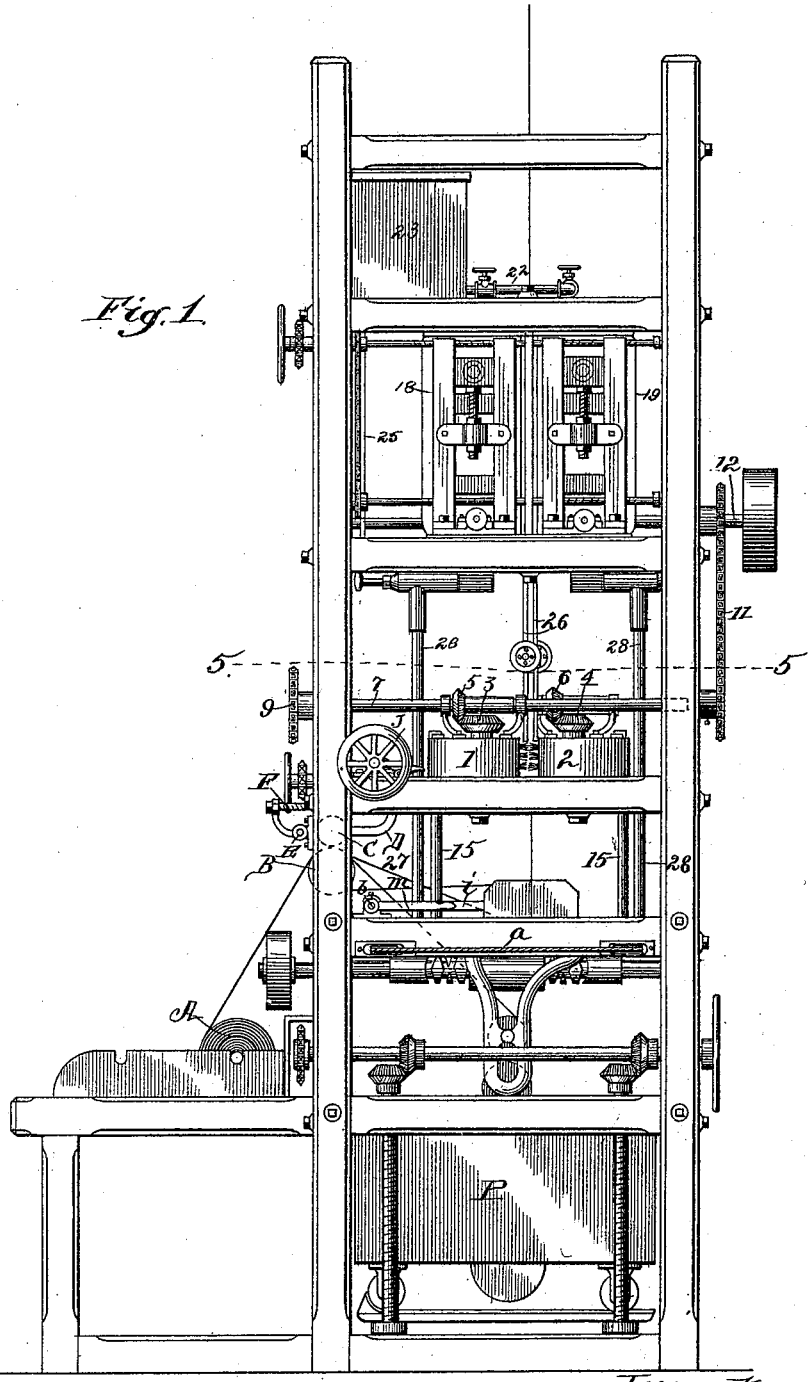
(No Model.) 4 Sheets—Sheet 1.

E. H. SCHOFIELD.

CLOTH PAINTING MACHINE.

No. 494,493. Patented Mar. 28, 1893.

Fig. 1.



