

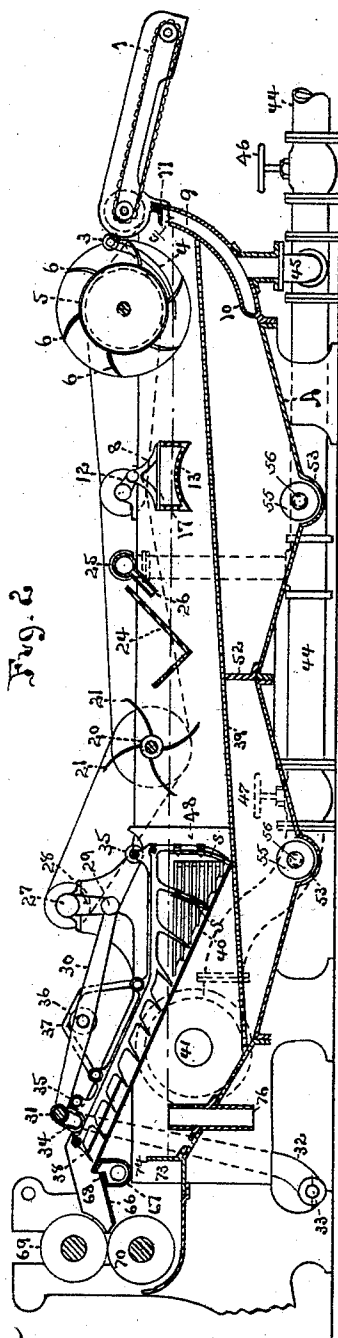
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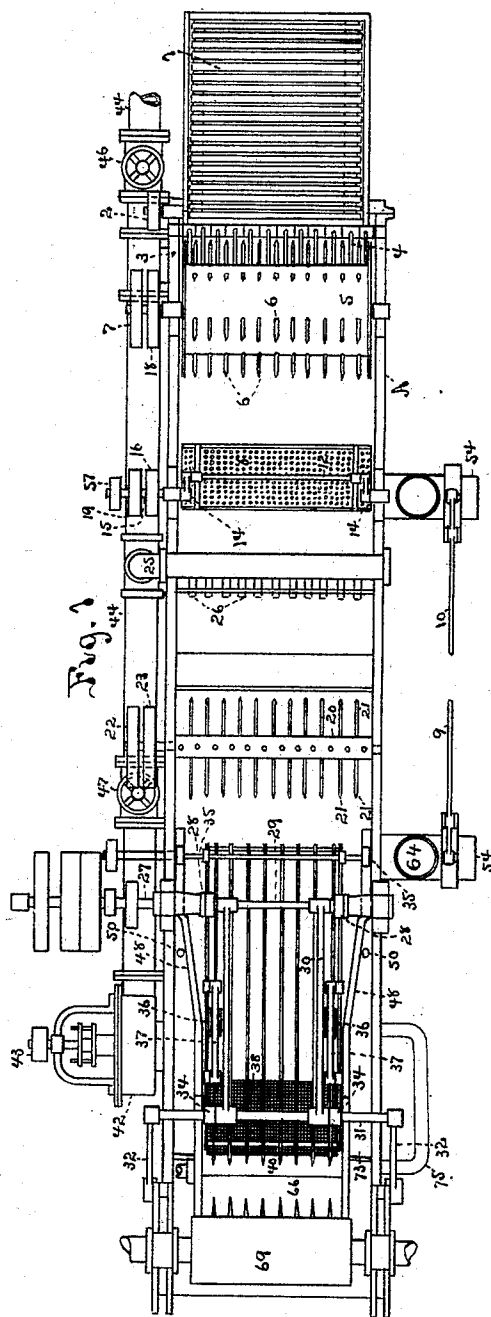
F. G. & A. C. SARGENT.
WOOL WASHING MACHINE.

No. 498,889.

Patented June 6, 1893.



Witnesses
W. D. Brown
W. P. Ockington



Inventors
Frederick G. Sargent
Alvan C. Sargent
By David Hall Lee
Att'y

(No Model.)

