

(No Model.)

2 Sheets—Sheet 1.

J. EDMUNDS.

WASHING MACHINE FOR PIECE GOODS.

No. 537,445.

Patented Apr. 16, 1895.

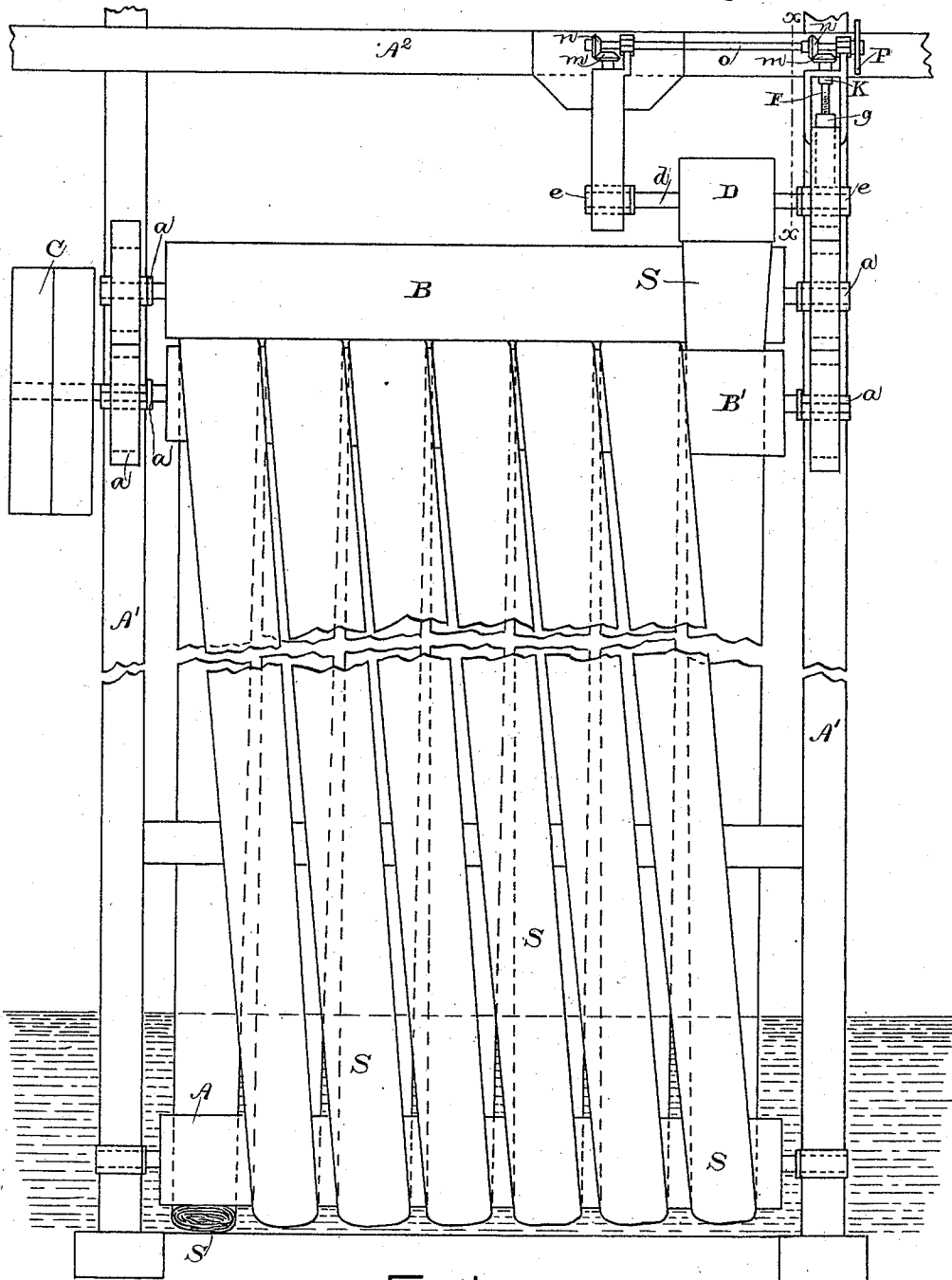


FIG. 1—

WITNESSES

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H. J. Hayes

