

T. S. PATTERSON.
WASHING MACHINE.
APPLICATION FILED FEB. 14, 1908.

974,591.

Patented Nov. 1, 1910.

2 SHEETS-SHEET 1.

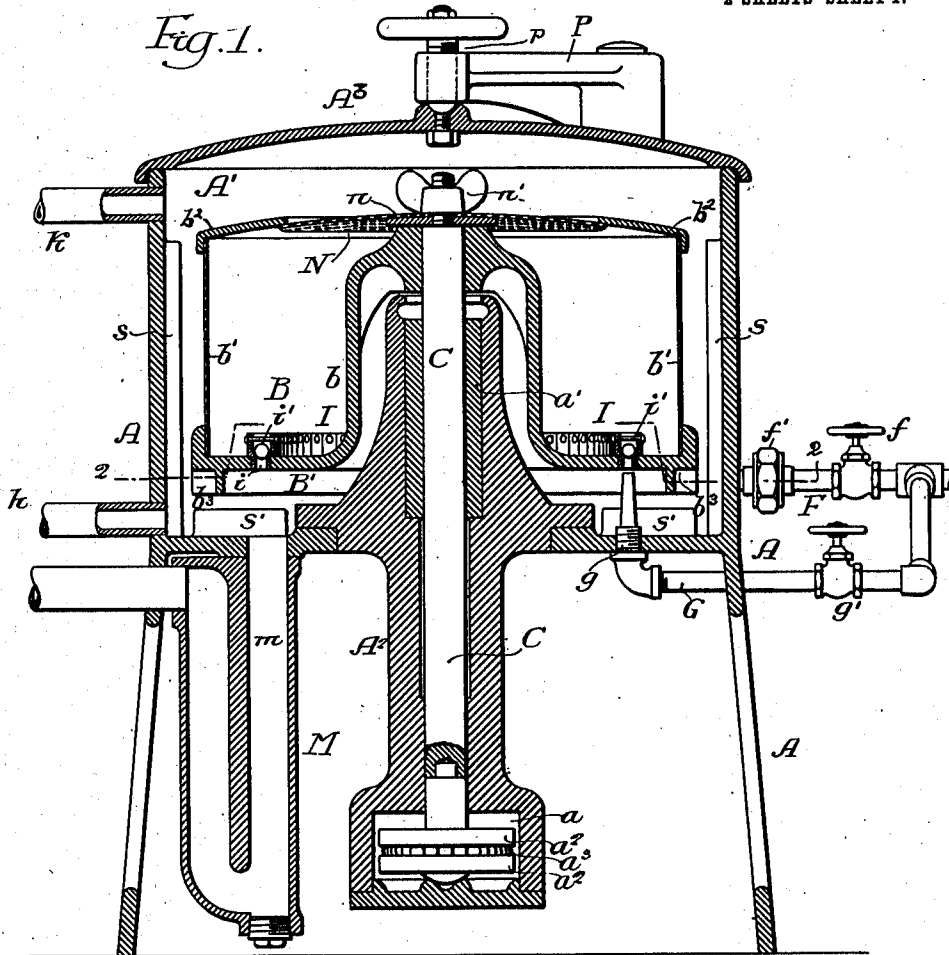
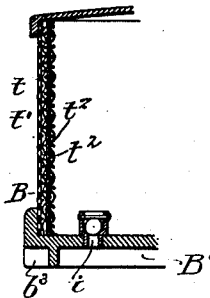


Fig. 6.



Witnesses:
Augustus B. Coppes
Litus McInnes.

