April 20, 1954 E. L. VERHAGEN 2,676,067

ADJUSTABLE HANDLE CONNECTION FOR FLOOR MACHINES

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FIG. 1

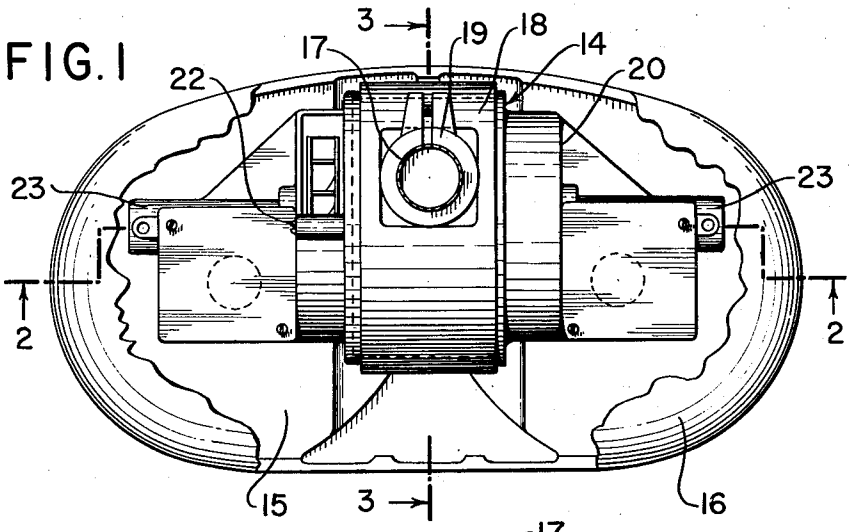
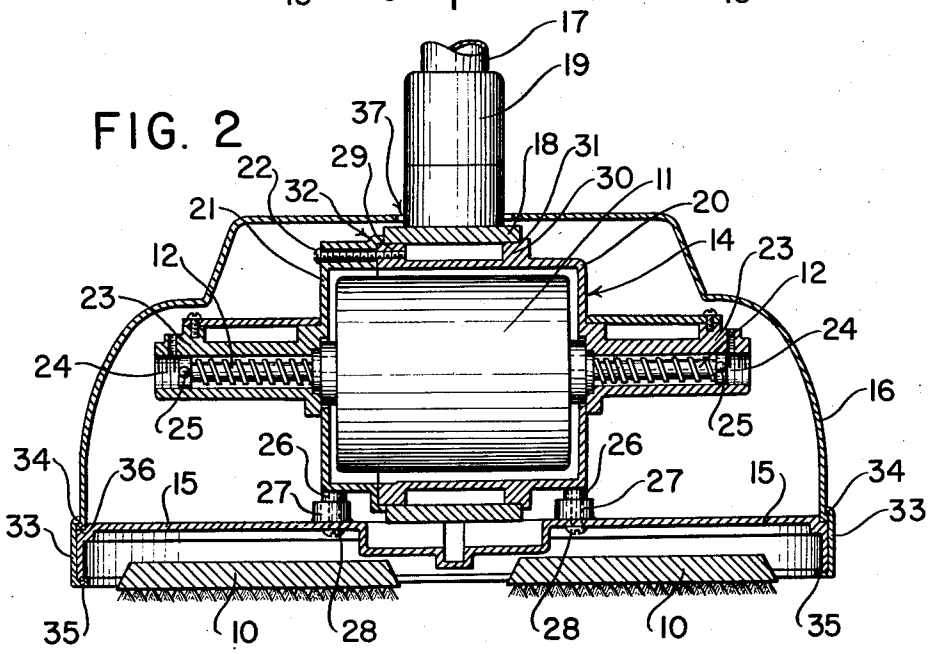


FIG. 2



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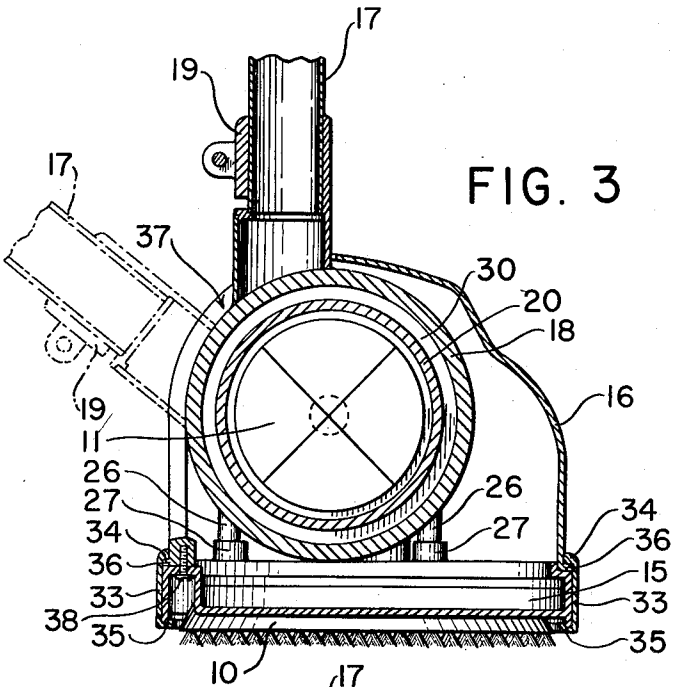


