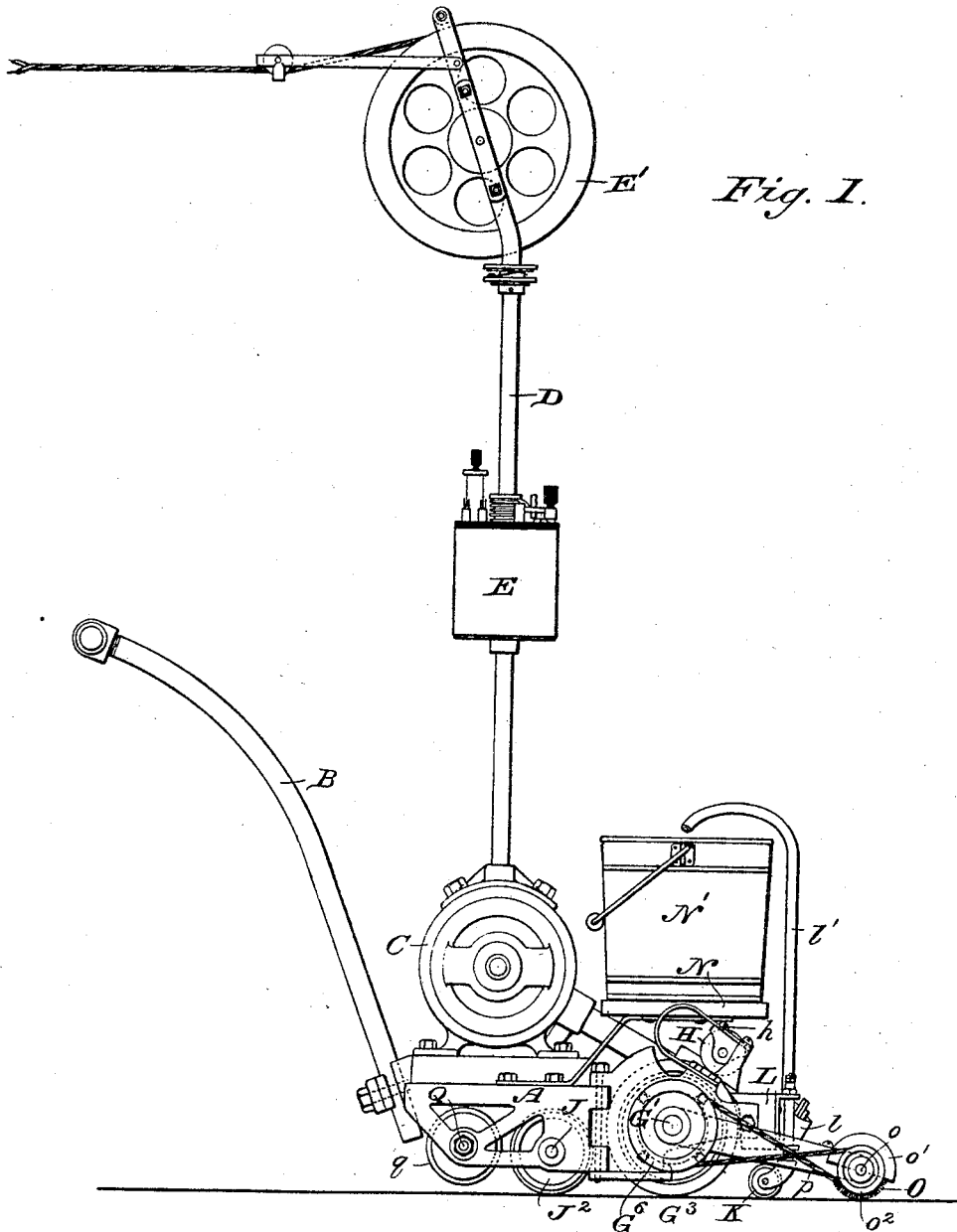


No. 794,817.

PATENTED JULY 18, 1905.

