H. M. Collier,

Washing Machine,

No. 32,469. Patented June 4, 186.

Fig: 1.

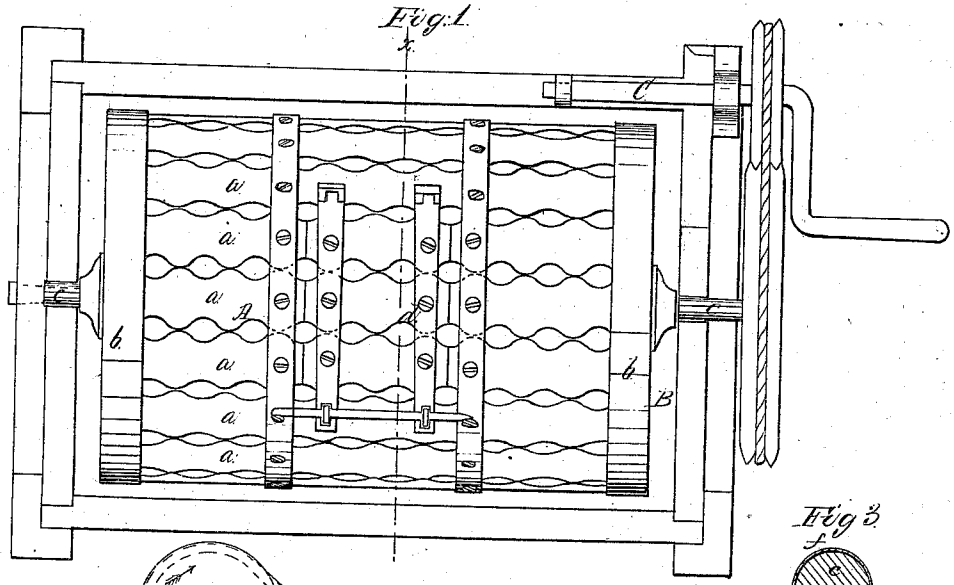
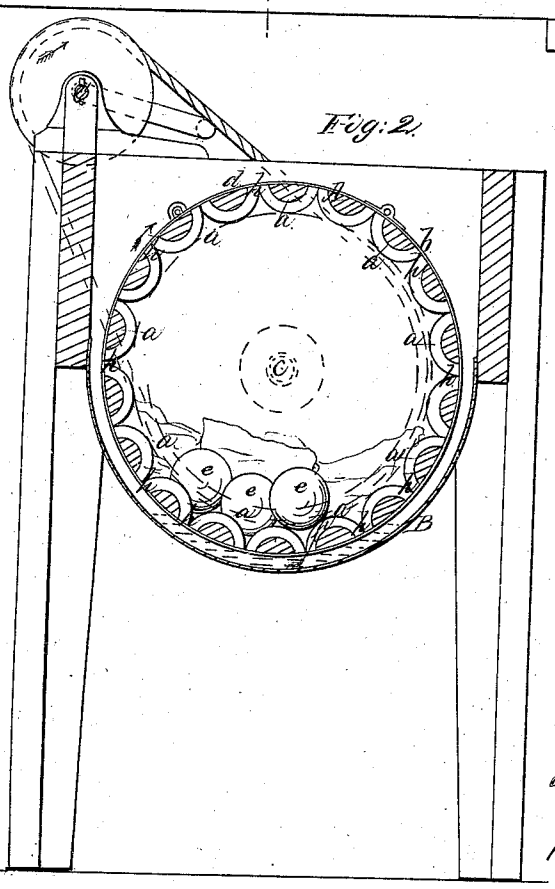


Fig 3.



Fig: 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

H. M. COLLIER, OF BINGHAMTON, NEW YORK.

WASHING-MACHINE.

Specification of Letters Patent No. 32,469, dated June 4, 1861.

To all whom it may concern:

Be it known that I, H. M. COLLIER, of Binghamton, in the county of Broome and State of New York, have invented a new and Improved Washing-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a plan or top view of my invention. Fig. 2 is a transverse vertical section of the same, the line *x*, *x*, Fig. 1, indicating the plane of section. Fig. 3 is a central section of one of the balls which I use with my machine, in an enlarged scale.

Similar letters of reference in the three figures indicate corresponding parts.

