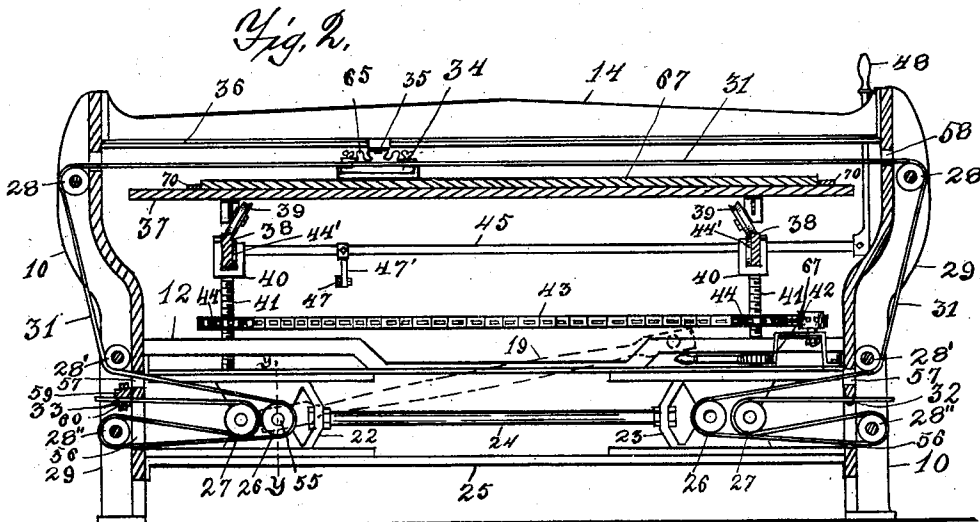
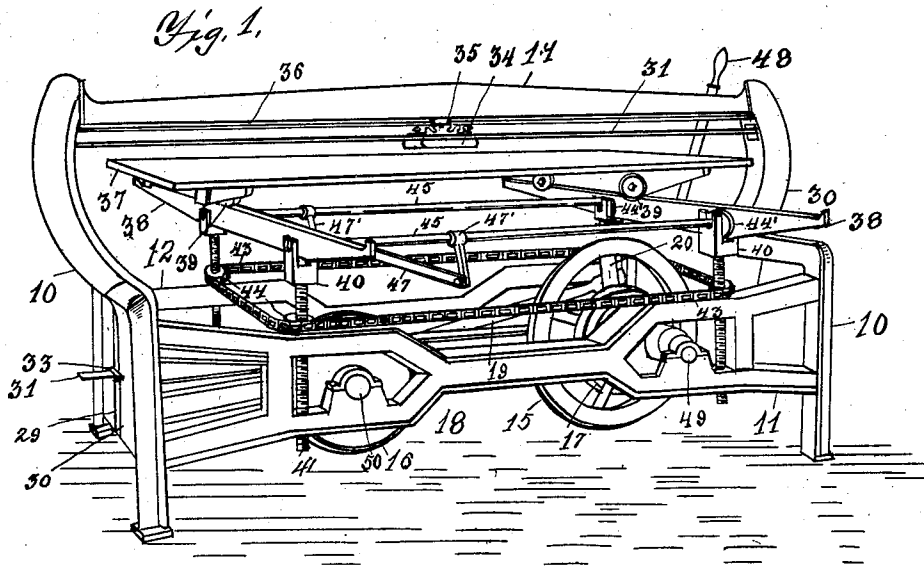


