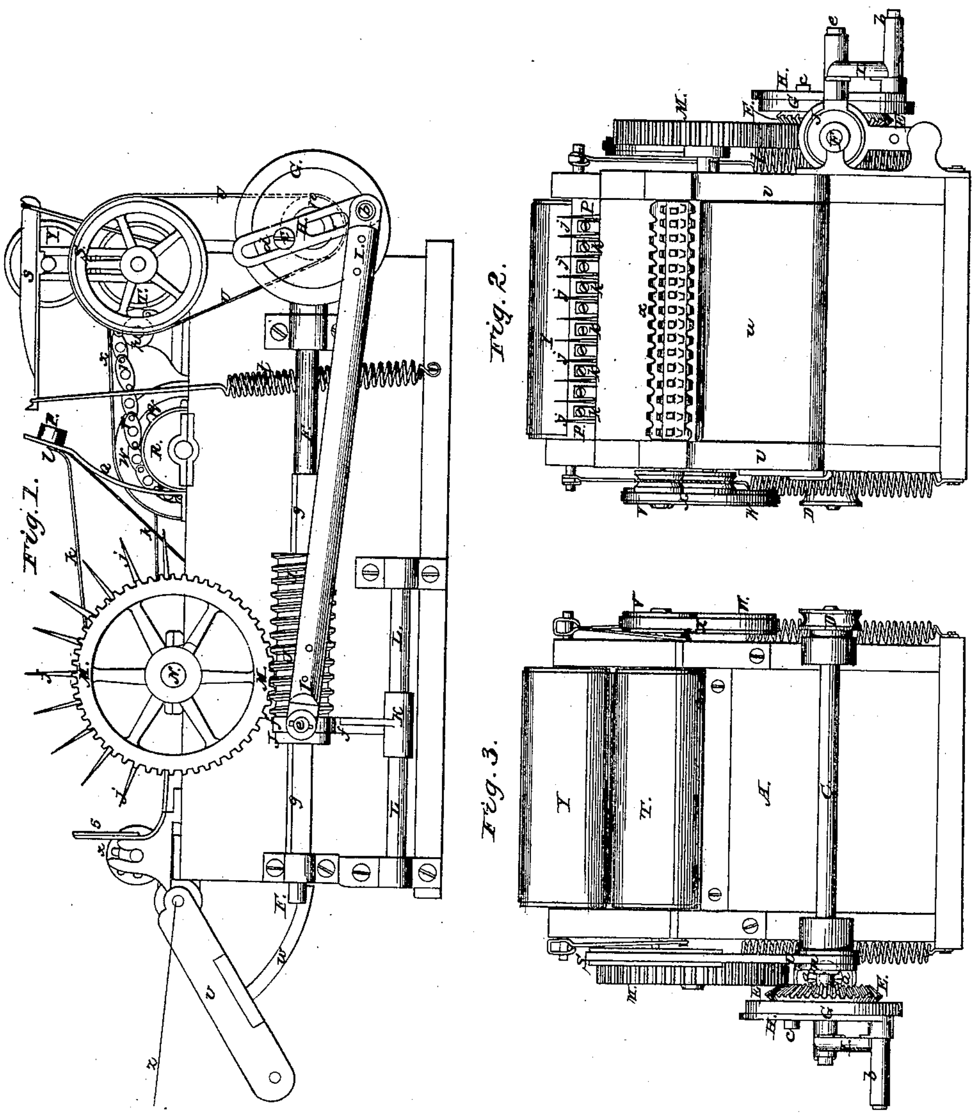
2 Sheets—Sheet 1.

W. MURKLAND.

MACHINE FOR WASHING WOOL AND OTHER FIBROUS MATERIALS.

No. 51,900. Patented Jan. 2, 1866.



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2 Sheets—Sheet 2.

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Fig. 4.