Witnesses.
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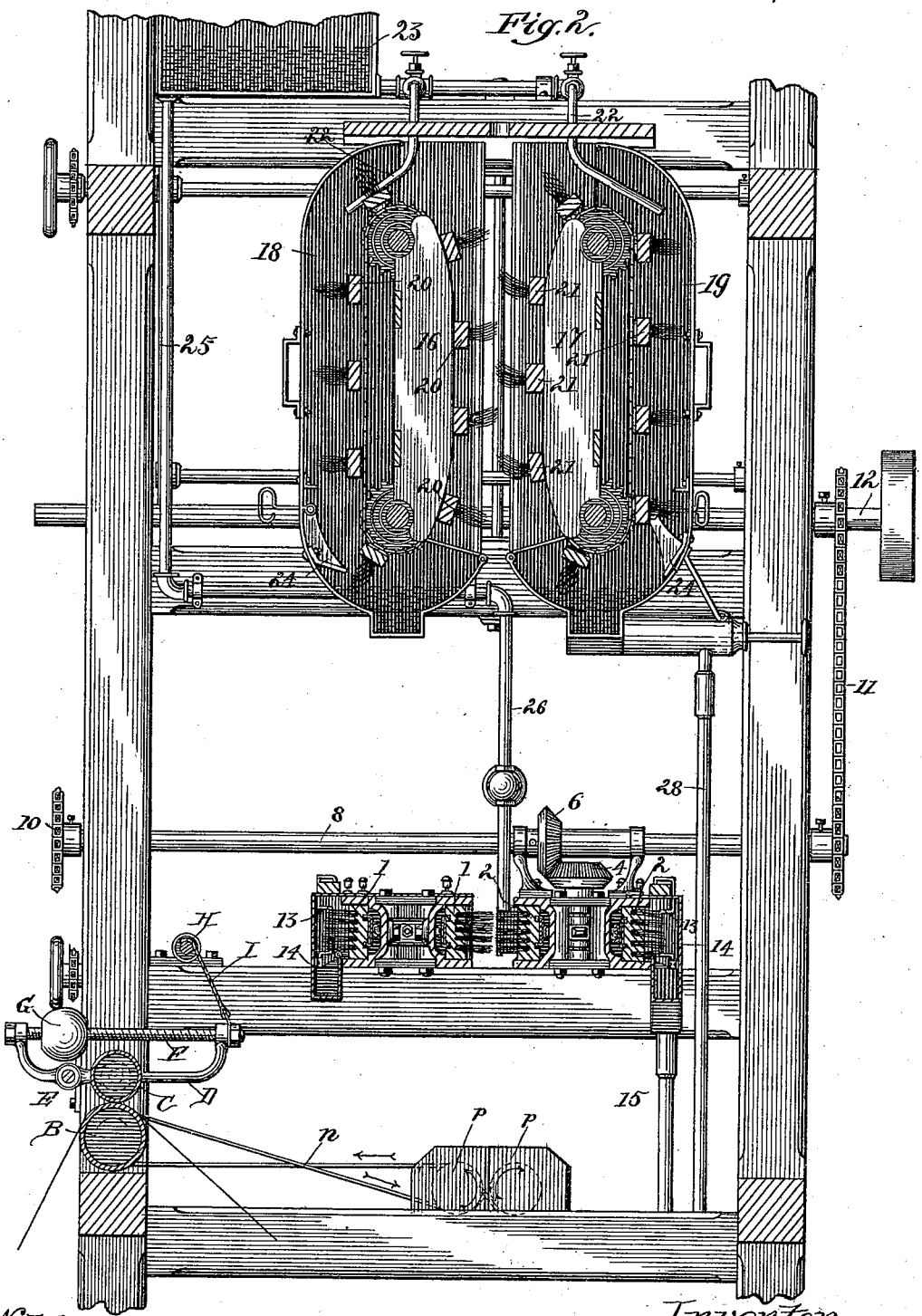
Fig. 2.



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(No Model.) 4 Sheets—Sheet 3.

E. H. SCHOFIELD.

CLOTH PAINTING MACHINE.

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Fig. 3.

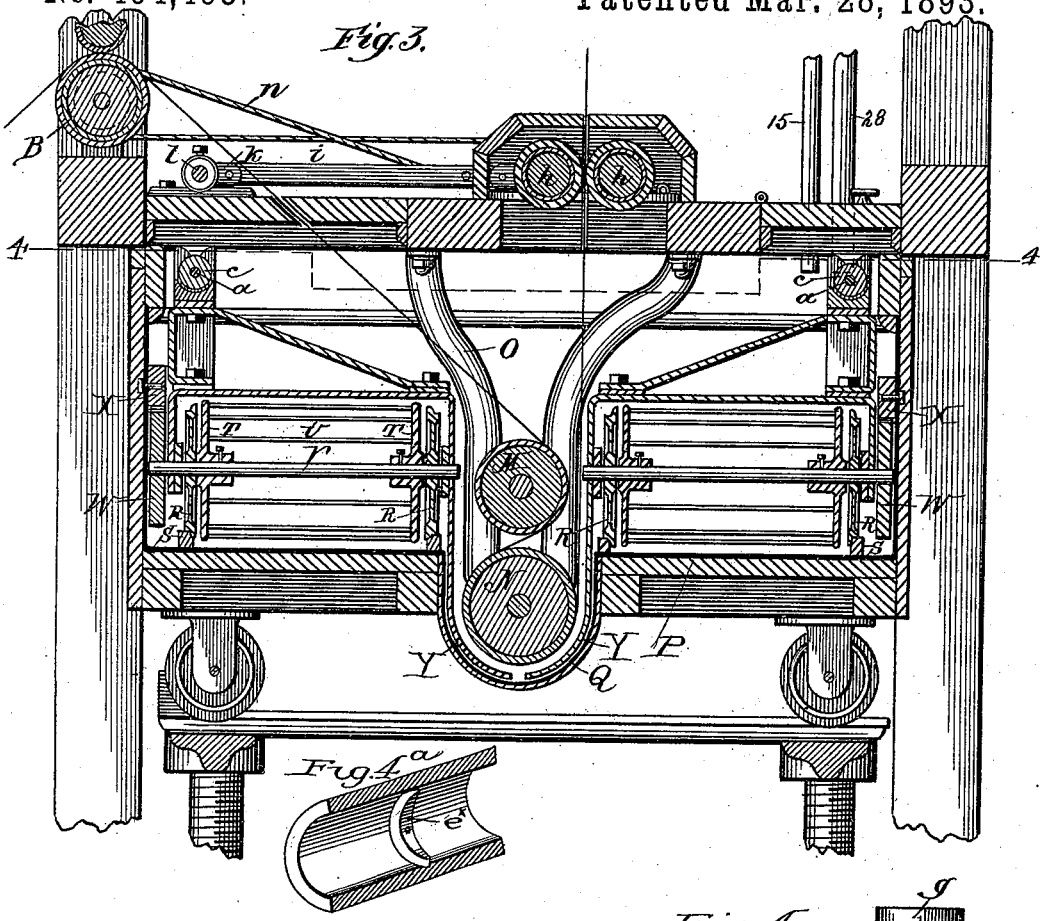
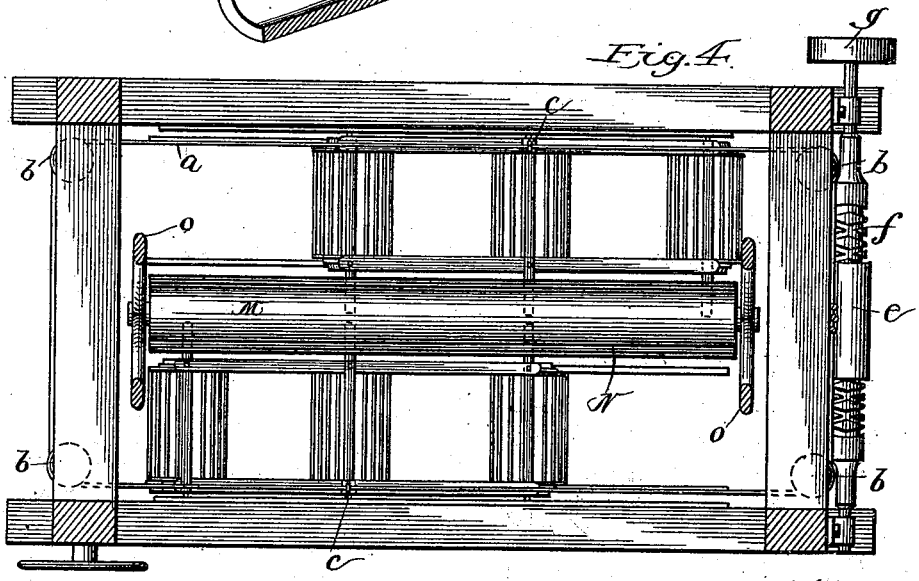


