rack, said standard having means turnably supporting the pinion, and hanging means carried by the rack for suspending the garment in a central position over the outlet opening.

11. In a machine of the character described, a hollow body, heating means and a motor driven fan contained by said body, a shutter across the body dividing the heating means from the fan, means to hold the shutter in adjusted position, said fan drawing air across the heating means when the shutter is open, and a ventilator in the body adjacent to the fan at which to draw in cool air when the shutter is closed.

12. A machine of the character described comprising a sizing tank and a spray pipe to which sizing is delivered from the tank, a steam heating coil located in proximity to the tank to warm the sizing by heat radiated by the coil, and a steam discharge pipe in proximity to the spray pipe having a branch pipe in connection with the coil to receive steam, the proximity of the steam discharge and spray pipes facilitating the atomization of the sizing.

WALTER ALCORN.
LLOYD HAMITER.