INVENTOR

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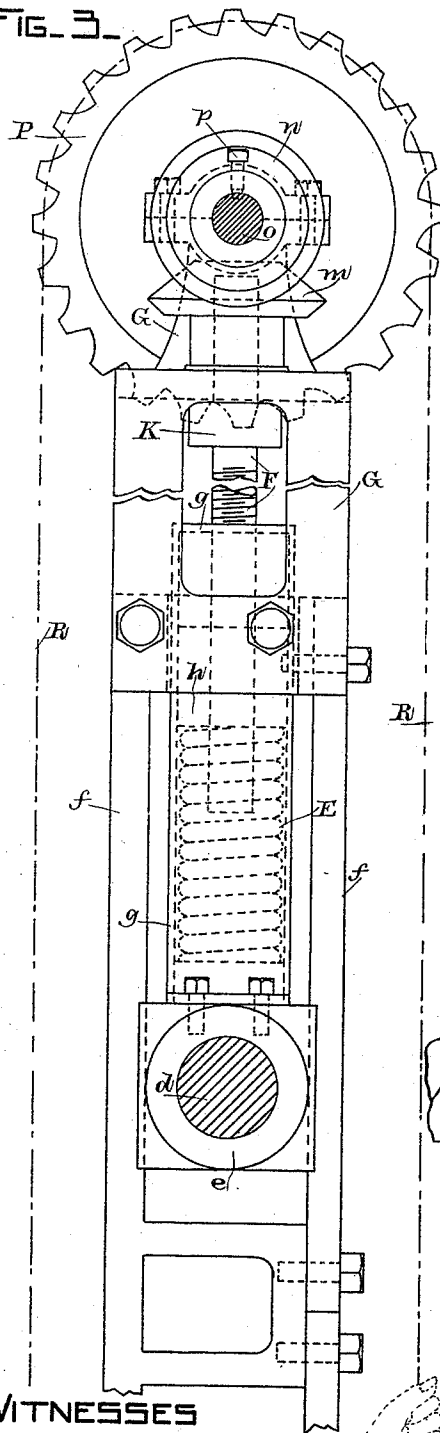
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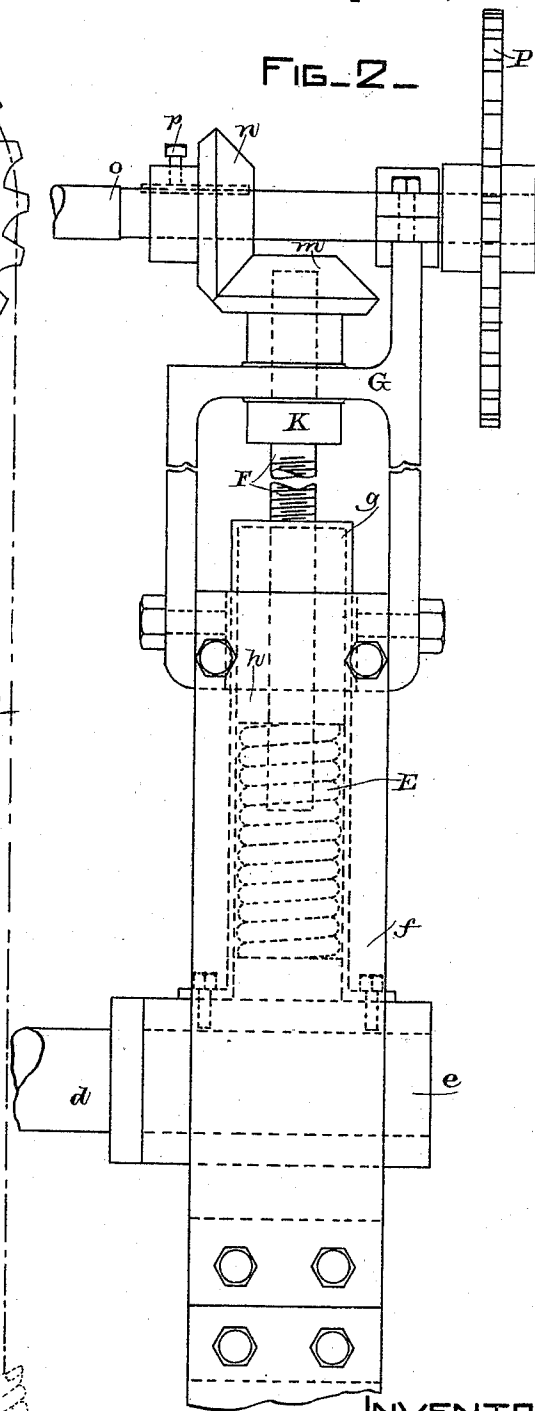
FIG. 3.