Fig. 4a

Fig. 4.



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CLOTH PAINTING MACHINE.

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Fig. 5.

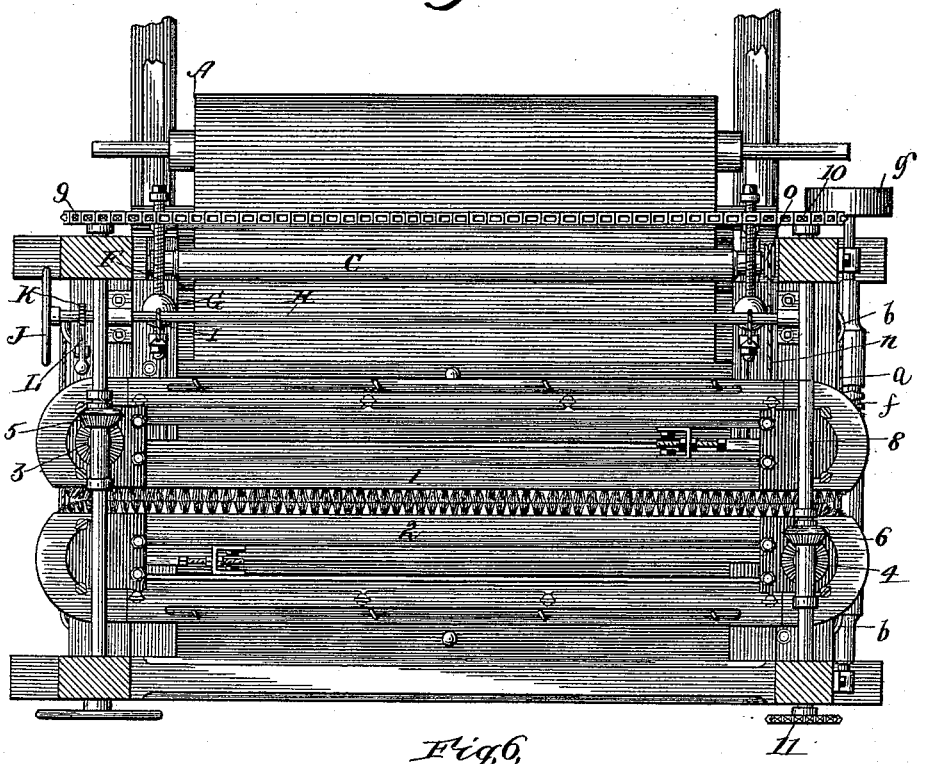
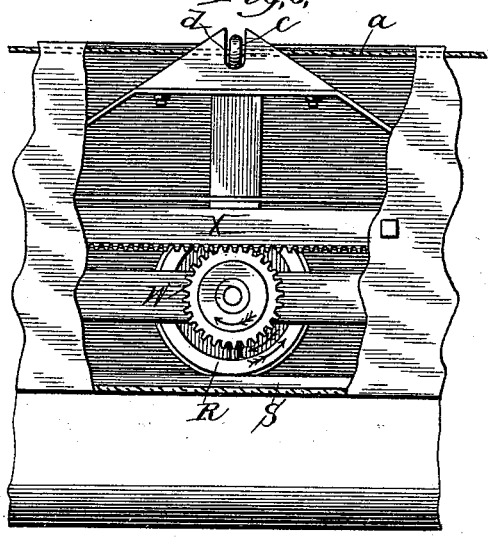


Fig. 6.



