DESCRIPTION

TITLE OF THE INVENTION: CLEANING DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 202320580031.3, entitled "CLEANING DEVICE", and filed on March 22, 2023, the contents of which are incorporated herein by reference in its entirety.
[0002] This application claims priority to Chinese Patent Application No. 202320778586.9, entitled "CLEANING DEVICE", and filed on April 10, 2023, the contents of which are incorporated herein by reference in its entirety.
[0003] This application claims priority to Chinese Patent Application No. 202320932692.8, entitled "CLEANING DEVICE", and filed on April 23, 2023, the contents of which are incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0004] The present disclosure relates to the technical field of cleaning devices, and in particular to a cleaning device.

BACKGROUND

[0005] With the improvement of material living standards, people’s requirements for their home environments are getting higher and higher. Cleaning device is increasingly applied in people’s lives due to its simple operation and convenient use. In the cleaning device, a fan is driven to generate negative pressure within a channel of the cleaning device, enabling suction of dust, dirt and air via a suction part. A filtration system retains the dust and dirt while the air is discharged by the fan.
[0006] In the related art, with the prolonged operation of the cleaning device, more dust and dirt are accumulated on the filter of the separation structure. If the filter is not cleaned for a long time, it is prone to cause the filter screen to be clogged, resulting in reduced suction. Moreover, cleaning the dirt on the filter is difficult, and requires disassembling the dust cup housing, taking out the filter, etc. If the disassembly is frequently performed, it is prone to reduce the sealing performance between the components, which affects the service life and the dust removal effect of the cleaning device.

SUMMARY

[0007] The present disclosure aims to solve at least one of the technical problems in the related art to some extent. To this end, an object of the present disclosure is to provide a cleaning device, which is convenient to clean the filter, so as to improve the cleaning effect of the first filter, and is convenient to open the cover, thereby providing convenience for users.
[0008] The cleaning device according to embodiments of the present disclosure includes a main body portion, a dust cup, and a dust scraping assembly, the main body portion includes a first filter;

[0009] the dust cup includes a cup body and a cup cover, the cup body is connected to the main body portion and covers an outer side of the first filter; at least a part of the dust scraping assembly is disposed around the outer side of the first filter, and is configured to move in a reciprocating manner along an axial direction of the first filter to scrape off dust from the first filter.

[0010] In the cleaning device according to embodiments of the present disclosure, by providing the dust scraping assembly, it is convenient to clean the first filter, thereby improving the cleaning effect of the first filter, and providing convenience for users.

[0011] In addition, the cleaning device according to the above embodiment of the present disclosure may further have the following additional technical features.

[0012] In some examples of the present disclosure, the cleaning device further includes an air inlet pipe, wherein the air inlet pipe and the cup body are arranged side by side and extend in a same direction; the cup body is provided with a dust-dumping opening at an end thereof, and the cup cover closes the dust-dumping opening and is openable.

[0013] In some examples of the present disclosure, the dust scraping assembly includes a dust scraping portion, and the dust scraping portion is disposed around an outer peripheral surface of the first filter, and is configured to move in a reciprocating manner along the axial direction of the first filter to scrape off the dust.

[0014] In some examples of the present disclosure, the dust scraping portion is disposed between the dust cup and the first filter, a dust compression space is defined between the dust scraping portion and a bottom wall of the dust cup, the dust scraping portion includes a compression member extending towards an inner wall of the dust cup and adjacent to the inner wall of the dust cup, and the compression member is configured to move along the axial direction of the first filter to compress the dust in the dust compression space.

[0015] In some examples of the present disclosure, the compression member includes a first side wall and a second side wall disposed opposite to each other in a radial direction, the first side wall and the outer side of the first filter are disposed opposite to each other in a radial direction of the first filter, and the second side wall and the inner wall of the dust cup are disposed opposite to each other in the radial direction of the first filter.

[0016] In some examples of the present disclosure, the first side wall is connected with a dust scraping member, and the dust scraping member extends along the axial direction of the first filter and is configured to be in clearance fit with the outer side of the first filter.

[0017] In some examples of the present disclosure, the first side wall is in clearance fit with the outer side of the first filter.

[0018] In some examples of the present disclosure, the second side wall is in clearance fit with the inner wall of the dust cup.

[0019] In some examples of the present disclosure, the dust scraping assembly further includes an operating portion, the operating portion is drivably connected with the dust scraping portion, and is configured to drive the dust scraping portion to move, and at least a part of the operating portion is located outside the dust cup for manual operation.

[0020] In some examples of the present disclosure, the cleaning device further includes a connecting rod, and two ends of the connecting rod are respectively connected to the dust scraping portion and the operating portion, so that the operating portion is drivably connected with the dust scraping portion.

[0021] In some examples of the present disclosure, the cleaning device further includes a connecting rod, and two ends of the connecting rod are respectively connected to the dust scraping portion and the operating portion, so that the operating portion is drivably connected with the dust scraping portion.

[0022] In some examples of the present disclosure, the dust scraping assembly further includes: a guide rod and a support portion, the guide rod extends along the axial direction, with one end

connected to the dust scraping portion; and the support portion is connected to the other end of the guide rod and movably supported on the main body portion. The support portion is drivably connected with the operation portion.

[0023] In some examples of the present disclosure, the main body portion further includes a motor housing, a space for accommodating a motor is defined in the motor housing, the motor housing and the first filter are arranged along the axial direction, and the support portion is disposed around the outside of the motor housing.

[0024] In some examples of the present disclosure, the main body portion further includes a guide portion, the guide portion is disposed between the support portion and the dust scraping portion, and the guide portion is provided with a guide hole for the guide rod to pass through and to guide movement of the guide rod in the axial direction.

[0025] In some examples of the present disclosure, the dust scraping assembly further includes a spring, the spring is disposed around the guide rod, with two ends respectively abutting against the guide portion and the support portion, and the spring is configured to generate a force for driving the dust scraping assembly to move away from the cup cover.

[0026] In some examples of the present disclosure, the operating portion is further configured to drive the cup cover to open; the dust cup further includes a locking portion, one side of the cup cover is hinged with the cup body, and the other side of the cup cover is locked with the cup body through the locking portion, and the operating portion includes an abutting portion, and the abutting portion is configured to abut against and unlock the locking portion to open the cup cover.

[0027] In some examples of the present disclosure, the locking portion is rotatably connected to the dust cup, the locking portion includes a trigger end and a lock hook, the lock hook hooks the cup cover, and the abutting portion is configured to abut against the trigger end to enable the lock hook to unlock the cup cover.

[0028] In some examples of the present disclosure, the dust scraping assembly has a first position, a second position and a third position in the axial direction, a distance between the dust scraping assembly and the cup cover gradually decreases as the dust scraping assembly moves from the first position to the second position, and to the third position, and the dust scraping assembly drives the cup cover to open at the third position, and the dust scraping assembly is configured such that damping from the first position to the second position is less than damping from the second position to the third position.

[0029] In some examples of the present disclosure, the cleaning device further includes a damping structure, and the damping structure is configured to damp movement of the operating portion from the second position to the third position.

[0030] In some examples of the present disclosure, the main body portion includes a housing, the dust scraping portion is disposed in the housing, the housing is provided with a sliding rail extending along the axial direction, and the operating portion slidably mates with the sliding rail along the axial direction.

[0031] In some examples of the present disclosure, the operating portion is U-shaped and disposed around the air inlet pipe, and both ends of the operating portion are connected to and slidably mate with the housing.

[0032] In some examples of the present disclosure, the main body portion further includes a handle, a support member, and a power supply assembly, the power supply assembly extends along the axial direction, the support member and the handle are arranged opposite to each other and spaced apart from each other along the axial direction, the support member is connected to the air inlet pipe and the power supply assembly, and the handle is connected to the housing and the power supply assembly.

[0033] In some examples of the present disclosure, an inlet of the air inlet pipe and the dust-dumping opening of the cup body are orientated in a same direction.

[0034] In some examples of the present disclosure, the cleaning device includes an air inlet pipe, the air inlet pipe and the dust cup are arranged side by side, the dust scraping assembly and the air inlet pipe extend in a same direction, and the dust scraping assembly is located outside the air inlet pipe.

[0035] In some examples of the present disclosure, the dust scraping portion is a flexible structure and/or the dust scraping portion has bristles facing an inner wall of the dust cup.

[0036] In some examples of the present disclosure, the cleaning device further includes a fourth filter, the fourth filter is at least partially located in the dust cup, and the dust scraping portion moves along an axial direction of the fourth filter.

[0037] In some examples of the present disclosure, the main body portion further includes an airflow channel; the cleaning device further includes: a driving assembly, a rear cover, and a display component, at least a part of the driving assembly is disposed in the airflow channel to drive airflow; the rear cover detachably covers an outlet of the airflow channel; the display component is mounted on the driving assembly and separated from the rear cover, and the display component is configured to display information towards an outside of the rear cover.

[0038] In some examples of the present disclosure, the rear cover is configured to be detachable from the main body portion independently of the display component.

[0039] In some examples of the present disclosure, the driving assembly includes a motor, and the display component is mounted on an air outlet side of the motor.

[0040] In some examples of the present disclosure, the display component is mounted at an end of the motor close to the outlet.

[0041] In some examples of the present disclosure, a mounting support is provided at the air outlet side of the motor, and the display component is mounted on the mounting support.

[0042] In some examples of the present disclosure, the driving assembly further includes a third filter, the third filter is disposed at the air outlet side of the motor and located at the outlet of the airflow channel, and the display component is mounted on the third filter.

[0043] In some examples of the present disclosure, at least a portion of the third filter extends beyond the outlet, and the rear cover covers an outer side of the third filter.

[0044] In some examples of the present disclosure, the third filter is mounted on an outside of the motor, and the third filter partially overlaps with the motor in a projection in a predetermined direction perpendicular to an axis of the motor.

[0045] In some examples of the present disclosure, the third filter includes: a support and a filter member, the support has a hollow structure, the support is connected to the main body portion, and the hollow structure is in communication with the airflow channel; and the filter member covers the hollow structure.

[0046] In some examples of the present disclosure, the support has a first end and a second end opposite to each other, the hollow structure is disposed between the first end and the second end of the support, the first end of the support is connected to the main body portion, and the display component is disposed at the second end of the support.

[0047] In some examples of the present disclosure, a positioning ring is provided at the first end of the support, an end cover is provided at the second end of the support, the positioning ring and the end cover are connected with each other through a connecting rib to form the hollow structure between the positioning ring and the end cover, and the display component is mounted on a side of the end cover facing away from the positioning ring.

[0048] In some examples of the present disclosure, the end cover is provided with an annular rib, and a groove is defined in the annular rib for mounting the display component.

[0049] In some examples of the present disclosure, the rear cover is provided with an opening, and the annular rib is embedded in the opening.

[0050] In some examples of the present disclosure, the main body portion extends in a front-to-rear direction, the outlet of the airflow channel is provided at a rear end of the main body

portion, and the display component is provided on the driving assembly and displays information towards the rear end of the main body portion.

[0051] In some examples of the present disclosure, the rear cover is provided with a display area, the display area has an opening, and a transparent area or a semi-transparent area, and the display area is opposite to the display component to enable the display component to display information.

[0052] In some examples of the present disclosure, the display component is disposed inside the display area, and is at least partially embedded in the display area or extends beyond the display area.

BRIEF DESCRIPTION OF DRAWINGS

[0053] In order to more clearly illustrate the technical solutions of the embodiments of the present disclosure or in the related art, the drawings to be used in the description of the embodiments or the related art will be briefly described below. It is apparent that the drawings as described below only illustrate some embodiments of the present disclosure, and those of ordinary skill in the art can obtain other drawings according to the structures shown in these drawings without creative efforts.

[0054] FIG. 1 is a schematic structural diagram of a cleaning device according to some embodiments of the present disclosure.

[0055] FIG. 2 is a cross-sectional view of FIG. 1.

[0056] FIG. 3 is a schematic diagram of a partial structure of a cleaning device according to some embodiments of the present disclosure.

[0057] FIG. 4 is a schematic diagram of a partial structure of a cleaning device according to some embodiments of the present disclosure, in which a locking portion and an abutting portion are shown.

[0058] FIG. 5 is a schematic structural diagram of a dust scraping assembly according to some embodiments of the present disclosure.

[0059] FIG. 6 is a side view of a dust scraping assembly according to some embodiments of the present disclosure.

[0060] FIG. 7 is a schematic diagram of a partial structure of a cleaning device according to some embodiments of the present disclosure, in which a dust scraping assembly, a first filter and a dust cup are shown, and a state when a dust scraping portion moves is shown.