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Fig. 3

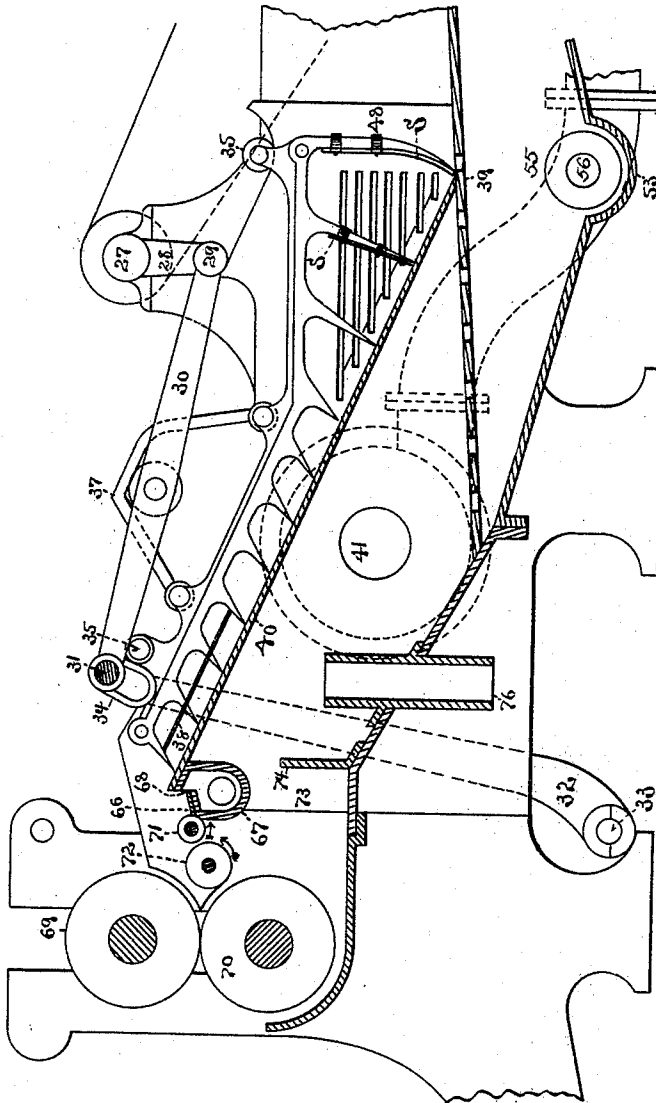
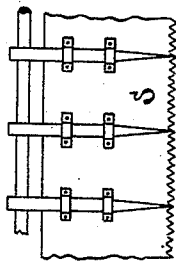


