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(54) GROUND BRUSH FOR VACUUM CLEANER AND VACUUM CLEANER WITH THE SAME

(57) A ground brush (1) for a vacuum cleaner includes a ground brush body (10), a brushroll (301) and a brushroll cover (20), wherein the ground brush body (10) is provided with a mounting groove (11) which has an upper opening and a lower opening in communication with each other; the brushroll (301) is rotatably mounted in the mounting groove (11); and the brushroll cover (20) covers the brushroll (301), and has a first end inserted in the ground brush body (10) and a second end snapped into the ground brush body (10).

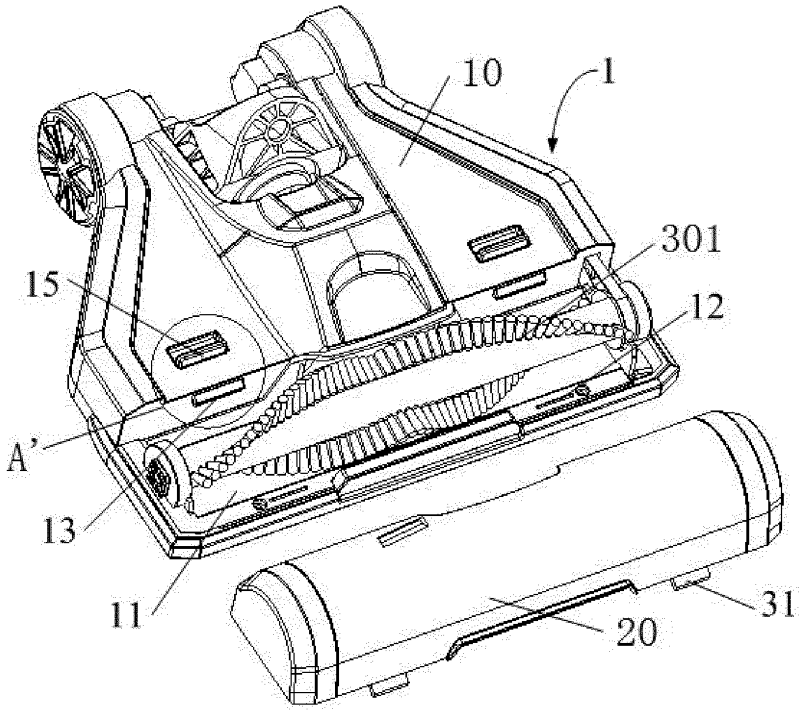

Fig. 1

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Description

FIELD

[0001] The present disclosure relates to a technical field of a vacuum cleaner, and more particularly to a ground brush for a vacuum cleaner and a vacuum cleaner with the same.

BACKGROUND

[0002] In the related art, when a brushroll of a present vacuum cleaner needs to be cleaned or replaced, the brushroll needs to be taken out or put in from a bottom of a ground brush, that is the ground brush needs to be turned over first, and then the brushroll can be cleaned or replaced, which is tedious in operation and inconvenient in usage. Furthermore, the brushroll is still working when a brushroll cover is opened, which may injure a user accidentally.

SUMMARY

[0003] The present disclosure seeks to solve at least one of the problems existing in the related art to at least some extent. An objective of the present disclosure is to provide a ground brush for a vacuum cleaner, in which the brushroll is convenient to clean or replace.

[0004] Another objective of the present disclosure is to provide a vacuum cleaner with the above ground brush.

[0005] The ground brush for a vacuum cleaner according to a first aspect of the present disclosure includes: a ground brush body provided with a mounting groove, in which the mounting groove has an upper opening and a lower opening in communication with each other; a brushroll rotatably mounted in the mounting groove; and a brushroll cover covering the brushroll, in which the brushroll cover has a first end inserted in the ground brush body and a second end snapped into the ground brush body.

[0006] According to the ground brush for the vacuum cleaner, the ground brush body is provided with the mounting groove, and the mounting groove has the upper opening and the lower opening in communication with each other. The brushroll is rotatably mounted in the mounting groove, and the brushroll can clean a carpet through the lower opening of the mounting groove, thus accomplishing a normal cleaning function of the brushroll. When the brushroll needs to be cleaned or replaced, first the second end of the brushroll cover needs to be separated from the snap connection with the ground brush body, then the first end of the brushroll cover needs to be pulled out from the ground brush body, and thereby the brushroll can be taken out from the upper opening of the mounting groove, i.e. the brushroll can be cleaned or replaced conveniently, which involves simple operations and is easy to use with less time and less effort. In such a way, a problem that the brushroll in the related art may be replaced only by turning over the ground brush, thereby resulting in tedious operation and inconvenient usage, can be solved to improve user experience.

[0007] According to an embodiment of the present, one of a bottom wall surface of the first end of the brushroll cover and the ground brush body is provided with at least one protrusion, the other one of the bottom wall surface of the first end of the brushroll cover and the ground brush body is provided with at least one groove, and the protrusion can be inserted in or pulled out from the groove.

[0008] According to an embodiment of the present, a plurality of the protrusions and a plurality of the grooves are provided respectively, and the plurality of the protrusions and the plurality of the grooves are arranged in one-to-one correspondence.

[0009] According to an embodiment of the present, the second end of the brushroll cover has an outside wall which is provided with a snap groove, the ground brush body is provided with a snap fitted with the snap groove, and the snap has a first end protruding out of a side wall of the mounting groove and snapped into the snap groove.

[0010] According to an embodiment of the present, the ground brush body has an upper end face which is provided with a mounting hole, and a release key is mounted in the mounting hole; and the mounting hole has a first side wall which is provided with a communicating hole running through the side wall of the mounting groove, the snap has a second end connected with a lower end of the release key, and the release key can be pushed to drive the snap to move in the communicating hole to approach or leave the side wall of the mounting groove.

[0011] According to an embodiment of the present, an elastic member is supported between a second side wall of the mounting hole opposite the communicating hole and the release key, and the elastic member normally pushes the release key to approach the side wall of the mounting groove, such that the first end of the snap protrudes out of the side wall of the mounting groove.

[0012] According to an embodiment of the present, the second end of the brushroll cover has an outside wall which is provided with a snap, the ground brush body is provided with a snap groove fitted with the snap, and the snap is configured to be snapped into the snap groove.

