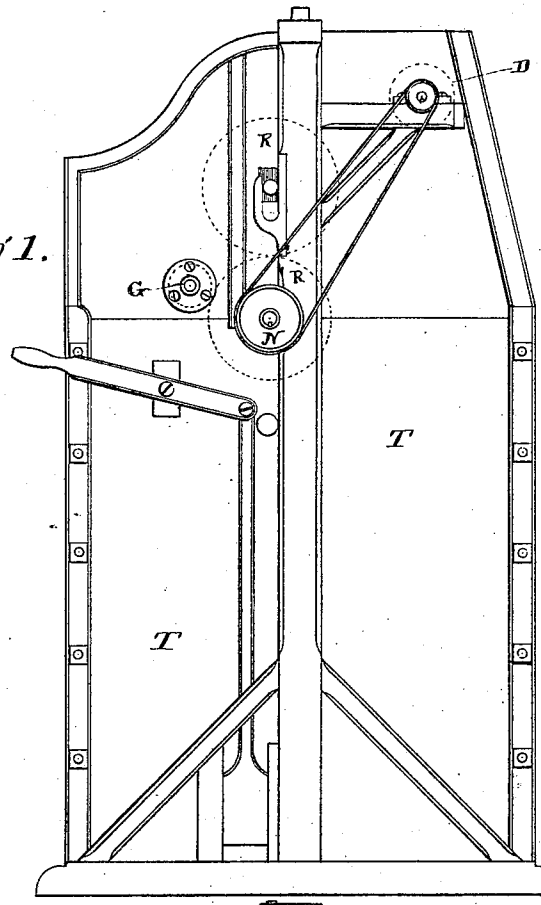
2 Sheets--Sheet 1.

A. S. HOPKINS.

Machines for Washing Woolen Fabrics.

No. 148,703. Patented March 17, 1874.

Fig 1.



Witnesses.

Isaac A. Bonnell.

Stephen Esser

Inventor.

Addison S. Hopkins

Fig 2.

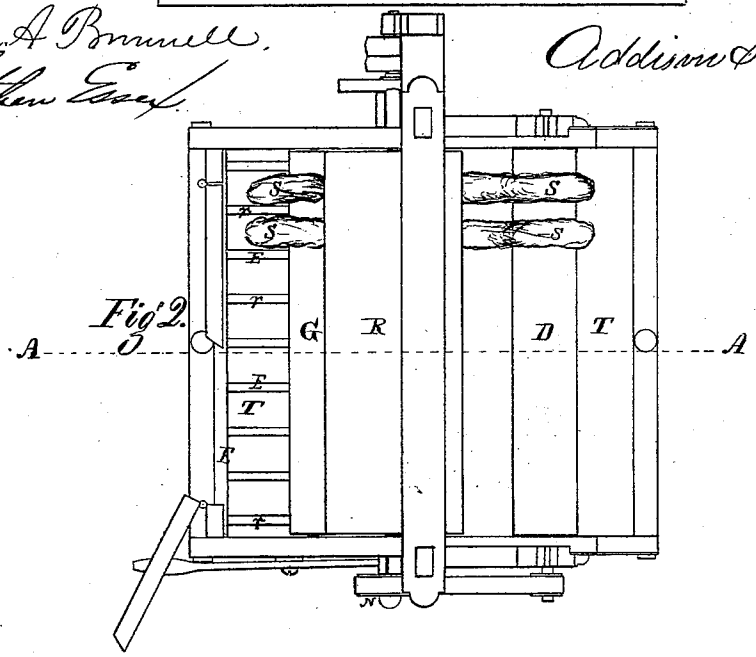


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Fig 3.

