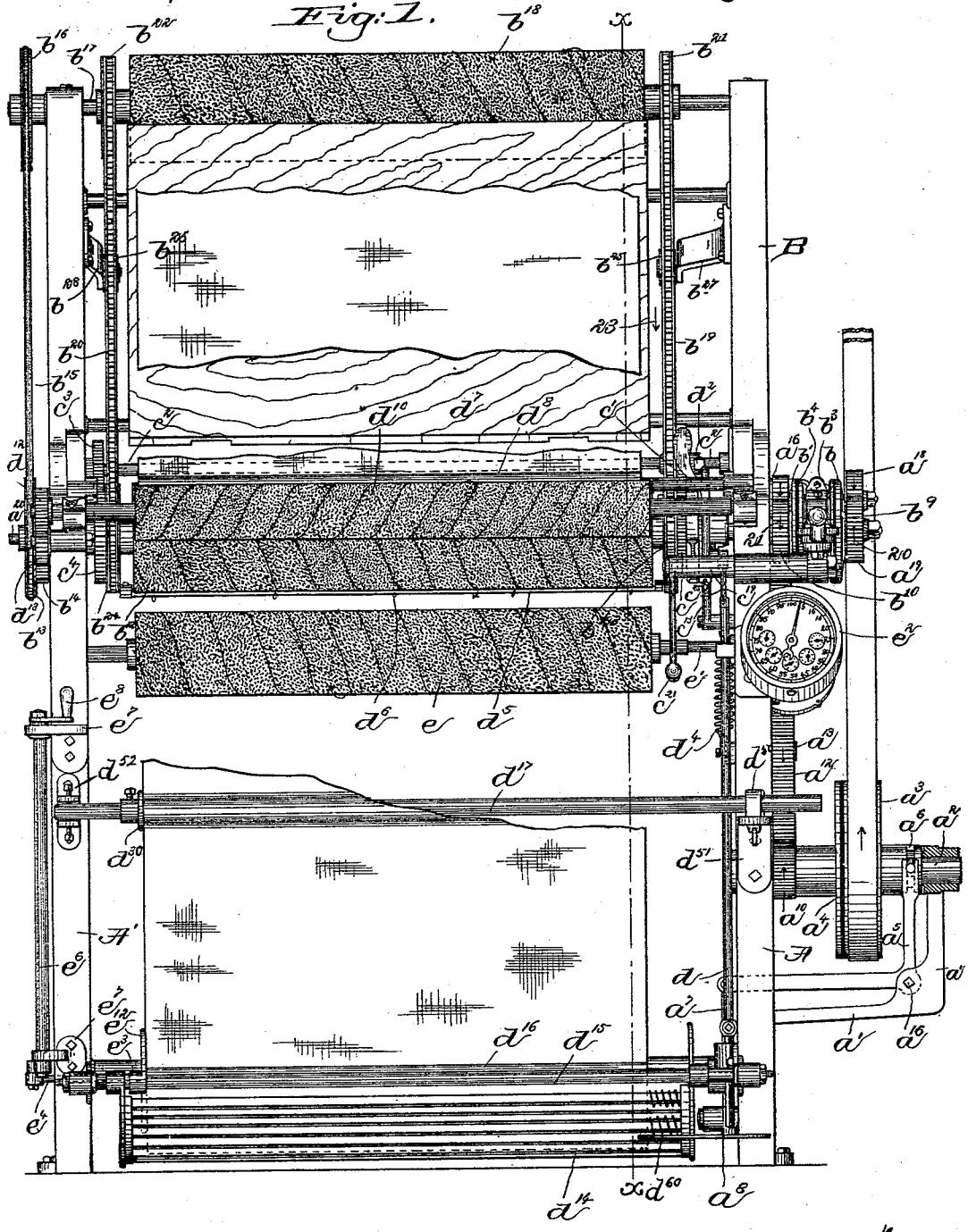
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A. S. DINSMORE.

APPARATUS FOR TREATING CLOTH.

No. 458,224. Patented Aug. 25, 1891.

Fig. 1.



Witnesses.
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APPARATUS FOR TREATING CLOTH.

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Fig: 2.

