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(54) **APPARATUS FOR CLEANING A FLOOR SURFACE**

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(71) Applicant: **TECHTRONIC FLOOR CARE TECHNOLOGY LIMITED**, Tortola (VG)

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(72) Inventors: **Richard Waters**, West Midlands (GB);
Charlene Reid, West Midlands (GB)

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(57) **ABSTRACT**

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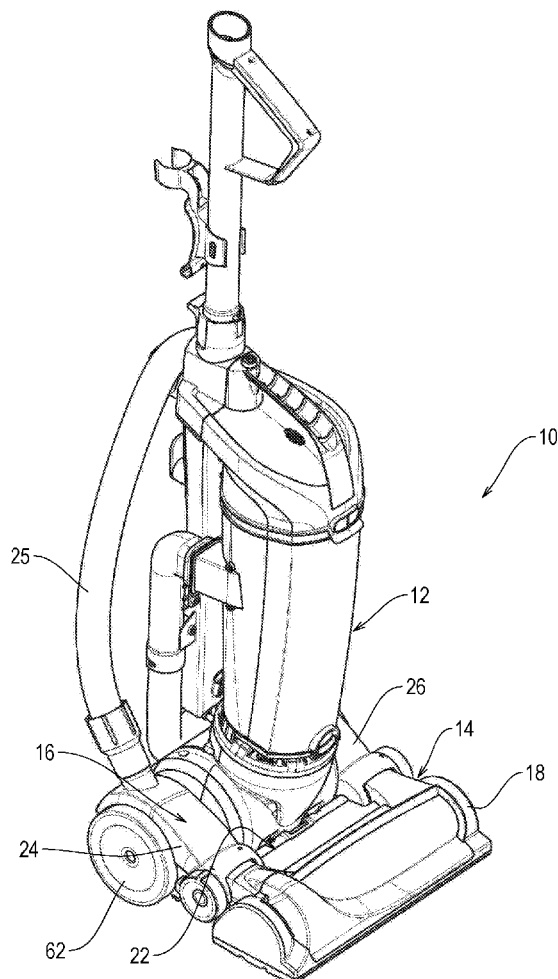
Related U.S. Application Data

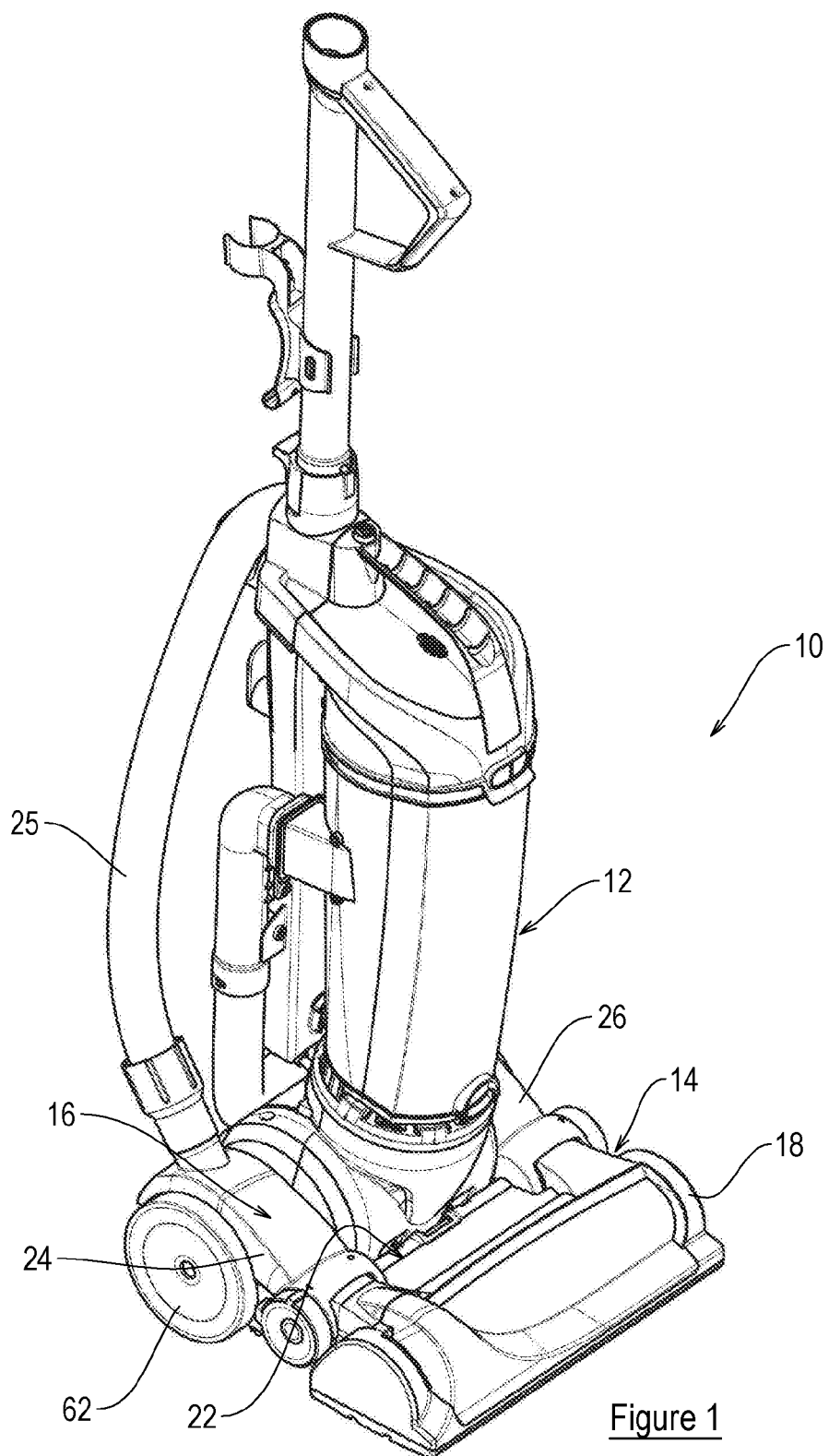
(63) Continuation of application No. 15/102,741, filed on Jun. 8, 2016, filed as application No. PCT/GB2014/050359 on Feb. 7, 2014.

An apparatus for cleaning a floor surface including an upright part having a user graspable handle; a base assembly is connected to the upright part and includes a base part having a first passage with a respective inlet; and a second passage with a respective inlet. The apparatus includes a device for effecting movement of the base part between respective first and second conditions, and a suction source for providing suction to one or both of the first and second passages. As the base part is moved between its first and second conditions by the device, the suction provided to one or both of the first and second passages is changed.

