July 27, 1937. N. NELSON 2,088,246

FLOOR WASHING MACHINE

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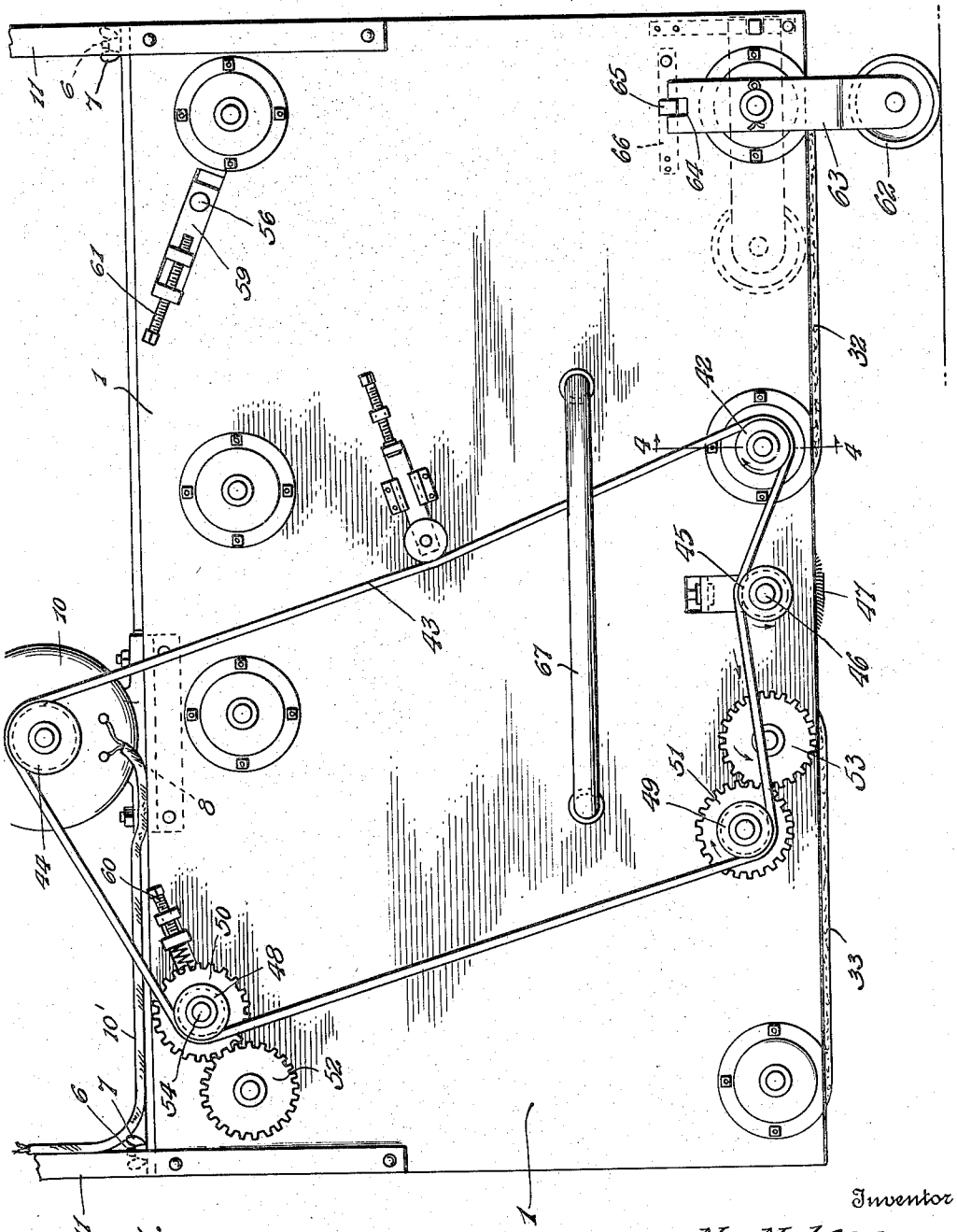


Fig. 1.