This invention relates to that class of washing machines in which the washing is effected by placing the clothes into a cylinder which rotates in a semi cylindrical tub, the water from this tub being admitted into the cylinder through suitable apertures in its sides and the action of the water on the clothes to be washed is facilitated by a number of balls, which together with the clothes are placed into the cylinder.

My invention consists 1st. In an improved construction of inner cylinder, for the purpose named. 2nd. In an improved construction of balls employed within the said cylinder.

For the purpose of constructing the rotary cylinder A, I take a series of turned rolls of wood or other suitable material about two inches in diameter and twenty-four inches in length including the round tenon at each end. These rolls are deeply beaded or knurled similar to the beaded or knurled posts or legs of modern "cottage" bedsteads, tables, stands etc. By sawing these rolls in half, lengthwise, I produce a number of half rolls *a*, with sharp knurled edges, and by securing the ends of these half rolls in two disks *b*, suitable for heads I form the cylinder. The half rolls are put close enough together to prevent the clothes from protruding through or becoming caught in the meshes of the cylinder and yet separated sufficiently to allow the water passing freely to the clothes which may be placed in the cylinder.

The cylinder A is journaled in a suitable tub or water reservoir B by boxes secured to the frame of the tub and gudgeons *c*, attached to each head of the cylinder in such a manner that it may be freely rotated. A door or hinged opening *d*, is cut in the cylinder, through which I introduce the clothes to be washed together with about a dozen or fifteen balls *e*, of wood or of any other suitable material. These balls are covered with coarse cloth or other suitable fabric *f*, to deaden the noise of the machine in operation as well as to facilitate the process of washing.

The counter or crank shaft C, which serves to impart motion to the cylinder, is secured in suitable bearings attached to the frame of the tub at such a height as will be most convenient for the operator. This crank shaft is belted or geared to the rotating cylinder the pulley or gear upon the crank-shaft being about half the size of the pulley or gear upon the gudgeon of the cylinder. This arrangement of crank shaft pulleys or gears accomplishes the several objects of securing a slower motion to the cylinder (too rapid a motion interfering with the perfect action of the machine) a reduction of labor and an avoidance of the painful stooping position experienced when the crank is attached directly to the cylinder.

With this machine a very small quantity of water is required to effect the washing, since on imparting to the cylinder a rotary motion the peculiar formation of the openings or meshes in the cylinder causes the water to pass with great ease up through the rounded channels *h*, (Fig. 2) formed by the half-rolls on the inside of the cylinder and to be thrown against the clothes which have been placed in the cylinder. The cylinder is thus allowed to pass with great ease and with very little resistance through the water not only on account of its smooth surface and of the peculiar shaped sharp edged openings, but also on account of the small quantity of water, through which it has to travel, and at the same time the balls, which are usually made of wood or some other materal of smaller specific gravity than water, are not caused to float on the water and they are allowed to act with their full weight on the clothes. By these means the washing is effected with little exertion in a simple, cheap and convenient manner.

I am aware that it is not new to construct a washing machine with an open or slat cyl-

inder rotating within a tub and also that the slats of which the peripheries of the said cylinders are composed, have been constructed in various forms, square, beveled and round, and likewise that knurled round bars have been so employed. But having thoroughly tested my invention, I have found superior results to be produced by the specific construction of slats or bars which I have described, namely deeply knurled round bars divided longitudinally and placed with their flat sides outward. The proximity of the salient portions effectually prevents the protrusion of the clothes between the bars, while at the same time the acute angles presented, act to inject water freely through the larger cavities between the bars. I am also aware that wooden balls have long been used in washing machines of the class to which my improvement relates, and likewise that it is common to cover balls with soft materials for other purposes but I know of no previous instance in which covered wooden balls have been employed in washing machines in the manner I have described. The covering of the balls tends to deaden the noise, prevent their floating and increase their cleansing effect upon the clothes.

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

1. Constructing the rotating cylinder A. of a washing machine of a series of half rolls *a*, deeply knurled, and placed at short intervals and with their smooth surfaces outside substantially as herein described so that the cylinder when in motion offers the least resistance to the water and that the meshes or openings with their sharp edges cut the water and force the same into the cylinder and against the clothes facilitating the washing and insuring a supply and a constant change of the water in the cylinder.

2. The use in connection with a washing machine constructed substantially as above described of wooden balls *e*, covered with cloth or other suitable fabric *f*, for the purposes explained.

H. M. COLLIER.

Witnesses:
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