Feb. 14, 1967 W. E. SCHNEIDER 3,303,524

VERTICALLY ADJUSTABLE CRADLE FOR A SURFACE BRUSHING MACHINE

Filed Jan. 27, 1965 2 Sheets-Sheet 1

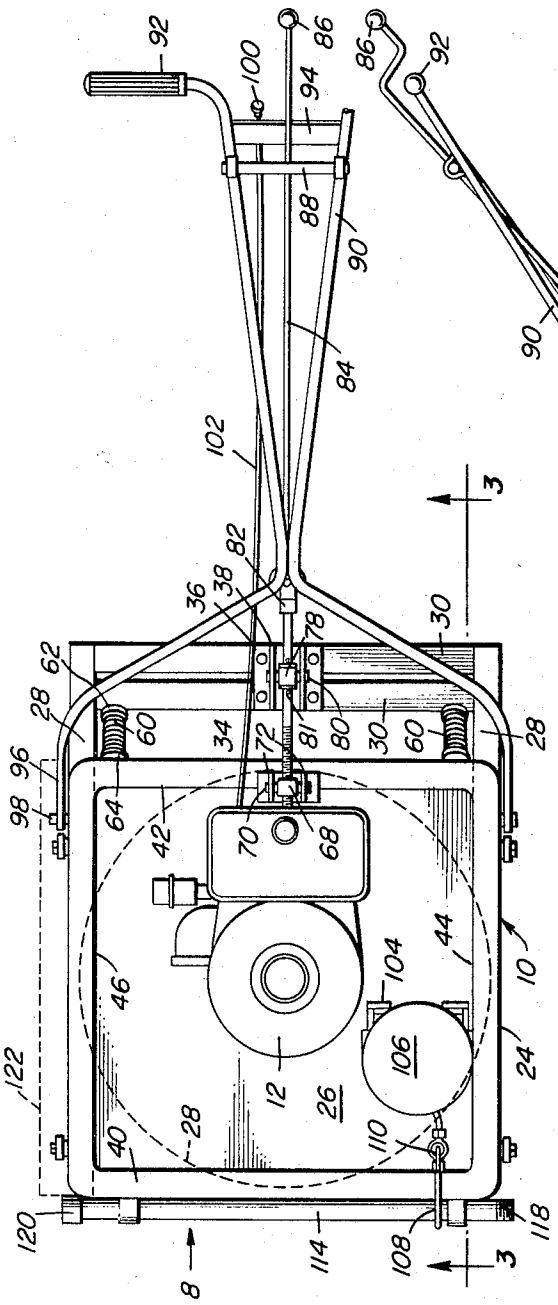


Fig. 1

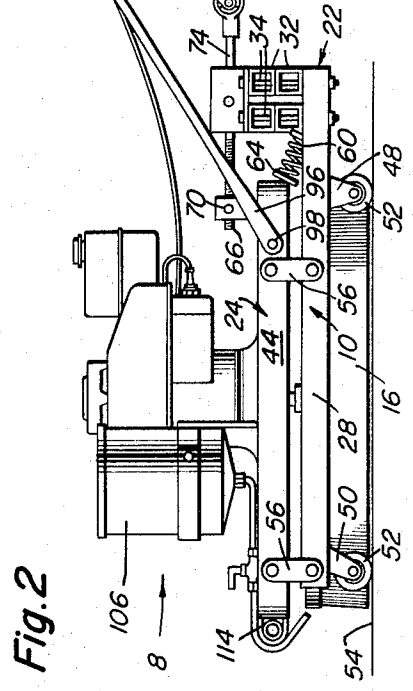


Fig. 2

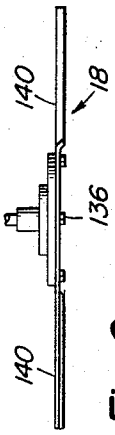


Fig. 5

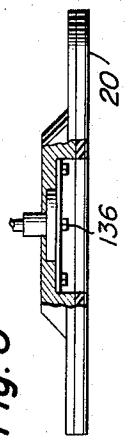


Fig. 6

INVENTOR

Walter E. Schneider

BY Gustave Miller

ATTORNEY

Feb. 14, 1967 W. E. SCHNEIDER 3,303,524

VERTICALLY ADJUSTABLE CRADLE FOR A SURFACE BRUSHING MACHINE

Filed Jan. 27, 1965 2 Sheets-Sheet 2

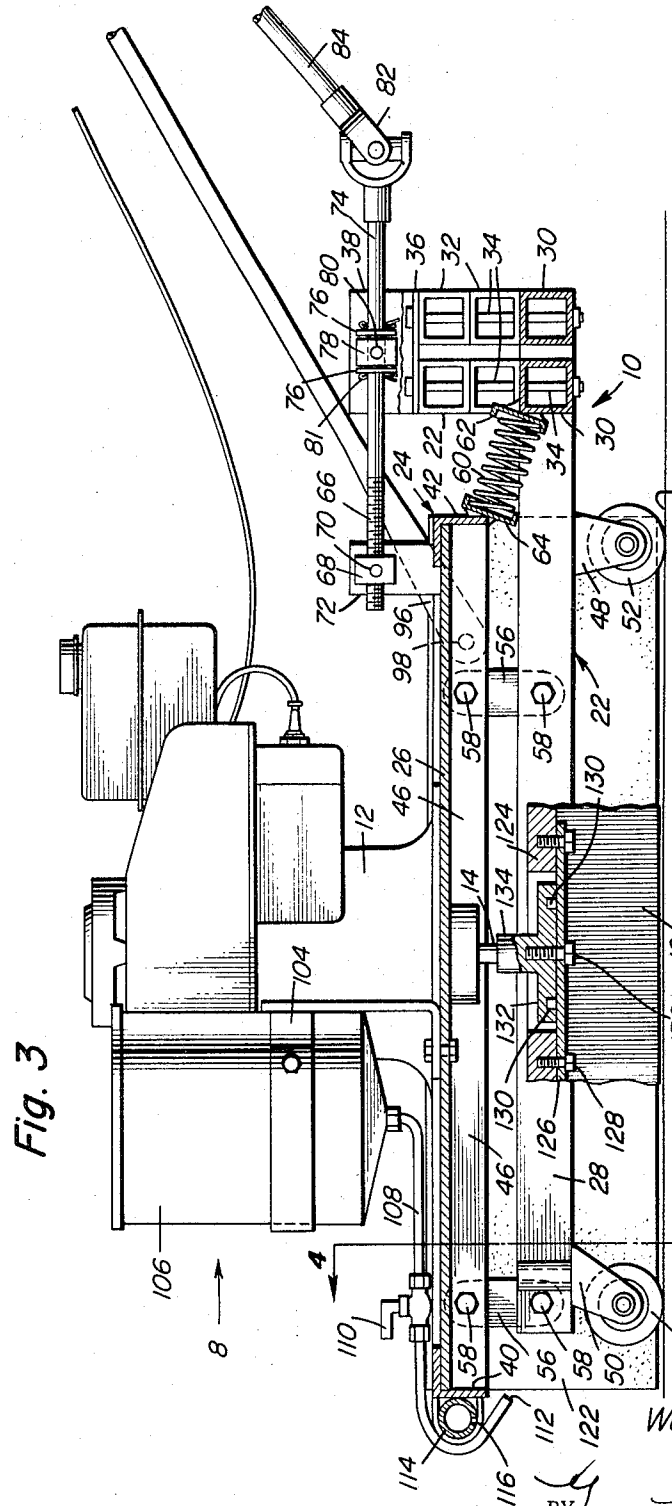


Fig. 3

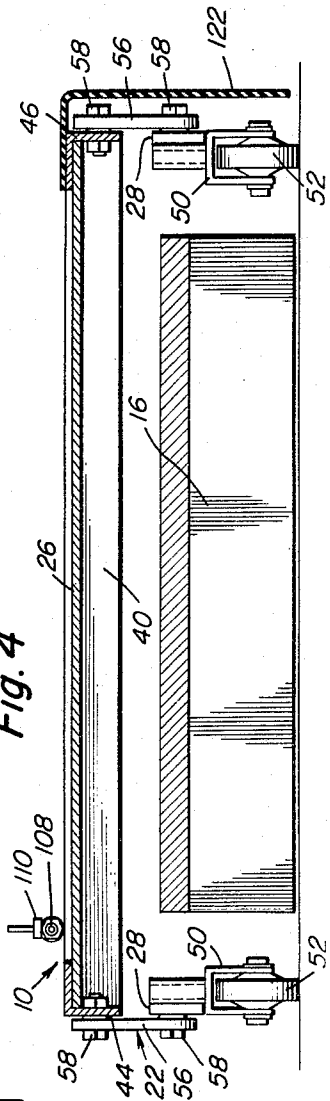


Fig. 4

INVENTOR
Walter E. Schneider
BY Gustave Miller
ATTORNEY

United States Patent Office 3,303,524 Patented Feb. 14, 1967

3,303,524

VERTICALLY ADJUSTABLE CRADLE FOR A SURFACE BRUSHING MACHINE

Walter E. Schneider, 1005 E. Airline, Victoria, Tex. 77901

Filed Jan. 27, 1965, Ser. No. 428,325
4 Claims. (Cl. 15—49)

This invention relates to a cradle for adjustably supporting a floor or ground surface treating machine. It is an object of this invention to provide an improved cradle for a machine for floor cleaning, lawn mowing, sanding, polishing, leveling wet cement or other similar purposes, having a detachable and replaceable surface treating implement which may be raised above or lowered to support the entire weight of the machine, or readily adjusted to any desired height from the surface being treated, always maintaining the plane of the rotating implement parallel to the plane of the surface being treated.

