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3,150,394

BASEBOARD SCRUBBING MACHINE

Filed Aug. 21, 1962

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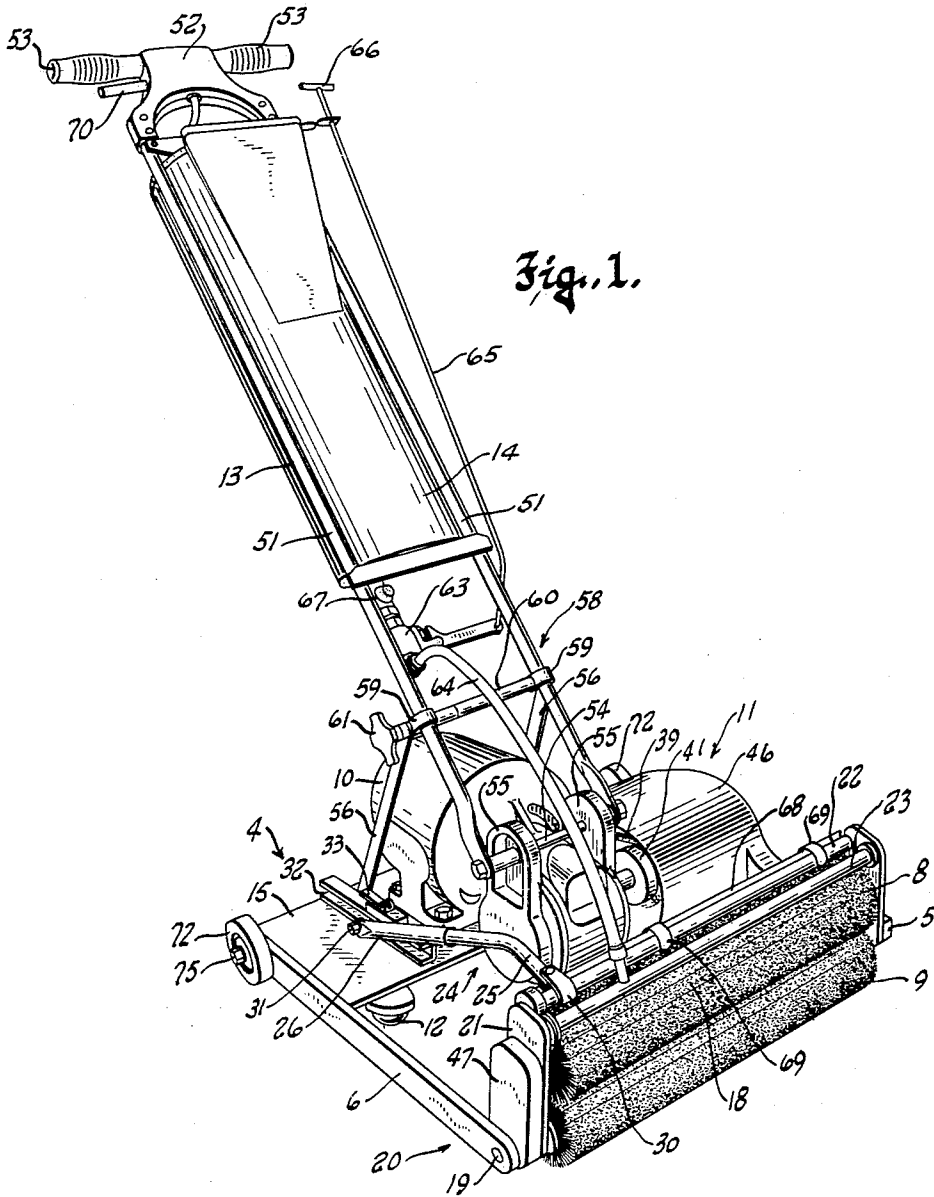


Fig. 1.

