

J. S. FARMER.

APPARATUS FOR WASHING TEXTILE FABRICS.

No. 404,078.

Patented May 28, 1889.

FIG. 2.

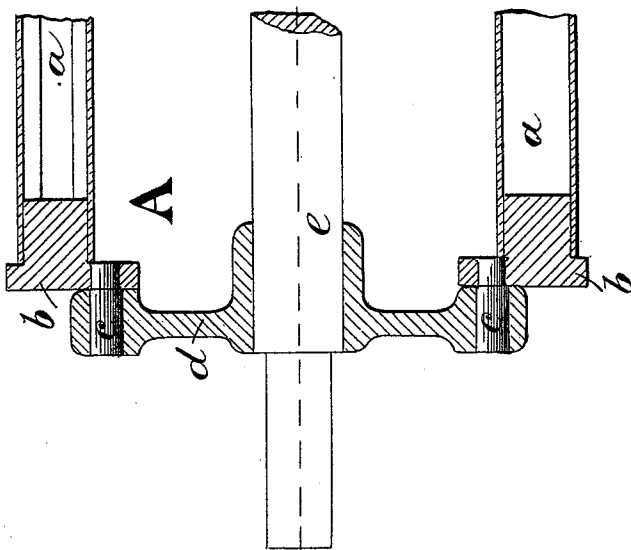
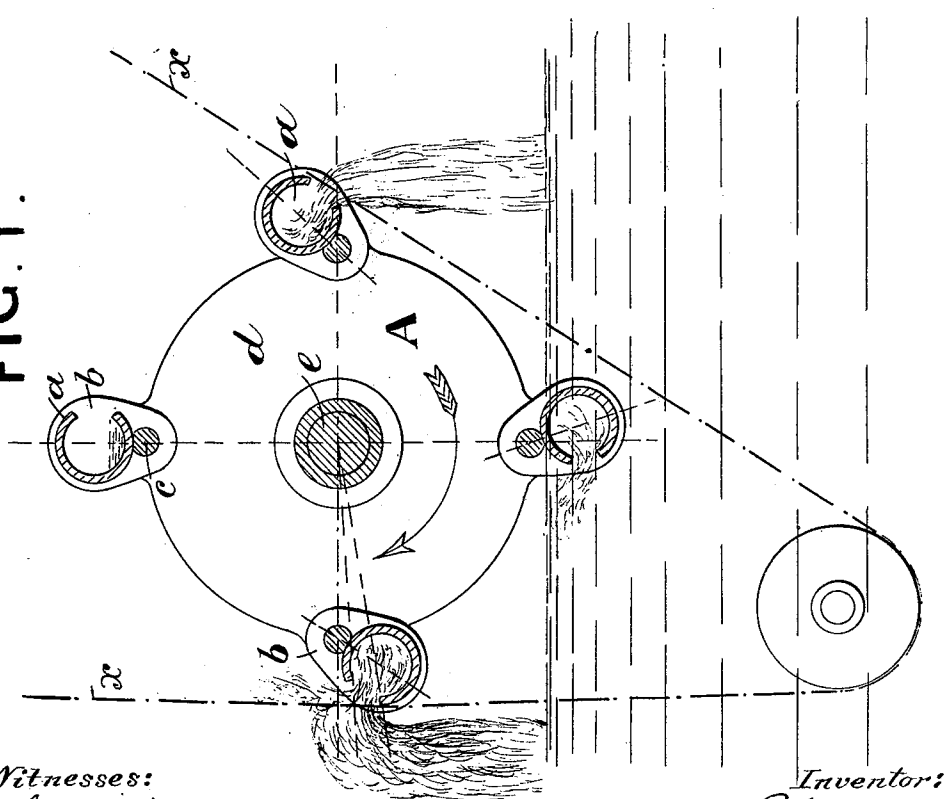


FIG. 1.



