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CLEANING APPARATUS

FIELD OF THE INVENTION

The present invention relates to a cleaning apparatus. More particularly, the present invention relates to a floor cleaning apparatus.

BACKGROUND TO THE INVENTION

A number of different machines have been developed over the years to clean floors. Examples of the wide range of machines that have been developed include vacuum cleaners, floor polishers, carpet cleaners, steam cleaners and the like.

One form of floor cleaner that has been developed is a so-called orbital floor cleaner. In orbital floor cleaners, an unbalanced plate is caused to rotate by a motor. This causes the plate to wobble and oscillate in an orbital manner. A cleaning pad is normally attached to the oscillating plate, or to another plate that is itself driven by the oscillating plate. Orbital floor cleaners can be used to clean both hard floors and carpets. One manufacturer of orbital floor cleaners is Hruby Orbital Systems, of Ontario, California, USA.

BRIEF DESCRIPTION OF THE INVENTION

In one aspect, the present invention provides a floor cleaner comprising a cleaning portion that contacts the floor, the cleaning portion being driven by a motor, the floor cleaner including two spaced handles and one or more control switches for controlling operation of the motor, wherein at least one of the one or more control switches is positioned between the handles.

In some embodiments, each handle includes an upper end portion that extends forwardly from a main part of each handle.. The upper end portion that extends forwardly provides a convenient gripping portion for an operator of the floor cleaner to grip. As an additional benefit, should the handles fall forwardly, the upper end portions of the handles act as spacers to space the at least one control switch from any

surface that the end portions of the handles contact. In this manner, accidental operation of the motor by the control switch contacting a surface in the event that the handles fall forwardly is unlikely to occur.

In some embodiments, the floor cleaner may comprise an on switch and an off switch. In these embodiments, a single switch may operate to both turn on the motor and turn off the motor. Alternatively, a separate on switch and a separate off switch may be provided, with the on switch turning on the motor and the off switch turning of the motor. The on switch and the off switch may be colour-coded for ease identification, for example, the on switch maybe green and the off switch may be red.

In some embodiments, a support or a panel extends between the two handles and the at least one control switch is located on or mounted to the support or the panel. If more than one control switch for controlling operation of the motor is provided, preferably at least the switch that turns on the motor is positioned between the handles, such as on the support or panel that extends between the two handles. In some embodiments, the present invention provides a panel extending between the two handles, with the panel having an on switch for turning on the motor and an off switch for turning off the motor.

The panel or the support that extends between the two handles desirably is positioned towards an upper end of the handles. If the handles include an end portion that extends forwardly from the main portion of the handles, the panel or the support may be located at just below the part of the handles where the end portion begin to project forwardly. Placing the panel or support towards the top end of the handles allows for more convenient operation of the control switch(es) by an operator of the floor cleaner.

The panel or the support may form part of a body or a housing that extends between the handles.

In some embodiments, the handles comprise telescopic handles. For example, each handle may comprise a lower portion and an upper portion that extends telescopically from the lower portion. The upper portion may extends telescopically into and out of

the lower portion. The upper portion may have a smaller diameter than the lower portion so that the upper portion extends into the lower portion. Alternatively, the upper portion may have a larger diameter than the lower portion so that the upper portion extends around the lower portion. The telescopic handles may be provided with a locking means for locking the handles into a desired position or height.

In some embodiments, the floor cleaner comprises a frame, with the motor being connected (either directly or indirectly) to the frame. The handles may be pivotally mounted to the frame. In some embodiments, the handles may be positioned at a plurality of angles relative to the frame.

In some embodiments, the frame may include one or more regions defining peaks and troughs, and the handle carries a member that can be received in one of troughs to hold the handle any desired angular position, the member being movable out of a trough and over a peak to enable the handle to be moved to a different angular position. The member may comprise, for example, a bolt or a rod. The member may be received in a slot formed in the handle. In this embodiment, to change the angular position of the handle, the member can be simply lifted up out of a trough in which is resting. As the member locks the handle in position when it is in the trough, lifting the member out of the trough frees the handle for angular movement. The handle can be moved to a desired new angular position and the member returned to the trough associated with that desired new angular position. This locks the handle in the new angular position. In some embodiments, movement of the member may be effected by use of the foot of the operator. In some embodiments, the weight of the member is sufficient to retain the member in the slot. In other embodiments, the member is biased into the trough. The member may be biased by use of appropriate biasing means, such as a spring or an elastomeric or rubber member.

In some embodiments, the cleaning portion is pivotally mounted to the frame of the floor cleaner.

