F. A. ESPELAND.

MOPPING MACHINE.

APPLICATION FILED SEPT. 18, 1920.

1,393,100. **Patented Oct. 11, 1921.**

2 SHEETS—SHEET 1.

FIG. 1.

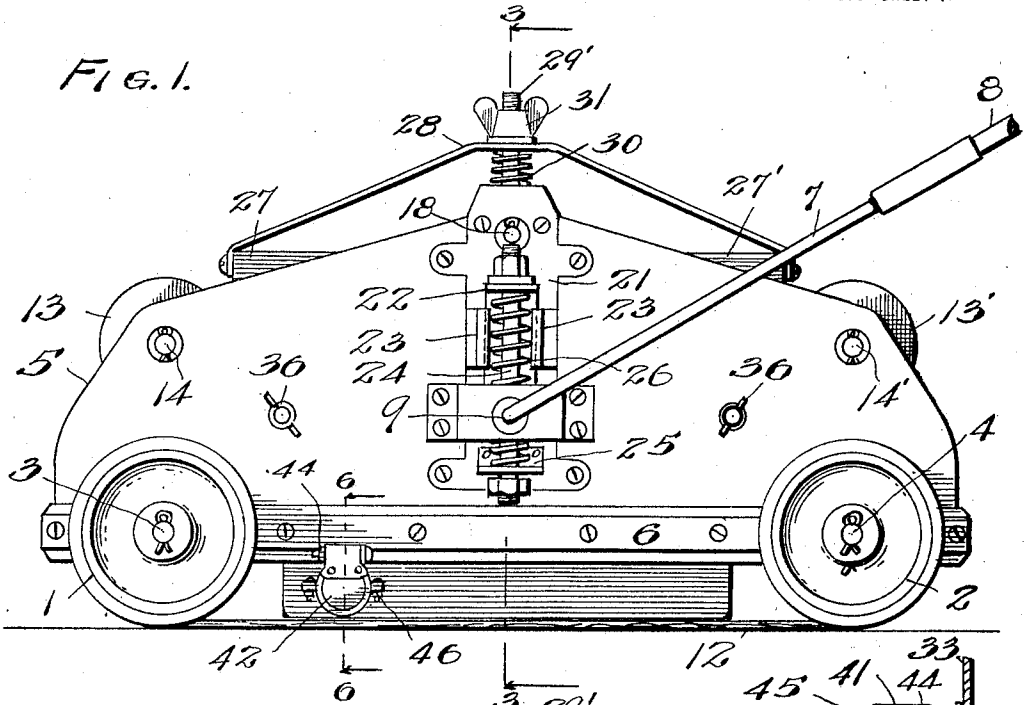


FIG. 2.

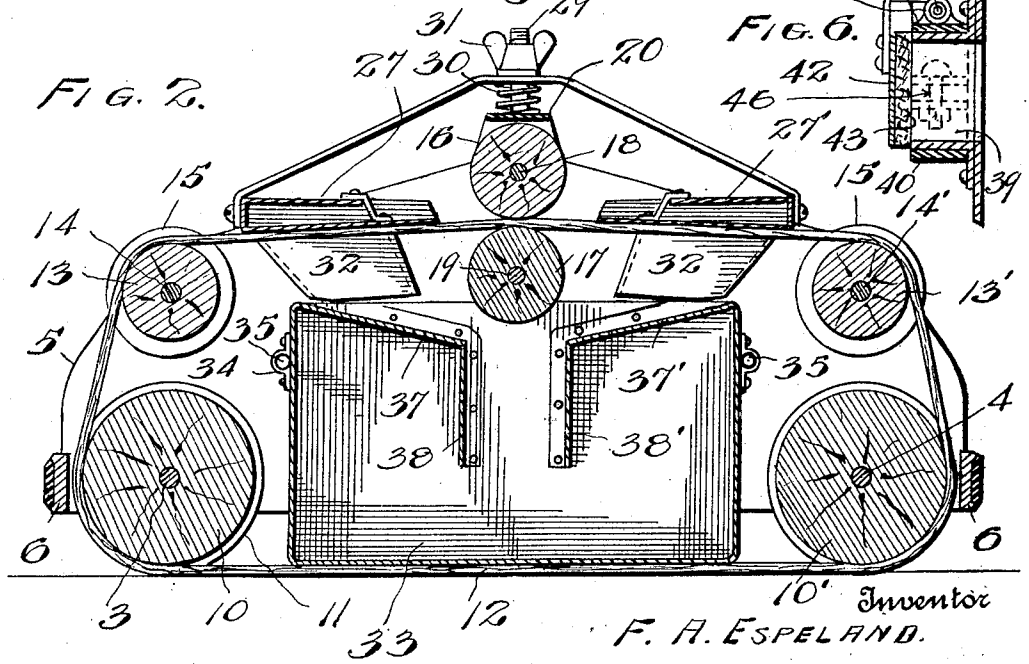


FIG. 6.