A further object of this invention is to provide a surface treating machine which may be steered, controlled and adjusted by an attendant while walking behind it.

A further object of this invention is to provide an improved floor scrubbing machine with a removable brush, along with various other surface treating implements which may be used in place of the brush.

Still a further object of this invention is to provide an improved floor scrubbing machine or surface treating machine wherein the scrubbing brush or other implement may be adjusted in height from the treated surfaces, or to support a selected part or all of the weight of the machine on the treated surface, such adjustment being capable of being carried out while the machine is in operation.

A further object of this invention is to provide an improved floor scrubbing machine, particularly useful in large areas, such as garage floors, service station driveways as well as other large areas, and wherein the scrubbing brush can be placed on the floor with the plane of its bristles coincident with the plane of the floor, wherein the brush may be raised or lowered relative to the machine to place any desired fraction of or all of the weight of the entire machine on the brush 16, or remove the weight entirely from the brush, always maintaining the plane of the bristles parallel to the plane of the floor, and wherein the machine may be adjusted for this purpose by the operator while in use.

In brief, this invention is a cradle consisting of a U-shaped chassis and a frame adjustably supported thereabove in a manner that the planes of both frame and chassis always remain parallel to each other. A platform on the frame carries a motor having a shaft depending vertically through the platform on which is detachably secured a surface treating implement for the surface over which the cradle may travel by wheels mounted on the cradle, or in different adjustment, the implement may carry part or all of the weight of the cradle and all its supported parts. The implement may be a brush, for scrubbing a floor or other surface, a blade for cutting a lawn, a sander for sanding a floor, a polishing brush or buffer. Shock absorbing springs are provided between the frame and the platform. In addition, the platform carries a soap container and a valved conduit therefor, leading the soap to the area being scrubbed. The frame is supported on the chassis by parallel links or tilt bars and a threaded bolt swiveled to both chassis and frame, which bolt is controlled by a universally connected hand crank control located on handle bars for steering the invention, on which is also mounted a throttle or control for the implement operating motor on the platform.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the acompanying drawing, in which:

FIG. 1 is a top plan view of the complete machine of this invention.