A. LAWSON.  
RUBBING MACHINE.

APPLICATION FILED AUG. 11, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

*A. W. Little.*  
*B. A. Sample.*

INVENTOR

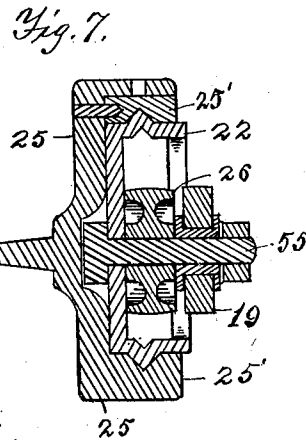
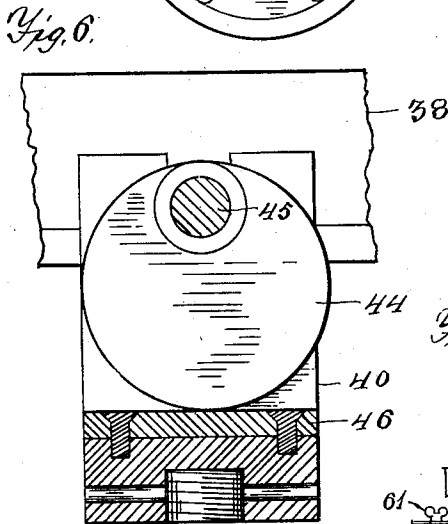
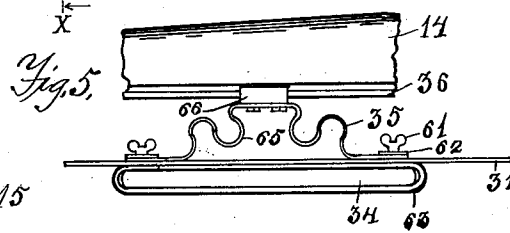
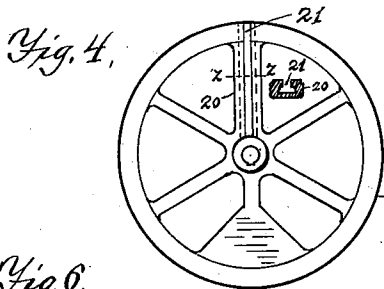
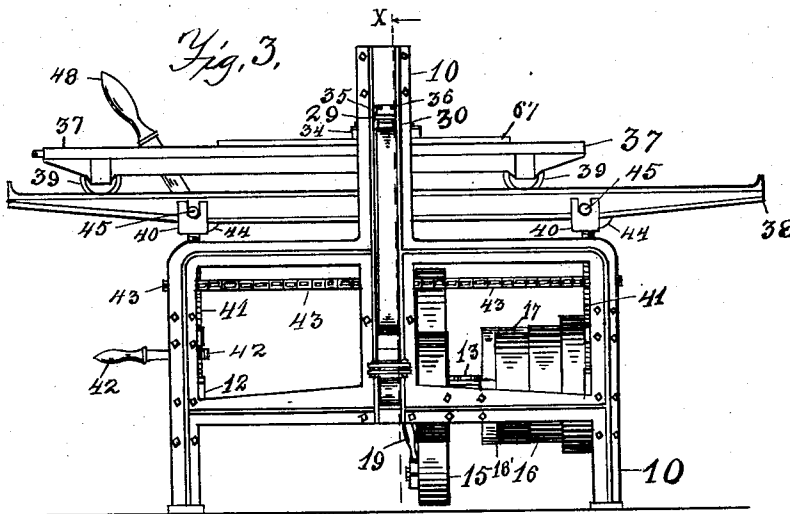
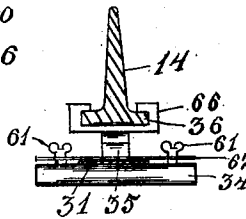
*August Lawson*  
BY  
*J. Arthur Baldwin*  
ATTORNEY

A. LAWSON.  
RUBBING MACHINE.

APPLICATION FILED AUG. 11, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

*Fig. 5a.*

WITNESSES:

A. W. Kettle.  
B. A. Sample

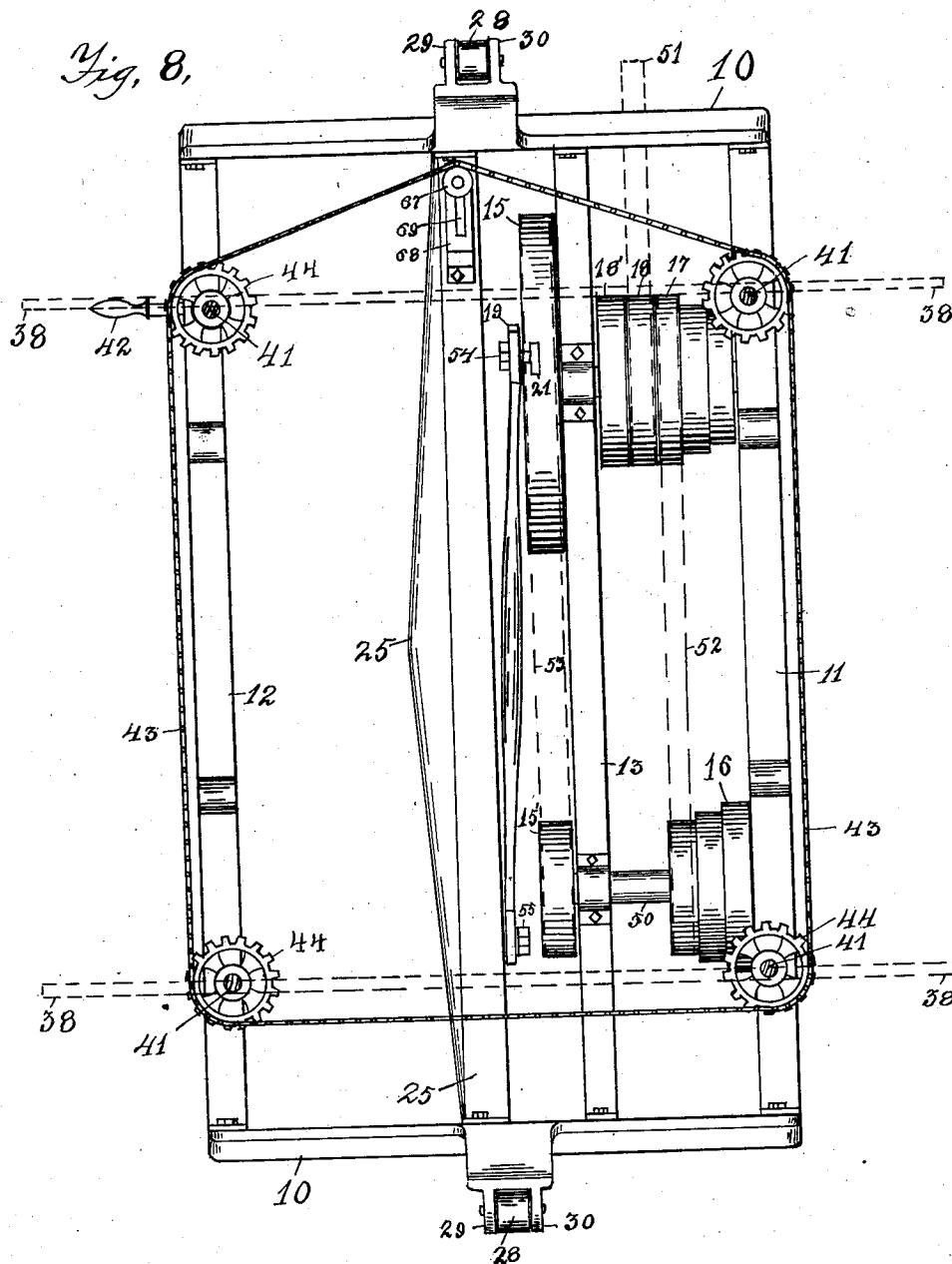
INVENTOR

August Lawson  
BY  
S. Arthur Baldwin  
ATTORNEY

A. LAWSON.  
 RUBBING MACHINE.  
 APPLICATION FILED AUG. 11, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES:

*W. W. Kettle*  
*B. A. Samples*

INVENTOR

*August Lawson*  
 BY  
*S. Arthur Baldwin*  
 ATTORNEY

# UNITED STATES PATENT OFFICE.

AUGUST LAWSON, OF JAMESTOWN, NEW YORK, ASSIGNOR OF TWO-THIRDS TO ENOCH OHNSTRAND, OF JAMESTOWN, NEW YORK, AND CHARLES JACOBSON, OF WARREN, PENNSYLVANIA.

## RUBBING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 738,921, dated September 15, 1903.

Application filed August 11, 1902. Serial No. 119,273. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST LAWSON, a citizen of the United States, and a resident of Jamestown, in the county of Chautauqua and State of New York, have invented a new and useful Rubbing-Machine, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to rubbing and polishing machines which have reciprocating rubbing-blocks and are adapted to work on wood, stone, varnish, metal, or any material on which it is desired to use any of the various rubbing, abrading, or polishing materials; and the objects of my improvement are, first, to provide a belt or strap having its ends held stationary and relays of sliding and loose pulleys engaged by said belt, whereby a reciprocative motion is given to the central portion of the belt and to the rubbing-blocks thereon, means being supplied for controlling the length of the block's stroke; second, to provide a carriage whose flanged wheels are placed at an inward or converging angle upon perpendicularly-adjustable tracks which are placed transversely to the reciprocating belt and block. The angular placing of the wheels serves a double purpose—the bracing of the carriage against the cross stroke and the taking up of the wear—thus giving added firmness and preventing shucking.

