

(No Model.)

2 Sheets—Sheet 1.

A. ERBOR.
WASHING MACHINE.

No. 519,303.

Patented May 1, 1894.

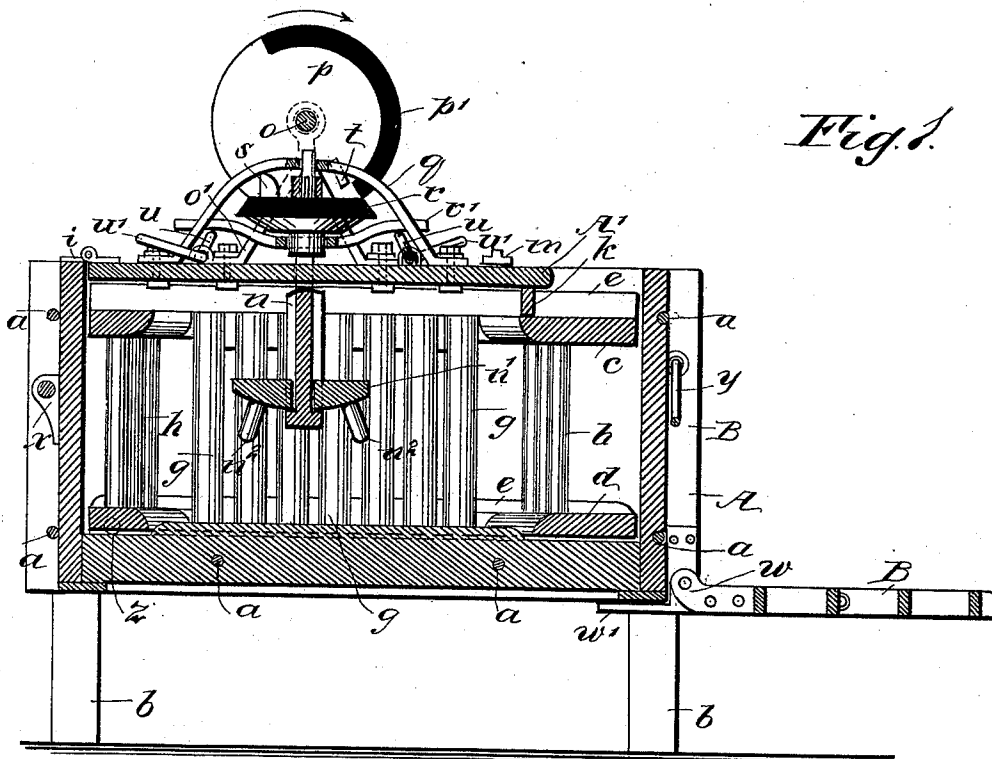


Fig. 1

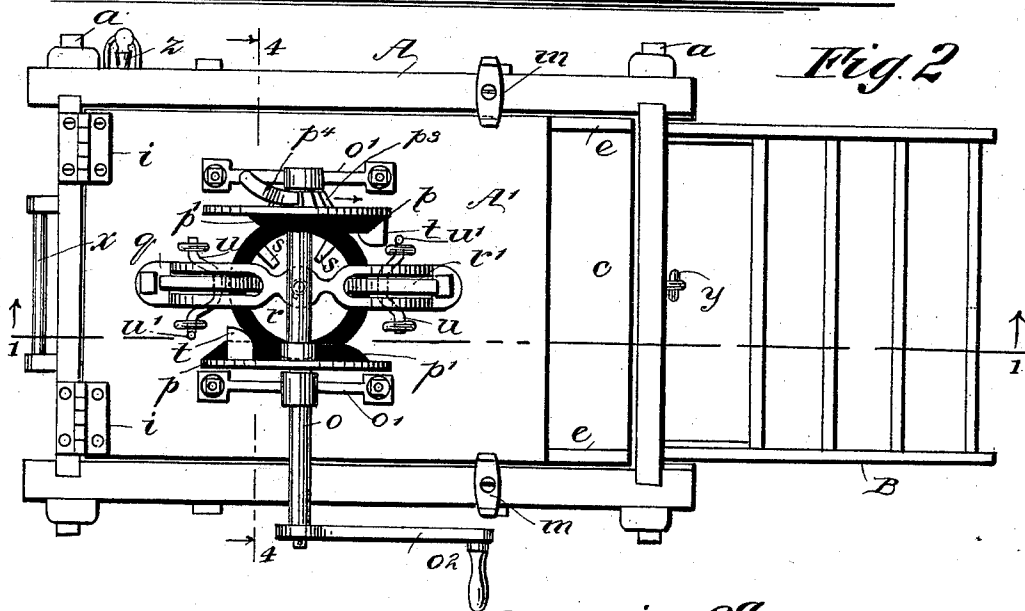


Fig. 2

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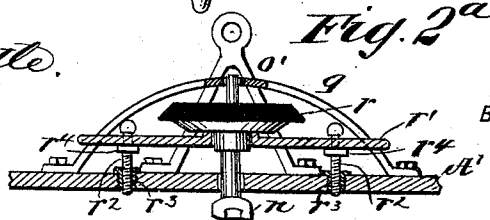