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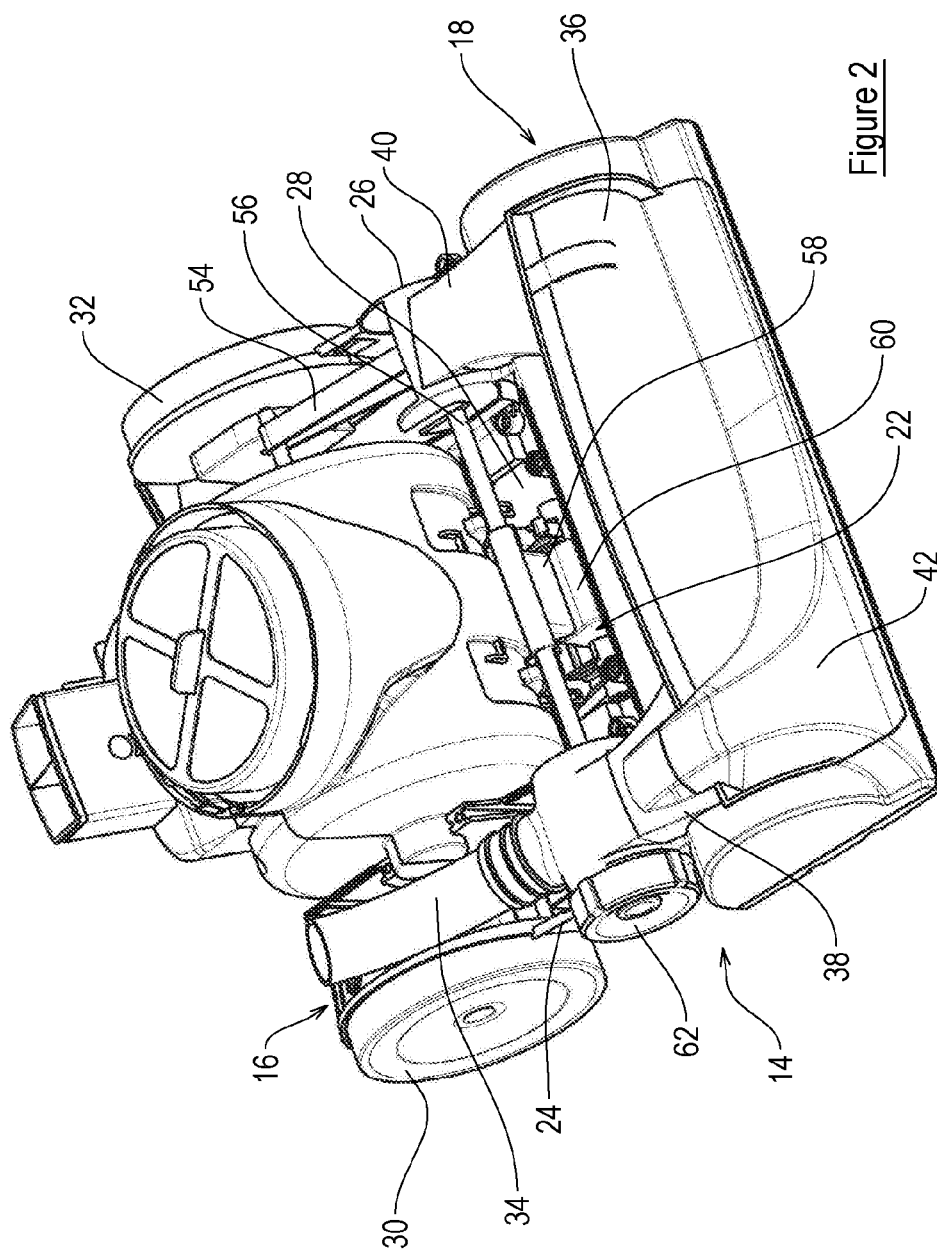