Inventor

F. A. ESPELAND.

Chas. K. Davies

Attorney

F. A. ESPELAND.

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2 SHEETS—SHEET 2.

FIG. 3.

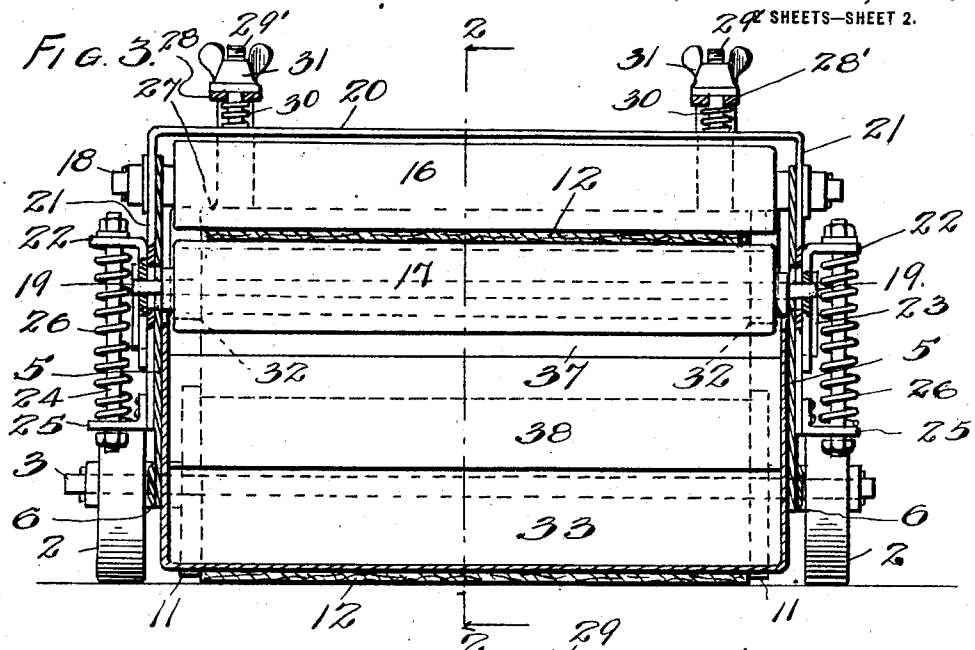


FIG. 4.

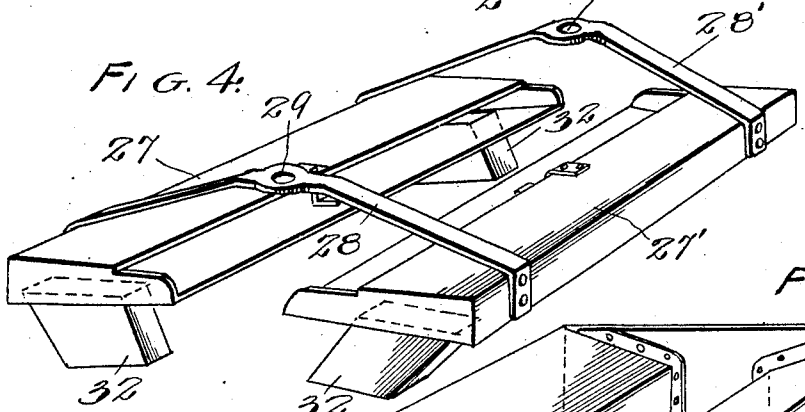
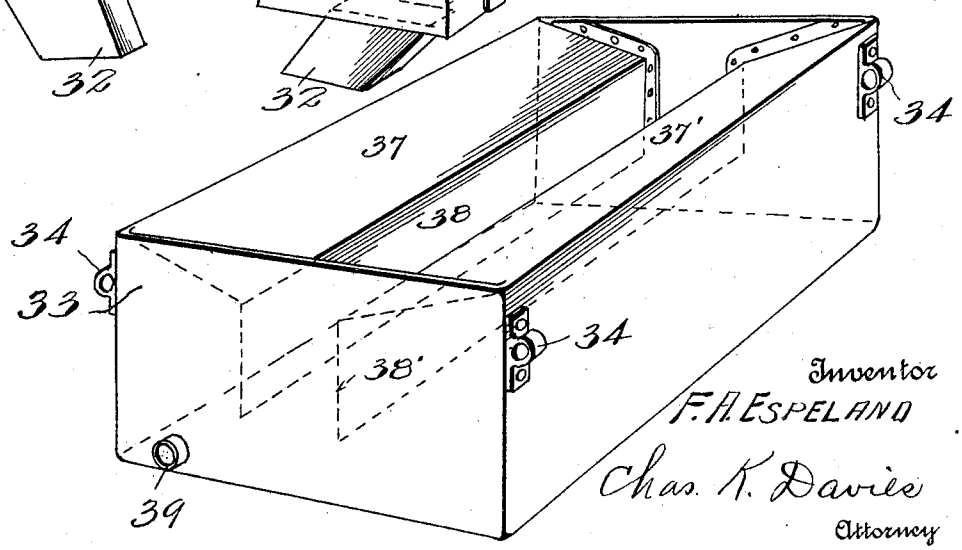