J. B. SLATTERY.
SCRUBBING MACHINE.
APPLICATION FILED NOV. 6, 1903.

4 SHEETS—SHEET 1.



WITNESSES:
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INVENTOR:
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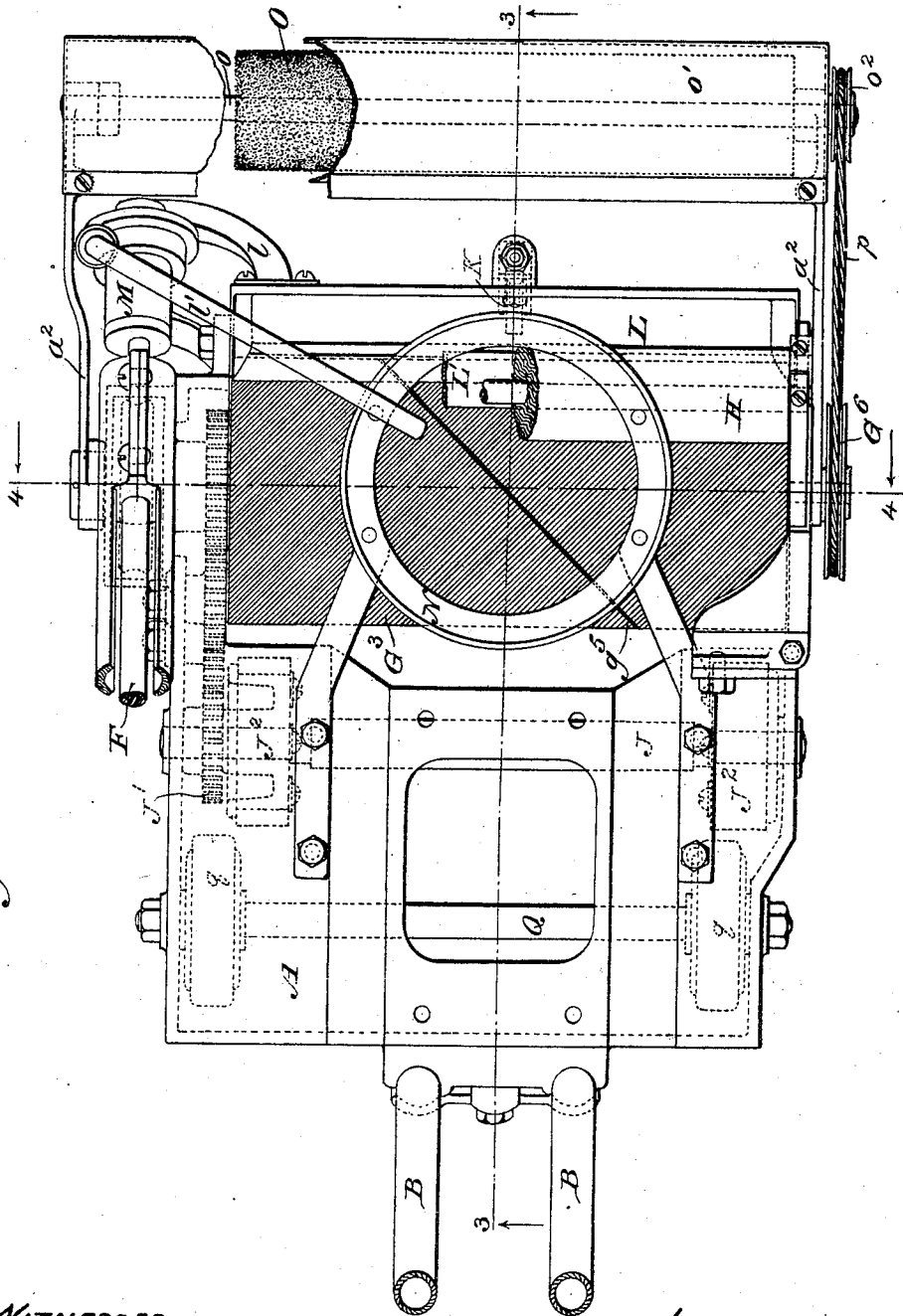
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4 SHEETS—SHEET 2.

Fig. 2.



