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(54) **HANDHELD WET GRINDER**

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(57) **ABSTRACT**

A handheld wet grinder designed with water-discharging mechanism for wetting the powders. The wet grinder includes a main body and a water-discharging switch. A water incoming flow way is disposed in the main body and extends from the rear end of the main body to the front end thereof. A valve is installed in the flow way. The water-discharging switch is mounted on a circumference of the front end of the main body and connected with the valve. When shifting the water-discharging switch, the valve is driven to block or unblock the water incoming flow way so as to control water flow. The water incoming flow way is directly disposed in the main body without being exposed to outer side so that the flow way of water is protected from being damaged. In addition, the water-discharging switch is positioned at the front end of the main body so that a user can conveniently operate the water-discharging switch with the hand holding the main body without using the other hand.

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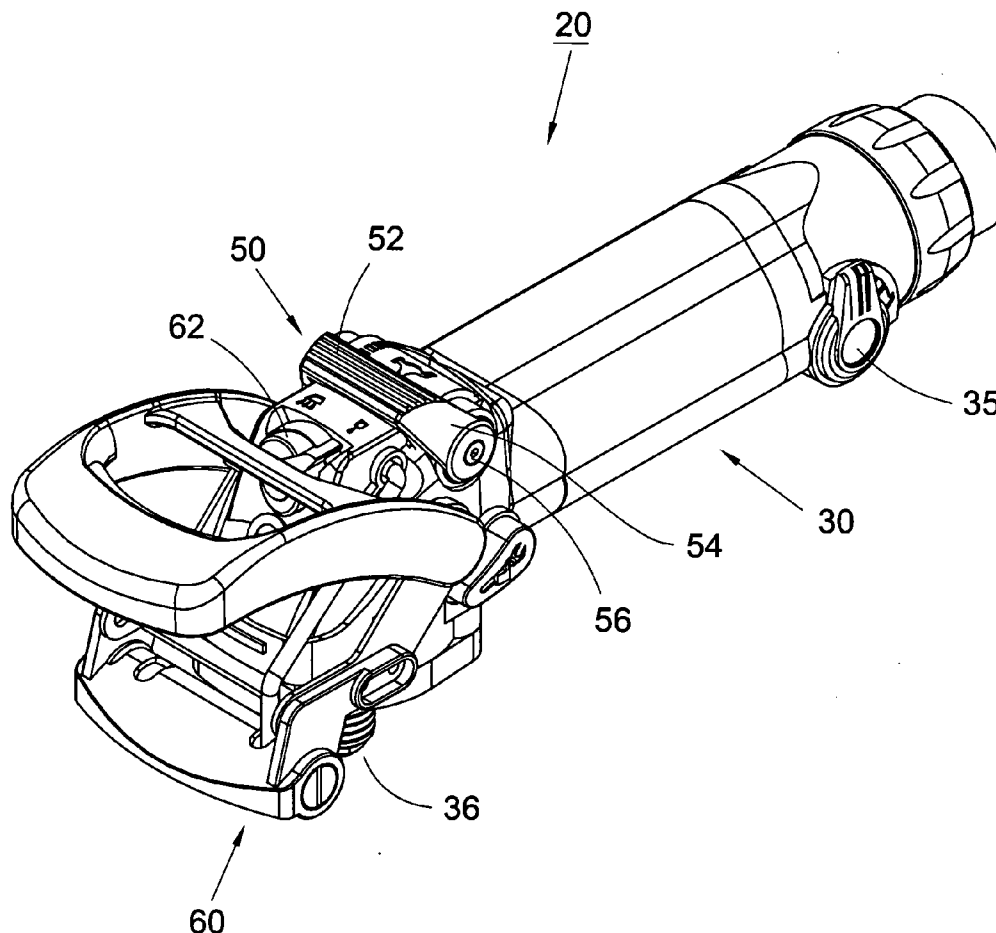
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(63) Continuation-in-part of application No. 11/514,362, filed on Sep. 1, 2006, now Pat. No. 7,311,588.

