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(54) MULTIFUNCTIONAL VACUUM CLEANER

(57) The present application discloses a multifunctional dust collector, including: a machine body, a dirt storage tank, an electric floor brush, a hand-held dust collector and a cleaning fluid tank, wherein the hand-held dust collector is detachably plugged on an upper end of the machine body, the hand-held dust collector includes a dust cylinder assembly, the dust cylinder assembly includes a dust-air separation chamber and a dust storage chamber, the dust-air separation chamber and the dust storage chamber are parallel to each other and are independently disposed, and the dust-air separation chamber is positioned upstream of the dust storage chamber; the hand-held dust collector is detachably mounted on the machine body; and the multifunctional dust collector at least includes two working modes, namely, a stick type dust collector mode and a hand-held dust collector mode.

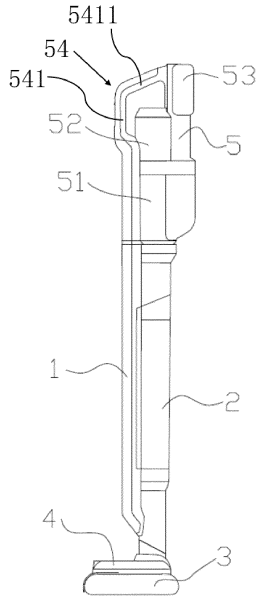

FIG.1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The disclosure claims priority to Chinese Patent Application No. 202210906084.X filed on July 29, 2022, before the Patent Office of the China National Intellectual Property Administration, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present application relates to the technical field of dust collectors, and for example, relates to a multifunctional dust collector.

BACKGROUND

[0003] In the related art, for a hand-held dry and wet dual-purpose dust collector, a dirt storage tank is generally disposed on a machine body or the dirt storage tank for dust is taken as a separate accessory. Such design results in that although the machine body of the hand-held dust collector is designed to be detachable, when the hand-held dust collector is taken down for separate use, it is impossible to directly suck liquid or dust, and other accessories must be added for use, thereby being very inconvenient.

SUMMARY

[0004] The present application provides a multifunctional dust collector which has an optimized structure and can facilitate hand-held operation for dust collection by a user, so as to enable the user to obtain a better use experience.

[0005] An example of the present application provides a multifunctional dust collector, including: a machine body provided with a dirt storage tank; an electric floor brush pivotably connected to a lower end of the machine body and provided with a detachable cleaning fluid tank; and a hand-held dust collector detachably plugged on an upper end of the machine body and including a dust cylinder assembly, the dust cylinder assembly including a dust-air separation chamber and a dust storage chamber, the dust-air separation chamber and the dust storage chamber being parallel to each other and being independently disposed, and the dust-air separation chamber being positioned upstream of the dust storage chamber; the multifunctional dust collector at least including the following two working modes:

a stick type dust collector mode, wherein the hand-held dust collector is connected to the upper end of the machine body by plugging and bonding, under the action of a suction force of the hand-held dust collector, a fluid entrained with dirt enters the dirt storage tank from a suction inlet of the electric floor brush for first-stage fluid separation, and at least one of dust and liquid is stored in the dirt storage tank; and the fluid after the first-stage separation enters the dust cylinder assembly through a fluid channel in the machine body for second-stage fluid separation, and separated clean air is discharged from an air outlet of the hand-held dust collector; and

a hand-held dust collector mode, wherein the hand-held dust collector is unlocked and separated from the upper end of the machine body and used alone, under the action of the suction force of the hand-held dust collector, a fluid entrained with dirt enters the dust-air separation chamber of the dust cylinder assembly from an air inlet of the hand-held dust collector for dust-air separation, separated dust is stored in the dust storage chamber, and separated clean air is discharged from the air outlet of the hand-held dust collector.

BRIEF DESCRIPTION OF DRAWINGS

[0006]

FIG. 1 is a side view of a complete machine of a multifunctional dust collector in one example;
FIG. 2 is a front view of FIG. 1;
FIG. 3 is a schematic view of a hand-held dust collector in FIG. 1 after being separated and unlocked from a machine body;
FIG. 4 is a front view of FIG. 3;
FIG. 5 is a front view of the complete machine of the multifunctional dust collector in another example;
FIG. 6 is a side view of FIG. 5;
FIG. 7 is a schematic view of the hand-held dust collector in FIG. 5 after being separated and unlocked from the machine body; and
FIG. 8 is a side view of FIG. 7.

Reference numerals:

[0007] 1. machine body; 2. dirt storage tank; 3. electric floor brush; 4. cleaning fluid tank; 5. hand-held dust collector; 51. dust cylinder assembly; 52. main machine; 53. battery assembly; 54. handle; 55. air inlet duct; 541. handle section; 5411. handle holding section; 511. dust-air separation chamber; and 512. dust storage chamber.