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UNITED STATES PATENT OFFICE.

EUGENE H. SCHOFIELD, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO OREN DUNHAM, OF LUDINGTON, MICHIGAN.

CLOTH-PAINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,493, dated March 28, 1893.

Application filed July 23, 1891. Serial No. 400,419. (No model.)

To all whom it may concern:

Be it known that I, EUGENE H. SCHOFIELD, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Cloth-Painting Machines, of which the following is a specification.

This invention relates to improvements in machines designed for painting or coating a continuous web of cloth while passing through the machine, but is more especially designed for use in connection with the manufacture of shade cloth for window shades.

The prime object of this invention is to apply the paint and uniformly spread the same upon the surface of the cloth so as to impart thereto a smooth and perfect finish without streaks or marks of any kind whether due to the brushes or to a surplus of paint whereby the market value of the cloth is materially enhanced, and cost of production materially reduced by performing the operation automatically and continuously upon an endless web of cloth.

Another object is to have the paint applying mechanism of such character that while the paint is continuously agitated practically all of it contained in the vat may be applied uniformly to the web without necessitating the refilling of the vat to accomplish successful work.

A further object is to have the web fed through the machine in a smooth condition and under a constant and sufficient tension to insure the even painting or coating thereof.

Other objects are to provide a tension device of novel construction and operation, and adjustable in such manner that the tension may be changed for different kinds, widths and weights of cloth; to combine with the tension device squeeze rollers for removing the surplus paint, co-operating therewith in such manner that while the rollers are actuated by the tension device the cloth is not subjected to any pull or strain from the squeeze rollers; to provide an agitator for the paint vat of novel construction and which automatically keeps the paint in a constantly agitated condition without the slightest interference with the application of the paint to the cloth by the vat rollers; to provide for cleaning the paint applying brushes at any time when necessary without the necessity for removing or disconnecting the brushes; and finally to provide certain novel details of construction in the carrying out of my invention, all as illustrated in the accompanying drawings, in which:—

Figure 1 represents the side elevation of a cloth painting machine embodying my invention; Fig. 2 an enlarged vertical central section through the upper half of the machine, more particularly illustrating the construction and relative location of the paint applying brushes; Fig. 3 a similar view of the lower portion of the machine more particularly illustrating the construction and operation of the paint vat and its directly co-operating connections; Fig. 4 a horizontal section on the line 4—4 of Fig. 3. Fig. 4ª is a detail perspective view, hereinafter described; Fig. 5 a horizontal section on the line 5—5 of Fig. 1, and Fig. 6 a sectional elevation of a portion of a paint vat showing a part of the vat broken away to more clearly disclose the mechanism for actuating the stirrers.

Similar letters and numerals of reference indicate the same parts in the several figures of the drawings.

In the practical operation of my machine the cloth or web to be painted is wound from one roll onto another, during which operation it is passed first through a tension device which maintains the cloth in a sufficiently taut and smooth condition for the proper application of the paint, thence into a paint vat in which it is immersed and the paint applied thereto, after emerging from which it passes on between squeeze rollers which remove the surplus paint, and thence first between a pair of endless horizontally traveling brushes, which work transversely over the cloth, and next between a pair of vertically traveling endless brushes, which move longitudinally over the cloth for the final finish, the various groups of mechanism co-operating with each other in successive operations to produce the finished painted cloth, by a succession of operations each of which is dependent upon the others for successful results in the finished article.

Referring by letters and figures to the ac-

companying drawings, A indicates the reel upon which the unpainted cloth is wound, B a guide roll, preferably located above the reel, and C a tension roller between which and the guide roller the cloth is passed. The guide roller is loosely journaled in the frame of the machine while the tension roller is loosely journaled in a U shaped bracket D about the center of length thereof which bracket is in turn pivotally supported at E upon the frame of the machine and has journaled in the ends thereof a screw threaded rod F upon which works a correspondingly threaded weight G which when rotated is caused to move along the rod toward and away from the pivotal support of the bracket and thus furnish an adjustable pressure for the tension roller by which the tension of said roller upon the cloth may be adjusted to give the necessary tension to the cloth. It will thus be seen that the centers of the guide and tension rollers are in a vertical line with each other while the pivot of the bracket supporting the tension roller is to one side of the line through the center of said rollers, which construction not only enables the changing of the pressure of the tension roller but also permits the said roller to be swung upward away from the guide roller whenever such operation becomes necessary in the starting of the cloth through the machine, which operation may be readily effected by means of the rotary shaft H loosely journaled upon the frame of the machine above the bracket and connected with one end thereof by means of ropes I, one end of said shaft having mounted thereon a hand wheel J, for convenience in manipulation, and the ratchet wheel K engaged by a weighted or spring actuated pawl L pivoted to the frame of the machine (see Fig. 5.) by means of which the shaft, which acts as windlass, may be locked after the ropes are wound thereon so as to maintain the tension roller in an elevated position as long as desired.

