(No Model.) 3 Sheets—Sheet 1.

J. SCHWEITER.

CLOTH RUBBING APPARATUS.

No. 545,252. Patented Aug. 27, 1895.

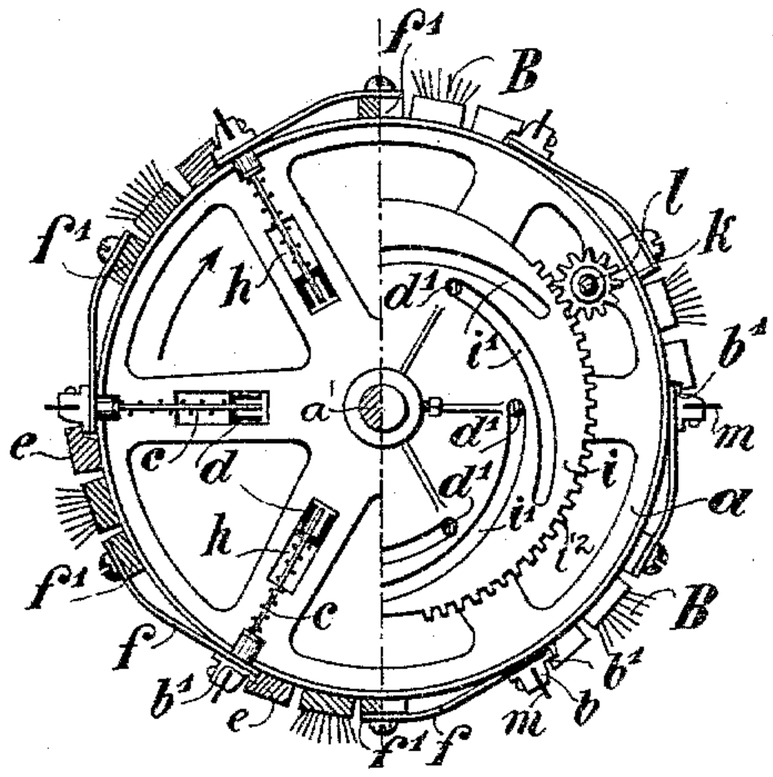
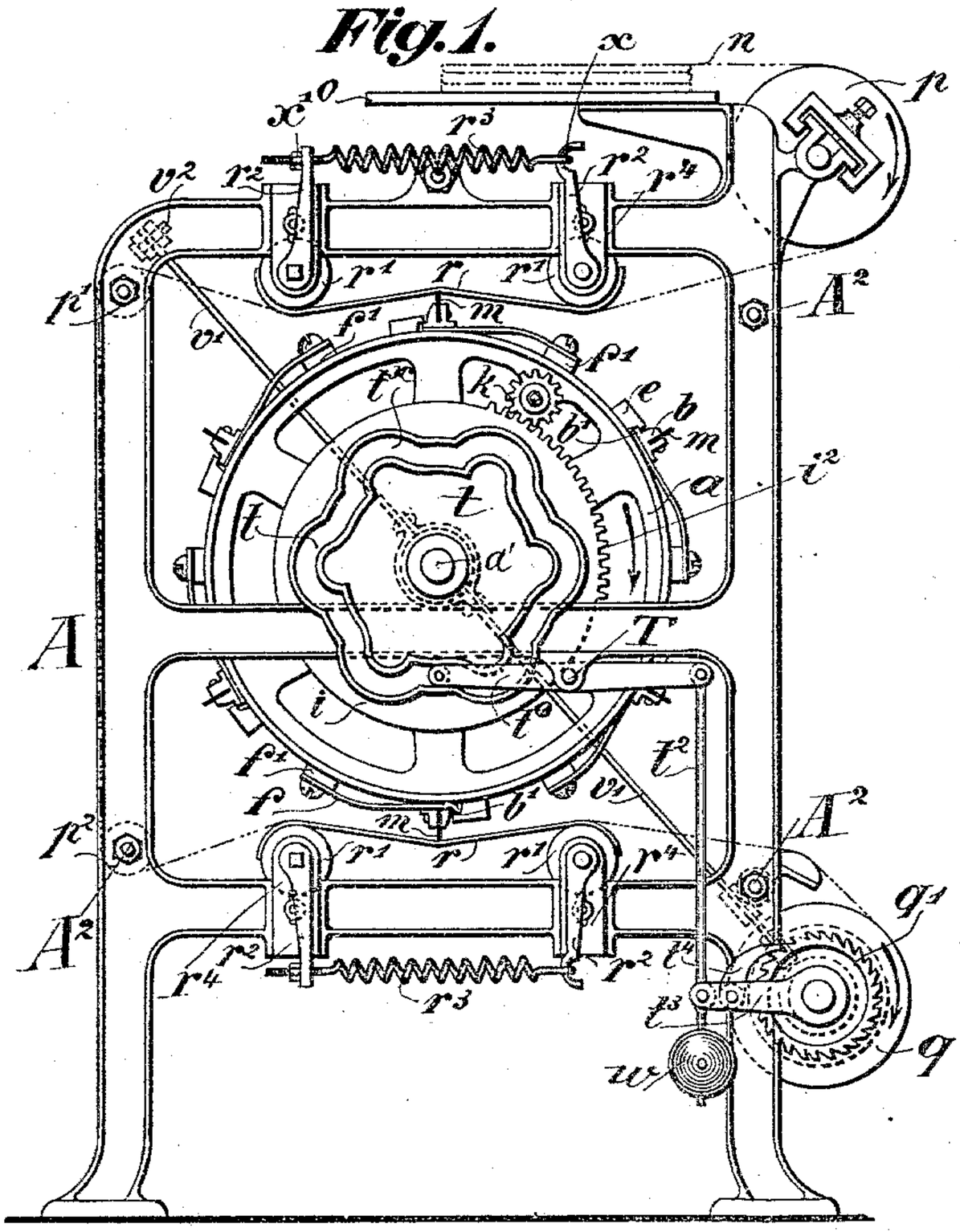