In the drawings, Figure 1 is a perspective rear view of my rubbing-machine. Fig. 2 is a sectional view at line X X in Fig. 3, showing the reciprocating belt and block and the system of loose pulleys. Fig. 3 is an end elevation of machine. Fig. 4 is an elevation of fly-wheel, showing adjusting slot for connecting-rod, also a sectional view at line Z Z. Fig. 5 is a side elevation of rubbing-block and spring and a portion of the top rail. Fig. 5<sup>a</sup> is an end elevation of rubbing-block with top rail and reciprocating belt in section. Fig. 6 is a detail, partly in section, of one of the eccentrics for adjusting the track and carriage to the rubbing-block. Fig. 7 is a sectional view at line Y Y in Fig. 2 of the sliding block, pulley, connecting-rod, and guide-rail. Fig. 8 is a plan view of frame and pul-

leys with the top bar, rubbing-belt, and carriage removed, the tracks and driving-belts in dotted outline, and the track-adjusting screws in section.

Similar numerals refer to corresponding parts.

Numerals 10 10 are the end brackets of the machine-frame. End brackets 10 are connected by the side brackets 11 and 12, the center bracket 13, guide-rail 25, and top rail 14 in forming the frame of my machine. Shaft 49 is mounted in suitable boxes on and near one end of side bracket 11 and central bracket 13, as shown in Fig. 8, and bears thereon the loose cone-pulley 17, the loose pulleys 18 and 18', and the fly-wheel 15. Driving-pulley 18 is attached to cone 17 and is actuated by driving-belt 51. Loose pulley 18' is an idler for throwing belt 51 on and off in starting and stopping the machine. A similar shaft 50 to shaft 49 is mounted on side bracket 11 and central bracket 13 at about the same distance from the opposite end bracket 10. A fast cone-pulley 16 is secured on shaft 50 opposite loose cone 17 and connected thereto by belt 52. On the inner end of shaft 50 opposite fly-wheel 15 is mounted pulley 15', and a belt 53 connects pulley 15' and fly-wheel 15.

A connecting-rod 19 is attached at one end to fly-wheel 15 on slotted spoke 20 in slot 21 by crank-pin bolt 54, as shown in Figs. 4 and 8, and I thereby adjust the length of the stroke of rod 19. The other end of rod 19 is attached to a sliding block or cross-head by bolt 55. The sliding cross-head has usually two blocks 22 and 23, which are connected by rod 24, that the two blocks may act as one. Blocks 22 23 are mounted in the grooved ways 25' in guide-rail 25, as shown in Figs. 2 and 7.

Loose pulley-wheels 26 and 27 are mounted on suitable bolts or pins on blocks 22 and 23. Similar loose pulleys are mounted on suitable pins in end brackets 10 between flanges or ribs 29 and 30, one pulley 28'' being placed at each end on a horizontal plane slightly below that of pulleys 26 and 27 and opposite openings 56 in bracket 10. A second pair of pulleys 28' are placed in a horizontal plane above pulleys 26 and 27 and opposite open-

ings 57, and a third pair are placed some distance above the pair 28' and opposite openings 58 at each end.

A rubbing-block belt or driving-strap 31 is attached at one end to bracket 10, as at 32. It passes through opening 56 and in over pulley 27, then out over pulley 28'', then in under pulley 26 and out through opening 57 and under pulley 28', thence up over pulley 28 and through openings 58, thence down over pulley 28 at that end and under pulley 28', thence in through opening 57 and over pulley 26 on block 22, thence out through opening 56 and under pulley 28'', thence back through opening 56 and under pulley 27, and then back to clamp 33. Clamp 33 is made by a projection 59 on end bracket 10, which has openings for suitable bolts through the same and a corresponding clamping-piece 60. The end of belt 31 is inserted between parts 59 and 60 and drawn tight. The bolts are then tightened, thus clamping the end of the belt securely.