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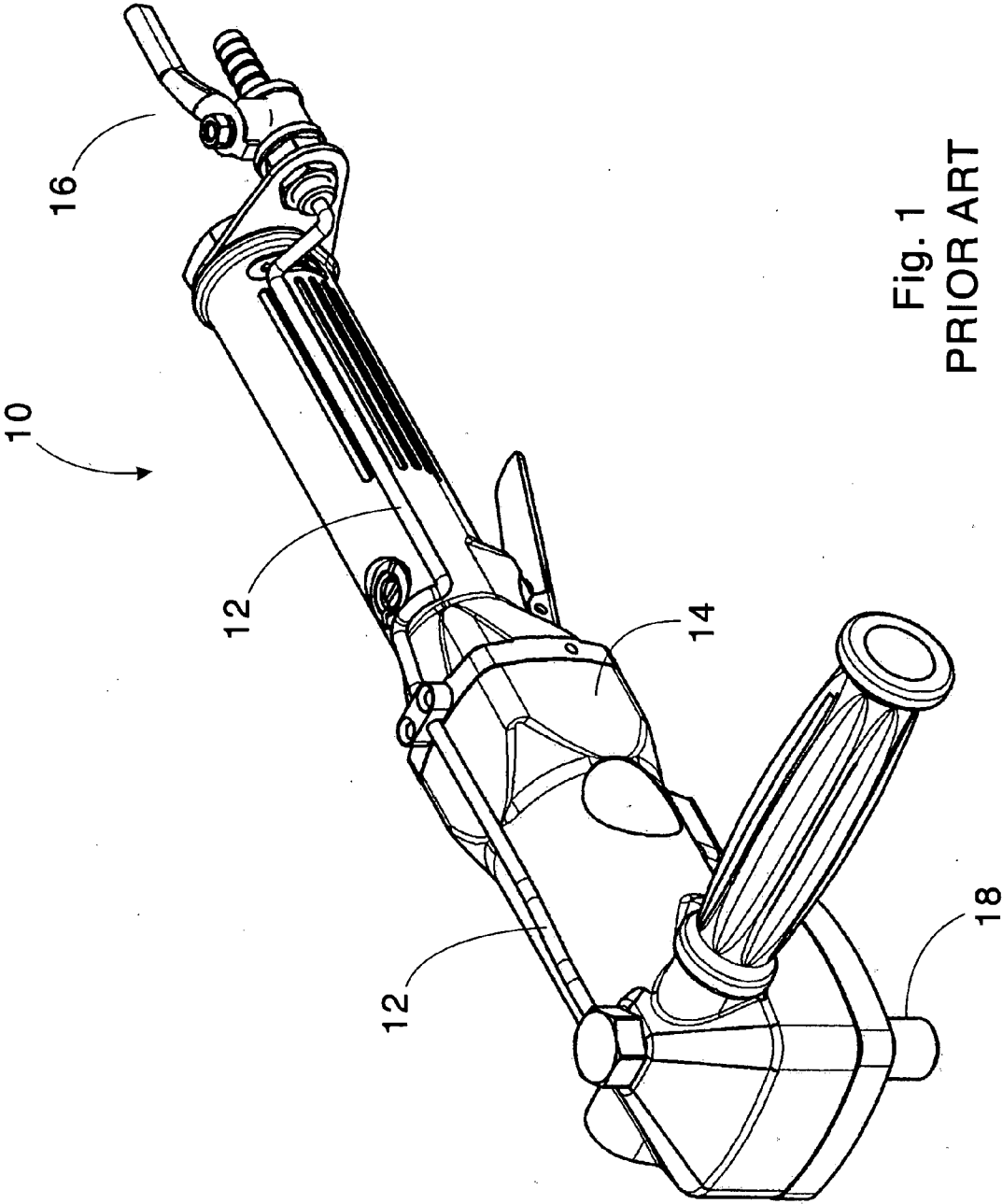