Figure 2

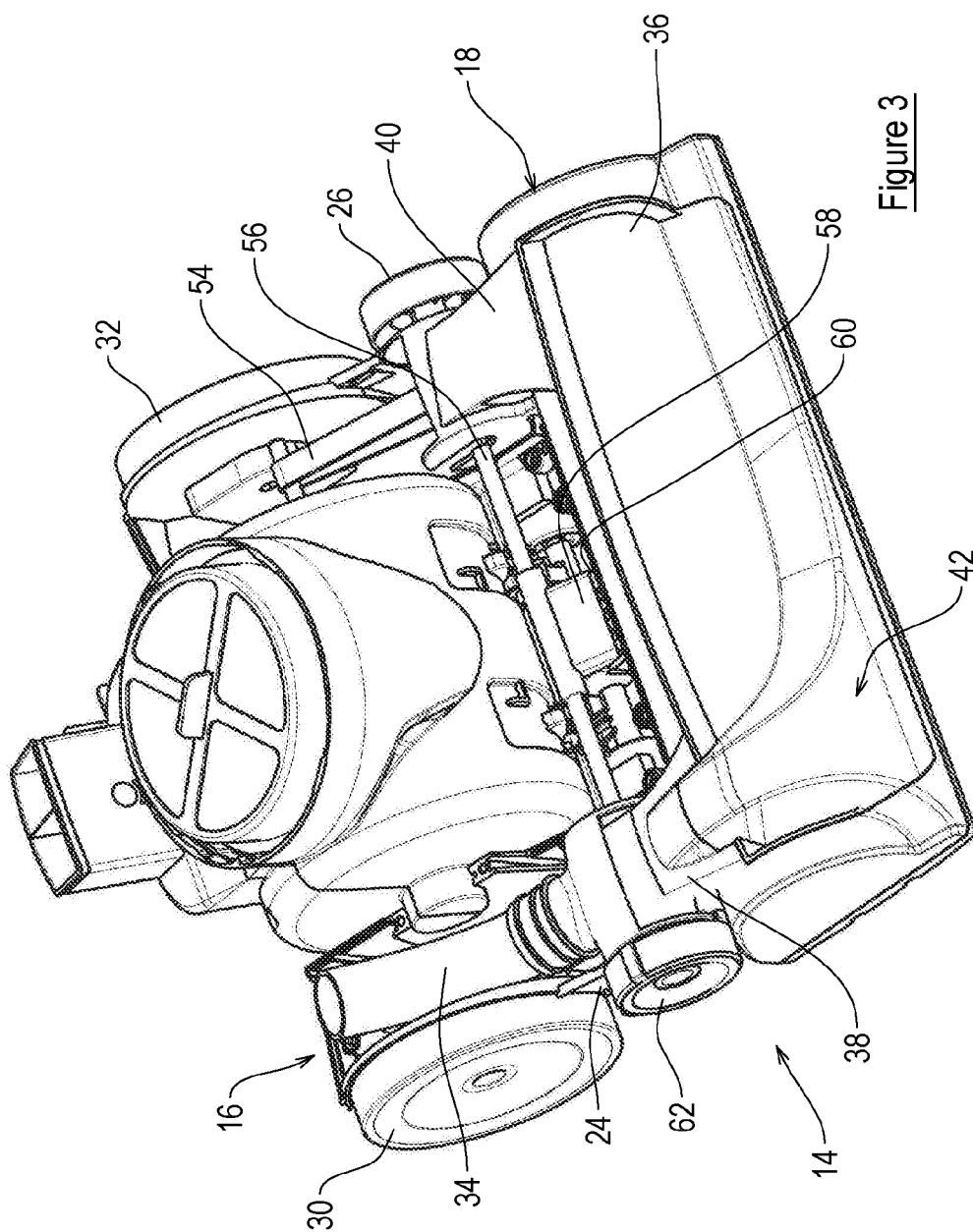


Figure 3

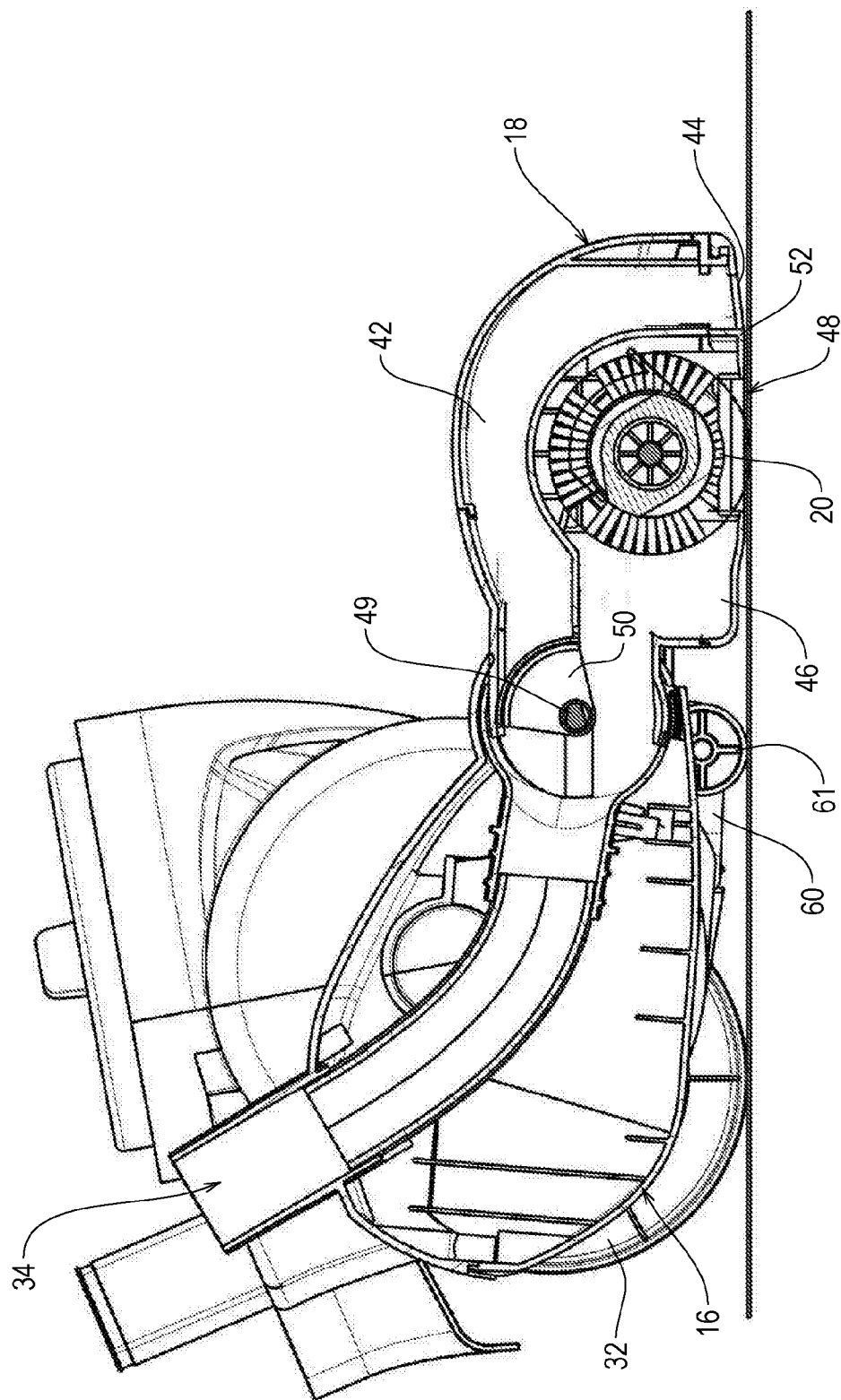


Figure 4

