

FLOOR GRINDING MACHINE

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present disclosure claims priority of Chinese Patent Application No. 202010286974.6, entitled “floor grinding machine”, filed on April 13, 2020, the content of which is incorporated herein by reference in its entirety.

FIELD

[0002] The present disclosure relates to the field of construction equipment, and particularly to a floor grinding machine.

BACKGROUND

[0003] Floor grinding machine is an automated equipment used to polish or grind a concrete ground. The floor grinding machine can be widely used in floor construction for underground garages and industrial plants, and is an indispensable equipment in processes of epoxy floor construction, curing floor construction and emery floor construction. The floor grinding machine is mainly used to remove a laitance on concrete surfaces (after the concrete is completely dried out), so as to carry out subsequent floor surface construction work. The floor grinding machine can carry out a floor polishing or floor grinding function by changing different machine tool heads. In order to achieve better grinding efficiency and grinding quality for floor grinding, it is necessary to frequently replace tool heads (or grinding discs) for different ground qualities.

[0004] At present, a general method for replacing tool heads (or grinding discs) is to manually tip over the whole equipment, so that the whole equipment is toppled over on the ground, and then a tool head (or grinding disc) can be replaced. After the tool head (or grinding disc) is replaced, it is also necessary to lift the equipment manually to restore it to a workable state, which is very physically exhausting. In addition, in order to improve

work efficiency, floor grinding machines currently on the market are showing a trend of having larger and larger work areas, resulting in the weight of the equipment themselves becoming heavier and heavier, and the weight of many equipment has exceeded 500kg. Therefore, it usually requires multiple people to move the equipment, which is time-consuming and labor-intensive, and improper operation may even cause harm to the operator. In addition, due to the frequent tilting of the whole machine caused by frequent replacement of tool heads or grinding discs, water in water tank of the floor grinding machines is easy to overflow after the whole machine is tilted, resulting in uselessness of the water tank of the floor grinding machines on the market. Operators usually use additional buckets for manual watering, which is time-consuming and labor-intensive.

[0005] Furthermore, the floor grinding machines currently on the market are usually powered by cables, so that it requires the operator to push during a transition process, which is time-consuming and labor-intensive.

SUMMARY

[0006] The present disclosure mainly aims to provide a floor grinding machine to solve the problems of inconvenient replacement of tool heads and inconvenient moving of the floor grinding machine in the prior art.

[0007] In order to achieve the above-mentioned object, the present disclosure provides a floor grinding machine, includes: a body bracket; a grinding disc connected to the body bracket, wherein the grinding disc has a first position configured to grind a ground and a second position configured to replace a grinding member provided thereon, and the grinding disc is provided to be switchable between the first position and the second position; a first moving wheel provided on the body bracket; a second moving wheel connected to the body bracket, wherein the second moving wheel has a travelling position in which the second moving wheel is capable moving along the ground and an avoiding position in which the second moving wheel is away from the ground, and the second moving wheel is provided to be switchable between the travelling position and the avoiding position. The floor grinding machine has a first working state configured to grind the ground and a second working state configured to travel or to replace the grinding

member. When the grinding disc is in the first position and the second moving wheel is in the avoiding position, the floor grinding machine is in the first working state; and when the grinding disc is in the second position and the second moving wheel is in the travelling position, the floor grinding machine is in the second working state.

[0008] Further, the floor grinding machine further includes a telescopic member connected to both the body bracket and the grinding disc, and at least a part of the telescopic member is provided to be telescopic to drive the grinding disc to switch between the first position and the second position.

[0009] Further, the floor grinding machine further includes a first support member, a first connection end of the first support member is hinged to the grinding disc, and a second connection end of the first support member is hinged to the body bracket. The telescopic member is hinged to the first support member, a connection point between the telescopic member and the first support member is located between the first connection end and the second connection end.

[0010] Further, the first support member includes a first support portion and a second support portion. The first support portion and the second support portion are provided to be tilted with respect to each other. An end of the first support portion is connected to the second support portion, and the other end of the first support portion is hinged to the grinding disc. An end of the second support portion away from the first support portion is hinged to the body bracket. The telescopic member is hinged to both the first support portion and the body bracket, such that the grinding disc rotates around a connection point where the second support portion and the body bracket are connected.