It is apparent that by loosening clamp 33 the slack of belt 31 may be taken up when desired. It is equally apparent that the ends of belt or strap 31 are held stationary on brackets 10 at 32 and 33, the purpose of which will be hereinafter explained. A rubbing-block 34 is attached to belt 31 by thumb-screws 61 and suitable clamping-plates 62 at each end of the block. Rubbing or abrading material 63 suitable to the work is secured to block 34 by screws 61 and plate 62. Screws 61 and plate 62 also hold the ends of spring 35, which is attached with suitable screw-bolts to block 66. Block 66 is formed with suitable projections to engage ways 36 on each edge of the under side of top rail 14, as shown in Fig. 5<sup>a</sup>, which ways 36 extend along the entire length of the top rail 14. Spring 35 has the double or S-shaped convolutions 65 each side of sliding block 66, whereby block 34 is caused to follow the work with a giving pressure much like the human hand.

Numeral 37 is the carriage for holding the article 67 which is to be rubbed or abraded, the article 67 being held in place by suitable cleats 70. Carriage 37 is mounted upon wheels 39 39, which wheels are attached to carriage 37 at an angle, so that the wheels on opposite ends converge inwardly, and thus brace the carriage against the rubbing stroke. Wheels 39 have a grooved or flanged rim to run on the corner of tracks 38.

Track-pieces 38 38 run crosswise of the machine or at right angles to belt 31 and are mounted in saddle-pieces 40, which saddles or yokes are secured on the upper ends of the four adjusting-screws 41 both by being pinned and screwed thereon, as shown in Fig. 6, in order that saddles 40 may not work loose by the constant strain of the carriage passing back and forth on tracks 38. Adjusting-screws 41 are mounted in suitably-threaded openings in side brackets 11 12. In order to turn screws 41, and thereby adjust the height of tracks 38 and carriage 37, a ratchet 42

with suitable handle is attached to one of said screws 41. A sprocket-wheel 44 is secured on each screw 41, and a sprocket-chain 43 surrounds the four sprocket-wheels, as shown in Fig. 8, so that by the operating of ratchet 42 turning one screw the four screws are turned simultaneously. In order to make room for the driving-gear and fly-wheel 15, sprocket-chain 43 is extended out around a small sprocket-wheel 67, which wheel 67 is mounted on bracket 68 on guide-rail 25. A slot 69 is made in bracket 68, and the pin on which wheel 67 turns is adjustably mounted in slot 69 in order to take up the slack in chain 43.

In order that I may have full control over carriage 37 and adjust said carriage instantly and with nicety, I provide a second means for adjusting the height of said carriage. For this purpose rods 45 are secured in track-pieces 38. Eccentrics 44' are made fast on rods 45 to work within saddles 40, a brass rubbing-piece 46 being usually secured in the bottom of the slot of saddle 40, as shown in Fig. 6, for eccentric 44' to bear upon. Cross-rods 45 are connected by link 47 and arms 47'. One of the rods 45 is extended at one end of the machine, and a lever 48 is secured thereto.

I will next describe the operation of my machine. Power is applied to the machine through driving-belt 51, which runs on loose pulley 18' when the machine is standing idle and is shifted to pulley 18 when it is desired to start the machine. Pulley 18 is attached to cone 17, as stated, and both pulley 18 and cone 17 run loose on shaft 49. Cone 17 is attached to cone 16 by belt 52, and it is apparent that the turning of cone 17 by belt 51 will turn the fast cone 16. It is equally evident that different speeds may be attained by the different steps of the cone-pulleys 16 and 17. The turning of cone 16 causes shaft 50 and fast pulley 15' to revolve. Pulley 15' is connected to the outer rim of fly-wheel 15 by belt 53 and causes said fly-wheel to revolve, thus giving to connecting-rod 19 and sliding cross-head 22 23 a reciprocating motion in guide-rail 25.

Turning now to Fig. 2, it will be noted that belt 31, which is mounted in relays or laps on the loose pulleys 26, 27, 28, 28', and 28'', is engaged near its stationary ends 32 33 by the loose pulleys 26 27 at each end of the sliding cross-head. It is apparent, therefore, that the giving of a reciprocating motion to said sliding cross-head will cause said belt 31 to alternately feed in and out of the opposite ends of the cross-head. It is equally apparent that such an alternating motion being given to the central part of belt 31 will cause it to move backward and forward, which is precisely the desired motion for a rubbing-block.