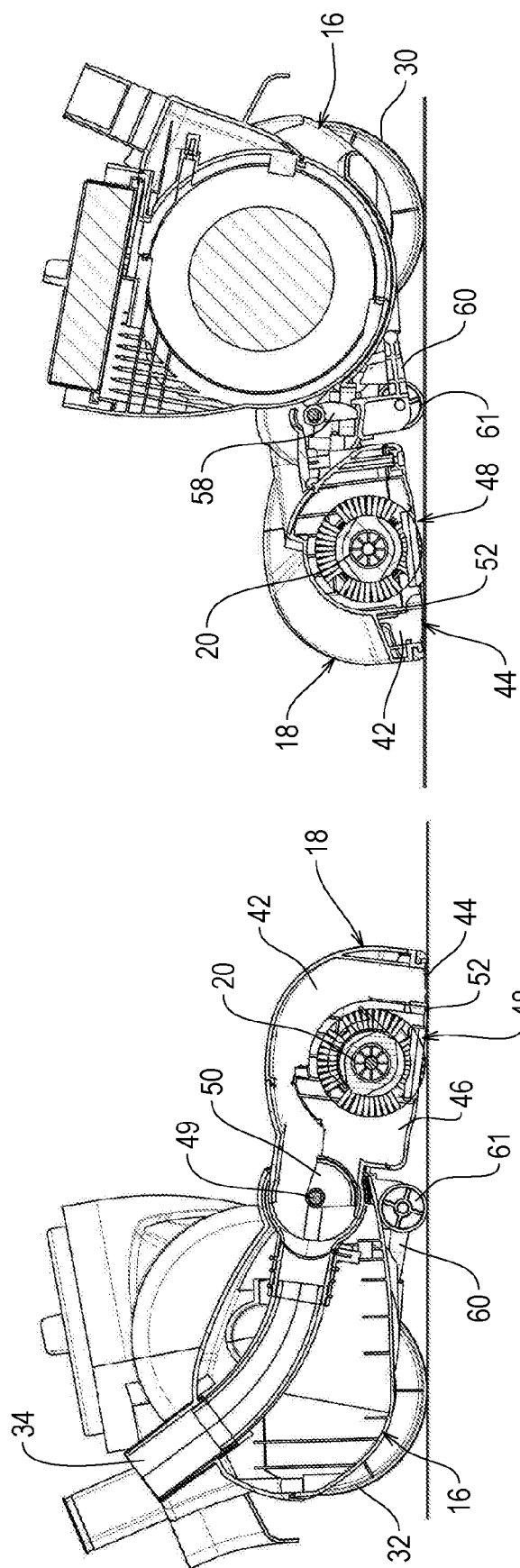
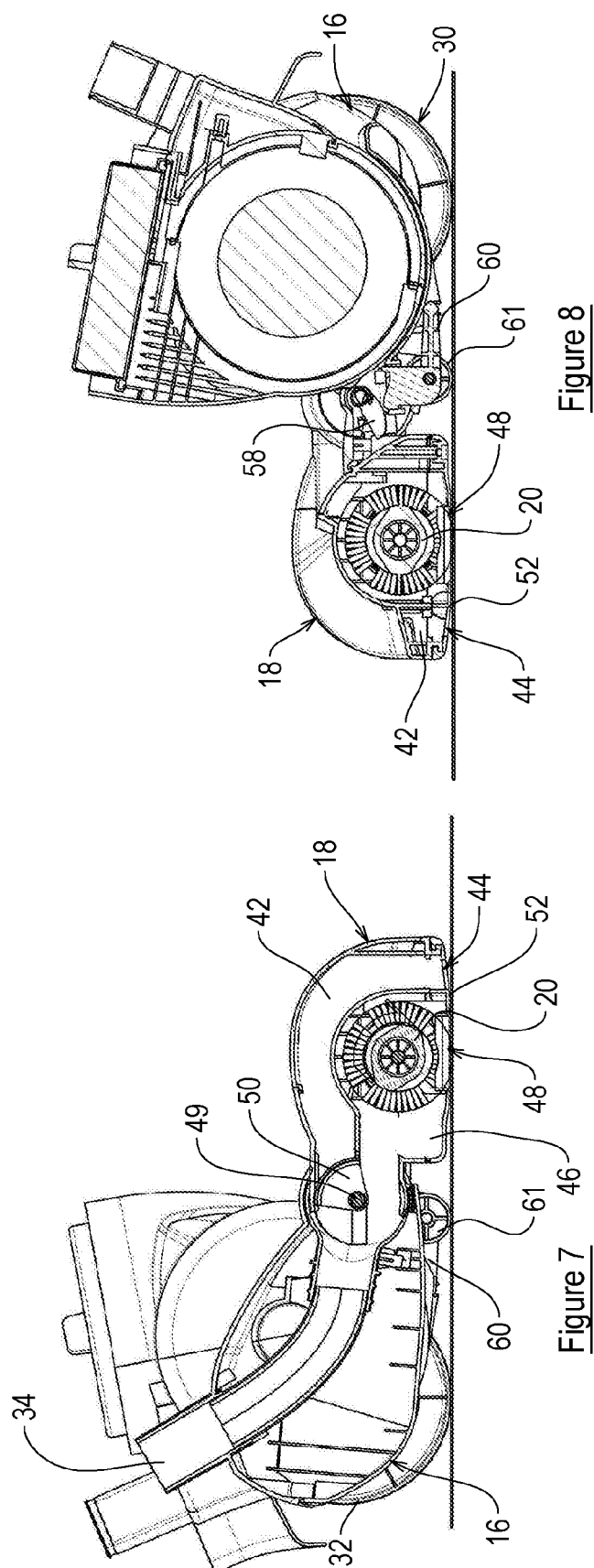
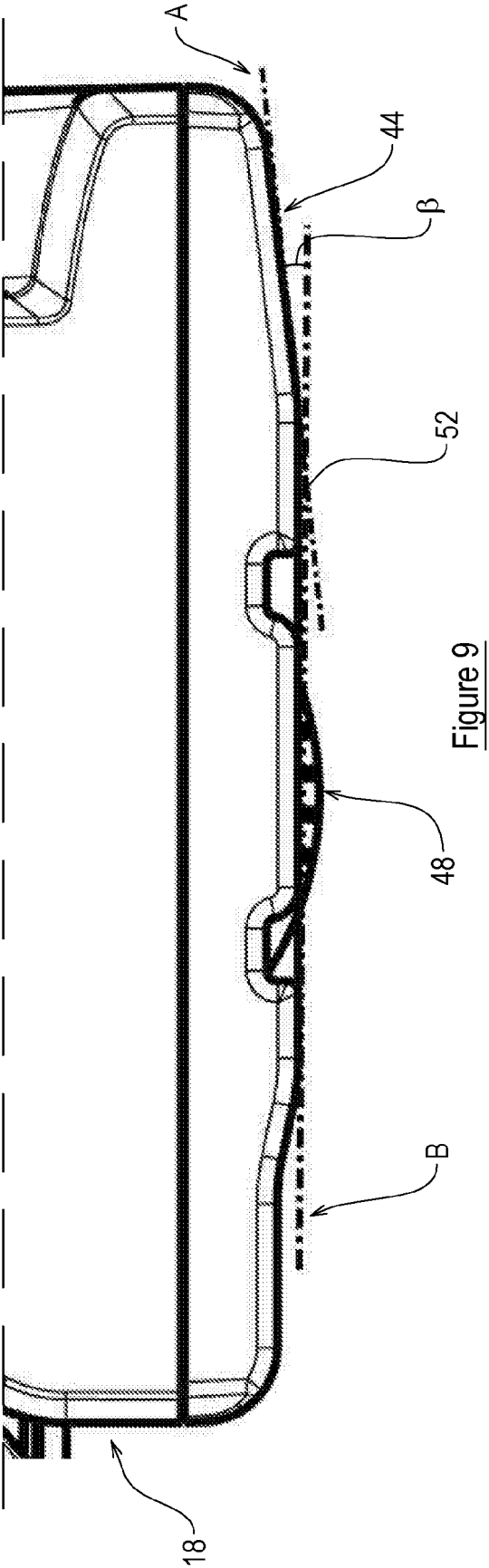