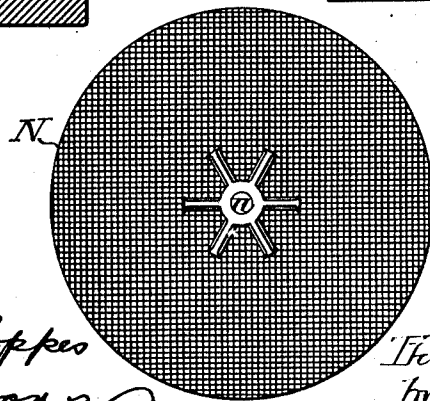
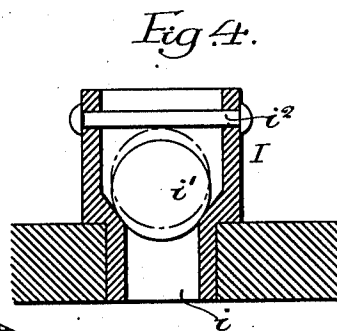
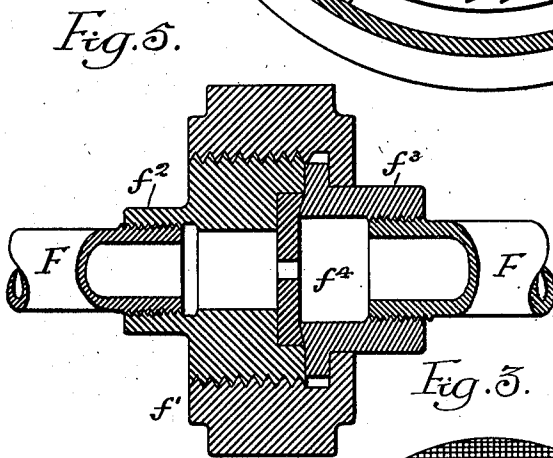
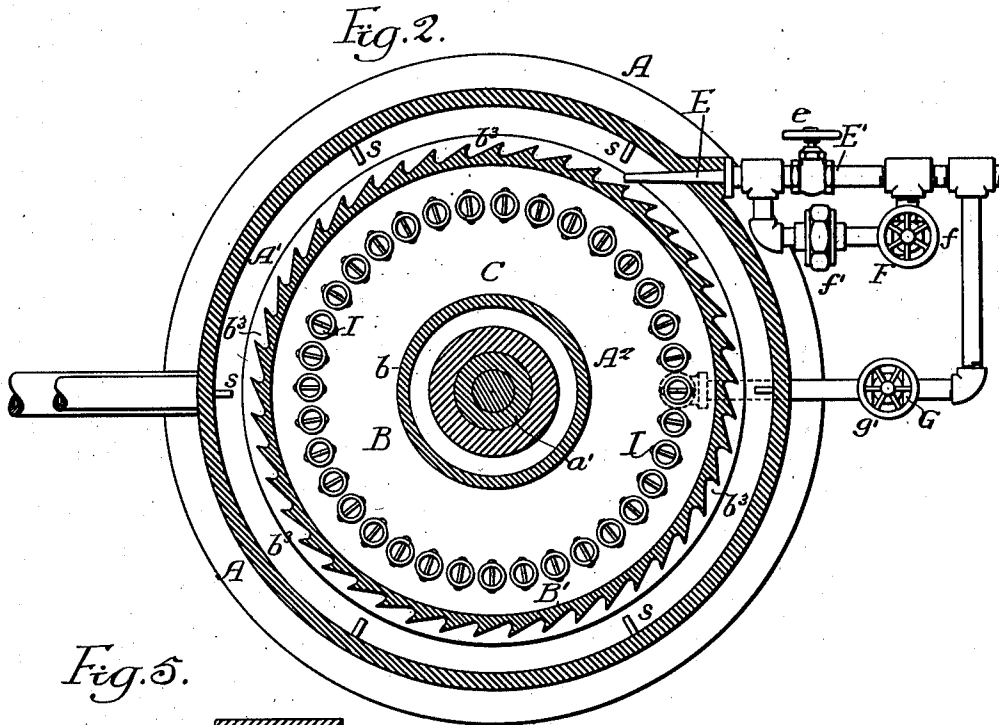
Inventor:
Thomas S. Patterson.
by his Attorneys,
Horn & Horn

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2 SHEETS—SHEET 2.



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 James McIvor.

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UNITED STATES PATENT OFFICE.

THOMAS S. PATTERSON, OF ROSEMONT, PENNSYLVANIA, ASSIGNOR TO THE OIL AND WASTE SAVING MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

WASHING-MACHINE.

974,591.

Specification of Letters Patent.

Patented Nov. 1, 1910.

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To all whom it may concern:

Be it known that I, THOMAS S. PATTERSON, a subject of the King of Great Britain and Ireland, residing in Rosemont, Pennsylvania, have invented certain Improvements in Washing-Machines, of which the following is a specification.

My invention relates to certain improvements in machines for washing loose material and removing the water from the material after washing.

My invention is particularly adapted for use in connection with washing material known as "waste" or "rags", from which the oil has been previously removed and which must be thoroughly cleansed and washed before it can be used again.

Waste and rags are used particularly in railway car axle boxes, and in machine shops and manufacturing establishments in general, and it is now the practice instead of discarding the oily waste to remove the oil from the waste and wash the waste so that it can be used again.