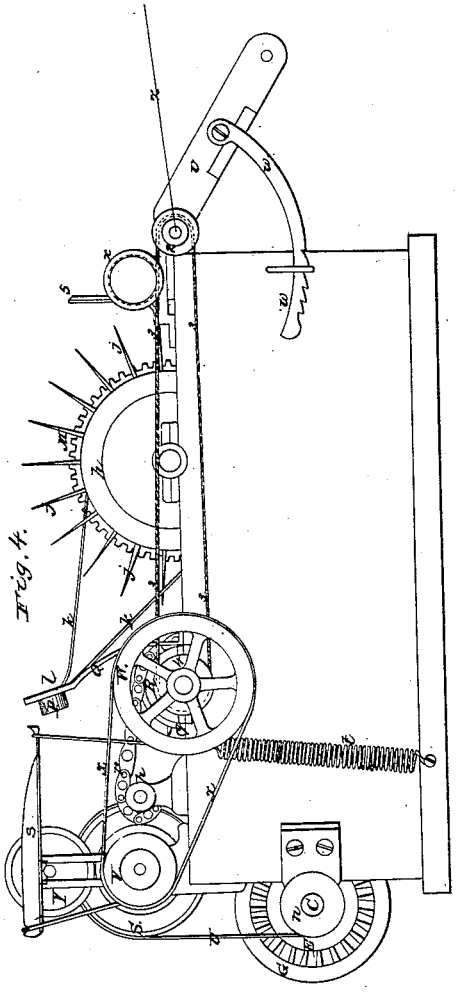
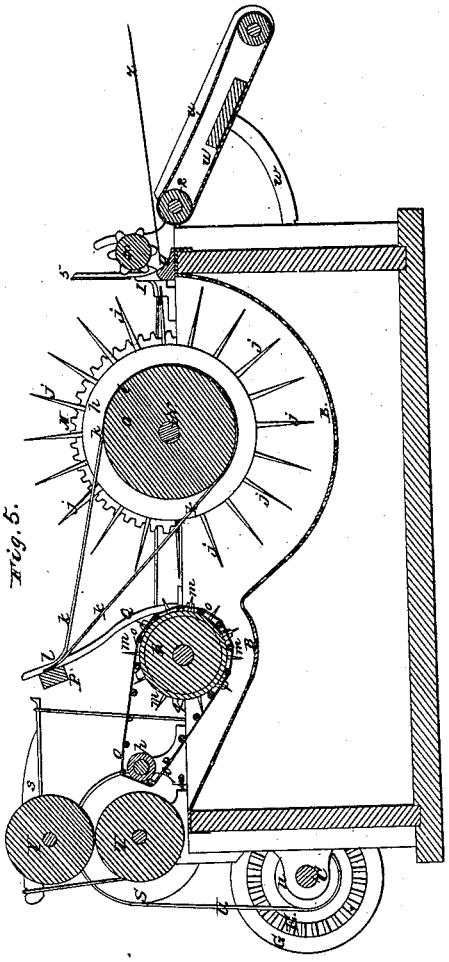


Fig. 5.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MACHINES FOR WASHING WOOL AND OTHER FIBROUS MATERIAL.

Specification forming part of Letters Patent No. **51,900**, dated January 2, 1866.

To all whom it may concern:

Be it known that I, WILLIAM MURKLAND, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Washing Wool; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents an elevation of one of the sides of the machine. Fig. 2 represents an elevation of that end of the machine that the wool is fed in at. Fig. 3 represents an elevation of the delivery end of the machine. Fig. 4 represents an elevation of that side of the machine opposite that shown in Fig. 1; and Fig. 5 represents a longitudinal vertical section taken through the machine centrally.

Similar letters of reference, where they occur in the separate figures, denote like parts in all the drawings.

My invention consists in washing wool and other fibrous material by giving it an oscillating and progressive movement in and through the liquid by means of certain devices and combinations of devices for agitating and feeding the wool or other material to be washed through the machine, and subjecting it to the several operations of the different devices, as will be explained.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A represents a tank, on and in which the mechanism is arranged. Inside of the tank there is a perforated bottom, B, for catching and holding the wool or other material to be washed while the water may flow through its perforations. The tank may be also furnished with the usual inlet and draw-off pipes.

At one end of the tank or frame A there is a shaft, C, upon which a pulley, D, is fixed, and by means of a belt from any first-moving power passing over this pulley D motion may be communicated to the machine as follows: On that end of the shaft C opposite to the pulley D there is affixed a bevel-gear, E, that meshes with a bevel-spur gear, *a*, on a shaft, F, by which gears the said shaft is rotated; and to the gear E there is fastened (or to the shaft C, which is the same thing, as they all turn together) a crank-wheel, G, upon which there is an adjustable wrist-pin carrier, H, having a wrist-pin, *b*, on it, and made adjustable by the set-screw *c* and slot *d*.

To the wrist-pin *d* is connected one end of a pitman, I, the other end of said pitman being pivoted or hung to a wrist, *e*, projecting from a collar, *f*, upon or within which the worm-sleeve J turns. This worm J has a square opening through it, which opening works over or reciprocates upon the square portion *g* of the turning-shaft F; and to the collar *f* there is also secured a guiding-piece, K, that slides over a guide-rod, L.

It will be perceived that the worm J has a reciprocating motion on the shaft F by means of its pitman-connection I, and that it revolves with the shaft F, which is turned by the gears E *a;* but the collar *f*, though it reciprocates with the worm, does not turn with it. On the contrary, the worm turns in the collar. This peculiar connection or combination of motions gives to the gear M, which is reciprocated by the worm J, a very peculiar motion—viz., it turns said gear farther in one direction—namely, in the direction in which the material is to pass through the machine—than in the opposite direction, the object of which will be stated in connection with the operation of the machine.