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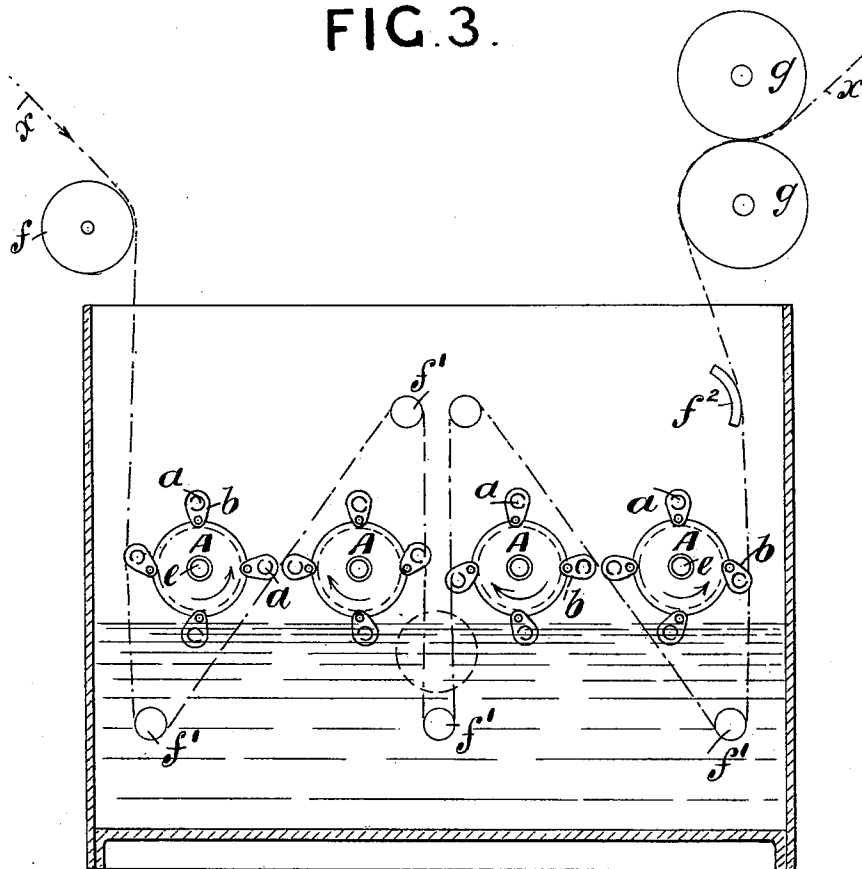
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FIG. 3.



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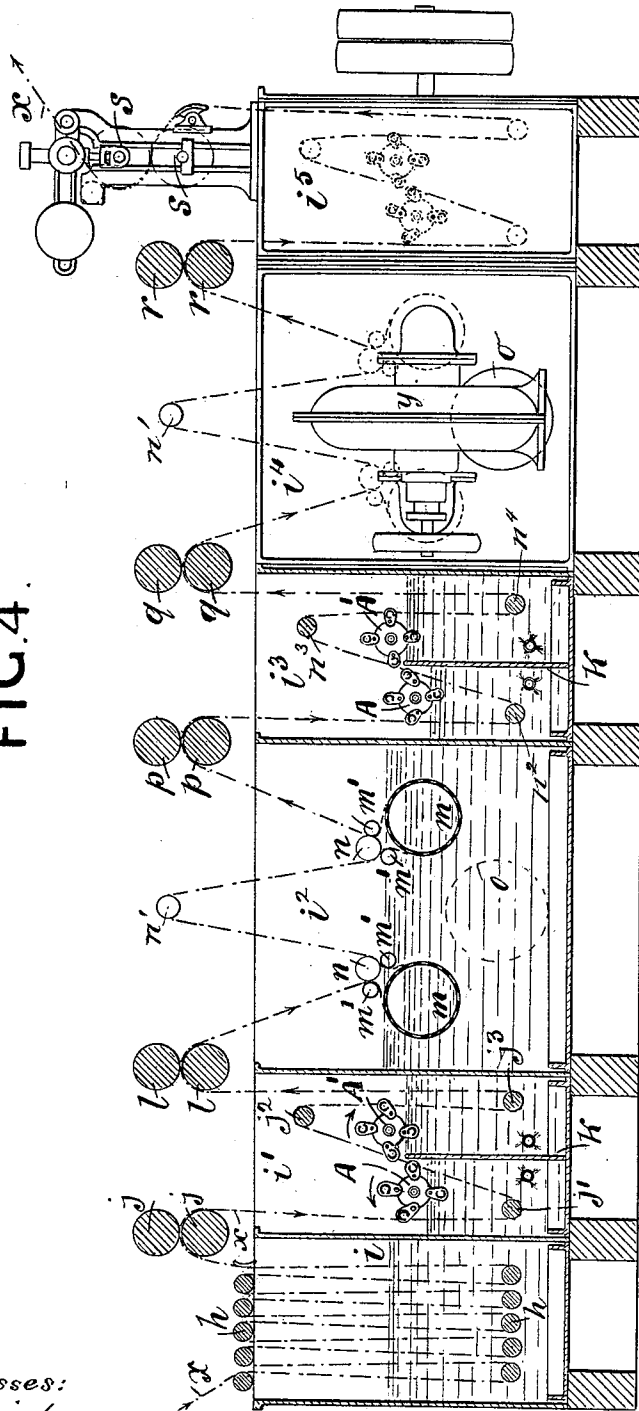
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FIG. 4.