FIG. 2 is a side elevation of FIG. 1.

FIG. 3 is a partly side elevation and partly sectional view, on an enlarged scale, showing some constructional details.

FIG. 4 is a sectional view on line 4—4 of FIG. 3.

FIG. 5 is a side elevational view of a lawn mower blade, which may be used instead of the scrubbing brush shown in FIG. 3.

FIG. 6 is a side elevational view of a sander disc.

There is shown a machine 8 including the cradle 10 of this invention on which is mounted a conventional motor 12 having a vertically depending motor shaft 14 on which may be detachably secured a surface treating implement, such as a floor scrubbing or polishing brush 16, a lawn mower blade 18, a sander disc 20, or any other type of floor or ground surface treating machine, such as a buffer, a wet concrete leveling screed, or other suitable implement.

The essence of this invention is that the position of the rotating surface or floor treating implement may be adjusted vertically while maintaining the plane of the implement parallel to the plane of the surface being treated. Where the implement is of the type that it contacts the surface being treated, such as a floor scrubbing or polishing brush or buffer 16, lawn mower 18 or floor sander 20, or wet concrete leveler, the cradle 10 may be adjusted while the machine is operating to place any desired fractional part or all of the weight of the machine on the implement.

The cradle 10 consists of a chassis 22, preferably U-shaped, and a top frame 24 carrying a motor platform 26 is adjustably supported on the chassis 22 in such a manner that the plane of the chassis 22 and the plane of the frame 24 or platform 26 always remain in parallelism in all positions of adjustment. The chassis 22 consists of a pair of parallel side bars 28 rigidly secured together at their rear ends by a pair of slightly spaced apart parallel cross bars 30 rectangular in cross section. At the center portion of each of their top sides, two superposed short bars 32, also rectangular in cross section, are bolted thereto at 34, which bolts 34 also pass through and secure top bridging right angle bars 36, with vertically extending spaced apart flanges 38 integrally extending vertically upward therefrom.

The top frame 24 consists of a right angle bar bent into a rectangle, here shown as having rounded corners, and includes a front bar 40, a rear bar 42 and two side bars 44 and 46.

A rear wheel fork 48 is fixedly secured near the rear of each side bar 44 and 46, and a front caster fork 50 is swivelly secured near the front of each side bar 44, a wheel 52 being journaled in each fork 48 and 50, the wheels 52 thus steerably supporting the chassis 22 when the wheels are in contact with the surface 54 which may be the surface being treated, or the surface over which the cradle 10 is being transported. The swiveled front forks 50 are slanted. The top frame 24 is adjustably supported and controlled on and relative to the chassis 22 by means of a plurality of parallel tilt bars or links 56, each tilt bar or link 56 being pivoted by short bolts and nuts 58 to chassis side bars 28 at their bottoms and to the top frame side bars 44 and 46 at their top ends. Additional support is provided by a pair of shock absorbing and stabilizing coil springs 60 biased between lower spring seats 62 secured as by spot welding to the forward one

of the chassis rear cross bars 30, and upper spring seat 64 spot welded to top frame rear cross bar 42.

The tilt bars or links 56 being equal in length and similarly positioned, they always maintain the plane of the rotating implement or brush 16 parallel to the surface 54. The position of the chassis 22 and thus of the implement or brush 16 is controlled by the bolt 66 which is swivelly connected to both platform 26 and chassis 22. The bolt 66 is threaded through a nut 68 which is mounted on a pair of aligned pivot pins 70 journaled through a pair of spaced apart stanchions 72 secured as by spot welding or the like to the rear bar 42 of top frame 24. The shank 74 of the threaded bolt 66 is swivelly mounted on the chassis 22 by extending through a pair of apertured stanchions 76 and through a sleeve 78, which sleeve 78 is mounted on a pair of aligned pivot pins 80 pivoted in aligned pivot apertures in angle iron spaced apart vertical flanges 38. Cotter pins 81 through appropriate holes in shank 74 keeps the shank 74 in proper position in sleeve 78. Obviously, rotating shank 74 of threaded bolt 66 will raise or lower platform 26 relative to chassis 22 while maintaining it parallel thereto, and raise or lower the implement 16 relative to the surface 54 or further place the implement 16 and thus place part or all of the weight of the entire machine 8 on the surface 54, and lift the wheels 52 off the surface 54, while the plane of the implement 16 will be maintained parallel to the plane of the surface 54.

