

April 3, 1962

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3,027,581

FLOOR MACHINE WITH ADJUSTABLE HANDLE ASSEMBLY

Filed Aug. 31, 1959

2 Sheets-Sheet 1

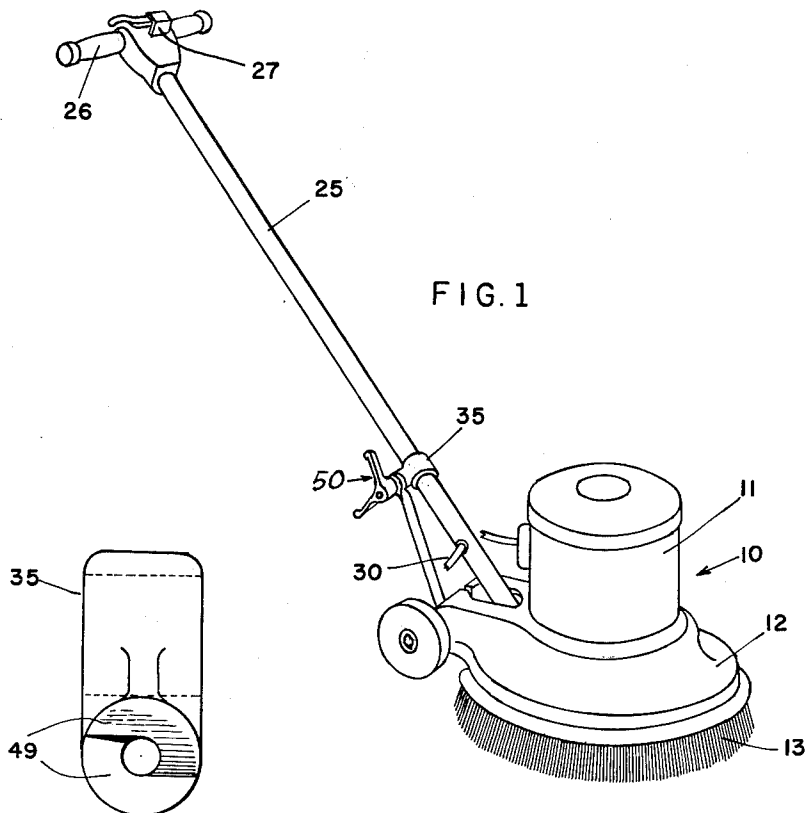


FIG. 1

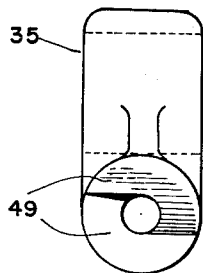


FIG. 8

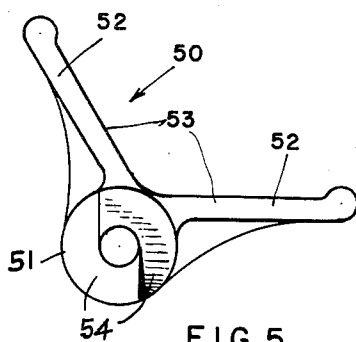


FIG. 5

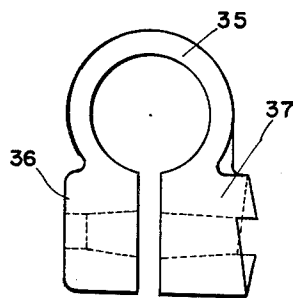


FIG. 7

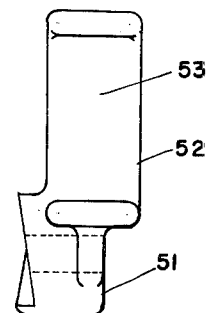


FIG. 6

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2 Sheets-Sheet 2

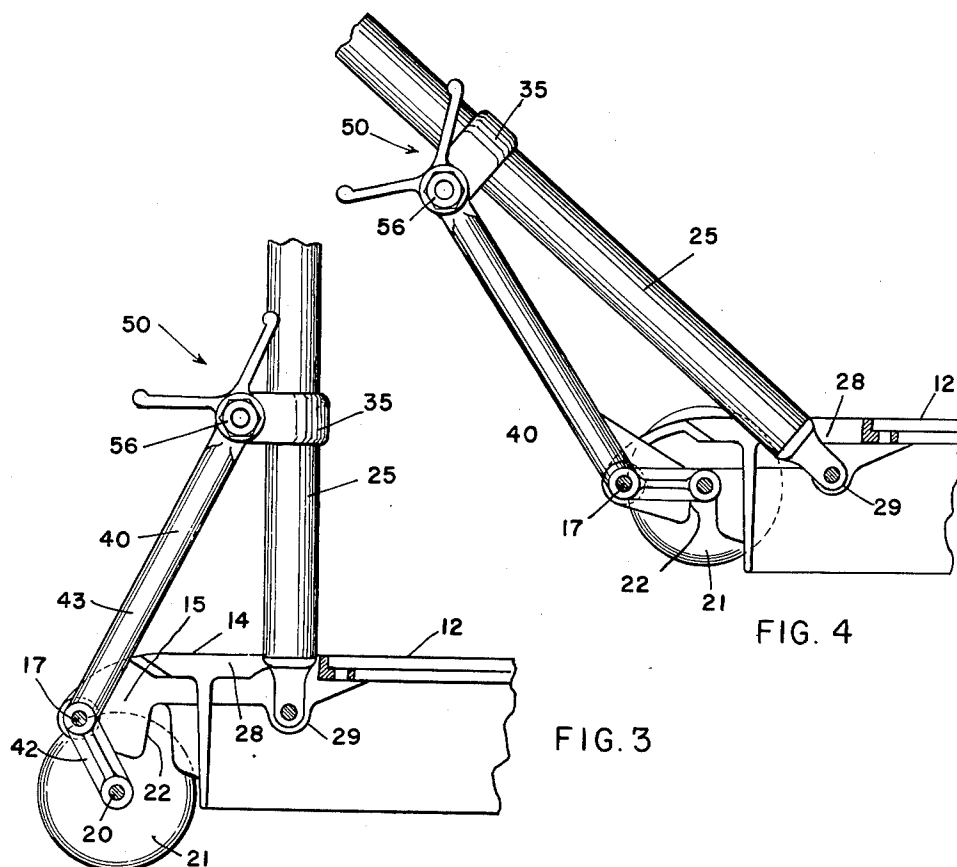


FIG. 4

FIG. 3

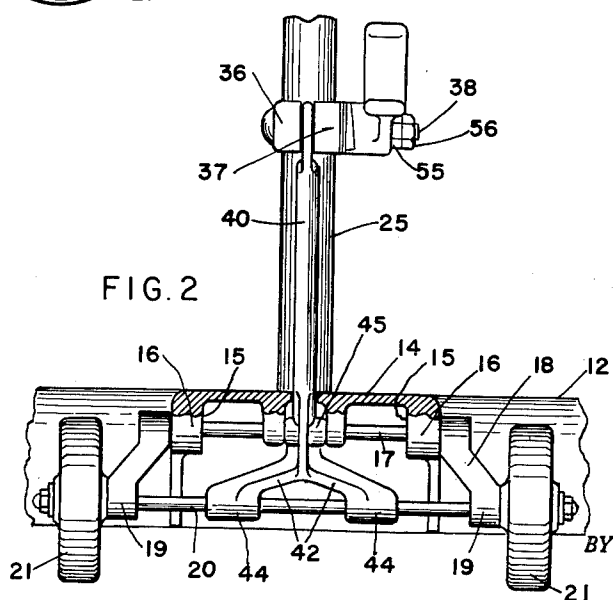


FIG. 2

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1

3,027,581

FLOOR MACHINE WITH ADJUSTABLE HANDLE ASSEMBLY

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Filed Aug. 31, 1959, Ser. No. 837,265

5 Claims. (Cl. 15-49)

The present invention relates to the construction of floor maintenance machines having an adjustable handle assembly, and more particularly, to floor maintenance machines of the character described with retractable supporting wheels in which the handle assembly is movable between a lower angular normal operating position in which the wheels at their maximum elevation and an upper upright storage or transport position in which the wheels are in their lowermost position.