Figure 6

Figure 5





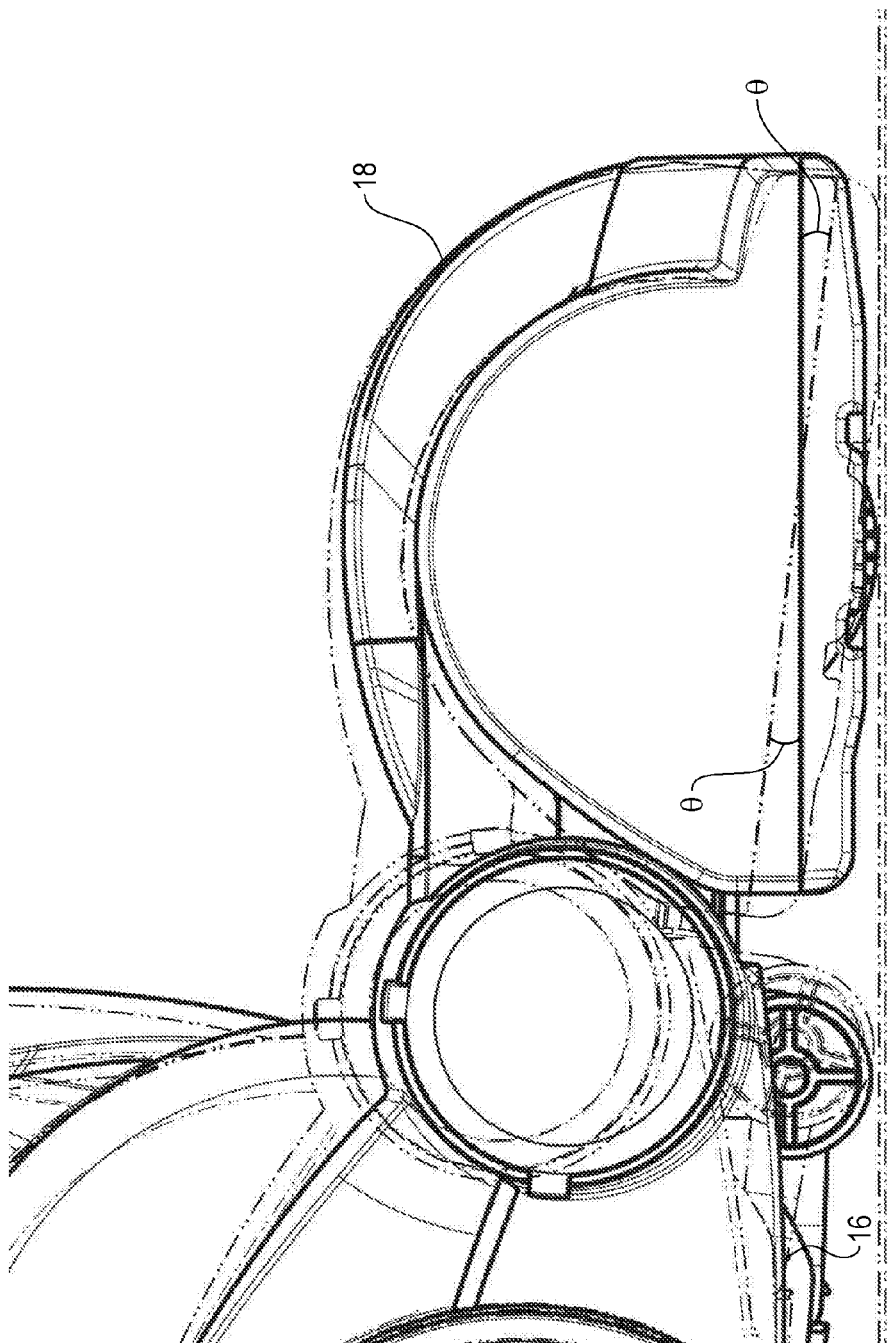


Figure 10

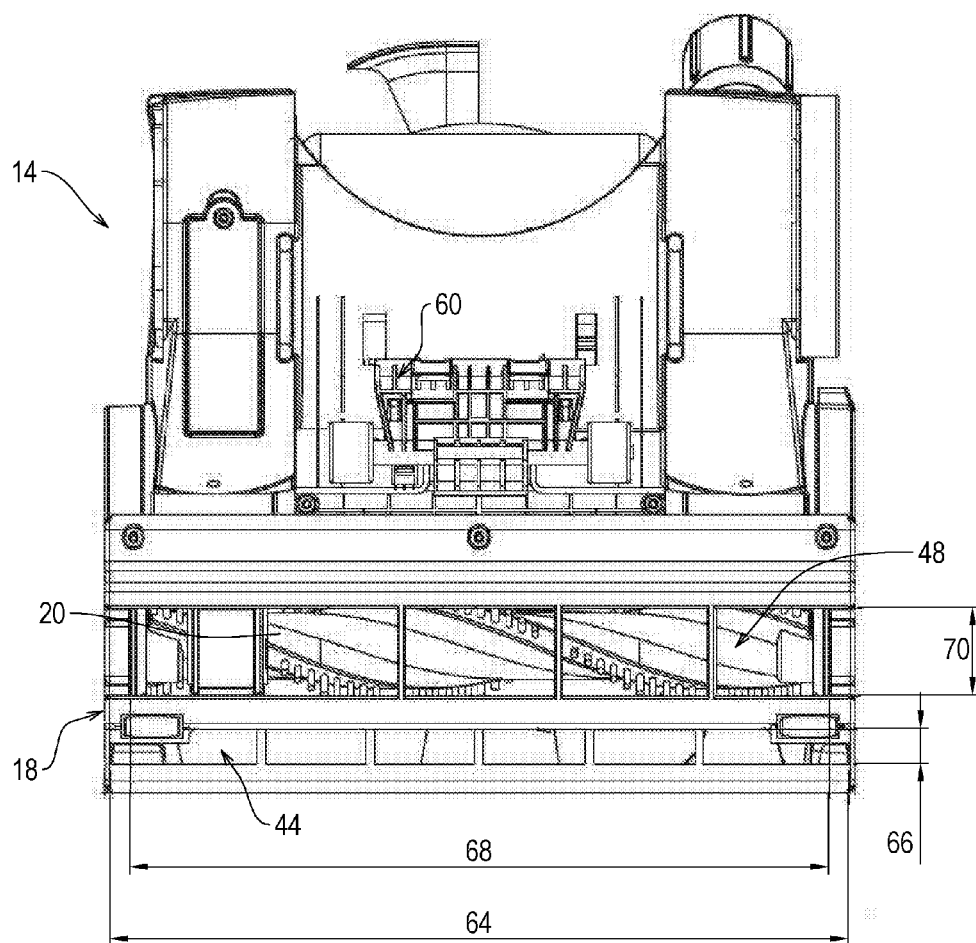
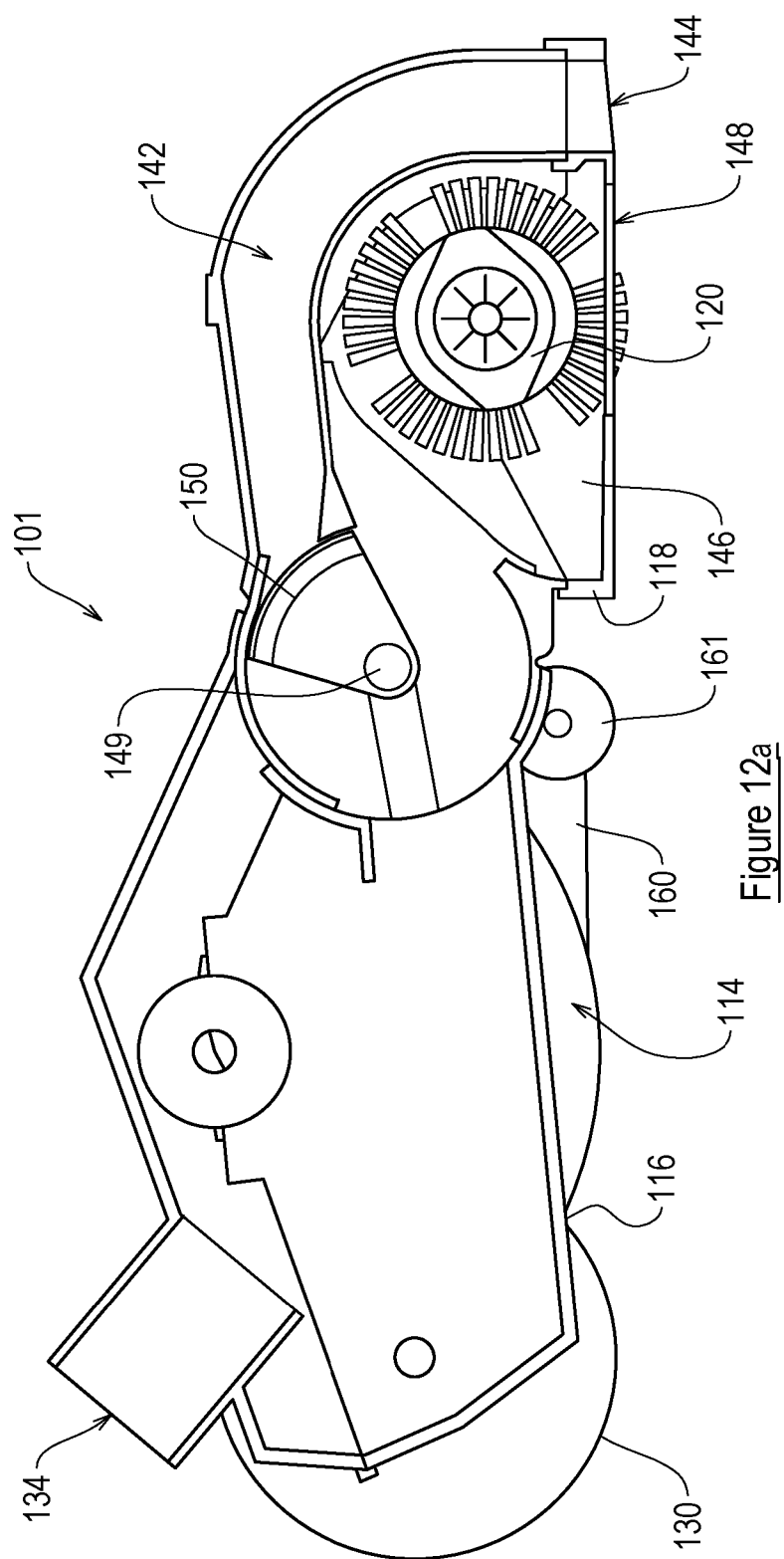
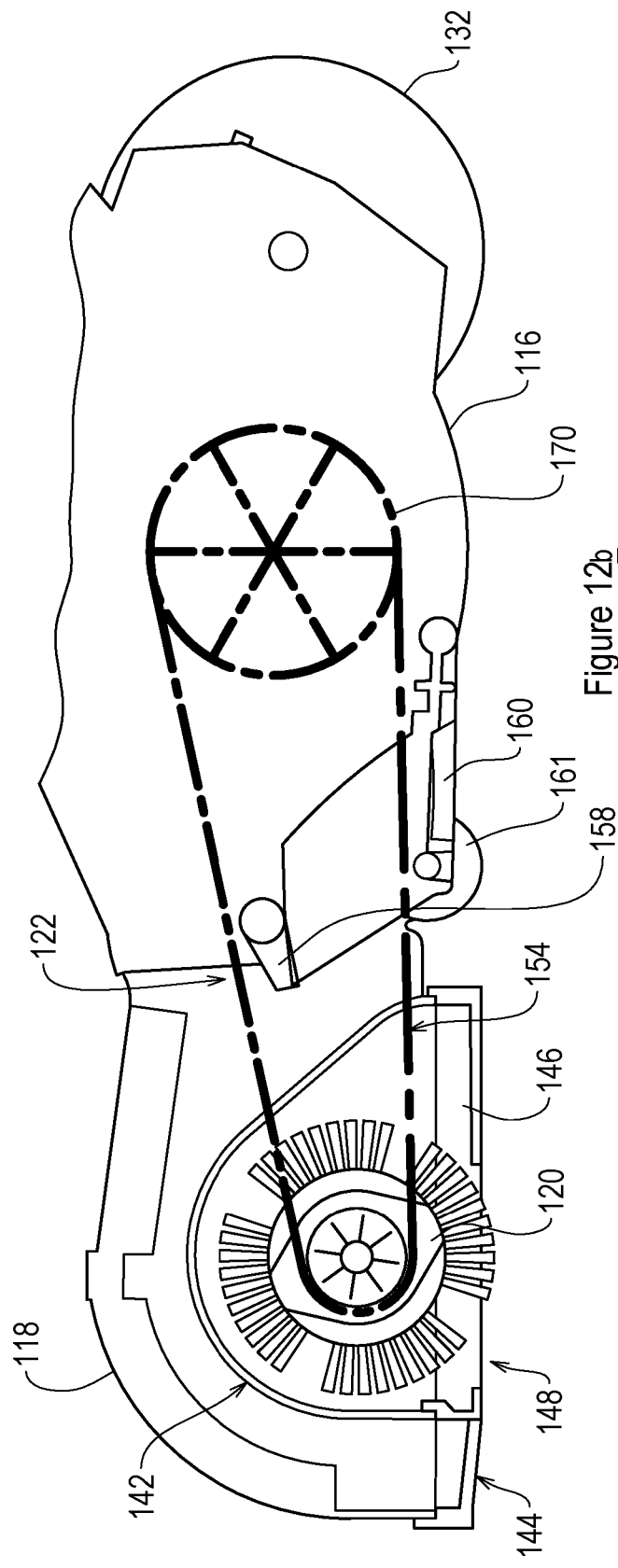