Fig. 8



Witnesses

Wm. S. Brown
A. P. Ockington

Inventors

Frederick G. Sargent
Allan C. Sargent
By David Hall Rice
Att'y

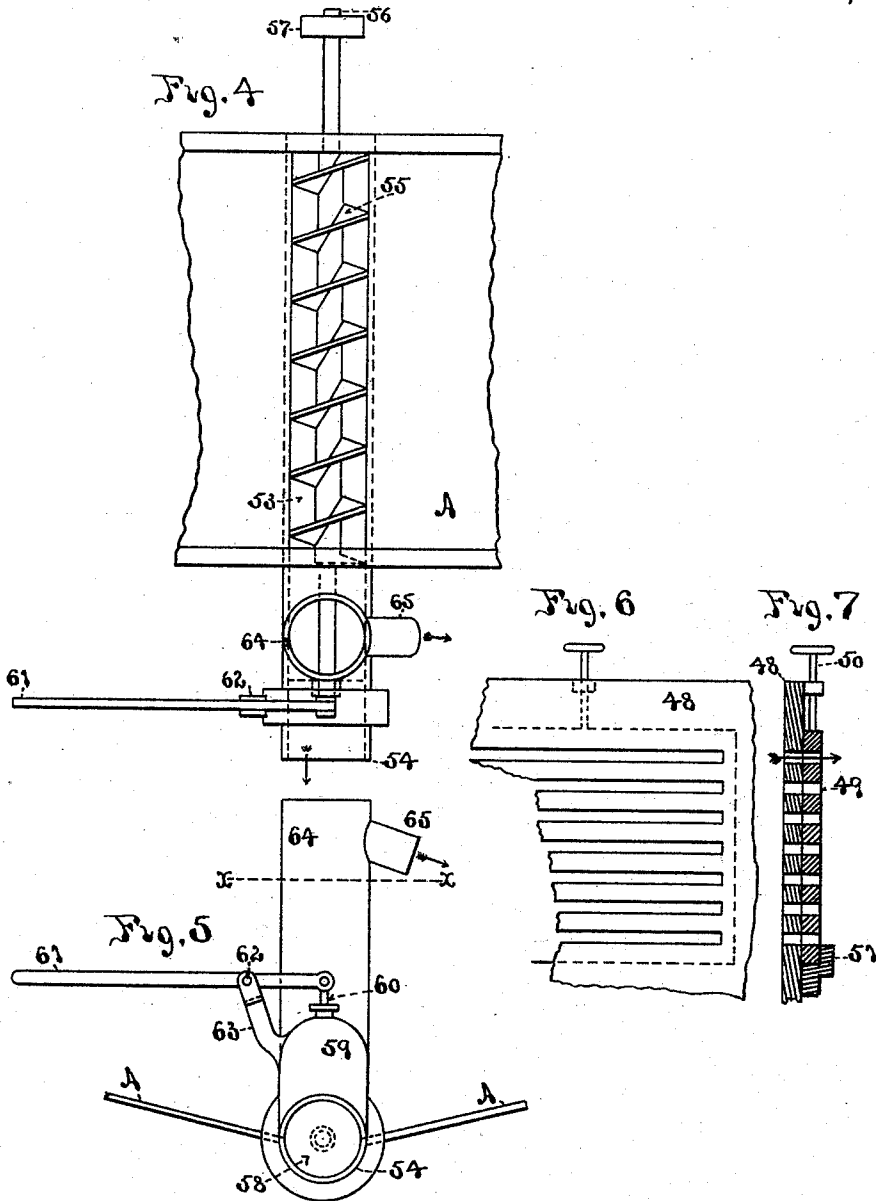
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Atty

UNITED STATES PATENT OFFICE.

FREDERICK G. SARGENT AND ALLAN C. SARGENT, OF GRANITEVILLE,
MASSACHUSETTS.

WOOL-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 498,889, dated June 6, 1893.

Application filed January 7, 1891. Serial No. 376,995. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK G. SARGENT and ALLAN C. SARGENT, of Graniteville, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Wool-Washing Machines, of which the following is a specification.

Our invention relates to machines for washing wool or other fibers, and it consists in certain new and useful constructions and combinations of the various parts of the same, substantially as hereinafter described and claimed.

In the drawings: Figure 1 is a top plan view of a wool washing machine constructed according to our invention. Fig. 2, is a side elevation of the same, with one side removed to show the construction of the parts. Fig. 3 is an enlarged view of the carrier end of the bowl shown in Fig. 2, with a modification of the incline or chute which connects the carrier bed with the squeeze rolls. Fig. 4 is an enlarged top plan view of a portion of the bowl with the souser and false bottom and pipes removed to show the cleaning-out apparatus. Fig. 5 is a side elevation of the discharge pipe of the cleaning-out apparatus, showing the valve connections and arrangement of the same. Fig. 6 is a side elevation of a portion of the fluid discharge grating on the side of the carrier bed looking from its inside face. Fig. 7 is a vertical section through the same showing the valve for opening and closing it, mounted on its rear side. Fig. 8. is a rear view of part of the carrier scraper.

A is the bowl of the machine mounted upon feet, which support it upon the floor, and supporting the working mechanism. A feed apron, 1, delivers the fiber to the bowl at its feed-in end, being driven by the pulley 2 on the end of its upper roll shaft. The wool is delivered under the shaft or head of the rake 3, composed of the teeth 4, 4, which are made of yielding material, or to yield on the shaft. These teeth serve to hold the fiber against the draft of the feed-in cylinder, 5, which is provided with curved teeth 6, 6, that pass around between the rake teeth 4, 4, as the cylinder rotates. The cylinder 5 is revolved by pulley 7 on the end of its shaft. At the feed-in end of the bowl the reservoir, 9, is formed by

a curved partition, 10, which reaches across the bowl and extends upward parallel to its curved end so as to form an outflow, *c*, which has a mouth-piece, 11, above the outflow to direct the sheet of washing fluid against the wool which is held between the rake teeth 4 and the bowl, thus sousing or rinsing the wool before it has been carried beyond the rake teeth by the cylinder and its teeth, 6, and this function of holding the wool in position to be rinsed by the fluid projected from the mouth-piece *c* is the valuable one of the rake teeth 4, 4.