WITNESSES

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FIG. 2.



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UNITED STATES PATENT OFFICE.

JOHN EDMUNDS, OF WALTHAM, MASSACHUSETTS, ASSIGNOR TO HARRY A. BURNHAM, TRUSTEE, OF SAME PLACE.

WASHING-MACHINE FOR PIECE GOODS.

SPECIFICATION forming part of Letters Patent No. 537,445, dated April 16, 1895.

Application filed August 23, 1894. Serial No. 521,061. (No model.)

To all whom it may concern:

Be it known that I, JOHN EDMUNDS, a citizen of the United States, residing at Waltham, county of Middlesex, State of Massachusetts, have invented a certain new and useful Improvement in Washing-Machines, of which the following is a specification.

The invention relates to an improvement in washing machines, mangles, &c., with especial mention to certain features which will be hereinafter set forth.

During the process of washing cloth preparatory to dyeing or bleaching, it is customary to employ a series of rolls, one of which is immersed in water, and about which the cloth is passed back and forth, the last two rolls in the series serving to compress the cloth between them, and thereby squeeze out the bulk of the liquid with which the cloth had become saturated during its passage about the submerged roll. The arrangement generally is to submerge the first roll in a pool of running water. At a point above in substantially the same vertical plane with the first roll, is a set of two rolls making contact with each other, and it is between this set that the cloth is compressed to extract the superfluous water. These rolls are of the same length and all rotate in bearings supported in the frame of the machine.

When about to wash a piece of cloth, the attendant first passes one end under the submerged roll. It is then brought up and passed between the set of two, again passed round under the submerged roll, and the operation continued until a sufficient number of turns are taken to cover the desired extent of rolls, the end then being led on its final passage through the upper two off to a wringer or "squeezer," and from thence to the dyeing or bleaching room.

By starting upon one side of the machine in winding the cloth about the rolls, and at each turn passing it a little farther along the length thereof, when the winding is completed the cloth leaves the machine on the side opposite to that on which it is fed in. The same relative position of the different turns is maintained when the machine is in operation, the cloth entering at the submerged roll on one

side and passing out from between the upper two on the opposite side. By this method, the cloth in its progress through the machine is repeatedly saturated as it passes under the submerged roll, and compressed and relieved of the water as it runs between the upper two.

One of the difficulties encountered in the operation of the machine is the stretching of the cloth as soon as it becomes saturated in passing over and along the rolls. This causes the cloth in the last few turns to run "slack," and if provisions are not taken to overcome the difficulty, the cloth would run on the rolls, the turns overlapping and becoming tangled.

It is to be understood that the cloth is not passed through the machine extended to its full width. Just before reaching the submerged roll, it enters a circular eyelet, which folds and laps the cloth longitudinally to such an extent that it issues from the eyelet in substantially a ropy condition.

The method in common use to compensate for the stretching of the cloth is to subject it to tension, before it passes into the machine. This is done by leading the cloth over a joist running up obliquely from the floor to the framework. By varying the degree of obliquity as occasion requires, the slack due to stretching is provided for. This, however, is very unsatisfactory, since the presence of an attendant is necessary to adjust the joist as required, and because of the danger of injuring the cloth. The cloth being in a ropy condition, the strain caused by its being passed over the joist is liable to produce in it a broken appearance where the folds occur called "herring bone." It is also subject to considerable wear, and frequently tears upon passing over the joist. In addition the cloth is not relieved of sufficient moisture when it has passed out of the machine to make it ready for the dyeing or bleaching fluid, which too much moisture would so dilute as to render its action ineffective. Therefore the cloth must be further wrung to avoid this difficulty, and for this purpose a separate wringer or "squeezer" is generally provided, into which the cloth is led directly after leaving the washing machine. At this point another difficulty arises. It is evident that to pro-