Fig. 1
PRIOR ART

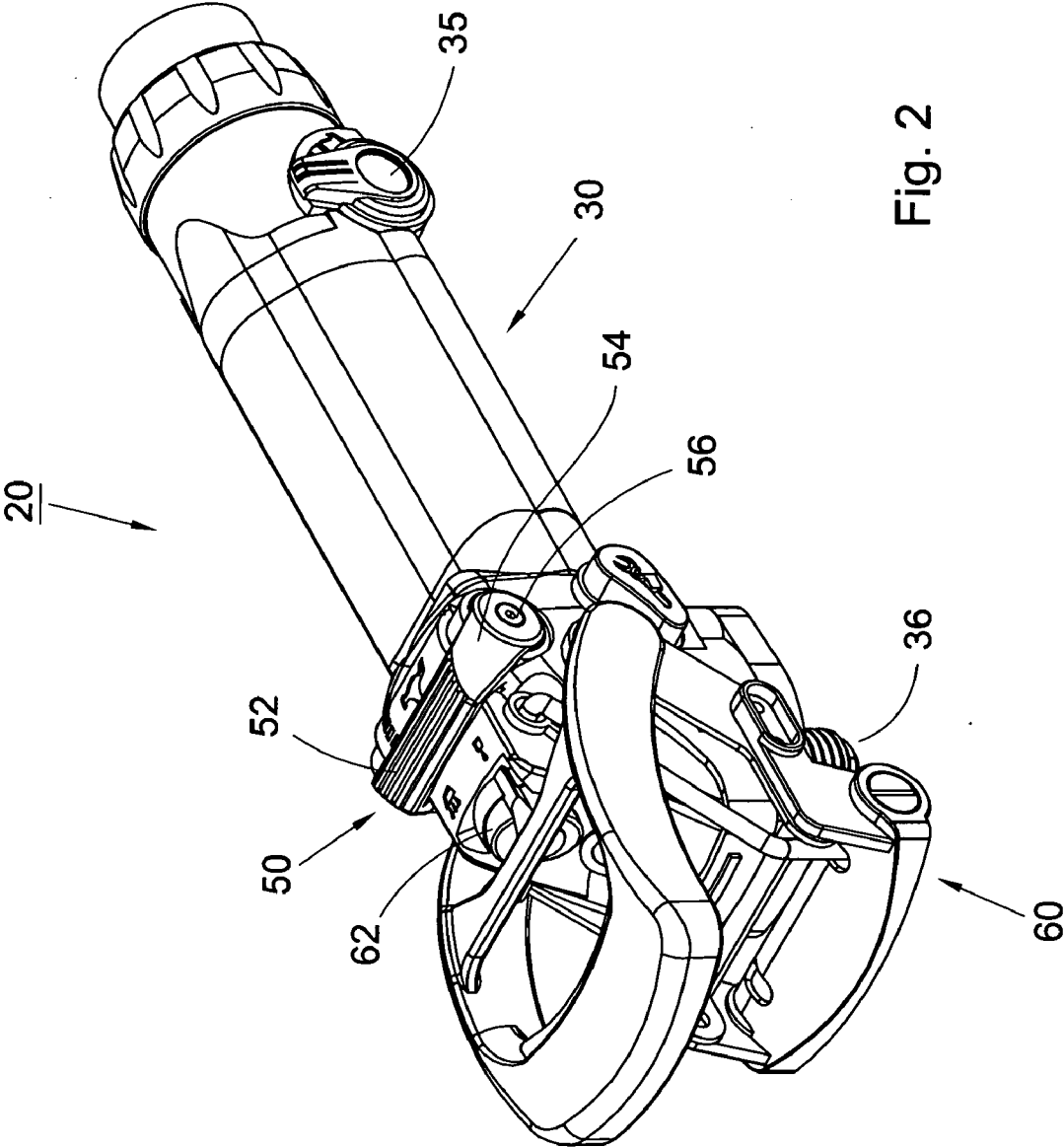


Fig. 2

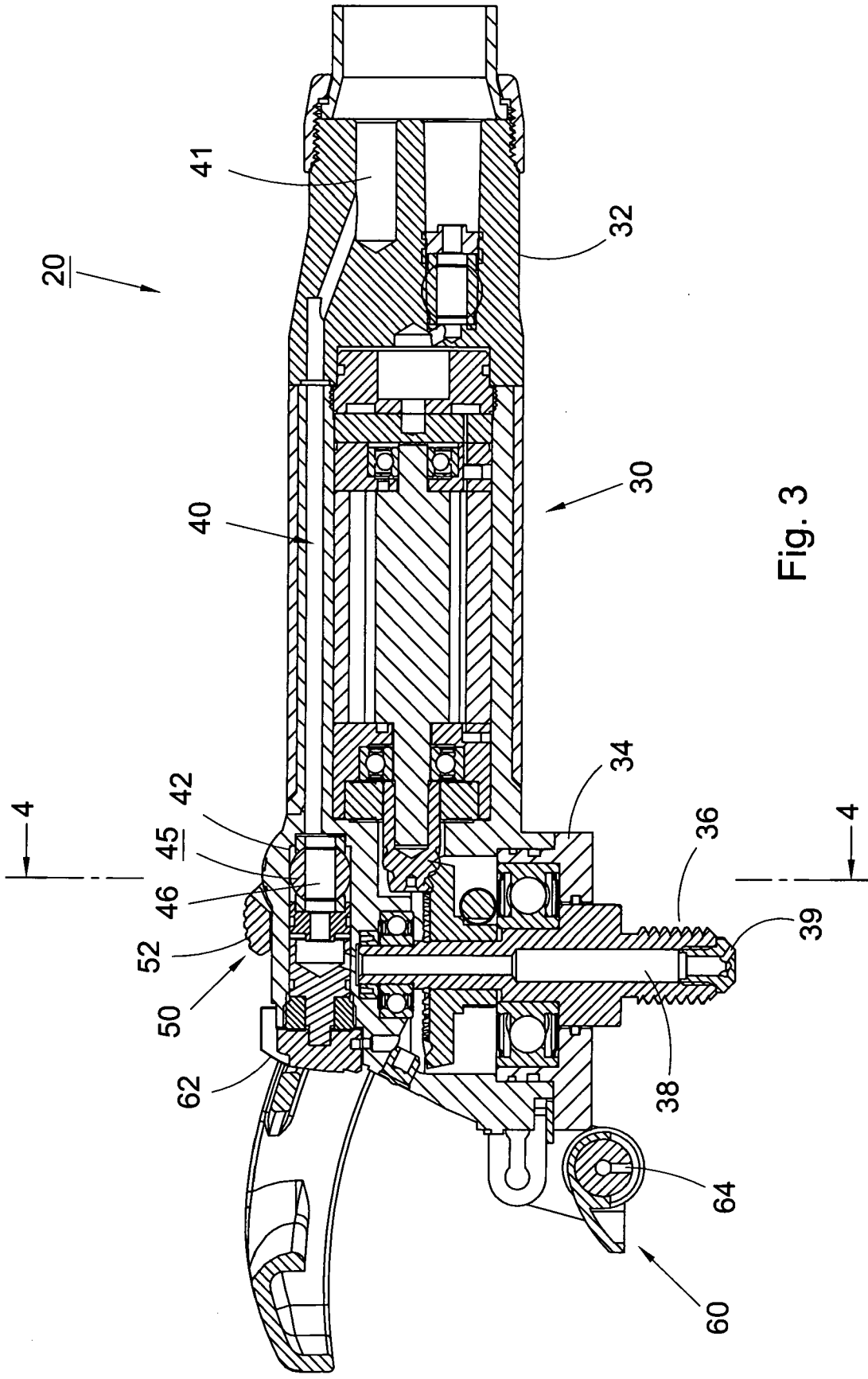