From the tension device thus described the cloth passes around a pair of vat rollers M, N, arranged one above the other and loosely journaled in hangers O depending from cross bars on the frame of the machine so that when the paint vat P, which is vertically adjustable for the sole purpose of changing or refilling the vat, is brought up into position, the rollers will hang suspended therein without direct connection therewith, which gives greater convenience in the manipulation of the machine while at the same time imparts greater stability thereto than if the rollers were journaled in the vat. With the rollers arranged one above the other and the cloth passing around the upper one first, on one side, and thence down around the lower one to the opposite side, the paint will be pressed into or through the cloth alternately from opposite sides, and afterward applied thereto in an even coating on each side by passing vertically upward from the lower roller through the entire contents of the vat.

The bottom of the vat is provided with a semi-cylindrical depression Q of slightly greater diameter than the lower vat roller N and in which the said roller works so that in operation practically all of the paint contained in the vat may be used before it becomes necessary to refill the vat.

In order that the paint may not settle on the bottom of the vat or in the depression or pocket Q therein I prefer to provide a stirrer of suitable character which will constantly agitate the paint during the operation of the machine. To this end I provide at each side of the pocket or depression in the vat a carriage traveling back and forth parallel with the vat rollers and mounted upon wheels R running upon rails S laid upon the bottom of the vat. In these carriages are mounted a series of agitators comprising a pair of disks T connected by rods U and mounted upon shafts V journaled in the frame of the carriage, upon the outer end of each of which shafts is keyed a pinion W adapted and arranged to engage a fixed rack X secured to the walls of the vat so that as the carriages are moved back and forth in the vat the agitators will be rotated in alternately opposite directions and thus keep the paint constantly stirred.

From each carriage depends a series of curved arms Y extending down into the pocket beneath the lower vat roller, the ends of the arms on each carriage extending nearly to the center of the depression so that as the carriages are moved back and forth these arms operate to stir the paint in the depression at the same time that the agitators are stirring it in the body of the vat, and hence no opportunity is given the paint for settling either on the bottom or in the pocket of the vat.

Any suitable mechanism may be employed for causing the carriages to reciprocate, many forms of which are now well known to skilled mechanics, one, and the preferred, construction being illustrated in the drawings comprising an endless cable working in a horizontal plane about four pulleys *b* loosely journaled in the frame of the machine at opposite sides thereof, so as to bring the two longest sides of the cable parallel with but above the outer edge of the frames of the respective carriages. On each of these portions of the cable is mounted a button *c* adapted and arranged to seat in a suitable socket *d* formed in the frame of the carriage as more clearly illustrated in Figs. 3, 4, and 6, so that when the endless cable is moved about the pulleys in one direction the carriages will be moved thereby simultaneously in opposite directions and when the movement of the cable is reversed that of the carriages will be similarly reversed thus producing a constant reciprocation of the carriages in alternately opposite directions. This endless cable is secured at a suitable point to a non-rotatable sleeve *e* mounted

upon a double or endless worm shaft *f* and provided with a dog $e^{\times}$ and pivoted therein as shown in Fig. 4^{a} of usual form in such devices which, traveling in the endless worm, causes the sleeve to travel back and forth as the worm is rotated continuously in one direction by a belt pulley *g* mounted on one end thereof, or equivalent mechanism, thus through the medium of the sleeve imparting the desired movement of the cable back and forth to cause the reciprocation of the carriages connected therewith as before described.

Immediately above the vat rollers is journaled in the frame of the machine a pair of squeeze rollers *h*, one of which has adjustable bearings which slide in guides of any suitable character so that the roller so supported may be moved toward and away from the other roller by some such device as the rods *i* connected at one end respectively with the bearings of the roller and at their opposite ends with crank arms *k* upon a rock-shaft *l* at one side of the machine having a crank handle *m* secured thereto for convenience in actuating the shaft. The normal position of these rollers, which are preferably padded, is in contact with each other under sufficient pressure to squeeze the surplus paint from the cloth as it passes therebetween, and the rollers are only separated while starting the cloth through the machine, and when not in use. It is desirable, and in fact essential, to the successful operation of the machine that these rollers neither lag or drag upon the cloth as it is drawn therethrough, nor revolve with a greater surface speed than that of the cloth as in either event the scraping resulting from the difference in travel between the cloth and the rollers would be detrimental to the finish of the cloth, the cloth would slip through at times without revolving the rollers and this would result in uneven and unsightly places in the finish thereof and I have found by practice that to produce the best and most perfect results the surface speed of the squeeze rollers should coincide exactly with that of the cloth. In order to produce this result I provide a twisted belt *n* working over a pulley *o* mounted upon one end of the shaft of the guide roller B and around a pair of pulleys *p* keyed on the ends of the squeeze roller shafts, between which the belt is also crossed as more clearly illustrated in Fig. 2, so that when the guide roller is caused to revolve by the action of the cloth thereon it will impart to the squeeze rollers, through the medium of the belt and pulley connection just described, a corresponding rotation in the direction indicated by arrows in said figure, and as the various pulleys and rollers correspond in diameter and are dependent solely upon the movement of the cloth for their actuation, obviously the surface speed of all of such rollers will substantially correspond with that of the cloth.