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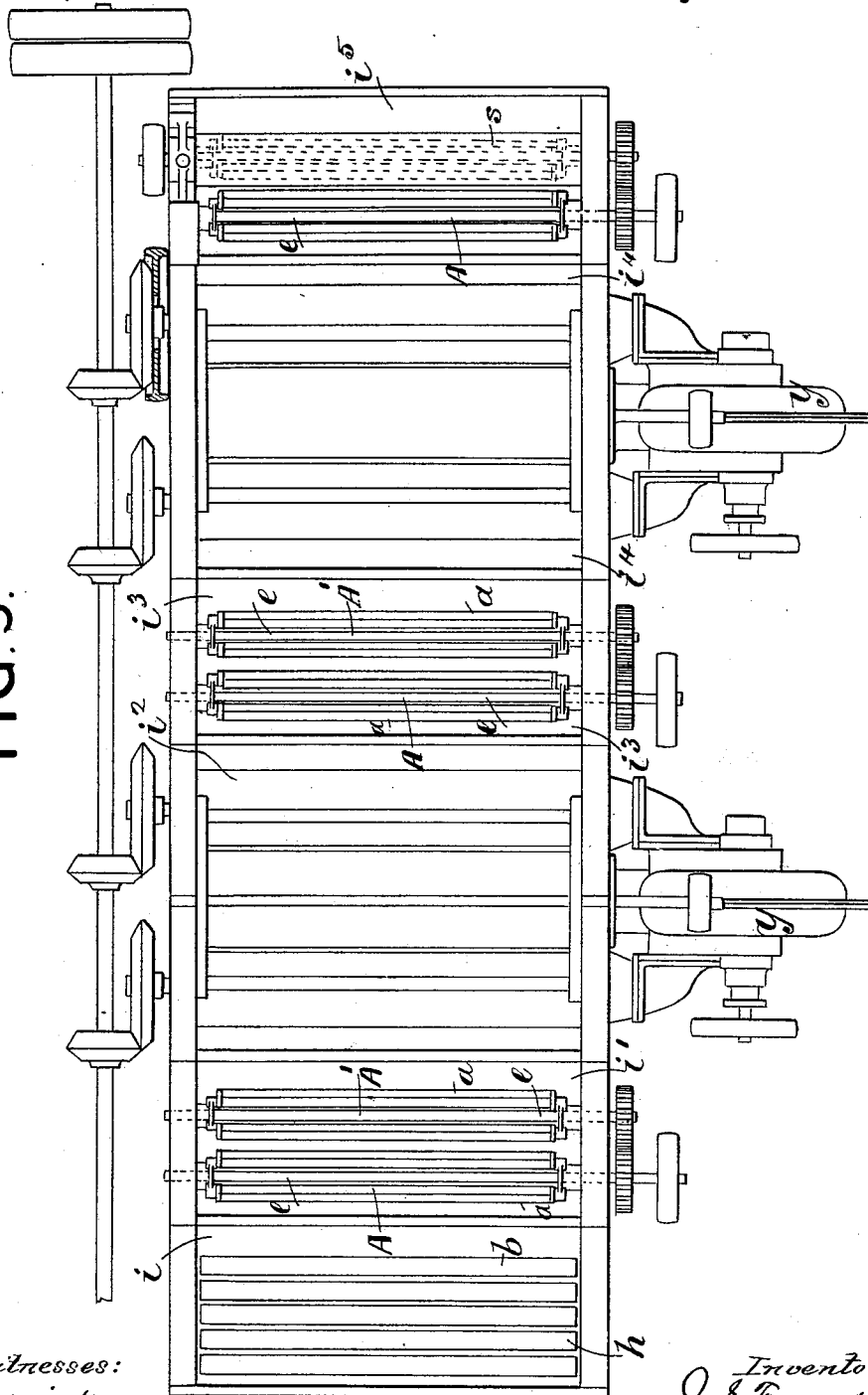
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FIG. 5.