Figure 11





APPARATUS FOR CLEANING A FLOOR SURFACE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 15/102,741, filed Jun. 8, 2016, which is a U.S. national phase of international application PCT/GB2014/050359, filed Feb. 7, 2014, which claims priority to U.K. Patent Application No. 1321662.7, filed Dec. 9, 2013, the entire contents all of which are hereby incorporated by reference herein.

BACKGROUND

[0002] This invention relates to an apparatus for cleaning a floor surface and/or a floor tool for such an apparatus. In particular, this invention relates to an apparatus which utilises a source of suction to draw dirt and/or debris from a floor surface being cleaned for storage in a dirt chamber or bag for emptying by a user. Such apparatus are typically known as “vacuum cleaners”.

[0003] More particularly the invention relates to an apparatus which has an upright part pivotally connected to a base assembly supported on wheels. The user can grasp a handle of the upright part so as to push and pull the base assembly over the floor surface to clean it as required. The base assembly includes a passage which terminates at a floor facing opening and to which suction is applied by a suction source to cause air, and any dirt entrained within the air, to travel towards the dirt chamber. The base assembly includes a cleaning member driven by a motor for assisting in the cleaning of a carpet or upholstery. The cleaning member is generally cylindrical and has bristles which extend radially outwardly from its elongate axis. The cleaning member is supported for rotation about its elongate axis and remote parts of the bristles extend through the floor facing opening of the apparatus during use. A motor is drivingly connected to the cleaning member by a belt or the like to cause rotation of the cleaning member.

[0004] When the apparatus is to be used to clean a floor surface covered by a carpet, it is desirable for the cleaning member to be positioned close to the carpet so that the bristles are in contact with the carpet. Dirt is loosened by the cleaning member and entrained in the suction air flow. When the apparatus is to be used to clean a hard floor surface, e.g. a laminate or tiled floor, it is not desirable for the bristles of the cleaning member to contact the floor surface as this can cause deterioration in the finish of the floor surface. The bristles may, for example, cause scratches or remove any floor surface coating such as polish. To overcome this issue, it is known to provide means for raising the part of the base assembly which supports the cleaning member away from the floor surface to move the cleaning member out of contact with the floor surface. Dirt from the floor surface is still entrained in the suction air flow through the floor facing opening. However, a disadvantage of this arrangement is that the floor facing opening is further away from the floor surface meaning that the amount of suction air flow near or at the floor surface is reduced. The cleaning process is thus less effective.

SUMMARY

[0005] According to a first aspect of the invention we provide an apparatus for cleaning a floor surface including

an upright part including a user graspable handle, a base assembly including: a first base part connected to the upright part; and a second base part connected to the first base part, which second base part includes a cleaning member; and a device for effecting movement of the first and second base parts relative to each other.

[0006] According to a second aspect of the invention we provide an apparatus for cleaning a floor surface including an upright part including a user graspable handle, a base assembly connected to the upright part, the base assembly including a base part having a first passage with a respective inlet and a second passage with a respective inlet. The apparatus also includes a device for effecting movement of the base part between respective first and second conditions and a suction source for providing suction to one or both of the first and second passages, wherein as the base part is moved between its first and second conditions by the device, the suction provided to one or both of the first and second passages is changed.

[0007] According to a third aspect of the invention we provide a floor tool for an apparatus for cleaning a floor surface, said apparatus including a source of suction, the floor tool including a base assembly including a base part having a first passage with a respective inlet and a second passage with a respective inlet. The floor tool includes a device for effecting movement of the base part between respective first and second conditions; wherein the first and second inlets are positioned in respective planes.

[0008] According to a fourth aspect of the invention we provide an apparatus for cleaning a floor surface including a floor tool according to the third aspect of the invention.

[0009] According to a fifth aspect of the invention we provide a floor tool for an apparatus for cleaning a floor surface, said apparatus including a source of suction, the floor tool including a base assembly. The base assembly including a passage with an inlet for communication with the source of suction and the inlet has a length of between 280 to 350 mm.

[0010] According to a sixth aspect of the invention we provide an apparatus for cleaning a floor surface including a floor tool according to the fifth aspect of the invention.