[0013] According to an embodiment of the present, the brushroll cover is provided with a triggering part, the ground brush body is provided with a microswitch; the triggering part triggers the microswitch to turn on the control circuit coupled with the brushroll when the brushroll cover is closed on the ground brush body, and the triggering part releases a trigger action on the microswitch to turn off the control circuit when the brushroll cover is opened.

[0014] According to an embodiment of the present, when the brushroll cover is closed on the ground brush body, the triggering part directly contacts and triggers the microswitch.

[0015] According to an embodiment of the present, the microswitch includes: a fixing member fixed to the ground brush body and coupled with the control circuit; a resilient member disposed on the fixing member; and a button disposed on the fixing member and located between the resilient member and the fixing member, in which the triggering part can turn on the control circuit if the resilient member presses the button, and when the triggering part is separated from the resilient member, the button returns to turn off the control circuit.

[0016] According to an embodiment of the present, the ground brush further includes: a driving member disposed on the ground brush body and cooperating with the microswitch, in which when the brushroll cover is closed on the ground brush body, the triggering part triggers the driving member and contacts the microswitch indirectly through the driving member.

[0017] The vacuum cleaner according to a second aspect of the present disclosure includes the ground brush of the first aspect of the present disclosure.

[0018] Additional aspects and advantages of embodiments of present disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] These and/or other aspects and advantages of the present disclosure will become apparent and more readily appreciated from the following descriptions of embodiments made with reference to the drawings, in which:

Fig. 1 is a perspective schematic view of a ground brush for a vacuum cleaner according to an embodiment of the present disclosure;
Fig. 2 is an enlarged view of part A' in Fig. 1;
Fig. 3 is a schematic view of a ground brush for a vacuum cleaner according to an embodiment of the present disclosure, in which a brushroll cover is opened;
Fig. 4 is an enlarged view of part A circled in Fig. 3;
Fig. 5 is a schematic view of the ground brush for the vacuum cleaner shown in Fig. 3, in which the brushroll cover is closed;
Fig. 6 is an enlarged view of part B circled in Fig. 5;

Reference numerals:

[0020]

1 ground brush; 10 ground brush body; 11 mounting groove; 12 groove; 13 snap; 14 mounting hole; 15 release key; 16 communicating hole; 31 protrusion; 20 brushroll cover; 201 cover body; 202 rotating shaft; 203 triggering part; 30 brushroll assembly; 301 brushroll; 40 microswitch; 401 fixing member; 402 resilient member; 4021 fixing part; 4022 resilient part; 403 button.

DETAILED DESCRIPTION

[0021] Reference will be made in detail to embodiments of the present disclosure. Examples of the embodiments are shown in the drawings. The same or similar elements and the elements having same or similar functions are denoted by like reference numerals throughout the descriptions. The embodiments described herein with reference to drawings are explanatory, illustrative, and used to generally understand the present disclosure. The embodiments shall not be construed to limit the present disclosure.

[0022] In the specification, it is to be understood that terms such as "central," "upper," "lower," "front," "rear," "left," "right," "vertical," "horizontal," "top," "bottom," "inner," and "outer" should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present invention be constructed or operated in a particular orientation.

[0023] In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or to imply the number of indicated technical features. Thus, the feature defined with "first" and "second" may comprise one or more of this feature. In the description of the present invention, "a plurality of" means two or more than two, unless specified otherwise.

[0024] In the following, a ground brush 1 for a vacuum cleaner (not shown in the drawings) according to embodiments of a first aspect of the present disclosure will be described with reference to Fig. 1 to Fig. 6.

[0025] As shown in Fig. 1 and Fig. 2, the ground brush 1 according to an embodiment of the first aspect of the present disclosure includes a ground brush body 10, a brushroll 301 and a brushroll cover 20.

[0026] The ground brush body 10 is provided with a mounting groove 11, and the mounting groove 11 has an upper opening and a lower opening in communication with each other. The brushroll 301 is rotatably mounted in the mounting groove 11. The brushroll cover 20 covers the brushroll 301, and the brushroll cover 20 has a first end inserted in the ground brush body 10 and a second end snapped in the ground brush body 10.

[0027] For the ground brush 1 according to the embodiment of the present disclosure, the ground brush body 10 is provided with the mounting groove 11, the mounting groove 11 has the upper opening and the lower opening in communication with each other, and the brushroll 301 is rotatably mounted in the mounting groove 11, such that the brushroll 301 can clean a carpet through the lower opening of the mounting groove 11, thus accomplishing a normal cleaning function of the brushroll 301. When the brushroll 301 needs to be cleaned or replaced, first the second end of the brushroll cover 20 needs to be

separated from a snap connection with the ground brush body 10, then the first end of the brushroll cover 20 needs to be pulled out from the ground brush body 10, and thereby the brushroll 301 can be taken out from the upper opening of the mounting groove 11, i.e. the brushroll 301 can be cleaned or replaced conveniently, which involves simple operations and is easy to use with less time and less effort. In such a way, a problem that the brushroll 301 in the related art may be replaced only by turning over the ground brush 1, thereby resulting in tedious operation and inconvenient usage, can be solved to improve user experience.

[0028] In some embodiments of the present disclosure, one of a bottom wall surface of the first end of the brushroll cover and the ground brush body is provided with at least one protrusion, the other one of the bottom wall surface of the first end of the brushroll cover and the ground brush body is provided with at least one groove, and the protrusion can be inserted in or pulled out from the groove.

[0029] Specifically, as shown in Fig. 1, the bottom wall surface of the first end of the brushroll cover 20 is provided with the protrusion 31, the ground brush body is provided with the groove 12, and the protrusion 31 can be inserted in or pulled out from the groove 12.

[0030] In the above embodiment, when the brushroll cover 20 needs to be closed, the protrusion 31 on the first end of the brushroll cover 20 can be inserted in the groove first to limit the brushroll cover 20 in a circumferential direction, and the second end of the brushroll cover 20 is snapped to the ground brush body 10 to mount the brushroll cover 20 on the ground brush body 10. When the brushroll 301 needs to be taken out, the snap connection between the second end of the brushroll cover 20 and the ground brush body 10 is removed, the protrusion 31 on the first end of the brushroll cover 20 can be pulled out from the groove 12, the brushroll cover 20 can be taken down, and the ground brush 1 can be taken out, which is easy and convenient.