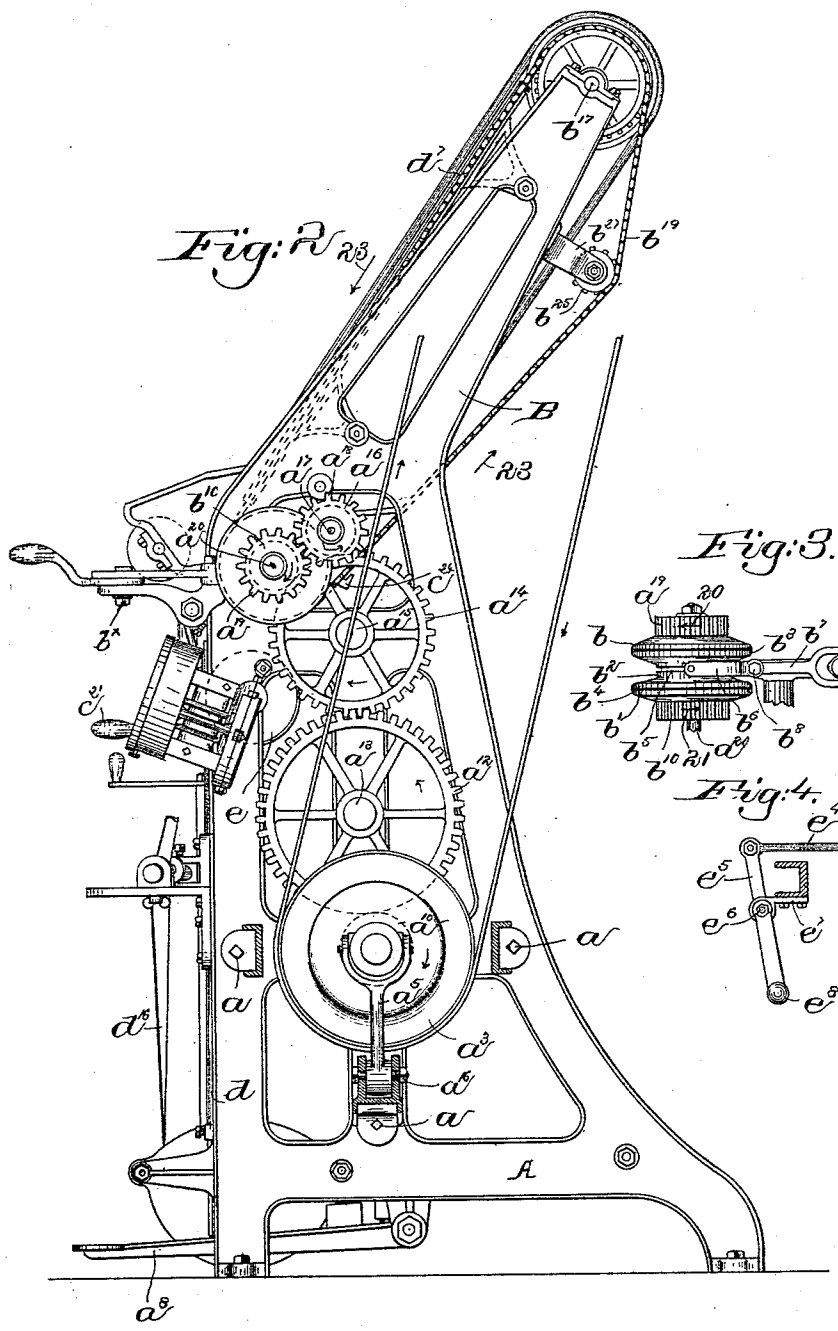


Fig: 3.

Fig: 4.

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(No Model.) 3 Sheets—Sheet 3.

A. S. DINSMORE.

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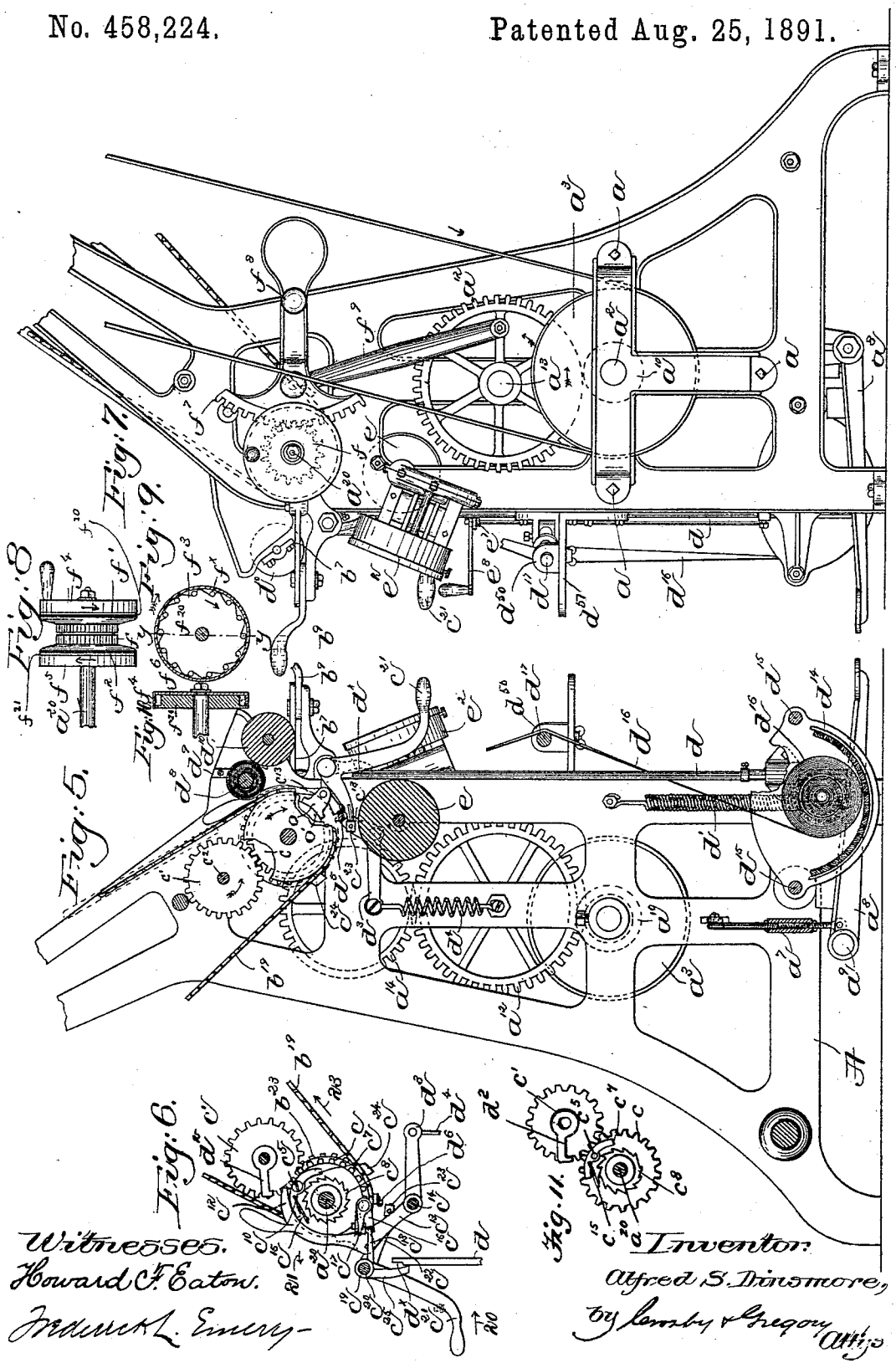