Fig. 3

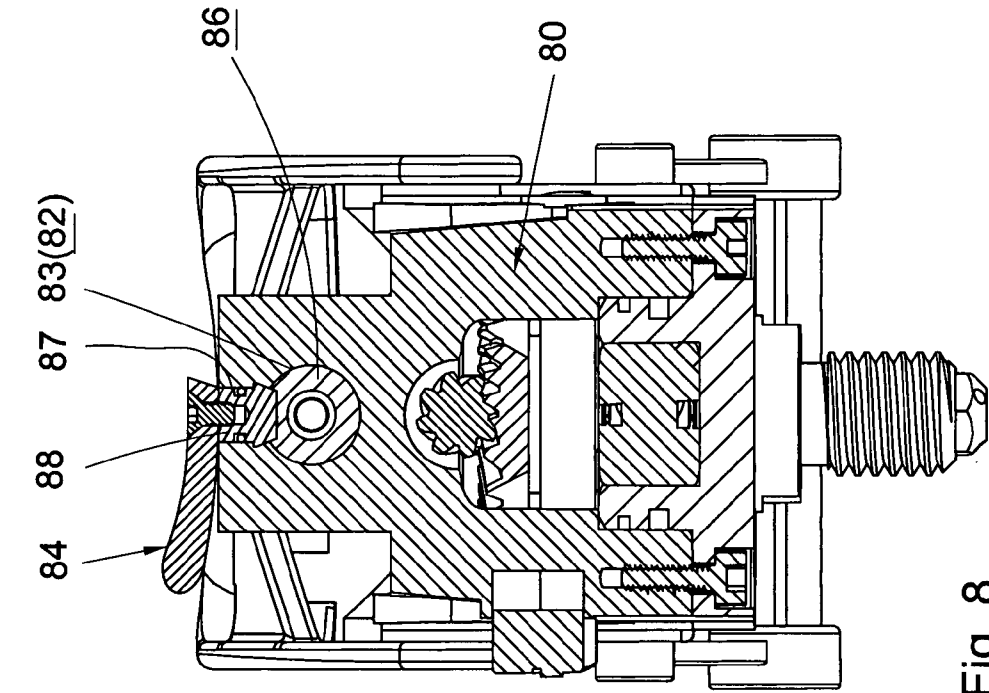


Fig. 4

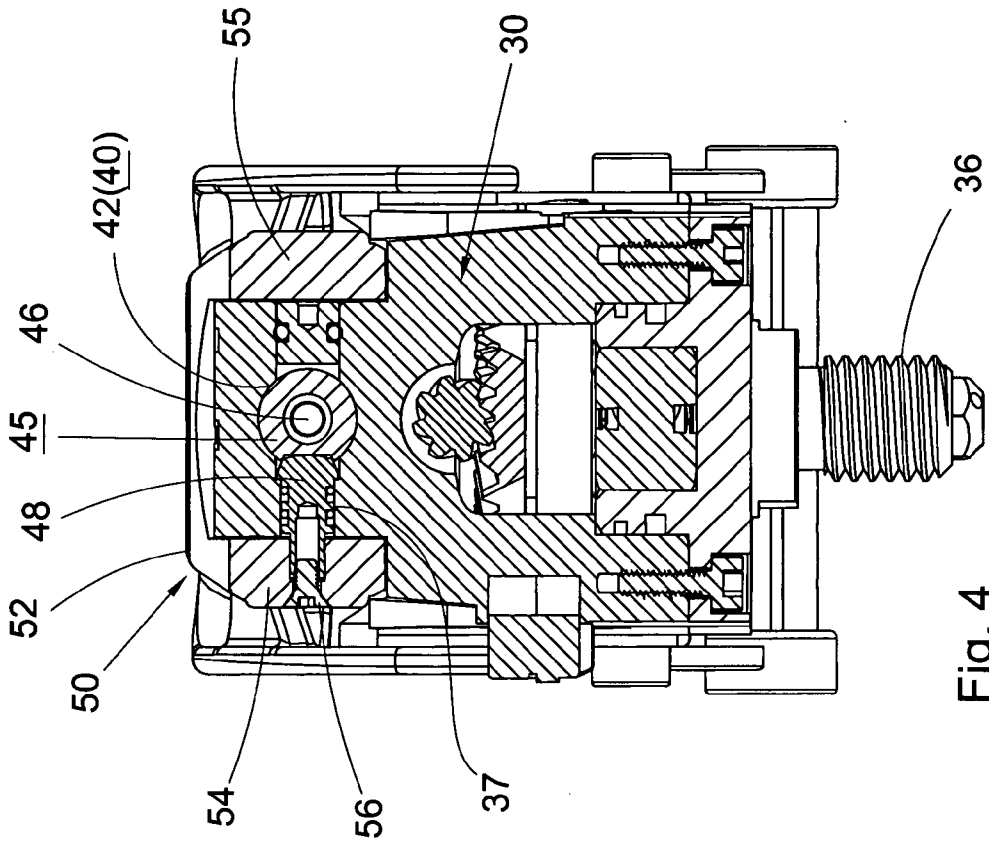