It will be noted that according as more loose pulleys and corresponding additional laps of belt 31 are used a longer range of

stroke is given to the rubbing-block. Each lap of belt 31 will add to or take from the length of the stroke. I use this principle broadly in the construction of the different sizes of my rubbing-machines. After a machine is constructed I depend upon the changing of connecting-rod 19 in slot 21 of fly-wheel 15 for adjusting the length of the rubbing stroke.

10 Rubbing-block 34 is attached to belt 31, as above described, and travels backward and forward with said belt, being guided on ways 36 on the under side of stationary top rail 14.

The operator places the article 67 to be 15 rubbed or abraded upon carriage 37 and adjusts said carriage by ratchet 42, so that the actuation of lever 48 and eccentrics 44' raises the article against rubbing-block 34 with the desired pressure. It is apparent that this 20 pressure may be increased or diminished by adjusting-screws 41. Belt 31 is attached directly to block 34, as described, and not to spring 35. Hence block 34 will rub evenly and will not tip or overrub the ends of the 25 rubbed surface. The convolutions 65 of spring 35 are such that they give block 34 practically a pivotal action in its adaptability to the rubbing-surface, thus resembling, as above stated, the action of the human hand, 30 which, as is well known, is ideally perfect for such work.

It is apparent that by simply taking off washers from between the carriage 37 and the wheels 39 and tightening up the bolts which 35 hold the wheels 39 all necessary allowance is made for taking up the wear and all shucking of the carriage is prevented.

I claim as new—

1. In a rubbing-machine, a suitable frame, 40 a strap having its ends secured to said frame, means for giving a reciprocating motion to the central portion of said strap, and a rubbing-block on said central portion.

2. In a rubbing-machine, a suitable frame, 45 reciprocative mechanism mounted in said frame, loose pulley-wheels on said frame and on said reciprocating part, a belt having its ends attached to said frame, the end portions of said belt mounted on said pulleys in inter- 50 lapping lengths to give length of reciprocating stroke to the central portion of said belt.

3. In a rubbing-machine, a suitable frame, a block slidably mounted in said frame and means for reciprocating said block, loose pul- 55 ley-wheels on said block and on said frame, a belt, each end portion of the belt mounted alternately on said frame-pulleys and on said block-pulleys in interlapping lengths.

4. In a rubbing-machine, a suitable frame, 60 a carriage for holding the work mounted

thereon on adjustable tracks, connected blocks slidably mounted in said frame and means for giving a reciprocating motion thereto, loose pulleys on said blocks and on said frame, a belt having its ends attached to said 65 frame and mounted on said pulleys in laps that said block may impart a reciprocating motion to the central part of the belt.

5. In a rubbing-machine, a suitable frame, a fixed guide-rail on said frame, a rubbing- 70 block having slidable bearing on said guide-rail, a leaf-spring for said block having a double or S-shaped convolution in each end, and means for reciprocating said block.

6. In a rubbing-machine, a suitable belt 75 and means for giving a reciprocating motion thereto, a rubbing-block attached directly to the under side of said belt, and spring-pressure on the upper side of said block and belt.

7. In a rubbing-machine, parallel tracks 80 crosswise of the machine, a carriage for holding the work having wheels which incline sidewise, substantially as and for the purpose specified.

8. A rubbing and polishing machine com- 85 prising a suitable frame having a fixed guide-rail, transverse ways mounted on adjusting-screws in said frame, eccentrics on said ways and a lever for quick adjustment of the same, a carriage on said ways having wheels which 90 incline inwardly toward their upper edges, a belt having its ends held stationary, reciprocating means for the central portion of said belt, a rubbing-block attached to the under side of said belt, and a double convoluted 95 spring on said block having a guide bearing on said guide-rail.

9. A rubbing-machine comprising a suitable frame, a block slidably mounted in said frame and means for reciprocating said block, 100 loose pulleys on said block and on said frame, a belt mounted alternately on said block and frame pulleys whereby a reciprocating motion is imparted to a portion of said belt by said reciprocating block, a rubbing-block on said 105 reciprocated portion of belt, parallel tracks supported crosswise in said frame on adjusting-screws, eccentrics for instantaneous adjustment of said tracks, and a carriage on said tracks for holding the work having 110 wheels which incline inwardly to brace against the rubbing stroke, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of 115 two subscribing witnesses.

AUGUST LAWSON.

Witnesses:

A. W. KETTLE,

S. A. BALDWIN.