[0011] Further, the telescopic member has a fixed portion and a telescopic portion. The telescopic portion is connected to the fixed portion and is provided to be telescopic with respect to the fixed portion, the telescopic portion is connected to the body bracket, and the fixed portion is connected to the grinding disc.

[0012] Further, the floor grinding machine further includes a second support member. An end of the second support member is connected to the body bracket, and the second moving wheel is provided at the other end of the second support member. the second support member is provided to be rotatable with respect to the body bracket to drive the

second moving wheel to switch between the travelling position and the avoiding position.

[0013] Further, the floor grinding machine further includes a locking portion provided on the body bracket, and the locking portion is used to lock or unlock the second support member and the body bracket.

[0014] Further, the floor grinding machine further includes a first driving device drivingly connected to the grinding disc to drive the grinding disc to rotate. An end of the first support member away from the body bracket is connected to the first driving device.

[0015] Further, the floor grinding machine further includes a second driving device provided on the body bracket, and the second driving device is connected to the first moving wheel to drive the first moving wheel to rotate.

[0016] Further, the floor grinding machine further includes a water tank and a rechargeable battery, and the water tank and the rechargeable battery are both provided on the body bracket.

[0017] The floor grinding machine of the present disclosure includes the body bracket, the grinding disc, the first moving wheel, and the second moving wheel. When the grinding disc is in the first position and the second moving wheel is in the avoiding position, the grinding member on the grinding disc is in contact with the ground and the second moving wheel is not in contact with the ground. At this time, the floor grinding machine is capable of grinding the ground. When the grinding wheel is in the second position and the second moving wheel is in the travelling position, the grinding disc is at a certain height from the ground, and both the second moving wheel and the first moving wheel are in contact with the ground to support the floor grinding machine. At this time, the grinding member can be replaced, and the second moving wheel and the first moving wheel can also drive the floor grinding machine to travel. It can be seen that the grinding member of the floor grinding machine can be easily replaced, so as to solve the problem in the existing operation method of manually moving the equipment to replace the grinding member, which reduces the labor intensity of the operator and improves the work efficiency. In addition, the whole machine does not need to be tilted when replacing the grinding member of the floor grinding machine, that is, the body bracket and the accessories such as the water tank mounted thereon will not be tilted, and the water in the water tank will not

overflow. Further, the position of the body bracket will not change, it is also convenient for a large industrial vacuum cleaner to be externally attached. In addition, the floor grinding machine is easy to travel when transferring, saving time and effort.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The drawings of the specification forming a part of the disclosure are used to provide a further understanding of the disclosure, and the exemplary embodiments and descriptions of the disclosure are used to explain the disclosure, and do not constitute an improper limitation on the disclosure.

[0019] FIG. 1 shows a schematic view of a floor grinding machine according to the present disclosure in a first working state;

[0020] FIG. 2 shows a side view of the floor grinding machine in FIG. 1;

[0021] FIG. 3 shows a top view of the floor grinding machine in FIG. 1;

[0022] FIG. 4 shows a schematic view of the floor grinding machine according to the present disclosure in a second working state;

[0023] FIG. 5 shows a side view of the floor grinding machine in FIG. 4; and

[0024] FIG. 6 shows a top view of the floor grinding machine in FIG. 4.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0025] It should be noted that embodiments in this disclosure and features in the embodiments can be combined with each other if there is no conflict. Hereinafter, the disclosure will be described in detail with reference to the drawings and in conjunction with the embodiments.