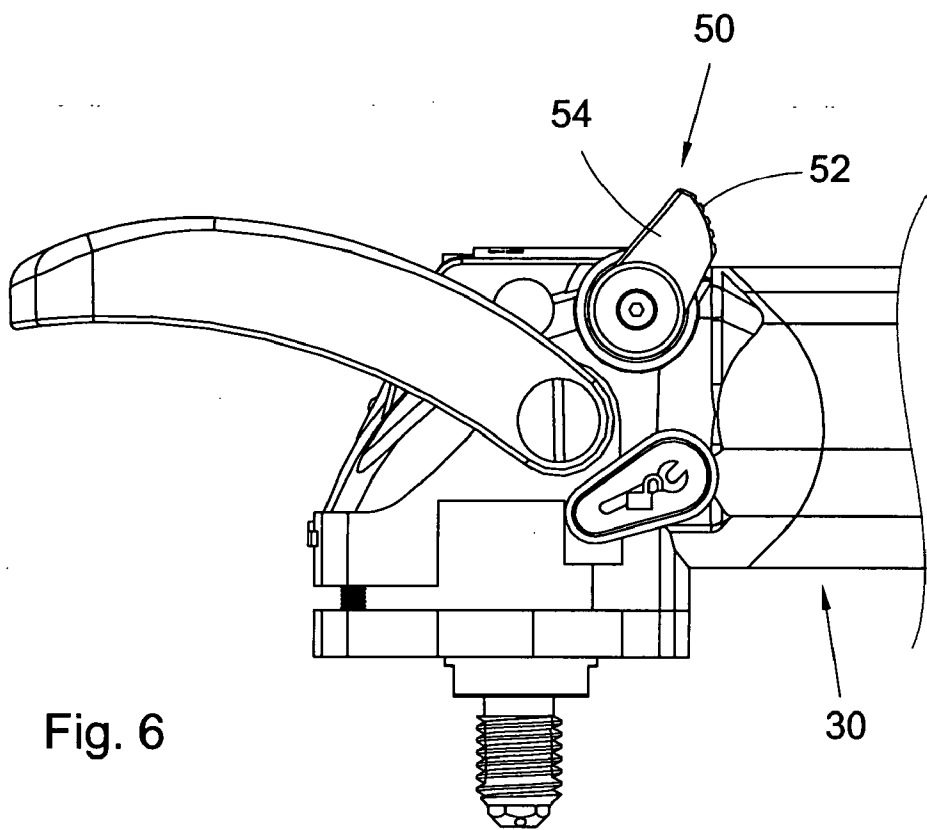
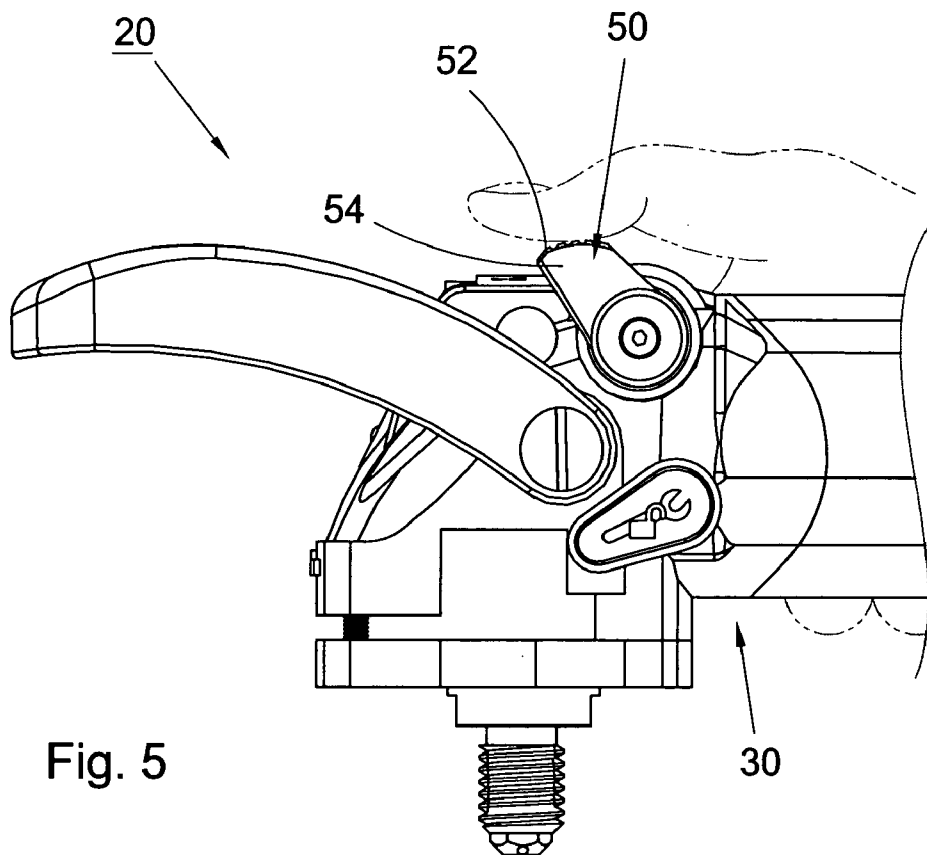


