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(54) **A surface treating appliance**

(57) The present invention relates to a surface treating appliance, such as a vacuum cleaner (1) having a fluid flow path (12,13) extending between at least one

fluid inlet (11,14) and at least one fluid outlet wherein at least a part of the fluid flow path (13) is housed within a releasable portion (16) of the surface treating appliance (1).

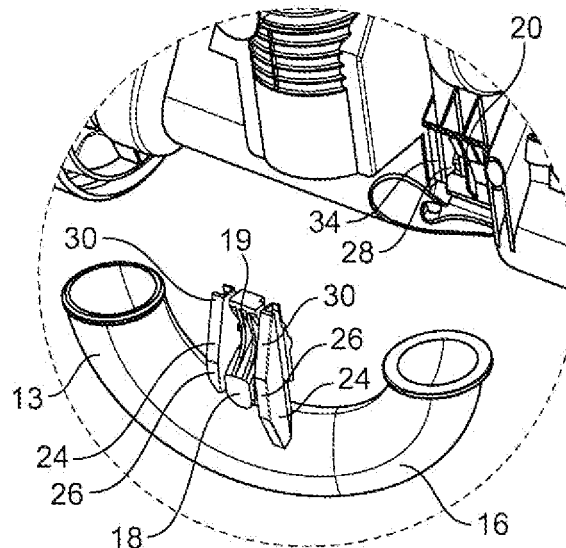


FIG. 4b

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Description

[0001] This invention relates to a surface treating appliance, such as a vacuum cleaner. More particularly this invention relates to a surface treating appliance having a fluid flow path extending between at least one fluid inlet and at least one fluid outlet wherein at least a part of the fluid flow path is housed within a releasable portion of the surface treating appliance.

[0002] Surface treating appliances such as vacuum cleaners are well known. The majority of vacuum cleaners are either of the 'upright' type or of the 'cylinder' type. A typical vacuum cleaner comprises a main body which houses the main components of the vacuum cleaner, such as a motor and fan for drawing dirty air into the machine and some form of separating apparatus for separating dirt, dust and other debris from a dirty airflow drawn in by the fan.

[0003] Vacuum cleaners having at least one and often a plurality of alternative airflow paths between an air inlet and an air outlet are known. Such vacuum cleaners often incorporate a valve for selecting one of the said airflow paths to carry an airflow from an air inlet to an air outlet.

[0004] The airflow path(s) of vacuum cleaners can become blocked during use. In prior art vacuum cleaners, it was found to be somewhat awkward to gain access to the portions of the airflow paths in which blockages can occur. The construction of these vacuum cleaners was therefore improved in order to facilitate maintenance and repair.

[0005] This was achieved by providing a releasable portion in the airflow path which allows the user of the vacuum cleaner to release the releasable portion should any blockages occur in the airflow path. Release of the releasable portion gives the user of the vacuum cleaner easy access to the airflow path allowing any blockages to be quickly and easily cleared.

[0006] In the known prior art the releasable portion was retained in an operational position with respect to the remainder of the vacuum cleaner by a release means, for example a resilient push-button, to enable an unskilled user of the vacuum cleaner to carry out basic maintenance and removal of blockages. This advantageously reduces the amount of professional time required to maintain the vacuum cleaner and keeps the vacuum cleaner operational for longer periods, thus increasing user satisfaction and decreasing the amount of time required for maintenance and repair.

[0007] A disadvantage has however been found to occur with some of the prior art arrangements and in particular with those where the release means is located on the lower half of a vacuum cleaner. The release means has generally been placed somewhere which is very visible and accessible. Such a location and visibility however make the release means prone to being knocked or kicked by accident which may cause the releasable portion to fall off.

[0008] The term "surface treating appliance" is intended

ed to have a broad meaning, and includes a wide range of appliances for cleaning or treating a surface in some manner. It includes, inter alia, appliances which apply suction to the surface so as to draw material from it, such as vacuum cleaners (dry, wet and wet/dry), as well as appliances which apply a fluid to a surface, such as polishing/waxing machines, pressure washing machines, ground marking machines and shampooing machines.