[0026] Referring to FIGS. 1 to 6, the present disclosure provides a floor grinding machine including: a body bracket 10; a grinding disc 20 connected to the body bracket 10, wherein the grinding disc 20 has a first position for grinding the ground and a second position for replacing a grinding member 30 disposed thereon, and the grinding disc 20 is provided to be switchable between the first position and the second position; a first moving

wheel 40 provided on the body bracket 10; a second moving wheel 50 connected to the body bracket 10, wherein the second moving wheel 50 has a travelling position in which the second moving wheel 50 is capable of moving along the ground and an avoiding position in which the second moving wheel 50 is away from the ground. The second moving wheel 50 is provided to be switchable between the travelling position and the avoiding position. The floor grinding machine has a first working state for grinding the ground and a second working state for travelling or replacing the grinding member 30. When the grinding disc 20 is in the first position and the second moving wheel 50 is in the avoiding position, the floor grinding machine is in the first working state. When the grinding disc 20 is in the second position and the second moving wheel 50 is in the travelling position, the floor grinding machine is in the second working state.

[0027] The floor grinding machine of the present disclosure includes a body bracket 10, a grinding disc 20, a first moving wheel 40, and a second moving wheel 50. When the grinding disc 20 is in a first position and the second moving wheel 50 is in the avoiding position, a grinding member 30 on the grinding disc 20 is in contact with the ground and the second moving wheel 50 is not in contact with the ground. At this time, the floor grinding machine is capable of grinding the ground. When the grinding disc 20 is in a second position and the second moving wheel 50 is in a travelling position, the grinding disc 20 is at a certain height from the ground, and both the second moving wheel 50 and the first moving wheel 40 are in contact with the ground to support the floor grinding machine. At this time, the grinding member 30 can be replaced, the second moving wheel 50 and the first moving wheel 40 can also drive the floor grinding machine to travel. It can be seen that the grinding member on the floor grinding machine can be easily replaced, so as to solve the problems in the existing operation method of manually moving the equipment to replace the grinding member, which reduces the labor intensity of the operator and improves work efficiency. In addition, the whole machine does not need to be tilted when replacing the grinding member of the floor grinding machine, that is, the body bracket and accessories such as water tank mounted thereon will not be tilted, thus water in the water tank will not overflow. Further, the position of the body bracket will not change, it is also convenient for a large industrial vacuum cleaner to be externally attached.

In addition, the floor grinding machine is easy to travel when transitioning, saving time and effort.

[0028] Specifically, when the grinding disc 20 is in the first position, the grinding disc 20 is used to polish the ground. At this time, a polishing end of the grinding disc 20 is in a parallel or nearly parallel position with respect to the ground. When the grinding disc 20 is in the second position, the grinding disc 20 is at a certain height from the ground, and the polishing end of the grinding disc 20 is tilted to the ground.

[0029] Specifically, the grinding member 30 is a tool head or a grinding disc, and the grinding member 30 is fixed on the bottom of the grinding disc 20. The tool head and the grinding disc are both consumables and need to be replaced frequently. The tool head is used for rough grinding, and the grinding disc is used for fine grinding.

[0030] In this embodiment, the floor grinding machine further includes a telescopic member 60. The telescopic member 60 is connected to the body bracket 10 and the grinding disc 20. At least a part of the telescopic member 60 is provided to be telescopic to drive the grinding disc 20 to switch between the first position and the second position.

[0031] In this embodiment, the floor grinding machine further includes a first support member 70. A first connection end of the first support member 70 is hinged to the grinding disc 20, and a second connection end of the first support member 70 is hinged to the body bracket 10. The telescopic member 60 is hinged to the first support member 70, and a connection point where the telescopic member 60 and the first support member 70 are connected is located between the first connection end and the second connection end. Therefore, it allows the telescopic member 60 and the first support member 70 to drive the grinding disc 20 to swing within a predetermined angle range.

[0032] In this embodiment, the first support member 70 includes a first support portion 71 and a second support portion 72, and the first support portion 71 and the second support portion 72 are provided to be tilted with respect to each other. An end of the first support portion 71 is connected to the second support portion 72, and the other end of the first support portion 71 is hinged to the grinding disc 20. An end of the second support portion 72 away from the first support portion 71 is hinged to the body bracket 10. The telescopic member 60 is hinged to both the first support portion 71 and the body bracket 10, such that

the grinding disc 20 rotates around a connection point where the second support portion 72 and the body bracket 10 are connected.

