No. 712,209. Patented Oct. 28, 1902.

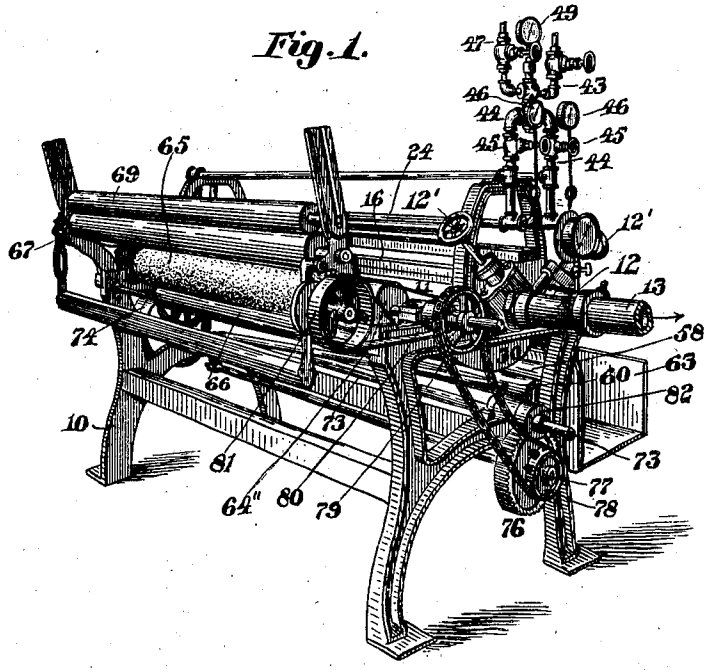
F. STINER.

CLOTH FINISHING MACHINE.

(Application filed May 11, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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Fig. 2.

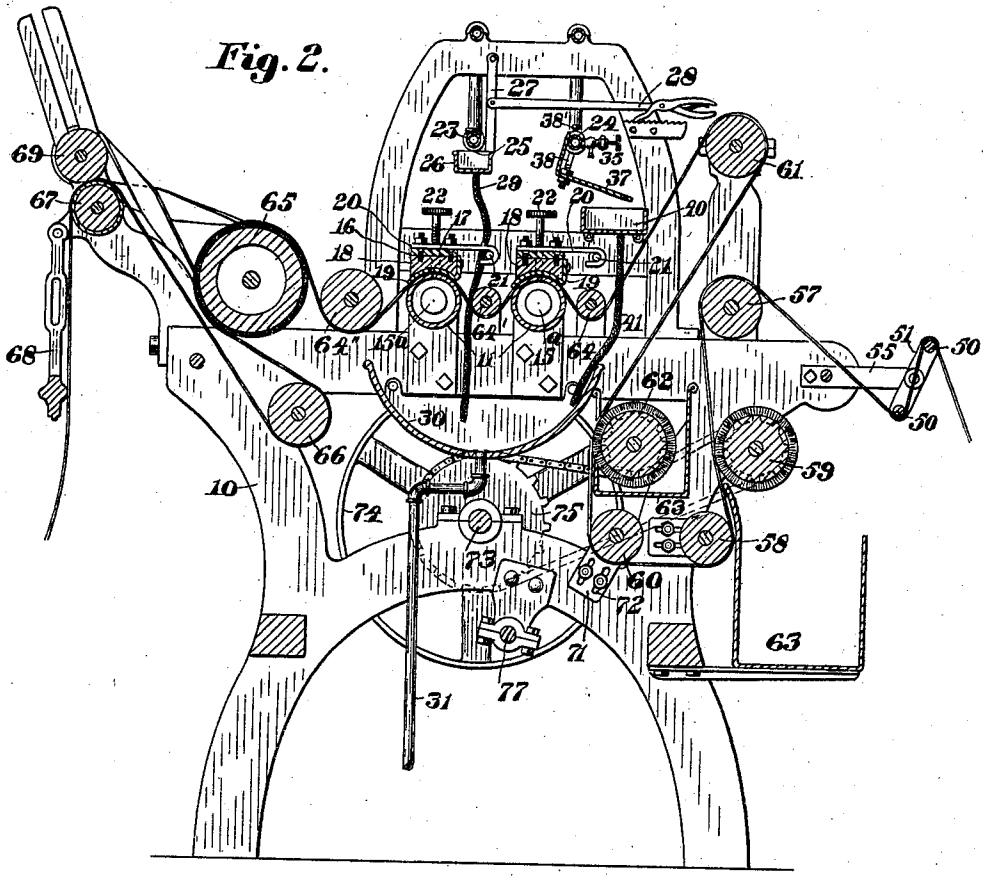


Fig. 4.