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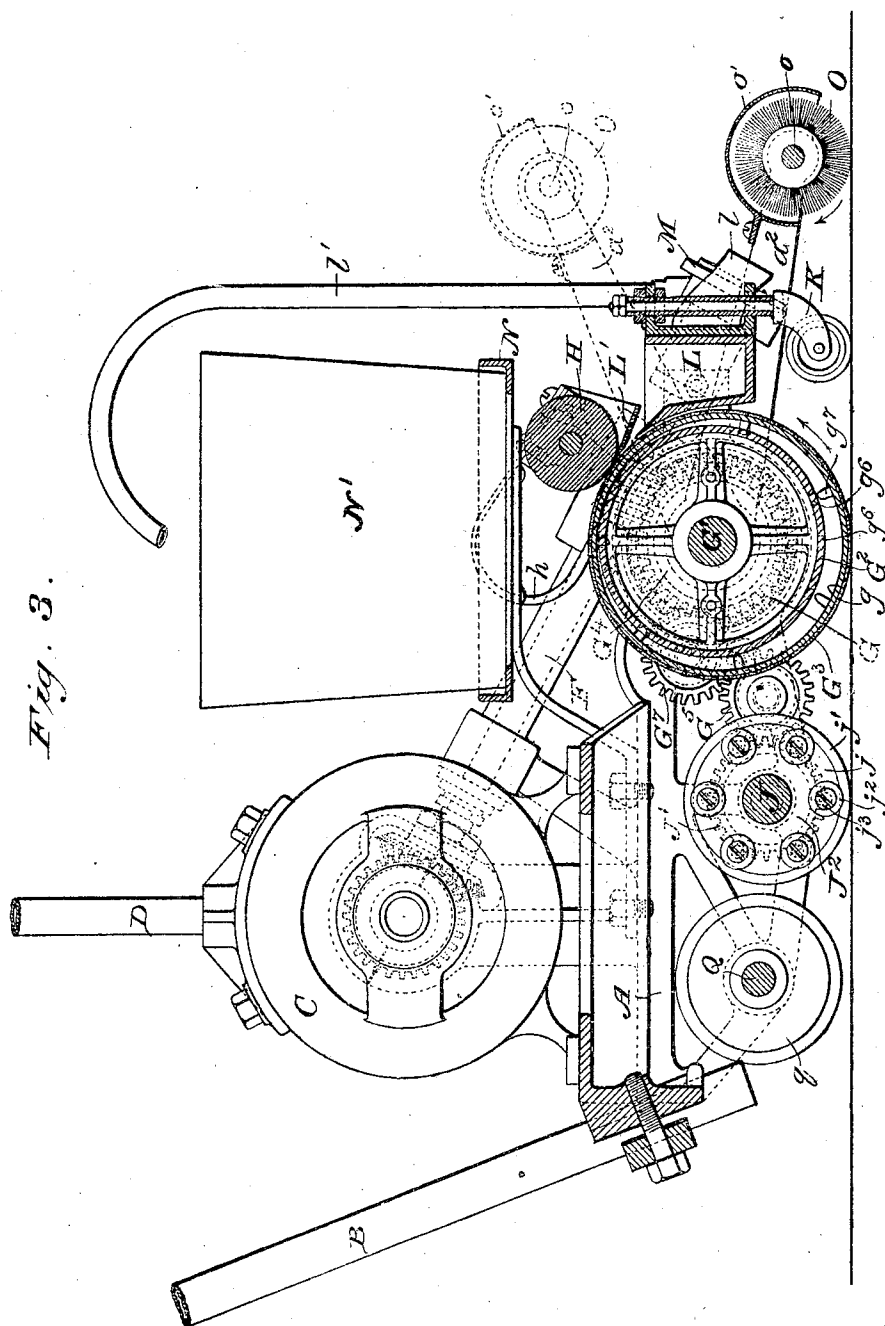
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 4.