[0061] FIG. 8 is a schematic diagram of a cleaning device according to some embodiments of the present disclosure.

[0062] FIG. 9 is a diagram of a cleaning device, in which a rear cover is disassembled, according to some embodiments of the present disclosure.

[0063] FIG. 10 is a diagram of a cleaning device, in which a rear cover is installed, according to some embodiments of the present disclosure.

[0064] FIG. 11 is a front view of a cleaning device according to some embodiments of the present disclosure.

[0065] FIG. 12 is a cross-sectional view of a cleaning device according to some embodiments of the present disclosure.

[0066] FIG. 13 is a schematic diagram of a cleaning device according to some other embodiments of the present disclosure.

[0067] FIG. 14 is a schematic diagram of a rear cover according to some embodiments of the present disclosure.

[0068] FIG. 15 is a schematic diagram of a support according to some embodiments of the present disclosure.

[0069] Description of reference signs:

100 cleaning device; 10 main body portion; 110 airflow channel; 11 dust cup; 111 cup body; 101 dust compression space; 112 cup cover; 12 first filter; 102 sliding rail; 13 second filter; 131 lifting handle; 14 locking portion; 141 trigger end; 142 lock hook; 15 third filter; 151 support; 1511 hollow structure; 1512 positioning ring; 1513 end cover; 15131 annular rib; 15132 groove; 1514 connecting rib; 152 filter member; 16 motor housing; 18 air inlet pipe; 108 inlet; 109 outlet; 19 fourth filter; 20 dust scraping portion; 21 guide rod; 22 dust scraping member; 23 support portion; 24 spring; 25 compression member; 30 operating portion; 31 abutting portion; 40 motor; 50 connecting rod; 60 guide portion; 71 handle; 72 support member; 73 power supply assembly; 80 rear cover; 81 opening; 82 ventilation opening; 90 display component; axis A-A.

DETAILED DESCRIPTION

[0070] Embodiments of the present disclosure will be described in detail below, and examples of the embodiments are shown in the accompanying drawings, in which the same or similar reference numerals represent the same or similar elements or elements having the same or similar functions throughout. The embodiments described below with reference to the accompanying drawings are illustrative, and are intended to explain the present disclosure, but cannot be understood as a limitation on the present disclosure.

[0071] Referring to FIGS. 1 to 15, a cleaning device 100 according to embodiments of the present disclosure includes a main body portion 10, a dust cup 11, an air inlet pipe 18 and a dust scraping assembly. The main body portion 10 includes a first filter 12. The dust cup 11 includes a cup body 111 and a cup cover 112. The cup body 111 is connected to the main body portion 10. Specifically, the first filter 12 may perform dust-air separation on the air with dust in the cleaning device 100, and the dust cup 11 is disposed around an outer side of the first filter 12 for collecting the dust gathered by the first filter 12. The cup body 111 is provided with a dust-dumping opening at an end thereof. The cup cover 112 closes the dust-dumping opening and is openable, and the dust in the cup body 111 can be discharged from the dust-dumping opening to remove the dust from the cup body 111. More specifically, the air inlet pipe 18 and the cup body 111 are arranged side by side and extend in the same direction, which can facilitate the spatial arrangement and improve the structural compactness of the device. At least a part of the dust scraping assembly is disposed around the outer side of the first filter 12 and is configured to move in a reciprocating manner along an axial direction of the first filter 12 to scrape off the dust on the first filter 12, so that the dust on the outer side of the first filter 12 can be scraped off to prevent the first filter 12 from being clogged, thereby achieving a cleaning effect, improving the performance of the first filter 12, and facilitating collection of the dust. Specifically, the cup body 111, the first filter 12, the dust scraping assembly and the air inlet pipe 18 extend in the same direction. On the one hand, this facilitates reducing the size of the cleaning device 100 and facilitates the spatial arrangement. On the other hand, the air inlet pipe 18 may be disposed on an outer peripheral wall of the cup body 111 and extend along an axial direction of the cup body 111, so that the airflow can flow spirally after entering the cup body 111 from the air inlet pipe 18, which facilitates improving the separation effect. The dust scraping assembly can scrape off the separated dust from the first filter 12, thereby facilitating improving the cleaning effect and facilitating collection and disposal of the dust.

[0072] The cleaning device 100 according to the embodiments of the present disclosure may facilitate the cleaning of the filter, improve the cleaning effect of the first filter 12, and provide convenience for users, by providing the dust scraping assembly.

[0073] In practical applications, during the cleaning process of the cleaning device 100, dust and dirt are continuously accumulated on the first filter 12. If the first filter 12 is not cleaned for a long time, the filter is easily clogged, thereby reducing the filtering effect or weakening the suction. Therefore, during use, the dust scraping assembly can be driven to move, so that

the dust scraping assembly can move outside the first filter 12 to scrape off the dust and dirt on the outer surface of the filter, and the dust and dirt that are scraped off can be directly collected in the cup body 111. The dust scraping assembly may be driven manually, automatically or electrically. For example, the user may manually move the dust scraping assembly to scrape off the dust, or may press a button to activate the operation of the dust scraping assembly. Alternatively, a detection device may be disposed in the dust cup, and when there is a large amount of dust on the first filter 12, the dust scraping assembly is automatically activated or the user is prompted that the first filter 12 needs to be cleaned, which is not limited in the present disclosure.

[0074] For example, when there is a large amount of dust accumulated on the outer side of the first filter 12, the user may feel that the dust scraping assembly is subjected to resistance during movement. As the cleaning process proceeds, the dust on the outer side of the first filter 12 is cleaned, and the movement of the dust scraping assembly is gradually smooth. The user may confirm the cleaning effect by sensing the change in hand feeling during the cleaning process.

[0075] With reference to FIG. 2 and FIG. 3, in some embodiments of the present disclosure, the cleaning device 100 further includes a dust scraping portion 20 and an operating portion 30. Specifically, the dust scraping portion 20 is disposed around an outer peripheral surface of the first filter 12 and is configured to move in a reciprocating manner along the axial direction of the first filter 12 to scrape off the dust, so as to scrape off the dust on the outer side of the first filter 12, thereby improving the dust scraping effect, occupying a small space, and facilitating spatial arrangement. The operating portion 30 is drivably connected with the dust scraping portion 20 to drive the dust scraping portion 20 to move, and the operating portion 30 is configured to drive the cup cover 112 to open. That is, the operating portion 30 can not only drive the dust scraping assembly to move to clean the first filter 12, but also be used to open the cup cover 112, so that the user does not need to manually open the cup cover, which can avoid secondary pollution caused by dust raising and provide convenience for the user.

[0076] In the related art, the user needs to hold the cleaning device with one hand and open the cup cover with the other hand, which is prone to cause dust raising and is inconvenient to operate. In the cleaning device 100 according to the embodiments of the present disclosure, after the cleaning device 100 operates for a period of time, there is a significant amount of dust in the cup body 111, and when the dust is required to be cleaned, the cup cover 112 may be driven to open by controlling the operating portion 30, which may facilitate cleaning the dust in the cup body 111. Therefore, during cleaning, the user can operate with one hand to drive the operating portion 30 to automatically open the cup cover, which brings convenience to the user. Moreover, during cleaning of the cup body 111, the dust-dumping opening can be aligned with the dust collection device or the garbage bag in advance. When the operating portion 30 drives the cup cover 112 to open, the dust in the cup body 111 can directly enter the dust collection device or the garbage bag to prevent the dust from scattering everywhere.

[0077] With reference to FIG. 5, more specifically, the dust scraping portion 20 includes a bracket and a ring portion, and the bracket is axially connected to the ring portion. The ring portion is connected to an inner side of the bracket, and the ring portion gradually tapers inward in a radial direction, so as to fit an outer side of the first filter 12 and thus improve the dust scraping effect.

[0078] With reference to FIG. 3 and FIG. 5, in some embodiments of the present disclosure, the cleaning device 100 further includes a connecting rod 50, and two ends of the connecting rod 50 are respectively connected to the dust scraping portion 20 and the operating portion 30, so that the operating portion 30 is drivably connected with the dust scraping portion. That is, the connecting rod 50 can transmit the power from the operating portion 30 to a guide rod 21, thereby driving the dust scraping portion 20 to move. By providing the connecting rod 50, the position of the operating portion 30 can be flexibly arranged, which is convenient for the user

operation and facilitates the spatial arrangement. Optionally, the connecting rod 50 may also be connected to a support portion 23, the operating portion 30 is drivably connected with the support portion 23, and the movement of the support portion 23 may drive the dust scraping portion 20 to move. Specifically, the connecting rod may include a first rod portion and a second rod portion, one end of the first rod portion is connected to the guide rod 21 and extends in the same direction as the guide rod 21, the other end of the first rod portion is connected to one end of the second rod portion, and the other end of the second rod portion is connected to the operating portion 30. Here, there is an included angle between the rod bodies of the first rod portion and the second rod portion at the joint, or there is an included angle between the extension lines in the extension directions of the first rod portion and the second rod portion. In this way, the position where the operating portion 30 is provided can be flexibly arranged.

[0079] With reference to FIG. 3 and FIG. 5, in some embodiments of the present disclosure, the dust scraping assembly further includes the guide rod 21 and the support portion 23. The support portion 23 is connected to the dust scraping portion 20 by the guide rod 21, and can support the dust scraping portion 20 in the axial direction, to avoid shaking of the dust scraping portion 20 during movement, and improve structural and operational stability of the dust scraping portion 20. In this way, even when relatively large dirt is attached to the outer side of the first filter 12, the dust scraping portion 20 can scrape them off, which is beneficial for enhancing the cleaning effect and durability. The guide rod 21 extends in the axial direction, with one end connected to the dust scraping portion 20, and the support portion 23 is connected to the other end of the guide rod 21 and movably supported on the main body portion 10. The guide rod 21 extends in the axial direction, can guide the axial movement of the dust scraping portion 20, and can also provide support between the support portion 23 and the dust scraping portion 20, which is beneficial for dispersing the force.

[0080] With reference to FIG. 2 and FIG. 3, in some embodiments of the present disclosure, the main body portion 10 further includes a motor housing 16, a space for accommodating a motor 40 is defined in the motor housing 16, the motor housing 16 and the first filter 12 are arranged in the axial direction, and the support portion 23 is disposed around an outer side of the motor housing 16. Specifically, the support portion 23 may be arranged between the motor housing 16 and a housing of the cleaning device 100 to facilitate accommodating the support portion 23. Moreover, the support portion 23 may move axially along the motor housing 16, and the dust scraping portion 20 may also move axially outside the first filter 12 when the support portion 23 moves.

[0081] With reference to FIG. 3, in some embodiments of the present disclosure, the main body portion 10 further includes a guide portion 60. The guide portion 60 is disposed between the support portion 23 and the dust scraping portion 20, and the guide portion 60 is provided with a guide hole for the guide rod 21 to pass through and to guide movement of the guide rod 21 in the axial direction, which facilitates the axial extension of the dust scraping assembly on the main body portion 10, can save space and improve the compactness of the device. In addition, the guide portion 60 can limit the guide rod 21 in the radial direction to prevent the dust scraping assembly from shaking during use.

[0082] With reference to FIG. 3, in some embodiments of the present disclosure, the dust scraping assembly further includes a spring 24. The spring 24 is disposed around the guide rod 21, with two ends respectively abutting against the guide portion 60 and the support portion 23, and the spring 24 is configured to generate a force for driving the dust scraping assembly to move away from the cup cover 112, providing a restoring force for the dust scraping portion 20, so that the dust scraping portion 20 can automatically reset, which is convenient for the user operation. During use, the operating portion 30 may drive the dust scraping assembly to move close to the cup cover 112 to pass through the first filter 12 and scrape off the dust on the outer side of the first filter 12. At this time, the support portion 23 also moves close to the cup

cover 112 or the guide portion 60, the spring 24 abuts against the support portion 23 and the guide portion 60 while being compressed, and when the driving force disappears, the restoring force of the spring 24 may drive the support portion 23 and the dust scraping portion 20 to reset, which facilitates simplifying the operation.

[0083] With reference to FIG. 2 and FIG. 3, in some embodiments of the present disclosure, the operating portion 30 is configured to drive the cup cover 112 to open. The dust cup 11 further includes a locking portion 14, one side of the cup cover 112 is hinged with the cup body 111, and the other side of the cup cover 112 is locked with the cup body 111 through the locking portion 14. The operating portion 30 includes an abutting portion 31, and the abutting portion 31 is configured to abut against the locking portion 14 to open the cup cover 112, enabling automatic opening of the cup cover without manual operation. Specifically, the locking portion 14 may lock the cup cover 112 when the cup cover 112 closes the dust-dumping opening, and when the cup cover 112 needs to be opened, the operating portion 30 abuts against the locking portion 14 to unlock the locking portion 14, and the locking portion 14 may release the cup cover 112. As a result, one side of the cup cover 112 is connected to the cup body 111, while the other side of the cup cover 112 is separated from the cup body 111, thereby opening the dust-dumping opening.