Fig. 2a

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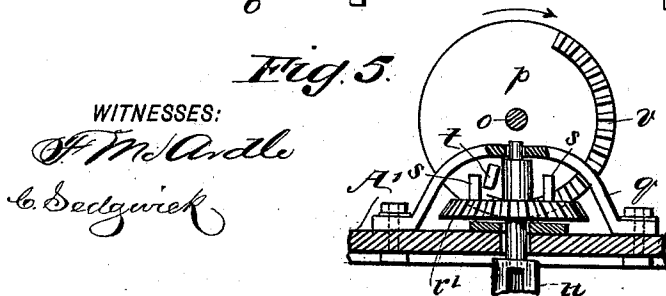
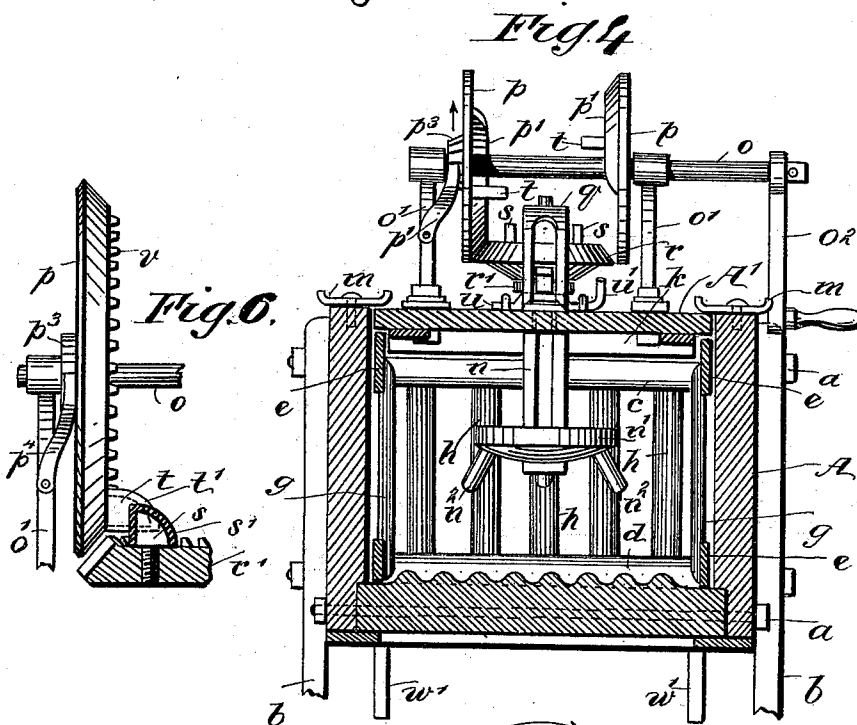
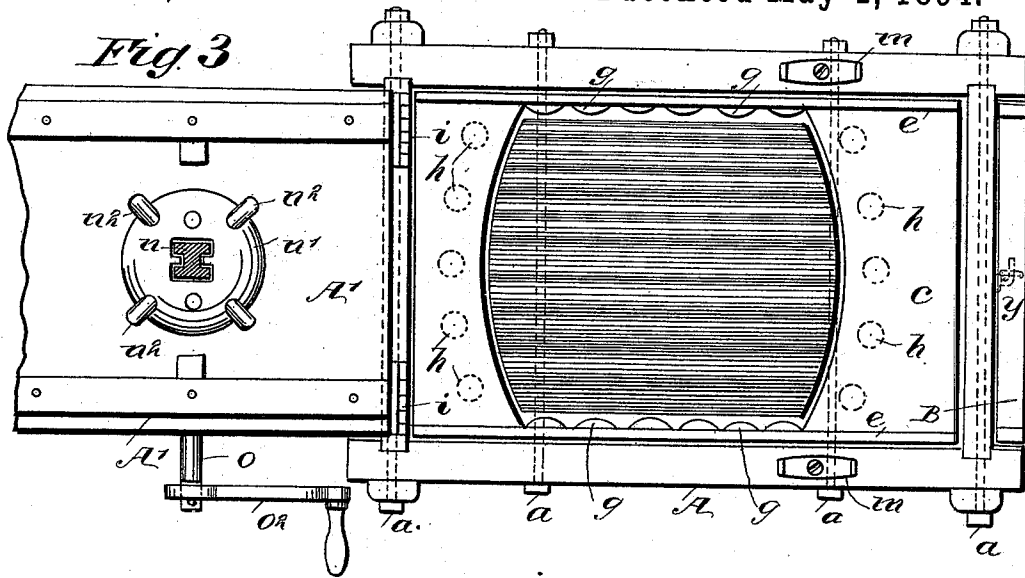
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2 Sheets—Sheet 2.