FIG. 5



Inventor

F. A. ESPELAND

Chas. K. Davies

Attorney

UNITED STATES PATENT OFFICE.

FRANKLIN A. ESPELAND, OF OAKES, NORTH DAKOTA.

MOPPING-MACHINE.

1,393,100. Specification of Letters Patent. Patented Oct. 11, 1921.

Application filed September 18, 1920. Serial No. 411,101.

To all whom it may concern:

Be it known that I, FRANKLIN A. ESPELAND, a citizen of the United States of America, residing at Oakes, in the county of Dickey and State of North Dakota, have invented certain new and useful Improvements in Mopping-Machines, of which the following is a specification.

The present invention relates to an improved mopping machine under the broad class of brushing and scrubbing machines of the hand operated type for domestic use possessing many of the characteristics of manipulation as the well known carpet sweeper or cleaner. The primary object of the invention is the provision of a device of this character for mopping floors, &c., to cleanse them in an efficient and thorough manner, which may be manufactured at comparatively inexpensive cost, which is durable, and may be manipulated with facility. By the combination and arrangement of the operating parts of the device I am enabled to produce a compact and comparatively small implement which may be manipulated under furniture or beneath otherwise inaccessible objects, for mopping or cleansing the floor or other surface in a thorough and satisfactory manner.

With the above and other ends in view, the invention consists essentially in a carrier and endless mop or mat combined with means for moving or wiping the mat or mop over the floor to be cleaned, and in associating therewith means for wringing or rinsing the mop of dirty water and depositing it in a receptacle provided therefor. And the invention further consists in certain novel features and combinations of parts in connection with the wringing or rinsing device and with the means for gathering and depositing the dirty water in a receptacle or reservoir carried by the machine, as will be hereinafter more fully pointed out and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to the best mode I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a view in side elevation of a machine embodying my invention, the handle for pushing or pulling the machine being shown as broken away.

Fig. 2 is a longitudinal vertical sectional view of the device, on line 2—2 of Fig. 3.

Fig. 3 is a transverse vertical sectional view of the device on line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the gathering troughs and connections, detached, for conveying or passing the dirty water from the wringing or rinsing rollers to the receptacle therefor.

Fig. 5 is a perspective view of the detachable container or reservoir for dirty water.

Fig. 6 is a detail, sectional view, enlarged, at line 6—6 of Fig. 1 showing the outlet from the reservoir.

While I shall refer to the device herein as a hand operated device for household or domestic use, it will be apparent that the mopping machine may be power driven and made of various sizes to suit different conditions. In the preferred form of the invention as illustrated in the drawings I have depicted a device for domestic use which may be moved backward and forward across a floor or other surface, similar to the manipulation of a carpet sweeper or cleaner, and the device is operative on both strokes, to mop up or wipe a previously wetted or dampened surface, and gather the dirty water in a receptacle carried thereby. The device is supported on and operated by two pairs of wheels 1 and 2, fixed on their respective shafts or axles 3 and 4, the wheels being of suitable size and type, and acting as drive wheels or traction wheels for the operating parts of the mopping machine, and the axles or shafts are journaled in the opposed side plates 5, 5, which form an open housing for the machine. These plates may be of wood or preferably of metal, and a rectangular shaped frame 6, with a rubber bead, joins the plates to form a rigid supporting structure for the device. In addition braces and coverings may be utilized if desired, to strengthen and inclose the operating parts, and other features not essential to a clear understanding of the invention, may be incorporated in the device. As seen in Fig. 1 the device is of a low-down structure and has a U-shape yoke 7 and handle or rod 8 to be grasped by the hand of the operator, and by means of the

pivot 9 of the yoke, a flexible connection is made to the housing at each side thereof in order that the machine may be pushed and pulled in alternate directions, running on its wheels 1 and 2.