[0033] Specifically, the first support portion 71 and the second support portion 72 are provided in a predetermined angle.

[0034] Specifically, the first support portion 71 is hinged to the grinding disc 20 through a first connection shaft 140, and the second support portion 72 is hinged to the body bracket 10 through a second connection shaft 150, such that the first support member 70 swings up and down around the second connection shaft 150.

[0035] In this embodiment, the telescopic element 60 has a fixed portion 61 and a telescopic portion 62. The telescopic portion 62 is connected to the fixed portion 61 and is provided to be telescopic with respect to the fixed portion 61. The telescopic portion 62 is hinged to the body bracket 10, and the fixed portion 61 is hinged to the grinding disc 20.

[0036] Specifically, the fixed portion 61 is hinged to the first support portion 71 through a third connection shaft 160, and the telescopic portion 62 is hinged to the body bracket 10 through a fourth connection shaft 170.

[0037] Specifically, the telescopic member 60 is an electric cylinder or a hydraulic cylinder or a manual screw. The telescopic member 60 has a telescopic function and can withstand tension and pressure.

[0038] In this embodiment, the floor grinding machine further includes a second support member 80, an end of the second support member 80 is connected to the body bracket 10, and the second moving wheel 50 is provided at the other end of the second support member 80. The second support member 80 is provided to be rotatable with respect to the body bracket 10 to drive the second moving wheel 50 to switch between the travelling position and the avoiding position.

[0039] Specifically, the second support member 80 is connected to the body bracket 10 through a fifth connection shaft 180, such that the second support member 80 rotates around the fifth connection shaft 180.

[0040] In this embodiment, the floor grinding machine further includes a locking portion 90 provided on the body bracket 10. The locking portion 90 is used to lock or unlock the second support member 80 and the body bracket 10.

[0041] Specifically, the locking portion 90 is an elastic pin, which allows the locking and unlocking of the second support member 80 to be conveniently operated.

[0042] In this embodiment, the floor grinding machine further includes a first driving device 100, and the first driving device 100 is drivingly connected to the grinding disc 20 to drive the grinding disc 20 to rotate. An end of the first support member 70 away from the body bracket 10 is connected to the first driving device 100.

[0043] Specifically, the first driving device 100 is a motor.

[0044] In this embodiment, the floor grinding machine further includes a second driving device 110 provided on the body bracket 10. The second driving device 110 is connected to the first moving wheel 40 to drive the first moving wheel 40 to rotate, which allows the first moving wheel 40 to drive the floor grinding machine to travel, that is, the first moving wheel 40 is a driving wheel.

[0045] Specifically, the second moving wheel 50 is a universal wheel.

[0046] Specifically, the second driving device 110 is a motor.

[0047] In this embodiment, the floor grinding machine further includes a water tank 120 and a rechargeable battery 130. Both the water tank 120 and the rechargeable battery 130 are provided on the body bracket 10, which ensures that water in the water tank 120 will not overflow. The rechargeable battery 130 can be used to supply power to the second driving device 110.

[0048] In specific implementation, as shown in FIG. 1, when the floor grinding machine is in the first working state, the second support member is located at the upper left of the body bracket and is locked by the elastic pin, such that the second support member and the body bracket are relatively fixed. At this time, the electric cylinder (that is, the telescopic member) is in a fully extended state, the grinding disc and the tool head (or grinding disc) thereon are directly in contact with the ground. When the first driving device rotates, the grinding disc is driven, and the tool head (or grinding disc) is driven by the grinding disc to grind the ground.

[0049] In specific implementation, as shown in FIG. 4, when the floor grinding machine is in the second working state, the second support member is located at the lower left of the body bracket and is locked by the elastic pin, such that the second support

member and the body bracket are relatively fixed, and the second moving wheel is in contact with the ground. At this time, the electric cylinder is in a fully retracted state, the grinding disc and the tool head (or grinding disc) thereon are not in contact with the ground, and are at a certain height from the ground. It is very convenient to replace the tool head (or grinding disc) at the bottom of the grinding disc at this time. At this time, only position states of the grinding disc, the first driving device, and the first support member are changed to a tilted state, but the state of the body bracket is the same as the state of the body bracket when the floor grinding machine is grinding, and is still in a horizontal state. Therefore, the water tank mounted on the body bracket is also in a horizontal state, the water tank will not overflow due to the lifting of the grinding disc, and it is also convenient for a vacuum cleaner to be externally attached to the rear of the floor grinding machine.