Fig. 3.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

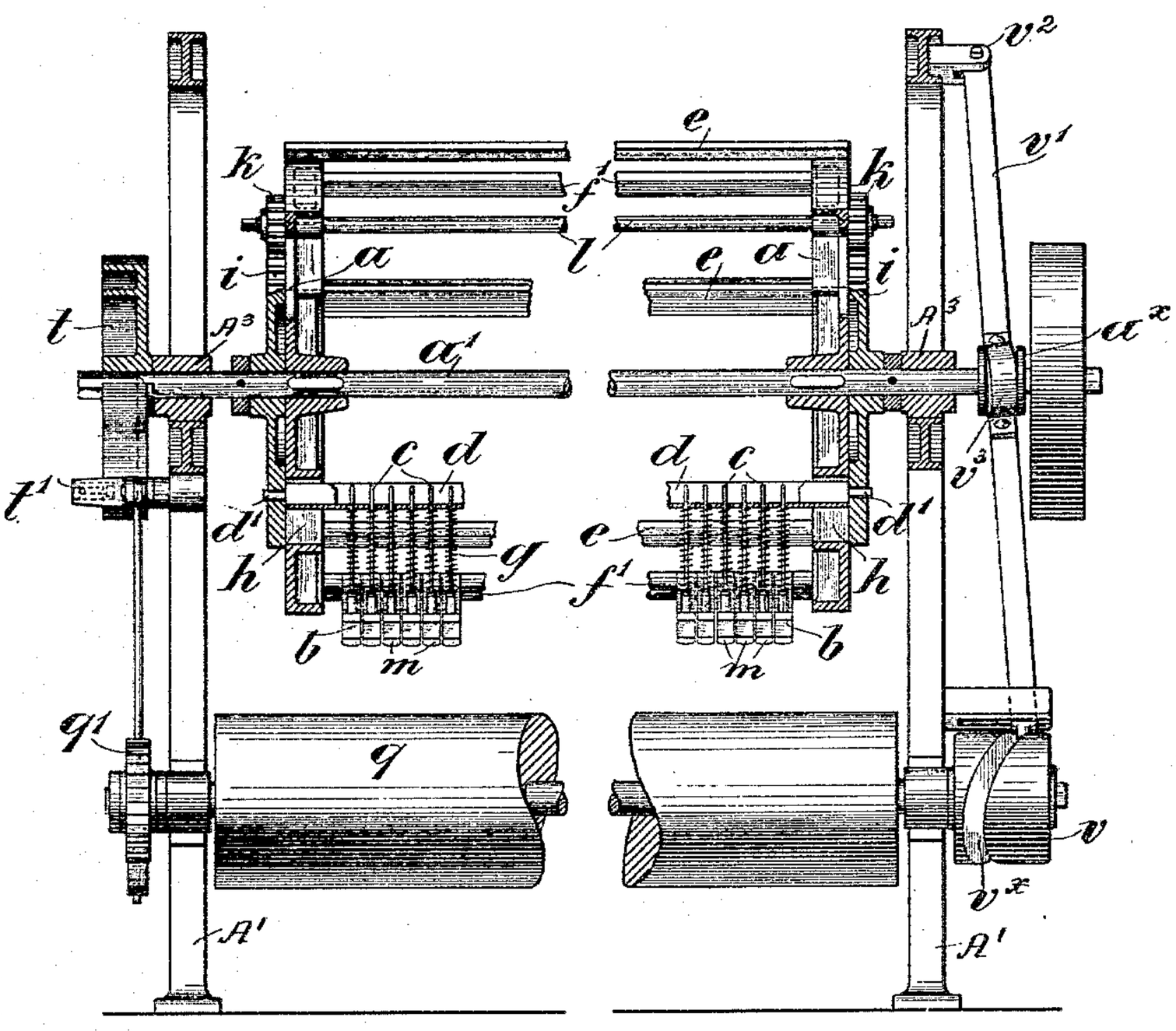
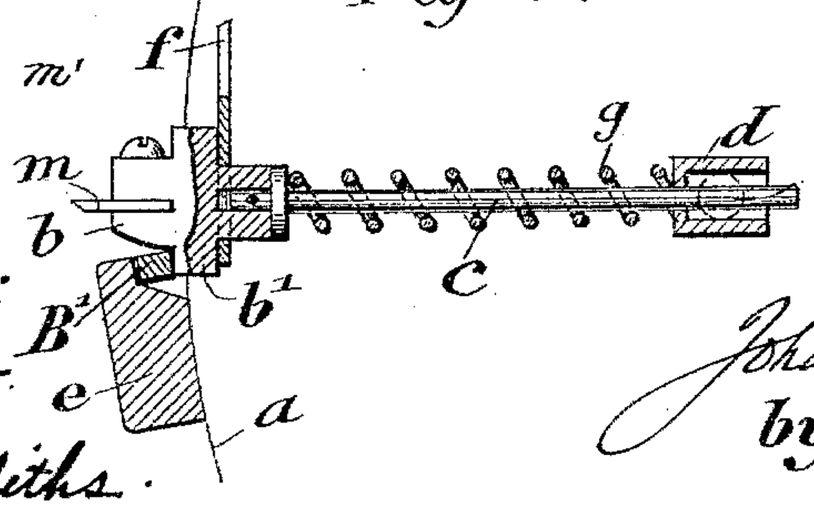


Fig: 4.



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(No Model.) 3 Sheets—Sheet 3.

J. SCHWEITER.

CLOTH RUBBING APPARATUS.