The gear M, which is reciprocated by the worm J, is fixed upon the end of a shaft, N, upon which shaft, or that portion of it which is over the tank A, is a hub or drum, O, the perimeter of which is formed into a series of flanges, *h*, with a series of recesses, *i*, between the adjacent flanges. In the flanges *h* are arranged radially a series of spikes or teeth, *j*, which project far enough to reach into the wool or other material to be washed, as shown in Fig. 5, so as to open, pick, agitate, and convey forward the material that is being washed. Around the recesses *i* are passed straps or slats *k*, of thin metal or other material, which are fastened at *l* to a cross-bar, P, supported by the arms or ribs Q. These slats or straps *k* serve as guards to prevent the material from being carried over the top of the oscillating cylinder O and beyond its action. The teeth

or spikes *j* pass through the openings between the straps, while anything carried over by the spikes would be caught and held by said guard slats or straps.

Beyond the oscillating cylinder O, and toward the delivery end of the machine, there is a cylinder, R, armed with spikes or pointed teeth *m*, which cylinder has a continuous rotary motion in the direction in which the material is carried through the machine, which motion is attained as follows: On the shaft *c* there is a pulley, *n*, over which, and over a pulley, S, on the journal of the under squeeze-roll, T, passes an endless belt, U, which drives said roll T, and on the journal of said roll, at the opposite side of the machine, Figs. 3, 4, there is a pulley, V, around which, and around a pulley, W, on the journal of the cylinder R, passes an endless belt, X, which gives motion to said cylinder. An apron, *o*, made of rods and links, so as to be quite open, passes around the cylinder R and around a guiding and supporting cylinder, *p*, which apron is moved in the direction in which the material passes through the machine by a sprocket-wheel, *q*, on the cylinder R and a chain, *r*, on the apron. This apron is as wide as the cylinder R is long, and the points of the spikes or teeth *m* pass through the open spaces or interstices of the apron. The object of this arrangement is to allow the spikes *m* to carry up the washed material from the tank and to deliver it upon the apron *o*, where it can drain, and by it be carried and delivered to the squeeze-rolls T Y, by which the water is pressed out of the washed material, and it drops upon the floor. The top squeeze-roll, Y, is held down against the lower one, T, by levers *s* and springs *t*, so that it may yield, when necessary, but be firm enough to squeeze the water out of the material passed through between them.

The material to be washed is fed into the machine as follows: An apron, *u*, is arranged on a frame, *v*, which frame may be hinged to the tank or main frame, so that by means of curved and notched arms *w* it may be set at any suitable inclination toward the feed-roll *x*. (In the drawings the frame and apron are represented as let down; but when in working order they should be raised up to about the position and inclination shown by the red lines *z*, Figs. 1 and 4.) The feed-roll *x* is grooved horizontally and serrated circumferentially, and works over or against a concave, *y*, that has teeth or bars 1 upon it, through and between which the wool or other material, after being picked or loosened up by the feed-roll *x*, is forced, where it is taken by the pointed spikes or teeth *j* of the oscillating cylinder O and agitated, picked, washed, and then advanced to the discharge end of the machine, as above mentioned. The feed-roll *x* and the roll 2 of the endless apron *u* are driven by an endless belt, 3, that passes around a pulley, 4, on the journal of the cylinder R, and thence around both rolls *x* 2. A guard or shield plate, 5, is placed behind the feed-roll *x* and over the teeth, rack, or comb 1, to prevent the material from going over the top of the roll *x*, instead of underneath it.

The object in rotating the gear M of the toothed cylinder farther in one direction than in the other is for the purpose of causing the material, although constantly and repeatedly acted upon and agitated, to be at the same time gradually but surely advanced through the machine.

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

1. In a machine for the washing of wool or other fibrous material, the combination of the toothed cylinder with a revolving and traversing worm and with a worm-gear, so that said worm will act as a worm and a rack both in giving the gear and the parts connected with it both an oscillating and a progressive motion, substantially as and for the purpose described.

2. An adjustable crank or its equivalent, in combination with the worm-rack, for the purpose of increasing or diminishing the oscillations of the picking and washing cylinder, substantially as described.

3. The combination of the toothed and fluted feed-roll, the toothed shell or comb, and the oscillating cylinder, for feeding in the material to be washed to the tank, substantially as described.

4. In combination with the oscillating cylinder, the clearers *k*, passing under and around said cylinder, substantially as and for the purpose described.

5. The combination of the endless open belt with the toothed cylinder R, and passing around said cylinder, for the purpose of taking up, receiving, and delivering the washed wool to the squeeze-rolls or to any other point of delivery, substantially as described.

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