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UNITED STATES PATENT OFFICE.

JAMES SALTER FARMER, OF SALFORD, COUNTY OF LANCASTER, ENGLAND.

APPARATUS FOR WASHING TEXTILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 404,078, dated May 28, 1889.

Application filed September 28, 1888. Serial No. 286,633. (No model.)

To all whom it may concern:

Be it known that I, JAMES SALTER FARMER, a subject of the Queen of Great Britain, residing at Salford, in the county of Lancaster, England, have invented certain new and useful Improvements in Machinery or Apparatus for Washing, Cleansing, and Similarly Treating Textile Fabrics, of which the following is a specification.

10 My invention relates to improvements in apparatus for washing, cleansing, and similarly treating textile fabrics; and the principal object of my improvements is to provide means for accelerating such operations.

15 In carrying out my improvements I construct a compound roller, which consists of a pair of disks or spider-wheels mounted on a shaft or other center, free to rotate in suitable bearings. Near the peripheries of the disks or extremities of the arms of the spider-wheels I mount, say, four slotted or perforated hollow cylinders or vessels on the ends of links pivoted loosely to the disks or arms, preferably at quarter-centers round the shaft, as hereinafter fully described with reference to the accompanying drawings.

Figure 1 is a cross-section of the compound roller in action, and Fig. 2 is a longitudinal section showing one end of the same. Fig. 3 is a sectional view of a simple machine for washing open fabrics, to which the compound roller is applied, Fig. 4 is a side elevation, partly in section; and Fig. 5, a plan view illustrating the application of the compound roller to a machine or range of apparatus for washing, cleansing, and otherwise treating textile fabrics.

Each compound roller A is made up preferably of four hollow cylinders or vessels, *a*, slotted from end to end and mounted on links or swivel-arms *b*, pivoted loosely on studs *c*, fixed to the end disks, *d*, which are secured on the shaft *e*. The shaft *e* is arranged to be rotated by any convenient driving mechanism, (not shown,) so as to cause the vessels *a* to act upon the fabric, *x*, in the manner clearly illustrated by Fig. 1.

In the sectional drawing, Fig. 3, part of a simple washing-machine is shown, in which are mounted four of my compound rollers A, the direction of the fabric and course of the rollers being indicated by the arrows.

The fabric, *x*, enters the machine over a guide-roller, *f*, and passes under and over guide-rollers *f' f'* and a guide, *f*², in the tank to squeeze-rollers *g*, where the excess of liquid is squeezed out and returns back to the tank. The rollers A are driven by suitable gearing, (not shown,) so that the links *b*, with the slotted hollow vessels *a*, fly out by centrifugal force, and as each vessel *a* passes through the liquid it collects a certain quantity, and then coming in contact with the fabric its course is momentarily checked thereby, which causes the liquid in said vessel to be dashed with more or less force onto and through the fabric. A portion of the liquid, however, is carried forward in the vessel, and as the latter again meets the fabric this liquid is dashed upon it, as before, whereby the fabric is most effectually washed and cleansed.