[0031] Preferably, a plurality of the protrusions and a plurality of the grooves are provided, and the plurality of the protrusions and the plurality of the grooves are arranged in one-to-one correspondence. As shown in Fig. 1, the first end of the brushroll cover 20 is provided with the plurality of the protrusions 31, and the ground brush body 10 is provided with the plurality of the grooves 12, in which the plurality of the protrusions 31 and the plurality of the grooves 12 are arranged in one-to-one correspondence.

[0032] In the above embodiment, the plurality of the protrusions 31 and the plurality of the grooves 12 are provided, which can raise firmness of fixation between the brushroll cover 20 and the ground brush body 10, make the second end of the brushroll cover 20 snapped into the ground brush body 10 conveniently, raise force balance applied on the brushroll cover 20, and further facilitate an operation of the snap connection between the brushroll cover 20 and the ground brush body 10.

[0033] Certainly, the present disclosure is not limited thereby. The bottom wall surface of the first end of the brushroll cover 20 can also be provided with the groove 12, the ground brush body 10 is provided with the protrusion 31 fitted with the groove 12, and the protrusion 31 can be inserted in or pulled out from the groove 12.

[0034] In the above embodiment, the first end of the brushroll cover 20 is provided with the groove 12, and the ground brush body 10 is provided with the protrusion 31, which can also accomplish that the brushroll cover 20 is taken out from and mounted on the ground brush body 10, such that the ground brush 1 can be taken out and mounted easily and practically.

[0035] In an embodiment of the present disclosure, as shown in Fig. 1 and Fig. 2, the second end of the brushroll cover 20 has an outside wall which is provided with a snap groove, the ground brush body 10 is provided with a snap 13 fitted with the snap groove, and the snap 13 has a first end protruding out of a side wall of the mounting groove 11 and snapped into the snap groove.

[0036] Preferably, as shown in Fig. 1 and Fig. 2, the ground brush body 10 has an upper end face provided with a mounting hole 14, in which a release key 15 is mounted; the mounting hole 14 has a first side wall which is provided with a communicating hole 16 running through the side wall of the mounting groove 11, the snap 13 has a second end connected with a lower end of the release key 15, and the release key 15 can be pushed to drive the snap 13 to move in the communicating hole 16 to approach or leave the side wall of the mounting groove 11.

[0037] Further, as shown in Fig. 1 and Fig. 2, an elastic member is supported between a second side wall of the mounting hole 14 opposite the communicating hole 16 and the release key 15, and the elastic member normally pushes the release key 15 to approach the side wall of the mounting groove 11, such that the first end of the snap 13 protrudes out of the side wall of the mounting groove 11.

[0038] In the above embodiment, a fixation provided between the second end of the brushroll cover 20 and the ground brush body 10 is configured to be the snap connection by means of the snap 13 and the snap groove, so the fixation between the brushroll cover 20 and the ground brush body 10 is firm and reliable. The release key 15 is fitted with the elastic member, such that when the brushrolll cover 20 needs to be closed, the brushroll cover 20 can push the first end of the snap 13 to retract into the communicating hole 16 and press the elastic member, and then the elastic member stores elastic potential energy; after the brushroll cover 20 is closed in place, the snap groove is just located at a position corresponding to the snap 13 and at the same time, the elastic member releases the elastic potential energy to push the first end of the snap 13 to protrude out of the side wall of the mounting groove 11 and be snapped into the snap groove, so as to realize the firm fixation between the brushroll cover 20 and the ground brush body 10;

and when the brushroll cover 20 needs to be opened, the release key 15 is pushed by hand to drive the snap 13 to leave the side wall of the mounting groove 11, such that the first end of the snap 13 retracts into the communicating hole 16, at the same time, the snap 13 is separated from the snap connection with the snap groove, and a force applied to the ground brush body 10 by the second end of the brushroll cover is removed, in which case the brushroll cover 20 can be pulled out from the ground brush body 10. At the same time, the first end of the snap 13 protrudes out from the side wall of the mounting groove 11 again under an elastic action of the elastic member, and the brushroll cover 20 can be opened and closed by such cycle, which is simple in structure, convenient in operation, easy and practicable.

[0039] In another embodiment of the present disclosure, the outside wall of the second end of the brushroll cover 20 is provided with the snap 13, the ground brush body 10 is provided with the snap groove fitted with the snap 13, and the snap 13 can be snapped into the snap groove.

[0040] In the above embodiment, the brushroll cover 20 is provided with the snap 13, and the ground brush body 10 is provided with the snap groove correspondingly. The second end of the brushroll cover 20 can also be fixedly or detachably connected with the ground brush body 10 through a fit between the snap 13 and the snap groove, such that the brushroll cover 20 can be conveniently opened or closed, which will not be described in detail herein.

[0041] In an embodiment of the present disclosure, the ground brush body 10 is provided with a driving assembly connected with the brushroll 301, and the driving assembly can drive the brushroll to rotate relative to the ground brush body 10.

[0042] As shown in Fig. 3 to Fig. 6, the brushroll cover 20 is provided with a triggering part 203, and the ground brush body 10 is provided with a microswitch 40. The triggering part 203 triggers the microswitch 40 to turn on a control circuit coupled with the brushroll when the brushroll cover 20 is closed on the ground brush body 10, and the triggering part 203 releases a trigger action on the microswitch 40 to turn off the control circuit when the brushroll cover 20 is opened.

[0043] With reference to Fig. 3 and Fig. 5, the brushroll cover 20 is disposed on the ground brush body 10 in such a manner that the brushroll cover 20 can be opened and closed. The brushroll cover 20 and the ground brush body 10 define a mounting space therebetween, that is, the brushroll cover 20 can be closed on the ground brush body 10 and form the mounting space through cooperation with the ground brush body 10. The brushroll assembly is disposed in the mounting space and provided with the control circuit. The brushroll cover is provided with the triggering part 203 configured to cooperate with the microswitch 40.