Fig. 7.

Fig. 9.

Fig. 8

Fig. 10

Fig. 5.

Fig. 6.

Fig. 11.

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UNITED STATES PATENT OFFICE.

ALFRED S. DINSMORE, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR TREATING CLOTH.

SPECIFICATION forming part of Letters Patent No. 458,224, dated August 25, 1891.

Application filed May 28, 1889. Serial No. 312,417. (No model.)

To all whom it may concern:

Be it known that I, ALFRED S. DINSMORE, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Apparatus for Treating Cloth, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to apparatus for treating cloth, and is especially adapted to be used in the inspection of cloth, and has for its object to construct a machine, as will be described, whereby both sides of the cloth may be inspected at the same time from one end or side of the machine. In accordance with my invention the cloth to be inspected is preferably taken from a roll, and is first carried, preferably, in front of the lower portion of the machine and secured to a carrier, preferably a hooked bar fastened to endless chains, by which the cloth is carried to the back of the machine, over the top or end, and then in front of the said machine, where the cloth is removed from the carrier and placed about a shaft or roller, upon which it is wound by a friction roller or surface, as will be described. One side of the cloth is presented to view to be inspected at one part of the machine, and the other side of the cloth is presented to view as it passes in front of the other portion of the machine.

The particular features of my invention will be pointed out in the claims at the end of this specification.

Figure 1 is a front elevation, partly in section, of one form of machine embodying my invention; Fig. 2, a side elevation, partly in section, of the same, looking to the left in Fig. 1; Figs. 3 and 4, details to be referred to; Fig. 5, a longitudinal section of a portion of the machine on line $x\,x$, Fig. 1, looking toward the right, parts being in elevation and parts being broken away; Fig. 6, a detail to be referred to; Fig. 7, a modification to be referred to; Figs. 8 and 9, details to be referred to; Fig. 10, a section on line $y\,y$ of Fig. 9, and Fig. 11 a detail to be referred to.