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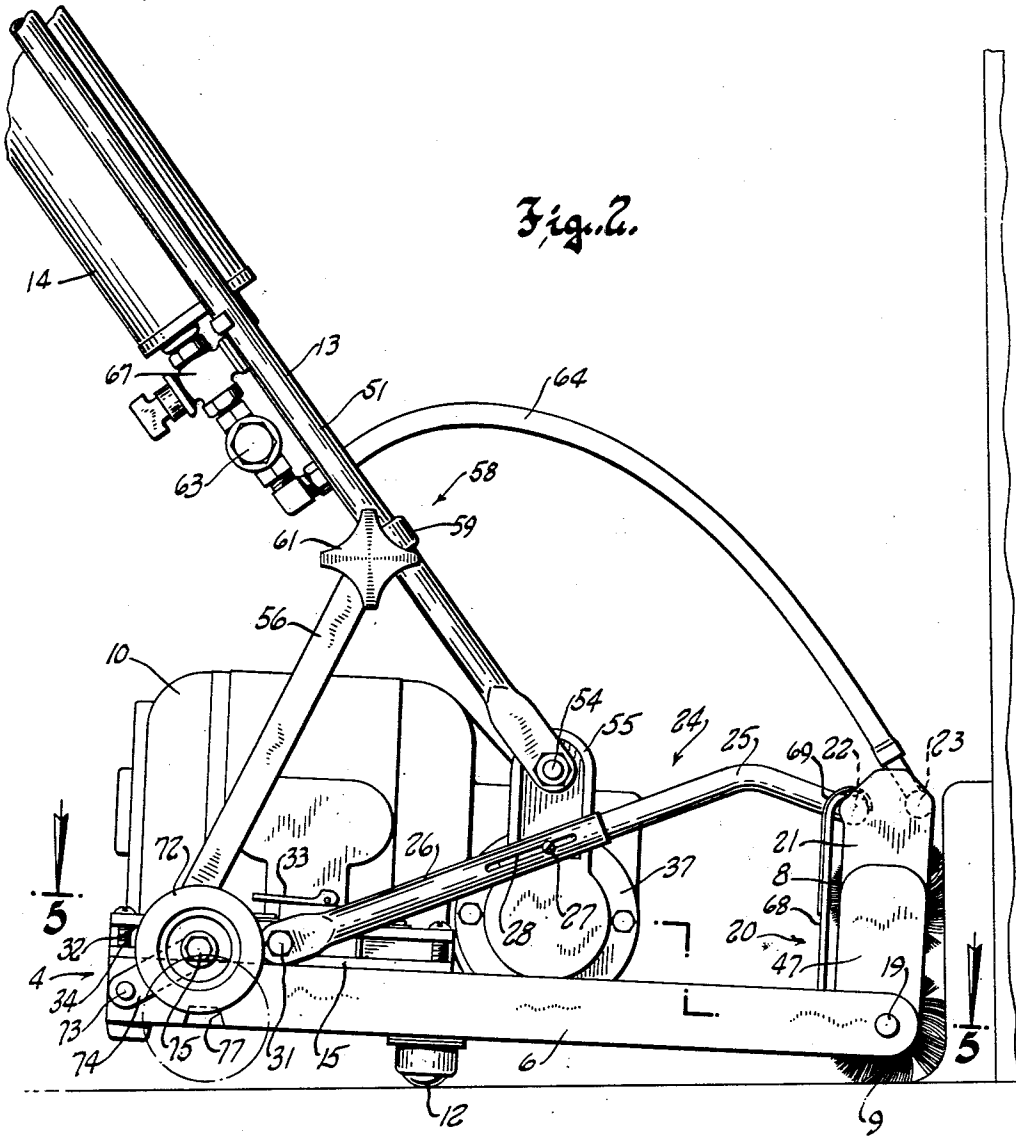


Fig. 2.

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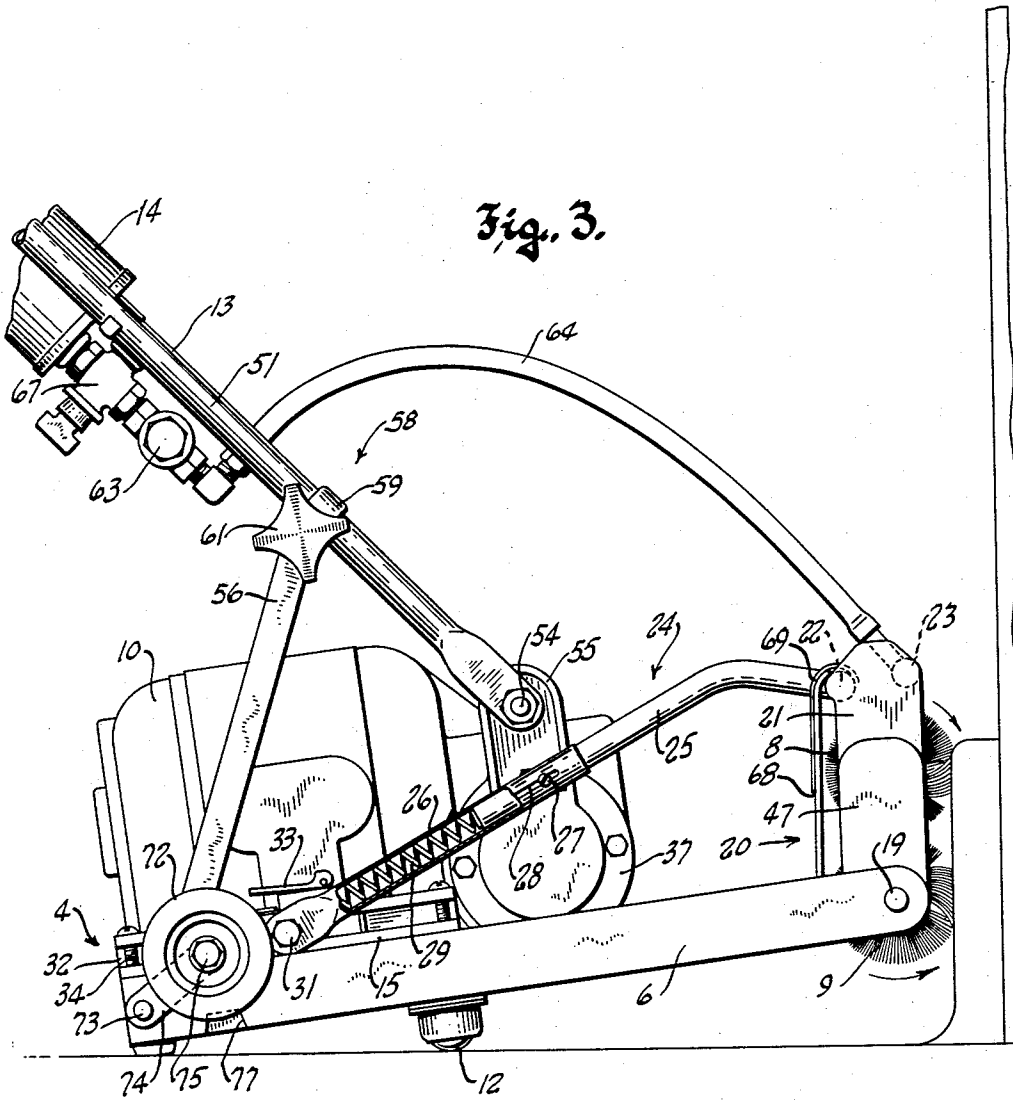
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BASEBOARD SCRUBBING MACHINE