[0009] Accordingly the present invention provides a surface treating appliance comprising

a fluid flow path extending between a fluid inlet and a fluid outlet, a portion of the fluid flow path being housed within a releasable portion of the surface treating appliance,
a release means for releasing the releasable portion, and
an accidental release prevention means for preventing accidental release of the release means.

[0010] This is advantageous because the accidental release prevention means may help to prevent a user from accidentally knocking or kicking the release means during normal use of the surface treating appliance.

[0011] In a preferred embodiment the surface treating appliance is a vacuum cleaner.

[0012] Preferably the fluid flow path is an airflow path.

[0013] In an embodiment the release means may comprise a catch, for example a quick-release catch or other suitable locking, attaching or snap fit means. The release means may comprise a user-operated interface, for example a button.

[0014] In a particular embodiment the release means may comprise a first part integral with, associated with or located on the releasable portion and a second cooperating part integral with, associated with or located on the remainder of the surface treating appliance.

[0015] In a preferred embodiment the two parts inter-engage to keep the releasable portion in position on the remainder of the surface treating appliance during normal use. The two parts may be disengaged to release the releasable portion from the remainder of the surface treating appliance. In a particular embodiment this may be achieved by a user activating, for example by pressing on, a user-operated interface.

[0016] In an embodiment the accidental release prevention means may comprise one or more projections located adjacent the release means or a part thereof. In a preferred embodiment the accidental release prevention means may be located adjacent the user-operated interface. The one or more projection(s) may comprise one or more raised rib(s), wall(s), point(s), hood(s) or any other suitable raised region(s).

[0017] Preferably the projection(s) is located from 0.25 cm, or 0.5cm or, 1cm or 1.5cm, or 2cm, or 2.5 cm, or 3cm, or 3.5cm to 4cm, or 4.5cm, or 5cm, or 5.5cm, or 6cm, or 6.5cm or 7cm from the user-operated interface.

[0018] The projection(s) may encircle or form an en-

closure around the user-operated interface, for example the projection(s) may be located on all sides of the user-operated interface forming a circle, square, rectangle or other shape around it. In a particular embodiment a single projection may surround the user-operated interface.

[0019] In an alternative embodiment several projections may be located adjacent the user-operated interface. For example, the user-operated interface may have from one, two, three, four or more projections located adjacent to it.

[0020] In a particular embodiment projections may be located on at least two sides of the user-operated interface such that it is flanked by the projections. The projections may comprise a pair of elongate ribs which are preferably arranged parallel to one another.

They may be arranged either vertically or horizontally. The ribs may have a level outwardly facing surface or alternatively they may be tapered along at least a part of their length. In a preferred embodiment the outer surface of one or both ribs may have a level portion and one or two sloping portions which may slope towards the remainder of the surface treating appliance. In a particular embodiment one rib slopes towards both ends and has a level portion between the two sloped portions and the other rib has a level surface at one end and slopes towards the remainder of the surface treating appliance at the other end.

[0021] In a preferred embodiment the projections are spaced far enough apart to allow access to the user-operated interface by a user's fingers, but close enough together to ensure that a user's foot cannot accidentally activate the user-operated interface. Preferably the projections are from 1cm or, 1.5cm, or 2cm, or 2.5 cm, or 3cm, or 3.5cm to 4cm, or 4.5cm, or 5cm, or 5.5cm, or 6cm, or 6.5cm or 7cm apart.

[0022] In a particular embodiment the at least one projection, or the outer surface of the projection may project the same distance or further from the remainder of the surface treating appliance than the user-operated interface. Alternatively the at least one projection may project the same distance or further from the remainder of the surface treating appliance than the distance from the remainder of the surface treating appliance that the user-activated interface projects in its activated position, for example when it has been pressed by a user.

[0023] The releasable portion may be a simple straight fluid flow path or it may comprise a bend for changing the direction of fluid flow, the bend being housed within the releasable portion. Additionally or alternatively the releasable portion may comprise other components, for example if the surface treating appliance comprises a plurality of alternative fluid flow paths, the releasable portion may further comprise a valve.