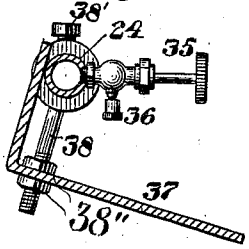


Fig. 3.

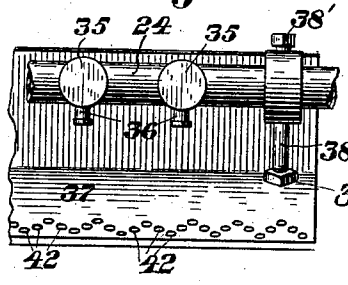
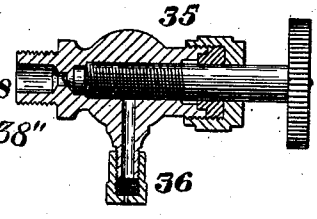


Fig. 10.



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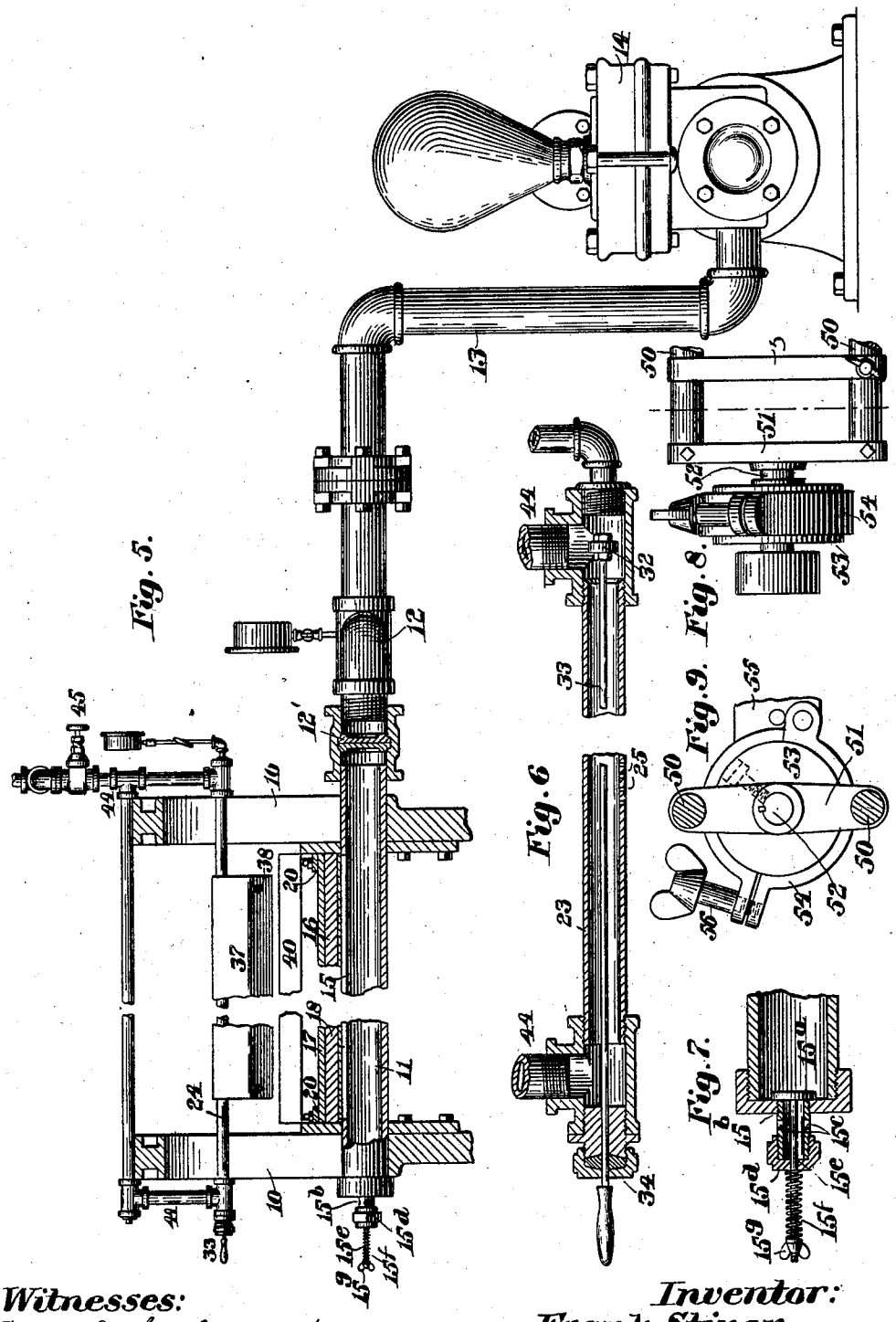
No. 712,209. Patented Oct. 28, 1902.