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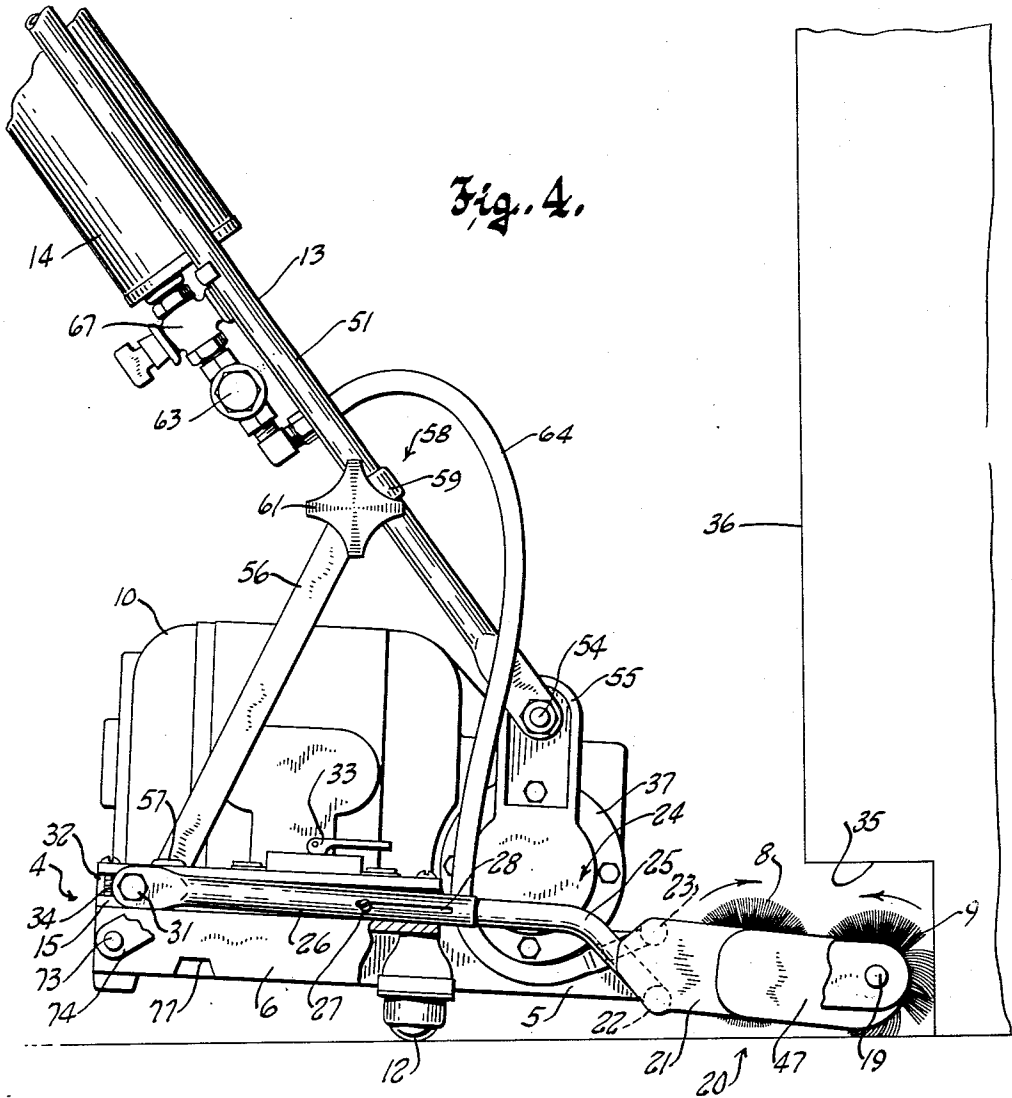
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BASEBOARD SCRUBBING MACHINE