[0084] With reference to FIG. 4, in some embodiments of the present disclosure, the locking portion 14 is rotatably connected to the dust cup 11, and the locking portion 14 includes a trigger end 141 and a lock hook 142. The lock hook 142 hooks the cup cover 112. The abutting portion 31 is configured to abut against the trigger end 141 to unlock the lock hook 142 from the cup cover 112. Specifically, the lock hook 142 has a locked state and an unlocked state. In the locked state, the lock hook 142 can be configured to lock the cup cover 112. The trigger end 141 is drivably connected with the lock hook 142, so that the trigger end 141 can control the state of the lock hook 142, and can adjust the lock hook 142 from the locked state to the unlocked state, allowing the lock hook 142 to release the cup cover 112.

[0085] With reference to FIG. 1 and FIG. 3, in some embodiments of the present disclosure, the dust scraping assembly has a first position, a second position, and a third position along the axial direction, a distance between the dust scraping assembly and the cup cover 112 gradually decreases as the dust scraping assembly moves from the first position to the second position, and then to the third position, and the dust scraping assembly drives the cup cover 112 to open at the third position. That is, the operating portion 30 can drive the dust scraping assembly to move between the first position and the third position, so as to achieve the dust-scraping and cover-opening effects. For example, since the first filter 12 is disposed in the cup body 111 and the cup cover 112 is disposed at the end of the cup body 111, when the operating portion 30 controls the dust scraping assembly to move between the first position and the second position, the dust scraping assembly passes along the outer side of the first filter 12 to achieve the dust scraping effect, and when the operating portion 30 controls the dust scraping assembly to gradually move towards the third position, the dust scraping assembly gradually approaches the cup cover 112, enabling the operating portion 30 to abut against and unlock the locking portion 14. In addition, by providing the third position, which is closer to the cup cover 112 than the second position, during the dust scraping operation, there is a certain distance between the abutting portion 31 and the locking portion 14, which can prevent the user from accidentally touching the operating portion 30 to open the cup cover 112 when performing the dust scraping operation, thereby improving the reliability of use.

[0086] Further, the dust scraping assembly is configured such that the damping from the first position to the second position is less than the damping from the second position to the third position, which facilitates the user to scrape off the dust, and facilitates the user to identify the control state of the operating portion 30. Specifically, when the dust scraping assembly moves between the first position and the second position, the damping is lower, so that the user can

control the operating portion 30 with a small force. When the dust scraping assembly moves between the second position and the third position, the damping is higher, so that when the user manually operates the operating portion 30, more force is required to control the operating portion 30 to open the cup cover 112, which can prevent the cup cover from being opened by accidental touch. Moreover, because the difference in the damping provides a prompt to the user, the user can determine the position and state of the dust scraping assembly according to different hand feelings.

[0087] However, alternatively, a limiting structure may be provided between the second position and the third position, and the operating portion 30 needs to pass the limiting structure to abut against the locking portion 14, which may provide operation feedback for the user and improve the use effect.

[0088] In some embodiments of the present disclosure, the cleaning device 100 further includes a damping structure configured to damp the movement of the operating portion 30 from the second position to the third position. That is, when the operating portion 30 moves between the first position and the second position, there is no damping effect, so that the user can more easily drive the dust scraping assembly to move between the first position and the second position. When the operating portion 30 moves from the second position to the third position, the damping force needs to be overcome. When the operating portion 30 reaches the third position, the abutting portion 31 can trigger the locking portion 14 to open the cup cover 112, which can prevent the cup cover 112 from being opened due to operation errors, and can also provide the user with a hand feeling that may be different from that in the operating state of the operating portion 30, thereby facilitating the user to determine the operating state of the dust scraping assembly.

[0089] The first position and the second position are respectively disposed at two ends of the first filter 12 in the axial direction, so that when the dust scraping assembly moves between the first position and the second position, the dust scraping assembly can scrape off the dust on the outer side of the first filter 12.

[0090] With reference to FIG. 1, in some embodiments of the present disclosure, the main body portion 10 includes a housing, and the dust scraping portion 20 is disposed in the housing. The housing is provided with a sliding rail 102 extending in the axial direction, and the operating portion 30 slidably mates with the sliding rail 102 in the axial direction. The operating portion 30 can slide within the sliding rail 102, to limit a sliding range of the operating portion 30, thereby helping improve operational stability.

[0091] With reference to FIG. 1, in some embodiments of the present disclosure, the operating portion 30 is U-shaped and disposed around the air inlet pipe 18, enabling the operating portion 30 to surround a part of the air inlet pipe 18, which facilitates improving stability of fitting. Both ends of the operating portion 30 are connected to and slidably mate with the housing, thereby improving the stability of connection between the operating portion 30 and the housing, and also helping improve the stability of the operating portion 30 during sliding.

[0092] With reference to FIG. 1, in some embodiments of the present disclosure, the main body portion 10 further includes a handle 71, a support member 72, and a power supply assembly 73. The power supply assembly 73 extends in the axial direction, the support member 72 and the handle 71 are arranged opposite to each other and spaced apart from each other along the axial direction, the support member 72 is connected to the air inlet pipe 18 and the power supply assembly 73, and the handle 71 is connected to the housing and the power supply assembly 73, so that structural stability can be improved. Specifically, the power supply assembly 73 may be configured to support the main body portion 10, and when placing the cleaning device 100, the power supply assembly 73 is supported on the flat surface for convenient storage. The handle 71 is connected between the power supply assembly 73 and the main body portion 10. The handle 71 can not only play a supporting role, but also allow the user to insert the hand

into the space between the power supply assembly 73 and the main body portion 10, which is convenient for the user to hold the cleaning device 100 and move the cleaning device 100 for cleaning. Further, when the user needs to use the dust scraping assembly, the user can directly pull the operating portion 30 connected to the air inlet pipe 18 forward with the fingers, which is convenient for the user to operate with one hand and provides convenience for the user.

[0093] With reference to FIG. 2, the power supply assembly 73 also houses a battery to provide an accommodating space for the battery, so that the user can use energy of the battery to drive the cleaning device 100 to operate in the case of power outage. Moreover, placing the battery inside the power supply assembly 73 is beneficial for improving the stability of the power supply assembly 73 and lowering the center of gravity of the cleaning device 100, thereby facilitating stable placement of the cleaning device 100.

[0094] With reference to FIG. 1, in some embodiments of the present disclosure, an inlet 108 of the air inlet pipe 18 and the dust-dumping opening of the cup body 111 are orientated in the same direction, which is beneficial for improving the cleaning effect of the cleaning device 100. Generally, when in use, the user may align the inlet 108 with the position to be cleaned and make the surface to be cleaned in contact with the inlet 108 to improve the cleaning effect. When this side of the cleaning device 100 is in contact with the surface to be cleaned, the contact between the cleaning device 100 and the surface to be cleaned can be improved, and it is easier for the user to move the cleaning device, which is convenient for the user to operate and is beneficial for improving the dust suction effect.

[0095] With reference to FIG. 3, in some embodiments of the present disclosure, the main body portion 10 further includes a second filter 13. The second filter 13 extends in the axial direction, and is provided with a lifting handle 131 at an end. The lifting handle 131 is located at the end of the second filter 13 close to the cup cover 112, and the lifting handle 131 is configured to pass through the cup cover 112 and is detachably and sealingly connected to the cup cover 112. In this way, when the cup cover 112 of the dust cup 11 is not opened, the user may pull out the second filter 13 along the axial direction through the lifting handle 131 and clean the second filter 13, which is convenient for cleaning and assembling the second filter 13 and provides convenience for the user. Specifically, the second filter 13 is located in front of the motor 40 in the airflow path. During use, the airflow first enters the second filter 13 for filtering and then flows towards the motor 40, which is beneficial for improving the cleaning effect and protecting the motor 40. Therefore, in order to improve the filtering effect and facilitate the user to quickly disassemble and clean the second filter 13, the lifting handle 131 may be disposed on the second filter 13 and cooperate with the dust cup 11 to improve the assembly efficiency. During use, the second filter 13 may be inserted into the main body portion 10, and the main body portion 10 is provided with a snap-fit portion, which may improve the installation stability of the second filter 13. Sealing rings are provided between the second filter 13 and the main body portion 10 and between the second filter 13 and the cup cover 112 for sealing. Alternatively, the second filter 13 can be inserted into the main body portion 10 and then rotated to find a docking portion, and the second filter 13 abuts against or forms a snap-fit connection with the docking portion.

[0096] Furthermore, the main body portion 10 further includes a third filter 15, and the third filter 15 is located in rear of the motor 40 in the airflow path. During use, the airflow flows towards the motor 40 and then is discharged from the third filter 15, which is beneficial for improving the cleanliness of the discharged air and avoiding secondary pollution.

[0097] A cleaning device according to a specific embodiment of the present disclosure will be described below with reference to the accompanying drawings.

[0098] With reference to FIGS. 1 to 5, the cleaning device 100 according to the embodiment of the present disclosure includes the main body portion 10, the dust cup 11 connected to the main body portion 10, the handle 71, the motor 40, the power supply assembly 73, the air inlet

pipe 18, the first filter 12, and the second and third filters 13 and 15 that are connected to the motor 40. In this embodiment, the cleaning device 100 adopts a side air intake design, so the inlet 108 is located at the side of the dust cup 11. The second filter 13 and the third filter 15 are respectively located in front and rear of the motor 40 along the airflow path for filtering the airflow, and the third filter 15 may overlap with the motor 40 in space according to the actual situation. The dust cup 11, the motor 40, and the third filter 15 are sequentially arranged along a longitudinal axis direction of the dust cup 11, and the second filter 13 is located inside the dust cup 11. The power supply assembly 73 is located at the bottom of the cleaning device 100 and can support the whole device. The handle 71 is located between the motor 40 and the power supply assembly 73, an axis of the handle 71 does not pass through the motor 40, and the motor 40 is more rearward relative to the axis of the handle 71, with a rearward center of gravity, so as to avoid extra wrist force for the user during use, which is beneficial for improving the hand feeling. The cleaning device 100 has distal and proximal ends opposite to each other, the inlet 108 is located at the distal end, and the third filter 15 is located at the proximal end. With reference to FIG. 2, the distal end may be a front end, and the proximal end may be a rear end.

[0099] The dust cup 11 includes the cup body 111 and the cup cover 112 for dumping the dust. The first filter 12 is disposed in the cup body 111. The first filter 12 may be a filter screen with a plurality of through holes on its surface for filtering dust with large particle size. The dust cup 11 may also be provided with a multi-cyclone separator including a plurality of small cyclones, and the plurality of small cyclones are arranged circumferentially inside the dust cup 11 and located downstream of the first filter 12 to perform further filtering and improve the filtering effect. The dust cup 11 is further provided with the locking portion 14 for locking and unlocking the cup cover 112.

[0100] With reference to FIG. 3, the cleaning device 100 further includes the dust scraping assembly, where the dust scraping assembly includes the operating portion 30, the connecting rod 50 connected to the operating portion 30, the support portion 23 fixed inside the main body portion 10, and the dust scraping portion 20 connected to the support portion 23. The dust scraping portion 20 abuts against an outer wall of the first filter 12, and is located at an end of the first filter 12 close to the motor 40 in an initial position thereof.

[0101] Specifically, the support portion 23 and the dust scraping portion 20 are connected through three guide rods 21 arranged at intervals, which transmit the movement of the operating portion 30. One end of the connecting rod 50 is connected to the operating portion 30, and the other end of the connecting rod 50 is connected to at least one of the guide rods 21, enabling the dust scraping portion 20 to move when the connecting rod 50 moves. The support portion 23 is disposed around the periphery of the motor housing 16 and can move along the motor housing 16 when the operating portion 30 is pushed. Since the dust scraping portion 20 is connected to the support portion 23 through the guide rods 21, when the support portion 23 moves along the motor housing 16, the dust scraping portion 20 moves in the same direction as the support portion 23 and scrapes off the dust from the periphery of the first filter 12.

[0102] Further, the spring 24 is disposed around each of the guide rods 21. During dust scraping, the movement of the support portion 23 causes the springs 24 to be compressed. When the dust scraping action is completed, the dust scraping portion 20 automatically resets due to the restoring force of the springs 24. The operating portion 30 is located below the dust cup 11, which may provide a position for the user to push and pull the operating portion 30 more conveniently, so that the pushing and pulling actions are smoother.