The machine herein shown is set upright, and consists of two side frames A A′, preferably made of iron or other suitable material of sufficient strength to sustain the working parts. The side frame A at or near its bottom has secured to it, as herein shown, as by bolts a, a T-shaped bracket a', in which is journaled one end of a main shaft a^2, having its other end supported by the side frame A. The main shaft a^2 has loosely mounted on it a driving-pulley a^3, which co-operates with a friction-disk a^4, fast on the shaft, the said pulley being moved longitudinally on the said shaft by a clutch mechanism, herein shown as the forked arm of a lever a^5, engaging a groove a^6 in the hub of the said pulley, the said lever being pivoted, as at a^{16}, to the casting a', and having its inner end connected, preferably by an adjustable turn-buckle a^7, to a treadle or foot-lever a^8, pivoted, as at a^9, to the side frame A and preferably extended out in front of the machine. The loose pulley a^3 is brought into engagement with the friction-disk a^4 to produce rotation of the main shaft by depressing the foot-treadle. The friction-disk a^4 has mounted on its hub a pinion a^{10} in mesh with a gear a^{12} on a shaft or arbor a^{13}, supported by the frame A, the gear a^{12} meshing with a smaller gear a^{14} on a shaft a^{15}, (see Fig. 2,) and the gear a^{14} meshes with a pinion a^{16}. (See full lines, Fig. 1, and dotted lines, Fig. 2.) The pinion a^{16} is mounted on a shaft a^{17}, having at its opposite end a small gear a^{18} in mesh with a gear a^{19} on a shaft a^{20}. The shaft a^{20} has mounted upon it a clutch mechanism consisting, as herein shown, of two loosely-mounted friction-disks b and b', (see Figs. 1 and 3,) between which is located to slide on the shaft a^{20} a hub b^2, keyed on said shaft and provided with disks b^3 b^4, the said hub being provided with a groove b^5, engaged by the arms b^6 of a forked lever b^7, pivoted as at b^8 and provided with a suitable handle b^9, which is herein shown pivoted, as at $b^\times$, to the frame of the machine, the said pivot having an enlarged head to loosely engage the slotted end of the lever b^7, whereby the said hub may be moved in opposite directions to produce opposite rotations of the shaft a^{20}, the enlarged head on the handle b^9 acting on the slotted end of the lever b^7 and turning the said lever on its pivot b^8, the enlarged head turning the slotted end of the lever in the same direction as the handle, and thereby moving the other end of the lever b^7 and the

hub b^2 in the opposite direction to that in which the said handle is moved. The gear a^{19}, as herein shown, is secured to the disk b, and both are loose on the shaft a^{20}, while the disk b' has secured to or forming part of it a pinion b^{10}, which is loose upon the shaft a^{20}, and is positively driven by the gear a^{14}, with which it is in mesh, as shown by dotted lines, Fig. 2. It will thus be seen that the gear a^{14}, through the pinion a^{16} and gear a^{18}, drives the gear a^{19}, as indicated by arrow 20, while the gear a^{14} at the same time drives the pinion b^{10} in the opposite direction, as indicated by arrow 21. The shaft a^{20} has its opposite ends supported in the side frames of the machine, and between the said frames it has fast upon it a friction-surface, preferably a roller b^{12}, which may be of wood or other material provided with a covering or surface of sand-paper or other rough material. The shaft a^{20} has mounted upon it beyond or outside of the side frame A', as herein shown, a pulley b^{13} and a gear b^{14}, the said pulley being connected by a suitable band b^{15} to a like pulley b^{16} on a shaft b^{17}, supported at the top of the frames A A', the upper portion of the said side frames marked B being shown as inclined from the lower or upright portion. The shaft b^{17} has fast on it between the side frames A A' a friction surface or roller b^{18}, which in practice is operatively connected to the friction-roller b^{12} by the cloth to be inspected. The shaft b^{17} has loosely mounted on it sprocket-wheels b^{21} b^{22}, which are connected by endless sprocket-chains b^{19} b^{20} to like sprocket-wheels b^{23} b^{24}, loose on the shaft a^{20}. The endless chains b^{19} b^{20} are connected preferably by a bar d^5, provided with a series of hooks d^6, which forms with the said chains a carrier by which the cloth is carried from one side, as the back, to the other side, as the front of the machine, as will be described. The endless chains b^{19} b^{20} are preferably passed about auxiliary sprocket-wheels b^{25} b^{26}, mounted on arms b^{27} b^{28}, secured to the side frames A A', (see Figs. 1 and 2,) to take up the slack in the chains, which are made of sufficient length to be readily removed from the sprocket-wheels on the friction-rollers. The sprocket-wheel b^{23}, loose on the shaft a^{20}, is rendered fast on the said shaft, so as to produce travel of the sprocket-chains, as herein shown, by a gear c, secured to or forming part of the sprocket-wheel b^{23} and in mesh with a pinion c' on a shaft c^2, having bearings in suitable brackets attached to the side frames and located, as herein shown, above the friction-roll b^{12}. The shaft c^2 is provided at its opposite end with a pinion c^3, which meshes with a gear c^4, secured to or forming part of the sprocket-wheel b^{24}, loosely mounted on the shaft a^{20}. The gear c has pivoted to its face, as at c^5, (see Fig. 6,) a pawl c^7, adapted to engage the teeth of a ratchet-wheel or gear c^8, keyed on the shaft a^{20}. The pawl c^7 is made, as herein shown, in the segment of a circle, it being pivoted at its center and having its rear arm c^{10} engaged when the machine is stopped or out of operation by an arm c^{12} of a lever c^{13}, pivoted as at c^{14}. The pawl c^7 has co-operating with it a spring c^{15}, which acts to throw the forward end of the pawl into engagement with the teeth of the ratchet-wheel c^8 when the arm c^{12} of the lever c^{13} is out of engagement with the arm c^{10} of the pawl—that is, when the machine is in operation. The lever c^{13}, as herein shown, has extended from it an arm c^{16}, upon which is pivoted a pawl c^{17}, adapted to engage a latch or arm c^{18}, extended from a sleeve c^{19}, mounted upon a shaft or arbor c^{20}. The sleeve c^{19} is provided with a handle c^{21}, and also with an arm c^{22}, extended in beneath the sprocket-wheel b^{23}, the said arm being provided at its end, as herein shown, with a cam or projection c^{23}, which is adapted to be struck by a cam or projection c^{24} on the endless chain b^{19}. The sleeve c^{19} is also provided with a depending arm c^{25}, adapted to engage a notch or tooth $d^{\times}$ at the upper end of a rod d, secured to the foot-treadle a^8, the said treadle having secured to it a spring d', (see Fig. 5,) by which it is lifted when the pawl c^{25} is disengaged from the tooth $d^{\times}$. The gear c' is preferably made smaller than the gear c, with which it meshes, (see Fig. 11,) and has secured to or forming part of it a dog d^2, which is adapted to strike the arm c^{10} of the pawl and lift the latter out of engagement with the teeth of the ratchet-wheel c^8 for a purpose as will be described. The lever c^{13} has its short arm d^3 connected to a spring d^4, (see Figs. 5 and 6,) by which the end c^{12} of the said lever is thrown forward into engagement with the arm c^{10} of the pawl to keep the latter out of engagement with the ratchet-wheel c^8. The end of the cloth is attached to the hooks d^6, by which it is carried in the machine herein shown up around the back side of the machine over the roller b^{18} and down in front of a blackboard d^7 until it reaches the starting-point—namely, the position shown in Fig. 1—when the cloth is disengaged and laid around a preferably-smooth shaft or roller d^8, having its ends supported, as herein shown, in brackets d^9, (see Fig. 5,) secured to the side frames of the machine. The brackets d^9 may also support, as herein shown, a friction-roller d^{10}, located in front of the friction-roller b^{12}, the roller d^{10} being rotated in the same direction as the roller b^{12}, as herein shown, by a gear d^{12}, in mesh with an intermediate gear or pinion d^{13}, (see Fig. 1,) driven by the gear b^{14} on the shaft a^{20}. The side frames at their lower ends, as at the front of the machine, support, as herein shown, a trough or receptacle d^{14}, mounted upon rods d^{15}, secured to the said side frames and in which the roll of cloth d^{16} to be inspected is placed.