[0044] The microswitch 40 is disposed on the ground brush body 10, electrically connected with the control circuit of the brushroll assembly, and configured to control the control circuit to be turned on or turned off. The microswitch 40 is disposed on the ground brush body 10, and the triggering part 203 triggers the microswitch 40 to turn on the control circuit when the brushroll cover 20 is closed on the ground brush body 10, and the triggering part 203 releases the trigger action on the microswitch 40 to turn off the control circuit when the brushroll cover 20 is opened.

[0045] The triggering part 203 is disposed on the brushroll cover 20 and cooperates with the microswitch 40. When the brushroll cover 20 is closed, the triggering part 203 can trigger the microswitch 40 directly or indirectly to make the brushroll 301 work normally, and when the brushroll cover 20 is opened, the triggering part 203 can release the trigger action on the microswitch 40 to make the brushroll 301 stop working, thus avoiding accidental injury to a user caused by the brushroll 301 if the user opens the brushroll cover 20 by mistake, and improving safety and market competitiveness of the product.

[0046] Specifically, the overall brushroll cover 20 can be rotatably connected with the ground brush body 10, and be closed or opened through turnover; or the brushroll cover 20 and the ground brush body 10 can be connected in a snapping manner or an inserting manner, that is the brushroll cover 20 can be closed or opened through mounting or dismounting - the overall brushroll cover 20 can be closed on the ground brush body 10, or separate from the ground brush body 10 to be opened.

[0047] In some embodiments of the present disclosure, as shown in Fig. 3 and Fig. 5, the brushroll cover 20 includes a cover body 201 and a connecting part. The cover body 201 cooperates with the ground brush body 10 to form the mounting space, and the connecting part is connected between the cover body 201 and the ground brush body 10 to make the cover body 201 connected to the ground brush body 10. The triggering part 203 is disposed on any one of the cover body 201 and the connecting part, that is, the triggering part 203 may be disposed on the cover body 201 or disposed on the connecting part.

[0048] In the above embodiments, the brushroll cover 20 includes the cover body 201 and the connecting part, and the cover body 201 cooperates with the ground brush body 10 to form the mounting space to cover the brushroll 301, thus avoiding injury to the user when the brushroll 301 works, and improving safety of the ground brush 1. The brushroll assembly located in the mounting space may be mounted on the cover body 201 or mounted on the ground brush body 10, and preferably, the brushroll assembly is mounted on the ground brush body 10, which is simpler in structure and more convenient to assemble. The connecting part is connected with the cover body 201 and cooperates with the ground brush body 10, and the connecting part is configured to fix the cover body 201 to the ground brush body 10, thus preventing the brushroll cover 20 from separating from the ground brush

body 10 and further improving the safety of the ground brush 1.

[0049] In some embodiments of the present disclosure, as shown in Fig. 3 to Fig. 6, the connecting part includes a rotating shaft 202, the cover body 201 is rotatingly closed on the ground brush body 10 through the rotating shaft 202, the triggering part 203 is disposed on the rotating shaft 202, and the rotating shaft 202 rotates to make the triggering part 203 trigger the microswitch 40 when the cover body 201 is closed.

[0050] In the embodiments, as to a scheme that the brushroll cover 20 is closed on and connected with the ground brush body 10 in a rotating manner, when the brushroll cover 20 is closed on and connected with the ground brush body 10 through rotation of the rotating shaft 202, the triggering part 203 is disposed on the rotating shaft 202. In this way, when the cover body is rotated to be closed, the triggering part 203 also rotates along with the rotating shaft 202 until the cover body 201 is fully closed on the ground brush body 10, and the triggering part 203 also rotates exactly to a position corresponding to the microswitch 40 and triggers the microswitch 40, to turn on the control circuit of the brushroll assembly, thus guaranteeing that the vacuum cleaner can work normally. When the cover body 201 is rotated to be opened, the triggering part 203 also rotates to separate from the microswitch 40, to turn off the control circuit of the brushroll assembly timely, and the brushroll 301 stops working immediately, thus avoiding accidental injury to the user caused by the brushroll 301 and improving the safety of the ground brush 1.

[0051] In some other embodiments of the present disclosure, the connecting part includes the rotating shaft 202, the cover body 201 is closed on the ground brush body 10 through rotation of the rotating shaft 202, the triggering part 203 is disposed on the cover body 201, and the triggering part 203 triggers the microswitch 40 when the cover body 201 is closed.

[0052] In the embodiments, the connecting part includes the rotating shaft 202, that is the brushroll cover 20 is closed on and connected with the ground brush body in a rotating manner; the triggering part 203 located at the cover body 201 will rotate along with the cover body 201 until the cover body 201 is fully closed on the ground brush body 10, and the triggering part 203 rotates exactly to a position corresponding to the microswitch 40 and triggers the microswitch 40 to turn on the control circuit of the brushroll assembly, thus guaranteeing that the vacuum cleaner can work normally. When the cover body 201 is rotated to be opened, the triggering part 203 also rotates to separate from the microswitch 40, to turn off the control circuit of the brushroll assembly timely, and the brushroll 301 stops working immediately, thus avoiding accidental injury to the user caused by the brushroll 301 and improving the safety of the ground brush 1.

[0053] In some more embodiments of the present disclosure, the connecting part includes at least one of a snapping member and an inserting member, through which the brushroll cover 20 is connected to the ground brush body 10, and the triggering part 203 is disposed on the cover body 201.

[0054] In the embodiments, the connecting part includes the snapping member and/or the inserting member, that is, the brushroll cover 20 is closed on and connected with the ground brush body 10 in a snapping manner or an inserting manner. Only when the cover body 201 is closed on the ground brush body 10, can the triggering part 203 located at the cover body 201 trigger the microswitch 40, to turn on the control circuit of the brushroll assembly, such that the vacuum cleaner can work normally. When the cover body 201 is separated from the ground brush body 10, the triggering part 203 is separated from the microswitch 40, such that the microswitch 40 returns to turn off the control circuit of the brushroll assembly timely, and the brushroll 301 stops working immediately, thus avoiding accidental injury to the user caused by the brushroll 301 and improving the safety of the ground brush 1.

[0055] In some embodiments of the present disclosure, as shown in Fig. 5 and Fig. 6, when the brushroll cover 20 is closed on the ground brush body 10, the triggering part 203 directly contacts and triggers the microswitch 40.