[0103] In the cleaning device 100 according to the embodiments of the present disclosure, the dust cup 11 remains stationary during the dust scraping process, and only the dust scraping portion 20 moves inside the dust cup 11. The principle of dust scraping is as follows: during the dust scraping operation, the user pushes the operating portion 30, the operating portion 30 drives the connecting rod 50 to move, the movement of the connecting rod 50 drives the support

portion 23 to move along the periphery of the motor housing 16, the movement of the support portion 23 drives the dust scraping portion 20 to abut against the periphery of the first filter 12 for dust scraping, at which time the springs 24 are compressed, the pushing and pulling actions for dust scraping can be performed multiple times, and the dust scraping portion 20 can repeatedly move to scrape off the dust on the outer side of the first filter 12 more thoroughly; at the end of the dust scraping operation, under the action of the elastic restoring force of the springs 24, the operating portion 30 returns to the initial position, which in turn drives the dust scraping portion 20 to move to the initial position. By providing the dust scraping assembly, the dust and dirt accumulated on the first filter 12 can be scraped off each time the dust is dumped, enabling regular cleaning, preventing the filter screen from being clogged, and avoiding affecting the suction of the cleaning device 100. Moreover, there is no need to detach the dust cup 11, which makes the operation simple and convenient, and provides better dust removal effect.

[0104] In addition, the dust scraping assembly has no connection or mating relationship with the outer or inner wall of the dust cup 11. The entire inner wall of the dust cup 11 is a complete annular wall. This design ensures the continuity of the airflow inside the dust cup 11 and prevents the airflow from being disrupted.

[0105] Furthermore, the operating portion 30 further includes the abutting portion 31. The abutting portion 31 is located at the end of the connecting rod 50 close to the operating portion 30. When the dust scraping portion 20 moves to the end of travel (i.e., the third position) or moves close to the end of travel (i.e., the third position), the abutting portion 31 abuts against the locking portion 14 of the dust cup 11 to perform unlocking, enabling the cup cover 112 to open. Opening the cup cover 112 after the dust scraping operation is completed or during the dust scraping operation enables the operations of dust scraping and dust dumping, at which time the user may operate over the garbage can. Since the dust cup 11 is in the form of a horizontally-arranged structure in the present disclosure, the garbage is directly poured into the garbage can from the front end of the dust cup 11, thereby preventing the dust from scattering everywhere and from falling back onto the cleaned floor. At the same time, the user only needs to push the operating portion 30 without touching the vicinity of the cup cover 112, thus avoiding contact with the dust, and improving the user experience.

[0106] In actual use, the whole airflow path of the cleaning device is as follows: the airflow enters the air inlet pipe 18 from the inlet 108, dust and air enter the dust cup 11 from the side of the dust cup 11, and a portion of the dust falls into a first dust collection space after being filtered by the first filter 12; the airflow containing a small amount of dust continues to enter the multi-cyclone separator for filtering, and the filtered fine dust falls into a second dust collection space; and the airflow continues to enter the second filter 13 for filtering, then flows towards the motor 40, passes through the third filter 15, and finally is discharged from an outlet 109.

[0107] Specifically, the dust and the air enter the cleaning device from the inlet and tangentially enter the dust cup 11 along the air passage. The dust and debris rotate downwards along the wall of the dust cup 11 to the first dust collection space of the dust cup 11 under the action of the centrifugal force. A flange at a certain angle to a horizontal direction is disposed below a filter screen. The flange below the filter screen can prevent the dust that has entered the bottom due to the centrifugal force from entering the multi-cyclone separator, thereby effectively reducing the total amount of dust entering the multi-cyclone separator. A portion of the dust passes through the filter screen and enters the multi-cyclone separator. Similarly, under the action of the centrifugal force, the dust rotates downwards along the wall of the multi-cyclone separator to the second dust collection space at the bottom. The air, at a dust-air separation port, enters the second filter 13 through the porous air passage, then enters the motor 40, then is filtered by the third filter 15, and then is discharged. In this case, by providing two

cyclone filtrations and using a multi-cyclone mechanism for the secondary filtration, the separation efficiency of dust and air can be greatly increased, the number of times of cleaning the filter can be reduced, and the service life of the filter can be prolonged.

[0108] The second filter 13 is located inside the first filter 12. The second filter 13 is provided with the lifting handle 131 at an end. The lifting handle 131 is configured to take out the second filter 13 along the longitudinal axis of the dust cup 11. The lifting handle 131 of the second filter 13 is arranged at a position close to the cup cover 112, and the second filter 13 is detachable in a direction away from the cup cover 112. The third filter 15 can be detached backwards, so that the second filter 13 and the third filter 15 can be conveniently cleaned. The second filter 13 is disposed coaxially with the first filter 12. The second filter 13 includes a filter cotton and a filter support. The airflow passes through and is filtered by the filter cotton, then enters the interior through a plurality of through holes on the filter support, and flows towards the motor 40 through the internal channel. As stated above, in order to enable the second filter 13 to be quickly disassembled and cleaned, the second filter 13 is located in the middle of the dust cup 11, and is communicated with a fan assembly through a sealing ring at the upper part, and the dust-air separated air enters the second filter 13 through the porous air passage, then enters the motor 40, and then is discharged. Usually, a small amount of fine dust is attached to the outer wall of the second filter 13. When the second filter 13 needs to be cleaned, at the position of the opening at the bottom of the dust cup 11, the user holds the lifting handle 131 of the second filter 13 with the hand and pulls the second filter 13 out, and after the cleaning is completed, the second filter 13 is assembled in the same manner. In this way, the second filter 13 can be quickly cleaned or replaced without disassembling any other components, thereby greatly improving the user convenience and satisfaction.

[0109] A power switch is arranged above the handle 71, and located on the housing or the position of the screen. The cleaning device 100 is further provided with a rear end cover, and the display screen faces rearward and is disposed on the rear end cover. During disassembly, the rear end cover is first disassembled, and then the third filter 15 is disassembled for cleaning.

[0110] With reference to FIGS. 1 to 7, the cleaning device 100 according to the embodiments of the present disclosure includes the main body portion 10 and the dust cup 11. The main body portion 10 includes the first filter 12. The first filter 12 may perform dust-air separation on air with dust in the cleaning device 100. The dust cup 11 is connected to the main body portion 10, and the dust cup 11 covers the outer side of the first filter 12, so that the dust cup 11 may be configured to collect dust filtered by the first filter 12.

[0111] Further, the dust filtered by the first filter 12 is distributed in the space formed between the first filter 12 and the dust cup 11. The first filter 12 may filter out some light dust, which is distributed in a flocculent form between the dust cup 11 and the first filter 12, and the light dust is not only prone to clog the first filter 12 and affect the dust suction effect, but also may adhere to the wall of the dust cup 11 and cannot be poured out when the dust cup 11 is cleaned, or may cause dust raising when the user pours the dust out, resulting in secondary pollution. Therefore, the cleaning device 100 is further provided with the dust scraping assembly, which is configured to compress the dust between the first filter 12 and the dust cup 11 for easier collection of the dust. Specifically, the dust scraping assembly includes the dust scraping portion 20. The dust scraping portion 20 is disposed between the dust cup 11 and the first filter 12. A dust compression space 101 is formed between the dust scraping portion 20 and the bottom wall of the dust cup 11, and the dust scraping portion 20 covers one end of the dust compression space 101 and is movable along the axis of the first filter 12. That is, the dust scraping portion 20 can move in the dust compression space 101. During the movement of the dust scraping portion 20, the scattered flocculent dust in the dust compression space 101 can be collected to one end of the dust compression space 101. In this way, the flocculent or lighter dust can be prevented from affecting the operation of the first filter 12, and after the dust is

compacted by the dust scraping portion 20, the discrete dust in the dust compression space 101 is compressed, which reduces the space occupied by the dust in the dust compression space 101, and is beneficial for increasing the dust collection capacity of the dust cup 11. In this way, the user does not need to frequently empty the dust in the dust cup 11, which can reduce the cleaning time and provide convenience for the user. In addition, when the dust scraping assembly collects and compresses the dust, the cleanliness in the dust cup 11 can be improved, and the phenomenon of dust raising or dust spraying can be avoided when the user cleans or opens the dust cup 11.

[0112] In the cleaning device 100 according to the embodiments of the present disclosure, by providing the dust scraping assembly between the first filter 12 and the dust cup 11, the dust can be collected and compressed in the dust cup 11, which is beneficial for improving the cleaning effect of the dust cup 11 and avoiding the problem of dust spraying or dust raising when the dust cup 11 is opened, thereby avoiding the secondary pollution and facilitating the use of the cleaning device 100 by the user.

[0113] With reference to FIG. 3 and FIG. 5, in some embodiments of the present disclosure, the dust scraping portion 20 is disposed around the outer side of the first filter 12. The dust scraping portion 20 has a compression member 25 extending towards the inner wall of the dust cup 11 and adjacent to the inner wall of the dust cup 11, and the compression member 25 is configured to move along the axial direction of the first filter 12 to compress the dust in the dust compression space 101. That is, the compression member 25 may extend from the outer side of the first filter 12 to a position adjacent to the inner wall of the dust cup 11, which is beneficial for expanding the dust compression space 101, compressing more dust, and improving the dust collection and compression effect. Specifically, when the distance between the compression member 25 and the inner wall of the dust cup 11 is reduced, the cleaning effect of the compression member 25 on the dust in the vicinity of the inner wall of the dust cup 11 or the dust adhering to the inner wall of the dust cup 11 may be improved, enabling dust compression and cleaning of the dust cup 11 simultaneously, thereby reducing the workload of the user in cleaning the dust cup 11. However, the size of the compression member 25 may also be adjusted according to the actual situation, such as the size of the first filter 12 or the dust cup 11 or the actual application scenario, etc., which is not limited in the present disclosure.

[0114] With reference to FIG. 5, in some embodiments of the present disclosure, the compression member 25 includes a first side wall and a second side wall that are disposed opposite to each other in a radial direction. The first side wall and the outer side of the first filter 12 are disposed opposite to each other in a radial direction of the first filter 12, and the second side wall and the inner wall of the dust cup 11 are disposed opposite to each other in the radial direction of the first filter 12. Specifically, the compression member 25 may have a certain thickness along the axial direction of the first filter 12, which can improve the structural stability and operation stability of the compression member 25, improve the compression effect of the compression member 25 on the dust, facilitate the dust compaction, and further increase the contact area between the compression member 25 and the first filter 12 or the inner wall of the dust cup 11 when they are fitted with each other, thereby improving the cleaning effect.

[0115] With reference to FIGS. 3 to 6, in some embodiments of the present disclosure, a dust scraping member 22 is connected to the first side wall, and the dust scraping member 22 extends in the axial direction of the first filter 12 and is configured to be in clearance fit with the outer side of the first filter 12.

[0116] Specifically, the dust scraping member 22 is disposed around the outer peripheral surface of the first filter 12 and is configured to move in a reciprocating manner along the axial direction of the first filter 12 to scrape off the dust on the outer side of the first filter 12, which can improve the cleaning effect on the first filter 12. Moreover, the dust scraping member 22 is integrated into the dust scraping assembly and occupies less space, which is beneficial for

spatial arrangement. In other words, the dust scraping portion 20 can clean the outer surface of the first filter 12 to prevent the dust from adhering to the outer side of the first filter 12 to affect the filtering effect or the cleaning effect of the cleaning device 100. Meanwhile, the dust scraping portion 20 can also collect the dust in the dust compression space 101. In particular, when the dust scraping portion 20 is in operation, after the dust scraping member 22 scrapes off the dust on the outer side of the first filter 12, the dust is scattered in the dust compression space 101 and can be directly collected and compressed by the compression member 25, thereby further improving the cleaning effect and enhancing the functionality of the dust scraping assembly.

[0117] In some embodiments of the present disclosure, the first side wall is in clearance fit with the outer side of the first filter 12, that is, there may be a clearance (including a minimum clearance equal to zero) between the first side wall and the outer side of the first filter 12. There is a clearance between the first side wall and the outer side of the first filter 12, which can improve the movement flexibility of the compression member 25 and facilitate the user operation. With reference to FIG. 6, when the clearance between the first side wall and the first filter 12 is small or zero, the cooperation effect between the first side wall or the dust scraping member 22 on the first side wall and the first filter 12 can be improved, which is beneficial for cleaning the first filter 12. The dust scraping member 22 may be integrated on the first side wall, or the dust scraping member 22 and the first side wall may be integrally formed, which is not limited in the present disclosure.