The main object of the present invention is the provision of a floor maintenance machine of the character described having simple compact low cost foot-operable provisions for releasably clamping the supporting wheels and/or handle assembly in any position between a lowermost angular operating and an upright storage or transport position of the handle.

A further object is the provision of a handle locking clamp operable by a touch of the foot to permit easy and rapid adjustment of the handle between its upper and lower limit positions.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described a preferred embodiment of my invention.

Of the drawings:

FIG. 1 is a perspective view of a floor maintenance machine embodying the present invention with the supporting wheels and handle assembly in an operating position;

FIG. 2 is a rear view, partly broken away, of the lower portion of the machine shown in FIG. 1;

FIG. 3 is a fragmentary sectional elevation showing the supporting wheels and handle assembly in their storage position;

FIG. 4 is a view of the parts shown in FIG. 3 in their lowermost operating position;

FIG. 5 is a side view of the handle locking pedal;

FIG. 6 is a rear view of the pedal shown in FIG. 5;

FIG. 7 is an end view of the handle clamp; and

FIG. 8 is a side view of the clamp shown in FIG. 7.

The floor maintenance machine illustrated includes a metal housing 10 having a substantially cylindrical top section 11 enclosing an electric drive motor (not shown) and an enlarged circular downwardly curving base section 12. The base section surrounds the upper portion of a removable rotary surfacing element, such as a rotary brush 13, arranged to rotate about a vertical axis with the lower ends of the brush bristles in contact with the floor.

The rear portion of the circular housing base section 12 has a rearwardly and downwardly curving center extension 14, having a pair of depending side flanges 15, in the rear portions of which are a pair of transversely spaced aligned hubs 16, through which pass an axle 17. The axle 17 projects beyond the hubs 16 and on each projecting end is rigidly secured an outwardly and downwardly bent wheel lug 18 extending forwardly to a terminal hub 19. The hubs 19 are laterally aligned to fixedly receive an axle 20 therethrough, on the projecting

2

ends of which are rotatably mounted wheels 21 for supporting the housing 10 in its storage and transport position, as shown in FIG. 3.

The lower edge of each side flange 15 is cut away in an upwardly tapering recess 22 which is located so as to receive the axle 20 when the wheels 21 are swung to their raised location in the brush operating position, as shown in FIG. 4.

A tubular handle 25 having hand grips 26 and an operating switch 27 at its upper end is pivotally mounted on the machine housing, the lower end of the handle extending through an elongated slot 28 formed in the housing extension 14 and pivotally mounted in hubs 29 formed in the side flanges 15 subjacent the front end of the slot 28. The switch 27 is connectable to an electric power supply by wiring (not shown) and to the machine motor by wiring 30 extending downwardly through the handle 25 and out through the lower part thereof to provide a flexible connection to the motor permitting movement of the handle throughout its desired range.

In accordance with the present invention, the handle 25 can be pivotally adjusted to the positions shown in FIGS. 3 and 4 and any position therebetween. The provisions for this purpose include a circular split clamp 35 surrounding and slideably mounted on the lower portion of the handle 25. The split end portions of the clamp are formed by enlarged hubs 36 and 37, through which a square-headed bolt 38 extends. The middle unthreaded portion of the bolt 38 serves as a pivot pin for the upper end of a strut 40, which in the embodiment illustrated, is in the form of a rigid bell-crank lever having a lower forked end 42 bent forwardly at an angle of approximately 125° to the upper section 43 and serves as a wheel lifting strut. The forked end portions 42 terminate in laterally aligned hub portions 44, through which the wheel axle 20 projects, so that any movement of the lower end of the strut will cause a corresponding movement of the wheels 21 supported on the axle 20. The wheel lifting strut 40 also has a hub 45 formed therein at the junction of the upper and lower strut sections. The hub 45 is arranged to fit between laterally spaced depending flanges 46 forming the sides of a narrowed extension of the slot 28, which thus symmetrically divides the housing extension 14 into two parts. The shaft 17 is arranged to extend through the hub 45 and corresponding openings in the flanges 46.