FIG. 3

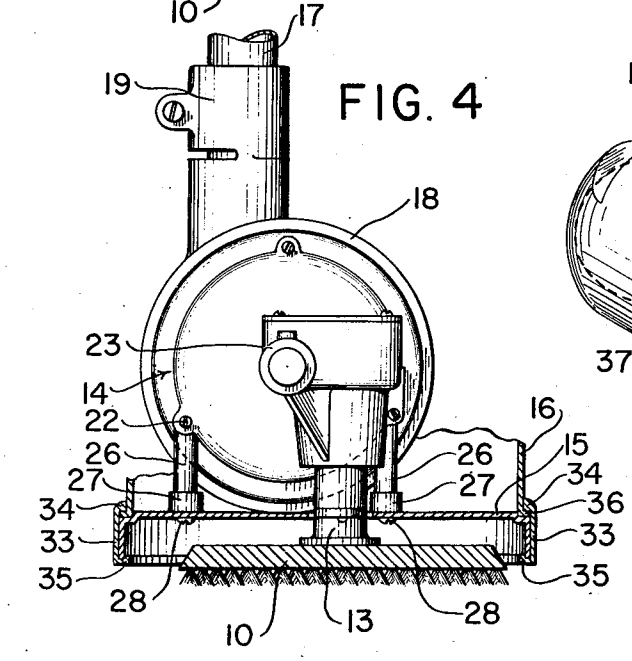


FIG. 4

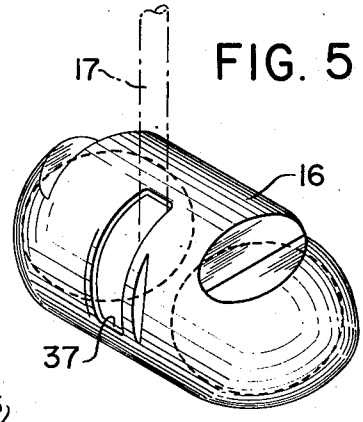


FIG. 5

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ADJUSTABLE HANDLE CONNECTION FOR FLOOR MACHINES

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Application August 3, 1950, Serial No. 177,404

1 Claim. (Cl. 306—11)

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The present invention relates to a handle mounting and casing for machines of the ambulant type, for instance, floor polishing machines, vacuum cleaners, and the like, in which a long handle is secured to the machine; so that the machine may be pushed and pulled along the floor or rug at a convenient angular disposition of the handle.

It is an object of the present invention to provide a handle which is secured to a floor polishing machine or the like without any protruding parts around the base thereof. It is also an object of the present invention to provide a handle which is pivotally mounted and directly secured to the motor within the casing.

In structures of the type here considered, heretofore in use, it has been a common hazard for those using the machine that the bail or yoke used to secure the handle to the casing of the machine, would come into contact with the base of furniture that might be in the area in which the machine was being used. This very often caused the lower portion of the furniture to become scratched and marred. It is therefore an object of the present invention to provide a means for mounting the handle to the machine without the presence of any projecting parts that could scratch or otherwise damage any furniture in the vicinity of the machine while in operation.

It is also an object of the present invention to provide a structure which during operation will readily pass underneath various pieces of furniture, there being no protruding parts likely to interfere with its passage. This will enable the operator to polish or clean those areas heretofore inaccessible by such machines.

It has also been a common fault of devices of the type here being considered, in which the handle was secured to the lower part of the machine by means of a bail or yoke, that the bail or yoke would catch and become engaged in low hanging draperies or fringes on furniture. It is therefore an object of the present invention to provide a structure which completely eliminates this danger. In a device embodying the present invention the handle is mounted within the casing and is mounted directly to the motor housing; thus, there are no protruding parts that could catch or become entangled with portions of the draperies or the furniture.

It is a further object of the present invention to provide a device of the type here considered which may be lifted by means of the long handle without the danger of the machine pivoting or tipping. This is very important where the device

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is used to operate on stairs or counters. It is important that when the operating surface is lifted from direct support, that the machine remain level; otherwise the operator will experience serious difficulty moving it about by lifting.

It is also important in devices of the type here under consideration that it remain level while in operation. Some structures heretofore in use, have had a tendency to tip backwards when a force is applied on the handle to move the machine forward, or to exert a downward force on the machine to aid in polishing or cleaning effect. It is therefore a further object of the present invention to provide a machine of the ambulant type which will remain perfectly level while in operation, no matter how great the downward component of the force exerted on the handle may become.