[0024] In a preferred embodiment the releasable portion may be arranged to be releasable from the remainder of the surface treating appliance in a rearward direction away from the remainder of the surface treating appliance. However, the releasable portion may be arranged

to be releasable from the remainder of the surface treating appliance in any suitable direction. The releasable portion may be attached to the remainder of the surface treating appliance in such a way that when the user-operated interface is activated the releasable portion is released but remains associated with the remainder of the surface treating appliance. For example the releasable portion may remain hingedly attached to the remainder of the surface treating appliance. In an alternative embodiment the releasable portion may completely disassociate from the remainder of the surface treating appliance when the user-operated interface is activated.

[0025] In a particular embodiment the first part of the catch may comprise the at least one projection. In an alternate embodiment the second part of the catch may comprise the at least one projection. Alternatively or additionally at least one projection may be provided on the releasable portion or on the remainder of the surface treating appliance.

[0026] A preferred embodiment of a surface treating appliance according to the invention will now be described in detail with reference to the accompanying drawings in which:

Figure 1a is a rear perspective view of a prior art vacuum cleaner which has a releasable portion;

Figure 1b is a close up of the releasable portion shown in Figure 1a;

Figure 2a is a rear perspective view of a prior art vacuum cleaner showing the releasable portion removed from the remainder of the vacuum cleaner;

Figure 2b is a close up of the releasable portion shown in Figure 2a;

Figure 3a is a rear perspective view of an embodiment of the present invention which has a releasable portion;

Figure 3b is a close up of the releasable portion shown in Figure 3a;

Figure 4a is a rear perspective view of an embodiment of the present invention showing the releasable portion removed from the remainder of the vacuum cleaner;

Figure 4b is a close up of the releasable portion shown in Figure 4a;

Figure 5a is a rear perspective view of an embodiment of the present invention showing a connector between the releasable portion and the releasing means; and

Figure 5b is a close up of the releasable portion

shown in Figure 5a

Figure 6a is a rear perspective view of an alternative embodiment of the present invention which has a releasable portion;

Figure 6b is a close up of the releasable portion shown in Figure 6a;

[0027] With reference to Figures 1a to 2b the structure of a prior art vacuum cleaner can be seen. The vacuum cleaner indicated generally by the reference numeral 1 comprises a main body 2, a user-operable handle 3 and a cleaner head 4. The cleaner head 4 is pivotably mounted to the lower end of the main body 2, and serves, in use, to treat a floor surface. The lower, floor-facing side of the cleaner head 4 has an air inlet slot 11.

[0028] The vacuum cleaner 1 houses a motor and fan for generating a suction airflow (not visible in these drawings). The main body 2 houses separating apparatus 6 for separating dirt, dust and other debris from a dirty airflow drawn into the cleaner 1 by the fan and motor.

[0029] In this prior art cleaner the separating apparatus 6 is cyclonic, in which the dirt and dust is spun from the airflow. The cyclonic separating apparatus 6 comprises two stages of cyclone separation arranged in series with one another. The first stage is a cylindrically-walled chamber 7 and the second stage comprises a set of tapering, substantially frusto-conically shaped chambers 8 arranged in parallel with one another. Airflow is directed tangentially into the upper part of the chamber 7 by a duct 9. Larger debris and particles are removed and collected in this cyclonic chamber 7. The airflow then passes through a shroud (not shown) to the set of cyclonic chambers 8. Finer dust is separated by these chambers 8 and collected in a common collecting region. The second set of separators 8 can be upright, i.e. with their fluid inlets and outlets at the top and their dirt outlets at the bottom, or inverted, i.e. with their fluid inlets and outlets at the bottom and their dirt outlets at the top. The nature of the separating apparatus 6 is not material to the present invention.

[0030] The main body 2 also houses filters (not visible in these drawings) for trapping fine particles in the cleaned airflow. These filters remove any fine particles of dust which have not already been removed from the airflow by the separating apparatus 6. A first filter, called a pre-motor filter, is provided before the motor and fan. A second filter, called a post-motor filter, is provided after the motor and fan. Where the motor for driving the suction fan has carbon brushes, the post-motor filter also serves to trap any carbon particles emitted by the brushes. Clean air is then expelled to the atmosphere.