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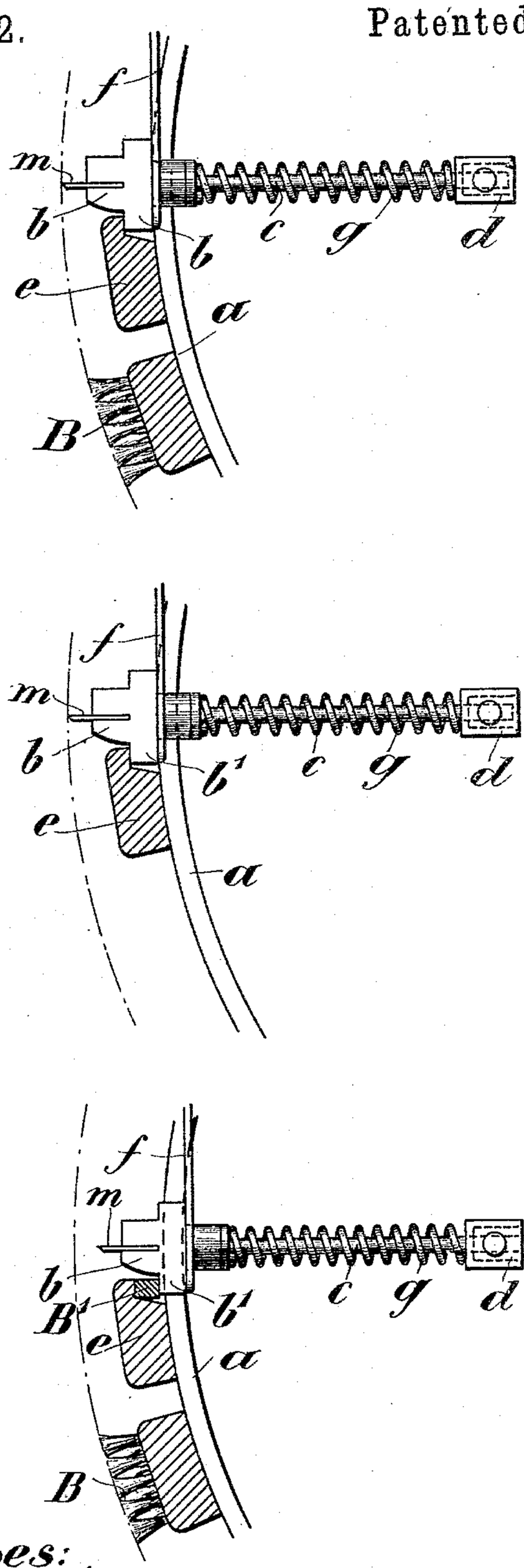

Fig. 4a.

Fig. 4b.

Fig. 4c.

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UNITED STATES PATENT OFFICE.

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CLOTH-RUBBING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 545,252, dated August 27, 1895.

Application filed September 21, 1894. Serial No. 523,744. (No model.)

To all whom it may concern:

Be it known that I, JOHANN SCHWEITER, a citizen of the Republic of Switzerland, and a resident of Horgen, in Switzerland, have invented certain new and useful Cloth-Rubbing Apparatus, of which the following is a specification.

My invention relates to an apparatus for rubbing cloth, such as silk, whereby the same may be rubbed or scraped by means of scraper-blades and the same cleaned by means of brushes. Heretofore in nearly all cloth-rubbing apparatus the scraper-blades were caused to make a reciprocating lateral motion, whereby the rubbing was accomplished on the forward stroke, but the same passed over the material on the backward stroke. The scraper-blade of my cloth-rubbing apparatus rotates continuously in one direction, such direction being the direction of the motion of the material which is being acted upon, whereby not only is the loss of time incurred by the ineffectual backward stroke of the scraper-blades prevented, but an equal and perfect manipulation of the whole breadth of the material insured.