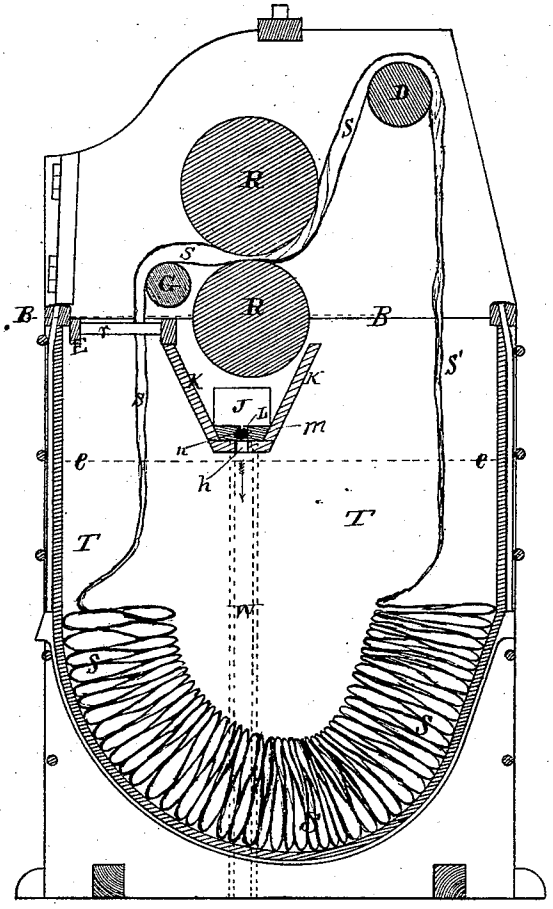
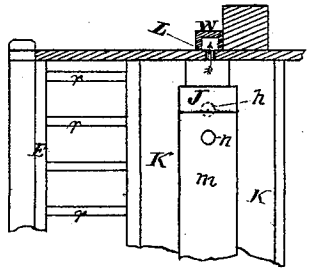


Fig 4.



Witnesses.

Inventor.

Isaac A. Brownell
Stephen Esdaile

Addison S. Hopkins

UNITED STATES PATENT OFFICE.

ADDISON S. HOPKINS, OF PASCOAG, RHODE ISLAND.

IMPROVEMENT IN MACHINES FOR WASHING WOOLEN FABRICS.

Specification forming part of Letters Patent No. **148,703**, dated March 17, 1874; application filed November 13, 1873.

To all whom it may concern:

Be it known that I, ADDISON S. HOPKINS, of Pascoag, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Machines for Washing Woolen Fabrics, of which the following is a specification, referring to the accompanying drawings making part of the same, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is a top view of the same. Fig. 3 is a vertical section, by the line A A, of Fig. 2. Fig. 4 is a plan and section, by the line B B, of Fig. 3.

Similar letters mark like parts in all the figures.

My invention consists, in the first place, in providing means for guiding the strings of cloth in front of the squeezing-rollers, and guiding and producing a tension on the cloth at the rear of the squeezing-rollers, for the purpose of confining the string of cloth to narrow limits in a line on the rollers, so that a greater number of strings can be accommodated and washed in the machine at the same time than heretofore. The strings of cloth to be washed are composed of one or more pieces of woolen fabric sewed together by the ends in the form of an endles web or string, and a number of these strings are run from one side of a tank filled with soap and water, between powerful squeezing-rollers, and deposited at the other side of said tank continuously, by which operation the oil and other foreign matter are washed from the fabric.

Heretofore, but two such strings were run together, side by side, in the same machine; or, in other words, one machine could run but two such strings, for the reason that the two webs opened and spread, and in so doing occupied so much space laterally on the rollers that they became entangled with each other, and in consequence abraded and torn; and because a machine on the same plan that would be capable of washing three strings or more at a time was deemed impracticable, from the fact that it would be too expensive for the additional work it would perform over a two-string machine or two-string machines; so that the manufacturer has been necessarily confined to the two-string machines, and has been obliged to provide space, and water, and apparatus, and labor for attendance for the requisite number of two-string machines that the producing capacity of his establishment demanded. But by the improvement hereinafter set forth I have been enabled to confine the said strings to narrower limits in line on the same squeezing-rollers, so much so that eight strings can be run in the same machine that formerly could run but two such strings, and as thoroughly washed with the same water, and apparatus, and labor, and with but a small excess of soap or cleansing material, as the said two-string machine.