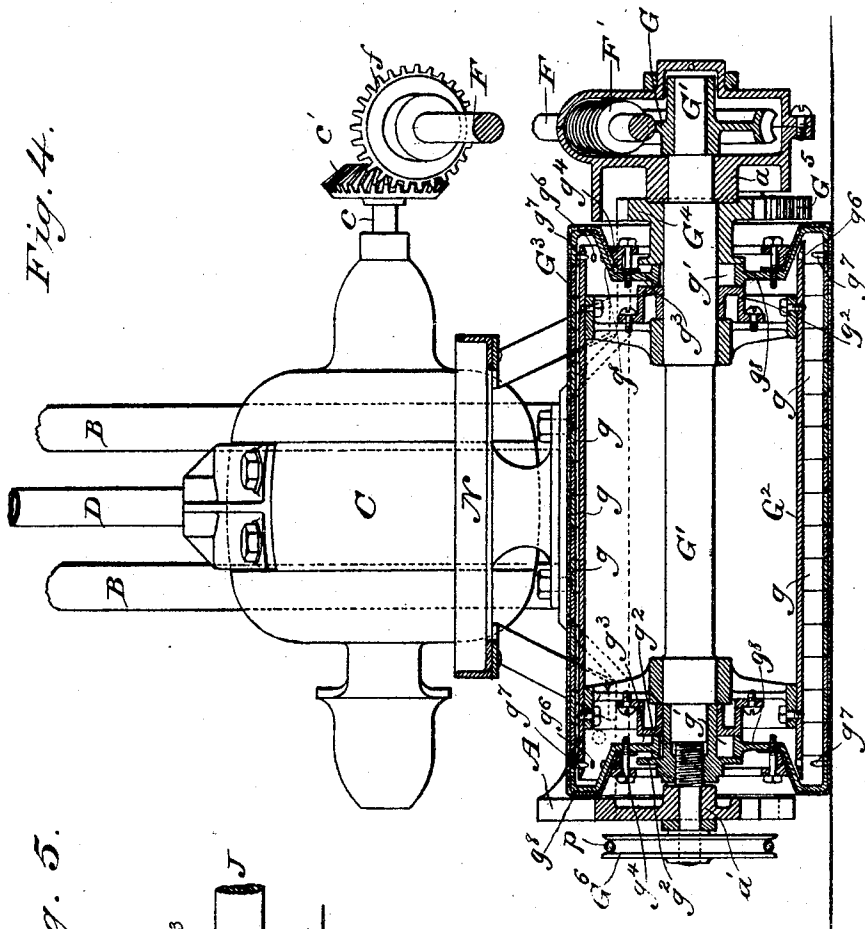
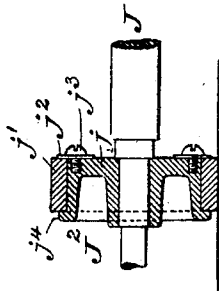


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN B. SLATTERY, OF CLEVELAND, OHIO.

SCRUBBING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 794,817, dated July 18, 1905.

Application filed November 6, 1903. Serial No. 180,015.

To all whom it may concern:

Be it known that I, JOHN B. SLATTERY, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Scrubbing-Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to devices for cleaning floors and the like, its object being to effect such cleaning in an efficient and economical manner.

The said invention consists of means hereinafter fully described, and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure 1 represents a side elevation of a complete machine embodying my invention. Fig. 2 represents, on an enlarged scale, a plan view of the lower or main portion of the machine, showing a portion of the scrubber-shield broken away to disclose the scrubber, also showing the motor as removed and connected parts broken away. Fig. 3 represents a vertical longitudinal section, on the scale of Fig. 2, of said lower machine portion, the motor being, however, shown in side elevation, such section being taken upon the plane indicated by line 3 3, Fig. 2. Fig. 4 represents a vertical transverse section on the scale of Fig. 2 and taken upon the plane indicated by line 4 4, Fig. 2. Fig. 5 represents a detail axial section of one of the traction-wheels embodied in the machine.