These and other objects and advantages of the present invention will be more readily apparent from the following description and drawing of one specific embodiment of the present invention, in which drawing:

Fig. 1 is a plan view of a floor polishing machine embodying the present invention, with the casing partially broken away;

Fig. 2 is a sectional view taken along line 2—2 on Fig. 1;

Fig. 3 is a sectional view taken along line 3—3 on Fig. 1;

Fig. 4 is a partially broken away side view thereof; and

Fig. 5 is a perspective view of the casing.

The device shown in the drawings is a twin brush floor polishing machine. However, it will be readily apparent that the invention set forth herein is also adaptable for use in all similar types of machines of the ambulant type.

Polishing brushes 10 are driven by motor 11 through worm shafts 12 and drive shafts 13. The motor 10 is entirely encased in housing 14 which in turn is mounted on base 15. Mounted on base 15 is the casing 16. The ring 18 is mounted on the housing 14 for pivotal movement relative thereto, and an elongated handle 17 is secured to the ring 18 by means of clamp 19.

The motor housing 14 consists of two members, the primary housing member 20 and the housing end plate 21. The two housing members 20 and 21 are secured together by screws 22 which hold the housing end plate 21 firmly against the primary housing member 20. On both sides of the motor housing 14 are the worm housings 23. The worm shafts 12 are held in proper position by screws 24 and thrust bearing 25. The brushes

10 are driven by drive shafts 13 which are connected with the worm shafts 12 by suitable gears (not shown).

Lugs 26 extending downwardly from the housing extend into openings in the base 15 which are surrounded by flanges 27. Screws 28 extending upwardly through the base 15 and threaded into lugs 26 hold the motor housing 14 and its associated parts securely in position against the base 15.

Although the handle is shown broken off in all views, it extends upwardly about three to four feet, the normal distance for such handles, and is provided at the upper end with a conventional hand grip. In moving the lower portion of the device namely the floor polishing machine, over the area to be polished, it is necessary that the handle 17 be mounted in such a way that it can assume various angular positions relative to the machine. For this reason the handle is mounted for pivotal movement relative to the lower portion of the device which rides on the floor or other area to be polished.

To accomplish this pivotal movement, the handle 14 is secured by means of clamp 19 to ring 18. The ring 18 is fitted onto the motor housing 14 so that it may rotate about the housing. To insure smooth relative movement the primary housing member 12 is provided with outwardly extending annular ribs 29 and 30, the outer surfaces of which are machined to provide a smooth bearing surface for ring 18. The ring 18 is held against axial movement on one side by small flange 31 on annular rib 30, and on the other side by the edge of the housing end plate 21 which has an enlarged portion 32 adapted to fit over the annular rib 29.

The casing 16 is secured to the base 15 by means of three vertical bolts 38. A bumper 33 is provided with an upper lip 34 and a lower lip 35. The upper lip 34 engages flange 36 at the bottom of casing 16 and the lower lip engages the bottom of the base 15. The casing 16 is provided with a slot 37 through which the handle 17 projects and is free to move.

As is apparent from the above, the entire device is enclosed within casing 16 and base 15 with only the brushes 10 exposed at the bottom and the handle 17 extending out from the top.

As can be seen best from Fig. 3 the pivot point for the handle 17 is the center of the circle formed by ring 18 which is approximately the center of the motor 11. This point is only a very short distance behind the center of gravity of the machine and is also a small distance above the center of gravity of the machine. Because

of this, when the machine is lifted from the floor with the handle 17 in a vertical position, there is a very small force moment tending to tip the machine from its normally horizontal position. The frictional force between the ring 18 and the motor housing 14 is enough to overcome this tipping moment and thus hold the machine in its horizontal position. It is to be noted that the instant the machine is lifted from the floor, its entire weight acts to increase the frictional force between the motor housing 14 and the ring 18.

It should also be noted that no matter what position the handle 17 assumes during use of the polishing machine, the surface of the brushes extends far enough back to act as a support and prevent any backward tipping due to the downward force applied as the machine is used for polishing.

I claim:

An ambulant device such as a floor polisher, vacuum cleaner, or the like, comprising a base, a motor housing mounted on the base, said housing being formed of two portions, one portion being a cup-shaped member having spaced circumferential ribs, one of said ribs having a flange thereon, and the other portion being a cap for the firstnamed portion, the external diameter of said cap being substantially equal to that of said flange, a ring mounted on and surrounding the firstnamed portion of said housing and bearing on the ribs thereof for rotary movement relative to said housing in a vertical plane, said ring being held against axial movement by said flange and said cap, and a handle mounted on said ring.

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