A. ERBOR.
WASHING MACHINE.

No. 519,303.

Patented May 1, 1894.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ANDREW ERBOR, OF COPLAY, PENNSYLVANIA.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 519,303, dated May 1, 1894.

Application filed November 22, 1893, Serial No. 491,653. (No model.)

To all whom it may concern:

Be it known that I, ANDREW ERBOR, of Coplay, in the county of Lehigh and State of Pennsylvania, have invented a new and useful Improvement in Washing-Machines, of which the following is a full, clear, and exact description.

My invention relates to an improvement in washing machines, of a type having a rotary clothes agitator operated within a stationary suds box that is provided with stationary rubbers; and has for its objects to provide a novel and superior mechanism for the reversible rotation of the agitator head, a removable rubber frame for the suds box, and a novel folding tub rest for the machine.

To these ends my invention consists in the peculiar construction and combination of parts, as hereinafter described and claimed. Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side view on the line 1—1 in Fig. 2. Fig. 2 is a plan view of the improved machine in the preferred form. Fig. 2^a is a sectional side view of a modified form of details of construction shown in Figs. 1 and 2. Fig. 3 is a plan view of the suds box, its lid in part in open adjustment, and other parts loosely secured by the lid. Fig. 4 is a transverse sectional view on the line 4—4 in Fig. 2. Fig. 5 is a longitudinal sectional view, showing a modified form of the actuating gearing; and Fig. 6 is an enlarged detached view of a portion of the gearing shown in Fig. 5.

The suds box A, is preferably given an elongated rectangular shape, having dimensions suited to the desired capacity for the machine, the parts being secured together water-tight by bolts *a*, or other means; and legs *b* are provided to support it.

Within the box A a rubber-frame is loosely fitted, comprising a top board *c* and a bottom board *d*, each provided with side strips *e*. The top and bottom boards are each formed of two pieces secured to the ends of the side strips *e* and having their inner edges curved, as shown most clearly in Fig. 3. The rubber strips *g*, are preferably rounded on their inner surfaces from end to end, and are secured

by said ends upon the side strips *e*, between the inner edges of the parts of the top and bottom boards. At a proper distance from the incurved edges mentioned, a series of vertical spaced rubber bars *h* are secured by their ends to the top and bottom boards *c, d*, thereby providing transverse rubbing surfaces near each end of the removable frame, and as shown in Figs. 1 and 3, a water space is produced at each side and at the ends of said frame, between it and the inner surface of the suds box A. By making the frame removable the suds box may be readily cleansed.