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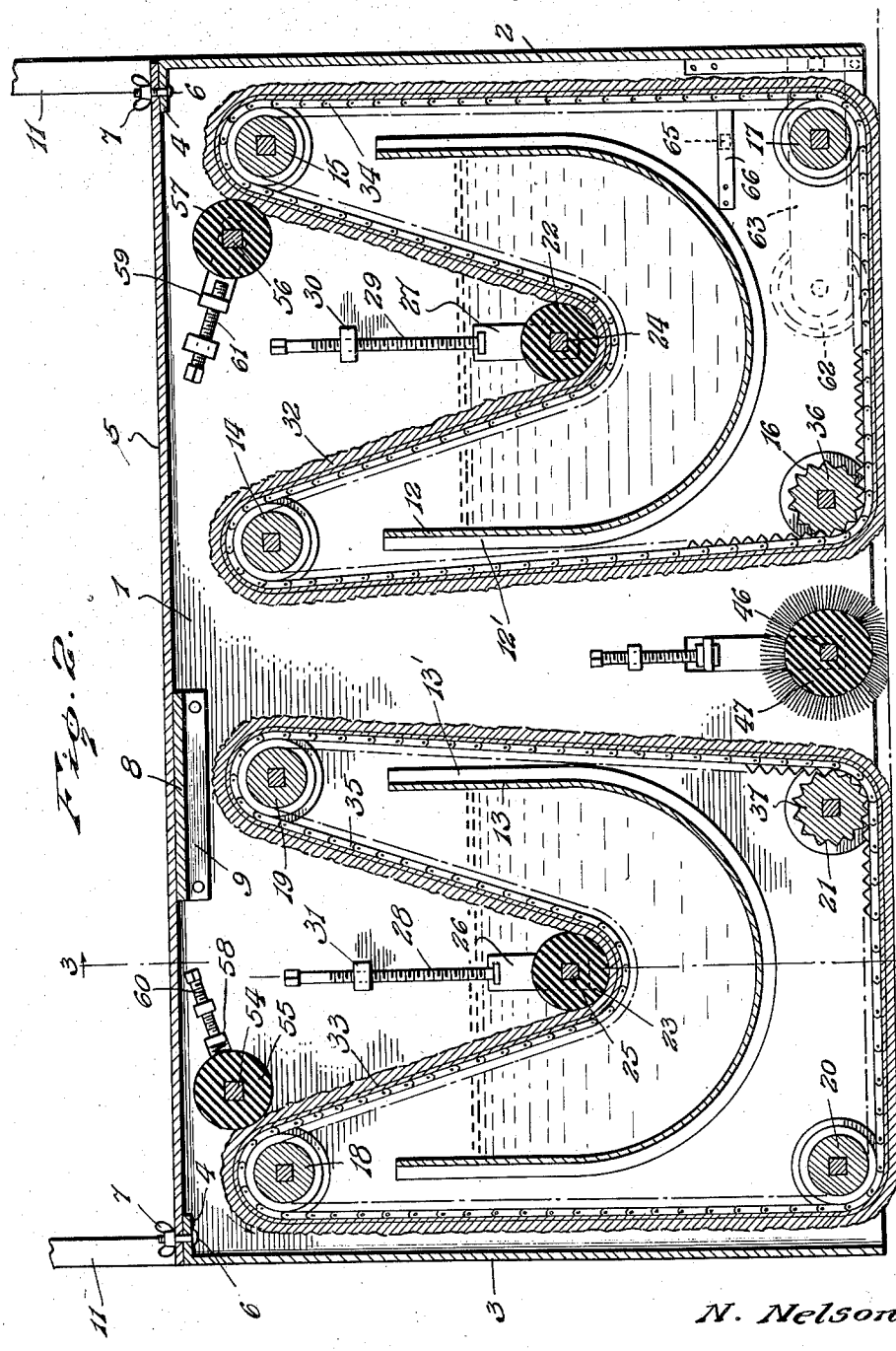


Fig. 2.

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Fig. 3.