My invention consists of a frame in which is mounted a continuously-revolving drum, said drum being provided with blade-holders for holding the scraper-blades, which holders are in turn provided with shanks that are guided within the drum, means for adjusting the position of the scraper-blades with respect to the periphery of the drum, rollers for guiding the cloth through the machine and against the scraper-blades at diametrically-opposite points of the drum, a take-up roller for drawing the cloth through the machine and over said guide-rollers, means for intermittently operating the take-up roller, said take-up roller operating to draw the cloth through the machine during the interval which occurs between the non-activity of one series of scraper-blades and that of the following series of scraper-blades, means for pressing the cloth with a greater or less degree of pressure against the scraper-blades, said pressure medium being provided with an adjusting device whereby the pressure may be regulated; and my invention consists also of the construction and combination of parts and details, to be fully described hereinafter, and then claimed.

In the accompanying drawings, Figure 1 is an end elevation of my improved cloth-rubbing apparatus. Fig. 2 is a broken longitudinal vertical section through the drum, the lower parts of the machine being in elevation and others broken away, while some of the scrapers are removed. Fig. 3 is an end view of the drum which carries the knives, the left-hand portion of said drum being shown in section while the right-hand portion is shown in elevation; and Fig. 4 is a detail enlarged view showing one of the blade-holders and its shank, and the scraper-blade carried by the holder, together with means for guiding the same in the drum, while Figs. 4^a, 4^b, and 4^c are similar views showing three different arrangements or positions of the same parts.

Similar letters of reference indicate corresponding parts.

The frame of the apparatus comprises end sections A A′, which are connected together by suitable tie-rods, such as A^2. The shaft a' of the scraper-drum of the machine is journaled in boxes A^3 A^3, supported in the end sections A A′ of the same, said shaft a' carrying at each end the heads a of the drum, which heads are shown in the shape of a wheel or spider-frame for the purpose of lightness. In the slots of the blade-holders b are inserted the well-known steel rubbing-blades m, the same being retained therein by means of set-screws m'. These blade-holders are held in position in the drum by means of inwardly-extending shanks c, which are attached to said holders and at their inner ends passed through openings in the laterally-movable guide-bars d, which in cross-section are U-shaped, while the holders themselves are retained in position at the periphery of the drum by means of cross-bars e that connect the heads a a of the drum, said bars e overlapping the laterally-projecting heel portions b' of the blade-holders b. A series of scraper-blades is, as clearly shown in Fig. 2, arranged longitudinally of the periphery of the drum and for each series there is an inner guide-bar d. As shown clearly in Figs. 1 and 3, several series of the scraper-blades are arranged, respectively, at equal distances apart around the periphery of the drum. Under the influence of the springs g and f the blade-holders h are pressed radially outward against the retaining-bars e, their heel

projections b' impinging against the same. The springs f are flat springs attached to cross-bars f', arranged at equal distances apart upon the periphery of the drum and connecting the heads $a\,a$ of the same, and serve to maintain the relative position between the blade-holders and the cross-bars e, the drum being supposed to rotate in the direction of the arrow, Figs. 1 and 3. The spiral springs g are coiled around the shanks c of the blade-holders and press against the U-shaped guide-bars d, and also upon the rear portions of the blade-holders.

Mounted loosely upon the shaft a' of the scraper-drum and arranged outside of the heads a of the same are two disks $i\,i$, respectively, which for a portion of their peripheral length are each provided with cog-teeth i^2, and also with a series of slots i', which extend eccentrically with respect to the shaft and receive studs d', that project from the ends of guide-bars d, whereby when said disks are rotated upon the shaft the same are caused to act upon the studs d' of the guide-bars and shift the bars laterally with respect to the periphery of the drum—that is to say, said guide-bars are caused to approach or recede from the shaft a', according to the direction of the rotation of the disks i—the guide-bars being further guided in their movements by means of the radial slots h, formed in the end portions a of the drum, and through which slots h the bars extend. The cog-disks i are rotated by means of pinions $k\,k$, respectively, which are mounted upon the ends of a shaft l, having bearing in the heads $a\,a$ of the drum, said pinions engaging the toothed portion of the disks i and turned by said shaft l through the medium of a suitable hand-crank (not shown) having a socket, whereby it may be fitted onto the squared ends of the shaft l. It will be understood that the guide-bars d are caused to recede from or approach the shaft a' by reason of the eccentric arrangement of the slots i'. By this means the springs g may be uniformly compressed or permitted to expand, so that the position of the scraper-blades m with respect to the periphery of the drum may be simultaneously regulated and the degree of pressure which they exert upon the cloth controlled.