duce a successful co-operation of the two machines, the wringer must take up the cloth at substantially the same speed at which it issues from the washer; otherwise there would
 5 be either an accumulation of the cloth between the two or an injurious strain on it, according as the wringer was slower or faster than the washer. This nicety of adjustment of the two machines relative to each other, is
 10 difficult to maintain, since a very slight difference in the size of rollers, or a substantial variation of speed is sufficient to produce either of the troubles above mentioned. By means of my invention these difficulties are
 15 met in a much more satisfactory, effectual and economical manner than has heretofore been possible. By the addition of a single "squeeze roll" to the existing type of machine, with perfect means of regulating pressure,
 20 no additional wringer is necessary to prepare the cloth for the dye or bleaching fluid.

A further object attained is the compensation for stretching by an automatic means, thus doing away with the need of an attendant, and accomplishing the object without
 25 the danger of injury to the cloth.

Referring to the drawings, Figure 1 is an elevation of my improved washing machine, showing the beveled roll. Fig. 2 is a view of
 30 part of the frame showing details of mechanism for regulating pressure of the "squeeze roll," and Fig. 3 is a section on line *x-x*, Fig. 1.

Rotating in bearings secured in the frame pieces *A'*, *A'*, is the roll *A*, submerged in
 35 water. At a suitable distance above in the same vertical plane is the set of rolls *B*, *B'*, also having shaft bearings *a*, *a* secured in the frame pieces *A'*, *A'*. The roll *B'* is slightly larger in diameter at the right end, the surface being beveled for a purpose hereinafter
 40 described. In adjusting the roll *B'* it is so placed that its upper surface is level. Roll *B'* is provided with a driving pulley *C*. Roll *B*, resting upon *B'* makes with it a frictional contact and therefore rotates with *B'*. The
 45 bearings in which the shaft of roll *B* turns, have a certain range of vertical movement in the frame pieces *A'*, *A'* to allow for the proper clearance between the rolls *B'* and *B* when
 50 the thickness of the material passing between them is varied.

Immediately above the roll *B* and bearing upon it is the short roll *D*. This roll is mounted upon the shaft *d*, both ends of which
 55 turn in movable bearings supported in a manner hereinafter described, the bearings for the inner end moving in a frame depending from the cross beam *A*². This roll is provided with means for regulating its pressure upon the roll
 60 *B*, best seen in Figs. 2 and 3. The arrangements at both ends of the shaft are the same.

The shaft *d* is mounted in the bearings *e*, *e* adapted to move up and down within the guides *f*, *f* securely bolted to the frame work
 65 of the machine. Between the guides *f*, *f* and secured to the bearings *e*, *e* is a hollow casing *g* within which is the coiled spring *E* resting

upon the bearings *e*, *e*. The top of the casing is perforated and a screw *F* passes loosely through the perforation, and enters a threaded
 70 nut *h* contained in the casing and resting on top of the spring *E*. The casing is made of such shape inside as to conform with that of the nut and prevent its turning with the screw. The screw *F* is provided with a fixed
 75 collar *K* which transfers the reaction of the spring *E* to the framework *G*. The framework *G* may also be of iron and is securely bolted to the guides *f*, *f*. The upper end of the screw *E* after passing through the cross
 80 piece of the framework *G* carries the beveled gear wheel *m*, meshing with a similar gear *n* on the shaft *o*. The shaft *o* turns at one end in bearings supported by an extension of the
 85 framework *G*, and at the other end in bearings supported in the framework depending from the cross beam *A*². The gear *n* on the shaft *o* is provided with a set screw *p*. The outer end of the shaft *o* carries a sprocket
 90 wheel *P*, from which depends a sprocket chain *R*, easily reached by an attendant.