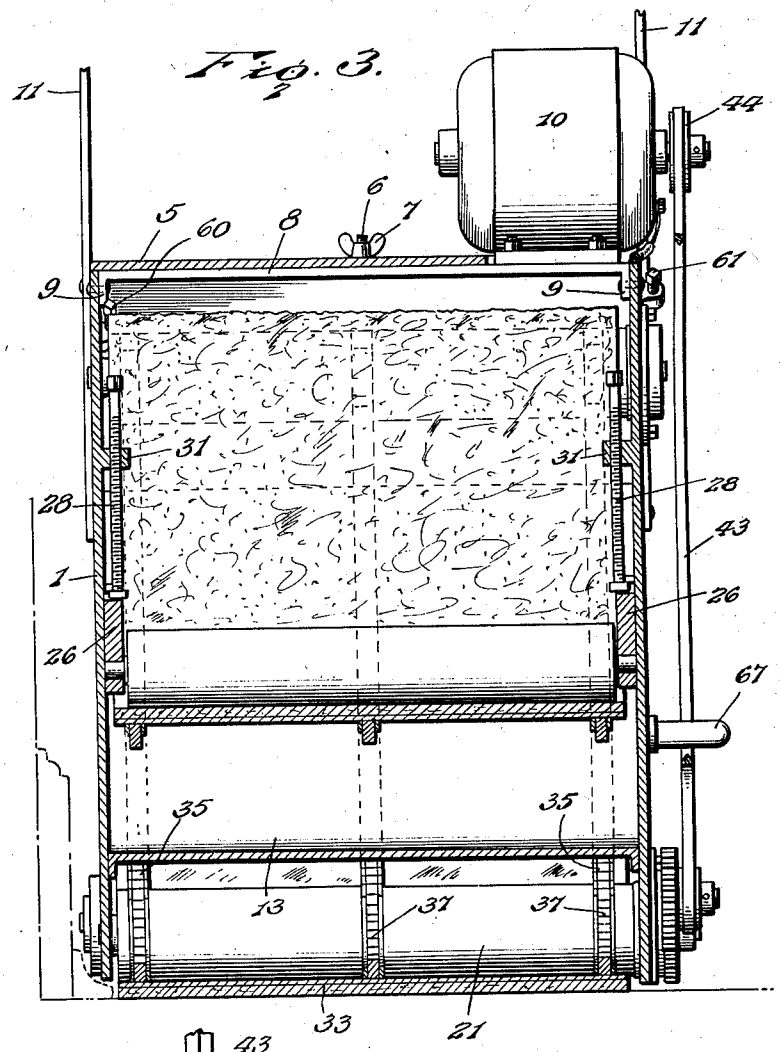
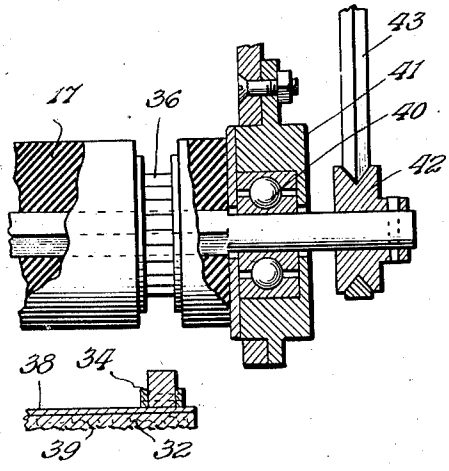


Fig. 4.



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FLOOR WASHING MACHINE

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Application July 31, 1935, Serial No. 34,076

1 Claim. (Cl. 15—51)

This invention relates to an improved floor washing machine, and one object of the invention is to provide a machine of this character which may be very easily propelled across a floor which is to be cleaned and the surface of the floor thoroughly scrubbed and dried during movement of the machine over the same.

Another object of the invention is to so construct the improved machine that as it is moved across a floor, a cleaning fluid will first be applied to the floor, a scrubbing action then take place to thoroughly loosen dirt upon the floor, and the floor then mopped in order to remove the dirt and cleaning fluid.

Another object of the invention is to provide a machine of this character which will be very compact in its construction and will have the applying mechanism, scrubbing mechanism, and mopping mechanism enclosed in a housing which will very effectively prevent walls of a room from being soiled when the floors are being cleaned.

Another object of the invention is to provide improved cleanser applying and removing belts which are so mounted that they will be held under proper tension for efficient operation and further so mounted that as the belts move, certain portions thereof will travel longitudinally of the bottom of the housing in contact with a floor, while other portions will pass through containers, one of which is to be filled with a cleaning fluid and the other serve as a receptacle into which liquid squeezed from the mopping belt will be received.

This invention is illustrated in the accompanying drawings, wherein

Figure 1 is a side elevation of the improved floor cleaning machine.

Figure 2 is a vertical sectional view taken longitudinally through the cleaning machine.

Figure 3 is a sectional view taken transversely through the cleaning machine along the line 3—3 of Figure 2.

Figure 4 is a fragmentary sectional view taken along the line 4—4 of Figure 1.

