To all whom it may concern:

Be it known that I, Arthur C. Mason, a citizen of the United States, residing at Hawthorne, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Fabric-Rubbing Machines, of which the following is a specification.

This invention has for its object to provide a machine for rubbing fabrics, and especially the finer fabrics, for the purpose of working out irregularities therein that result from the weaving and detract from the appearance of the fabric. According to the invention the fabric is held stretched and its stretched portion is acted upon by rotating rubbers on both sides thereof but placed out of opposition to each other. The rotation of the rubbers may be oscillatory or continuously in one direction, but one of the salient features of the invention is that the movements of the rubbers are preferably such that the rubbers neutralize each other in their rubbing action, some rubbing one way and some the other. The fabric is preferably advanced, and at a uniform rate, while being rubbed.

The drawings show,

In Fig. 1 a side elevation of a form of fabric rubbing machine embodying the invention and in which the rubbers are oscillated;

Fig. 2 being a front elevation thereof, and

Fig. 3 a vertical sectional detail; and

In Fig. 4 a fragmentary side view of a machine embodying the invention and in which the rubbers are rotated continuously in the same direction;

Fig. 5 being a fragmentary front elevation thereof, partly in section; and

Fig. 6 a section on line 6--6, Fig. 4.

Referring, first, to Figs. 1 to 3: A roll of the fabric A to be treated is wound on a removable beam 1 in brackets 2 on the upright frame 3 and the fabric extends therefrom over a guide roller 4, journaled in the frame and then downward to the nip roller 5 (which affords a guide bar and under a nip roller 6 freely journaled in a pair of arms 7 pivoted to the frame, and then over a nip roller 8 journaled in fixed bearings in the frame, and then onto a beam 9 removably journaled in the frame. The shafts or gudgeons 8 and 9 of the nip roller 8 and beam 9 have affixed thereto pulleys 10 and 11 around which extends an endless belt 12, the pulley 11 being of less diameter than pulley 10 (which about equals that of the beam 9), so that, with some incidental slip of the belt, the fabric will be wound compactly on the beam. The nip rollers when rotated count with the beam 1 and guide roller 4, which offer the necessary resistance, to maintain the fabric taut between said roller 4 and the shaft 5; and the rotation of the nip rollers is effected through an endless chain 13 which extends around sprocket-wheels 14 and 15, the former of which is fixed on the shaft of nip roller 8 and the latter on the counter-shaft 16 of a suitable electric or other motor 17 whose main shaft 18 may be connected with the counter-shaft by gearing 19 shown by dotted lines in Fig. 1.

The frame carries at the front two brackets 20, 21 arranged at a level between the guide roller 4 and the shaft 5, and in these brackets are journaled on horizontal axes the shafts of two pairs of rubbers, the two pairs being in vertical planes between which lies the portion of the fabric A extending from roller 4 down inward to shaft 5. Each rubber consists of a shaft 21 having a series of radial blades 22 projecting therefrom, all of sufficient length (longitudinally of the shaft) to reach across the whole width of the fabric and the radial extent of all the blades being equal and they having their free edges parallel with the axis of the shaft 21.

The two pairs of rubbers are arranged so that the rubbers in one pair are out of opposition to those in the other and so that when the rubbers are rotated the blades of each will project through the plane which the stretched fabric tends to assume; in other words, the rubbers are adapted to hold the fabric in sinuous arrangement as shown in Fig. 3. The oscillating of the rubbers is effected by affixing to the ends of their shafts 21 pinions 23, one pair of pinions engaging one toothed side of a compound rack 25 which is guided vertically in the bracket 26 and is adapted to be reciprocated through a link 24 from a crank pin 25 on the end of the shaft 5, the opposite toothed side of the rack being engaged by a pinion 26 in mesh with the other pair of pinions 23. This shaft 5 is driven from the shaft 13 of the motor 17 by an endless chain 27 extending around sprocket-wheels 28 and 29 on shafts 5 and 18.
While the motor is causing the fabric to be advanced from beam 1 and wound up on beam 9 and meanwhile held under tension between guide-roller 4 and shaft 5 it is causing the rack to be reciprocated and this oscillates the pairs of rubbers in opposite directions, which in the present case only perform partial revolutions. Both sides of the fabric are treated at once, and on account of the oscillating movement of the rubbers the surface of the fabric is rubbed both ways, so that the threads are displaced first in one direction and then in the other in each complete oscillation of the fabric.

Referring now to Figs. 4 to 6: The machine in this case is substantially the same as that already described except with respect to the rubbing means and excepting that in place of shaft 5 (which in figures 1 to 3 forms part of the means for transmitting motion to the rubber) a plain bar 29 may be employed. In the frame 3 is journaled a set of rubbers arranged with their axes horizontal, each rubber consisting of a shaft 30 journaled in the frame and having radial blades 31 all longer than the fabric is wide and all extending uniform radial distances from the axis of the shaft and being uniformly spaced around the shaft. Projecting from the frame is a pair of brackets 32 in which are journaled another set of rubbers similar in all respects to the first set and arranged so as to be out of opposition thereto and so that the intervening fabric will be held by the two sets of rubbers in a sinusous disposition. All the rubbers have at the ends of their shafts sprocket-wheels 33 all standing in the same vertical plane (the teeth of the sprocket-wheels are omitted in Figs. 5 and 6). An endless chain 34 engages the several sprocket-wheels in such manner that it extends inward, outward and inward around the first, second and third (from the top down) of the sprocket-wheels of the first set of rubbers and then outward, inward and outward (from the bottom up) of the sprocket-wheels of the second set of rubbers. The lowest rubber in the whole complement has a sprocket-wheel 35 around which may be driven in the same manner as the chain 34 already described.

When the machine of Figures 4, 5 and 6 is being operated the action of each rubber is continuous, or always in the same rotary direction, the fabric being drawn downwardly, moreover, in the construction as described, the several rubbers are caused to rotate so that half of the whole complement of rubbers rotates in one direction and the other half in the opposite direction, whereby they neutralize the influence of each other in the rubbing action.

In the construction of Figs. 1 to 3 the neutralizing of the rubbing action takes place as between the rubbers on one side of the fabric and those on the other; in the construction of Figs. 4 to 6 it takes place as between the several rubbers on each side of the fabric.

In both constructions each surface of the fabric becomes rubbed both ways, in Figs. 1 to 3 by the oscillation of the rubbers and in Figs. 4 to 6 because the several rubbers in each set rotate oppositely.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination, means to hold the fabric stretched, separate fabric rubbing members revolvable on individual axes, and means to oscillate said members on their axes and in rubbing contact with the fabric in relatively opposite directions substantially simultaneously.

2. In combination, means to hold the fabric stretched, separate fabric rubbing members revolvable on individual axes and arranged in opposite sides of the fabric, and means to oscillate said members on their axes and in rubbing contact with the fabric in relatively opposite directions substantially simultaneously.

3. In combination, means to hold the fabric stretched, separate fabric rubbing members revolvable on individual axes and arranged on opposite sides of the stretched part of the fabric out of opposition to each other and holding said part sinusous, and means to oscillate said members on their axes, each member including rubbing blades arranged spaced from each other around the oscillating axis of said member.

4. In combination, means to advance the fabric, means against which one face of the fabric bears while being advanced, a fabric rubbing member in contact with the opposite face of the fabric and revolvable on an axis substantially parallel with the fabric, and means to oscillate said member on said axis while the fabric is being advanced, said member including rubbing blades arranged spaced from each other around the oscillating axis of said member.

In testimony whereof, I affix my signature.

ARTHUR C. MASON.