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5 Sheets-Sheet 4



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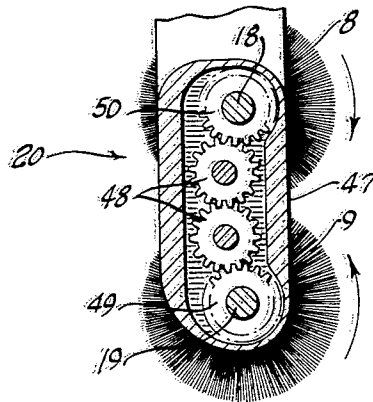
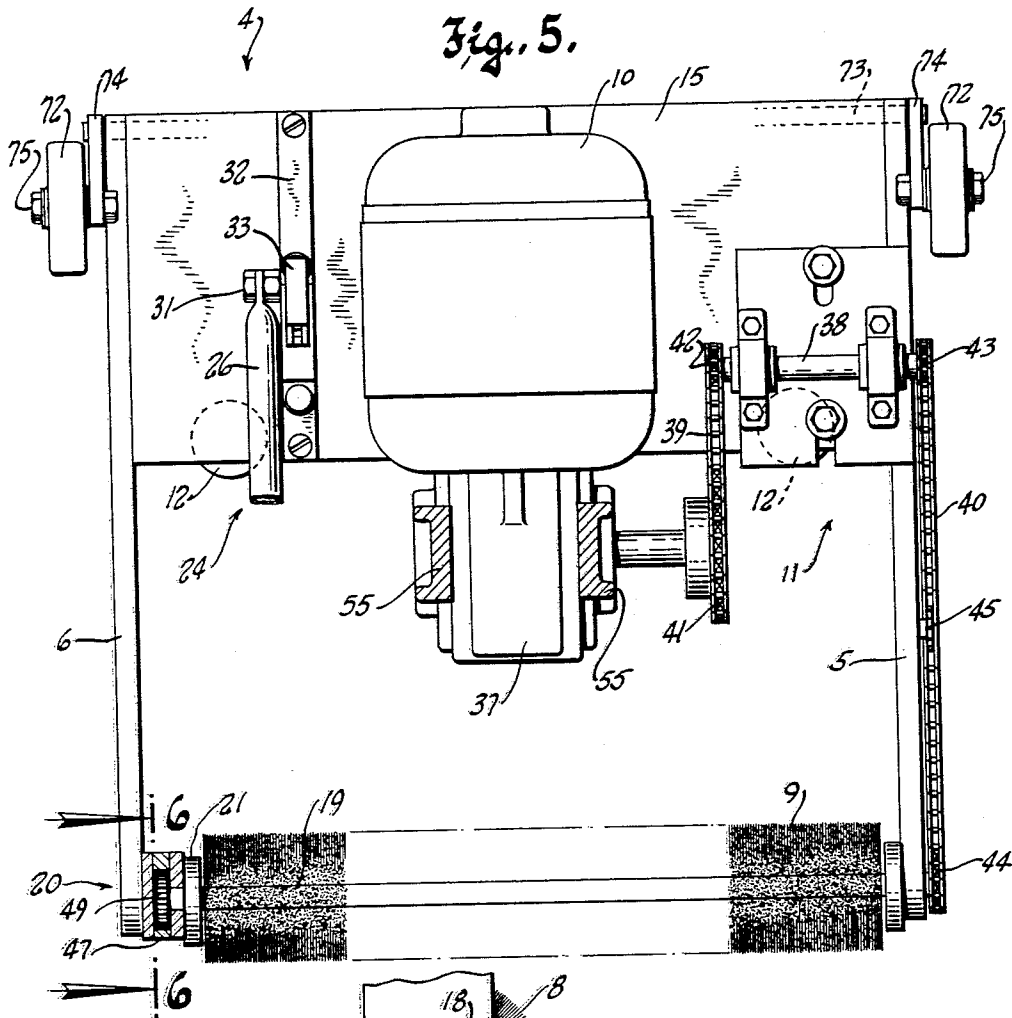
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BASEBOARD SCRUBBING MACHINE

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5 Sheets-Sheet 5



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**BASEBOARD SCRUBBING MACHINE**  
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 Filed Aug. 21, 1962, Ser. No. 218,415  
 7 Claims. (Cl. 15-50)

This invention relates to cleaning machines, and refers more particularly to a machine for scrubbing upright cove or baseboard surfaces adjacent to floors.

In hospitals and similar institutions having large floor areas that must be regularly scrubbed, floor cleaning is often performed with the aid of a machine that deposits water or other cleaning liquid on the floor, scrubs the floor with a rotary brush, and picks up the dirty wash water. A certain amount of splashing is inevitable with such machines, and when they are used near baseboards or other upright surfaces at the edges of the floor area some of the dirty water splashed by the machine strikes such upright surfaces. Even hand mopping tends to cause a certain amount of dirty water to be splashed onto the coves or baseboards. In either event, when the cove or baseboard dries, the dirt in the splashed water is left behind, creating both an unsightly appearance and an unsanitary condition which nullifies to some extent the results obtained by scrubbing the floors. Neither a floor scrubbing machine nor a mop can be effective to remove such splashed water from the coves or baseboards.