[0031] The cleaner has two different airflow paths 12, 13 which direct the air either from the air inlet slot 11 during floor cleaning use or from the end of the wand 14 during above floor cleaning. A change over valve 15 is provided to automatically change between the two airflow

paths 12, 13 in response to movement of the vacuum cleaner 1 between its upright position as shown in Figure 1a and an inclined position.

[0032] As can be seen in Figure 1 the airflow paths 12, 13 comprise bends. Whenever a vacuum cleaner incorporates a bend in the airflow path 12, 13, there is an increased risk of blockages occurring.

[0033] In order to help an end user to clear blockages in the airflow paths 12, 13 prior art vacuum cleaners 1 have been provided with releasable portions 16, 160. Releasable portion 16 can be seen in its released configuration in Figures 2a and 2b. Removal of these releasable portions 16, 160 gives the user of the vacuum cleaner 1 easy access to the airflow paths 12, 13 which allows any blockages to be quickly and easily cleared.

[0034] It can be seen that the releasable portion 16 can be retained in an operational position with respect to the remainder of the vacuum cleaner 1 by a quick release mechanism 17.

The quick release mechanism 17 comprises a user-operated interface, for example a button 18. The quick release mechanism 17 also has a first part 19 located on the releasable portion 16 and a second cooperating part 20 located on the remainder of the vacuum cleaner 1. The two parts 19, 20 inter-engage to keep the releasable portion 16 in position on the vacuum cleaner 1 during normal use, but can be disengaged quickly by a user pressing on the button 18 and sliding the two parts 19, 20 out of engagement with each other.

[0035] It can be seen in Figures 1a to 2b that the button 18 stands proud of the features adjacent to it and it is therefore prone to being knocked or kicked by accident. This is especially true during normal use of the cleaner 1 due to the location of the button 18 near the base of the cleaner 1. When the button 18 is kicked the releasable portion 16 may be released from the remainder of the vacuum cleaner 1 by accident.

[0036] Accordingly the present invention aims to help with this problem. As can be seen in Figures 3a to 5b the vacuum cleaner 1 of the present invention shares many features with the vacuum cleaner described with reference to Figures 1a to 2b and the same numbers will be used to denote similar features.

[0037] In Figures 3a to 5b it can be seen that the vacuum cleaner 1 of the present invention further comprises an accidental release prevention means 24 in the form of a pair of projecting ribs positioned one on either side of the user-operable button 18. These ribs 24 help to prevent accidental activation of the user-operable button 18.

[0038] The ribs 24 are elongate and are preferably parallel to one another. They are vertically arranged in the Figures but may be arranged horizontally or at any suitable angle. The ribs 24 have a level surface 26 opposite their attachment surface. The outer surface of one or both ribs 24 may also comprise one or more sloping portions 30 which slope towards the remainder of the vacuum cleaner 1. In the embodiment shown in Figures 3a

to 5b, one of the ribs 24 slope towards both ends from a level surface 26 in the middle and the other rib 24 slopes towards one end from a level surface 26.

[0039] In a preferred embodiment the ribs 24 are spaced far enough apart to allow access to the button 18 by a user's fingers, but close enough together to ensure that a users foot or other unintended part of the body cannot accidentally activate the button 18. Preferably the ribs 24 are from 1cm or, 1.5cm, or 2cm, or 2.5 cm, or 3cm, or 3.5cm to 4cm, or 4.5cm, or 5cm, or 5.5cm, or 6cm, or 6.5cm or 7cm apart.

[0040] The outer surface of at a least a portion of the ribs 24 preferably projects the same distance or further from the remainder of the vacuum cleaner 1 than the button 18. Alternatively at least a portion of the ribs 24 may project the same distance or further from the remainder of the vacuum cleaner 1 than the distance from the remainder of the vacuum cleaner 1 that the button 18 has to be pressed before the quick release mechanism 17 is activated and the releasable portion 16 can be released from the remainder of the vacuum cleaner 1. If during use of the vacuum cleaner 1 a user accidentally kicks the area were the button 18 is located, the user's foot will hit the ribs 24 and not the button 18.