A revolving ducker 8 is suspended on the wrist pin shaft, 12, so as to turn closely thereon, and be balanced with its lower surface horizontal to the fluid in the bowl, and has its lower surface 13 formed perforated, so that as it descends into the fluid the inrush of fluid into the ducker through the perforated lower surface will hold the wool against it and press it downward into the fluid. The shaft 12 is mounted in the outer ends of the cranks 14, 14, which are rotated by the shaft 15, to which one of them is attached, the latter being driven by pulley 16 on its outer end. The sides of the ducker are also perforated to allow the air to escape from it as it descends into the fluid, and to allow the fluid to escape from it as it rises. The upper side of the ducker is formed of the board or plank, 17, to which the sides are attached at their upper edges, and two brackets attached to the upper surface of this plank serve to suspend the ducker upon the rod 12, as shown. This arrangement of the ducker enables it to be operated positively and certainly without undue strain or jar upon the working parts of the machine.

The pulley 2 is intended to be belted to the pulley 18 on the shaft of cylinder 5, and the pulley 7 is intended to be belted to the pulley 19 on the shaft 15 of the ducker but the belts are omitted to illustrate other parts clearly. A toothed roller, 20, having teeth 21, 21, curving backward, also serves to again submerge the wool and carry it along in the bowl. It is driven by the pulley, 22, on the outer end of its shaft and the pulley 23, also on the same shaft is belted to pulley 16 of the ducker.

On the feed-in side of the toothed roller 20 is a shield, 24, extending downward beneath the fluid level in the bowl and thence upward toward the toothed roller so that the wool 5 passing under it will be caught by the teeth of the roller as it rises under the upwardly inclined surface of the shield toward the roller. To force the fiber under this shield, the pipe 25 is made to extend across the bowl 10 in advance of it, and has the spouts or nozzles 26 projecting forward and downward, so that when fluid is forced into the pipe the streams ejected from the spouts will drive the fiber under the shield 24, and the current thus 15 created serves to draw the fiber forward from the ducker 8 to the shield. The teeth 21 of the roller pass the fiber forward to the carrier, which is driven by the shaft, 27, having attached to it the cranks 28, 28. These cranks 20 are connected together by a shaft, 29, forming a wrist pin, to which is attached one end of the pitman rods or bars, 30, the other end being connected to the rock shaft, 31, which passes through the upper ends of the rocking bars, 32, 25 which rock on the shaft 33 mounted in bearings underneath the bowl. The shaft 31 passes through links, 34, attached to the upper end of the carrier, and these cause the carrier to be moved by the pitmen bars 30, as the cranks 28 30 revolve. S is a scraper which if desired may be (as shown in Fig. 8) attached to the two rear lines of carrier teeth, serving to assist to clear off particles of wool from the whole breadth of the carrier bed. Its serrated lower 35 edge also clears the wool from the perforations of the carrier bed, where it is deposited by the suction of the pump. The carrier is provided with inclined ways on each side of the bed, to which the trucks 35, 35, are fitted 40 so that the carrier in its upward movement shall travel on the trucks up these ways. When the cranks 28 revolve in the upper part of their circumferential path, however, the trucks or rollers, 36, which are attached to the 45 middle part of the pitmen bars, 30, rise under the straps 37, which are attached to the body of the carrier and lift its rear end, on its backward movement, off its ways and drop it into the fluid on the wool, ready to carry it 50 up the carrier bed during the other part of the revolution of cranks 28. The upper part of the carrier is provided with a horizontal screen, 38, shown as extending past four rows of carrier teeth, which is made of wire net- 55 ting, or other similar material sufficiently dense to press the wool down upon this part of the carrier bed, which is above the fluid level in the bowl, and squeeze the fluid out of it as it is carried upward. The construction 60 of the open straps 37 and of the open links, 34, allows the carrier to traverse upward on the trucks 35 parallel to the carrier bed, without interfering with the rotary movements of the cranks 28 and pitmen bars 30, 65 which impart motion to the carrier.