[0056] Further, as shown in Fig. 4 and Fig. 6, the microswitch 40 includes a fixing member 401, a resilient member 402 and a button 403. Specifically, the fixing member 401 is fixed to the ground brush body 10 and coupled with the control circuit, the resilient member 402 is disposed on the fixing member 401, the button 403 is disposed on the fixing member 401, and the button 403 is located between the resilient member 402 and the fixing member 401. The triggering part 203 can turn on the control circuit if the resilient member 402 presses the button 403, and when the triggering part 203 is separated from the resilient member 402, the button 403 returns to turn off the control circuit.

[0057] Furthermore, the resilient member 402 may be rotatably disposed on the fixing member 401, when the brushroll cover 20 is closed, the triggering part 203 triggers the resilient member 402, such that the resilient member 402 rotates relative to the fixing member 401 and presses the button 403, to turn on the control circuit and enable the brushroll assembly to work normally. When the brushroll cover 20 is opened, the triggering part 203 is separated from the resilient member 402, the resilient member 402 returns to remove a pressure on the button 403, such that the button 403 returns automatically to turn off the control circuit, and the brushroll assembly stops working immediately, thus avoiding accidental injury to the user. Certainly, the present disclosure is not limited thereby; as shown in Fig. 2 and Fig. 4, the resilient member 402 may include a fixing part 4021 and a resilient part 4022. Specifically, the fixing part 4021 has a first end fixed to the fixing member 401, the resilient part 4022 has a first end connected with a second end

of the fixing part 4021, and the resilient part 4022 has a second end extending to the button 403. Preferably, as shown in Fig. 2 and Fig. 4, the button 403 is close to a first end of the resilient part 4022.

[0058] Optionally, as shown in Fig. 4 and Fig. 6, the resilient member 402 is configured as an L-shaped resilient sheet.

[0059] In the above embodiments, the microswitch 40 includes the fixing member 401, the resilient member 402 and the button 403, and the fixing member 401 is coupled with the control circuit of the brushroll assembly. The button 403 can turn on or turn off the control circuit, the control circuit is turned off at a natural state; when the button 403 is pressed, the control circuit is turned on; and when the pressure is removed, the button returns automatically. The resilient member 402 is configured to press the button 403. Specifically, when the brushroll cover 20 is closed, the triggering part 203 applies the pressure on the resilient member 402, and the resilient member 402 deforms resiliently to press the button 403, so as to turn on the control circuit and enable the brushroll assembly to work normally. When the brushroll cover 20 is opened, the triggering part 203 is separated from the resilient member 402, the resilient member 402 returns to remove the pressure on the button 403, so the button 403 returns automatically to turn off the control circuit, and the brushroll assembly stops working, thus avoiding accidental injury to the user.

[0060] Certainly, those skilled in the art should understand that the microswitch 40 is not limited to the above structure, and it may be configured as a small button 403 or other structures, as long as having a function of the microswitch 40, so those technical schemes are within the scope of the present disclosure.

[0061] The resilient member 402 includes the fixing part 4021 and the resilient part 4022, the fixing part 4021 can fix the resilient member 402 to the fixing member 401, thus avoiding displacement of the resilient member 402 and guaranteeing usage reliability of the microswitch 40. The resilient part 4022 is resilient and can deform resiliently to apply a pressing force on the button 403, such that the button 403 can turn on the control circuit. A distance between the resilient member 4022 and a surface of the fixing part 402 is no less than a height of the button 403 at the natural state, thus guaranteeing that the button 403 is located between the resilient member 402 and the fixing member 401.

[0062] The button 403 is disposed close to the first end of the resilient part 4022 connected with the fixing part 4021, and a second end of the resilient part 4022 is relatively far away from the button 403. As to the scheme that the brushroll cover 20 is rotatingly closed, only when the brushroll cover 20 is fully closed on the ground brush body 10, can the resilient part 4022 press the button 403 to a positon where the control circuit is turned on. In the process of rotatingly closing the brushroll cover 20, the button 403 cannot turn on the control circuit, thus avoiding that the brushroll starts working when the brushroll cover 20 is not fully closed, and further improving the safety of the product.

[0063] In other embodiments of the present disclosure, the ground brush 1 further includes a driving member which is disposed on the ground brush body 10 and cooperates with the microswitch 40. When the brushroll cover 20 is closed on the ground brush body 10, the triggering part 203 triggers the driving member and triggers the microswitch 40 indirectly through the driving member.

[0064] In the above embodiments, the triggering part 203 triggers the microswitch 40 through the driving member, that is when the brushroll cover 20 is closed on the ground brush body 10, the microswitch 40 is not directly but indirectly triggered, which can also accomplish the objective of the present disclosure. Specifically, when the brushroll cover 20 is closed, the triggering part 203 triggers the driving member to apply an acting force on the driving member, such that the driving member moves to trigger the microswitch 40, so as to turn on the control circuit. When the brushroll cover 20 is opened, the triggering part 203 is separated from the driving member, the acting force applied on the driving member is removed, so an acting force on the microswitch 40 applied by the driving member is removed, the microswitch 40 returns to turn off the control circuit.

[0065] A vacuum cleaner according to an embodiment of a second aspect of the present disclosure includes the ground brush 1 according to the embodiments of the first aspect of the present disclosure.

[0066] To sum up, in the ground brush provided by the embodiments of the present disclosure, the ground brush body 10 is provided with the mounting groove 11, and the mounting groove 11 has the upper opening and the lower opening in communication with each other. The brushroll is rotatably mounted in the mounting groove 11, and the brushroll 301 can clean a carpet through the lower opening of the mounting groove 11, thus accomplishing a normal cleaning function of the brushroll. When the brushroll needs to be cleaned or replaced, first the second end of the brushroll cover 20 needs to be separated from the snap connection with the ground brush body 10, then the first end of the brushroll cover 20 needs to be pulled out from the ground brush body 10, and thereby the brushroll can be taken out from the upper opening of the mounting groove 11, i.e. the brushroll 301 can be cleaned or replaced conveniently, which involves simple operations and is easy to use with less time and less effort. In such a way, a problem that the brushroll 301 in the related art may be replaced only by turning over the ground brush 1, thereby resulting in tedious operation and inconvenient usage, can be solved to improve user experience.