DETAILED DESCRIPTION

[0008] The present application will be described in conjunction with accompanying drawings and examples. It should be understood that the examples described herein are merely illustrative of the present application. In addition, it should also be noted that for ease of description, only some, but not all, of the structures associated with the present application are shown in the accompanying drawings.

[0009] In the description of the present application,

unless expressly stated and limited otherwise, the terms "connected", "connection", and "fixed" should be interpreted broadly, for example, either fixed connection or detachable connection, or integral connection; may be mechanical connection or electric connection; and may be direct connection or indirect connection through an intermediate medium, and may be internal communication between two elements or an interaction relationship between two elements. For those ordinarily skilled in the art, the meaning of the above terms in the present application may be understood according to circumstances.

[0010] In the present application, unless expressly stated and limited otherwise, a first feature being "above" or "below" a second feature may include direct contact between the first feature and the second feature, and may further include contact between the first feature and the second feature through an additional feature between them without direct contact. Furthermore, the first feature being "on", "above" and "over" the second feature includes the first feature being directly above and obliquely above the second feature, or merely indicates that the first feature is at a higher level than the second feature. The first feature being "under", "below" and "beneath" the second feature includes the first feature being directly below and obliquely below the second feature, or merely indicates that the first feature is at a lower level than the second feature.

[0011] In the description of the present examples, the terms "upper", "lower", "left", "right" and other orientation or positional relationships are based on the orientation or positional relationships shown in the accompanying drawings for ease of description and simplicity of operation only and do not indicate or imply that the referenced devices or elements must have a particular orientation, or be constructed and operated in a particular orientation. In addition, the terms "first" and "second" are used merely to distinguish one from another in a descriptive sense without special meanings.

[0012] Referring to FIG. 1 to FIG. 8, a multifunctional dust collector (for example, the multifunctional dust collector may be a dry and wet dual-purpose multifunctional hand-held stick type dust collector with three-in-one of floor dust collection, floor rinsing and hand-held dust collection) provided in an example of the present application includes: a machine body 1, a dirt storage tank 2, an electric floor brush 3, a cleaning fluid tank 4 and a hand-held dust collector 5.

[0013] The hand-held dust collector 5 is detachably plugged on the machine body 1, for example, the hand-held dust collector 5 is positioned at an upper end of the machine body 1. The machine body 1 is provided with a dirt storage tank 2; and the electric floor brush 3 is pivotably connected to a lower end of the machine body 1 and provided with a detachable cleaning fluid tank 4. When the multifunctional hand-held stick type dust collector runs, it is necessary to mount the hand-held dust collector 5, and the hand-held dust collector 5 is disposed to extract and collect dirt from a surface to be cleaned.

[0014] The hand-held dust collector 5 includes: a dust cylinder assembly 51, wherein the dust cylinder assembly 51 includes a dust-air separation chamber 511 and a dust storage chamber 512, the dust-air separation chamber 511 and the dust storage chamber 512 are parallel to each other and are independently disposed, and the dust-air separation chamber 511 is positioned upstream of the dust storage chamber 512.

[0015] It should be noted that the fluid in the present application may be clean airflow, and may also be airflow entrained with dirt; and the dirt is at least one of dust, solid contaminants (such as cigarette ends, scraps of paper, and rice grains), and soiling solutions (such as orange juice, dirty water, and egg liquid).

[0016] In one of the examples, the cleaning fluid tank 4 is disposed in a cleaning fluid supply assembly, and the cleaning fluid supply assembly may further include a spray nozzle and a pump, wherein the pump is disposed to guide a cleaning fluid from the cleaning fluid tank 4 to the spray nozzle, and the spray nozzle, as an output tail end of the cleaning fluid supply assembly, sprays or guides the cleaning fluid to a rolling brush of the electric floor brush 3 or a floor, so as to wet dirt on the floor, and facilitate picking and collection of the dirt by the dust collector.

[0017] Illustratively, the cleaning fluid tank 4 is detachably mounted on the electric floor brush 3, and by disposing the cleaning fluid tank 4 on the electric floor brush 3, there is no need to dispose a relatively long cleaning fluid water pipe, and a spraying response is relatively fast; in addition, the electric floor brush 3 is weighted to increase a force for pressing down the floor, so that a cleaning effect can be improved.

[0018] In one of the examples, the cleaning fluid tank 4 is detachably mounted on the machine body 1, and by disposing the cleaning fluid tank 4 on the machine body 1, for example, disposing the cleaning fluid tank 4 on a rear side of the machine body 1, and disposing the cleaning fluid tank 4 symmetrically with the dirt storage tank 2, the weight of a complete machine may be uniform, and the use experience of a user may be improved.