[0050] When an operator needs to replace the tool head (or grinding disc), that is, when turning from the state in FIG. 1 to the state in FIG. 4, first, the elastic pin fixed with the body bracket needs to be pulled out, and the second support member is swung from the state in FIG. 1 to the state in FIG. 4 around the fifth connection shaft, and then the elastic pin is inserted, such that the second support member is fixed with the body bracket. Then the electric cylinder is operated to retract, the grinding disc and the first support member are swung upwards around the second connection shaft. When the electric cylinder is fully retracted, the grinding disc stops moving and the lifting is completed, as shown in FIG. 4. At this time, the tool head (or grinding piece) can be easily replaced, or the machine can automatically transition and travel, that is, automatic transition from one construction site to another.

[0051] When the operator finishes replacing the tool head (or grinding disc) and needs to continue grinding, that is, when turning from the state in FIG. 4 to the state in FIG. 1, the electric cylinder needs to be operated to extend outwards, the grinding disc and the first support member are swung downwards around the second connection shaft. When the electric cylinder is fully extended, the tool head (or grinding disc) on the grinding disc is in contact with the ground. Then the elastic pin fixed with the body bracket is pulled out, the first support member is swung from the state in FIG. 4 to the state in FIG. 1 around the fifth connection shaft, and then the elastic pin is inserted, such that the first support member

is fixed with the body bracket, as shown in FIG. 1.

[0052] When the operator needs to transport the floor grinding machine from an operating point to another area, such as from basement level 1 to basement level 2, since the floor grinding machine in this disclosure is equipped with the rechargeable battery and the second driving device for travelling, after the floor grinding machine is adjusted to the state in FIG. 4, and a travelling power switch is turned on, the floor grinding machine can automatically walk for a long distance. Neither an external vehicle for transfer nor a manpower for pushing the equipment to move is required, so the transfer is time-saving and labor-saving.

[0053] The telescopic member of the floor grinding machine of the present disclosure can automatically lift the grinding disc to the second position, and the operator can easily replace the tool head or grinding disc. After the replacement of the tool head or grinding disc is completed, the telescopic member can automatically lower the grinding disc to the ground. During the whole process, the position state of the body bracket of the floor grinding machine will not be changed, so the operation is simple and labor-saving, and the water tank and other parts mounted on the body bracket does not tilt. Therefore, it is convenient to use a water spray function of the floor grinding machine and the external industrial vacuum cleaner, and the like.

[0054] The floor grinding machine of the present disclosure can travel automatically when transporting, without manual pushing, which is time-saving and labor-saving.

[0055] From the above description, it can be seen that the above-mentioned embodiments of the present disclosure achieve the following technical effects.

[0056] The floor grinding machine of the present disclosure includes the body bracket 10, the grinding disc 20, the first moving wheel 40, and the second moving wheel 50. When the grinding disc 20 is in the first position and the second moving wheel 50 is in the avoiding position, the grinding member 30 on the grinding disc 20 is in contact with the ground and the second moving wheel 50 is not in contact with the ground, at this time, the floor grinding machine can grind the ground. When the grinding wheel 20 is in the second position and the second moving wheel 50 is in the travelling position, the grinding disc 20 is at a certain height from the ground, and the second moving wheel 50 and the first moving

wheel 40 are in contact with the ground to support the floor grinding machine, at this time, the grinding member 30 can be replaced, and the second moving wheel 50 and the first moving wheel 50 can also drive the floor grinding machine to travel. It can be seen that the grinding member of the floor grinding machine can be easily replaced, so as to solve the problem in the existing operation method of manually moving the equipment to replace the grinding member, which reduces the labor intensity of the operator, and improves the work efficiency. In addition, the whole machine does not need to be tilted when replacing the grinding member of the floor grinding machine, that is, the body bracket and the accessories, such as the water tank, and the like, mounted thereon are not tilted, and the water in the water tank does not overflow. In addition, since the position of the body bracket does not be changed, it is also convenient to externally attach a large industrial vacuum cleaner. Furthermore, the floor grinding machine is easy to travel when transferring, saving time and effort.