[0011] According to a seventh aspect of the invention we provide a surface cleaning apparatus according to the first aspect of the invention including one or more or all of the features of any one of the second to sixth aspects of the invention.

[0012] According to an eighth aspect of the invention we provide a surface cleaning apparatus according to the second aspect of the invention including one or more or all of the features of any one of the third to sixth aspects of the invention.

[0013] According to a ninth aspect of the invention we provide a floor tool according to the third aspect of the invention including one or more or all of the features of any one of the fourth to sixth aspects of the invention.

[0014] According to a tenth aspect of the invention we provide a surface cleaning apparatus according to the fourth aspect of the invention including one or more or all of the features of the fifth and sixth aspects of the invention.

[0015] According to an eleventh aspect of the invention we provide a floor tool according to the fifth aspect of the invention including one or more or all of the features of the sixth aspect of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Embodiments of the various aspects of the invention will now be described by way of example only, with reference to the accompanying drawings, of which:

[0017] FIG. 1 is a perspective view of an apparatus for cleaning a floor surface in accordance with the present invention;

[0018] FIG. 2 is a perspective view of a base assembly of the apparatus of FIG. 1 in a first condition with some component parts removed;

[0019] FIG. 3 is a perspective view of part of the apparatus of FIG. 1 in a second condition, again with some component parts removed;

[0020] FIG. 4 is a first side cross-sectional view of the base assembly of FIG. 3;

[0021] FIG. 5 is a first side cross-sectional view of the base assembly in a first condition;

[0022] FIG. 6 is a second side cross-sectional view of the base assembly in a first condition;

[0023] FIG. 7 is a first side cross-sectional view of the base assembly in a second condition;

[0024] FIG. 8 is a second side cross-sectional view of the base assembly in a second condition;

[0025] FIG. 9 is a side view of part of a second base part of the base assembly;

[0026] FIG. 10 is a side view of the second base part of the base assembly in both its first (dashed lines) and second (solid lines) conditions;

[0027] FIG. 11 is an underside view of the base assembly;

[0028] FIG. 12a is a first side cross-sectional view of a floor tool in accordance with an aspect of the present invention; and

[0029] FIG. 12b is a second side cross-sectional view of the floor tool shown in FIG. 12a.

DETAILED DESCRIPTION

[0030] Referring to the figures, these show an embodiment of an apparatus 10 embodying various aspects of the invention. The apparatus 10 includes an upright part 12 including a user graspable handle and a base assembly 14. The base assembly 14 includes a first base part 16 and a second base part 18 which are connected to each other. The first base part 16 is positioned rearwardly of the second base part 18. The first base part 16 is connected to the upright part 12. The second base part 18 includes a cleaning member 20. An aspect of the present invention is that the apparatus 10 has a device 22 for effecting movement of the first and second base parts 16, 18 relative to each other.

[0031] The upright part 12 is pivotally connected to the base assembly 14 remote from a leading edge of the base assembly 14. The upright part 12 contains operative components of the apparatus 10 such as a suction source in the form of a suction motor and fan to provide the suction to the base assembly 14, and a dirt chamber for receiving any dirt entrained in the suction air flow drawn through the base assembly 14. The upright part 12 includes a dirt separator in the form of a cyclonic separator for separating dirt entrained in the suction air flow from the base assembly 14. These components are not shown in the figures but are well known in the art and so will not be discussed in any further detail. Although this embodiment includes a cyclonic separator,

other embodiments of the invention may have no such separator, but instead rely on a bag for collection of dirt from the air flow.

[0032] The first base part 16 includes first and second side portions 24, 26 spaced apart from one another to define part of an interior space 28. Within the space 28 a lower portion of the upright part 12 is positioned near a rear portion of the base assembly 14. The lower portion of the upright part 12 is pivotally connected to the respective side portions 24, 26. The side portions 24, 26 support respective wheels 30, 32 which permit the base assembly 14 to be rolled over a floor surface. One of the side portions 24 includes an air flow passage 34 one end of which includes a connection for a hose 25 and the other end of which is fluidly connected to the second base part 18 as will be described in more detail. The hose 25 is connected to the air flow passage 34 at one end and at its opposite end to a passage in the upright part 12 which is in fluid communication with the suction source (not shown). This arrangement permits the flow of suction through the second base part 18 from the first base part 16 and towards the dirt chamber.

[0033] The second base part 18 has a generally elongate main portion 36 which expands laterally across the apparatus with a curved, semi-circular (inside cross section), outer surface. The second base part 18 has two portions 38, 40 spaced apart from one another and which extend away from the main portion 36 towards the first base part 16. The portions 38, 40 connect to the respective side portions 24, 26 of the first base part 16 as will be described below.

[0034] The second base part 18 has a first passage 42 with a respective inlet 44 and a second passage 46 with a respective inlet 48. A part of the first passage 42 passes around the outer surface of the main portion 36 whilst a part of the second passage 46 is formed from an interior space defined by the main portion 36. The passages 42, 46 pass through one of the side portions 38 and communicate with a valve 49 which has a valve member 50. The valve 49 is also in fluid communication with the air flow passage 34 of the first base part 16. The suction source provides suction to both of the first and second passages 42, 46 and movement of the valve member 50 controls the flow of suction to the passages 42, 46.

[0035] The inlet 48 of the second passage 46 is positioned rearwardly of the inlet 44 of the first passage 42 and is positioned in between the inlet 44 of the first passage 42 and the connection of the first base part 16 to the upright part 12. The inlets 44, 48 are rectangular in shape and extend lengthwise of the main portion 36 of the second base part 18. The lengthwise direction is defined as the direction which is perpendicular to the forward and rearward direction in which the base assembly 14 is moved by the user during cleaning. The widthwise direction is defined as the direction which is parallel to the forward and rearward direction in which the base assembly 14 is moved by the user during cleaning. The inlets 44, 48 permit the flow of air through them. The inlet of the first passage 42 is relatively narrow in comparison to the inlet of the second passage 46. The inlets 44, 48 each include respective rib portions which extend widthwise across the inlets 44, 46 to divide the inlets 44, 48 into a plurality of respective apertures. The width of each of the ribs of the inlet 44 is 4 mm and the width of each of the ribs of the inlet 48 is 4 mm. In other embodiments the rib portions may not be present or there may be more or fewer.

The second base part **18** includes a ground engaging portion **52** which is positioned between the inlets **44**, **48** of the first and second passages **42**, **46**.

[0036] The cleaning member **20** is positioned in the second passage **46** and its respective inlet **48**. The cleaning member **20** is generally cylindrical in shape and has bristles which extend radially outwardly from its elongate axis. The cleaning member **20** is supported for rotation about its elongate axis and remote portions of the bristles extend through the inlet of the second passage **48**. A motor (not shown) for driving the cleaning member **20** is positioned in the first base part **16** and is drivingly connected to the cleaning member **20** by a belt **54**.

[0037] The connection between the first and second base parts **16**, **18** includes an elongate generally cylindrical rod **56** which extends width wise of the interior space **28**. The rod **56** passes through respective apertures provided in end portions of the side portions **24**, **26**, **38**, **40** to pivotally connect the parts **16**, **18** together. The valve member **50** is connected to the rod **56** such that rotation of the rod **56** causes pivotal movement of the valve member **50**.