Fig. 8



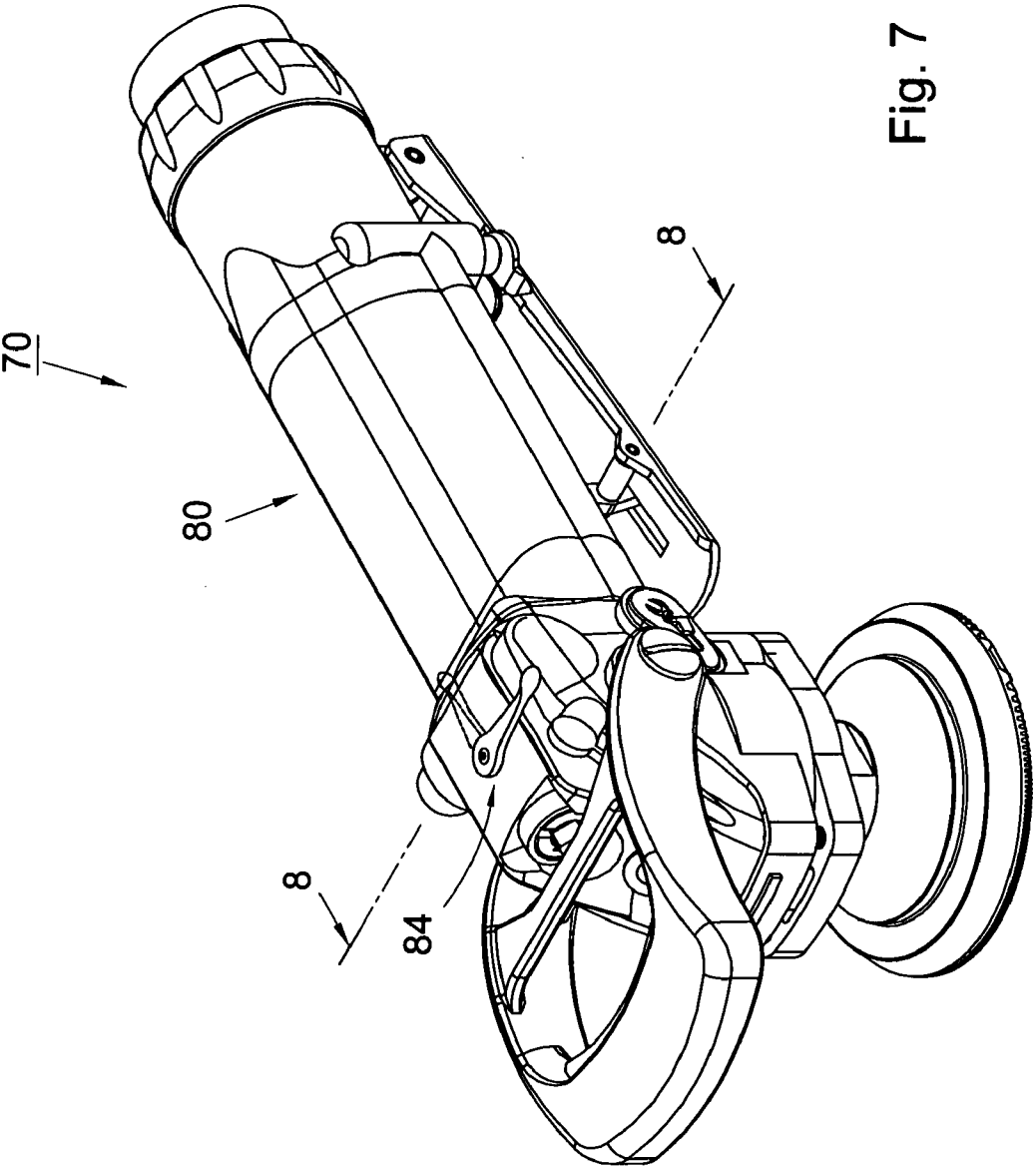


Fig. 7

HANDHELD WET GRINDER

[0001] This application is a Continuation-in-Part of pending application U.S. Ser. No. 11/514,362, entitled "WATER GRINDER" and filed on Sep. 1, 2006.

FIELD OF THE INVENTION

[0002] The present invention is related to a grinding device, and more particularly to a handheld grinder with wetting effect. The water incoming flow way of the grinder is disposed in the grinder. In addition, the water-discharging switch of the grinder is easily operable.

BACKGROUND OF THE INVENTION

[0003] When grinding a work piece with a handheld grinder, much powder dust is produced. The conventional grinder is designed with a water-discharging unit for wetting the powder dust and avoiding flight thereof.

[0004] FIG. 1 shows a conventional handheld wet grinder 10 in which a water pipe 12 is mounted on the main body 14 for connecting with a water source. A water-discharging switch 16 is connected to the water pipe 12. When the switch 16 is switched on, the water will flow into the water pipe 12 and then flow out from the rotary shaft 18 of the grinder.

[0005] In the above handheld wet grinder, the water pipe 12 is externally added to the main body and exposed to outer side thereof. In use, the water pipe tends to be collided and broken to lead to leakage of the water.

[0006] Moreover, the water-discharging switch 16 is positioned at a rear end of the main body 14 so that it is inconvenient to operate the switch 16. That is, when controlling the water flow, a user needs to hold the main body 14 with one hand and switch the switch 16 with the other hand. Therefore, it is necessary for the user to use both hands to operate the grinder, unable to operate with single hand.

SUMMARY OF THE INVENTION

[0007] It is therefore a primary object of the present invention to provide a handheld wet grinder in which the flow way of the water is protected from being collided and broken.

[0008] It is a further object of the present invention to provide a handheld wet grinder having a water-discharging switch for controlling water flow. The wet grinder enables a user to operate the water-discharging switch with single hand.

[0009] According to the above objects, the handheld wet grinder of the present invention has a water incoming flow way which is directly disposed in the main body of the grinder. Therefore, the water incoming flow way is protected from being collided and damaged.

[0010] The grinder of the present invention has a water-discharging switch positioned at a front end of the main body. Accordingly, a user can conveniently operate the water-discharging switch with the hand holding the main body. Therefore, the user can operate the water-discharging switch with single hand.

[0011] Preferably, the water-discharging switch is positioned on a top face of the front end of the main body of the grinder.

[0012] Preferably, the water-discharging switch is back and forth shiftable along the length of the main body. Alternatively, the water-discharging switch is rotatable to control the water flow.