[0019] The dust collector in the present application at least includes the following two working modes:

a stick type dust collector mode, wherein the hand-held dust collector 5 is connected to the upper end of the machine body 1 by plugging and bonding, under the action of a suction force of the hand-held dust collector 5, a fluid entrained with dirt enters the dirt storage tank 2 from a suction inlet of the electric floor brush 3 for first-stage fluid separation, and at least one of dust and liquid is stored in the dirt storage tank 2; and the fluid after the first-stage separation enters the dust cylinder assembly 51 through a fluid channel in the machine body 1 for second-stage fluid separation, and separated clean air is discharged from an air outlet of the hand-held dust collector 5; and

a hand-held dust collector mode, wherein the hand-

held dust collector 5 is unlocked and separated from the upper end of the machine body 1 and used alone, under the action of the suction force of the hand-held dust collector 5, a fluid entrained with dirt enters the dust-air separation chamber 511 of the dust cylinder assembly 51 from an air inlet of the hand-held dust collector 5 for dust-air separation, separated dust is stored in the dust storage chamber 512, and clean air is discharged from the air outlet of the hand-held dust collector 5.

[0020] In one example, for the multifunctional dust collector provided in the example of the present application, three functions of floor dust collection, floor rinsing and hand-held dust collection which can be achieved by a plurality of machines in the related art can be achieved only by one machine; the cleaning efficiency is greatly improved by the second-stage fluid separation in the stick type dust collector mode; the use scenarios of the hand-held dust collector 5 is enriched by the hand-held dust collector mode; and the requirements for floor dust collection, floor rinsing and hand-held dust collection of the user are met.

[0021] In one example, the hand-held dust collector 5 further includes a main machine 52, a battery assembly 53 and a handle 54; and the dust cylinder assembly 51 and the main machine 52 are disposed front and back in a fluid direction, a first end of the handle 54 is fixed on the main machine 52, and a second end of the handle 54 is fixed on the battery assembly 53.

[0022] In one example, the first end of the handle 54 is fixed on one side of the machine body 52 and bent backwards to be behind the machine body 52. The handle 54 includes a handle holding section 5411, and the handle holding section 5411 is at least partially or entirely formed on a handle section 541 positioned on a rear portion of the main machine 52.

[0023] In one example, the main machine 52 includes a vacuum motor and a power source, wherein the vacuum motor is disposed to provide a vacuum suction force for the complete machine of the dust collector, and the power source is disposed to provide electric power for the vacuum motor, the pump, a rolling brush motor, and the like.

[0024] In one example, the hand-held dust collector 5 further includes an air inlet duct 55 disposed on one side of the dust cylinder assembly 51, a first end opening of the air inlet duct 55 is formed as the air inlet of the hand-held dust collector 5, and a second end opening of the air inlet duct 55 is in fluid connection with an inlet of the dust-air separation chamber 511.

[0025] In one example, when the air inlet duct 55 of the hand-held dust collector 5 is plugged on the upper end of the machine body 1, the dirt storage tank 2, the dust cylinder assembly 51, the main machine 52 and the handle holding section 5411 are all positioned on same sides of the machine body 1 and the air inlet duct 55.

[0026] In one example, when the air inlet duct 55 of the hand-held dust collector 5 is plugged on the upper end of the machine body 1, the dust-air separation chamber 511 and the dust storage chamber 512 are distributed front and back or left and right.

[0027] In one example, when the air inlet duct 55 of the hand-held dust collector 5 is plugged on the upper end of the machine body 1, the dirt storage tank 2, the dust cylinder assembly 51, the main machine 52 and the handle holding section 5411 are all positioned on front sides of the machine body 1 and the air inlet duct 55, and axes of the machine body 1 and the air inlet duct 55 pass through the battery assembly 53. For example, the machine body 1, the air inlet duct 55 and the battery assembly 53 are positioned on the same axis.

[0028] In one example, when the air inlet duct 55 of the hand-held dust collector 5 is plugged on the upper end of the machine body 1, the dirt storage tank 2, the dust cylinder assembly 51, the main machine 52 and the battery assembly 53 are all positioned on rear sides of the machine body 1 and the air inlet duct 55, and the dust storage chamber 512 of the dust cylinder assembly 51 is farther from the air inlet duct 55 than the dust-air separation chamber 511.

[0029] In one example, the dust cylinder assembly 51 includes an inlet pipeline, and the inlet pipeline is disposed downstream of the air inlet of the hand-held dust collector 5 and is in fluid connection with the suction inlet of the electric floor brush 3. The inlet pipeline may be fluidly connected to a bottom or a side portion of the dust cylinder assembly 51.

[0030] In one example, the dust cylinder assembly 51 includes an outlet pipeline, and the outlet pipeline is in fluid connection with the vacuum motor of the main machine 52.

[0031] In one example, the dust-air separation chamber 511 is internally provided with a cyclone separation cone, so that the separation efficiency is higher.