In order that the nature and extent of my said improvement may be fully understood, I will proceed to describe the same by reference to the accompanying drawings, in which—

T is the tank, filled with water to the line *e e*, and S is a string of cloth at the bottom of said tank, where it deposits itself in folds, as shown, by the peculiar rounded form of the said bottom, and from which it is drawn up over the front guide-roller G, then at right angles between the squeezing-rollers R R, and then upward and over the rear guide-roller D, from which it descends again into the tank on the opposite side from which it is taken. Now, in the two-string-machine above mentioned, the same rollers were employed, and the two strings ran from the front up, and over, and between, and up, and over, and down on the opposite side of the tank in a similar manner, but with this difference: the two webs or strings were drawn from the tank through two large round holes arranged horizontally in front of the first guide-roller G, which merely served to keep the two webs separate, but did not preserve the form of the string or rope, but, on the contrary, suffered the strings to open and spread on the guide-roller, and still move under the crushing effect of the squeezing-rollers, so that the string form, or its preservation, which is of the first importance, was merely accidental, and due simply to a certain amount of twisting the web received by being run repeatedly through the machine.

In lieu of this mode of delivering the said strings to the squeezing-rollers I provide a rack, E, (shown in Figs. 2, 3, and 4,) in front of the first guide-roller G, said rack being di-

vided, by cross-bars *r*, into eight or more of equal narrow spaces, through which the several strings are drawn from the front side of the tank, and which has the effect to mass the strings and deliver each in the same space to the squeezing-rollers, which effectually controls the several strings in this particular on the front side of the squeezing-rollers. But it should be remarked here that this device and method would be ineffectual for the purpose unless suitable means were provided on the rear side of said rollers to co-operate with the former; and these consist, first, in carrying the strings upward sharply at the rear of the squeezing-rollers, so much so that the strings will have a bearing against the surface of the upper roller, and by that means be prevented from spreading, and likewise forming a guide or sustaining surface; and in addition to this—which is accomplished by elevating the rear guide-roller D above the squeezing-rollers—the said roller D has a rotative movement by means of a belt from the pulley N, that is more rapid than the delivery movement of the strings from the squeezing-rollers, which, with the drag produced by the weight of the free portion S′ of the string at its rear, produces a considerable tension on that portion of the string immediately at the rear of the squeezing-rollers, all which contributes to keep the portion of the string that is immediately in front and at the rear of the squeezing-rollers in a mass or string, and confined to a narrow line of the rollers' surface, and by that means to admit of increasing the working capacity of the machine fourfold.

Another feature of improvement relates to the mode of distributing the soap or cleansing material in the machine, and for separating and conducting off the unclean water; and this consists in constructing a soap-box with a sliding false bottom, and a gate for opening and closing the passage into the waste-pipe, so that the soap may be delivered gradually through the bottom of said box to the tank of the machine in the first part of the washing operation, and after the washing is completed the soap-box may serve as the receptacle for the unclean water which is squeezed from the fabric, and be conducted off through the waste-pipe while the tank is being refilled. This is accomplished by arranging the soap-box K directly beneath the squeezing-rollers, as shown in Fig. 3, through the bottom of which are formed several holes, *h*, and at corresponding distances apart similar holes, *n*, in the sliding false bottom *m*, so that when the two sets of holes are brought opposite to each other, the soap will be distributed from the box into the tank, and mingle with the water and the fabric immersed in it.

By sliding the false bottom *m* in one direction, the holes *h* and *n* slide by each other and shut off the supply of soap, and by the same sliding movement the gate J at one end of the box uncovers the opening L into the waste pipe W, and conducts off the unclean water which is squeezed into the box from the rollers above.

I claim—

1. The combination of the rack E, the guide-roller G, and the squeezing-rollers R R with the rear guide-roller D, the whole operating substantially as and with the effect specified.

2. The soap-box K, constructed as described, with a sliding bottom having discharge-openings, and a gate connecting with the waste-pipe, substantially as and to effect the purpose specified.

ADDISON S. HOPKINS.

Witnesses:

ISAAC A. BROWNELL,

STEPHEN ESSEX.