Since a hospital or similar institution can have baseboard area that is literally measurable in miles of length, cleaning such upright surfaces presents a serious problem. While hand tools are available for this task, they require manual effort which is difficult and tedious, and by contrast with the relatively fast action of a floor scrubbing machine the use of such hand tools is very time consuming.

With the foregoing in mind, it is the general object of this invention to provide a machine for cleaning coves or baseboard surfaces adjacent to a floor, whereby such cleaning can be quickly and easily performed without danger of splashing dirty water onto wall surfaces above the cove or baseboard being cleaned.

Another object of this invention is to provide a simple, rugged and efficient machine for cleaning coves and baseboards and which is also adaptable for cleaning recesses under cabinets and the like.

A more specific object of this invention is to provide a machine of the character described having a pair of rotary brushes mounted in side-by-side relation with their axes horizontal and parallel to one another, and wherein the brushes can be very quickly and easily changed from a cove cleaning arrangement, in which they have their axes in a common substantially vertical plane, to a recess cleaning arrangement, in which their axes are in a common substantially horizontal plane, without disrupting or requiring adjustment of a transmission between the brushes and a motor on the machine by which they are rotatably driven.

Another specific object of this invention is to provide a machine of the character described having a tank for water or other cleaning liquid and having a pair of coaxially swingable brush holder elements at opposite sides of a frame, connected by an elongated member which constrains the brush holder elements to swing in unison and which also serves as a distributor through which liquid from the tank can be discharged onto a brush carried by the brush holder elements.

It is also a specific object of this invention to provide a cleaning machine of the character described having a pair of rotary cylindrical brushes, mounted on a frame in side-by-side relation with their axes parallel to one

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side of the frame, wherein one of said brushes is carried on a brush holder mounted on the frame for swinging movement about an axis parallel to that of the brushes, to carry said one brush in arcuate translatory motion relative to the other, and which machine has means thereon adjustably connected between the frame and the brush holder to maintain the brush holder in either a recess cleaning position, in which said one brush has its axis in a common substantially horizontal plane with that of the other, or in a cove cleaning position, in which said one brush is substantially above the other but is yieldable rearwardly to a limited extent to insure that both brushes will maintain good scrubbing engagement with an upright surface to be cleaned.

A further specific object of this invention is to provide a machine of the character described having a carriage upon which are mounted rotary brush means and power means for rotating the brushes, and wherein the carriage is supported on roller means, specifically ball casters, which support the carriage for free movement across the floor in all directions and which are so spaced from the brushes that the carriage can be tilted or rocked about the casters to impart substantially translatory up and down motion to the brushes whereby they can be engaged with all portions along the height of a baseboard to be cleaned, while providing for movement of the machine along the length of a baseboard.

In this connection it is still another specific object of this invention to provide a machine of the character described, having a carriage with the ball casters described in the preceding statement of objects, and also having wheels mounted on the carriage for adjustment between a floor engaging or transit position in which the wheels alone or in cooperation with the casters support the carriage for movement over a floor, and a retracted position in which the wheels do not interfere with tilting or rocking of the carriage about the casters.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

FIGURE 1 is a front perspective view of a cove cleaning machine embodying the principles of this invention;

FIGURE 2 is a side elevation of the lower portion of the machine;

FIGURE 3 is a view generally similar to FIGURE 2 but with a portion thereof cut away and the machine rocked to a position in which the brushes can have scrubbing engagement with the upper portion of a cove or baseboard;

FIGURE 4 is a view generally similar to FIGURE 2, also with a portion cut away, but with the machine adjusted for cleaning in a low recess;

FIGURE 5 is a view generally in section on the plane of the line 5-5 in FIGURE 2; and

FIGURE 6 is a fragmentary sectional view taken on the plane of the line 6-6 in FIGURE 5.

Referring now more particularly to the accompanying drawings, the machine of this invention comprises, in general, a frame or carriage 4 having a pair of forwardly extending arms 5 and 6 at its opposite sides which at their front ends support between them a pair of generally cyl-

indrical rotary brushes 8 and 9 that are disposed with their axes horizontal, parallel to one another, and transverse to the arms.

The frame or carriage also supports an electric motor 10 and transmission means 11 by which the motor is drivingly connected with the brushes to rotate them in opposite directions about their respective axes. At its underside the carriage has roller means, specifically ball casters 12, which support it for motion in all directions across a floor and fulcrum it for rocking motion by which the brushes are carried up and down. A rearwardly and upwardly extending handle 13 on the carriage permits it to be easily moved horizontally and rocked upon the casters, and the handle also supports a tank or reservoir 14 for cleaning liquid that can be released onto the brushes at the will of an operator.

More specifically, the frame or carriage 4 is generally U-shaped, with a substantially wide and deep bight portion 15 upon which the motor 10 is mounted and which can comprise a rectangular metal plate. The arms 5 and 6, which can comprise beams extending the length of the carriage, project a substantial distance forwardly from the bight portion 15.