[0067] Furthermore, when the brushroll cover 20 is closed, the triggering part 203 may trigger the microswitch 40 directly or indirectly, to turn on the control circuit of the brushroll assembly, and a driving component drives the brushroll 301 to rotate, such that the vacuum cleaner works normally. When the brushroll cover 20 is

opened, the triggering part 203 can release a trigger action thereof, the microswitch 40 returns to turn off the control circuit of the brushroll assembly, the driving component stops working, to make the brushroll 301 stop rotating, thus avoiding injury to the user.

[0068] It is should be noted that those skilled in the art should understand that the triggering part 203 may be configured as a component individually disposed on the brushroll cover 20 or a part of the brushroll cover 20, both of which can accomplish the function of the microswitch 40 and fall into the scope of the present disclosure.

[0069] As the vacuum cleaner according to the embodiments of the present disclosure is provided with the ground brush 1 according to the embodiments of the first aspect, the vacuum cleaner has high safety and will not injure the user if the user opens the brushroll cover 20 by mistake.

[0070] To sum up, in the ground brush 1 provided by the present disclosure, the brushroll cover 20 is provided with the triggering part 203, and the triggering part 203 cooperates with the microswitch 40. When the brushroll cover 20 is closed, the triggering part 203 can trigger the microswitch 40 directly or indirectly to make the brushroll 301 work normally; and when the brushroll cover 20 is opened, the triggering part 203 can release the trigger action on the microswitch 40 to make the brushroll stop working, thus avoiding accidental injury to the user if the user opens the brushroll cover 20 by mistake, and improving safety and market competitiveness of the product.

[0071] Specifically, as to a present vacuum cleaner, a brushroll is still working when a brushroll cover is opened, which may injure the user accidentally. However, as to the ground brush 1 provided by the present disclosure, the brushroll stops working when the brushroll cover 20 is opened, thus avoiding injury to the user, and improving the safety and the market competitiveness of the product. Specifically, when the brushroll cover 20 is closed, the triggering part 203 can trigger the microswitch 40 directly or indirectly to turn on the control circuit of the brushroll assembly, and the driving component drives the brushroll 301 to rotate, such that the vacuum cleaner works normally; when the brushroll cover 20 is opened, the triggering part 203 can release the trigger action thereof, the microswitch 40 returns to turn off the control circuit of the brushroll assembly, and the driving component stops working to make the brushroll stop rotating, thus avoiding injury to the user.

[0072] Reference throughout this specification to "an embodiment," "some embodiments," "an example," "specific examples" or "some examples" means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present invention. Thus, the appearances of the above phrases throughout this specification are not necessarily referring to the same embodiment or example of the present invention. Furthermore, the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples. Those skilled in the art can integrate and combine different embodiments or examples and the features in different embodiments or examples in the specification.

[0073] Although embodiments of the present invention have been shown and illustrated, it shall be understood by those skilled in the art that various changes, modifications, alternatives and variants without departing from the principle and spirit of the present invention are acceptable. The scope of the present invention is defined by the claims or the like.

Claims

1. A ground brush (1) for a vacuum cleaner, comprising:

   a ground brush body (10) provided with a mounting groove (11), wherein the mounting groove (11) has an upper opening and a lower opening in communication with each other;
   a brushroll (301) rotatably mounted in the mounting groove (11); and
   a brushroll cover (20) covering the brushroll (301), wherein the brushroll cover (20) has a first end inserted in the ground brush body (10) and a second end snapped into the ground brush body (10).

2. The ground brush (1) according to claim 1, wherein one of a bottom wall surface of the first end of the brushroll cover (20) and the ground brush body (10) is provided with at least one protrusion (31), the other one of the bottom wall surface of the first end of the brushroll cover (20) and the ground brush body (10) is provided with at least one groove (12), and the protrusion (31) can be inserted in or pulled out from the groove (12).

3. The ground brush (1) according to claim 2, wherein a plurality of the protrusions (31) and a plurality of the grooves (12) are provided, and the plurality of the protrusions (31) and the plurality of the grooves (12) are arranged in one-to-one correspondence.

4. The ground brush (1) according to any one of claims 1 to 3, wherein the second end of the brushroll cover (20) has an outside wall which is provided with a snap groove, the ground brush body (10) is provided with a snap (13) fitted with the snap groove, and the snap (13) has a first end protruding out of a side wall of the mounting groove (11) and snapped into the snap groove.

5. The ground brush (1) according to claim 4, wherein the ground brush body (10) has an upper end face

which is provided with a mounting hole (14), and a release key (15) is mounted in the mounting hole (14); and the mounting hole (14) has a first side wall which is provided with a communicating hole (16) running through the side wall of the mounting groove (11), the snap (13) has a second end connected with a lower end of the release key (15), and the release key (15) can be pushed to drive the snap (13) to move in the communicating hole (16) to approach or leave the side wall of the mounting groove (11).

6. The ground brush (1) according to any one of claim 5, wherein an elastic member is supported between a second side wall of the mounting hole (14) opposite the communicating hole (16) and the release key (15), and the elastic member normally pushes the release key (15) to approach the side wall of the mounting groove (11), such that the first end of the snap (13) protrudes out of the side wall of the mounting groove (11).

7. The ground brush (1) according to any one of claims 1 to 3, wherein the second end of the brushroll cover (20) has an outside wall which is provided with a snap (13), the ground brush body (10) is provided with a snap groove fitted with the snap (13), and the snap (13) is configured to be snapped into the snap groove.

8. The ground brush (1) according to any one of claims 1 to 7, wherein the brushroll cover (20) is provided with a triggering part (203), and the ground brush body (10) is provided with a microswitch (40);
the triggering part (203) triggers the microswitch (40) to turn on a control circuit coupled with the brushroll (301) when the brushroll cover (20) is closed on the ground brush body (10), and the triggering part (203) releases a trigger action on the microswitch (40) to turn off the control circuit when the brushroll cover (20) is opened.

9. The ground brush (1) according to claim 8, wherein when the brushroll cover (20) is closed on the ground brush body (10), and the triggering part (203) directly contacts and triggers the microswitch (40).