A suitable frame A has attached to its rear a handle B, by means of which, together with rotatable members hereinafter described, the machine may be moved about or guided, as will hereinafter appear. Upon the rear of the frame is mounted an electric motor C,

and supported by and projecting from the motor-frame is an upwardly-extending standard D, which supports a reel E and suitable switching means E' for controlling the motor-current. Reel E carries the wire for providing such current and is arranged to wind such wire automatically and to turn in a horizontal plane, so as to conform in its movement with the movements of the machine and at the same time allow the wire to maintain proper connection with a source of current-supply. The specific structure of the reel forms no part of my present invention and is separately described and claimed in Letters Patent No. 704,671, issued to H. F. Ackerman July 15, 1902.

The motor-shaft *c* is provided at one end (the right as viewed in Fig. 4) with a beveled gear *c'*, which meshes with a beveled gear *f*, secured to the upper end of a downwardly-inclined operating-shaft F. Upon this shaft and near its lower end is secured a worm F', which engages a worm-wheel G, secured upon the end of a spindle G', forming a part of a mopping means, hereinafter fully described, and suitably journaled in the frame in bearings *a* and *a'*, Fig. 4. Intermediate of its ends and fixedly secured to said spindle is a cylindrical drum G², forming an inner shell of such mopping means. An outer shell of such mopping means comprises a series of juxtaposed annular rings *g*, which are loosely mounted in a direction transverse relatively to the spindle-axis—i. e., they are movable in a vertical plane, Fig. 4, and they are also movable in said vertical plane independently of each other. The end or side rings *g*⁸, which extend inwardly within a short distance of the spindle G', are provided with apertures *g'*, whereby they may move in a transverse or vertical direction and are held against displacement in a longitudinal direction with reference to the spindle-axis by means of flanges *g*² *g*², suitably formed or secured upon the spindle and forming grooves *g*³ *g*³. Surrounding the entire series of rings is a covering G³ of a fabric material which will absorb or hold water. This covering is caused to fit snugly over the rings, so as to

normally form a cylinder, and is fastened at its ends by means of plates g^4 , bolted to the end rings g^8 . The rings g^7 are thus bound together by the covering G^3 and have free movement between said covering and the inner member G^2 of the mopping means independently of each other and in a direction transverse to the axis of said mopping means. The covering is laid so as to cause the strands of the fabric to lie helically upon the outer shell member, as shown in Fig. 2. Such described arrangement prevents the covering from bulging or becoming loose in planes perpendicular to the axis of rotation when strands become parted by being worn through and also presents finished or selvage edges to be united to form the seam g^5 . The said seam being usually somewhat thick, lying in a helical position, also allows the mopping-surface so formed to rotate more evenly when in contact with the floor than would be the case were the seam to lie parallel with the rotation axis.

Near each edge of the shell member G^2 is formed a series of apertures g^6 , each of which is engaged by a series of pins g^7 , secured to the inside of the end rings g^8 , the latter overhanging such inner shell member ends, as shown in Figs. 3 and 4. These pins are made of a length such that during the rotation of the mopping-roller they will engage the apertures g^6 at the top of member G^2 and disengage same at the bottom, as shown, thus acting like a pinion meshing with an internal gear. The outer shell member or series of rings is constrained to maintain such described position relatively to the inner shell member by means of a rubber wringer-roller H , mounted above the mopping-roller in suitable bearings carried by downwardly-acting springs h , secured to the frame, as shown in Fig. 3. It will thus be seen that the mopping-surface is caused to rotate with the spindle and that such surface is, by means of the construction described and shown, rendered yielding and relatively to the whole surface depressible in parts. These peculiarities of yielding and depressibility enable the mopping-surface to adapt itself to inequalities which may exist in such surfaces to which it may be applied. The yielding of the said mopping-surface results from the elasticity of the wringer-roller and also from the elasticity of the fabric covering, the depressibility of course being a result of the peculiarity of construction of the outer shell member.

Secured upon the spindle G' and near its right-hand end, Figs. 3 and 4, is a gear G^4 , which meshes with a gear G^7 , mounted on the frame, the latter meshing with an idle gear G^5 , which in turn meshes with a pinion J' , secured to an axle J , journaled in suitable bearings in rear of the mopping-roller. Secured to this axle are two traction-wheels

$J^1 J^2$. Each of these wheels consists of a main body portion j and an outer loose rim j' , Fig. 5. These rims are retained upon the bodies by means of washers j^3 , projecting radially from and secured to the body by means of screws j^3 , a flange j^4 being formed upon the opposite side of the body, as shown.