Above the squeeze rollers at a suitable distance is arranged a pair of endless brushes, 1 and 2, traveling in a horizontal plane parallel with the squeeze rollers and therefore transversely of the cloth which passes between the opposing brushes, which said brushes consist of a series of brushes attached to endless chains, but are designated by me as "endless brushes" for convenience and clearness of description. These brushes may be actuated by any suitable means so as to travel in either the same or opposite direction, but the latter mode of operation is preferred and may be accomplished in many different ways such as by keying upon the shafts of the driving sprocket wheels at the opposite ends of the brushes, beveled gears, 3 and 4, meshing with and driven by corresponding beveled gears, 5 and 6, mounted upon cross shafts 7 and 8 journaled in the frame of the machine, which shafts are connected together by a sprocket chain working over sprocket wheels 9 and 10 on the ends thereof, and one of said shafts is driven by a sprocket wheel and chain connection, 11, with the power shaft 12 operated in any convenient manner. These horizontally traveling endless brushes operate simultaneously upon both sides of the cloth, transversely of its length, while the cloth is passing between them, which combined travel of the brushes and cloth has the effect of causing the brushes to move over the surface of the cloth in opposite diagonal directions and thus effectually smooth the coating of paint thereon, the paint accumulated and picked up by the brushes in passing over the cloth being constantly removed therefrom by scrapers 13, located in suitable casing 14 attached to the support of the endless brushes, which casing has connected therewith a pipe, 15, for conducting the paint so removed from the brushes back to the vat. After passing from between the horizontal endless brushes the cloth ascends vertically between a pair of vertically traveling endless brushes, 16 and 17, corresponding in general structure with the endless brushes 1 and 2, and working in suitable casings, 18 and 19, which are open on their inner opposing sides so as to permit the brushes to work through against the cloth, over which they move longitudinally in the same direction, that is downwardly, the sections 20 of one brush preferably alternating with the section 21 of the other brush, so that each pair of sections on one brush act as a support for the cloth against the pressure of the intervening section of the other brush, thus operating to stretch and smooth the cloth while spreading and evening the paint thereon, and thereby materially contributing to the high degree of finish obtained by a machine having the general features of construction previously described. These brushes may be actuated in any suitable manner from the power shaft 12 and may, if desirable, be made adjustable toward and away from each other for convenience in the first passing of the

cloth therebetween, as may also the horizontal endless brushes 1 and 2, but as the adjustability of these brushes may be attained in many ways well known to the skilled mechanic, I have not deemed it necessary to herein illustrate or describe the same in detail. The lower ends of the casing 18 and 19 constitute chambers which are intended to be partially filled with benzine by pipes, 22, leading from a reservoir, 23, above the vertical endless brushes, so that as the brushes revolve they will dip down into the benzine and then pass over adjustable scrapers, 24, located in the lower ends of the casings in the path of the brushes, by which scrapers the benzine and surplus paint adhering to the brushes will be removed therefrom. A pipe, 25, also leading from the benzine reservoir ends in two parallel pipes, 26, the ends of which respectively terminate just above the working sides of the horizontal endless brushes 1 and 2 so as to drop the benzine thereon whenever it is desired to clean these brushes, the scrapers, 13, of which are also adjustable. It will of course be understood that during the operation of cleaning the brushes the cloth is removed, as it would otherwise be rendered valueless by the action of the benzine and paint, and that this cleaning operation only occurs at such intervals as may be rendered necessary by the character of the paint, the pipes 22 and 26 being supplied with suitable valves to control the flow of the benzine. The chambers in the lower ends of the casings 18 and 19 are also provided with valved discharge pipes, 27 and 28, through which the paint and benzine are discharged into the paint vat after the brushes are thoroughly cleaned, it being understood that the scrapers for both the horizontal and vertical brushes are moved out of the path of the brushes after the cleaning operation is completed. By the combined operations of these horizontal and vertical endless brushes the paint is spread evenly upon and thoroughly incorporated with the fibers of the cloth, filling the interstices of its weft and at the same time perfectly smoothing and finishing the cloth ready for its delivery to a dryer and storage upon suitable reels, the vertical brushes by "crossing" finishing the work commenced by the horizontal brushes giving a smoothness and finish to the cloth which it could not otherwise have.

I am aware that prior to this invention stationary horizontal brushes working upon both sides of the cloth have been employed in connection with rotary brushes located above the same, but I am not aware that prior to this invention a pair of horizontally traveling endless brushes working simultaneously upon both sides of the cloth and moving transversely over the cloth in either the same or opposite directions, have ever before been used either by themselves, or in conjunction with rotary brushes such as shown in the prior art, or in conjunction with vertically traveling endless brushes such as herein shown and described, and I therefore desire to claim these features broadly in that they possess great utility and combine many advantages which are fully set forth above.

Having described my invention, what I desire to claim and secure by Letters Patent is—

1. In a cloth painting machine, the combination with the paint applying devices, of endless traveling belts between which the painted cloth is passed and brushes secured to each belt at a distance from one another, substantially as set forth:

2. In a cloth painting machine, the combination with the paint applying devices, of endless traveling belts between which the painted cloth is passed, and brushes secured at intervals to such belts, the brushes on one belt being opposite the spaces between the brushes on the other belt, substantially as set forth:

3. In a cloth painting machine the combination with the paint applying devices of a pair of endless brushes between which the painted cloth is passed, and means for causing said brushes to move transversely across the cloth, substantially as described.

4. In a cloth painting machine the combination with the paint applying devices of a pair of endless brushes between which the painted cloth is passed, and means for moving said brushes transversely across the cloth in opposite directions to each other, substantially as described.

5. In a cloth painting machine, the combination with the paint applying devices of two pairs of endless brushes between which the cloth is passed, one pair of said brushes being actuated to move transversely across the cloth and the other longitudinally of the cloth, substantially as described.