[0032] In one example, the multifunctional dust collector further includes a pipe connector and a brush head member, and when the hand-held dust collector 5 is used alone, the pipe connector and the brush head member are disposed to be connected with the hand-held dust collector 5 for use; wherein the pipe connector includes a hose, a long connecting pipe, and the like, and the brush head member includes a mite removing brush, a flat brush, a hair brush, a pet brush, and the like.

[0033] It should be understood that when the hand-held dust collector 5 is used alone, the mite removing brush, a flat suction nozzle, the pet brush, or the hose can be attached to achieve whole house cleaning in various scenarios.

Claims

1. A multifunctional dust collector, comprising:

a machine body provided with a dirt storage

tank;
an electric floor brush pivotably connected to a lower end of the machine body and provided with a detachable cleaning fluid tank; and
a hand-held dust collector detachably plugged on an upper end of the machine body and comprising a dust cylinder assembly, the dust cylinder assembly comprising a dust-air separation chamber and a dust storage chamber, the dust-air separation chamber and the dust storage chamber being parallel to each other and being independently disposed, and the dust-air separation chamber being positioned upstream of the dust storage chamber;
the multifunctional dust collector at least comprising the following two working modes:

a stick type dust collector mode, wherein the hand-held dust collector is connected to the upper end of the machine body by plugging and bonding, under the action of a suction force of the hand-held dust collector, a fluid entrained with dirt enters the dirt storage tank from a suction inlet of the electric floor brush for first-stage fluid separation, and at least one of dust and liquid is stored in the dirt storage tank; and the fluid after the first-stage separation enters the dust cylinder assembly through a fluid channel in the machine body for second-stage fluid separation, and separated clean air is discharged from an air outlet of the hand-held dust collector; and
a hand-held dust collector mode, wherein the hand-held dust collector is unlocked and separated from the upper end of the machine body and used alone, under the action of the suction force of the hand-held dust collector, a fluid entrained with dirt enters the dust-air separation chamber of the dust cylinder assembly from an air inlet of the hand-held dust collector for dust-air separation, separated dust is stored in the dust storage chamber, and separated clean air is discharged from the air outlet of the hand-held dust collector.

2. The multifunctional dust collector according to claim 1, wherein the hand-held dust collector further comprises a main machine, a battery assembly and a handle; and the dust cylinder assembly and the main machine are disposed front and back in a fluid direction, and a first end of the handle is fixed on one side of the main machine and bent backwards to be behind the main machine.

3. The multifunctional dust collector according to claim 2, wherein the handle comprises a handle holding section, and the handle holding section is at least partially or entirely formed on a handle section positioned on a rear portion of the main machine.

4. The multifunctional dust collector according to claim 3, wherein a second end of the handle is fixed on the battery assembly.

5. The multifunctional dust collector according to claim 4, wherein the hand-held dust collector further comprises an air inlet duct disposed on one side of the dust cylinder assembly, a first end opening of the air inlet duct is formed as the air inlet of the hand-held dust collector, and a second end opening of the air inlet duct is in fluid connection with an inlet of the dust-air separation chamber.

6. The multifunctional dust collector according to claim 5, wherein when the air inlet duct of the hand-held dust collector is plugged on the upper end of the machine body, the dirt storage tank, the dust cylinder assembly, the main machine and the handle holding section are all positioned on same sides of the machine body and the air inlet duct.

7. The multifunctional dust collector according to claim 6, wherein when the air inlet duct of the hand-held dust collector is plugged on the upper end of the machine body, the dirt storage tank, the dust cylinder assembly, the main machine and the handle holding section are all positioned on front sides of the machine body and the air inlet duct, and axes of the machine body and the air inlet duct pass through the battery assembly.

8. The multifunctional dust collector according to claim 5, wherein when the air inlet duct of the hand-held dust collector is plugged on the upper end of the machine body, the dirt storage tank, the dust cylinder assembly, the main machine and the battery assembly are all positioned on rear sides of the machine body and the air inlet duct, and the dust storage chamber of the dust cylinder assembly is farther from the air inlet duct than the dust-air separation chamber.

9. The multifunctional dust collector according to claim 1, wherein the dust-air separation chamber is internally provided with a cyclone separation cone.

10. The multifunctional dust collector according to claim 1, wherein when the hand-held dust collector is used alone, a mite removing brush, a flat suction nozzle, a pet brush, or a hose can be attached to achieve whole house cleaning in various scenarios.