The object of my invention is to provide a single machine which will thoroughly wash the waste or like material, and in which the water used in washing can be quickly removed from the material without allowing the scum to reënter the material when the water is removed. This object I attain in the following manner, reference being had to the accompanying drawings, in which:—

Figure 1, is a vertical sectional view of my improved washing apparatus; Fig. 2, is a sectional plan view on the line 2—2, Fig. 1; Fig. 3, is a plan view of the detachable screen; Fig. 4, is a detached sectional view of one of the valves; Fig. 5, is a view showing a form of reducer used in one of the steam pipes; and Fig. 6, is a view showing the construction in which a filter is used.

A is a casing inclosing the chamber A' in which the cage B is mounted.

C is a vertical shaft mounted in a bearing.

A² is a frame secured to the central portion of the casing A, as clearly shown in Fig. 1, and containing a stepped bearing *a* at the bottom, and a bearing *a'* near the top. The stepped bearing *a* in the present instance is a ball bearing consisting of two disks *a*² with balls *a*³ between them. Other forms of bearings may be used without departing from my invention.

The cage B consists of a base portion B' having a central portion *b* and a screen *b'* having at its upper end an internal flange *b*², and on the base portion B' is a series of blades *b*³ forming the wheel of a turbine motor.

E is a nozzle projecting through the casing in line with the blades *b*³, and having connected to it two pipes E' and F. The pipe E' has a valve *e* and the pipe F is a bypass connected to the pipe E' on each side of the valve *e* and has a valve *f* and a reducer *f'*, preferably of the form shown in Fig. 5.

The reducer consists of two parts *f*², *f*³ of a coupling between which is mounted a disk *f*⁴ having a small hole therein. Other forms of reducer may be used if desired. The opening in the disk *f*⁴ can be of any diameter according to the amount of steam required to wire-draw through the reducer.

When it is desired to turn the cage slowly the valve *e* is closed and the valve *f* is opened, allowing the steam to pass through the pipe F and wire-draw through the reducer *f'*, but when it is desired to turn the cage rapidly the valve *e* is opened and the valve *f* closed, allowing steam at full pressure to pass through the nozzle.

In the bottom of the cage B is a series of openings *i* in which are mounted valve casings I inclosing ball valves *i'* adapted to seats in the casing and held in place by a cross bar *i*², or other suitable means, as clearly shown in Fig. 4. These valves may be placed any distance apart as desired, but they should be centered in respect to the center of rotation of the cage; and there may be two or more series of the valves spaced any distance apart, depending upon the size of the apparatus.

Mounted in the cage is a projecting nozzle *g* in line with the openings *i* in the cage, and this nozzle is attached to a steam supply pipe G provided with a valve *g'*, so that when steam is turned into the pipe G a jet of steam will be forced through the nozzle and through the openings *i* in the cage, entering the cage and agitating the material under treatment.

The casing A inclosing the washing chamber A' is, during the washing process, filled with water so as to submerge the material in the cage during the washing process. *h* is

the water inlet and *k* is an outlet; this outlet is so situated in respect to the cage that the water line will be above the top of the cage. There is also a waste passage *m* within a casing *M*, the casing being so formed as to provide a trap, as indicated; this waste pipe communicates with the bottom of the casing so as to draw all the water off when desired. The several pipes are provided with suitable valves.

Mounted upon the cage is a detachable screen *N* carried by a spider *n* confined to the cage by a set screw *n'* adapted to the threaded end of the shaft *C*. This screen is preferably made flexible and extends under the internal flange of the cage, and is for the purpose of holding material within the cage below the surface of the water. Other forms of screens may be used without departing from my invention.

*A*³ is a cap for the casing, which is held down by a set screw *p* carried by a pivoted arm *P* in the present instance.

In order to prevent the water rotating with the cage I preferably provide a series of vertical blades *s*, *s* which project into the washing chamber from the casing *A*, and I also provide a series of blades *s'* projecting from the bottom of the casing, for the same purpose.

In Fig. 6, I have shown a modification in which a filter is used to filter the wash water as it escapes, if it is desired so to do. *t* is a wire screen placed against the perforated surface of the cage and supported by the screen are one or more sheets of filtering material *t*; a screen *t*² of wire gauze is placed against the filtering material so as to keep the waste from coming in direct contact with it.