The cleaning portion may comprise a cleaning plate that carries one or more cleaning pads. The cleaning plate may be driven by the motor. The cleaning plate may be directly driven by the motor. Alternatively, the cleaning plate may be indirectly driven

by the motor. In one embodiment, the motor drives an out of balance driving plate that, in turn, is connected to a cleaning plate. The cleaning plate is then caused to rotate or move in an orbital or oscillating manner so that the cleaning pad(s) also move to thereby clean the floor.

The motor may be connected to the driving plate or to the cleaning plate by a bearing. The bearing may be keyed onto a driveshaft of the motor.

The motor may be located within a housing. In this fashion, the moving parts of the motor are difficult to access and the risk of body parts, such as hair or fingers, becoming caught in the motor, is greatly reduced.

The floor cleaner may also include wheels to facilitate movement of the floor cleaner across the floor. In some embodiments, the floor cleaner includes two wheels. In this embodiment, it will be appreciated that, during the normal use of the floor cleaner, the wheels and the cleaning portion are in contact with the floor that is being cleaned.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a perspective view of a floor cleaner in accordance with an embodiment of the present invention;

Figure 2 shows a front view of the floor cleaner shown in figure 1;

Figure 3 shows a top view of the floor cleaner shown in figure 1;

Figure 4 shows another perspective view of the floor cleaner shown in figure 1;

Figure 5 is a side view of the floor cleaner shown in figure 1;

Figure 6 is another side of view of the floor clearly shown in figure 1; and

Figure 7 is a perspective view of part of the floor cleaner shown in figure 1, with figure 7 showing the mechanism for adjusting the angle of the handles in greater detail.

DETAILED DESCRIPTION OF THE DRAWINGS

It will be appreciated that the drawings have been provided for the purposes of illustrating preferred embodiments of the present invention. Therefore, it will be understood that the present invention should not be considered to be limited solely to the features as shown in the attached drawings.

The floor cleaner 10 shown in figures 1 to 7 comprises a cleaning portion 12 and two spaced handles 14, 16.

The cleaning portion 12 comprises a cleaning plate 18 that is operatively driven by a motor. The motor is housed inside housing 20. Housing 20 has ventilation openings 22 to allow the motor to be cooled. The motor is typically an electric motor. The floor cleaner 10 shown in the attached drawings is a floor cleaner of the orbital type in which the motor drives the cleaning plate in an orbital fashion. The person skilled in the art will readily understand that such orbital cleaners typically have a driving plate that is driven by the motor. The driving plate comprises an out of balance plate that, when rotated by the motor, oscillates or wobbles and causes an orbital movement to take place in the cleaning plate 18. The cleaning plate 18 carries one or more cleaning pads in a manner known to the person skilled in the art. For example, the one or more cleaning pads may be joined to the cleaning plate 18 by use of hook and loop fasteners (such as Velcro®), or by use of clips or other attachments.

The floor cleaner 10 includes a frame comprising side frame members 24, 26. Side frame member 24 is pivotally connected to bracket 28 via pivot pin 30. Bracket 28 is, in turn, fixedly mounted to the cleaning plate 18, for example, by welding. Similarly, side frame member 26 is mounted to bracket 32 by pivot pin 34. Bracket 32 is also mounted to the cleaning plate 18. As a result, cleaning plate 18 is pivotally mounted to the frame.

The frame also includes a first cross member 36 that extends between handles 14 and 16. A second cross member 38 also extends between the handles 14, 16.

The frame includes a further crossmember 40 that is positioned rearwardly of the first crossmember 36. Wheels 42, 44 are rotatably mounted to the further crossmember 40. This may be achieved any manner known to the person skilled in the art. For example, the further crossmember 40 may be a hollow crossmember and it may carry an axle that supports the wheels 42, 44. Alternatively, each wheel 42, 44 may be mounted in bearings that are carried by the further crossmember 40. The actual manner of supporting the wheels on the frame is not especially critical.

The handle 14 comprises a lower handle portion 14A and an upper handle portion 14B. Similarly, handle 16 comprises a lower handle portion 16A and an upper handle portion 16B. Upper handle portion 14B is telescopically received in lower handle portion 14A. Upper handle portion 16B is telescopically received in lower handle portion 16A. In this manner, the height of the upper part of the handle can be adjusted by telescopically adjusting the upper portion of the handle relative to the lower portion of the handle. This enables the operator to set the handles to a desired and comfortable height. Knobs 46, 48 that are mounted to the top part of respective handles 14, 16 are used to operate a locking mechanism that locks the handles to the desired height. The knobs 46, 48 may actuate extendable members to lock the telescopic handlers in place. Alternatively, the knobs may actuate camming mechanisms. Again, the actual mechanism of the locking mechanism is not essential to the present invention.