The lid A' of the suds box is hinged by one end to an end wall of the box, as indicated at *i* in Figs. 1, 2 and 3, its opposite end extending toward the other end wall of the suds box, so that a depending ledge *k*, that is transversely secured upon the normally lower side of the lid, will rest on the top board and seal the aperture in it when the lid is closed and held in that position by the turn buttons *m*, which are oppositely pivoted upon the top edges of the side walls of the box A. The lid A', is perforated at its transverse center, and a proper distance from each end, to receive the pendent head shaft *n*, which is square in cross section below the lid and cylindrical where it projects through and above it. The lower portion of the shaft *n*, is longitudinally channeled on two opposite sides to receive and loosely support the agitator head *n'*, which is centrally apertured in a manner that will adapt it to slide longitudinally of the shaft and be caused to rotate with it, see Fig. 3; a sufficient length being afforded to the shaft portion engaged by the head, to permit the latter to hang near the vertical center of the suds box when free to do so, its removal from the shaft being prevented by shoulders formed on its lower end, as shown in Figs. 1 and 4.

The preferred form of the mechanism provided to alternately rotate the head shaft *n* and head *n'* together in opposite directions, comprises a horizontal drive shaft *o*, that is supported to revolve above the axis of the head shaft by its loose engagement with the upright bracket frames *o'*, that are secured upon the lid A', at equal distances from the shaft *n*, one end portion of the horizontal shaft being extended beyond the side wall

of the suds box for the reception of a crank handle o^2 , that is attached thereto.

On the shaft o , two disk-like wheels p , are affixed at an equal distance from the center of the shaft n , and on said wheels there is a curved friction gear segment p' , formed on or secured to each one on its inner face, coincident with the curved edge of the wheel. The friction gear segments p' , are semi-circular, and are located at opposite points with regard to the positions of the wheels on the shaft they are affixed upon. Each gear segment p' , is faced with leather, gum fabric, or other suitable material that is firmly secured thereto, and as indicated in Figs. 2 and 4 they are bevel pitched an equal degree.

On the upper portion of the shaft n , a bevel-faced drive pinion r , is mounted and secured so as to be rotated by the shaft, a key, shown in Fig. 1, affording means to connect the wheel and shaft together by key-slotting the bore of the wheel for the indicated purpose; or any other means may be employed to fix the wheel in place. The face of the pinion r , is formed of material similar to that which forms the facing of the gear segments p' , and said pinion has such a relative diameter as will permit its face to be alternately engaged with the beveled segments p' when the pinion is adjusted to effect this. Preferably the friction gear pinion r , is supported on a carrier bar r' , which is perforated at its center of length and width to loosely receive the true cylindrical hub of the pinion, the end portions of the carrier bar being engaged on the lower side by the similar rock shafts u , which are bent to project as cranks near their longitudinal centers, the journal ends of the same having a loose engagement with bracket boxes that project from the top surface of the suds box lid A' .

Each rock shaft u , is furnished with an arm u' at one end, which affords means for the rocking movement of the shafts by their manipulation, and it will be seen that by a rocking adjustment of the shafts u the pinion r may be pressed toward the gear segments p' with graduated force, and thus assure the semi-rotation of the shaft n in opposite directions as the drive shaft o , is rotated. The upper end of the shaft n is supported by the perforated arched brace q . The carrier bar r' , may also be supported by the screws r^2 , that engage their lower ends with the sleeve nuts r^3 , which are secured in the lid A' , a collar r^4 on each screw bolt affording a seat for the bar, as shown in Fig. 2^a.

On the pinion r , two studs s , are erected, which are placed along the inner edge of the bevel face of said pinion, and separated a proper distance to receive the impinge of two studs t , that are projected one from the inner face of each bevel gear segment p' near one terminal of the same, the location of the studs being at opposite ends of the segments.

Between one upright bracket frame o' and an adjacent friction gear wheel p , the ratchet

cut pinion p^3 is secured to the shaft o , or it may be formed integral with said gear wheel, its location permitting the spring pawl p^4 to engage the teeth of the pinion, and thus restrict the rotation of the shaft o to the direction indicated by an arrow in Figs. 1, 2 and 4.