The motor is arranged so as to effect the rotation of the mopping-roller in the direction indicated by the arrow in Fig. 3, whence it will be seen that the traction-rollers will be driven in the opposite direction—i. e., that required to move the machine forward.

Journaled in the forward part of the frame is a caster K , which may be adjusted upwardly or downwardly with reference to the frame, and upon this caster and the traction-wheels the weight of the machine principally rests when operating normally. It will therefore be seen that the amount of frictional contact between the mopping-roller and floor may be regulated by adjusting the caster K to raise or lower the front part of the machine. This adjustment hence also regulates the amount of weight carried by the traction-wheels, and hence the amount of frictional contact between the traction-wheel bodies and their respective rims. In the normal position upon a floor the mopping-surface of the machine is in such contact with the floor as will press the outer shell member (rings g) a short distance away from the inner member G^2 in an upward direction against the action of the springs h , so as to allow the rings to play downwardly when encountering a depression, upward play in encountering projections being amply provided for, as will be seen in the drawings. It will be seen that the tendency of the mopping-roller is to propel the machine backward; but the caster is so adjusted that the frictional resistance between the traction-wheels and floor will be greater than that between the roller and floor and the resultant movement will be forward. Such adjustment is, further, such as to effect an amount of frictional contact of the rims such as to allow the rims j' to slip on the bodies j when the rotation of the axle is inaugurated, thus preventing the marring of the surface of the floor in contact with the rims and causing the machine to start gradually, at the same time allowing the mopping-roller to start with sufficient speed to properly perform its function. As the machine gathers headway the relative movement of the rims and wheel-bodies becomes less and less until they finally move in unison.

Below the wringer-roller H and forward of the mopping-roller is a transversely-placed trough L , which receives the liquid expressed from the absorbent covering, a plate L' , overhanging the trough slightly, directing such liquid properly. Tapping the left-hand end of this trough is a duct l , which communi-

cates with a rotary or centrifugal pump M, operated by the lower end of shaft F, Fig. 2, and which pumps the liquid up through a discharge-duct l' , which extends upwardly and is bent toward the middle of the machine. At this point a seat N is secured to the frame over the mopping-roller, which is adapted to receive and hold a removable receptacle N'. (Shown in Fig. 3.) The expressed liquid flows from the trough through duct l into the pump, whence it is lifted up above the trough over the mopping-roller and discharged into the receptacle N', by means of which latter it may be readily removed, so as not to come into contact with the mopped portion of the floor. By means of the described arrangement the liquid is removed and carried along with the machine without the aid of extraneous means.

The main frame A is provided with two side extension members a^1 a^2 , Fig. 2, in the front end of which is journaled the spindle o of a scrubbing-roller O, which is housed beneath a shield o' . These side members are pivotally secured to the main frame, their pivotal axis being coincident with the axis of the mopping-roller. Upon the right-hand end of the spindle G' is secured a pulley G^1 , and on the corresponding end of spindle o is secured a pulley o^2 . Over these pulleys passes a crossed belt p , which operates the scrubbing-roller, as will be understood, the rotation of the latter being such as to throw the liquid back into the path of the mopping-roller. When it is not desired to utilize the scrubbing-roller, it is swung upwardly and held out of contact with the floor by any suitable means, (not shown,) as will be readily understood.

In rear of the traction-wheels is mounted in suitable bearings in the frame a shaft Q, upon which are secured two truck-wheels q . The diameter of these truck-wheels is such as to prevent their peripheries from coming into contact with the floor when the machine is normally operating with the traction-wheels, mopping-roller, and caster all in such contact, as shown in Figs. 1 and 3.