In the practice of my invention as thus far described the operator takes one end of the cloth and first carries it up to the bar d^5 and engages it with the hooks d^6 thereon, the said cloth being preferably passed over a horizon-

tally-inclined bar or rod d^{17}, having one end, as herein shown, extended through a box d^{50}, secured to a bracket d^{51}, attached to the side frame A, and having its other end supported by a bracket d^{52}, attached to the side frame A′, and by which bar the cloth as it leaves the roll is put under tension, the said tension being greater at one side of the cloth than at the other—that is, the tension of the cloth passing over the outermost end of the bar, which may be supposed to be the right-hand end of the bar in Fig. 1, is greater than the tension upon the cloth passing over the left-hand end of the bar in Fig. 1, and as a result the roll in the receptacle or tub is drawn or forced toward the left-hand end of the said tub. It is evident that the bar or rod d^{17} may be inclined in either direction, or it may be straight and the tub or receptacle inclined in either direction and effect the same result. The cloth having been secured to the cross-bar d^5 is now ready to be carried, as herein shown, up the back side of the machine and down over the blackboard d^7, and to do this the operator first depresses the foot-treadle a^8 and through the turn-buckle a^7 and lever a^5 engages the loose pulley a^3 with the friction-disk a^4, thereby producing rotation of the shaft a^2. The loose pulley a^3 is maintained in contact with the friction-disk a^4 by locking the foot-treadle in its depressed position, which is accomplished by throwing the handle 21 of the sleeve 19 in the direction of arrow 20, Fig. 6, thereby bringing the pawl or arm c^{25} into engagement with the tooth $d^\times$ on the rod d. The inward movement of the handle c^{21} raises the arm c^{22} of the sleeve c^{19} and places the block or projection c^{23} thereon into position to be acted upon or struck by the cam c^{24} on the endless chain b^{19}. The lever c^{13} is now thrown back in the direction indicated by arrow 21, Fig. 6, leaving the arm c^{10} of the pawl free to be acted upon by the spring c^{15}, to turn the said pawl on its pivot and into engagement with the ratchet-wheel c^8, so that when the shaft a^{20} is rotated, as will be described, the gear c and its attached sprocket-wheel will also be rotated, and the endless chains b^{19} b^{20}, made to travel, the sprocket-wheel b^{24} being rotated through the gears c' c^3 on the shaft c^2, and the gear c^4, secured to the said wheel. When the handle of the lever c^{13} is moved in the direction of arrow 21, the pawl c^{17} on the arm c^{16} of the said lever is moved forward into engagement with its latch c^{18}, thereby locking the sleeve c^{19} in its position and maintaining the pawl c^{25} in engagement with the tooth $d^\times$ to keep the foot-treadle depressed and the loose pulley a^3 in engagement with the friction disk a^4 until released by the cam-projection c^{24} striking the cam c^{23} on the arm c^{22}, secured to the said sleeve. The machine is now in position to be started and to produce travel of the endless chains in the direction of arrow 23, Figs. 1 and 6, thereby to carry the end of the cloth up the back and over and then down in front of the machine to the starting-point. The handle b^9 of the lever b^7 is now moved toward the right in Fig. 1, or in the direction opposite to that indicated by arrow 24, Fig. 3, to cause the friction-disk b^4 to be brought into engagement with the friction-disk b', which produces rotation of the shaft a^{20} in the direction of arrow 21. The shaft a^{20} continues to revolve in the direction indicated by arrow 21 until the cam or projection c^{24} strikes the cam c^{23} on the arm c^{22}, thereby stopping the movement or travel of the endless chains, for as the cam c^{24} strikes the cam c^{23} the sleeve c^{19} is turned on the shaft c^{20} and the pawl c^{25} disengaged from the tooth $d^\times$ of the rod d, thereby permitting the spring d' to raise the foot-treadle a^8 and through the turn-buckle a^7 and lever a^5 move the loose pulley a^3 out of engagement with the friction-disk a^4, thereby stopping rotation of the main shaft. When the arm c^{22} is struck by the cam c^{24}, the latch c^{18} is dropped down and out of engagement with the pawl c^{17}, thus permitting the spring d^4 to turn the lever c^{13} on its pivot and bring the end c^{12} forward into engagement with the arm c^{10} of the pawl c^7 to maintain the latter out of engagement with the ratchet-wheel c^8.