The bowl is provided with a false bottom, 39, extending throughout its length and

formed of perforated material, so that the dirt washed out of the wool will drop through underneath it onto the bottom of the bowl. 70 This false bottom 39 pitches downward from the feed-in end of the bowl in order to assist the carrying of the wool forward to the carrier bed. The carrier bed 40 meets this false bottom at its lower end and is also perforated 75 to allow the washing fluid to pass through it.

Under the carrier bed and above the false bottom, a discharge outlet, 41, is provided to which is connected the rotary pump, 42, driven by the pulley 43 on the outer end of its shaft. 80 This pump discharges into the pipe 44, which extends along the side of the bowl and is connected to the pipe 25 and also to the short pipe 45, which opens into the reservoir 9. The pipe 44 also has the valve 46 attached to 85 it, by which the fluid can be delivered from its outer end instead of being circulated back through the bowl by the other connections described. It also has another valve, 47, between the pump and the pipe 25, by which 90 the amount of fluid delivered through it to the latter and to the reservoir 9 may be regulated.

The delivering of the fluid through the spouts 26 and the mouth-piece *c* of reservoir 95 9, and its being constantly taken up through the outlet 41 by the pump, causes a constant current of the washing fluid to carry the fiber forward and lodge it upon the perforated carrier bed, 40, in position for the carrier to take 100 it up, but it has been found that sometimes the suction of the fluid passing through the perforated carrier bed held the fiber too firmly upon the latter to permit the carrier to readily strip it off and carry it forward to the 105 squeeze rolls. In order to regulate this suction of the fluid through the carrier bed, we have provided side walls or partitions, 48, which are carried inward from the sides of the bowl and above the fluid level in the latter as 110 shown, and are provided with bars, forming openings through which the fluid may pass to reach the outlet, 41, and thus relieve the suction through the perforated carrier bed. To regulate the amount of fluid passing through 115 between the bars of the supplemental side walls 48, we have provided a valve, 49, behind the sides, [Figs. 6 and 7] formed of bars fitted to slide across the openings between the bars of the side walls, and close the same in 120 whole or part. This valve has a piston handle, 50, whose rod slides in a sleeve at its upper end and has brackets at its lower end, and allow of its sliding movement. By taking hold of the valve handle, 50, and sliding 125 the valve the openings in the side walls 48 may be increased or diminished, so as to regulate the suction through the carrier bed, as before described.

Underneath the false bottom, 39, the bowl 130 of the machine is divided into two portions by the vertical partition, 52, and the bottom of the bowl in each portion inclines downward from each way to the semi-tubular drop

or cavity, which extends transversely across the bowl. This cavity 53 opens at one end through the side of the bowl into a short horizontal tube, 54, the lower half of which forms a horizontal extension of and coincides with the cavity 53. In the latter a screw 55 is fitted, mounted on the horizontal shaft 56 so as to extend into the tube 54, in which one end of the shaft extends and is mounted axially on a spider. The other end of the shaft 56 extends through the opposite side of the bowl and has the pulley, 57, attached to it. The fit of the screw 55 is such that it revolves quite closely to the walls of the cavity, 53, and the extension thereof, tube 54. The outer end of the tube 54 is closed by the slide valve, 58, which slides up and down in the box 59 and is attached to the piston rod, 60, passing through a stuffing box on the top of the box. A lever, 61, is attached to the piston rod, being mounted on the pivot 62 in arm 63. By means of this lever the valve 58 is opened or closed. Outside of the bowl A, a vertical tube, 64, is connected to the tube 54 and extends above the level of the fluid in the bowl, being there provided with a side spout 65. The operation of this part of the mechanism is as follows: The dirt falling through the false bottom 39, as it descends to the bottom of bowl A, slides down the latter into the cavity 53 around screw 55. By applying a belt to pulley 57 the screw is revolved in the right direction and carries the dirt along into tube 54 and forces it into the latter and up tube 64, and out of spout 65. The space under the false bottom 39 is thus cleaned out, without the necessity of removing the bottom to clean it, or of stopping the washing machine for that purpose, which is important.