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(Application filed May 11, 1901.)

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UNITED STATES PATENT OFFICE.

FRANK STINER, OF LAWRENCE, MASSACHUSETTS.

CLOTH-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 712,209, dated October 28, 1902.

Application filed May 11, 1901. Serial No. 60,236. (No model.)

To all whom it may concern:

Be it known that I, FRANK STINER, a citizen of the United States of America, and a resident of Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Cloth-Finishing Machines, of which the following is a specification.

My invention relates to improvements in cloth-finishing machines, and more particularly to such machines which may be used to dampen a fabric to shrink it or preparatory to pressing or to extract therefrom liquid already present.

It has for its objects the various features hereinafter particularly described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of one form of my machine. Fig. 2 is a vertical transverse section thereof. Figs. 3 and 4 are details in side elevation and transverse section, respectively, of a sprinkler. Fig. 5 is a detail in elevation, parts being in section, showing sprinkling and exhaust systems with the pump connected to the latter. Fig. 6 is a vertical longitudinal sectional detail of one of the sprinklers. Fig. 7 is a similar view of an automatic relief-valve located at one end of the suction-conduit. Figs. 8 and 9 are details in side elevation and transverse section, respectively, of an adjusting device for the tension-bars; and Fig. 10 is a sectional detail of one of the sprinkler-valves.

Similar characters designate like parts throughout the several figures of the drawings.

The numeral 10 designates a suitable framework for the machine, on which are supported suction pipes or conduits 11 11, which may be two in number, these being supported side by side, extending transversely of the frame and connected by a suitable fitting 12 with a pipe 13, leading to an exhaust-pump 14, which serves to produce a suction through the conduits. Each of these conduits 11 11 is preferably provided with a valve 12', by which the force of the exhaust may be controlled, and have in their upper side one or more openings 15, which are here shown in the form of continuous longitudinal slots. Over these openings the fabric to be finished is drawn under tension, as will be hereinafter described.

In each suction-conduit, preferably at the opposite end from that connected with the exhaust-pump, is an automatic relief-valve, which may consist of a disk 15^a, seated against the inside of a cap upon the end of the pipe, covering an opening therein, in which is secured a sleeve 15^b, provided with lateral openings 15^c to the outer air. Upon this sleeve is a cap 15^d, and through an opening therein slides a rod or stem 15^e, connected to the disk. Surrounding the rod and bearing against the cap is a spiral spring 15^f, which at its other end may rest against a thumb-nut 15^g, threaded upon the rod. The tension of the spring is so adjusted by turning the nut that when the exhaust is of proper strength to produce the desired suction through the openings 15 in the conduit the disk will be held tightly against its seat, preventing the entrance of air through the opening; but if for any reason, such as an increase in speed of the pump, the degree of exhaustion should attain such a point as to render it liable to injure the moving fabric by drawing it down into the slot the spring will yield, permitting the outside air to rush in through the openings 15^c and past the edges of the disk, thus relieving the excess of atmospheric pressure upon the fabric.

Coacting with the suction-conduits are pressure members 16, here shown as extending longitudinally of the parts and consisting of a metal bar 17, to the under side of which is secured a bar 18, conveniently formed of wood, with its side adjacent to the conduit conformed thereto to exert a uniform pressure for some distance upon each side of the opening. A facing-strip 19, of leather or other preferably flexible and comparatively non-porous material, is removably secured to one side of the wooden bar and extends between it and the conduit or fabric thereon. Each bar may be supported by arms 20, extending laterally therefrom at or near the ends and pivoted at 21 to the frame. Screws 22 preferably extend through the bars at each end, with their ends bearing upon the suction-conduits or some other stationary member. These serve when turned to raise or lower the members, thus preventing their approach closer to the conduits than a predetermined distance, and therefore varying the amount of pressure that will be exerted upon

the fabric passing beneath them, the weight of the bars alone being sufficient to give the desired maximum pressure. These bars as they bear upon the fabric extend far enough upon all sides of the slots in the conduits to obstruct the free passage of air therethrough and at the same time press the moisture from the fabric.