[0057] The foregoing descriptions are merely preferred embodiments of the disclosure, and are not intended to limit the disclosure. For those skilled in the art, the disclosure can have various modifications and changes. Any modification, equivalent replacement, improvement and the like made within the spirit and principle of this disclosure shall be included in the protection scope of this disclosure.

CLAIMS

What is claimed is:

1. A floor grinding machine, comprises:

a body bracket;

a grinding disc connected to the body bracket, wherein the grinding disc has a first position configured to grind the ground and a second position configured to replace a grinding member provided thereon, and the grinding disc is provided to be switchable between the first position and the second position;

a first moving wheel provided on the body bracket;

a second moving wheel connected to the body bracket, wherein the second moving wheel has a travelling position in which the second moving wheel is capable moving along the ground and an avoiding position in which the second moving wheel is away from the ground, and the second moving wheel is provided to be switchable between the travelling position and the avoiding position,

wherein the floor grinding machine has a first working state configured to grind the ground and a second working state configured to travel or to replace the grinding member, when the grinding disc is in the first position and the second moving wheel is in the avoiding position, the floor grinding machine is in the first working state; and when the grinding disc is in the second position and the second moving wheel is in the travelling position, the floor grinding machine is in the second working state.

2. The floor grinding machine of claim 1, wherein the floor grinding machine further comprises:

a telescopic member connected to both the body bracket and the grinding disc, at least a part of the telescopic member is provided to be telescopic to drive the grinding disc to switch between the first position and the second position.

3. The floor grinding machine of claim 2, wherein the floor grinding machine further comprises:

a first support member, a first connection end of the first support member is hinged to the grinding disc, a second connection end of the first support member is hinged to the body bracket, the telescopic member is hinged to the first support member, a connection point between the telescopic member and the first support member is located between the first connection end and the second connection end.

4. The floor grinding machine of claim 3, wherein the first support member comprises a first support portion and a second support portion, the first support portion and the second support portion are provided to be tilted with respect to each other, an end of the first support portion is connected to the second support portion, and the other end of the first support portion is hinged to the grinding disc, an end of the second support portion away from the first support portion is hinged to the body bracket, the telescopic member is hinged to both the first support portion and the body bracket, such that the grinding disc rotates around a connection point between the second support portion and the body bracket.

5. The floor grinding machine of claim 2, wherein the telescopic member has a fixed portion and a telescopic portion, the telescopic portion is connected to the fixed portion and is provided to be telescopic with respect to the fixed portion, the telescopic portion is connected to the body bracket, and the fixed portion is connected to the grinding disc.

6. The floor grinding machine of claim 1, wherein the floor grinding machine further comprises:

a second support member, an end of the second support member is connected to the body bracket, the second moving wheel is provided at the other end of the second support member, and the second support member is provided to be rotatable with respect to the

body bracket to drive the second moving wheel to switch between the travelling position and the avoiding position.

7. The floor grinding machine of claim 6, wherein the floor grinding machine further comprises:

a locking portion provided on the body bracket, and the locking portion is used to lock or unlock the second support member and the body bracket.

8. The floor grinding machine of claim 3, wherein the floor grinding machine further comprises:

a first driving device drivingly connected to the grinding disc to drive the grinding disc to rotate,

wherein an end of the first support member away from the body bracket is connected to the first driving device.

9. The floor grinding machine of claim 1, wherein the floor grinding machine further comprises:

a second driving device provided on the body bracket, and the second driving device is connected to the first moving wheel to drive the first moving wheel to rotate.

10. The floor grinding machine of any one of claims 1 to 9, wherein the floor grinding machine further comprises a water tank and a rechargeable battery, both the water tank and the rechargeable battery are provided on the body bracket.