The shaft 19 of one of the brushes 9 is rotatably journaled in the front end portions of the arms 5 and 6. The other brush 8 is carried on a brush holder assembly 20 comprising short legs or brush carrying members 21 which are pivoted for swinging motion on the shaft 19 of brush 9 and which are inwardly adjacent to the arms 5 and 6. The legs 21 are constrained to swing in unison about the shaft 19 by a pair of elongated transverse connecting members 22 and 23, the opposite ends of which are connected to the legs and which, of course, extend parallel to the brush axes and are located at the opposite side of brush 8 from brush 9.

The shaft 18 of brush 8 is rotatably journaled in the legs 21 of the brush holder assembly, and said brush is therefore bodily movable in an arc about the axis of brush 9, between a cove cleaning position, shown in FIGURES 1-3, in which the axis of brush 8 is substantially directly above that of the brush 9, and a recess cleaning position, illustrated in FIGURE 4, in which brush 8 is directly behind brush 9.

The brush holder assembly is releasably held in each of its positions of swinging adjustment by means of a positioning arm 24 connected between the bight portion 15 of the carriage and one of the transverse connecting members 22 of the brush holder assembly. The positioning arm comprises a pair of telescoped tubular members 25 and 26 which are restricted to limited lengthwise motion relative to one another by means of a screw 27 or the like engaged in the inner telescoped member 25 and projecting radially through a lengthwise elongated slot 28 in the outer member. The two telescoped members are yieldingly biased lengthwise relative to one another, toward an extended position, by means of a compression spring 29 confined in the outer tubular member 26 and reacting between it and the axially inner end of the inner tubular member 25.

By means of a strap 30 or the like on its front end, the positioning arm 24 is pivotally secured to the transverse connecting member 22 of the brush holder assembly in such a manner that it and the brush carrying members 21 can swing relative to one another. At its rear end the positioning arm has a slidable and pivoting connection 31 with a fore-and-aft extending track 32 on the bight portion 15 of the carriage, at one side of the motor 10. On the track 32 is a manually releasable catch 33 which is engageable with the connection 31 to releasably lock the rear end of the positioning arm in a forward position wherein the positioning arm holds the brush carrying members 21 upright, thus disposing the brush 8 in its cove cleaning position, above the brush 9. Preferably the axis of the brush 8 is then located somewhat forward of a vertical plane through the axis of the brush 9, but because

of the spring 29 that reacts between the telescoped members 25 and 26, the brush holder assembly can have a limited degree of yielding rearward motion as the brushes are brought against a baseboard or other upright surface upon movement of the carriage toward the same, thus assuring that both brushes will maintain good scrubbing engagement with such a surface as the machine is rocked upon the casters 12.

When the catch 33 is released, the connection 31 slides rearwardly along the track 32 until it engages a stop 34 at the rear end of the track. As the positioning arm thus moves bodily rearwardly, it and the brush carrying members swing downwardly toward a position of horizontal alignment, but the stop 34 is reached before they fully attain that position. However, the spring 29 provides for an overcenter toggle action during an additional few degrees of swing of the positioning arm and the brush holder assembly to the recess cleaning position of the latter, illustrated in FIGURE 4. Thus the brushes can be releasably locked with their axes in a common substantially horizontal plane, so that they can be readily inserted into a recess 35 defined by the overhanging front portion of a cabinet 36 or the like.

The transmission means 11 through which the brushes 8 and 9 are rotatably driven by the motor 10 can comprise a geared speed reducer 37 of a known type, which is directly attached to the motor. The transmission also includes a laterally extending idler shaft 38 mounted on the bight portion 15 of the frame, at the side of the motor opposite the track 32, and a pair of chains 39 and 40, one chain 39 being trained over a drive sprocket 41 on the speed reducer and a driven sprocket 42 on the inboard end of the idler shaft 38, and the other chain 40 being trained over a driving sprocket 43 on the outboard end of the idler sprocket and a driven sprocket 44 on the shaft 19 of the brush 9. The chain 40, which is substantially longer than the chain 39, extends along the outboard side of carriage arm 5, and an idler sprocket 45 may be mounted on said arm, midway along the stretch of the chain, to provide support and guidance for the chain. A suitable guard 46 can be provided to cover the chains 39 and 40, the sprockets around which they are trained, and the idler shaft.

Between the carriage arm 6 and its adjacent brush carrying member 21 there is a gear box 47 which is attached to the brush carrying member to swing therewith and which provides for rotatably driving the brush 8 in the direction of rotation opposite to that of brush 9. The gear box (see FIGURE 6) comprises a pair of meshing idler gears 48, one of which is meshingly engaged with a driving gear 49 on the shaft 19 of brush 9, and the other of which meshes with a driven gear 50 on the shaft 18 of brush 8. Because the brush carrying members swing about the shaft 19 of brush 9, which shaft is driven by the chain 40, swinging movement of the brush holder assembly between its cove cleaning and its recess cleaning positions does not disrupt or interfere with the driving connection between the brushes and the motor.