When in use, the machine is guided along the floor by means of handle B the truck-wheels being, as before mentioned, out of contact with the floor. Now if it be desired to throw the machine out of operation without stopping the motor—as, for instance, would be the case when it becomes necessary to draw the machine back to repeat the operation over the same area—the handle is depressed sharply by throwing the weight upon it, thus tilting the machine upon the circumference of the traction-wheels as an axis until the truck-wheels touch the floor. The location of the traction-wheels is such relatively to the distribution of weight of the machine that such tilting is effected with comparative

ease. The truck-wheels having reached the floor, the momentum of the machine enables the operator to still further tilt it upon the wheels q as an axis, and thereby cause the center of gravity to fall behind the vertical plane passing through the axis of tilting, in which position it will be seen the machine may be easily rolled about upon said wheels q .

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed provided the means stated by any one of the following claims be employed.

I therefore particularly point out and distinctly claim as my invention—

1. In rotary mopping means, the combination of a spindle, an inner shell member secured thereto, an outer shell member supported by said spindle and movable in a direction transverse to the axis thereof, and an absorbent covering upon such outer shell member.

2. In rotary mopping means, the combination of a spindle, an inner shell member secured thereto, an outer shell member supported by said spindle, movable in a direction transverse to the axis thereof, and comprising a plurality of independent sections movable relatively to each other, and an absorbent covering upon such outer shell member.

3. In a scrubbing-machine, the combination of a suitable frame, a rotary mopping member mounted upon such frame and embodying an outer shell member composed of a series of adjacent rings movable independently of each other in a direction transverse to the axis of rotation of the mopping member, together with an absorbent covering upon such shell member, and means exerting pressure upon such covering.

4. In a scrubbing-machine, the combination of a suitable frame, a rotary mopping member mounted upon such frame and embodying an outer shell member composed of a series of adjacent rings movable independently of each other in a direction transverse to the axis of rotation of the mopping member, together with an absorbent covering upon such shell member, and a resilient wringer-roller exerting pressure upon said covering.

5. In a scrubbing-machine, the combination of a suitable frame, a motor and rotary mopping means operated thereby both mounted upon said frame, and traction-wheels mounted upon such frame connected with said motor, said wheels being provided with outer rims capable of movement relatively to the main body of the wheel.

6. In a scrubbing-machine, the combination of a suitable frame, a motor and rotary mopping means operated thereby, both

mounted upon said frame, and traction-wheels mounted upon said frame, connected with said motor and arranged to rotate in a direction opposite that of said mopping member, such wheels being provided with outer rims engaging their respective main wheel-bodies by frictional contact.

7. In a scrubbing-machine, the combination of a suitable frame, a motor and rotary mopping means operated thereby, both mounted upon said frame, and traction-wheels mounted upon said frame connected with said motor and arranged to rotate in the direction opposite that of said mopping member, such wheels being provided with outer rims engaging their respective main wheel-bodies by frictional contact, and a vertically-adjustable caster located in front of said traction-wheels and adapted when adjusted vertically to raise or lower the front end of the machine, whereby the amount of frictional resistance between the said rims and their respective wheel-bodies is regulated.

8. In a scrubbing-machine, the combination of a suitable frame, rotary mopping means and traction-wheels mounted upon said frame, a motor mounted upon said frame and connected with said mopping member and traction-wheels, a suitable handle se-

cured to said frame, and truck-wheels normally out of contact with the surface operated upon.

9. In a scrubbing-machine, the combination of a suitable frame, a rotary scrubbing member mounted in the front end thereof, truck-wheels mounted in the rear end thereof, a rotary mopping member and traction-wheels mounted thereon intermediate of said scrubbing member and said truck-wheels, a motor for driving such members and wheels, and a suitable handle, said truck-wheels being normally out of contact with the surface operated upon, and said traction-wheels, mopping member and scrubbing member being normally in contact with the surface operated upon the construction being such that pressure upon said handle will cause said truck-wheels to contact with such surface, and cause said mopping member and scrubbing member to be thrown out of contact with such surface, said traction-wheels acting as an axis for such tilting operation.

Signed by me this 31st day of October, 1903.

JOHN B. SLATTERY.

Attest:

D. T. DAVIES,
G. W. SAYWELL.