Each of the axles 3 and 4 has fixed thereon a wooden roller as 10, 10′, located between the side plates of the housing and formed with end annular flanges 11, the rollers and their flanges being of less diameter than the traction wheels and elevated slightly above the floor or surface to be cleaned. The mop member 12 is an endless band or strip of absorbent, porous material which passes under the rollers 10, 10′ and between their end flanges which latter retain the mop and guide it in its movements, and the mop is suspended and supported over a pair of upper idler rollers 13 and 13′ journaled on the axles 14 and 14′. Thus the lower stretch of the mop is held down to the floor between the spaced actuating rollers 10 and 10′, while the upper stretch of the mop is suspended between the idler rollers 13 13′, the latter having guide flanges 15 at their ends complementary to the flanges 11 of the actuating rollers. The mop is actuated by rollers 1 and 2, as the machine is moved across the floor which causes the mop to wipe across the surface. Thus the endless mop is moved around the outside periphery of its four supporting rollers, bringing into use all parts of the outer surface of the mop and enhancing the durability and wear of the member 12.

The complementary pairs of rollers 10—13 and 10′—13′ are located at the front and rear of the machine, between the side plates, and between these pairs of rollers are located at the approximate center of the housing a pair of wringer rollers 16 and 17, between which the upper stretch of the mop passes and the soiled or dirty water is squeezed out of the mop by action of these rollers which are turned by movement of the mop.

The wringer rolls 16 and 17 are fixed to or may revolve on their respective shafts 18 and 19, the former having a stationary bearing in the two side plates of the housing, and the latter or under roller-shaft having a movable bearing, to insure a flexible friction contact of the upper and lower wringer rollers with the mop which passes therebetween. For strengthening and adding rigidity to the housing and for providing a stable support for the wringer rollers I utilize a top central, transverse brace bar 20, of flat metal in the form of an inverted U-shape strap with its legs 21 secured, as by screws to the outer faces of the side plates of the housing, and the bar 20 extending across the top of the housing to form a joint between its side plates.

The ends of the lower shaft 19 of the wringer device are fixed to a pair of inverted L-shape slide plates 22, slidable in contact with the outer faces of the legs 21 of the brace 20, and the side plates and legs of the brace are vertically slotted, as in Fig. 3 to permit movement of the shaft 19. The slide plates 22 are vertically movable and guided within the flanges 23 integral with or secured to the legs 21, and vertically disposed guide rods 24 are supported in the slide plates and complementary fixed brackets 25 attached to the housing, both members being perforated for reception of the vertically disposed rods. Between the heads of the guide brackets 25 and the slide plates 22 are interposed springs 26 coiled about the rods 24, resting on the brackets and at their upper ends in close contact with the slide plates. By means of the springs the roller 17 is held in close contact with the underface of the traveling belt or mop and the mop is squeezed against the upper roller 16 of the wringer device, to force out the water that is wiped up by the mop as it passes over the floor in the manner indicated. The moisture is thus squeezed out of the upper stretch of the mop at both the upper side and the lower side of the mop, between the wringer rollers.

The moisture or water eliminated from the mop, at its upper surface is caught in a pair of troughs 27 and 27′ located at opposite sides of the wringer rollers, over the upper stretch of the mop and resting thereon as shown in Fig. 2. In Fig. 4 it will be seen that these troughs have adjacent openings or mouths, and tops, the latter to prevent escape of the water, and the bottom of the troughs lie on the top of the mop to intercept water from the mop. The troughs are disposed parallel with the mop, and as the mop is supported between the wringer rollers at an attitude higher than the periphery of the idler rollers 13 and 13′, it will be apparent that the portions of the upper stretch of the mop decline or slant downward from the wringer rollers. Thus the water is caused to run down or be shed from both sides of the rollers 16—17, is intercepted by the front edges of the troughs, and is gathered in the troughs as indicated.