[0013] The present invention can be best understood through the following description and accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a perspective view of a conventional wet grinder;

[0015] FIG. 2 is a perspective view of a first embodiment of the present invention;

[0016] FIG. 3 is a longitudinal sectional view according to FIG. 2;

[0017] FIG. 4 is a sectional view taken along line 4-4 of FIG. 3;

[0018] FIG. 5 is a side view according to FIG. 2;

[0019] FIG. 6 is a side view according to FIG. 5, showing that the water-discharging switch is switched to the shutoff position;

[0020] FIG. 7 is a perspective view of a second embodiment of the present invention; and

[0021] FIG. 8 is a sectional view taken along line 8-8 of FIG. 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] Please refer to FIG. 2. According to a first embodiment, the handheld wet grinder 20 of the present invention has a main body 30 and an activation switch 35 mounted on a circumference of the main body 30 for activating the grinder. The activation switch 35 can be a rotary switch, a trigger, a press button or the like. When the grinder is turned on, a rotary shaft 36 is driven and rotated. The rotary shaft 36 is mounted in the main body 30 at a front end thereof. A bottom end of the rotary shaft extends out of the main body for mounting a grinding tool thereon for grinding a work piece.

[0023] The grinder of the present invention further has a water incoming flow way 40 and a water-discharging switch 50.

[0024] Referring to FIG. 3, the water incoming flow way 40 is disposed in the main body 30 and extends from a rear end 32 of the main body to a front end thereof. A rear end 41 of the water incoming flow way 40 is connected to a water source. A valve 45 which is a ball valve in this embodiment is disposed in the water incoming flow way 40. A valve chamber 42 is formed in the front end of the water incoming flow way 40 for installing the valve 45 therein.

[0025] The water-discharging switch 50 is mounted on a circumference of the front end 34 of the main body 30 for controlling the valve 45. Referring to FIG. 4, the water-discharging switch 50 has a shift section 52 and at least one lug 54 positioned on one side of the shift section 52. In practice, preferably there are two lugs 54, 55 respectively disposed on two sides of the shift section. The water-discharging switch 50 is bridged over a top face of the front

end of the main body with the two lugs **54**, **55** respectively positioned on two sides of the main body **30**. Accordingly, the shift section **52** is positioned on the top face of the main body **30** for a user to shift. At least one lug **54** is pivotally connected with one side of the main body, whereby the water-discharging switch **50** is rotatable about the pivot of the lug. The water-discharging switch **50** is substantially mounted above the rotary shaft **36**.

[0026] To speak more detailedly, at least one pivot hole **37** is formed on one side of the main body **30** to communicate with the valve chamber **42** of the flow way. A connector **48** is airtight rotatably disposed in the pivot hole **37**. An inner end of the connector **48** is connected with the valve **45**. The lug **54** is connected with an outer end of the connector **48** via a threaded member **56**. Accordingly, the water-discharging switch **50** is rotatable about the pivot hole. When shifting the water-discharging switch **50**, the valve **45** is driven to rotate. The connector **48** is connected with the center of the ball valve **45** so that the rotational center of the water-discharging switch **50** coincides with the center of the ball valve **45**.

[0027] Referring to FIG. 3, in this embodiment, the rotary shaft **36** has a passage **38** communicating with the water incoming flow way **40**. In addition, the front end of the main body is installed with an external water-discharging mechanism **60** communicating with the flow way **40**. By means of operating a selection switch **62**, the water is controlled to flow out from at least one outlet **39** of the rotary shaft or from at least one outlet **64** of the external water-discharging mechanism **60**. The position where the water flows out is not the major subject of the present invention so that this will not be further described hereinafter.

[0028] Referring to FIG. 5, in use, a user holds the main body **30** with one hand to operate the grinder. The water-discharging switch **50** is disposed on the top face of the front end of the main body, therefore, it can be clearly seen from FIG. 5 that the user can shift the shift section **52** of the water-discharging switch **50** with one finger (such as the thumb) of the same hand to control the water flow. When the water-discharging switch **50** is pushed forward to the fully open position as shown in FIG. 5, the valve **45** is positioned in a fully open position as shown in FIG. 3, where a through hole **46** of the valve **45** fully communicates with the flow way **40**. Under such circumstance, the water flowing into the water incoming flow way can pass through the valve **45** to flow out from the outlet **39** or the outlet **64** to wet the powders produced in grinding operation.

[0029] When the water-discharging switch **50** is shifted rearward to the shutoff position as shown in FIG. 6, the valve **45** is such driven and rotated by the switch **50** that the through hole **46** no more communicates with the water incoming flow way **40** to block the flow way. When the switch is shifted to a position between the positions of FIGS. 5 and 6, the amount of the water flow can be controlled.

[0030] FIGS. 7 and 8 show a second embodiment of the grinder **70** of the present invention, which also includes a main body **80**, a water incoming flow way **82**, a water-discharging switch **84** and a valve **86** installed in a valve chamber **83** of the flow way **82**.

[0031] A pivot hole **87** is formed on a top face of the main body **80** to communicate with the valve chamber **83**. The switch **84** is mounted on the top face of the main body. A

connector **88** is arranged in the pivot hole **87** to connect one end of the switch **84** with the valve **86**. The rotational center of the water-discharging switch coincides with the center of the valve **86**.