In Figs. 1 and 2 the ordinary form of chute, 66, connects the carrier bed with the squeeze rolls, and we have provided it with a tube 67, connected to a source of fluid supply and having a long slot, 68, for a mouthpiece, extending across the machine the whole width of the carrier bed, under the upper edge of the same, and opening toward the squeeze rolls. This construction causes a sheet of washing fluid to be projected over the surface of the chute, 66, and both aids to carry the wool forward to the squeeze rolls 69 and 70. On some kinds of wool, however, while it is advantageous to rinse them at this point, it is desirable to allow the rinsing fluid to escape before reaching the squeeze rolls as otherwise the excess of fluid at that point prevents the latter from taking a proper hold on the wool and carrying it through them, and the wool piles up on the chute and goes through irregularly. This is avoided by allowing the wool to drain off before entering the nip of the squeeze rolls. To effect this and carry the wool forward to the squeeze rolls, we adopt the modification shown in Fig. 3, in which a portion of the chute 66 nearest the squeeze rolls is cut away, and the rotary transfer rolls 71 and 72, mounted in bearings in the partitions 48, are sub-

stituted in place of it. These rolls revolve in the direction of the arrows as the fiber passes over them, and allow the fluid to drain off between them and between the roll 71 and the adjacent end of chute 66, and their rotary motion thus prevents the downward suction of the fluid draining off from retarding the progress of the bulk of the fiber to the squeeze rolls. These rolls are also valuable to allow the draining off of some grades of wool when the rinsing pipe 67 is not used. As the fluid drains off between these rolls it is caught in the trough, 73, formed by the sides of the bowl, its upwardly curving bottom beneath the lower squeeze roll 70, and the transverse partition 74, which reaches across the bowl from side to side, fitting the latter tightly on its ends and lower edge. This arrangement possesses the disadvantage of allowing small portions of the fiber to pass down with the fluid which drains off between rolls 71, 72, which would speedily settle in the trough 73 and fill it up, necessitating the stopping of the machine and the removal of the chute 66 and rolls 71 and 72 in order to clean it out. The disadvantage of this is so great that the solid chute 66 has been used more commonly than rolls like 71 and 72, because it does not let the particles of fiber escape to this disadvantageous extent into trough 73, although the advantageous drainage of the fiber is not accomplished. To obviate this difficulty and at the same time obtain the advantage of draining the sheet of fiber as it passes over rolls 71 and 72, we connect the trough 73 with the body of the bowl near the pump outlet 41, by the pipe 75, [Fig. 1] so that the suction of the pump shall serve to draw the fluid contents of trough 73 forcibly out of it, carrying the fibers of wool which have descended between rolls 71 and 72, forcibly out of the trough and keeping it constantly cleaned. These fibers so drawn out by the suction of the pump 42 are again delivered into the wool passing through the washing fluid in the bowl and incorporated with it, and all parts of the bowl are thus kept constantly cleaned of wool fiber, which usually settles and requires the machine to be stopped to clean it out.

An overflow pipe, 76, extends up through the bottom of bowl A under the carrier bed, 40, to the fluid level and keeps that constant in the bowl.

It will be observed that this machine does not require to be stopped to clean out either the dirt, or the wool fiber, which settles in the bowl, and so effects a great saving in expense of operation.

What we claim as new and of our invention is—

1. In a fiber-washing machine, in combination with the feed-in cylinder 5 provided with teeth 6, rake 3 provided with teeth 4 arranged to extend between the teeth 6 of the cylinder, and the fluid delivery mouth, c, whereby the fiber is rinsed while held between the bowl and the rake teeth, substantially as described.

2. In a fiber-washing machine, the combination of the shield 24 inclining downward into the fluid on its feed-in side, and the pipe 25, and spouts 26 arranged to project fluid downward under the shield and draw the floating fiber forward beneath the same, substantially as described.