The material n which is to be rubbed is led from a superposed table o on the frame A A′ of the machine, around the guide-rollers $p\,p'\,p^2$, respectively, to the take-up roller q in such a manner that it is rubbed simultaneously at diametrically-opposite points of the drum by means of diametrically-opposite scraper-blades. The large guide-roller p is arranged at one end of the table o at one side of the machine, while the guide-rollers $p'\,p^2$, respectively, are arranged at the upper and lower portions of the opposite side of the machine, and the take-up roller q is arranged at the bottom of the frame of the machine on that side on which the first guide-roller p is arranged, the whole arrangement of the rollers being such as that the material is guided in the manner stated. At the diametrically-opposite points whereat the scraper-blades m are permitted to act the material is pressed against the scraper-blades by means of flexible pressure-aprons $r\,r$, preferably made of leather, which are arranged above and below the drum, the respective ends of each being firmly fastened to the peripheries of tension-rollers $r'\,r'$, which are journaled in suitable bearings r^4, fixed to the frame of the machine. To the spindles of the tension-rollers $r'\,r'$ are applied levers $r^2\,r^2$, which are arranged in pairs, the members of each pair being connected by means of a tension-spring r^3. One of the members r^2 of each pair of levers is provided with a hook x, over which takes a loop formed on one end of the spiral spring r^3, while the other end of the spring is screw-threaded and passes through an opening in the other member and receives a nut x', whereby the members of the respective pairs of levers are caused to approach or recede from each other and the tension of the rollers r' regulated. Both of the flexible aprons r are in the direct line of passage of the rubbing-blades, and are consequently pressed outward by said blades in passing both. This has the effect of imparting to the cloth an elastic pressure, the degree of pressure being determined by the tension of the springs r^3.

The shaft of the take-up roller q is journaled in bearings q^2, and is provided at one end with a ratchet-wheel q', the teeth of which are to be engaged by a suitable pawl, whereby the take-up roller is caused to rotate so as to wind up the material every time the blades are not acting on the same—that is to say, the take-up roller acts during the interval when one set of scraper-blades has just passed the material and another set is coming into action by reason of the rotation of the drum. This intermittent rotation of the take-up roller q is effected by means of a wheel t, which is mounted on one end of the shaft a' of the drum and provided in its outer face with a sinuous cam-groove $t^\times$, into which projects an elongated pin t' that is located at one end of a double-armed lever t°, pivoted at T to the frame of the machine, while the other end of the double-armed lever t° is pivotally connected by means of a link t^2 with an operating-lever t^3, which is mounted loosely on the shaft of the take-up roller, and which carries the actuating-pawl t^4 that engages the teeth of the ratchet-wheel q'. The operative portions of the sinuous cam-groove $t^\times$ lie, respectively, between and alternate with the different series of scraper-blades, so that the forward motion of the material is caused to take place at the moment that it is relieved from the action of the blades.

To the end of the shaft of the take-up roller q opposite that on which the ratchet-wheel q' is mounted is applied a cam-wheel v, the groove $v^\times$ of which is formed upon the periphery of the same and receives the free

end of a lever v', which extends downwardly thereto from the pivotal point v^2, located at the upper end of the frame of the machine, and at about its mid-length it is provided with an eye v^3, within which is received a double-flanged collar $a^\times$, that is firmly attached to the shaft a'. This method of attaching the lever v' to the shaft a' of the drum permits the shaft to be moved longitudinally, but at the same time it does not interfere with the rotation of the same. At each forward motion of the take-up roller q the lever v' is caused to swing slightly on its pivot v^2 by reason of the action of the actuating cam-wheel $v^\times$, whereby the scraper-drum, together with all of the blades and parts carried thereby, are slightly displaced longitudinally. The purpose of imparting this slight axial motion to the scraper-drum is to cause the scraper-blades to operate over a greater breadth of material and not only in a continuous straight line along the material. All parts of the material are thus subjected to the rubbing operation and become homogeneous in appearance and quality.