Above the fabric are shown two sprinklers 23 and 24, which, as illustrated, are of different types, the former consisting of a pipe extending transversely of the machine and preferably provided with a series of openings 25 in its under side, from which liquid is delivered to the fabric below. If it is not desired to use the sprinkler, a trough 26, supported upon arms 27, pivoted to the frame, may be moved by a handle 28 below the openings, receiving their discharge and permitting it to be carried away by a pipe 29, which delivers to a trough 30, supported below the suction-conduits on the frame of the machine and provided with a discharge-pipe 31. The trough 30 also serves to catch any liquid extracted from the fabric by the pressure members which may flow down the sides of the suction-conduits. Within the pipe 23 is preferably located a head or swab 32, mounted upon a rod 33, extending through a stuffing-box 34 at one end of the pipe. As the swab is drawn back and forth through the pipe by its rod it will free the openings of any obstruction which may accumulate.

The sprinkler 24 may consist of a pipe situated similarly to 23 and provided with a plurality of openings, preferably at one side, in which are mounted valves 35, the outlets of which are conveniently in a plane at one side of the pipe and are covered by perforated screw-caps 36, reducing the size thereof. These valves may be opened to a greater or less extent to regulate the quantity of liquid discharged by the sprinkler, and this may be also controlled by the use of caps having different-sized perforations. The valves also enable any one of the sprinkler-openings to be entirely closed, allowing the caps to be readily removed and cleared of any obstruction. Below the outlets of the valves is situated a deflector 37, which may be formed of bent metal having a deflecting or contact surface extending in a direction nearly parallel to the valves, but preferably inclined somewhat downwardly toward a length of the cloth passing through the machine and a rear guard or extension rising at substantially right angles therefrom at the upper side only of the inclined contact-surface. From this deflector project arms 38, embracing the pipe, each being provided with a set-screw 38′, contacting therewith, to adjust the deflector at various inclinations. The arms are preferably threaded and the deflector adjustably retained in position thereon by pairs of nuts 38″ 38″. As the jets of liquid from the outlets of the valves impinge upon the deflecting or contact surface they break into a fine spray and fall upon the surface of the fabric, serving to very uniformly moisten it, the degree of moisture imparted depending upon the angle at which the deflecting-surface is inclined to the direction of the jets and the velocity of impact of the jets themselves, together with the distance of the surface from the outlets, which may be varied by the swinging of the deflector-arms about the pipe or the movement of the deflector itself upon the arms. Beneath the outer end of the deflecting-surface is provided a trough 40, from which a discharge-pipe 41 leads to the trough 30, receiving any excess of liquid which does not reach the fabric as spray. At the lower edge of the deflector is a series of openings 42, placed in "staggered relation" or at different distances from the valve-outlets. This will prevent the liquid from accumulating, as would be the case if it simply flowed off the straight edge of the deflector, and obviate the danger of its overflowing with sufficient force to cause it to be projected beyond the side of the trough and directly upon the fabric.

The delivery-pipes 23 and 24 of the sprinkler are connected with a liquid-supply pipe 43 through suitable connecting-piping 44. In the connections for each sprinkler is a valve 45, enabling either to be entirely shut off or the force of flow through all the openings regulated, and a pressure-gage 46. A steam-pipe 47 is connected with the liquid-supply pipe, providing the means for heating the supply to the desired temperature, and in the piping, under the influence of both the steam and liquid, may be situated the thermometer 49.

The fabric enters the machine under tension-bars 50 50, which may be supported upon arms 51 51, each provided with a trunnion 52. One of the trunnions preferably carries a disk 53, and acting upon the disk is a divided clamping-ring 54, hinged to an arm 55, extending from the frame and provided with a screw 56, serving to draw the parts together and clamp them upon the disk to lock the arms and tension-bars at any desired angle. From the tension-bars the fabric passes over a guide-roll 57 and then downwardly under a guide-roll 58, the intermediate stretch of fabric being subjected to the action of a rotating brush 59, which brushes the back side of the fabric. From the guide-roll 58 the fabric passes under a similar roll 60 and thence upwardly over a roll 61, the face or front side in its passage bearing against a rotating brush 62. Under the brushes 59 and 62 may be situated receptacles 63 for lint and the like removed from the fabric. From the guide-roll 61 the fabric runs under a roll 64, then upwardly between a suction-conduit and its pressure member, then down under a roll 64′, and then up between the other conduit and pressure member. From the rear of the last conduit the fabric passes down under a guide-roll 64″, then up over a draft-roll 65, provided with a suitably-roughened surface. From the draft-roll it runs down under a guide-roll 66 and