In order to disengage the pawl from its tooth, the dog d^2 on the gear c' strikes the arm c^{10} just before the cam c^{24} strikes the end of the arm c^{22}, and to effect this result the gear c' may be made somewhat smaller than the gear c, so that it will make, for instance, six complete revolutions while the gear c is making five, the dog d^2 being thus made to act on the arm c^{10} just before the cam c^{24} strikes the cam on the lever c^{22}. The cloth is now detached from the hooks on the bar d^5 and wound once about the shaft d^8, it being interposed between the said shaft and the friction-surface of the roller b^{12}. The foot-treadle is now again depressed and locked in its lowest position and the main shaft rotated. The rotation of the main shaft causes rotation of the shaft a^{20} in direction of arrow 21, Fig. 3, the friction-disk b^4 being in engagement with the disk b'. As the shaft a^{20} rotates in the direction of arrow 21 it causes rotation of the shaft d^8 in the opposite direction and winds the cloth upon the said shaft, the operation being continued until the roll of cloth in the trough d^{14} has been unwound. As the cloth passes upward in front of the machine one side is exposed to view and can be inspected, and as it passes over the top of the machine and down in front of the blackboard d^7 the other side is exposed to view and can be inspected at the same time, and therefore from one side of the machine. The cloth on its passage from the roll to the top of the machine preferably passes over a second friction-roller e, located, as shown, below the friction-roller b^{12}.

I have herein shown the machine as provided with one blackboard d^7 at its upper end; but it is evident that a second black-

board may be used in similar manner at its lower end.

If for any reason it is desired to run back a portion of the cloth wound upon the shaft d^8, the handle b^9 is moved in the direction indicated by arrow 24 to remove the friction-disk b^4 from the disk b' and bring the friction-disk b^3 into engagement with the disk b to produce reverse rotation of the shaft a^{20}, which is effected by the gear a^{19}, which rotates in an opposite direction to the gear b^{10}, as indicated by arrow in Fig. 2.

The shaft e' of the roller e may and preferably will operate a recording mechanism e^2 of any usual or well-known construction, by which the number of yards of cloth inspected in a given time may be ascertained.

In order to obtain a substantially straight edge on the roll wound up on the shaft d^8, I have provided, as herein shown, an adjusting device, (see Figs. 1 and 4,) which consists of a plate e^{12}, having hubs e^3, fitted loosely upon the rods d^{15}, which support the trough, the said plate having, as herein shown, an arm e^4, to which is connected a crank e^5 on a shaft e^6, having bearings in suitable brackets e^7, attached to the side frame A', and provided, as shown, with a handle e^8, by rotation of which the shaft e^6 may be rotated to produce longitudinal motion of the plate e^{12} and move the roll bodily in the trough, so that one edge of the cloth may be maintained in contact with a guide d^{30}, herein shown as a collar on the bar d^{17}, whereby the said edge of the cloth is made to follow a true path and be wound substantially straight upon the shaft d^8.

With some grades of cloth, especially of fine texture, it may be found that too great a tension would be a detriment and might injure the said cloth, and in this case the rod or bar d^{17} would be dispensed with, and the roll of cloth might and preferably would be maintained pressed against the adjusting device by suitable springs d^{60}, which encircle the lower rods d^{14} of the trough, as indicated in Fig. 1, the said springs being located at the end of the trough opposite to the adjusting device and acting against that end of the roll.