[0118] In some embodiments of the present disclosure, the second side wall is in clearance fit with the inner wall of the dust cup 11, that is, there may be a clearance (including a minimum clearance equal to zero) between the second side wall and the inner wall of the dust cup 11. When there is a clearance between the second side wall and the inner wall of the dust cup 11, the movement flexibility of the compression member 25 can be improved, which is convenient for the user operation. When the clearance between the second side wall and the inner wall of the dust cup 11 is small or zero, the cooperation effect between the second side wall and the inner wall of the dust cup 11 can be improved, and the effect of cleaning the inner wall of the dust cup 11 can be achieved during the process of compressing and scraping the dust.

[0119] In some embodiments of the present disclosure, the dust scraping portion 20 is a flexible structure and/or the dust scraping portion 20 has bristles (not shown in the figure), which can protect the components in the cleaning device 100, improve the flexibility during movement or use, and also facilitate improving the cleaning effect. The bristles may be arranged towards the inner wall of the dust cup 11, so that the inner wall of the dust cup 11 is cleaned by the bristles during the movement of the dust scraping portion 20, which improves the cleaning effect on the dust cup 11. For example, the dust scraping portion 20 may be a soft rubber strip or an annular soft rubber strip to facilitate reducing the weight of the dust scraping portion 20 and improving the flexibility of the dust scraping portion 20 during movement. In actual use, since the dust scraping portion 20 is in contact with the dust for a long time, the dust scraping portion 20 is prone to contamination. The soft rubber strip is easy to replace and purchase, and the user can also replace the rubber strip after a period of use to improve the cleaning performance of the device.

[0120] The dust scraping portion 20 may also have bristles, and the bristles may be disposed on a side of the dust scraping portion 20 close to the inner wall of the dust cup 11, so that when the dust scraping portion 20 moves, the inner wall of the dust cup 11 is cleaned by the bristles. The dust attached to the inner wall of the dust cup 11 may be removed by the bristles, and is compressed by the compression member 25, thereby improving the cleaning effect on the dust in the dust cup 11, and improving the automatic cleaning effect on the dust cup 11. Thus, when the user cleans the dust cup 11, the dust in the dust cup 11 is compressed into blocks, which can be directly poured out. Moreover, the compressed dust may not raise dust during dumping,

which can avoid the secondary pollution. Meanwhile, the inner wall of the dust cup 11 is cleaned by the dust scraping portion 20, which provides convenience for the user to clean the dust cup 11.

[0121] With reference to FIG. 2 and FIG. 5, in some embodiments of the present disclosure, the dust scraping assembly includes the operating portion 30. The operating portion 30 is drivably connected with the dust scraping portion 20 and is configured to drive the dust scraping portion 20 to move, and at least a part of the operating portion 30 is located outside the dust cup 11 for manual operation.

[0122] With reference to FIG. 4 and FIG. 5, in some embodiments of the present disclosure, the cleaning device 100 further includes the connecting rod 50. Two ends of the connecting rod 50 are respectively connected to the dust scraping portion 20 and the operating portion 30, so that the operating portion 30 is drivably connected with the dust scraping portion 20. That is, the connecting rod 50 can transmit the power from the operating portion 30 to the guide rod 21 to drive the dust scraping portion 20 to move. By providing the connecting rod 50, the position of the operating portion 30 can be flexibly arranged, which is convenient for the user operation and spatial arrangement. Optionally, the connecting rod 50 may also be connected to the support portion 23, the operating portion 30 is drivably connected with the support portion 23, and the movement of the support portion 23 may drive the dust scraping portion 20 to move. Specifically, the connecting rod 50 may include the first rod portion and the second rod portion, one end of the first rod portion is connected to the guide rod 21 and extends in the same direction as the guide rod 21, the other end of the first rod portion is connected to one end of the second rod portion, and the other end of the second rod portion is connected to the operating portion 30. There is an included angle between the rod bodies of the first rod portion and the second rod portion at the joint, or there is an included angle between the extension lines in the extension directions of the first rod portion and the second rod portion. In this way, the position where the operating portion 30 is provided can be flexibly arranged.

[0123] With reference to FIG. 4 and FIG. 5, in some embodiments of the present disclosure, the dust scraping assembly further includes the guide rod 21 and the support portion 23. The support portion 23 is connected to the dust scraping member 22 by the guide rod 21 and can axially support the dust scraping member 22, to avoid shaking of the dust scraping member 22 during movement, and improve structural and operational stability of the dust scraping member 22. In this way, even when relatively large dirt is attached to the outer side of the first filter 12, the dust scraping member 22 can scrape them off, which is beneficial for enhancing the cleaning effect and durability.

[0124] Further, the guide rod 21 extends in the axial direction of the first filter 12, with one end connected to the dust scraping portion 20. The support portion 23 is connected to the other end of the guide rod 21 and movably supported on the main body portion 10. The support portion 23 is drivably connected with the operating portion 30. The guide rod 21 extends in the axial direction, can guide the dust scraping member 22 to move in the axial direction, and can also provide support between the support portion 23 and the dust scraping member 22, which is beneficial for dispersing the force.

[0125] With reference to FIG. 3, in some embodiments of the present disclosure, the main body portion 10 further includes the motor housing 16, a space for accommodating the motor 40 is formed in the motor housing 16, the motor housing 16 and the first filter 12 are arranged in the axial direction, and the support portion 23 is disposed around the outer side of the motor housing 16. Specifically, the support portion 23 may be arranged between the motor housing 16 and the housing of the cleaning device 100, which is beneficial for accommodating the support portion 23. Moreover, the support portion 23 may move axially along the motor housing 16, and the dust scraping member 22 may also move axially outside the first filter 12 when the support portion 23 moves.

[0126] With reference to FIG. 3, in some embodiments of the present disclosure, the main body portion 10 further includes the guide portion 60. The guide portion 60 is disposed between the support portion 23 and the dust scraping portion 20, and the guide portion 60 is provided with a guide hole for the guide rod 21 to pass through and to guide the axial movement of the guide rod 21, which facilitates the axial extension of the dust scraping assembly on the main body portion 10, can save space and improve the compactness of the device. In addition, the guide portion 60 can limit the guide rod 21 in the radial direction to prevent the dust scraping assembly from shaking during use.

[0127] With reference to FIG. 3, in some embodiments of the present disclosure, the dust scraping assembly further includes the spring 24. The spring 24 is disposed around the guide rod 21, with two ends respectively abutting against the guide portion 60 and the support portion 23, and the spring 24 is configured to generate a force for driving the dust scraping portion 20 to reset, providing a restoring force for the dust scraping member 22, so that the dust scraping member 22 can automatically reset, which is convenient for the user operation. During use, the operating portion 30 may drive the dust scraping assembly to move close to the cup cover 112 to pass through the first filter 12 and scrape off the dust on the outer side of the first filter 12. At this time, the support portion 23 also moves close to the cup cover 112 or the guide portion 60, the spring 24 abuts against the support portion 23 and the guide portion 60 while being compressed, and when the driving force disappears, the restoring force of the spring 24 may drive the support portion 23 and the dust scraping member 22 to reset, which facilitates simplifying the operation.

[0128] With reference to FIG. 1 and FIG. 2, in some embodiments of the present disclosure, the cleaning device 100 includes the air inlet pipe 18. The air inlet pipe 18 and the dust cup 11 are arranged side by side, the dust scraping assembly and the air inlet pipe 18 extend in the same direction, and the dust scraping assembly is located outside the air inlet pipe 18. Specifically, the air inlet pipe 18 and the dust cup 11 are arranged side by side and extend in the same direction, which can facilitate spatial arrangement and improve the structural compactness of the device. The dust scraping assembly is located outside the air inlet pipe 18, and the dust cup 11, the first filter 12, the dust scraping assembly and the air inlet pipe extend in the same direction. On the one hand, this facilitates reducing the size of the cleaning device 100 and facilitates the spatial arrangement. On the other hand, the air inlet pipe may be disposed on the outer peripheral wall of the dust cup 11 and extend along the axial direction of the dust cup 11, so that the airflow may flow spirally after entering the dust cup 11 from the air inlet pipe 18, which facilitates improving the separation effect. The dust scraping assembly may collect and compress the dust in the dust compression space 101, thereby facilitating improving the cleaning effect and facilitating collection and disposal of the dust.

[0129] With reference to FIG. 2, in some embodiments of the present disclosure, the cleaning device includes a pre-motor filter 13 (i.e., the second filter 13). The pre-motor filter 13 is at least partially located in the dust cup 11, so that a filtering effect can be improved. The dust scraping portion 20 moves in the axial direction of the pre-motor filter 13, thereby facilitating spatial arrangement and assembly.

[0130] A cleaning device 100 according to a specific embodiment of the present disclosure will be described below with reference to the accompanying drawings.

[0131] Referring to FIGS. 1 to 6, the cleaning device 100 according to the embodiment of the present disclosure includes the main body portion 10, the dust cup 11 connected to the main body portion 10, the handle 71, the motor 40, the power supply assembly 73, the air inlet pipe 18, the second filter 13 and the third filter 15. In the present disclosure, the cleaning device 100 adopts a side air intake design, so the inlet 108 is located at the side of the dust cup 11. The second filter 13 and the third filter 15 are respectively located in front and rear of the motor 40 along the airflow path for filtering the airflow, and the third filter 15 may overlap with the

motor 40 in space according to the actual situation. The dust cup 11, the motor 40, and the third filter 15 are sequentially arranged along a longitudinal axis direction of the dust cup 11, and the second filter 13 is located inside the dust cup 11. The power supply assembly 73 supports the entire cleaning device 100. The handle 71 is located between the motor 40 and the power supply assembly 73, an axis of the handle 71 does not pass through the motor 40, and the motor 40 is more rearward relative to the axis of the handle 71. The handheld dust suction device (i.e., the cleaning device 100) has a distal end and a proximal end opposite to each other, the inlet 108 is located at the distal end, and the third filter 15 is located at the proximal end.

[0132] Further, with reference to FIG. 2, the dust cup 11 includes the cup body 111 and the cup cover 112 for dumping the dust. The first filter 12 and a fourth filter 19 are arranged in the cup body 111. The first filter 12 is a filter screen with a plurality of through holes on its surface for filtering dust with large particle size. The fourth filter 19 is a multi-cyclone separator, the fourth filter 19 includes a plurality of small cyclones, and the plurality of small cyclones are arranged circumferentially inside the dust cup 11 and located downstream of the first filter 12.

[0133] With reference to FIG. 7, the cleaning device 100 further includes the dust scraping assembly. The dust scraping assembly includes the dust scraping portion 20, and the dust scraping portion 20 is configured to move towards the cup cover 112 to compress the dust. The dust scraping portion 20 includes the compression member 25 extending towards the inner wall of the dust cup 11 and adjacent to the inner wall of the dust cup 11, and the compression member 25 extends close to the dust cup 11 in a direction perpendicular to the axis of the dust cup 11. In this way, the dust is compressed by the compression member 25, so that the collected dust can be compressed in volume, and more space is vacated for separation or collection of the dust, thereby preventing the suction force from being excessively reduced or the separation efficiency from being excessively reduced due to excessive accumulation of the dust without being dumped. Moreover, in the case that the dust is compressed, the user does not need to frequently dump the dust in the dust cup 11, which can save the time for the cleaning process, reduce the workload of the user, and enhance the user experience.

[0134] With reference to FIG. 7, in an embodiment, an extension end of the compression member 25 may be in contact with the inner wall of the dust cup 11 for scraping off the dust on the inner wall of the dust cup 11. An edge of the compression member 25 in contact with the inner wall of the dust cup 11 may be of a soft rubber strip structure or a bristle structure. Furthermore, cleaning the inner wall of the dust cup 11 enables the dust cup 11 to be cleaner, so that the dust is prevented from remaining on the inner wall of the dust cup 11.

[0135] In an embodiment, the dust scraping portion 20 further includes the dust scraping member 22. The dust scraping member 22 is disposed close to the first filter 12, and the dust scraping member 22 may extend in the axial direction of the first filter 12, or may extend obliquely in a direction close to the first filter 12, so as to improve the dust scraping effect in cooperation with the outer side of the first filter 12. The dust floating on the surface of the first filter 12 can be removed incidentally while the dust scraping member 22 compresses and scrapes the dust towards the cup cover 112. The dust scraping member 22 can be at a certain distance from the first filter 12 but close enough to the first filter 12. In this way, the floating dust adhered to the surface of the first filter 12 can be removed, which prevents the dust from being accumulated on the first filter 12 and affecting the air flow efficiency.

[0136] The dust scraping assembly includes the operating portion 30 for controlling the movement of the dust scraping portion 20, the connecting rod 50, and the support portion 23 that is fixed inside the main body portion 10. When the dust scraping portion 20 is in its initial position, the dust scraping portion 20 is located at an end of the first filter 12 close to the motor 40.