This improved floor cleaning machine has a housing 1 which may be formed of wood, metal, or any other suitable material but is preferably formed of metal and has upper ends of its front and rear walls 2 and 3 bent inwardly to form supporting flanges 4 upon which a cover 5 rests, the cover being detachably secured by bolts 6 which extend upwardly through the flanges and cover and carry wing nuts 7 upon their projecting upper end portions. The bolts are firmly secured in the openings of the flanges 4 through which they pass so that they will be prevented from dropping downwardly out of place when the securing nuts and the cover are removed. A cross plate or bridge 8 extends transversely across the housing intermediate the length thereof with its ends terminating in depending flanges 9 which are riveted or otherwise firmly secured to side walls of the casing, and upon referring to Figures 1 and 3 it will be seen that this cross plate or bridge serves not only as a support for the cover but also as a mounting for an electric motor 10 disposed above the casing with its base firmly bolted to the cross plate. A portion of the cover is cut out to accommodate the base of the motor and allow the cover to be removed without disturbing the motor. Handles 11 extend upwardly and rearwardly from the side walls of the casing and may have their rear ends connected by a cross bar to be grasped when operating the machine, and referring particularly to Figure 1 it will be seen that a cable 10', by means of which power is supplied to the motor, extends along one of the handles. This cable may be of any length desired in order that it may be plugged into a wall socket of a room.

Within the casing or housing which is open at its bottom, there have been provided containers or receptacles 12 and 13 which are formed of metal or any other desired material and at their sides are formed with flanges 12' and 13' welded or otherwise firmly secured against the side walls of the casing. Rollers 14 and 15 extend transversely through the housing above the receptacle 12 and other rollers 16 and 17 extend through the housing and below this receptacle. There have also been provided similar rollers 18 and 19 above the receptacle 13 and rollers 20 and 21 below the second receptacle. Other rollers 22 and 23 extend between the side walls of the housing within the receptacles and attention is called to the fact that the shafts 24 and 25 of the rollers 22 and 23 are mounted in bearings 26 and 27 carried by threaded stems 28 and 29 disposed vertically and engaged through threaded bearings 30 and 31. By this arrangement, the rollers 22 and 23 may be adjusted vertically and belts 32 and 33 tightened so that they will be tensioned properly and sprocket chains 34 and 35 of the belts held in proper engagement with sprockets 36 and 37 carried by the shafts of certain of the upper and lower rollers. The rollers are preferably formed of rubber and are of sectional formation with the sprockets between adjoining ends of the sections, and referring to Figure 4 it will be seen that the sections of the rollers

are of greater diameter than the sprocket wheels so that the sprocket chains may be disposed between the confronting ends of the roller sections with the belts in flat contacting engagement with the rollers, as shown clearly in Figure 3. Each of the belts or aprons, as they may be referred to, consists of a wide strip or sheet **38** formed of rubberized fabric or other material which will be water-proof, and a facing **39** which may be formed of thick absorbent fabric or any other suitable material which will absorb liquid. Therefore, the portions of the two belts or aprons which move longitudinally of the housing at the open bottom thereof, may have rubbing contact with a floor in order to apply a cleaning liquid or mop up this liquid after the floor has been scrubbed. End portions of the shafts of the various rollers are engaged through bearings **40** carried by blocks **41** which are detachably secured in openings formed in the side walls of the housing, and referring to Figure 4 it will be seen that the blocks and the openings in which they are secured are of greater diameter than the rollers in order that the rollers may be withdrawn when the blocks at one side of the machine are removed. The blocks at one side of the housing may be permanently secured, if so desired, as the blocks serve as thrust bearings and the shafts of the rollers only project from the blocks at the opposite side of the housing, this arrangement being provided in order that the side carrying the thrust bearings may be disposed close to a wall of a room without danger of the bearings or shafts scratching the wall during a cleaning operation.

The outer end of the shaft of the roller **16** carries a pulley **42** for engagement by a drive belt **43** which is trained about a pulley **44** carried by the shaft of the motor **10**. This belt also engages a pulley **45** at the outer end of the shaft **46** of a rotary brush **47** which extends transversely of the housing between the two belts or aprons, as shown in Figure 2, and upon referring to Figure 1 it will be seen that, in addition, the drive belt also has portions engaging pulleys **48** and **49** carried by idler gears **50** and **51** which mesh with gears **52** and **53** carried by the shafts of the rollers **18** and **21**. By this arrangement, rotary motion may be imparted to both of the aprons but they will travel in opposite directions and the lower flights of the two aprons will both have movement in a direction toward the rotary brush **47**. The shaft **54** which carries the pulley **48** extends transversely through the housing in spaced parallel relation to the roller **18** and carries a roller **55** which bears against the drier belt or apron **33** and a similar shaft **56** carrying a roller **57** extends through the housing adjacent the roller **15** to bear against the belt or apron **32**. The shafts **54** and **56** are slidable in slots formed diagonally through the side walls of the housing and are engaged by bearing brackets **58** and **59** which are shiftable toward and away from the rollers **18** and **15** and are engaged by screws **60** and **61** which serve to hold the bearings in adjusted position. By this arrangement, the rollers **55** and **56** may be disposed in predetermined relation to the rollers **18** and **15** and apply such pressure to the belts that liquid may be pressed from the belts. Therefore, the applying belt **32** will be prevented from carrying too much washing liquid to the floor and liquid taken up by the drier belt after the floor has been scrubbed by the brush **47** will be thoroughly removed from this belt and the drier belt brought into engagement with the floor in a sufficiently dry state to very effectively absorb moisture and remove dirt from the floor. The bearings and adjusting screws at one side of the housing are disposed externally, as shown in Figure 1, whereas the bearings and adjusting screws for the opposite ends of the shafts **51** and **57** are disposed within the housing, as shown in Figure 2. This arrangement is also clearly shown in Figure 3 where the adjusting screw **60** is shown within the housing close to the inner face of one side wall thereof and the adjusting screw **61** is shown externally of the other side wall.