10. The ground brush (1) according to claim 8 or 9, wherein the microswitch (40) comprises:

a fixing member (401) fixed to the ground brush body (10) and coupled with the control circuit;
a resilient member (402) disposed on the fixing member (401); and
a button (403) disposed on the fixing member (401) and located between the resilient member (402) and the fixing member (401), wherein the triggering part (203) can turn on the control circuit if the resilient member (402) presses the button (403), and when the triggering part (203) is separated from the resilient member (402), the button (403) returns to turn off the control circuit.

11. The ground brush (1) according to claim 8, further comprising:

a driving member disposed on the ground brush body (10) and cooperating with the microswitch (40), wherein when the brushroll cover (20) is closed on the ground brush body (10), the triggering part (203) triggers the driving member and triggers the microswitch (40) indirectly through the driving member.

12. A vacuum cleaner comprising a ground brush (1) according to any one of claims 1 to 11.

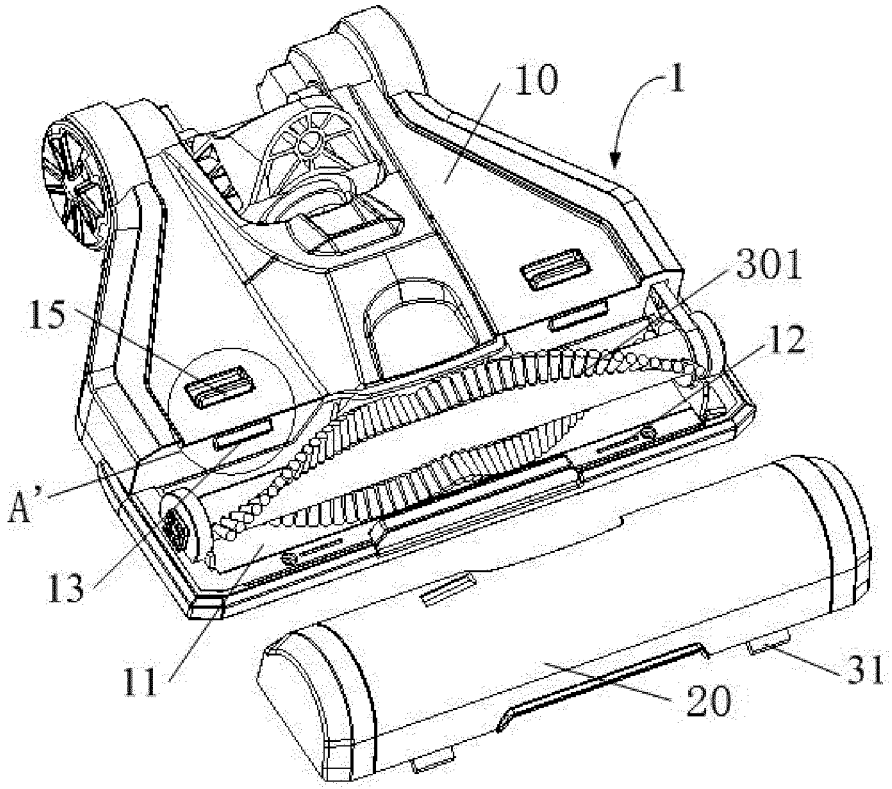

Fig. 1

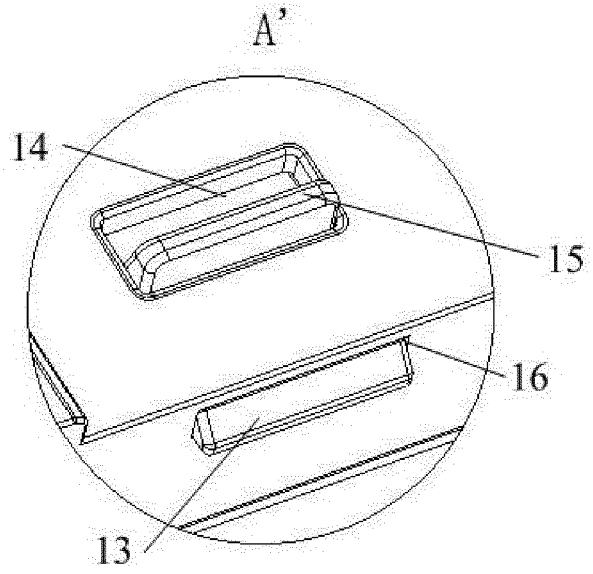

Fig. 2

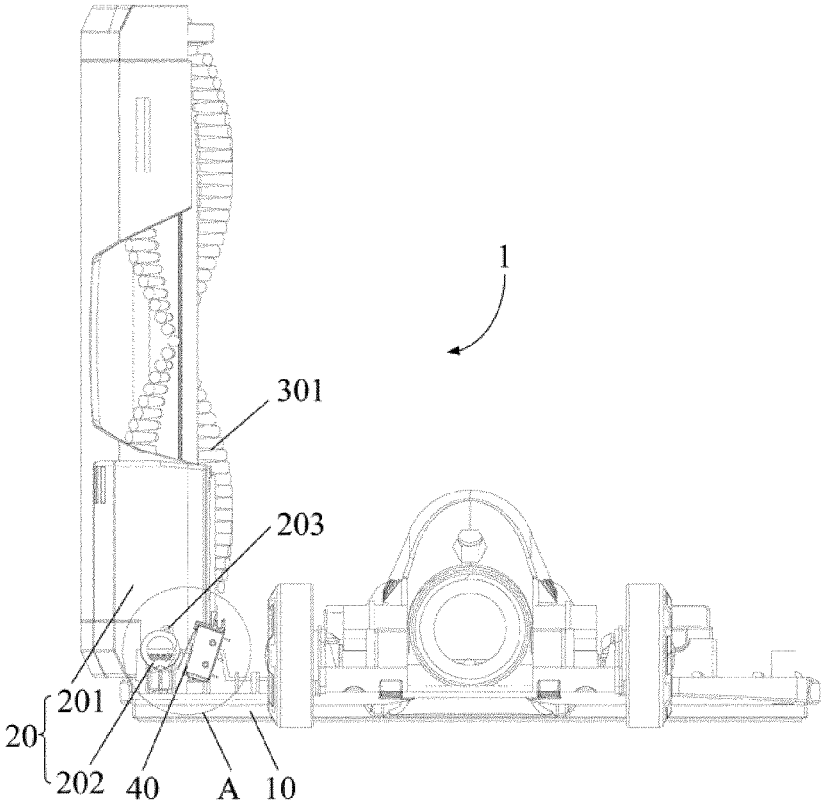

Fig. 3

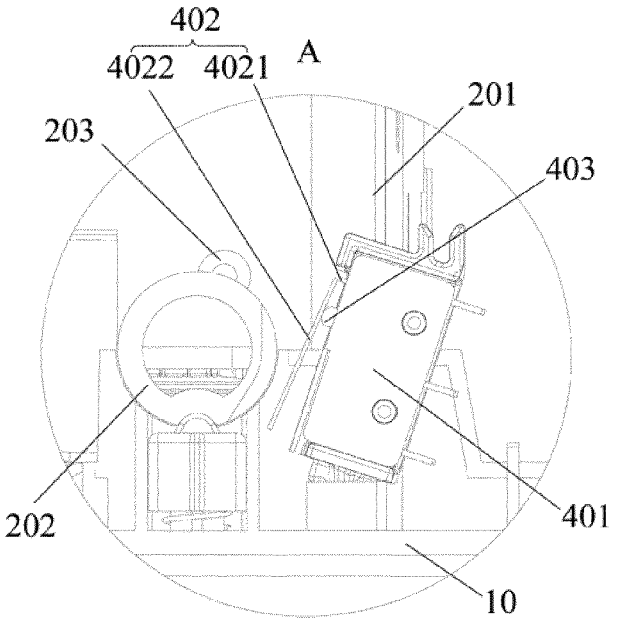

Fig. 4

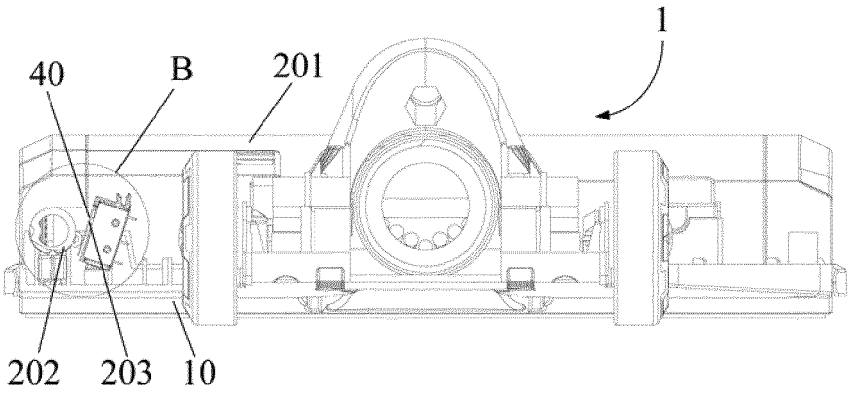

Fig. 5

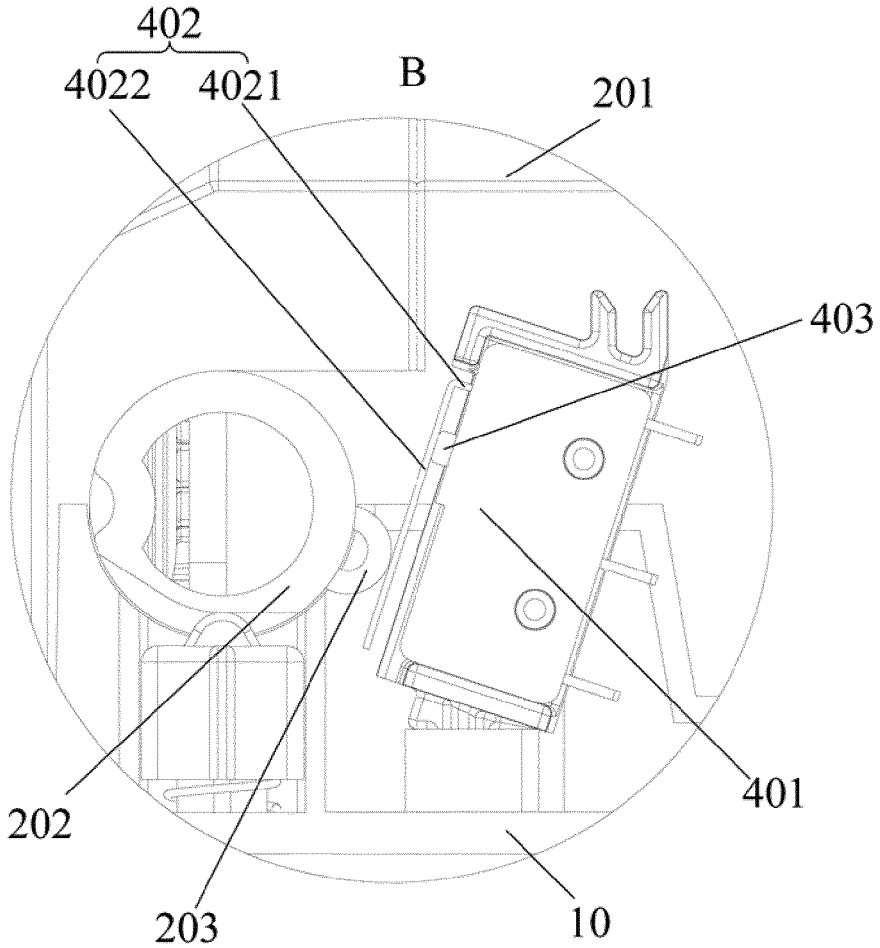

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 16 18 4471

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 204 146 956 U (LOTES GUANGZHOU CO LTD) 11 February 2015 (2015-02-11) * paragraph [0035] * & US 2016/058256 A1 (JU TED [TW] ET AL) 3 March 2016 (2016-03-03) * paragraph [0038] *	1-12	INV. A47L9/04
A	WO 2015/157196 A1 (TIGER TOOL INTERNAT INC [CA]; ANDREWS MICHAEL [US]; DODDY ERVONDY [CA]) 15 October 2015 (2015-10-15) * paragraphs [0031] - [0034] *	1-12	

TECHNICAL FIELDS SEARCHED (IPC)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 May 2017	Eckenschwiller, A

CATEGORY OF CITED DOCUMENTS

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