Secured to the head end of bolt shank 74 is a universal joint 82 mounted on the end of a crank arm 84 which terminates in a crank handle 86. The crank arm 84 is journaled through a brace rod 88 secured between divergent handle bars 90 which terminate in handle bar grips 92. A second brace member 94 helps rigidify the handle bars 90, which are suitably bent and then terminate in ends 96 pivoted at 98 to the side bars 44 and 46 of the rectangular top frame 24. A remote throttle or switch control 100 is mounted on one handle bar 90 adjacent the handle bar grips 92 and crank handle 86.

A flexible control cable 102 connects the throttle or switch 100 to the motor 12, the motor 12 being any conventional motor, gas, electricity or diesel powered, from which the vertical power shaft 14 depends down through the platform 26. The motor 12 is of a suitable horsepower, and being conventional, need not be further specified. Also mounted on the platform 26, as by a bracket 104, is a liquid soap or wax container and dispenser 106 connected by copper conduit 108, through a control valve 110, to a discharge end 112 extending down over and around the frame front bar 40 and a water spray pipe 114 secured thereto. The spray pipe 114 is provided with spray holes 116 at its bottom. It is open and threaded at one and at 118 complementary to the conventional threads of a garden hose, and is closed at 120 at its other end. Any time water is needed or wanted in the scrubbing operation, a garden hose may be connected at 118 to the spray pipe 114 to thus spray water in the path of the machine 8 as needed. On the right hand frame bar 46, a rubber skirt 122 is secured so that the brush 16, rotating in a clockwise direction as viewed in FIG. 1, will cast its spray thereagainst. Additional skirts may be added to the other side bars of frame 24, if desired.

The brush 16 consists of suitable bristles depending from an annular brush head 124 across the central opening of which is secured an attaching plate 126. The plate 126 is secured to brush head 124 by a plurality of threaded stud screws 128. The attaching plate 126 has a plurality of internal upwardly extending bosses 130 which will seat in complementary recesses formed on the underside of the head 132 of a T-bar 134 suitably secured to the end of the vertically depending motor shaft 14. With the bosses 130 seated in the T-head recesses a single stud screw 136 is threaded through a central aperture in plate 126 into a complementary female thread.

To change the brush 16 for another suitable implement, such as the lawn motor blade 18 or sander disc 20, only the single stud screw 136 needs to be removed, and then the lawn mower blade 18, made up of suitable blades 140, each attached by a pair of studs or bolts and nuts to the bottom of similar plate 126. The sander disc is similarly constructed by being attached to a similar plate 126, and so is another surface treating implement that may be attached to a similar plate 126.

In operation, with the brush 16 attached as just described, any large surface, such as a floor, garage floor or building room or corridor floor or the like may be scrubbed or polished. For washing or scrubbing, liquid soap may be put into the container and dispenser 106; for waxing, liquid wax will be placed in the container dispenser 106. The crank handle 86 controls the position of the brush 16 to the surface 54. For bringing the machine to the desired location on the surface, the top frame 24 will be raised to the maximum, with the tilt bars or links 56 extending vertically, as shown in FIG. 2, thus spacing the bottom of the bristles of the brush 16 from the floor surface 54, but in a plane parallel thereto.