The ball casters 12 are mounted near the front edge of the bight portion 15 of the frame, each being located near one of the side edges thereof. The casters cooperate to provide a fulcrum about which the carriage can be bodily rocked by means of the handle 13 to carry the brushes in substantially translatory up and down motion, so that when the brushes are in their cove cleaning (FIGURES 1-3) positions, the operator of the machine can engage them with all portions of a baseboard along the height thereof. Because of the weight of the motor and handle behind the casters, the machine tends to rock back to the position shown in FIGURE 3, with the rear of the carriage resting on the floor. However, the casters are close enough to the center of gravity of the machine so that only very slight lifting force need be exerted upon the handle to rock the machine forward.

The handle 13, which is used to push the machine sideways along the length of a baseboard, as well as to rock it,

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comprises a pair of laterally adjacent parallel tubes 51 connected at their upper ends by a yoke 52 on which are fixed laterally oppositely projecting hand grips 53. At their lower ends the tubular handle members 51 are swingably connected to the carriage, as by means of a rod 54 that extends parallel to the brush axes through upright brackets 55 on the speed reducer and through the handle members. The handle is adjustably held at any desired inclination to the carriage by means of a pair of struts 56 which are connected between it and the carriage. At their lower ends the struts are pivotally secured to small brackets 57 on the bight portion 15 of the frame, spaced to opposite sides of the motor, and their upper ends are pivotally connected to a yoke 58 comprising a pair of clamping collars 59 connected by a transverse member 60. Each of the collars 59 embraces one of the tubular handle members 51, and a clamping screw 61 or the like provides for tightening of the collars upon the handle members, to hold the yoke 58 in any desired position of adjustment along the tubular members. The position of the yoke of course defines the angle at which the handle extends rearwardly and upwardly from the carriage.

Mounted on the handle, above the yoke 58, is the tank 14 for water or other cleaning liquid. Through a valve 63 at its bottom and a flexible duct 64 connected with said valve, the tank is communicated with the front connecting member 23 of the brush holder assembly, which is tubular and provides a distributor having a series of small outlet ports at spaced intervals along its length, opening from its side adjacent to the brush 8. The valve 63 is biased to a normally closed position but a pull rod 65 extends upwardly along the handle from it and terminates at its upper end in a small T-handle 66, adjacent to one of the hand grips 53, by which an operator can open the valve at any time without removing his hand from the hand grips. Since the valve 63 might in time develop a tendency not to seal securely, a second valve 67 of another type can be connected in series with it, to be closed when the machine is not in use and insure that fluid will not leak out of the distributor 23 at such times.

The brushes are driven in such directions of rotation that the brush 8 revolves forwardly and downwardly when in its cove cleaning position, and hence it carries cleaning liquid from the distributor 23 directly to a baseboard being cleaned. Since brush 9 rotates in the opposite direction, it maintains such cleaning liquid in contact with the baseboard as long as possible, but water thrown upward by it is not permitted to strike a wall or other upright surface above a baseboard being cleaned because the upper brush 8 intercepts such water and drives it back down along the baseboard.

To prevent water from being thrown rearwardly onto the carriage and the operator, a curtain or fender 68 of heavy rubber or the like can be pendently suspended behind the brushes by means of hooks 69 on the top of the fender engaged over the transverse connecting member 22 of the brush holder assembly. The fender must of course be removed when the machine is used with the brushes in their recess cleaning positions (FIGURE 4), but this is readily done because of the manner of its attachment.

A switch 70 for the electric motor can be mounted adjacent to the hand grip opposite the T-handle 66, thus enabling an operator to have complete control of the machine without removing his hands from the grips.

To permit the machine to be easily pushed from place to place when it is not in actual use, it is equipped with a pair of retractable wheels 72 located at the rear of the carriage. The wheel mounting comprises a transverse shaft 73 which is rotatably journaled in the rear end portions of the beams comprising the arms 5 and 6 and which projects laterally beyond the sides of the frame. Short struts 74 are affixed to the projecting end portions of the shaft 73 to swing in unison about the shaft axis, and each

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carries at its free end a short shaft 75 that projects laterally both inwardly and outwardly from the strut. Each of the wheels 72 is journaled on the outwardly projecting portion of one of the shafts 75. The struts can be swung between a retracted position, shown in full lines in FIGURE 2, and a transport position shown in broken lines. In the retracted position of the struts the inwardly projecting portions of the shafts 75 rest on top of the frame, holding the wheels at a level above the bottom of the frame and out of engagement with the floor so that they do not interfere with rocking of the machine about the casters 12. In the transport position of the struts the inwardly projecting portions of the shafts 75 engage the undersides of the frame. Preferably there are small downwardly opening notches 77 in the frame in which these shafts are received to insure that the rear end of the frame will be carried low enough to keep the brush 9 off of the floor, so that it will not interfere with movement of the machine.

The transverse shaft 73 on which the wheel struts 74 are swingably carried must of course be located close enough to the rear of the frame to allow the inwardly projecting portions of the shafts 75 to clear the rear of the frame as the struts are swung from one of their positions to the other. Because the center of gravity of the machine is rearward of the casters, the machine will of course rest on the wheels when they are in their transport position.

From the foregoing description taken together with the accompanying drawings it will be apparent that this invention provides a simple, efficient and easily operated machine for cleaning coves, baseboards and similar upright surfaces adjacent to a floor and for cleaning recesses beneath the overhanging fronts of cabinets and the like.