With the described construction of the handle clamp, wheel lifting strut, and wheel assembly, and the clamp loose enough on the handle 25 to permit relative movement therebetween, arcuate movement of the handle about its bottom pivot support will cause arcuate movement of the rigid bell-crank wheel lifting strut 40 about the shaft 17, and thereby bodily movement of the axle 20 and wheels 21 in an arc about the shaft 17 between the lower wheel position shown in FIG. 3, in which the handle 25 is upright, and the raised position shown in FIG. 4, in which the handle is in its lowermost operating position and the axle 20 is in the upper end of the flange recesses 22. In the latter position, the machine is supported entirely on the rotary brush 13.

The handle 25 and thereby the supporting wheels 21 can be locked in the positions shown in FIGS. 3 and 4, or in any intermediate position by tightening the clamp 35 on the handle to prevent relative movement therebetween. For this purpose, the outer face of the clamp hub 37 is machined to form two oppositely arranged complementary arcuately extending inclined cam surfaces 49. Each cam surface rises for example, $\frac{3}{16}$ " during its arcuate extent. A lock pedal 50 is rotatably mounted on an unthreaded portion of the bolt 38 projecting beyond the hub 37. The pedal is cast with a

central hub 51 and two projecting arms 52 angularly spaced apart approximately 120° and having flat upper surfaces 53 adapted to be contacted by the operator's foot. The inner face of the hub 51 is formed with two oppositely arranged complementary arcuately extending inclined cam surfaces 54 which mate with the corresponding cam surfaces 49 on the clamp hub 37, with the projecting section of each cam surface 54 fitting into the recessed section of each cam surface 49 and vice versa, when the clamp is relatively loose on the handle 25. These parts are tightly held in mating relation on the bolt 38 by locknuts 55 and 56 on the threaded end of the bolt projecting beyond the outer face of the lock pedal hub 51.

When the operator desires to lock the clamp 35 to the handle 25 in any position of the handle, he presses his foot on the lower arm of the pedal 50 to cause the pedal to turn about the bolt 38, and thereby the cam surfaces 54 to ride upwardly on the stationary cam surfaces 49, forcing the clamp hub 37, and to a lesser extent the hub 36, laterally to tighten the clamp around the handle 25. When the operator desires to move the handle and supporting wheels to another position, the operator's foot is applied to the upper pedal arm 52 to move the cam surfaces 53 downwardly over the cam surfaces 49, allowing the clamp hub 37 to move outwardly on the bolt 38. As shown in FIG. 7, the passages through the clamp hubs 36 and 37 are flared inwardly to permit the hub 37 to move relatively to the bolt 38 without binding.

When the machine is to be transported, the handle assembly is moved to its extreme forward position wherein the supporting wheels will be in their lowermost position. The machine is tilted to clear the rotary brush from the floor and the entire weight taken by the wheels 21.

While in accordance with the provisions of the statutes I have illustrated and described herein a specific form of the invention now known to me, those skilled in the art will understand that changes may be made in the form of the apparatus disclosed without departing from the spirit of the invention covered by my claims, and that certain features of the invention may sometimes be used to advantage without a corresponding use of other features.

What is claimed is:

1. A floor maintenance machine comprising a main housing, a rotary floor treating element positioned within said main housing, a pair of laterally spaced housing extensions projecting rearwardly from the rear side of said main housing, a handle pivotally mounted in and extending upwardly between said housing sections, an axle mounted in and extending between said housing extensions rearwardly of the pivot axis of said handle, a strut pivotally mounted on said axle, a split clamp slidably mounted on said handle, means forming a pivotal connection between the upper end of said strut and said handle clamp, and means for locking said handle in positions between a lower inclined operating position and an upright transport position comprising a cam surface on one side of said clamp, and a foot-operable pedal member movable about the same axis as said strut and handle clamp pivotal connection and having a cam surface arranged to coact with the cam surface on said clamp to tighten and loosen said clamp on said handle.