It will be seen that when the drive shaft o is revolved by a manipulation of the crank handle o^2 , and semi-rotary motion is communicated to the vertical shaft n alternately in opposite directions, by the successive engagement of the gear segments p' with the bevel pinion r , the studs t will alternately have contact with the studs s , the stud on one segmental gear wheel striking one of the studs on the pinion on its outer side, the stud on the other wheel in a like manner impinging the other vertical stud on the pinion r .

The provision of the isolated studs that have been described, is of great service in effecting a positive reversal of rotary movement, as the momentum of the mass of clothing or other goods, that is being washed in the machine and that is engaged by the projecting pins n^2 , which are parts of the agitator head n' , will cause a slip of the gearing at the point of reverse movement, unless aided by the positive action of the stud-like teeth t and s , which serve to transmit motion long enough to insure a complete contact of the friction gearing in each direction of rotary motion.

In Figs. 5 and 6 the curved bevel gear segments v are toothed, and the pinion r' , is also furnished with teeth, so that a meshed engagement of the segment wheels p may be had with the pinion in lieu of a frictional contact as is effected by the gears p' and r , the studs t and s , being provided for the toothed gearing also, to produce a reliable reversal of movement of the shaft n and agitator head n' . The studs t and s , may be covered with leather or rubber, as shown at t' , s' in Fig. 6, and thus absorb the shock of sudden contact had between these parts in service.

The tub rest B, consists of a light, strong slatted rectangular frame, that is hinged to the end of the suds box toward which the crank handle o^2 is revolved, the hinges w being so connected to the frame and box that a portion w' of the lower end of the frame will project below the suds box when the latter is horizontally adjusted, as shown in Fig. 1. When so arranged the frame B is adapted to afford a reliable support for a tub or pail, that will thus be sustained in a convenient position to receive washed articles as removed from the suds box.

The tub rest B, may be closely folded against the end wall of the suds box A, and be thereto secured by a hook y , and when so arranged will be out of the way and afford a handle for the portage of the machine, another handle x being fastened to the opposite end of the suds box.

In use, the introduction of water and a proper detergent material such as soap, along

with the soiled goods that are to be washed, may be readily effected while the lid A', is folded away from over the box A, the replacing of the lid sealing the top of the suds box and embedding the agitator head n' among the clothing or goods within the box. The rapid reversing rotation of the head n', will communicate a like movement to the clothing or other fibrous material it engages, and cause them to engage with the ribbed sides of the removable rubber frame, and also with the ribbed bottom of the suds box around which the frame is placed. The reversal of movement given to the articles while being washed within the machine, causes the suds water to forcibly penetrate the goods in different directions, and together with the rubbing action of the device on the same, speedily removes dirt and stains from the fabric.

The soiled suds water may be removed from the box A by removal of a spile z that closes an orifice in one side of the box near the bottom, and if preferred clean water may be introduced and the goods be thoroughly rinsed by a rotation of the machine as before explained.

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

1. In a washing machine, the combination with a suds box, and a shaft projecting into the suds box and carrying an agitator, of two wheels on a horizontal shaft mounted on the suds box and having gear segments on their

inner faces, a beveled pinion mounted to slide on the upper end of the shaft carrying the agitator, but to turn therewith, a carrier bar for supporting the said pinion, and means for vertically adjusting said carrier bar, substantially as described.

2. In a washing machine, the combination, with the suds box, and a shaft projecting into the suds box and carrying an agitator of two spaced segmental driving wheels oppositely fixed on a rotary horizontal shaft, a beveled pinion supported on said shaft between the gear segments and alternately engaged therewith, studs on said pinion, and a stud on each segmental wheel near opposite terminals, which studs alternately impinge the studs on the beveled pinion, substantially as described.

3. In a washing machine, the combination, with the suds box, two spaced segmental friction gear wheels mounted on a horizontal rotatable shaft supported on the lid of the suds box, an intermediate upright shaft projecting into the suds box, a slidable head at the lower end of said shaft, and a bevel-faced friction pinion at the upper end of said shaft, of rock arms on the lid, and a carrier bar arranged to press the pinion upwardly when the arms are rocked to lift the bar, substantially as described.

ANDREW ERBOR.

Witnesses:

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J. O. YINGLING.