The method of operating the machine is as follows: The fold of cloth *S* entering the machine underneath the roll *A* passes success-
 95 ively between rolls *B* and *B'* and underneath *A*, finally issuing from between *B* and *B'* and then running between *B* and *D* off to the dye or bleaching room. Motion now being communicated to the rolls *B* and *B'* the cloth rapidly passes through the machine in the order
 100 above indicated. The end of *B'* over which the cloth last passes being larger in diameter than the other end, the last turn therefore takes up more cloth than the first turn, and this is sufficient to compensate for the stretch-
 105 ing of the cloth during its passage through the machine. The pressure of the roll *D* upon *B* is regulated by the arrangement above described. By turning the sprocket wheel *P* in the proper direction the nut *h* is run down
 110 upon the screw *F*, compressing the spring *E*, which then forces down the movable bearings *e* which in turn force the shaft *d* down with them, thus forcing roll *D* more firmly against *B*. To relieve the pressure it is merely neces-
 115 sary to turn the sprocket in the reverse direction. It has been before stated that the shaft *o* is connected with the same adjusting mechanism with which shaft *d* is provided at
 120 both ends; and therefore the turning of shaft *o* simultaneously raises or lowers both ends of shaft *d* exactly the same distance. Should it become necessary for any reason, to raise or lower one end of *d* without altering the position of the other end, the set screw *p* may
 125 be loosened and the gear *n* moved back on the shaft *o* out of contact with gear *m*. The shaft *o* now being rotated, only that end of shaft *d* will be raised or lowered at which *n* and *m* are still in contact. An extreme delicacy of
 130 adjustment of the rolls *B* and *D* in relation to each other is thus provided for, and this adjustment is limited only by the fineness of the screw threads and the pitch of the gears.

It is therefore possible to compensate for any unequal wear on the surface of roll D, and maintain a perfect parallelism in respect to the roll B.

5 Since roll D turns by reason of its friction upon B, it moves uniformly with B, and as B also turns by reason of its friction on D, there is substantially no variation of speed between any of these rolls. The pressure of D upon
10 B is sufficient to dry the cloth properly for bleaching or dyeing, without subjecting it to further pressure in another wringer.

With a machine of this construction it is only necessary to properly arrange the cloth before starting, and then no further attention
15 is required. By running the machine slowly at first the cloth may be examined to ascertain if sufficient moisture has been removed to render it in proper condition for dyeing or
20 bleaching. Should it be too wet, the sprocket wheel may be turned by means of the depending chain, thereby increasing the pressure between the rolls D and B, and forcing more water out of the cloth as it passes between
25 them.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for washing cloth or the like, the combination with a roller submerged
30 in a liquid, of a set of two rollers in the same vertical plane, all of said rollers being of substantially the same length, and another roller shorter than the others, spring-pressed movable bearings therefor, and means for simultaneously and exactly moving both ends of
35 said roll.

2. In a machine for washing cloth or the like, the combination with a roller submerged in a liquid, of a set of two rollers in the same
40 vertical plane, all of said rollers being of substantially the same length, and another roller shorter than the others, spring-pressed movable bearings therefor, a shaft substantially parallel to said roll, and connections between said shaft and bearings whereby the rotation
45 of the shaft causes a simultaneous and exact movement at both ends of said roll.

3. In a machine for washing cloth or the like, the combination with a series of rollers over which the cloth passes, of a beveled roller
50 bearing against one of said series, whereby the slack due to the stretching of the cloth is compensated for, substantially as set forth.

4. In a machine for washing cloth or the like, the combination with a submerged roller
55 about which the cloth passes, of a set of two rollers in the same vertical plane, and adapted to compress the cloth between them, the lower one of said set being beveled whereby the slack due to the stretching of the cloth is com-
60 pensated for, substantially as described.

5. In a machine for washing cloth or the like, the combination with a submerged roller over which the cloth passes, of a set of two rollers between which the cloth also passes,
65 one of said rollers having a beveled surface, and another roller adapted to compress the cloth against the other one of said set, substantially as set forth.

6. In a machine for washing cloth or the like, the submerged roller A in combination
70 with the rollers B and B', one of which B' has a beveled surface, the short roller D, and spring E, beveled gearings *m* and *n*, screw F and shaft *o* for causing the roller D to exert
75 a uniform pressure against B, substantially as described.

In witness whereof I have hereto set my hand this 7th day of August, 1894.

JOHN EDMUNDS.

Witnesses:

HARRY A. BURNHAM,
N. F. HAYES.