The handle 14 includes a forwardly projecting portion 50. Similar, handle 16 includes a forwardly projecting portion 52. Portions 50, 52 provide convenient handgrips for the operator to grip the cleaning apparatus.

The cleaning apparatus also includes a panel 54 that is mounted to the upper portions of handles 14, 16 and extends between the handles 14 and 16. Panel 54 carries a first control switch 56 and a second control switch 58. In the embodiment shown in the attached drawings, control switch 56 is an on switch and control switch 58 is an off

switch. Control switches 56, 58 are operable to respectively turn on the motor and to turn off the motor.

As can be seen from figure 1, the control switches 56, 58 are positioned rearwardly of the ends of handle portions 50, 52. Therefore, should the operator of the machine inadvertently push the machine into a surface (such as a table) or should the handles fall forwardly, the ends of handle portions 50, 52 are likely to contact the surface and therefore act to space the control switches 56, 58 from the surface. This greatly reduces the possibility of the control switches being inadvertently activated. It will be understood that inadvertent or accidental activation of the control switches is undesirable because inadvertent activation of the on switch could result in the machine turning on and moving away by itself without the operator controlling the machine. Inadvertent activation of the off switch simply stops the machine and this can be annoying to an operator of the machine if it turns itself off whilst it is being used.

Although the embodiment shown in the attached drawings include separate on and off switches, it will be understood that a single switch may be used to both turn on and turn of the machine. For example, a single button may turn on the machine and turn off the machine. Alternatively, a toggle switch may be provided to turn on and turn off the machine. However, in the embodiment shown, separate buttons are used to control turning on and turning off the machine.

The panel 54 may form the front panel of a housing that extends between the handles 14, 16. The housing may house appropriate electrical connections (not shown). Appropriate supply of electricity to the motor may be provided by running electrical cables down one or both of the handles. The cleaning apparatus will also include a power cord for connection to an electrical outlet. For the sake of clarity, the power cord has been omitted from the attached figures.

The handles 14, 16 are pivotally connected to respective frame members 24, 26. Figure 7 shows an expanded view of the lower part of the handle 14. As can be seen, the lower part of the handle 14 includes a bracket 60 that has arms 62, 64 extending

on either side of frame member 24. A slot 66 is formed in arm 62. A similar slot is formed in the arm 64.

The lower ends of arms 62, 64 include an opening. These openings are brought into alignment with a similar opening extending through frame member 24 and a bolt or pin 68 is passed through the aligned openings to thereby pivotally mount the handle 14 to the frame member 24.

Handled 16 is pivotally mounted to the frame member 26 in a similar fashion.

In order to enable the angular orientation of the handle to be altered, the frame member 24 is provided with a region that includes a plurality of alternating peaks and troughs. For example, the region may include a trough 70, a peak 72, a trough 74, followed by another peak, etc. A bolt or rod 76, which is positioned to extend through slot 66 and the similar slot in arm 64, can sit in a trough when the handle 14 is at a desired angular position. This acts to lock the handle in that desired angular position. Should the operator wish to change the angular position of the handle 14, the operator lifts bolt or rod 76 out of the trough by sliding it up along the slot. As the bolt or rod 76 is now out of the trough, the handle 14 is free to pivot about bolt or pin 68. The operator can then move the handle 14 to a new angular position and allow the bolt or rod 76 to move back into the new trough associated with the new angular position. Conveniently, the bolt or rod 76 may be lifted by a foot of the operator.

In some embodiments, the bolt or rod 76 may be retained in a respective trough by virtue of the weight of the bolt or rod 76 (i.e. gravity holds it in place). In other embodiments, the bolt or rod 76 may be biased to return to the trough when a lifting force is removed from the bolt or rod 76. For example, the bolt or rod may be spring-loaded or biased to a downwardly position.

Handle 16 can be adjusted for its angular position in a similar manner.

In figure 1, the handles 14, 16 are shown in an extended, in-use position. In figures 4 and 5, the handles 14, 16 are shown in a lowered or retracted position. This position may be useful for storage or transport of the floor cleaner 10. As can be seen from

figure 5, the upper portion 14B of handle 14 is pushed almost all of the way down into the lower portion 14A. As can also be seen in figures 4 and 5, the handles 14, 16 are extending at an almost vertical angle. For more convenient storage, the handles 14, 16 may be folded fully forwardly.