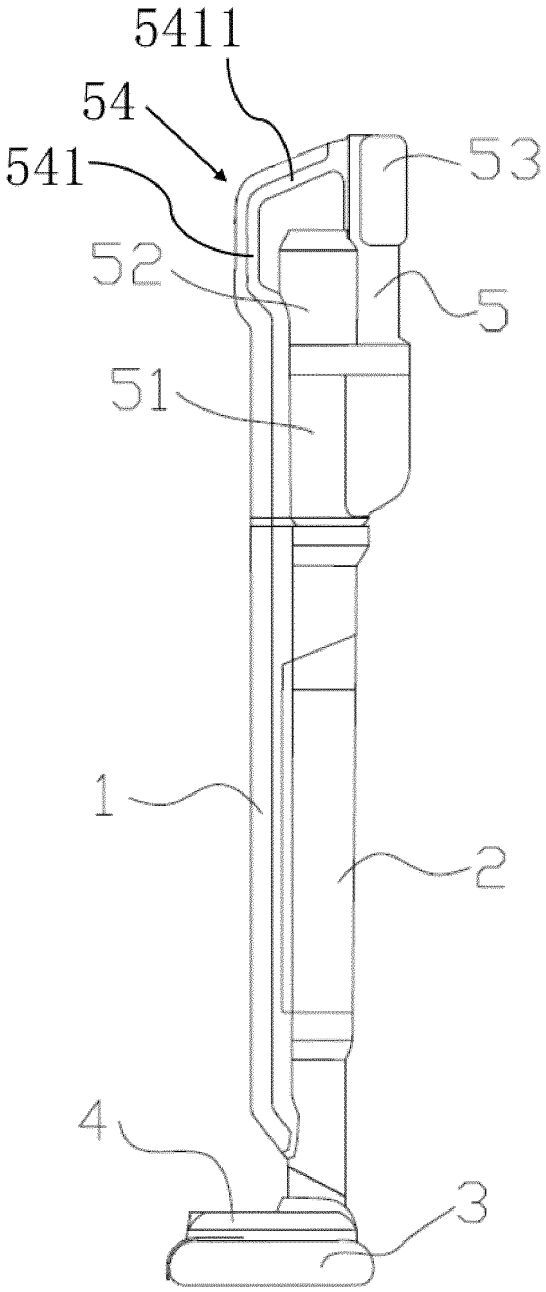

FIG.1

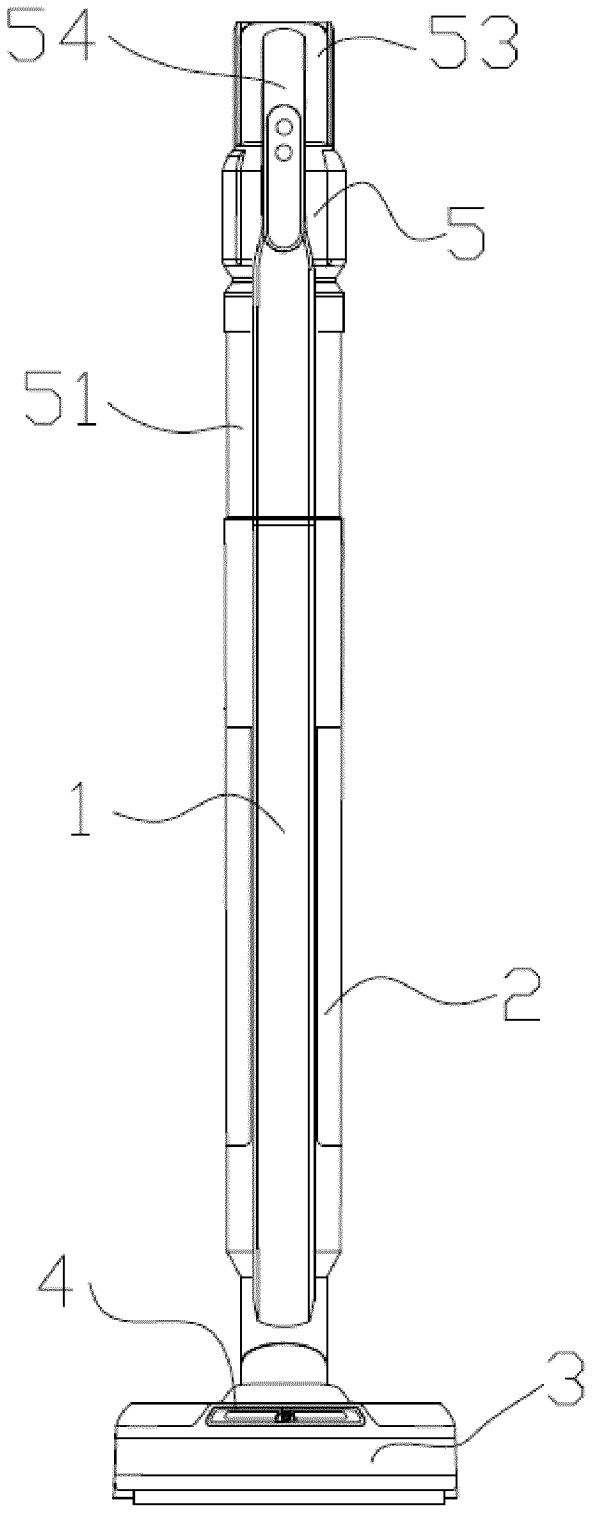

FIG.2

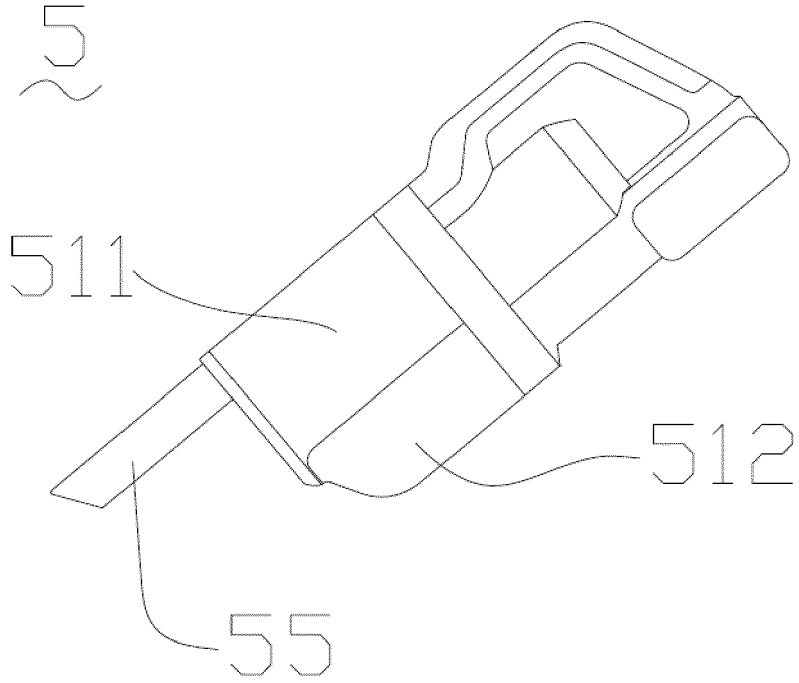

FIG.3

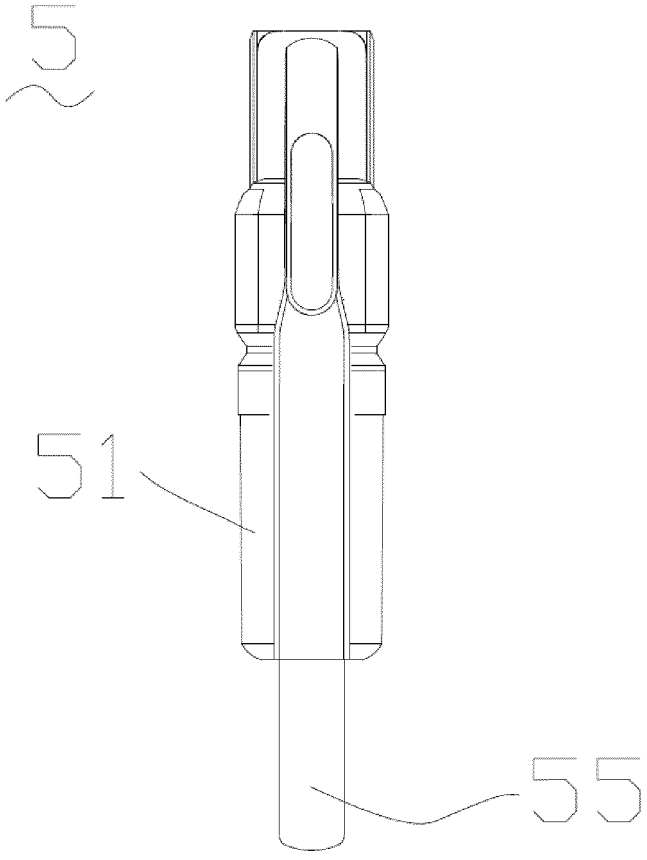

FIG.4

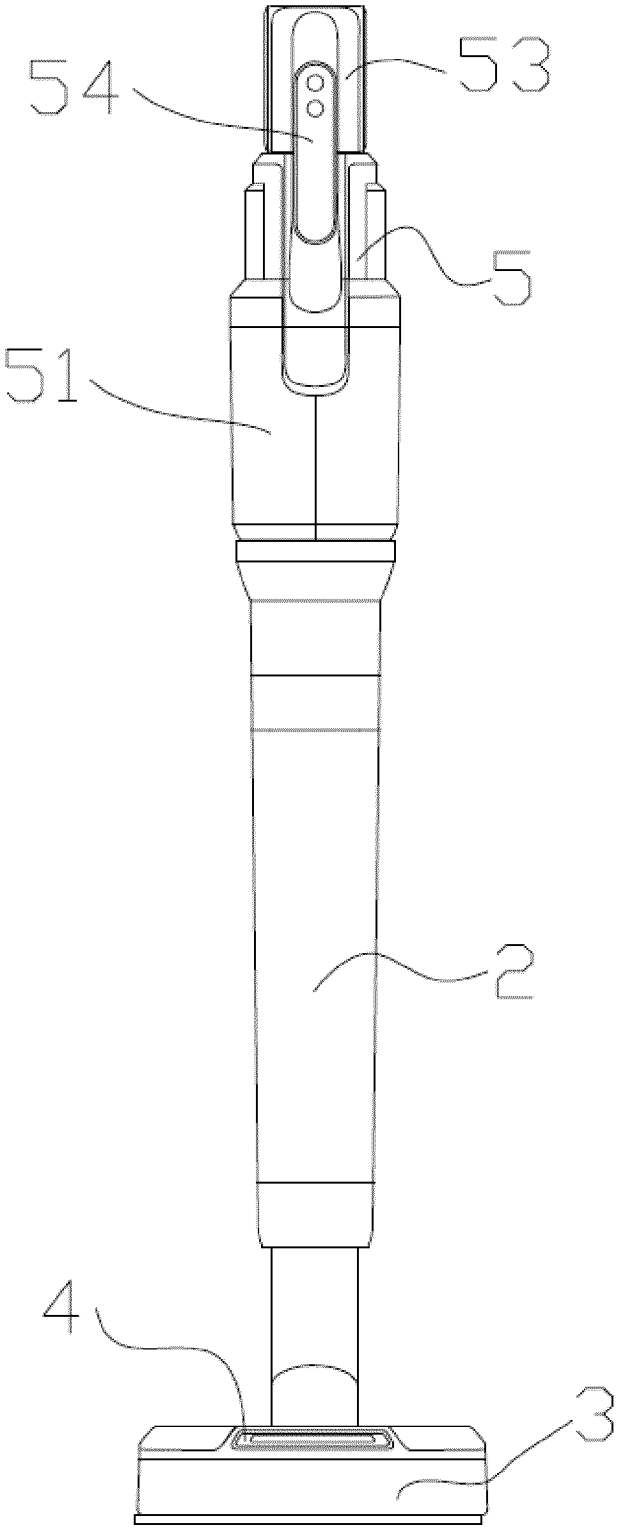

FIG.5

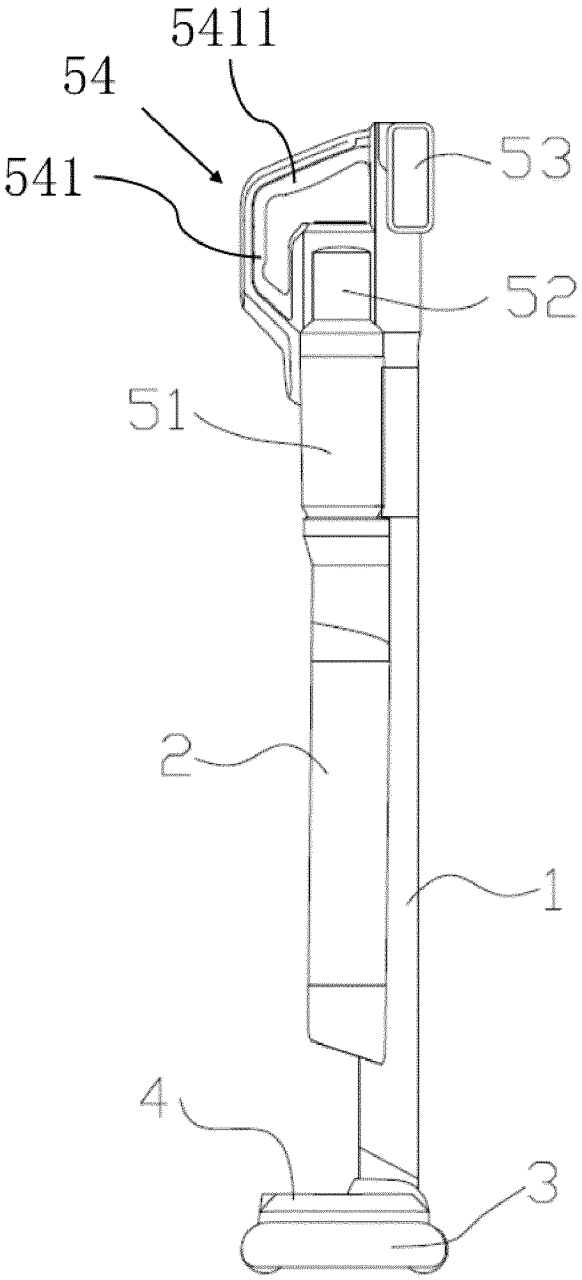

FIG.6

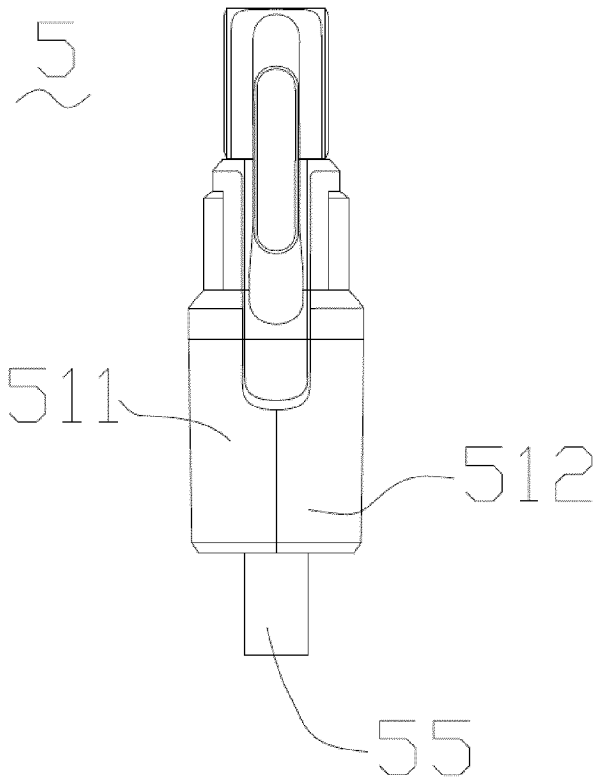

FIG.7

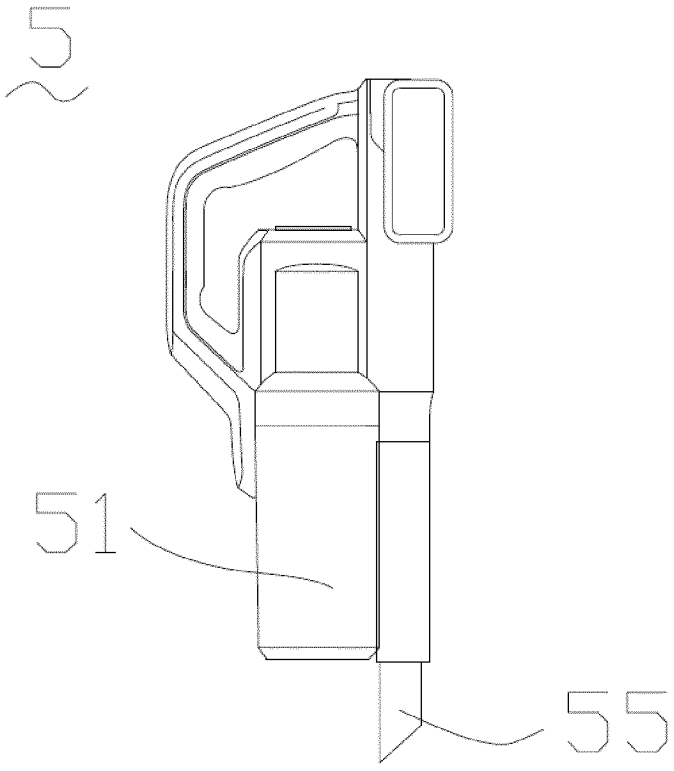

FIG.8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/135482

A. CLASSIFICATION OF SUBJECT MATTER

A47L11/40(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A47L11; A47L13