[0041] In Figures 3a to 5b it can be seen that the releasable portion 16 can be retained in an operational position with respect to the remainder of the vacuum cleaner 1 by the quick release mechanism 17. The quick release mechanism 17 comprises the button 18, a first part 19 and a second cooperating part 20. The two parts 19, 20 inter-engage to keep the releasable portion 16 in position on the vacuum cleaner 1 during normal use, but can be disengaged quickly by a user pressing on the button 18.

[0042] In Figure 5a and 5b it can be seen that the first part 19 is removably attachable to a connector 32 on the removable portion 16 for ease of manufacture. The first part 19 may be releasably attachable to the second cooperating part 20 by any means. In a preferred embodiment in order to locate the releasable portion onto the remainder of the vacuum cleaner a user may slide the first part 19 onto runners 34 (one can be seen in Figure 4b) of the second part 20 until it snaps into a locking engagement.

[0043] In order to release the releasable portion 16 a user can press the button 18 which is arranged to release the mechanism which secures the first part 19 into the second part 20. The first part 19 can then be slid out of engagement with the second part 20 and the releasable portion is then free and can be inspected for blockages.

[0044] Figures 6a and 6b show an alternative embodiment where ribs 24' are positioned one on either side of the user-operable button 18' to protect the removable portion 160 from accidental release.

[0045] Appropriate modifications and alternative arrangements will be apparent to a reader skilled in the art.

Claims

1. A surface treating appliance comprising, a fluid flow path extending between a fluid inlet and a fluid outlet, a portion of the fluid flow path being housed within a releasable portion of the surface treating appliance, a release means for releasing the releasable portion, and an accidental release prevention means for preventing accidental release of the release means.
2. A surface treating appliance according to claim 1 wherein the fluid flow path is an airflow path.
3. A surface treating appliance as claimed in claim 1 or 2, wherein the release means comprises a catch.
4. A surface treating appliance as claimed in any preceding claim, wherein the release means comprises a user-operated interface.
5. A surface treating appliance as claimed in any preceding claim wherein the accidental release prevention means is a projection located adjacent the release means.
6. A surface treating appliance as claimed in claim 4 wherein the accidental release prevention means is a projection located adjacent the user operated interface.
7. A surface treating appliance as claimed in claim 6 wherein the at least one projection projects the same distance or further from the remainder of the surface treating appliance than the user-operated interface.
8. A surface treating appliance as claimed in claim 6 wherein the at least one projection projects the same distance or further from the remainder of the surface treating appliance than the user-operated interface in its activated position.
9. A surface treating appliance as claimed in any of claims 6 to 8 wherein two projections are arranged such that the user-operated interface is located between them.
10. A surface treating appliance according to claim 9 wherein the projections are spaced far enough apart to allow access to the user-operated interface by a users fingers, but close enough together to ensure that a users foot cannot accidentally activate the user-operated interface.
11. A surface treating appliance as claimed in any preceding claim, wherein the fluid flow path incorporates a bend, the bend being housed within the releasable portion.

12. A surface treating appliance as claimed in any preceding claim, wherein the fluid flow path comprises a plurality of alternative fluid flow paths.