[0137] With reference to FIG. 5, in an embodiment, three guide rods 21 are disposed between the support portion 23 and the dust scraping portion 20 to connect them, and transmit the

movement of the operating portion 30. One end of the connecting rod 50 is connected to the operating portion 30, and the other end of the connecting rod 50 is connected to at least one of the guide rods 21 to drive the dust scraping portion 20 to move when the connecting rod 50 moves.

[0138] With reference to FIG. 3, in an embodiment, the support portion 23 is disposed around the periphery of the motor housing 16 and can move along the motor housing 16 when the operating portion 30 is pushed. Since the compression member 25 is connected to the support portion 23 through the guide rods 21, when the support portion 23 moves along the motor housing 16, the dust scraping portion 20 moves in the same direction as the support portion 23, can scrape off the dust from the periphery of the first filter 12, and collect and compress the dust in the dust compression space 101.

[0139] In an embodiment, the spring 24 is disposed around each of the guide rods 21. During dust scraping, the movement of the support portion 23 causes the springs 24 to be compressed. When the dust scraping action is completed, the dust scraping portion 20 automatically resets due to the restoring force of the springs 24.

[0140] With reference to FIG. 1, in an embodiment, the operating portion 30 is located below the dust cup 11, which may provide a position for the user to push and pull the operating portion 30 more conveniently, so that the pushing and pulling actions are smoother.

[0141] Specifically, during the cleaning process, the user may compress the dust multiple times to release more space for dust collection, and the user does not need to dump the dust in the dust cup 11 frequently.

[0142] In actual operation, with reference to FIG. 1 and FIG. 2, the whole airflow path of the cleaning device 100 is as follows: the airflow enters the air inlet pipe 18 from the inlet 108, the dust and air enter the dust cup 11 from the side of the dust cup 11, and a portion of the dust falls into the first dust collection space after being filtered by the first filter 12; the airflow containing a small amount of dust continues to enter the fourth filter 19 for filtering, and the filtered fine dust falls into the second dust collection space; and the airflow continues to enter the second filter 13 for filtering, then flows towards the motor 40, passes through the third filter 15, and finally is discharged from the outlet.

[0143] Specifically, the dust and the air enter the device from the inlet 108 and tangentially enter the dust cup 11 along the air passage. The dust and debris rotate downwards along the wall of the dust cup 11 to the first dust collection space of the dust cup 11 under the action of the centrifugal force. A portion of the dust passes through the first filter 12 and enters the fourth filter 19. Similarly, under the action of the centrifugal force, the dust rotates downwards along the inner wall of the fourth filter 19 to the second dust collection space at the bottom. The air, at a dust-air separation port, enters the second filter 13 through the porous air passage, then enters the motor 40, then is filtered by the third filter 15, and then is discharged. By providing two cyclone filtrations and using a multi-cyclone mechanism for the fourth filter 19, the separation efficiency of dust and air can be greatly increased, the number of times of cleaning the filter can be reduced, and the service life of the filter can be prolonged.

[0144] With reference to FIG. 2, the second filter 13 is located inside the first filter 12. The cleaning device is provided with the second filter 13. The pre-motor filter 13 is provided with the lifting handle 131. The lifting handle 131 is configured to take out the pre-motor filter 13 along the longitudinal axis of the dust cup 11. The lifting handle 131 is arranged at a position close to the cup cover 112, and the pre-motor filter 13 is detachable in a direction away from the cup cover 112. The third filter 15 can be detached backwards, so that the second filter 13 and the third filter 15 can be conveniently cleaned. The second filter 13 is disposed coaxially with the first filter 12, and the dust scraping portion 20 moves along the axial direction of the second filter 13. More specifically, the second filter 13 includes a filter cotton and a filter support. The airflow passes through and is filtered by the filter cotton, then enters the interior

through a plurality of through holes on the filter support, and flows towards the motor 40 through the internal channel.

[0145] As stated above, in order to enable the second filter 13 to be quickly disassembled and cleaned, as shown in FIG. 2, the second filter 13 is located in the middle of the dust cup 11, and is communicated with a fan assembly through a sealing ring at the upper part, and the dust-air separated air enters the pre-motor filter 13 through the porous air passage, then enters the motor 40, and then is discharged. Usually, a small amount of fine dust is attached to the outer wall of the second filter 13. When the pre-motor filter 13 needs to be cleaned, at the position of the opening at the bottom of the dust cup 11, the user holds the lifting handle 131 with the hand and pulls the pre-motor filter 13 out, and after the cleaning is completed, the pre-motor filter 13 is assembled in the same manner. In this way, the second filter 13 can be quickly cleaned or replaced without disassembling any other components, which provides convenience for the user operation.

[0146] As shown in FIGS. 8 to 15, in the cleaning device 100 according to embodiments of the present disclosure, the cleaning device 100 may be configured to suction dust for environment cleaning. The cleaning device 100 may include the main body portion 10, a driving assembly, a rear cover 80, and a display component 90.

[0147] The main body portion 10 has an airflow channel 110 therein, and at least a part of the driving assembly is disposed in the airflow channel 110 to drive airflow. The rear cover 80 detachably covers an outlet of the airflow channel 110. The display component 90 is mounted on the driving assembly and is separated from the rear cover 80, and the display component 90 is configured to display information towards the outside of the rear cover 80. In other words, the display component 90 may be configured to display operation information or other information of the cleaning device 100. In this way, operating stability of the display component 90 may be improved, and damage to the display component 90 may be avoided.

[0148] Specifically, the display component 90 is mounted on the driving assembly, and the driving assembly is disposed in the airflow channel 110. When the rear cover 80 is connected to the main body portion 10, the rear cover 80 can cover the outlet of the airflow channel 110 to encapsulate the driving assembly and the display component 90 on the main body portion 10. The rear cover 80 can protect the structural components in the cleaning device 100, so that the driving assembly can be stably connected to the main body portion 10. Meanwhile, the display component 90 can display information towards the outside of the rear cover 80, and the rear cover 80 can be beneficial for the display component 90 to display information to the outside. For example, at least a part of the rear cover 80 can define an opening 81, and the display component 90 can display information to the outside through the opening 81. For another example, at least a part of the rear cover 80 can be formed as a transparent structure, and the display component 90 can display information to the outside through the transparent structure, so as to improve the user convenience. When the third filter 15 needs to be cleaned, the rear cover 80 can be detached from the main body portion 10, at which time the display component 90 mounted on the driving assembly can be separated from the rear cover 80 to avoid damage to the display component 90 caused by falling of the display component 90 when the rear cover 80 is detached. In addition, the display component 90 mounted on the driving assembly allows the wiring to be arranged and hidden between the display component 90 and the driving assembly, so as to ensure the operating stability of the display component 90.

[0149] In addition, at least a part of the driving assembly is disposed in the airflow channel 110, so that the cleaning device 100 has a more compact structure and a smaller volume.

[0150] Therefore, the cleaning device 100 according to embodiments of the present disclosure can improve the operating stability of the display component 90, and can avoid damage to the display component 90.

[0151] As shown in FIG. 2, in some embodiments of the present disclosure, the rear cover 80 may be configured to be detachable from the main body portion 10 independently of the display component 90. That is, the rear cover 80 may be individually detached from the main body portion 10, and the rear cover 80 is detached from the main body portion 10 without detaching of the display component 90 from the main body portion 10. Such an arrangement can improve the operating stability of the display component 90, avoid damage to the display component 90, and facilitate cleaning of the third filter 15.

[0152] Specifically, after the cleaning device 100 is used for a period of time, garbage such as dust entrained in the airflow may be accumulated on the third filter 15. The user can detach the rear cover 80 from the main body portion 10 independently of the display component 90, so as to perform maintenance on the interior of the cleaning device 100, while the display component 90 can remain stably mounted on the driving assembly to prevent the display component 90 from falling off and being damaged when the rear cover is disassembled, and the electrical connection between the display component 90 and the main body portion 10 can also be maintained to ensure the normal operation of the display component 90.

[0153] In some embodiments of the present disclosure, the driving assembly may include the motor 40, and the display component 90 can be installed at an air outlet side of the motor 40. It may be understood that, in the cleaning device 100, the motor 40 may be mounted in the airflow channel 110, an air inlet side of the motor 40 may correspond to the inlet 108 of the airflow channel 110, the air outlet side of the motor 40 may correspond to the outlet 109 of the airflow channel 110, and the rear cover 80 may cover the outlet 109 of the airflow channel 110. Therefore, the display component 90 may be installed at the air outlet side of the motor 40 to display information towards the outside of the rear cover 80, which is beneficial for the user to obtain the operation information of the cleaning device.

[0154] Further, the display component 90 may be mounted at an end of the motor 40 close to the outlet 109, in other words, the display component 90 may be positioned close to the outlet 109 of the airflow channel 110, so that the display component 90 may display information towards the outside of the rear cover 80.

[0155] Alternatively, a mounting support 151 (hereinafter, support 151) may be provided at the air outlet side of the motor 40, and the display component 90 may be mounted on the mounting support 151. This arrangement may prevent the display component 90 from blocking the air outlet side of the motor 40, allowing the motor 40 to drive the airflow to pass through the airflow channel 110 while the display component 90 displays information towards the outside of the rear cover 80.

[0156] In some embodiments of the present disclosure, the driving assembly may further include the third filter 15.

[0157] The third filter 15 may be disposed at the air outlet side of the motor 40 and located at the outlet 109 of the airflow channel 110, and the display component 90 may be mounted on the third filter 15, so that the dust removal function of the cleaning device 100 is realized.

[0158] Specifically, during the operation of the cleaning device 100, the motor 40 can drive the airflow to sequentially pass through the inlet 108 of the airflow channel 110, the airflow channel 110, and the outlet 109 of the airflow channel 110, and be filtered by the third filter 15 at the outlet 109, so that the garbage such as dust entrained in the airflow can be filtered out by the third filter 15, thereby realizing the cleaning function of the cleaning device 100.

[0159] In some embodiments of the present disclosure, at least a part of the third filter 15 may extend beyond the outlet 109, and the rear cover 80 covers the outer side of the third filter 15. It may be understood that the display component 90 is mounted on the outer side of the third filter 15, and the display component 90 may be located at the air outlet side of the motor 40. In other words, the display component 90 may face the outlet 109 of the airflow channel 110, and at this time, at least a part of the third filter 15 may extend beyond the outlet 109, so that the

display component 90 may better display information towards the outside of the rear cover 80, thereby improving user convenience.

[0160] As shown in FIGS. 8 to 12, in some embodiments of the present disclosure, the main body portion 10 may extend in a front-to-rear direction, and the outlet 109 of the airflow channel 110 may be disposed at a rear end of the main body portion 10. The display component 90 is disposed on the third filter 15 and displays information towards the rear of the main body portion 10. This arrangement may be beneficial for the user to obtain the operation information of the cleaning device 100 and enhancing the user convenience.

[0161] The inlet 108 of the airflow channel 110 may be provided at a front end of the main body portion 10. In other words, the airflow enters the inlet 108 of the airflow channel 110 from the front end of the main body portion 10, then passes through the airflow channel 110, and is discharged from the outlet 109 disposed at the rear end of the main body portion 10. Alternatively, the main body portion 10 has a side wall extending in the front-to-rear direction, and the inlet 108 of the airflow channel 110 may be provided on the side wall of the main body portion 10. After entering the airflow channel 110, the airflow may flow in a tangential direction of the side wall of the main body portion 10 to perform a first filtration on a part of the dust by means of cyclone separation. Subsequently, the airflow may be discharged from the outlet 109 and subjected to a second filtration by the third filter 15, so as to realize dust removal by the cleaning device 100.

[0162] For example, in the front-to-rear direction, the inlet 108 of the airflow channel 110 is disposed at the front end of the main body portion 10, and the outlet 109 of the airflow channel 110 is disposed at the rear end of the main body portion 10. It can be understood that, when the user uses the cleaning device 100, the front end of the main body portion 10, that is, the inlet 108 of the airflow channel 110, can be aligned with the area to be cleaned, and the cleaning of the area to be cleaned can be completed by the cleaning device 100 under the airflow driving action of the motor 40. In addition, the outlet 109 of the airflow channel 110 can be disposed at the rear end of the main body portion 10, and the display component 90 can be disposed on the third filter 15, so that the display component 90 can face the user, which allows the user to obtain the operating parameters of the cleaning device 100 through the display component 90 and control the operation of the cleaning device 100 through the display component 90 during the operation of the cleaning device 100, thereby improving the user convenience.