What is claimed as my invention is:

1. In a machine for cleaning vertical surfaces adjacent to a floor:

- (A) a frame;
- (B) a pair of elongated substantially cylindrical brushes, each adapted to be rotated about its axis;
- (C) means on the frame rotatably mounting one of the brushes at the front of the frame with its axis horizontal and extending transversely of the frame;
- (D) supporting means on the frame rotatably mounting the other brush at the front of the frame substantially in vertically superimposed relationship to the first designated brush and with its axis parallel to that of the first designated brush, said supporting means providing for limited back and forth translatory motion of said other brush between defined limits;
- (E) biasing means reacting between the frame and said supporting means to yieldingly urge said other brush to its forward limit of motion;
- (F) power means on the frame for rotatably driving the brushes in opposite directions such that the front sides of the brushes move toward one another;
- (G) roller means on the underside of the frame mounting it for horizontal movement in directions parallel to the brush axes, said roller means being spaced from the front of the frame and located on a line substantially parallel to the axes of the brushes to fulcrum the frame for bodily fore-and-aft rocking by which substantially translatory up and down motion is imparted to the brushes; and
- (H) a handle on the frame by which an operator can move the machine horizontally and rock it about the roller means.

2. The machine of claim 1, further characterized by:

- (A) a tank carried by the frame for holding a supply of cleaning liquid; and
- (B) distributor means connected with said tank for releasing cleaning liquid from the tank at zones adjacent to one of the brushes and spaced along its length.



3. The machine of claim 1, further characterized by:
- (A) a pair of wheels; and
- (B) means on the frame mounting the wheels for free rotation and for bodily motion between
- (1) a floor engaging transport position in which the wheels project below the frame, at the opposite side of the center of gravity of the machine from the roller means, to cooperate with the roller means in supporting the machine for motion from place to place, and
- (2) to a retracted position in which the wheels are spaced above the bottom of the frame so as not to interfere with bodily rocking of the machine about the roller means.
4. In a cleaning machine of the character described:
- (A) a carriage having a pair of forwardly extending arms, one at each side of the carriage;
- (B) a pair of substantially cylindrical brushes, each adapted to be rotated about its axis;
- (C) means rotatably mounting the brushes on the carriage, between the front end portions of the arms, with the axes of the brushes horizontal and transverse to the arms and with the brushes laterally adjacent to one another, said means comprising a brush holder having
- (1) a pair of brush carrying members, one pivotally mounted near the front of each arm, said brush carrying members being swingable about a common horizontal axis transverse to the arms and carrying one of the brushes for translatory motion about said axis, and
- (2) an elongated element connected with the brush carrying members to constrain them to swing in unison;
- (D) means connected between the brush holder and the carriage for maintaining the brush holder in a predetermined position of swinging motion of the brush carrying members in which the brushes have their axes in a common substantially vertical plane, but providing for limited yielding movement of the brush holder out of said position;
- (E) power means on the carriage;
- (F) transmission means drivingly connecting the power means with the brushes to rotate them about their axes;
- (G) roller means on the carriage, spaced behind the front ends of the arms, supporting the carriage for horizontal motion in all directions and fulcruming the carriage for bodily rocking motion by which the brushes are carried up and down in substantially translatory motion; and
- (H) a handle on the carriage by which the machine can be guided and manually propelled for horizontal movement on the roller means and can be rocked about the roller means.
5. The cleaning machine of claim 4, further characterized by the fact that said means for maintaining the brush holder in said predetermined position comprises:
- (A) a pair of elongated members;

- (B) means connecting said elongated members with one another for limited endwise relative motion;
- (C) a spring reacting between said elongated members to bias them toward one limit of their endwise relative motion;
- (D) means connecting one of said elongated members with the carriage;
- (E) means connecting the other of said elongated members with the carriage;
- (F) one of said connecting means being adjustable to provide for selectively maintaining the brush holder either in said predetermined position or in a recess cleaning position in which the axes of the brushes are disposed in a common substantially horizontal plane.
6. The machine of claim 4, further characterized by the following:
- (A) the handle is elongated and is inclined upwardly and rearwardly away from the brushes;
- (B) a reservoir for cleaning liquid is mounted on the handle;
- (C) said elongated element connecting the brush holders comprises a tube extending parallel to the brush axes and having apertures at spaced intervals along its length, at the side of the tube adjacent to the brushes, through which liquid in the tube can be expelled onto one of the brushes; and
- (D) a duct communicates the reservoir with said tube.
7. The machine of claim 4, further characterized by the following:
- (A) each of the brushes has a coaxial shaft;
- (B) the shaft of one brush is rotatably journaled in said arms on the carriage;
- (C) the brush carrying members are swingably mounted in the shaft of said one brush, near the ends thereof;
- (D) the other brush has the opposite end portions of its shaft rotatably journaled to the brush carrying members; and
- (E) the transmission means comprises
- (1) a driven member on the shaft of the first designated brush connected with a driving member on the power means, and
- (2) means drivingly connecting the shaft of the first designated brush with that of said other brush.

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