When this improved machine is in use, cleaning liquid is poured into the container **12** and its level in the two tanks equalized by flowing through the pipe **67**. This may be a chemical compound or water having a cleaning liquid mixed therewith. The motor **10** is started and rotary motion is transmitted from the motor through the belt in order to rotate the rollers carrying the pulleys with which the belt is engaged. This will cause the belts to be moved with their lower flights, which project through the open bottom of the housing, traveling toward the rotary brush. By pushing upon the handle, the machine may be propelled along a floor and as it moves, the belt or apron **32** will deposit the cleaning liquid upon the floor in advance of the brush. A certain amount of rubbing action will take place as the lower flight of the belt **32** moves along the floor and the rotary brush will then thoroughly scrub the floor. After the floor has been scrubbed by the brush **47**, the lower flight of the belt or apron **33** moves into position to pass over the scrubbed floor and its facing of absorbent material will remove the liquid and loosen dirt from the floor. Liquid in the receptacle **13** acts as a rinsing bath and as the apron **33** passes between the roller **18** and the roller **55** before passing downwardly at the rear of the machine, dirt and liquid absorbed by this apron will be expelled and will drip down into the receptacle **13**. By regulating pressure of the rollers **55** and **56**, the amount of liquid applied to the floor by the apron or belt **32** may be regulated and also the dirty liquid may be thoroughly expelled from the apron **33**. In order to empty the containers, the cover may be removed and the device tilted to one side in order to allow the liquid to flow out. If the device is to be used for polishing a floor instead of cleaning it, liquid wax or any other desired polishing fluid may be placed in the container **12** and applied to the floor by the belt or apron **32**, the rotary brush **47** then serving as a buffing device and the belt or apron **33** as a polishing element. It is desired to permit the machine to be easily transported from one place to another and, therefore, there has been shown casters or floor engaging wheels **62** which are carried by metal strips or standards **63** pivoted at the front of the housing upon outer ends of the shaft of the roller **17** and each having one end formed with a notch or recess **64** to receive a lug **65** carried by a spring strip **66**. The spring strips **66** are secured against the side walls of the housing with the lug **65** projecting outwardly through openings formed in the side walls into position to engage in the notches **64** of the strips **63**, and by applying pressure to these lugs, they may be forced inwardly and allow the strips or standards **63** to be swung from the vertical position shown in Figure 1 to the horizontal position indicated by dotted lines in Figure 1. It will thus be seen that when the machine is in use, the standards

may be swung upwardly to a horizontal position where the wheels will be out of contact with the floor and permit the belts to rest directly on the floor, whereas when the machine is to be transported from one place to another, the standards may be swung to a vertical position to dispose the wheels in engagement with the floor and thus permit the machine to be easily moved. While the standards and wheels have only been shown at the front of the machine, it will be obvious that similar standards and floor engaging wheels may be provided at the rear of the machine and mounted upon the shaft of the roller **20**.

Having thus described the invention, what is claimed as new is:

A machine of the character described comprising a housing open at its bottom, a removable cover for the upper end of the housing, a bridge carried by side walls of the housing and extending transversely of the housing intermediate ends thereof and under the cover in supporting engagement with the cover, a portion of the cover above the bridge being removed to expose an end portion of the bridge, a motor mounted upon the exposed portion of said bridge and extending upwardly from the bridge above the cover, cleaning means movably mounted in said housing and having a portion exposed through the open bottom of the housing for engagement with a floor, and means for transmitting motion from the motor to the cleaning means.

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