The friction-roller b^{12}, as shown in Fig. 1, is rotated continuously, and while I prefer to have the roller b^{12} rotated continuously I do not desire to limit my invention in this respect, as it is evident the said roller may be rotated at intervals or intermittingly, one form of apparatus for producing the intermittent motion being shown in Figs. 7 to 10, inclusive.

Referring to Fig. 7, the shaft a^{20} has loosely mounted upon it a clutch mechanism (shown as a gear f) provided with an annular groove to be engaged by the arms of a forked lever, as b^7, the said gear having secured to or forming part of it friction-disks f' f^2, adapted to be brought in contact with two disks f^{20} f^{21}, loose on the shaft a^{20} and provided with inclined notches or recesses f^3 on their peripheries, as clearly shown in Fig. 9, the notches f^3 of one disk, as f^{20}, being inclined in an opposite direction to the notches of the other disk f^{21}. The inclined notches or recesses have located in them small rollers $f^\times$, which are kept in place by annular rings f^4 f^5, secured to or forming part of disks f^6, fast on the shaft a^{20}. The gear f meshes with a toothed segment f^7 on an arm pivoted, as at f^8, and connected by a rod f^9 to a crank on the gear a^{12}, in mesh with the pinion a^{10} on the shaft a^2.

The operation of the intermittent motion is as follows: For instance, the handle b^9 is moved to bring one of the friction-disks, as f', into engagement with or against a disk, as f^{20}, and as the gear a^{12} is rotated in the direction of the arrow thereon the segmental arm is carried upward and will move the gear f and cause one of the said disks, as f^{20}, to be moved in such direction—as, for instance, in the direction indicated by the arrow in Fig. 9—as to carry the rollers up the inclined sides of the notches and wedge them between the disk and the ring f^4, thus practically making the disk f^{20} fast on the shaft a^{20}, so that as the gear f is rotated the said shaft is rotated through the friction-disk f', rotation of the shaft a^{20} being continued as long as the segmental arm f^7 is moved upward, and on its downward movement the said arm moves the said gear f, its friction-disk f', and the disk f^{20}, so as to bring the rollers to the lowest points of the notches in the disk f^{20} and out of engagement with the band or ring f^4, and in this case the shaft a^{20} remains at rest. If it is desired to rotate the shaft a^{20} in the opposite direction, the handle b^9 is moved to engage the friction-disk f^2 with the disk f^{21} and bring the rolls of the other gear up the inclined notches and wedge them between the said disk and band f^5 to produce rotation of the shaft a^{20} in the opposite direction. It will thus be seen that when the gear f is moved to bring the disk f' into engagement with one disk f^{20} the shaft a^{20} will be rotated on the movement of the segmental arm in one direction and will not be moved or rotated on the movement of the said arm in the opposite direction.

I have herein shown the side frames A A' as upright; but I do not desire to limit my invention to an upright machine, as it is evident the said side frames might occupy a horizontal or substantially horizontal position—that is, the side frames might be turned into a position substantially at right angles to that shown in Fig. 2 and be supported at opposite ends by suitable legs or in any other suitable manner. In this case what is now the back of the machine in Figs. 1 and 2 would be the under side, and both sides of the cloth could be inspected from one side of the machine, for one side of the cloth will be exposed to view as the cloth passes from the roll to the cloth-carrier and the opposite side of the cloth will be exposed to view as it passes from over the machine back to the roll d^8.

The cloth-carrier herein described and also the device for effecting a straight edge on the

roll of cloth may be used on other machines for treating cloth—as, for instance, on a cloth-winding machine. The endless chains are held stationary while the cloth is being wound up, preferably, by a friction device shown as a shoe *o*, secured to an arm on the lever c^{13}, (see Fig. 5,) and engaging the periphery of a smooth disk *o'*, secured to or forming part of the sprocket-wheel b^{23}.

I claim—

1. In a machine for treating cloth, the combination, with a shaft, of a second shaft over which the cloth to be treated is passed, means to rotate said shafts, an endless carrier consisting of sprocket-chains passed about sprocket-wheels loose on said shafts, gearing to connect the sprocket-wheels on one of said shafts, and means to render one of the sprocket-wheels fast on its shaft, substantially as described.

2. In a machine for treating cloth, the combination, with a friction surface or roller, of a second friction surface or roller, shafts upon which said rollers are mounted, mechanism to rotate one of said rollers in opposite directions, a roller d^8 upon which the cloth is to be wound, a friction-roller d^{10}, and means to drive the friction-roller d^{10} to wind the cloth upon the roller d^8, substantially as described.

3. In a machine for treating cloth, the combination, with a shaft a^{20}, sprocket-wheels loosely mounted on said shaft, and gearing to connect said sprocket-wheels, of a shaft b^{17}, sprocket-wheels loose on the shaft b^{17}, endless sprocket-chains passed about said sprocket-wheels, means to render one of the sprocket-wheels on the shaft a^{20} fast thereon, a disengaging device to render the said sprocket-wheel loose on the shaft a^{20}, and means carried by one of the sprocket-chains to act on the disengaging device, substantially as described.