6. In a cloth painting machine the combination with the paint applying devices of two pair of endless brushes between which the painted cloth is passed, one pair of said brushes being actuated to travel transversely across the cloth in opposite directions to each other, and the other pair being actuated to travel longitudinally of the cloth in the same direction, substantially as described.

7. In a cloth painting machine, the combination with the paint applying devices and a pair of squeeze rolls between which the painted cloth is passed, of a pair of traveling endless brushes working on opposite sides of the cloth, each of said endless brushes being composed of a series of brushes with spaces between them, substantially as set forth:

8. In a cloth painting machine, the combination with the paint applying devices and a pair of squeeze rolls between which the painted cloth is passed, of a pair of traveling endless brushes adapted to work on opposite sides of the cloth, each of said brushes being composed of a series of brushes arranged at intervals and the brushes in one series being arranged opposite the spaces between the

brushes in the other series, substantially as set forth:

9. In a cloth painting machine the combination with the paint applying devices and a pair of squeeze rollers, of a pair of endless brushes working on opposite sides of the cloth and traveling transversely of the cloth in opposite directions to each other, substantially as described.

10. In a cloth painting machine the combination with the paint applying devices and a pair of squeeze rollers, of two pairs of endless brushes working on opposite sides of the cloth, one pair of said brushes traveling transversely of the cloth and the other pair traveling longitudinally of the cloth, substantially as described.

11. In a cloth painting machine the combination with the paint applying devices and a pair of squeeze rollers, of two pairs of endless brushes working on opposite sides of the cloth, said brushes of one pair traveling transversely of the cloth in opposite directions to each other and the brushes of the other pair traveling longitudinally of the cloth in the same direction, substantially as described.

12. In a cloth painting machine, the combination with paint applying devices and endless traveling brushes, of casings inclosing said brushes and being open at their adjacent sides, and scrapers arranged in said casings in the paths of said brushes substantially as set forth.

13. In a cloth painting machine the combination with paint applying devices endless traveling brushes, arranged to operate on opposite sides of the cloth casings inclosing the said brushes and chambers in said casings, of adjustable scrapers located in said chambers and adapted and arranged to be brought into the path of the brushes, a benzine containing tank and valved pipe connection between said tank and chambers, and discharge pipes for said chambers, substantially as described.

14. In a cloth painting machine the combination with paint applying devices endless traveling brushes, arranged to operate on opposite sides of the cloth casings inclosing the said brushes, and chambers in said casings, of adjustable scrapers located in said chambers and adapted and arranged to be brought into the path of the brushes, and discharge pipes for said chambers, substantially as described.

15. In a cloth painting machine the combination with a reel, a paint vat and suitable guide and immersing rollers of a tension device engaging the cloth between the reel and the immersing rollers comprising a pair of U shaped brackets pivoted to the frame of the machine, a roller loosely journaled in said brackets to one side of their pivots, a bar extending across each of said brackets and a weight adjustably secured on each of said bars, substantially as described.

16. In a cloth painting machine the combination with a reel, a paint vat and suitable guide and immersing rollers of a pair of squeeze rollers, connected by a belt with, and driven by, the guide roller, substantially as described.

17. In a cloth painting machine the combination with a reel, a paint vat and suitable guide and immersing rollers of a tension device engaging the cloth between the reel and the immersing rollers and a pair of squeeze rollers connected by a belt with, and driven by, the guide roller, substantially as described.

18. In a cloth painting machine the combination with a reel, a paint vat and suitable guide and immersing rollers of a weighted tension roller between which and the guide roller the cloth is passed and a pair of squeeze rollers connected by a belt with and driven, by the guide roller, substantially as described.

19. In a cloth painting machine, the combination with a reel, a paint vat, and suitable guide and immersing rollers, of a pair of squeeze rollers having paddled surfaces, connected with and driven by the said guide roller, substantially as described.

20. In a cloth painting machine the combination with a reel, a paint vat, suitable guide and immersing rollers, and a tension device engaging the cloth between said reel and the immersing rollers, of a pair of endless traveling brushes working on opposite sides of the cloth, and means for removing the surplus paint from the cloth located between said brushes and the immersing rollers, substantially as described.

21. In a cloth painting machine the combination with a reel, a paint vat, and suitable guide and immersing rollers, of a pair of endless traveling brushes working on opposite sides of the cloth, means for causing said brushes to travel transversely of the cloth, and means for removing the surplus paint from the cloth located between said brushes and the immersing rollers, substantially as described.

22. In a cloth painting machine the combination with a reel, a paint vat, suitable guide and immersing rollers, of a pair of endless traveling brushes working on opposite sides of the cloth, means of causing the said brushes to travel transversely of the cloth in opposite directions to each other, and means for removing the surplus paint from the cloth located between the said brushes and the immersing rollers, substantially as described.

23. In a cloth painting machine the combination with a reel, a paint vat, suitable guide and immersing rollers, and a tension device engaging the cloth between said reel and the immersing rollers, of two pair of endless traveling brushes working on opposite sides of the cloth, means for causing one pair of said brushes to travel transversely of the cloth and the other pair to travel longitudinally of the cloth, and means for removing the surplus paint from the cloth located be-

tween said brushes and the immersing rollers, substantially as described.