then up over a final guide-roll 67, from which point it may pass either downwardly by an oscillating folder 68 or upwardly to a winding-roll 69. Certain of the guide-rolls may be adjustably mounted in bearings upon brackets 71, attached to the frame by bolts passing through slots 72 in said brackets.

Journaled in the frame is a main driving-shaft 73, which may be rotated by a belt upon a pulley 74. This driving-shaft carries a sprocket-wheel 75, from which a chain extends over a sprocket-wheel upon one of the brushes and then under a similar wheel upon the other, causing their rotation in opposite directions at a considerable rate of speed. The opposite end of the driving-shaft is connected by slow-down gearing 76 with a counter-shaft 77, journaled in the frame. This counter-shaft carries a sprocket-wheel 78, from which a chain passes over a sprocket-wheel 79, fast upon the shaft of the draft-roll. A pulley 80 on the draft-roll shaft may be connected by a belt to a larger pulley 81, which actuates the folder. This system of gearing attains the desired slow speed of passage of the fabric through the machine, which it would be otherwise difficult to secure from the overhead shaft commonly employed to drive the exhaust-pump, which is run at a high speed. The counter-shaft may have turning loosely upon it an idler 82, preferably provided with a somewhat-yielding covering, as of leather, which will be so located as to press against the sprocket-chain and keep it from rattling.

It will be seen that when the machine is employed for dampening the fabric one or both valves 45 will be opened, and the sprinklers can be adjusted to deposit water upon the face thereof very uniformly and in any desired quantity, while the valves being above the jets discharged above the deflector and not inclosed thereby are freely accessible and may be adjusted by the attendant during the operation of the machine. When it is in use for extracting moisture from a previously-dampened fabric, these valves will be closed and the water-supply cut off. In either case the moisture will be drawn through the fabric from the front by the exhaust acting through the openings in the suction-conduits, so that the face of the goods is prevented from being streaked by the "bleeding" of dyes with which the backing may be impregnated, and during the whole process the fabric is kept smoothly stretched and free from wrinkles.

Having thus described my invention, I claim—

1. In a cloth-finishing machine, the combination with means for supporting and moving the fabric, of a sprinkler comprising a pipe situated above the path of the fabric and provided with a plurality of openings, a valve in each of the openings, and a deflector having a contact-surface situated beneath the valves against which their discharge impinges inclined downwardly toward the fabric, said deflector having an upward extension at the upper side only of the inclined contact-surface.

2. In a cloth-finishing machine, the combination with means for supporting and moving the fabric, of a sprinkler comprising a pipe situated above the path of the fabric and provided with a plurality of openings, a valve in each of the openings, a removable perforated cap covering the outlet of each valve, and a deflector having a contact-surface situated beneath the valves against which their discharge impinges inclined downwardly toward the fabric, said deflector having an upward extension at the upper side only of the inclined contact-surface.

3. In a cloth-finishing machine, the combination with means for supporting and moving the fabric, of a sprinkler comprising a pipe situated above the path of the fabric and provided with a plurality of openings, a valve in each of the openings, a deflector having a contact-surface situated beneath the valves against which their discharge impinges inclined downwardly toward the fabric, said deflector having an upward extension at the upper side only of the inclined contact-surface, and a trough situated beneath the lower end of the deflector.

4. In a cloth-finishing machine, the combination with means for supporting and moving the fabric, of a sprinkler comprising a pipe situated above the path of the fabric and provided with a plurality of openings, a valve in each of the openings, a deflector having a contact-surface situated beneath the valves against which their discharge impinges inclined downwardly toward the fabric, said deflector having an upward extension at the upper side only of the inclined contact-surface, and means for adjusting the contact-surface toward and from the valves.

5. In a cloth-finishing machine, a sprinkler comprising a pipe provided with a plurality of openings at one side thereof for the discharge of a liquid, a deflector provided with a contact-surface situated below the pipe and movable about the same, and a valve for controlling the flow from each opening projecting from the side of the pipe in a direction nearly parallel to the contact-surface and having its outlet on said side toward the deflector.