2. A floor maintenance machine comprising a main housing, a rotary floor treating element positioned within said main housing, a pair of laterally spaced housing extensions projecting rearwardly from the rear side of said main housing, a handle pivotally mounted in and extending upwardly between said housing sections, an axle mounted in and extending between said housing extensions rearwardly of the pivot axis of said handle, a strut pivotally mounted on said axle, a clamp slidably mounted on said handle and having laterally spaced split

portions, means forming a pivotal connection between the upper end of said strut and said handle clamp, and means for locking said handle in positions between a lower inclined operating position and an upright transport position comprising a cam surface on one side of said clamp, a bolt extending through the split portions of said clamp, and a foot-operable pedal member rotatably mounted on said bolt and having a cam surface arranged to coact with the cam surface on said clamp to tighten and loosen said clamp on said handle on rotation of said pedal member.

3. A floor maintenance machine comprising a main housing, a rotary floor treating element positioned within said main housing, a pair of laterally spaced housing extensions projecting rearwardly from the rear side of said main housing, a handle pivotally mounted in and extending upwardly between said housing sections, an axle mounted in and extending between said housing extensions rearwardly of the pivot axis of said handle, a bell-crank strut pivotally mounted on said axle, a pair of housing supporting wheels carried on the forward end of said bell-crank strut, a split clamp slidably mounted on said handle, means forming a pivotal connection between the upper end of said bell-crank strut and said handle clamp, and means for locking said handle in positions between a lower inclined operating position and an upright transport position comprising a cam surface on one side of said clamp, and a foot-operable pedal member having a cam surface arranged to coact with the cam surface on said clamp to tighten and loosen said clamp on said handle.

4. A floor maintenance machine comprising a main housing, a rotary floor treating element positioned within said main housing, a pair of laterally spaced housing extensions projecting rearwardly from the rear side of said main housing, a handle pivotally mounted in and extending upwardly between said housing sections, an axle mounted in and extending between said housing extensions rearwardly of the pivot axis of said handle, a bell-crank strut pivotally mounted on said axle, a pair of housing supporting wheels carried on the forward end of said bell-crank strut, a clamp slidably mounted on said handle and having laterally spaced split portions, means forming a pivotal connection between the upper end of said bell-crank strut and said handle clamp, and means for locking said handle in positions between a lower inclined operating position and an upright transport position comprising a cam surface on one side of said clamp, a bolt extending through the split portions of said clamp, and a foot-operable pedal member rotatably mounted on said bolt and having a cam surface arranged to coact with the cam surface on said clamp to tighten and loosen said clamp on said handle on rotation of said pedal member.

5. A floor maintenance machine comprising a main housing, a rotary floor treating element positioned within said main housing, a pair of laterally spaced housing extensions projecting rearwardly from the rear side of said main housing, a handle pivotally mounted in and extending upwardly between said housing sections, an axle mounted in and extending between said housing extensions rearwardly of the pivot axis of said handle, a bell-crank strut pivotally mounted on said axle, a pair of housing supporting wheels carried on the forward end of said bell-crank strut, a clamp slidably mounted on said handle and having laterally spaced split portions, means forming a pivotal connection between the upper end of said bell-crank strut and said handle clamp including a bolt extending through the split portions of said clamp and pivotally connected to said strut, and means for locking said handle in positions between a lower inclined operating position in which the supporting wheels are in a non-supporting position and an upright transport position comprising a cam surface on an outer

5

side of one of said clamp split portions, and a foot-operable pedal member rotatably mounted on said bolt and having a cam surface on one side thereof arranged to coact with the cam surface on said clamp to effect relative lateral movement of said clamp split portions to tighten and loosen said clamp on said handle.

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