13. A surface treating appliance substantially as hereinbefore described with reference to the accompanying drawings.

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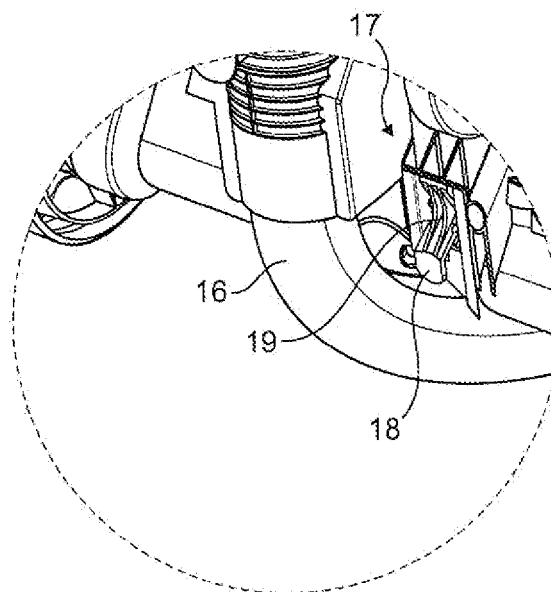
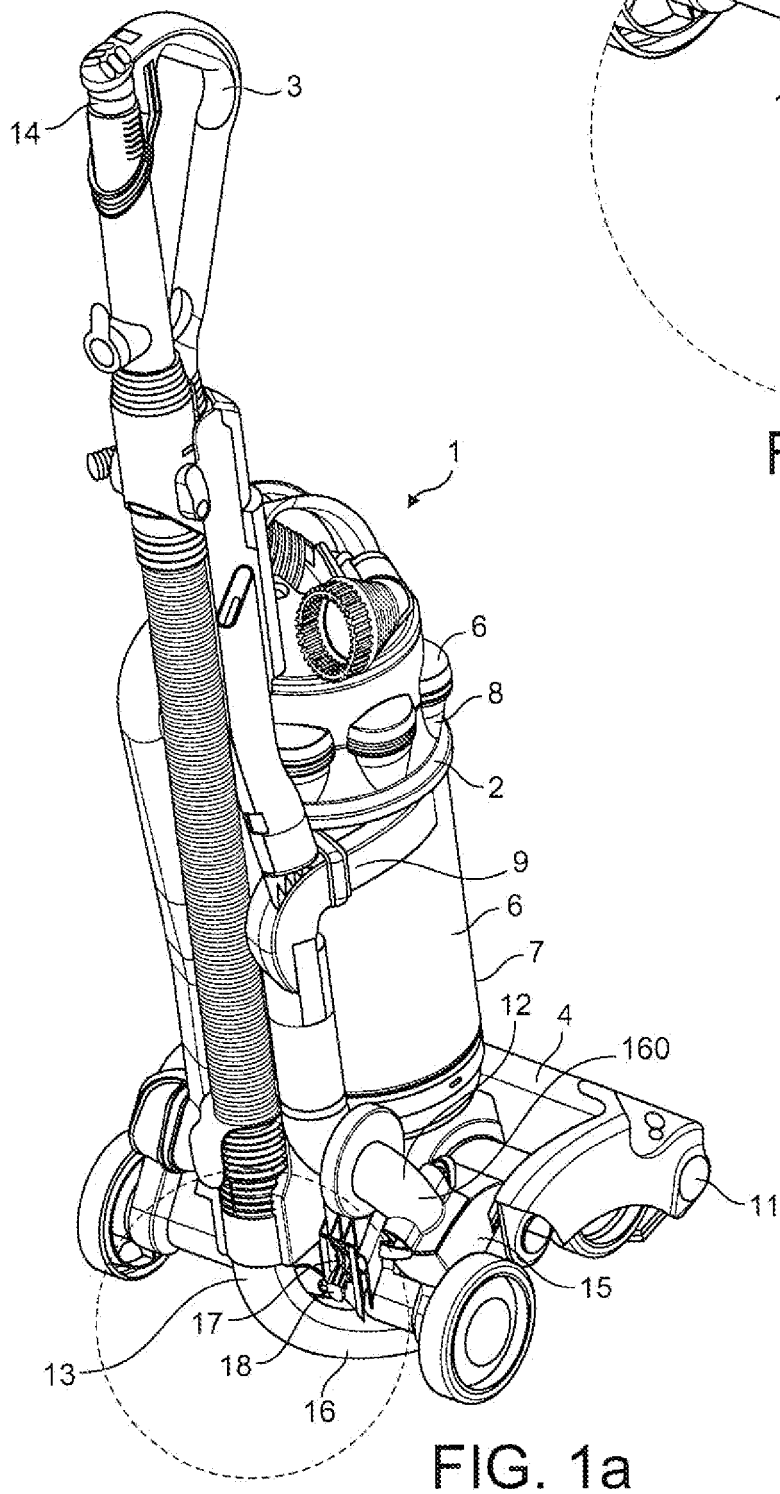
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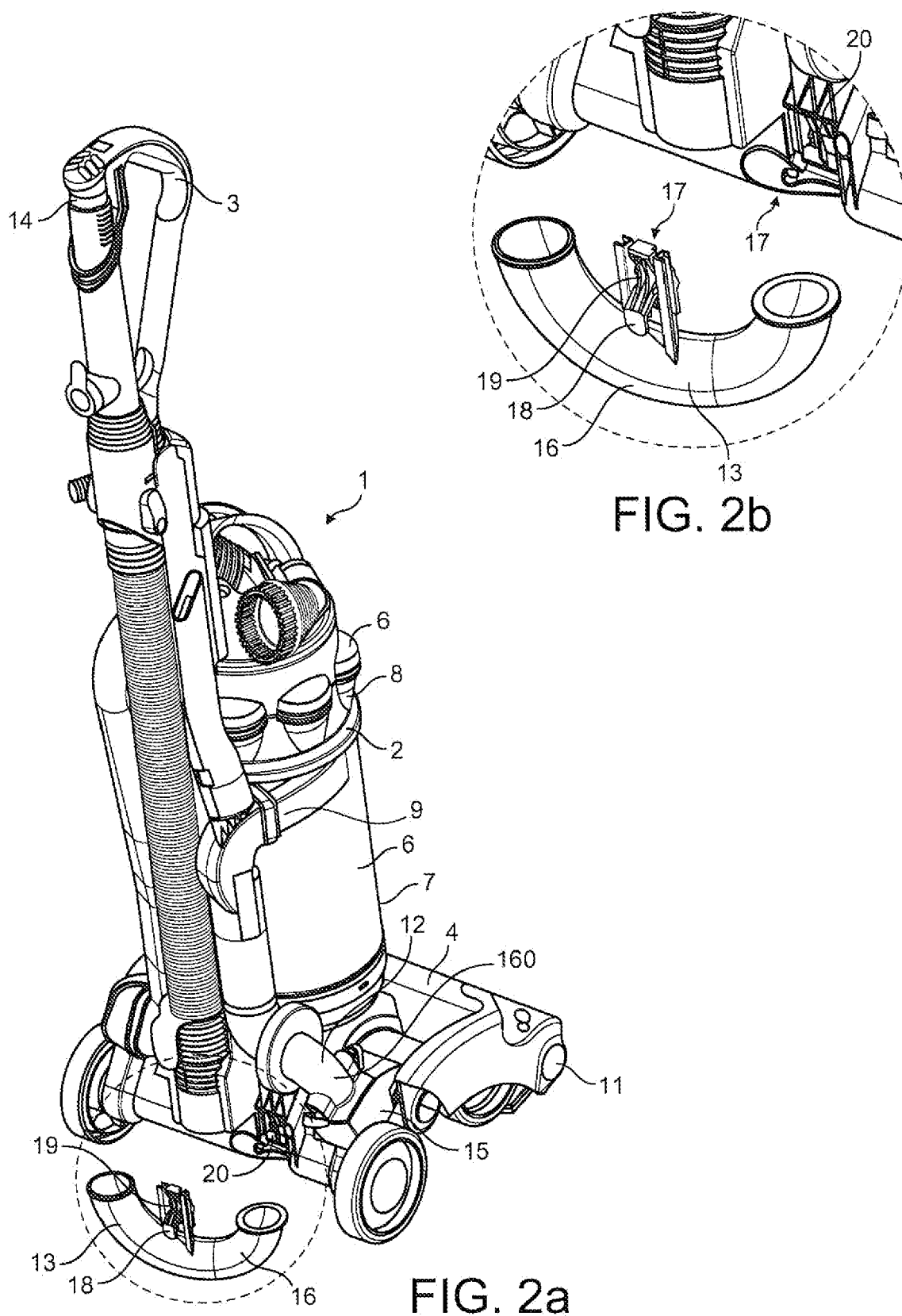


FIG. 2a

FIG. 2b