[0032] When the free end of the switch **84** is shifted, the switch **84** rotationally drives the valve **86** to control the water flow.

[0033] It should be noted that the water-discharging switch of the invention can be alternatively arranged on the circumference of the front end of the main body. The position of the water-discharging switch is not limited to the top face of the front end of the main body.

[0034] According to the above arrangement, the water-discharging switch can be directly operated with the hand holding the main body. Therefore, a user can operate the grinder and control the water-discharging switch by single hand. This facilitates the use of the grinder. Moreover, the water incoming flow way is directly disposed in the main body so that the water incoming flow way is protected from being collided and damaged.

[0035] The above embodiments are only used to illustrate the present invention, not intended to limit the scope thereof. Many modifications of the above embodiments can be made without departing from the spirit of the present invention.

What is claimed is:

1. A handheld wet grinder comprising:

a main body having a front end and a rear end;

a water incoming flow way disposed in the main body and extending from the rear end of the main body to the front end thereof;

a valve installed in the flow way; and

a water-discharging switch mounted on a circumference of the front end of the main body for a user to shift, the water-discharging switch being connected with the valve, whereby when shifting the water-discharging switch, the valve is driven to block or unblock the water incoming flow way.

2. The grinder as claimed in claim 1, wherein the water-discharging switch is arranged on a top face of the front end of the main body.

3. The grinder as claimed in claim 1, wherein when the water-discharging switch is shifted, the water-discharging switch is moved back and forth along the length of the main body.

4. The grinder as claimed in claim 2, wherein when the water-discharging switch is shifted, the water-discharging switch is moved back and forth along the length of the main body.

5. The grinder as claimed in claim 1, wherein the water-discharging switch is pivotally connected with the main body, whereby when the water-discharging switch is shifted, the water-discharging switch is rotated.

6. The grinder as claimed in claim 1, wherein one end of the water-discharging switch is pivotally connected with the main body, whereby when the other end of the water-discharging switch is shifted, the water-discharging switch is rotated.

7. The grinder as claimed in claim 1, wherein a valve chamber is formed at a front end of the water incoming flow way and the valve is disposed in the valve chamber.

8. The grinder as claimed in claim 7, wherein a pivot hole is formed on the circumference of the main body to communicate with the valve chamber; a connector is mounted in the pivot hole, an inner end of the connector is connected with the valve; the water-discharging switch is connected with an outer end of the connector.

9. The grinder as claimed in claim 1, wherein a pivot hole is formed on the circumference of the main body to communicate with the water incoming flow way; a connector is mounted in the pivot hole, an inner end of the connector is connected with the valve; the water-discharging switch is connected with an outer end of the connector.

10. The grinder as claimed in claim 1, wherein at least one pivot hole is formed on at least one side of the main body to communicate with the water incoming flow way; the water-discharging switch having a shift section and at least one lug positioned on one side of the shift section, the lug being pivoted with the pivot hole and connected to the valve; the shift section being positioned on the top face of the main body, whereby when shifted, the water-discharging switch is rotated about the pivot of the lug and the shift section of the water-discharging switch is moved back and forth along the length of the main body

11. The grinder as claimed in claim 10, further comprises a connector installed in the pivot hole, an inner end of the connector is connected with the valve; the lug of the water-discharging switch is connected with an outer end of the connector.

12. The grinder as claimed in claim 10, wherein the water-discharging switch has two lugs respectively disposed on two sides of the shift section, the two lugs respectively positioned on two sides of the main body.

13. The grinder as claimed in claim 1, wherein a pivot hole is formed on a top face of the main body to communicate with the water incoming flow way; the water-discharging switch is connected with the valve via the pivot hole, whereby when the water-discharging switch is shifted, the water-discharging switch is rotated.

14. The grinder as claimed in claim 1, wherein the front end of the main body has a rotary shaft; the water-discharging switch is positioned above the rotary shaft.

15. The grinder as claimed in claim 2, wherein the front end of the main body has a rotary shaft; the water-discharging switch is positioned above the rotary shaft.

16. A handheld wet grinder comprising:

a main body having a front end and a rear end;

a water incoming flow way disposed in the main body and extending from the rear end of the main body to the front end thereof;

a ball valve installed in the flow way; and

a water-discharging switch pivotally mounted on a circumference of the front end of the main body for a user to shift, the water-discharging switch being connected with the ball valve, the water-discharging switch having a rotational center coinciding with the center of the ball valve, whereby when shifting the water-discharging switch, the ball valve is driven and rotated.

17. The grinder as claimed in claim 16, wherein the front end of the main body has a rotary shaft; the water-discharging switch is arranged on a top face of the front end of the main body and is positioned above the rotary shaft.

18. The grinder as claimed in claim 16, wherein when the water-discharging switch is shifted, the water-discharging switch is moved back and forth along the length of the main body.

19. The grinder as claimed in claim 16, wherein the water-discharging switch is pivotally connected with the main body, whereby when the water-discharging switch is shifted, the water-discharging switch is rotated.

20. The grinder as claimed in claim 16, wherein at least one pivot hole is formed on at least one side of the main body to communicate with the water incoming flow way; the water-discharging switch having a shift section and at least one lug positioned on one side of the shift section, the lug being pivoted with the pivot hole and connected to the ball valve; the shift section being positioned on the top face of the main body, whereby when shifted, the water-discharging switch is rotated about the pivot of the lug and the shift section of the water-discharging switch is moved back and forth along the length of the main body

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