24. In a cloth painting machine the combination with a reel, a paint vat, and suitable guide and immersing rollers, of a pair of endless traveling brushes working on opposite sides of the cloth, and a pair of squeeze rollers connected by a belt with, and driven by, the guide roller, substantially as described.

25. In a cloth painting machine the combination with a reel, a paint vat, suitable guide and immersing rollers, and a tension device engaging the cloth between said reel and the immersing rollers, of a pair of endless traveling brushes working on opposite sides of the cloth and a pair of squeeze rollers connected by a belt with, and driven by, said guide roller, substantially as described.

26. In a cloth painting machine the combination with a reel, a paint vat, and suitable guide and immersing rollers, of a pair of endless traveling brushes working on opposite sides of the cloth, means for causing said brushes to travel transversely of the cloth, and a pair of squeeze rollers connected by a belt with and driven by, said guide roller, substantially as described.

27. In a cloth painting machine the combination with a reel, a paint vat, suitable guide and immersing rollers, and a tension device engaging the cloth between said reel and the immersing rollers, of a pair of endless traveling brushes working on opposite sides of the cloth, means for causing said brushes to travel transversely of the cloth, and a pair of squeeze rollers connected by a belt with, and driven by, said guide roller, substantially as described.

28. In a cloth painting machine the combination with a reel, a paint vat, suitable guide and immersing rollers, and a tension device engaging the cloth between said reel and the immersing rollers, of two pair of endless traveling brushes working on opposite sides of the cloth, means for causing one pair of said brushes to travel transversely of the cloth and the other pair to travel longitudinally of the cloth, and a pair of squeeze rollers connected by a belt with, and driven by, the guide roller, substantially as described.

29. In a cloth painting machine the combination with a reel, a paint vat, suitable guide and immersing rollers, and a tension device engaging the cloth between the said reel and the immersing rollers, of two pair of endless traveling brushes working on opposite sides of the cloth, means for causing the brushes of one pair of said brushes to travel transversely of the cloth in opposite directions to each other, and the brushes of the other pair to travel longitudinally of the cloth in the same direction, and a pair of squeeze rollers connected by a belt with, and driven by, the guide roller, substantially as described.

30. In a cloth painting machine the combination with a reel, a paint vat, and suitable guide and immersing rollers, of a tension device engaging the cloth between the reel and the immersing rollers comprising a pair of U shaped brackets pivoted to the frame of the machine, a roller loosely journaled in said brackets to one side of their pivots, a bar extending across each of said brackets a weight adjustably secured on each of said brackets and a windlass for swinging said brackets on their pivots so as to elevate the roller, substantially as described.

31. In a cloth painting machine the combination with a reel, a paint vat, and suitable guide and immersing rollers, of reciprocating carriages working in said vat, rotary agitators journaled in said carriages and means for actuating said carriages and agitators, substantially as described.

32. In a cloth painting machine the combination with a reel, a paint vat, and suitable guide and immersing rollers, of reciprocating carriages working in said vat, rotary agitators loosely journaled in said carriages, stationary racks in said vat and pinions on the journals of said agitators engaging said racks, substantially as described.

33. In a cloth painting machine the combination with a reel, a paint vat, and suitable guide and immersing rollers, of reciprocating carriages working in said vat, rotary agitators loosely journaled in said carriages, fixed racks in the paint vat, pinions on the journals of the agitators engaging said racks, a horizontally reciprocating endless cable connected with and actuating the carriages and means for operating the same, substantially as described.

34. In a cloth painting machine the combination with a reel, a paint vat, and suitable guide and immersing rollers, of reciprocating carriages working in said vat, rotary agitatcrs loosely journaled in said carriages, fixed racks in the paint vat, pinions on the journals of the agitators engaging said racks, a horizontally reciprocating endless cable connected with and actuating the said carriages, a rotary endless-worm shaft, and a sleeve working thereon attached to said cable and provided with a pivoted dog working in said worm, substantially as described.

35. In a cloth painting machine the combination with a reel, a vertically adjustable paint vat and suitable guide and immersing rollers, of reciprocating carriages working in said vat, rotary agitators loosely journaled in said carriages, fixed racks in the paint vat, pinions on the journals of the agitators engaging said racks, a horizontally reciprocating endless cable detachably connected with, so as to actuate, the said carriages, and means for operating the said cable, substantially as described.

36. In a cloth painting machine the combination with a reel, and suitable guide and immersing rollers of a paint vat provided with a pocket or depression in the bottom thereof

in which the lower immersing roller works, and stirrers dipping into said pocket substantially as described.

37. In a cloth painting machine the combination with a reel, suitable guide and immersing rollers, and a paint vat provided with a pocket or depression in the bottom thereof in which the lower immersing roller works, of reciprocating carriages working in said vat, rotary agitators journaled in said carriages, and arms depending from said carriages and working in said pocket or depression, substantially as described.

38. In a cloth painting machine the combination with a reel, suitable guide and immersing rollers, and a vat provided with a pocket or depression in the bottom thereof in which the lower immersing roller works, of reciprocating carriages working in said vat, rotary agitators loosely journaled in said carriages, fixed racks in the paint vat, pinions on the journals of the agitators engaging said racks, a horizontally reciprocating endless cable connected with and actuating said carriages in alternately opposite directions, and arms depending from said carriages and working in said pocket or depression below the lower immersing roller, substantially as described.

EUGENE H. SCHOFIELD.

Witnesses:
R. C. OMOHUNDRO,
MANTON MANNICK.