The operation of the machine is as follows:—When it is desired to wash waste, for instance, which is delivered in small bunches, it is preferable to keep the waste separated as much as possible, otherwise it has a tendency to cake and it is difficult to separate after the treatment. The washing chamber is filled with water in the first instance and small bunches of waste are placed in the cage until the cage is, say, half filled with waste, then the valve *f* is opened so as to allow a jet of steam to play through the nozzle *E*, and as this steam is wire-drawn only a comparatively small amount of steam is projected against the blades of the turbine wheel, and the cage is rotated very slowly—just sufficient to keep the material under treatment in motion without causing the material to be projected against the screen *b'* by centrifugal force. The water is prevented from turning with the cage by the fixed blades *s*, *s'*. Steam is then introduced through the pipe *G* and nozzle *g*, and is projected through the valved openings in the bottom of the cage, the valves preventing the

jet of steam striking the material with such force as to tear it asunder, but the steam is spread by the valve and the tendency is to open up the bunches of material and allow the water to gain access to the dirt or other foreign material in the waste.

After the machine is run a given length of time the scum will rise to the surface, and this is drawn off through the outlet pipe *k*, and when it is found that the waste is clean and that all the scum has been removed from the surface of the water, then the water is discharged through the outlet *m*, the valve *f* is closed, the valve *e* is opened and the valve *g'* is closed so that the cage is rotated at a high speed, causing the material within the cage to be forced outward by centrifugal force and against the screen *b'* of the cage; the water being forced from the material through the openings will pass away from the machine through the outlet *m*. After the water is removed from the waste the machine is stopped, the screen *N* removed, the contents of the cage taken out, and the cage is then charged with another batch of material.

If it is desired to filter the water or other cleansing medium, I place filtering material in the cage, as illustrated in Fig. 6, and it will be understood that while my invention is especially adapted for use with water, other cleansing liquids may be used without departing from my invention.

I claim:—

1. The combination in a washing machine, of a casing forming a washing chamber, a removable cover for the said chamber, a cage pivotally mounted in the chamber and capable of receiving the masses of loose material to be washed, said cage having in its bottom a series of openings, means for rotating the cage, and a steam nozzle at the bottom of the chamber, the opening in the nozzle being in a direct line with the series of openings in the bottom of the cage so that a jet of steam will be projected into the cage directly through the openings in succession so as to agitate the material within the cage by initial force of the jet of steam.

2. The combination of a casing inclosing a washing chamber, a cage mounted in the washing chamber and having a series of valved openings, means for turning the cage, and a steam nozzle alining with the openings of the cage so as to deliver steam into the interior of said cage.

3. The combination of a casing inclosing a washing chamber, a cage mounted in the chamber, means for rotating the cage, said cage having a series of openings in the bottom, valves in said openings, a steam nozzle mounted under the cage and in line with the openings, whereby as the cage is rotated steam will be projected through the valved openings and into the body of the cage.

4. The combination of a casing inclosing a washing chamber, a cage mounted in said chamber, means for rotating the cage, there being a series of openings in the bottom of the cage concentric with the center of rotation, a series of ball valves in said openings, a steam nozzle projecting through the bottom of the casing in line with said openings in the bottom of the cage, and means for supplying steam to said nozzle so that the ball valves will be operated by the steam projected from the nozzle as the cage rotates.

5. The combination of a casing, a cage mounted within the casing, a turbine wheel connected to or forming part of the cage, a nozzle, two steam pipes connecting with the nozzle, and a reducer mounted in one of the steam pipes so that when steam is turned into one pipe the cage will be rotated slowly and when turned into the other pipe the cage will be rapidly rotated.

6. The combination of a casing, a vertical shaft mounted in bearings in the casing, a cage mounted on the shaft and inclosed within the chamber formed by the casing, means for closing the casing, means for driving the cage, there being a series of valved

openings in the bottom of the cage and arranged concentrically with the center of rotation, a steam nozzle projecting under the cage and in line with the valved openings, a screen closing the upper portion of the cage, a water inlet, an outlet communicating with the casing above the upper end of the cage, a water outlet communicating with the bottom of the casing, and means for preventing the water turning with the cage.

7. The combination of a casing inclosing a washing chamber, a rotating cage mounted within the casing, a screen and filtering material mounted at the periphery of the casing, there being a series of openings in the bottom of the cage, a fixed steam nozzle in line with said openings and arranged to project steam through the openings into the cage, an inlet, and an outlet for wash water communicating with the casing.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

THOMAS S. PATTERSON.

Witnesses:

WM. E. SHUPE,

WM. A. BARR.