Figure 6 shows the handle 14 in an extended position in which upper portion 14B is extended telescopically relative to lower portion 14A. Furthermore, the handle 14 is now positioned at an angle relative to the vertical. This may comprise a convenient operating position.

The floor cleaner 10 shown in the attached drawings provide an effective and convenient to use floor cleaner with enhanced safety features by virtue of it being very difficult to accidentally switch on or switch off. Floor cleaner 10 has handles that are easily adjusted for height by virtue of the telescopic handle mechanism. Similarly, the angular orientation of the handles can be easily changed.

Throughout this specification, the term "comprising" and its grammatical equivalents shall be taken to have an inclusive meaning unless the context of use indicate otherwise.

The present applicant does not concede that the prior art discussed in this specification forms part of the common general knowledge in Australia or elsewhere.

Those skilled in the art will appreciate that the present invention may be susceptible to variations and modifications other than those specifically described. It will be understood that the present invention encompasses all such variations and modifications that fall within its spirit and scope.

CLAIMS

1. A floor cleaner comprising a cleaning portion that contacts the floor, the cleaning portion being driven by a motor, the floor cleaner including two spaced handles and one or more control switches for controlling operation of the motor, wherein at least one of the one or more control switches is positioned between the handles.

2. A floor cleaner as claimed in claim 1 wherein each handle includes an upper end portion that extends forwardly from a main part of each handle.

3. A floor cleaner as claimed in claim 1 or claim 2 wherein the one or more control switches comprise an on switch and an off switch in the form of a single switch operable to both turn on the motor and turn off the motor, or the one or more control switches comprise a separate on switch and a separate off switch.

4. A floor cleaner as claimed in any one of the preceding claims wherein a support or a panel extends between the two handles and the at least one control switch is located on or mounted to the support or the panel.

5. A floor cleaner as claimed in claim 4 wherein the one or more control switches comprises more than one control switch for controlling operation of the motor and at least a switch that turns on the motor is positioned on the support or panel that extends between the two handles.

6. A floor cleaner as claimed in claim 4 wherein the floor cleaner comprises a panel extending between the two handles, with the panel having an on switch for turning on the motor and an off switch for turning off the motor.

7. A floor cleaner as claimed in any one of claims 4 to 6 wherein the panel or the support that extends between the two handles is positioned towards an upper end of the handles.

8. A floor cleaner as claimed in any one of claims 4 to 7 wherein the handles include an end portion that extends forwardly from the main portion of the handles and the

panel or the support is located at or just below the part of the handles where the end portion begin to project forwardly.

9. A floor cleaner as claimed in any one of claims 4 to 8 wherein the panel or the support forms part of a body or a housing that extends between the handles.

10. A floor cleaner as claimed in any one of the preceding claims wherein the floor cleaner comprises a frame, with the motor being connected (either directly or indirectly) to the frame and the handles being pivotally mounted to the frame.

11. A floor cleaner as claimed in claim 10 wherein the frame includes one or more regions defining peaks and troughs, and the handle carries a member that can be received in one of troughs to hold the handle at a desired angular position, the member being movable out of a trough and over a peak to enable the handle to be moved to a different angular position.

12. A floor cleaner as claimed in claim 11 wherein the member is received in a slot formed in the handle and, to change the angular position of the handle, the member is lifted up out of a trough in which is resting to enable the handle to be moved to a desired new angular position and the member is returned to the trough associated with that desired new angular position.

13. A floor cleaner as claimed in claim 12 wherein movement of the member is effected by use of the foot of the operator.

14. A floor cleaner as claimed in any one of claims 11 to 13 wherein the weight of the member is sufficient to retain the member in the slot, or the member is biased into the trough.

15. A floor cleaner as claimed in any one of the preceding claims wherein the cleaning portion comprises a cleaning plate that carries one or more cleaning pads, the cleaning plate being driven by the motor.

16. A floor cleaner as claimed in claim 15 wherein the motor drives an out of balance driving plate that, in turn, is connected to the cleaning plate and the cleaning plate is then caused to rotate or move in and orbital or oscillating manner so that the cleaning pad(s) also move to thereby clean the floor.

17. A floor cleaner as claimed in claim 16 wherein the motor is connected to the driving plate or to the cleaning plate by a bearing that is keyed onto a driveshaft of the motor.

18. A floor cleaner as claimed in any one of the preceding claims wherein the handles comprise telescopic handles adjustable for height or length.

19. A floor cleaner substantially as hereinbefore described with reference to the accompanying drawings.