The groove $v^\times$ of the cam-wheel v is so dispcsed that the revolving drum makes one complete to-and-fro endwise motion with each rotation of the take-up roller. A weight w, arranged on the lower depending end of the link t^2, acts to cause a steady action of the parts influenced thereby and prevent rattling of said parts.

In addition to the rubbing-knives, brushes B can be attached along the periphery of the drum, and are preferably arranged at regular intervals between the scraper-blades m. The blades and brushes may be so arranged that they will not operate together upon the cloth—that is to say, they may be adjusted so that either one or the other are caused to act at one time. For instance, when it is desired to operate with the brushes alone small wedges B′ may be placed between the cross-bars e of the drum and the heels b' of the knife-holder, as shown clearly in Fig. 4.

Slight changes in the details of the construction of my improved cloth-rubbing apparatus will readily suggest themselves to skilled mechanics, and I do not desire to limit myself to the exact construction shown.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

1. In a cloth rubbing apparatus, the combination, with the frame, a drum provided with a shaft journaled in the frame, and scraper blades yieldingly supported upon the periphery of the drum, of means for guiding and drawing the material through the machine, flexible pressure aprons arranged upon tension rollers located at diametrically opposite points of the drum, and means for adjusting the tension of said rollers, substantially as set forth.

2. In a cloth rubbing apparatus, the combination, with the frame, a drum provided with a shaft journaled in the frame, and a series of scraper blades arranged upon the periphery of the drum, of means for guiding and drawing the material through the machine and around the drum, flexible pressure aprons arranged at diametrically opposite points of the drum, tension rollers to which the opposite ends of the aprons are attached, levers fixed to the rollers, and tension springs connecting each set of levers, substantially as set forth.

3. In a cloth rubbing apparatus, the combination, with the frame, and a drum mounted therein and provided on its periphery with a series of elastically mounted scraper blades, means for guiding the material around the drum, a take up roller around which the material is caused to be wound and means for imparting an intermittent rotary motion to the take-up roller, the same comprising a cam wheel, arranged upon the shaft of the drum, a ratchet wheel fixed to the take-up roller, an actuating lever provided with a pawl adapted to engage the teeth of said ratchet wheel, and connections between said cam wheel and the actuating lever, substantially as set forth.

4. In a cloth rubbing apparatus, the combination with the frame, a drum provided with a shaft journaled in the frame, and a series of scraper blades arranged upon the periphery of the drum, and provided with shanks, of disks mounted loosely on the shaft and provided with peripheral cogs, a second shaft journaled in the drum and provided with pinions adapted to engage said cog disks, whereby the disks may be rotated, said disks being provided with a series of eccentric slots, guide-bars extending through the head of the drum and into said eccentric slots, said guide-bars guiding the shanks of the blades, springs arranged between the blades and guide-bars, and means for pressing the material against the knives, substantially as set forth.

5. In a cloth rubbing apparatus, the combination, with the frame, a drum provided with a longitudinally movable shaft mounted in the frame, and scraper blades arranged upon the periphery of the drum, of a take-up roller for drawing the material through the machine, means for guiding the material, a cam wheel on the shaft of the take-up roller, a lever pivoted to the frame of the machine, said lever being connected with the shaft of the drum so that the same may rotate and yet be longitudinally shifted by the movement of the lever, and means for pressing the material against the knives, substantially as set forth.

In testimony whereof I hereunto sign my name in the presence of two subscribing witnesses.

JOHANN SCHWEITER.

Witnesses:
A. NÄGEH.
H. SCHUPISSER.