3. In a fiber-washing machine, the combination of the shield 24 inclining downward below the fluid surface of the bowl and thence upward on its feed-out side, and the rotary toothed cylinder, 20, provided with teeth 21 arranged to strike the floating fiber as it rises under the inclined feed-out side of shield 24, and carry it downward into the fluid, substantially as described.

4. In a fiber-washing machine, the combination of the bowl provided with ways for the carrier trucks, the carrier provided with said trucks 35, 35, at both ends thereof, mounted upon the arms 32 by the open links 34, and provided with the open straps 37, and the cranks 28, and pitmen bars 30, connected to the carrier and provided with projecting parts, 36, extending under said open links, whereby the carrier is allowed to travel upward on its trucks parallel to the carrier bed, and is then lifted and carried backward on the arms 32 and pitmen bars 30, substantially as described.

5. The combination of the inflow *c* at the feed-in end of the bowl, the perforated carrier bed, the outflow opening 41 beneath the carrier bed, one or more side openings through the wall 48 connected with said outflow, and the valve connected therewith arranged to open and close the same to regulate the flow of the washing fluid through the perforated carrier bed, substantially as described.

6. In a fiber washing machine, the combination of the carrier bed, the fluid supply pipe, 67, provided with the delivery mouth 68, and a series of rollers arranged successively lower toward the squeeze rollers to have the fluid projected from said delivery mouth over them, and to allow the fluid to drain away between them while transferring the fiber from the carrier bed to the squeeze rolls substantially as described.

7. The combination, in a fiber washing machine, of the bowl A, the inclined carrier bed, the squeeze rolls 69 and 70, the latter being mounted in the bowl so as to extend below the fluid level of the same, the rolls 71 and 72 arranged successively lower toward the squeeze rolls connecting the carrier bed with the squeeze rolls and to allow the fluid to drain away between them, the trough 73 placed below rolls 71 and 72 in position to catch the fluid and fiber draining off from them, the pipe 75 connecting said trough with the bowl, and the pump 42 and its outflow 41, located

in said bowl in position to create a suction of the fluid out of trough 73 through pipe 75 and remove the fiber therefrom, substantially as described.

8. The combination, in a fiber washing machine, of the bowl A provided with the perforated false bottom, 39, and having its bottom inclined from each way toward and formed into the trough 53, the tube 54 connected to said trough and forming an extension thereof outside of the bowl of the machine, and the shaft 56 provided with wings, 55, arranged to revolve in said trough and to force the dirt settling therein into the tube 54, substantially as described.

9. The combination, in a fiber washing machine, of the bowl A provided with the perforated false bottom, 39, and having its bottom inclined from each way and formed into the trough 53, the tube 54 connected to said trough and forming an extension thereof outside the bowl, the vertical tube 64 extending above the fluid level of the bowl, and the screw shaft 56 arranged in said trough to force the dirt into the tubes 54 and 64 and out of the bowl, substantially as described.

10. The combination in a fiber washing machine, of the bowl A provided with the perforated false bottom, 39, and having its bottom inclined from each way toward and formed into the trough, 53, the tube 54 connected to said trough and forming an extension thereof outside of the bowl of the machine, and provided at its outer end with a valve, and the screw shaft 56 arranged to revolve in said trough and to force the dirt out of it into the tube, substantially as described.

11. In a fiber washing machine, in combination with the carrier bed, 40, and the rising and falling carrier, the horizontal plate, 38, attached to the carrier teeth at the upper end of the carrier in position to compress the fiber between the carrier and its bed as it carries the fiber up the latter, substantially as described.

12. In a fiber washing machine, the combination of the bowl A provided with a fluid inlet on the feed-in side of the perforated carrier bed, and with a fluid outlet and pump beneath the carrier bed, 40, and the reciprocating inclined carrier bed 40, and the reciprocating carrier having its aftermost rows of teeth, which traverse the lower portion of the bed, provided with the serrated edge scraper, S, arranged to clear the fiber off of the perforations of the bed across its entire breadth, substantially as described.

FREDERICK G. SARGENT.

ALLAN C. SARGENT.

Witnesses:

ARTHUR B. PLIMPTON,
W. A. HARRIS,