6. In a cloth-finishing machine, a sprinkler comprising a pipe provided with a plurality of openings at one side thereof for the discharge of a liquid, arms adjustably mounted to turn about the pipe, a deflector carried by the arms and situated below said pipe, and a valve for controlling the flow from each opening projecting from the side of the pipe in a direction nearly parallel to the deflector and having its outlet on the side toward said deflector.

7. In a cloth-finishing machine, a sprinkler comprising a pipe provided with a plurality of openings at one side thereof for the dis-

charge of a liquid, a deflector situated below the pipe, a valve for controlling the flow from each opening projecting from the side of the pipe in a direction nearly parallel to the deflector and having its outlet on said side toward the deflector, and means for supporting the deflector to turn about the pipe whereby its angular relation to the liquid-jets and distance from the valve-outlets may be simultaneously adjusted.

8. In a cloth-finishing machine, a sprinkler comprising a pipe provided with a plurality of openings at one side thereof for the discharge of a liquid, a deflector situated below the pipe, a valve for controlling the flow from each opening projecting from the side of the pipe in a direction nearly parallel to the deflector and having its outlet on said side toward the deflector, means for supporting the deflector to turn about the pipe whereby its angular relation to the liquid-jets and distance from the valve-outlets may be simultaneously adjusted, and independent means for adjusting the position of the deflector toward and from the outlets.

9. In a cloth-finishing machine, a sprinkler comprising a pipe provided with one or more openings for the discharge of a liquid, a deflector situated beneath the valves and provided with a guard-wall rising at an angle therefrom and extending by the pipe at one side only, and arms adjustably mounted to turn upon the pipe upon which the deflector is supported.

10. In a cloth-finishing machine, a sprinkler comprising a pipe provided with one or more openings for the discharge of a liquid, a deflector situated beneath the valves and provided with a guard-wall rising at an angle therefrom and extending by the pipe at one side only, arms adjustably mounted to turn upon the pipe upon which the deflector is supported, and means for varying the point of support of the deflector upon the arms.

11. In a cloth-finishing machine, a sprinkler comprising a pipe provided with a plurality of jet-openings, a deflector having a surface common to all the openings, supports upon which the deflector is mounted, means for adjusting the supports to vary the inclination of the deflector to the jets and means for adjusting the deflector along the supports at different distances from the openings.

12. In a cloth-finishing machine, a sprinkler comprising a pipe provided with a plurality of openings, arms embracing the pipe, a deflector carried by the arms opposite the openings, and set-screws extending through the arms and engaging the pipe.

13. In a cloth-finishing machine, a sprinkler comprising a pipe provided with one or more openings for the discharge of a liquid, and a deflector having a surface against which the liquid impinges, and provided with a plurality of openings toward which the liquid flows.

14. In a cloth-finishing machine, a sprinkler comprising a pipe provided with one or more openings for the discharge of a liquid, and a deflector having a surface against which the liquid impinges and provided with a plurality of openings situated at different distances from the openings in the pipe.

15. In a cloth-finishing machine, the combination with a suction-conduit provided with one or more openings, of a pressure member coacting therewith extending for a considerable distance on each side of the openings and conformed to the conduit.

16. In a cloth-finishing machine, the combination with a suction-conduit, of a pressure member coacting with the conduit and adjustable toward and from the same, and means for preventing the approach of the pressure member closer to the suction-conduit than a predetermined distance.

17. In a cloth-finishing machine, the combination with a suction-conduit, of a pressure member coacting with the conduit and adjusting-screws extending through the pressure member and bearing upon a relatively fixed member.

18. In a cloth-finishing machine, the combination with a suction-conduit, of a pressure-bar pivotally supported at one side thereof, and screws extending through the bar and engaging the conduit.

19. In a cloth-finishing machine, the combination with a suction-conduit, provided with one or more openings, of a pressure-bar coacting therewith for some distance on each side of said openings and having its side adjacent to the conduit conformed thereto, and a facing for the bar on the side toward the conduit consisting of a comparatively non-porous material.

20. In a cloth-finishing machine, the combination with a suction-conduit, of a pressure member comprising a metal bar, a wooden bar conformed to the conduit, and a facing-strip secured to the wooden bar and extending between it and the conduit.

Signed by me at Lawrence, Massachusetts, this 4th day of May, 1901.

FRANK STINER.

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