The troughs are rigidly joined together by arched straps 28 28′ secured at their outer edges near the ends of the troughs and perforated at 29 on the transverse axis of the machine for the reception of complementary threaded stud bolts 29, attached to and projecting above the brace bar 20. Between the brace bars and the straps are interposed springs 30, and above the straps butterfly nuts 31 are threaded on the studs, thus providing a resilient but stable support for the troughs from the brace bar 20, and afford-

ing means for adjusting the position of the troughs with respect to the mop and wringer rolls.

At the ends of the troughs are provided delivery spouts 32 opening at their upper ends into the trough and disposed longitudinally of the machine, and these spouts are arranged somewhat at an angle to the troughs and converge toward the transverse center of the machine. The delivery spouts are designed to empty the troughs and convey water therefrom to the reservoir 33, and they are positioned at the outer edges of the mop, as indicated in dotted lines in Fig. 3, to perform the function of guiding the mop or the upper stretch thereof between the idler rollers and the wringer rollers.

The reservoir 33 is a rectangular receptacle, preferably of metal and located transversely of the mop machine in position to rest upon the upper surface of the lower stretch of the mop, and hold this wiping portion of the mop on the floor to perform its required functions. Thus in Fig. 2 it will be seen that the mop, throughout the major portion of its wiping stretch is held to the floor by the rollers 10, 10′ and the bottom of the reservoir 33.

The reservoir is detachably fastened inside the housing by means of perforated lugs or ears 34 arranged in alined pairs at the front and back of the reservoir, and pins or screws 35 are passed through the side plates of the housing, with heads 36 at the outer sides of the plates 5, to enter these ears which form sockets, and support the reservoir at its four corners. The reservoir is disposed beneath the wringer rollers and the delivery spouts to receive the dirty water from both above and below the upper stretch of the mop, and inclined plates 37, 37′ with vertical flanges 38, 38′ extend longitudinally of the reservoir, leaving an open space between the flanges as seen in Fig. 2.

The dirty water thus drops from the underside of the upper stretch of the mop and is conveyed from the upper side through spouts 32 to the declining top plates 37, 37′ of the reservoir, and thence flows into the reservoir through the open space between the flanges 38, 38′. The plates 37, 37′ and flanges or partitions 38, 38′ form an effectual closure for the reservoir to prevent splashing of the water from the reservoir, as do also the tops of the troughs 27, 27′ perform this function for the troughs, thus providing the device with means for preventing any possible outlet for the dirty water except through the nozzle 39 adapted for this purpose.

The nozzle is located at one end of the reservoir, as indicated in Figs. 1, 5, and 6, and it is equipped with a closure device that is detachable and adjustable, and carried on the exterior of the nozzle. The closure device includes a pair of semi-circular clamp straps 40 and 41 adapted to form a collar or sleeve to surround the nozzle and be clamped thereon, and a gate or metal disk 42 provided with a cork lining 43 is hinged to the device at 44. A spring 45 on the hinge pin 44 holds the cork-lined gate closed over the orifice of the nozzle, and clamp bolts or screws 46 are utilized to securely clamp the closure device on the nozzle. When desired, the gate 42 may be opened and the contents poured from the reservoir, as will be understood.

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

1. In a mopping machine the combination with a housing, an endless mopping belt and a wringer device, of a pair of troughs above said belt at the sides of said device, a reservoir beneath the device, and delivery spouts from said troughs to said reservoir for the purpose described.

2. In a mopping machine, the combination with a housing, an endless mopping belt and a wringer device, of means for gathering dirty water at the sides of the wringer device above the belt, a reservoir below the belt and means for conveying said water from the gathering means to said reservoir.

3. In a mopping machine, the combination with a housing, an endless mopping belt and a resilient wringer device, of resiliently supported means above the belt for gathering water at the sides of the wringer device, a reservoir beneath the belt and means for conveying said water to said reservoir.

4. In a mopping machine, the combination with a housing, an endless mopping belt and a resilient wringer device, of a pair of opposed gathering troughs at the upper surface of the belt to receive water from the wringer device, supporting studs on a part of the housing, perforated straps connecting said troughs and passed over said studs, supporting springs between said housing and straps, a reservoir beneath the wringer device, and conveying spouts at the ends of said troughs adapted to empty into said reservoir.

5. The combination in a mopping machine with its housing and wringer device and a mopping belt, of a pair of gathering troughs resting on the upper face of the belt, perforated straps rigidly connecting said troughs, a cross brace on the housing having a pair of studs passed through said perforated straps, springs between said brace and straps, and means on said studs for adjusting the position of the troughs with respect to said belt.

FRANKLIN A. ESPELAND.