4. In a machine for treating cloth, the combination, with a shaft, a second shaft over which the cloth is passed, and means to rotate said shafts, of a carrier to which the cloth is secured to carry it from one to the other side of the machine and means to produce travel of the shafts in opposite directions, substantially as described.

5. In a machine for treating cloth, a main shaft, a friction roller or surface, and intermediate gearing, substantially as described, to connect said friction-roller with the main shaft, a second friction roller or surface over which the cloth to be treated is passed, a driving mechanism for said rollers, and a clutch to operate said intermediate gearing to produce rotations of the friction-rollers in opposite directions, substantially as described.

6. In a machine for treating cloth, the combination, with a main shaft, of an endless carrier to which the cloth is secured to carry it from one to the other side of the machine, auxiliary shafts, sprocket-wheels thereon for the carrier, connections between one of said shafts and the main shaft, a guide against which one edge of the cloth is kept to obtain straight ends on the roll when wound, and an adjusting device by which the roll of cloth is moved, substantially as and for the purpose specified.

7. In a machine for treating cloth, a shaft a^{20}, a shaft b^{17}, sprocket-wheels loose on the shafts a^{20} b^{17}, endless chains connecting said sprocket-wheels, gears secured to the sprocket-wheels on the shaft a^{20}, a shaft c^2, and gears on the shaft c^2 in mesh with the gears on the sprocket-wheels, a ratchet-wheel fast on the shaft a^{20}, a pawl carried by a gear secured to the sprocket-wheel on the shaft a^{20} to engage the said ratchet-wheel and render the said sprocket-wheel fast on the shaft a^{20}, and means to act on the pawl and disengage it from its ratchet-wheel, substantially as described.

8. In a machine for treating cloth, the combination, with two shafts provided with sprocket-wheels loosely mounted thereon and endless chains passed about said sprocket-wheels, of a ratchet-wheel fast on one of the shafts, a pawl moving with one of said sprocket-wheels to engage the ratchet-wheel to render one of the sprocket-wheels fast on the shaft, and a lever to engage said pawl and hold it disengaged from its ratchet-wheel, substantially as described.

9. In a machine for treating cloth, the combination, with two shafts, of sprocket-wheels loosely mounted thereon, endless chains passed about said wheels, a ratchet-wheel fast on one of the said shafts, a pawl carried by a gear on one of said sprocket-wheels and adapted to engage the said ratchet-wheel to render the pawl-carrying sprocket-wheel fast on the shaft, the shaft e^2, gears c c' c^3 c^4, a lever to engage the said pawl, a sleeve c^{19}, an arm on said sleeve, a cam on one of the sprocket-chains to act on said arm, and devices connecting said lever and sleeve, substantially as described.

10. In a machine for treating cloth, the combination, with two shafts, of sprocket-wheels loosely mounted thereon, endless chains passed about said wheels, a ratchet-wheel fast on one of the said shafts, a pawl carried by a gear on one of said sprocket-wheels and adapted to engage the said ratchet-wheel to render the pawl-and-gear-carrying sprocket-wheel fast on the shaft, the shaft c^2, gears c c' c^3 c^4, a lever to engage the said pawl, an arm on said lever, a pawl pivoted on said arm, a sleeve c^{19}, carrying a latch to engage said pawl and lock the lever, an arm c^{22}, carried by said sleeve, and a cam on one of the sprocket-chains to act on said arm, substantially as described.

11. In a machine for treating cloth, the combination of the following instrumentalities, viz: two shafts a^{20} b^{17}, sprocket-wheels loose thereon, endless chains b^{19} b^{20}, passed about said sprocket-wheels, a gear *c*, attached to one of the sprocket-wheels, a gear *c'* in mesh with the gear *c*, a shaft on which the gear *c'* is

mounted, a gear c^3 in mesh with a gear c^4, attached to a second sprocket-wheel, a ratchet-wheel fast on the shaft a^{20}, a pawl pivoted to the gear c, a lever to engage said pawl, an arm c^{16} on said lever, a pawl on the said arm, a sleeve, a latch on said sleeve to engage the pawl on the arm, an arm on the sleeve, a cam on the sprocket-chain b^{19} to act on the said arm, a spring-actuated treadle, a rod provided with a notch to be engaged by a second arm on the sleeve, the driving-pulley, and connections between it and the shaft a^{20} and between the pulley and treadle, substantially as described.

12. In a machine for treating cloth, a shaft, a friction roller or surface mounted thereon, a second shaft having mounted on it a friction roller or surface over which the cloth to be treated is passed, gearing to connect said shafts, a driving-gearing for one of said shafts, and a clutch mechanism to operate said driving-gearing and produce rotation of the said shaft in opposite directions, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED S. DINSMORE.

Witnesses:
JAS. H. CHURCHILL,
MABEL RAY.