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT; ENTXT; ENTXTC; VEN; USTXT; WOTXT; EPTXT; DWPI; CNKI: 吸尘器, 清洁, 手持, 分离, 分开, 多功能, 多用, 杆式, 立式, 拆卸, 插, 刷, 液, 污水, 尘桶, 尘筒, 分离, 尘气, 旋风, 集尘, 储尘, vacuum, clean+, disassemb+, install+, separat+, hand, fluid, dirt, air, liquid, water, dust, collect+, storag+, suction, brush, cyclone

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 115399687 A (KINGCLEAN ELECTRIC CO., LTD.) 29 November 2022 (2022-11-29) description, paragraphs 22-41, and figures 1-3	1-10
PX	CN 115399689 A (KINGCLEAN ELECTRIC CO., LTD.) 29 November 2022 (2022-11-29) description, paragraphs 24-53, and figures 1-3	1-10
X	CN 216060387 U (KINGCLEAN ELECTRIC CO., LTD.) 18 March 2022 (2022-03-18) description, paragraphs 22-41, and figures 1-3	1-10
X	CN 216060390 U (KINGCLEAN ELECTRIC CO., LTD.) 18 March 2022 (2022-03-18) description, paragraphs 24-53, and figures 1-3	1-10
X	US 2011289719 A1 (SAMSUNG ELECTRONICS CO., LTD.) 01 December 2011 (2011-12-01) description, paragraphs 38-79, and figures 1-13	1-10
A	CN 211862696 U (SUZHOU KVC ELECTRIC CO., LTD.) 06 November 2020 (2020-11-06) entire document	1-10

☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
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"P" document published prior to the international filing date but later than the priority date claimed
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 January 2023	**09 March 2023**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/135482

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REFERENCES CITED IN THE DESCRIPTION

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