In Figs. 4 and 5 the fabric, *x*, passes over and under guide-rollers *h* through the liquid in the first section, *i*, of the tank and between squeeze-rollers *j j* into the second section, *i'*, of the tank, in which are two of my compound rollers, A A', (shown enlarged in Figs. 1 and 2,) which are caused to rotate in the direction indicated by the arrows by any convenient arrangement of gearing, so that when the vessels *a* strike against the fabric, *x*, which, by the guide-rollers *j' j*², is kept in their path, they are momentarily checked in their course by such contact and discharge forcibly against and through said fabric the liquid or part of the liquid previously collected by them. There is a vertical partition, *k*, in each of the sections *i' i*³ of the tank to keep the liquid at the desired level under each compound roller, and these partitions also serve to keep the liquid used by the first compound roller, A, separate from the cleaner liquid used by the second compound roller, A', the clean liquid being admitted to the compartment under the compound roller A' at the higher level, from which it flows into the other compartment under the lower compound roller, A. The liquid carried by the slotted vessels *a* is dashed first against one side and then against the other side of the fabric by the action of the revolving compound rollers. From the section *i'* of the tank the fabric, *x*, passes between the squeeze-rollers *l l* and around perforated cylinders *m*

5 *m*. Submerged in the liquid in the tank near each of these cylinders are two guide-rollers, *m'* *m'*, and the space between these guide-rollers is filled up by a roller, *n*. The liquid
 10 in the tank is drawn or sucked through the perforations in the cylinders *m* and through the fabric passing around them by means of pumps *y*, of any approved construction, located at one side of the tank, as shown in Fig.
 15 5 of the drawings, and adapted to be operated by a belt from any convenient motor. Said liquid is returned by the pumps to the tank through an inlet-pipe, *o*, leading from the pump and entering the side of the tank,
 20 preferably near its bottom, as shown in Fig. 4 of the drawings. The fabric passes from the first perforated cylinder *m* in the section *i*² of the tank, over the rollers *m'* and *n* out of the tank, over a guide-roller, *n'*, to the
 25 second perforated cylinder *m*, and from said cylinder over one of the guide-rollers *m'*, out of the section *i*², and between squeezing-rollers *p p*.

30 The fabric then passes into and through the section *i*³ of the tank, where it is treated as in section *i*, thence over and under guide-rollers *n*² *n*³ *n*⁴, through squeezing-rollers *q*, into the section *i*⁴, where it is operated upon as in the section *i*². The fabric then passes
 35 over and around the perforated cylinders *m*, guide-rollers *m'*, *n*, and *n'*, to and through squeezing-rollers *r* into the section *i*⁵, where it is again operated upon by two of the compound rollers *A*, after which it passes between
 40 weighted squeezing-rollers *s*, and is then plaited down or otherwise disposed of. Any number of sections or tanks may be employed to suit the treatment to be given to the fabric.

45 By the use of my compound rollers I obtain a rapidly-repeated discharge against the fabric of a solid body of liquid, whereby a great saving of time, labor, and space is effected in washing, cleansing, and similarly treating textile fabrics.

Although I have only shown cylindrical vessels on the compound rollers, it is obvious that vessels of other shape may be used for collecting and dashing the liquid in the tank against the fabric under operation, and they

may be pivoted in any convenient manner, so long as they have freedom to swivel on their pivots independently of their revolving motion around the shaft or center of the compound roller.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim, and desire to secure by Letters Patent of the United States, is—

1. A roller for washing and cleansing textile fabrics, consisting of disks mounted to rotate on a transverse shaft in a receptacle containing liquid, series of links or arms swiveled to the faces of said disks, and cylindrical vessels open at one side mounted on said links or arms and adapted as the shaft is revolved to dip up the liquid and project it upon the face of the fabric, substantially as shown and described.

2. In apparatus for washing and cleansing textile fabrics, the combination, with a tank divided into a series of sections containing liquid, series of guide-rollers for the fabric mounted to rotate in and upon said tank, series of perforated cylinders mounted to rotate in said tank and over which the fabric passes from and to the guide-rollers, and a series of squeezing-rollers through which the fabric passes to and from the guide-rollers, of a series of rollers consisting of disks mounted to rotate on transverse shafts in said tank, arms swiveled on said disks, and cylindrical vessels open at one side mounted on said arms adapted to raise the liquid and discharge it upon the faces of the fabric, and means for rotating said rollers and cylinders, substantially as shown and described, for the purposes set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 3d day of September, 1888.

JAMES SALTER FARMER.

Witnesses:

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