[0163] As shown in FIG. 14, in some embodiments of the present disclosure, a display area may be disposed on the rear cover 80. The display area has the opening 81, and a transparent area or a semi-transparent area. When the rear cover 80 is mounted on the main body portion 10, the display area may be opposite to the display component 90, to facilitate displaying information through the display component 90, thereby improving user convenience.

[0164] Specifically, the third filter 15 may be disposed on the rear side of the main body portion 10. When the rear cover 80 is mounted on the main body portion 10, the rear cover 80 may be disposed on the outer side of the third filter 15 to encapsulate the third filter 15 on the main body portion 10, so as to protect the third filter 15. In addition, the display area is provided on the rear cover 80. When the rear cover 80 is mounted on the main body portion 10, the display area may be opposite to the display component 90 on the third filter 15, so that the display component 90 may display information towards the rear of the main body portion 10 through the opening 81, which is convenient for the user to obtain the operating parameters of the cleaning device 100 when using the cleaning device 100.

[0165] As shown in FIGS. 9 to 12, in some embodiments of the present disclosure, the display component 90 may be disposed inside the display area, and may be at least partially embedded in the display area or extend beyond the display area. It may be understood that the display component 90 is mounted on the third filter 15. When the rear cover 80 is mounted on the rear end of the main body portion 10, the display component 90 may be disposed inside the display

area, and the display area may be a transparent area or a semi-transparent area, so that the user may obtain information on the display component 90 through the display area. Alternatively, at least a part of the display component 90 may be embedded in the opening 81 of the display area to position the display component 90 through the opening 81, and the part of the display component 90 embedded in the opening 81 may display information, that is, the display component 90 may display information towards the outside through the opening 81, so as to improve the user convenience. In addition, indirectly, the rear cover 80 may position the third filter 15. Alternatively, at least a part of the display component 90 may extend beyond the display area, so as to display information towards the rear side of the cleaning device 100, which is beneficial for the user to obtain the operating parameters of the cleaning device 100 and improves the user convenience

[0166] In some other embodiments of the present disclosure, a display surface of the display component 90 may be flush with a rear side surface of the rear cover 80, so that a rear side of the cleaning device 100 can be structurally flat, which is beneficial for the user to clean.

[0167] In still other embodiments of the present disclosure, at least a part of the display component 90 is embedded in the opening 81, so that the display component 90 can be positioned, and it can be ensured that the display component 90 can stably display information. Meanwhile, the display surface of the display component 90 is flush with the rear side surface of the rear cover 80, so that the rear side of the cleaning device 100 is structurally flat, which is beneficial for the user to clean.

[0168] As shown in FIGS. 8 to 12, in some embodiments of the present disclosure, the third filter 15 may be mounted at the end of the main body portion 10. In other words, in combination with the foregoing embodiments, the third filter 15 may be mounted at the rear end of the main body portion 10 to filter the airflow passing through the outlet 109 of the airflow channel 110, thereby achieving the dust removal effect of the cleaning device 100.

[0169] Further, at least a part of the third filter 15 may be embedded in the main body portion 10. In this way, the contact area between the third filter 15 and the main body portion 10 can be increased, thereby improving the connection strength between the third filter 15 and the main body portion 10, and ensuring that the third filter 15 can operate normally.

[0170] Furthermore, the rear cover 80 may be connected to the main body portion 10 and position the third filter 15. Specifically, the rear cover 80 includes a peripheral wall extending in the front-to-rear direction, and has a first end and a second end opposite to each other. The first end of the rear cover 80 is open, and the rear cover 80 may be mounted on the main body portion 10 through the first end and disposed on the outer side of the third filter 15 to realize the mounting of the housing of the cleaning device 100, thereby protecting the third filter 15 and the display component 90. In addition, the second end of the rear cover 80 is provided with a closed surface, and the closed surface may be provided with the opening 81. When the rear cover 80 is mounted on the main body portion 10, the display component 90 may be opposite to the opening 81, so that the display component 90 may display information towards the rear of the main body portion 10 to allow the user to obtain the operating parameters of the cleaning device 100. The closed surface may also be provided with an abutting portion, which may protrude forward. When the rear cover 80 is mounted on the main body portion 10, the abutting portion may abut against the rear side of the third filter 15 to position the third filter 15, ensuring the normal operation of the third filter 15.

[0171] As shown in FIG. 13, in some embodiments of the present disclosure, the third filter 15 may be mounted outside the motor 40, and the third filter 15 partially overlaps with the motor 40 in a projection in a predetermined direction, where the predetermined direction is perpendicular to an axis of the motor 40. It can be understood that at least a part of the motor 40 can be nested inside the third filter 15, reducing the volume of the combination of the motor

40 and the third filter 15 with high integration, and achieving miniaturization of the cleaning device 100.

[0172] In some embodiments of the present disclosure, the third filter 15 is detachably mounted on the main body portion 10. It can be understood that the third filter 15 and the main body portion 10 are separate structures, which can facilitate the manufacturing of the cleaning device 100 and reduce the complexity of the manufacturing process.

[0173] However, the third filter 15 and the main body portion 10 may be an integrated structure, thereby enhancing the structural strength of the cleaning device 100.

[0174] In addition, in combination with the foregoing embodiments, the rear cover 80 and the third filter 15 are detachably mounted on the main body portion 10. That is, the rear cover 80 and the third filter 15 can be simultaneously assembled on or disassembled from the main body portion 10 by assembling the third filter 15 on the main body portion 10 or disassembling the third filter 15 from the main body portion 10.

[0175] As shown in FIG. 9 and FIG. 15, in some embodiments of the present disclosure, the third filter 15 may include the support 151 and a filter member 152.

[0176] The support 151 has a hollow structure 1511, the support 151 is connected to the main body portion 10, the hollow structure 1511 is in communication with the airflow channel 110, and the filter member 152 covers the hollow structure 1511, so that the airflow in the airflow channel 110 can be filtered by the filter member 152 to realize the dust removal and display functions of the cleaning device 100.

[0177] Specifically, the third filter 15 is mounted outside the motor 40. When the cleaning device 100 operates, the motor 40 can drive the airflow in the airflow channel 110 to flow towards the hollow structure 1511. At this time, the filter member 152 can cover the hollow structure 1511 of the support 151. When the airflow in the airflow channel 110 flows to the hollow structure 1511, the filter member 152 can filter the airflow to filter out garbage such as dust entrained in the airflow, thereby achieving the dust removal function of the cleaning device 100.

[0178] Further, the support 151 has a first end and a second end opposite to each other, the hollow structure 1511 is disposed between the first end and the second end of the support 151, the first end of the support 151 is connected to the main body portion 10, and the display component 90 is disposed at the second end of the support 151 to realize the dust removal function of the cleaning device 100.

[0179] Specifically, the first end and the second end are opposite to each other in the front-to-rear direction (which is the same as the axial direction), and the second end is disposed behind the first end. At this time, the display component 90 may be disposed on the second end of the support 151. In other words, the display component 90 is disposed on the rear side of the third filter 15, so that the display component 90 may face the rear side to display the operating parameters of the cleaning device 100 to the user, thereby improving the user convenience.

[0180] In addition, the hollow structure 1511 is provided between the first end and the second end, and the hollow structure 1511 may be perpendicular to the predetermined direction and communicated with the airflow channel 110, so that the airflow in the airflow channel 110 may be discharged in the predetermined direction. It may be understood that the display component 90 is mounted at the second end and displays information rearward in the axial direction of the motor 40. Meanwhile, the airflow may be discharged in the predetermined direction through the hollow structure 1511, and the filter member 152 provided on the hollow structure 1511 may filter the airflow. Therefore, with the support 151, the airflow may be guided to be discharged and filtered while the information may be displayed by the display component 90. The embodiments of present disclosure improve the space utilization of the cleaning device 100 compared with reserving installation spaces for the display component 90 and the filter member 152 separately.

[0181] As shown in FIG. 15, in some embodiments of the present disclosure, the first end of the support 151 may be provided with a positioning ring 1512, and the second end may be provided with an end cover 1513. The positioning ring 1512 and the end cover 1513 are connected through a connecting rib 1514 to form the hollow structure 1511 between the positioning ring 1512 and the end cover 1513. The display component 90 is mounted on a side of the end cover 1513 facing away from the positioning ring 1512. In this way, the dust removal and display functions of the cleaning device 100 can be achieved.

[0182] Specifically, the positioning ring 1512 may be mounted on the rear side of the main body portion 10. When the airflow enters the support 151 through the airflow channel 110, the airflow may enter the interior of the support 151 through the positioning ring 1512. Under the guidance of the end cover 1513, the airflow may flow to the hollow structure 1511 formed between the positioning ring 1512 and the end cover 1513, and the airflow may pass through the hollow structure 1511 and then be discharged in a predetermined direction. During this process, the filter member 152 can cover the hollow structure 1511 to filter the airflow passing through the hollow structure 1511, achieving the dust-removal effect of the cleaning device 100.

[0183] In addition, the display component 90 may be mounted on a side of the end cover 1513 facing away from the positioning ring 1512, so that the display component 90 may display information rearward, thereby improving the user convenience.

[0184] In addition, a ventilation opening 82 can be provided on the rear cover 80. When the rear cover 80 is mounted on the main body portion 10, the ventilation opening 82 may be opposite to the hollow structure 1511, so that the airflow may sequentially pass through the hollow structure 1511 and the ventilation opening 82 in a predetermined direction to be discharged to the external environment.

[0185] As shown in FIG. 15, in some embodiments of the present disclosure, the end cover 1513 may be provided with an annular rib 15131, and a groove 15132 is defined in the annular rib 15131 for mounting the display component 90, so that the mounting strength of the display component 90 may be improved through the annular rib 15131.

[0186] Specifically, the end cover 1513 is provided with the annular rib 15131, and the annular rib 15131 extends in the axial direction of the motor 40 to protrude from the surface of the end cover 1513, so that the groove 15132 can be defined, and at this time, the display component 90 can be mounted in the groove 15132 to realize the mounting of the display component 90. In addition, when the rear cover 80 is mounted on the main body portion 10, a part of the rear cover 80 may abut against the end cover 1513 to position the support 151, thereby improving the mounting strength of the support 151.

[0187] Further, the rear cover 80 is provided with the opening 81, and the annular rib 15131 is embedded into the opening 81, so that the display component 90 mounted in the groove 15132 can display information to the rear side of the cleaning device 100 through the opening 81, thereby improving the convenience for the user to obtain the operation information of the cleaning device 100.

[0188] In some specific examples of the present disclosure, the cleaning device 100 includes the support 151, the display screen (that is, the display component 90) is mounted at an end of the support 151 and faces rearward, and the rear cover 80 is provided with a through hole or a transparent structure at a position corresponding to the display screen, so that content on the display screen can be observed through the rear cover. In this embodiment, the rear cover is provided with the through hole, and in other embodiments, however, the transparent structure may be adopted to make the content displayed on the display screen visible.

[0189] In some specific examples of the present disclosure, a post-motor filter (i.e., the third filter 15) may include two parts. Since the end of the support 151 is used for mounting the display screen, and there are still vacant positions on both sides of the support 151, the structure

and the internal space of the support 151 may be fully utilized through the structure design of the support 151 and the two-part structure design of the post-motor filter, and the arrangement of the structure may be reasonably arranged, which makes the overall structure of the cleaning device more compact, and is beneficial to the miniaturization of the device.

[0190] In some specific examples of the present disclosure, a filter assembly may be disposed in the main body portion 10. The filter assembly includes the first filter 12, the fourth filter 19, and the pre-motor filter (i.e., the second filter 13), where the first dust collection space is disposed between the first filter 12 and the fourth filter 19, the second dust collection space is disposed between the fourth filter 19 and the pre-motor filter, and the first dust collection space and the second dust collection space may be used to collect garbage such as dust filtered out from the airflow.

[0191] The airflow path of the cleaning device 100 may be as follows: the airflow enters the air inlet pipe from the inlet 108, the dust and air enter the main body portion 10 from the side of the main body portion 10, and a portion of the dust falls into the first dust collection space after being filtered by the first filter 12; the airflow containing a small amount of dust continues to enter the fourth filter 19 for filtering, and the filtered fine dust falls into the second dust collection space; and the airflow continues to enter the pre-motor filter for filtering, then flows towards the motor, passes through the post-motor filter (i.e., the third filter 15), and finally is discharged from the outlet 109.