When at the working area of the surface to be cleaned or waxed, crank handle 86 will be rotated drawing the platform 26 rearwardly and thus downwardly, tilting the bars or links 56 rearwardly and downwardly, the control bolt 66 swiveling as the crank handle 86 is rotated, until any desired part, or all of the weight of the machine 8, is supported on the bristles of the brush 16.

If scrubbing, and water is desired, a hose may be temporarily attached at 118 to spray pipe 114. If less weight is desired on the bristles, the crank handle 86 will be reversed somewhat. For sanding a floor, the sander 20 will be substituted for the brush 16, a head for the sander disc being made of suitable thickness so that the weight of the machine may be similarly placed thereon. When used as a lawn mower, the blade 18 will be substituted, and the mounting disc for the sander will be of suitable thinness so that the blades may come close to but never touch the level ground of the lawn. Any other implement may be similarly made and used.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. A cradle for adjustably supporting a floor or ground surface brushing machine comprising a chassis, said chassis including a pair of parallel side bars and a cross bar rigidly secured to the rear ends of said side bars, a rectangular top frame, a plurality of substantially identical tiltbars, at least a pair of said tilt bars being pivotally mounted on each chassis side bar and pivotally secured to corresponding bars of said top frame, screw threaded means swivelly mounted on said chassis cross bar and operatively swiveled on a corresponding part of said top frame for moving said top frame longitudinally of said chassis to thus pivot said tilt bars and adjust the distance of said top frame and chassis relative to each other while maintaining them in parallel relation to each other, manually operable means universally connected to said screw threaded means, and steerable wheel means journaled on said chasis, said screw threaded means comprising a bolt, a nut swivelly mounted on said top frame, a sleeve through which said bolt rotatably extends, said means preventing longitudinal motion of said bolt through said sleeve, means for swivelly mounting said sleeve on said chassis, a pair of handle bar rods pivotally secured to said frame, a handle bar at the end of each handle bar rod, a cross brace securing said handle bar rods together in spaced apart relation adjacent their handle bar ends, said manual-

ly operable means comprising a crank journaled through said cross brace, a crank handle on said crank adjacent said handle bar ends, a universal joint connecting the other end of said crank to said screw threaded means, a platform mounted on said top frame and a floor or ground brushing machine mounted on said platform, said machine comprising a motor, a motor shaft rotatably extending downwardly through said platform, and a floor or ground surface engaging brush detachably secured on said motor shaft below said platform, whereby operation of said crank handle to rotate said screw threaded means adjusts the pressure said brush provides on the surface on which the cradle is supported while maintaining the same angle of the plane of rotation of said implement.

2. The cradle of claim **1**, said motor shaft maintaining said brush with its bristle ends in a plane parallel to said platform, said chassis and top frame being adjustable by operation of said crank handle to extend said brush to adjustably support no part, some part or all of the weight of said cradle thereon and on the surface being brushed.

3. The cradle of claim **2** and shock absorbing means interposed between said chassis and said top frame.

4. The cradle of claim **3**, said shock absorbing means comprising a plurality of coil springs biased between the cross bar of said chassis and said top frame.

References Cited by the Examiner

UNITED STATES PATENTS

557,377	3/1896	Gee et al.	
1,791,812	2/1931	Harrison	15—49
2,877,476	3/1959	Kraszewski	15—546X
3,093,947	6/1963	Whitman	56—25
3,115,654	12/1963	Zimmerman	15—49
3,198,473	8/1965	Holz	248—421 X

FOREIGN PATENTS

804,493	11/1958	Great Britain.

References Cited by the Applicant

UNITED STATES PATENTS

2,624,896	1/1953	Atkin.
2,626,412	1/1953	Petersen.
2,640,211	6/1953	Petersen.
2,969,557	1/1961	Petersen.
2,978,719	4/1961	Arones.
3,017,648	1/1962	Wilson et al.
3,055,031	9/1962	Rachlin.
3,058,136	10/1962	Rachlin.

CHARLES A. WILLMUTH, *Primary Examiner.*

S. E. BECK, *Assistant Examiner.*