[0192] Specifically, the dust and the air enter the device from the inlet 108 and tangentially enter the main body portion 10 through the inlet 108. The dust and debris rotate downwards along the side wall of the main body portion 10 to the first dust collection space of the main body portion 10 under the action of the centrifugal force. The flange at a certain angle to the horizontal direction (which is the same as the axial direction) is disposed below the filter screen (i.e., the first filter 12). The flange below the filter screen (i.e., the first filter 12) can prevent the dust that has entered the bottom due to the centrifugal force from entering the multi-cyclone separator (i.e., the fourth filter 19), thereby effectively reducing the total amount of dust entering the multi-cyclone separator (i.e., the fourth filter 19). A portion of the dust passes through the filter screen (i.e., the first filter 12) and enters the multi-cyclone separator (i.e., the fourth filter 19). Similarly, under the action of centrifugal force, the dust rotates downwards along the wall of the multi-cyclone separator (i.e., the fourth filter 19) to the second dust collection space at the bottom. The air, at the dust-air separation port, enters the pre-motor filter through the porous air passage, then enters the motor, then is filtered by the post-motor filter, and then is discharged. In this case, by providing two cyclone filtrations and using a multi-cyclone mechanism for the secondary filtration, the separation efficiency of dust and air can be greatly increased, the number of times of cleaning the filter can be reduced, and the service life of the filter can be prolonged.

[0193] By providing the pre-motor filter and the post-motor filter, filtration processes are performed at both the air inlet and outlet ends of the motor, thereby improving the separation efficiency.

[0194] In the present disclosure, the display screen is disposed on the support 151, and the post-motor filter is mounted by using the structure of the support 151, so that the space is reasonably used, the overall structure is more compact, and the display screen is prevented from falling and being damaged.

[0195] The handheld dust suction device (i.e., the cleaning device 100) includes the main body portion 10, the dust cup connected to the main body portion 10, the handle, the motor, the battery, the inlet, the pre-motor filter, and the post-motor filter (i.e., the third filter 15). The handheld dust suction device according to the present disclosure may adopt a side air intake design, so the inlet is located at the side of the dust cup. The pre-motor filter and the post-motor filter are respectively located in front and rear of the motor in the airflow path for filtering the

airflow, and the pre-motor filter is located in the dust cup and at least partially located in the first filter.

[0196] The post-motor filter may overlap spatially with the motor according to actual conditions. The dust cup, the motor and the post-motor filter are sequentially arranged along the longitudinal axis of the dust cup. The battery supports the entire handheld dust suction device, the handle is located between the motor and the battery, the axis of the handle does not pass through the motor, and the motor is more rearward relative to the axis of the handle. The handheld dust suction device has a distal end and a proximal end opposite to each other, the inlet is located at the distal end, and the post-motor filter is located at the proximal end.

[0197] The dust cup includes the cup body, the cup cover for dumping the dust, and the first filter and the fourth filter 19 disposed in the cup body. The first filter 12 is the filter screen with a plurality of through holes on its surface for filtering dust with large particle size, the fourth filter 19 is a multi-cyclone separator, the fourth filter 19 includes a plurality of small cyclones, and the plurality of small cyclones are arranged circumferentially inside the dust cup and located downstream of the first filter 12. The dust cup is further provided with an unlocking button for unlocking the cup cover.

[0198] The pre-motor filter is located inside the first filter 12. The cleaning device is provided with the lifting handle of the pre-motor filter for taking out the pre-motor filter along the longitudinal axis of the dust cup. The lifting handle of the pre-motor filter is disposed near the cup cover. The pre-motor filter is disassembled in the direction away from the cup cover. The post-motor filter is detachable from the rear, so that the pre-motor filter and the post-motor filter can be conveniently cleaned. The pre-motor filter is disposed coaxially with the first filter 12. The pre-motor filter includes a filter support 151 and filter cotton disposed on the filter support 151. The airflow passes through and is filtered by the filter cotton, then enters the interior through a plurality of through holes on the filter support 151, and flows towards the motor through the internal channel.

[0199] As stated above, in order to enable the pre-motor filter to be quickly disassembled and cleaned, the pre-motor filter can be designed to have a quick disassembly function without disassembly of the whole dust cup. The pre-motor filter is located in the middle of the dust cup, and is communicated with the fan assembly through the sealing ring at the upper part. The dust-air separated air enters the pre-motor filter through the porous air passage, then enters the motor, and then is discharged. Usually, a small amount of fine dust adheres to the outer wall of the pre-motor filter. When the pre-motor filter needs to be cleaned, at the position of the opening at the bottom of the dust cup, the user holds the lifting handle of the filter with the hand and pulls the filter out. After the cleaning is completed, the pre-motor filter is assembled in the same manner. In this way, the pre-motor filter can be quickly cleaned or replaced without disassembling any other components, thereby greatly improving the convenience and satisfaction of the user.

[0200] In the description of the present disclosure, it should be understood that the orientation or positional relationship indicated by the terms “longitudinal”, “upper”, “lower”, “front”, “rear”, “left”, “right”, “vertical”, “horizontal”, “bottom”, “inner”, “outer”, “axial”, “circumferential” and the like is based on the orientation or positional relationship shown in the drawings, and is only for the convenience of describing the present disclosure and simplifying the description, rather than indicating or implying that the device or element referred to must have a specific orientation, be constructed and operated in a specific orientation, and therefore they cannot be understood as a limitation on the present disclosure.

[0201] In addition, the terms “first” and “second”, etc., are only used for descriptive purposes, and cannot be understood as indicating or implying relative importance or implicitly indicating the number of indicated technical features. Thus, features defined by the terms “first” and “second”, etc., may explicitly or implicitly include at least one such feature. In the description

of the present disclosure, the term “a plurality of” means at least two, such as two, three, etc., unless otherwise explicitly and specifically defined.

[0202] In the present disclosure, unless otherwise explicitly specified and defined, the terms “mount,” “connect,” “couple,” “fix,” and the like, should be interpreted broadly. For example, they may refer to a fixed connection, a detachable connection, or an integral connection; they may refer to a mechanical connection or an electrical connection; they may refer to a direct connection or an indirect connection via an intermediate medium; or they may refer to inner communications of two elements or interactions between two elements, unless otherwise explicitly defined. For a person of ordinary skill in the art, specific meanings of the foregoing terms in the present disclosure may be understood based on a specific situation. Although the embodiments of the present disclosure have been shown and described above, it would be appreciated by those skilled in the art that the above embodiments are illustrative and cannot be construed to be limiting of the present disclosure. A person of ordinary skill in the art can make changes, modifications, substitutions and variations to the aforementioned embodiments without departing from the scope of the present disclosure.

CLAIMS

Claim 1: A cleaning device, comprising:

a main body portion comprising a first filter;

a dust cup comprising a cup body and a cup cover, wherein the cup body is connected to the main body portion and covers an outer side of the first filter; and

a dust scraping assembly, wherein at least a part of the dust scraping assembly is disposed around the outer side of the first filter, and is configured to move in a reciprocating manner along an axial direction of the first filter to scrape off dust from the first filter.

Claim 2: The cleaning device according to claim 1, further comprising an air inlet pipe, wherein the air inlet pipe and the cup body are arranged side by side and extend in a same direction; the cup body is provided with a dust-dumping opening at an end thereof, and the cup cover closes the dust-dumping opening and is openable.

Claim 3: The cleaning device according to claim 1 or 2, wherein the dust scraping assembly comprises a dust scraping portion, and the dust scraping portion is disposed around an outer peripheral surface of the first filter, and is configured to move in a reciprocating manner along the axial direction of the first filter to scrape off the dust.

Claim 4: The cleaning device according to claim 3, wherein the dust scraping portion is disposed between the dust cup and the first filter, a dust compression space is defined between the dust scraping portion and a bottom wall of the dust cup, the dust scraping portion comprises a compression member extending towards an inner wall of the dust cup and adjacent to the inner wall of the dust cup, and the compression member is configured to move along the axial direction of the first filter to compress the dust in the dust compression space.

Claim 5: The cleaning device according to claim 4, wherein the compression member comprises a first side wall and a second side wall disposed opposite to each other in a radial direction, the first side wall and the outer side of the first filter are disposed opposite to each other in a radial direction of the first filter, and the second side wall and the inner wall of the dust cup are disposed opposite to each other in the radial direction of the first filter.

Claim 6: The cleaning device according to claim 5, wherein a dust scraping member is connected to the first side wall, and the dust scraping member extends along the axial direction of the first filter and is configured to be in

clearance fit with the outer side of the first filter; and/or

the first side wall is in clearance fit with the outer side of the first filter; and/or

the second side wall is in clearance fit with the inner wall of the dust cup.

Claim 7: The cleaning device according to claim 3, wherein the dust scraping assembly further comprises an operating portion, the operating portion is drivably connected with the dust scraping portion, and is configured to drive the dust scraping portion to move, and at least a part of the operating portion is located outside the dust cup for manual operation.

Claim 8: The cleaning device according to claim 7, further comprising a connecting rod, and two ends of the connecting rod are respectively connected to the dust scraping portion and the operating portion, so that the operating portion is drivably connected with the dust scraping portion.

Claim 9: The cleaning device according to claim 7, wherein the dust scraping assembly further comprises:

a guide rod extending in the axial direction, with one end connected to the dust scraping portion; and

a support portion connected to the other end of the guide rod and movably supported on the main body portion,

wherein the support portion is drivably connected with the operating portion.

Claim 10: The cleaning device according to claim 9, wherein the main body portion further comprises a motor housing, a space for accommodating a motor is defined in the motor housing, the motor housing and the first filter are arranged along the axial direction, and the support portion is disposed around an outside of the motor housing.

Claim 11: The cleaning device according to claim 9, wherein the main body portion further comprises a guide portion, the guide portion is disposed between the support portion and the dust scraping portion, and the guide portion is provided with a guide hole for the guide rod to pass through and to guide movement of the guide rod in the axial direction.

Claim 12: The cleaning device according to claim 11, wherein the dust scraping assembly further comprises a spring, the spring is disposed around the guide rod, with two ends respectively abutting against the guide portion and the support portion, and the spring is configured to generate a force for driving the dust scraping assembly to move away from the cup cover.

Claim 13: The cleaning device according to claim 7, wherein the operating portion is further configured to drive the cup cover to open; the dust cup further comprises a locking portion, one side of the cup cover is hinged with the cup body, and the other side of the cup cover is locked with the cup body through the locking portion; and the operating portion comprises an abutting portion, and the abutting portion is configured to abut against and unlock the locking portion to open the cup cover.

Claim 14: The cleaning device according to claim 13, wherein the locking portion is rotatably connected to the dust cup, the locking portion comprises a trigger end and a lock hook, the lock hook hooks the cup cover, and the abutting portion is configured to abut against the trigger end to enable the lock hook to unlock the cup cover.

Claim 15: The cleaning device according to claim 1, wherein the dust scraping assembly has a first position, a second position, and a third position in the axial direction, a distance between the dust scraping assembly and the cup cover gradually decreases as the dust scraping assembly moves from the first position to the second position, and to the third position, and the dust scraping assembly drives the cup cover to open at the third position, and the dust scraping assembly is configured such that damping from the first position to the second position is less than damping from the second position to the third position.

Claim 16: The cleaning device according to claim 15, wherein the dust scraping assembly further comprises an operating portion, and the cleaning device further comprises a damping structure configured to damp movement of the operating portion from the second position to the third position.

Claim 17: The cleaning device according to claim 7, wherein the main body portion comprises a housing, the dust scraping portion is disposed in the housing, the housing is provided with a sliding rail extending along the axial direction, and the operating portion slidably mates with the sliding rail along the axial direction.

Claim 18: The cleaning device according to claim 17, wherein the operating portion is U-shaped and disposed around the air inlet pipe, and both ends of the operating portion are connected to and slidably mate with the housing.

Claim 19: The cleaning device according to any one of claims 3 to 18, wherein the dust scraping portion is a flexible structure and/or the dust scraping portion has bristles facing an inner wall of the dust cup; and/or

the cleaning device further comprises a fourth filter, the fourth filter is at least partially located in the dust cup, and the dust scraping portion moves along an axial direction of the fourth filter.

Claim 20: The cleaning device according to any one of claims 3 to 22, wherein the main body portion further comprises an airflow channel; and the cleaning device further comprises:

a driving assembly, wherein at least a part of the driving assembly is disposed in the airflow channel to drive airflow;

a rear cover detachably covering an outlet of the airflow channel; and

a display component mounted on the driving assembly and separated from the rear cover, the display component being configured to display information towards an outside of the rear cover;

wherein the rear cover is configured to be detachable from the main body portion independently of the display component;

wherein the driving assembly comprises a motor, and the display component is mounted on an air outlet side of the motor;

wherein the display component is mounted at an end of the motor close to the outlet; or

a mounting support is provided at the air outlet side of the motor, and the display component is mounted on the mounting support;

wherein the driving assembly further comprises:

a third filter disposed at the air outlet side of the motor and located at the outlet of the airflow channel, the display component being mounted on the third filter.