[0038] The device **22** includes a generally wedge shaped cam member **58** which is connected to the rod **56** (they are formed as a single component part), and a cam follower **60** which is pivotally connected to the first base part **16**. The cam member **58** tapers to a respective free end. The cam member **58** extends radially away from the rod **56**. The cam follower **60** is a generally rectangular part which extends width wise across part of the interior space **28** and is supported on a pair of respective ground engaging wheels **61**. An upwardly facing surface of the cam follower **60** co-operates with the cam member **58**. Rotation of the rod **56** causes movement of the cam member **58** to effect relative movement between the first and second base parts **16**, **18** as will be described.

[0039] The apparatus includes a user operable member **62** which is pivotally supported and positioned on one side of the base assembly **14** for actuating the device **22**. The user operable member **62** is disc shaped and is connected to one end of the rod **56**. The pivot axis of the user operable member **62** is coaxial with the pivotal connection of the first and second base parts **16**, **18**. The pivotal connection of the first and second base parts **16**, **18** is parallel to the pivotal connection of the first base part **16** with the upright part **12**. The user operable member **62** can be operated by a user using his or her hand to cause it to rotate.

[0040] The user connects the apparatus **10** to an electricity source through a cable (not shown), although the apparatus could be powered by a battery. The user must put the apparatus **10** either into a first condition which is more suited to hard floor cleaning or a second condition which is more suited to carpet cleaning. As will be described, components of the apparatus **10** such as the first and second base parts **16**, **18**, the valve **49** and valve member **50** are moveable between respective first and second conditions that correspond to the first and second conditions of the apparatus **10**.

[0041] Considering the user putting the apparatus **10** into its first condition to clean a hard floor, the user uses his or her hand to hold the user operable member **62** and rotate it in a first, forward, direction and actuate the device **22** which effects a corresponding rotation of the rod **56**. The end of the cam member **58** then pushes onto and slides across the upwardly facing surface of the cam follower **60** as the cam member **58** pivots. The upwardly facing surface of the cam

follower **60** has a slight gradient which makes it easier for the cam member **58** to slide over it until the cam member **58** eventually reaches a generally vertical position. In doing so the connection between the first and second base parts **16**, **18** is moved generally upwards, i.e. away from the floor surface, into its respective first condition.

[0042] The first and second base parts **16**, **18** are pivotally connected and so raising the pivotal connection between them causes the second base part **18** to pivot downwardly about the connection under the effect of gravity. The second base part **18** also pivots about the ground engaging portion **52**, although said portion also translates rearwardly towards the first part **16**. It will be seen that a leading edge of the second base part **18**, which is positioned remote from its connection to the first base part **16**, pivots towards the floor surface whilst a rear portion of the second base part **18** remote to the leading edge is pivoted away from the floor surface. Once the device **22** has effected movement of the second base part **18** to its respective first condition the cleaning member **20** is in a raised position in which it is out of contact with the floor surface. When the second base part **18** is in its first condition the leading edge of the second base part **18** is positioned closer to a floor surface than it is positioned when the second base part **18** is in its second condition. It will also be seen that when the second base part **18** is in its first condition the inlet of the first passage **44** is positioned closer to the floor surface than it is positioned when the second base part **18** is in its second condition.

[0043] As the valve member **50** is connected to the rod **56**, the rotation of the rod **56** also causes corresponding movement of the valve member **50** to its first condition. When the valve member **50** is in its first condition the valve member **50** is positioned within the second passage **46** to block the second passage **46** whilst leaving the first passage **42** open. The suction source will therefore only provide a flow of suction in the first passage **42** due to the position of the valve member **50** blocking the flow of suction in the second passage **46**. The user can then commence cleaning of a hard floor surface.

[0044] Considering a user putting the apparatus into its second condition for carpet floor cleaning, the user uses his or her hand to rotate the user operable member **62** to rotate it in a second, rearward, direction, and actuate the device **22** which effects a corresponding rotation of the rod **56**. The end of the cam member **58** moves away from and out of contact with the upwardly facing surface of the cam follower **60** as it pivots. The cam member **58** eventually reaches a generally horizontal position. In doing so the connection between the first and second base parts **16**, **18** is moved generally downwards, i.e. closer to the floor surface, to its respective second condition.

[0045] Lowering of the pivotal connection causes the second base part **18** to pivot about the ground engaging portion **52** such that the rear portion of the second base part **18** remote to the leading edge pivots towards the floor surface and the leading edge of the second base part **18** pivots away from the floor surface. Once the device **22** has effected movement of the second base part **18** to its respective second condition the cleaning member **20** is in a lowered position which brings it into contact with the floor surface. It will be seen that when the second base part **18** is in its second condition the leading edge of the second base part **18** is positioned further from a floor surface than it is positioned when the second base part **18** is in its first

condition. When the second base part **18** is in its second condition the cleaning member **20** is positioned closer to a floor surface than it is when the second base part **18** is in its first condition. The apparatus is then in a suitable mode for carpet cleaning as the cleaning member **20** can agitate the carpet during cleaning.

[0046] Actuation of the device **22** causes movement of the valve member **50** to its second condition in which it is positioned in the first passage **42**. As the valve member **50** moves from its first condition towards its second condition the flow of suction is diverted from the first passage **42** to the second passage **46**. In other words, as the second base part **18** is moved to its second condition by the device **22**, the valve **49** is caused to decrease the flow of suction in the first passage **42** and increase the flow of suction in the second passage **46**. When the valve member **50** has moved to its second condition, the suction source will only provide a flow of suction in the second passage **46** due to the position of the valve member **50**. The user can then commence cleaning of a carpet.

[0047] The arrangement for movement of the second base part to its first condition is advantageous as it means that the first passage associated with hard floor cleaning is positioned closer to the floor surface whilst the cleaning member is positioned to be out of contact with the floor surface. The amount of suction air flow provided by the first passage through its respective inlet near or at the floor surface is therefore increased even though the part of the second base part which contains the cleaning member has been raised. Thus the cleaning process for the hard floor surface is more efficient. Similarly the movement of the second base part to its second condition is advantageous as it brings the passage associated with carpet cleaning closer to the floor surface to increase the amount of suction flow through it to make carpet cleaning more effective.

[0048] The linking of the valve operation with the movement of the second base part such that the flow of suction is diverted to the first passage or second passage based on the cleaning operation is also advantageous. This is because it means that substantially all of the suction provided by the suction source is directed to the passage associated with the corresponding cleaning operation. Thus the amount of suction air flow is maximised which provides more effective dirt/debris pick up.

[0049] In this embodiment the device **22**, user operable member **62** and valve member **50** are all connected to the rod **56**. In other words, they are mechanically connected to or form part of the connection between the first and second base parts **16**, **18**. Thus, operation of the user operable member **62** causes simultaneous actuation of the device **22** and valve member **50**. However, in other embodiments, one or more of the components may be formed separate from the connection between the base parts. In such embodiments there may be further mechanical devices to cause actuation or movement of the components when the user operates the user operable member **62**. In other embodiments one or more of the components may be electronically activated and controlled by electronic circuitry operable by the user.

[0050] Similarly, in the present embodiment the flow of suction in the first and second passages **42**, **46** is changed simultaneously on movement of the first and second parts. In other embodiments the flow of suction may be changed, i.e.

increased or decreased, before or after movement of the first and second base parts **16**, **18** to their first or second conditions has occurred.

[0051] The present embodiment utilises the valve member **50** to block one of the passages **42**, **46** so that there is no flow of suction or substantially no flow of suction in it. Other changes of the suction may take place in other embodiments where rather than blocking substantially all of the flow of suction in a passage, the suction is merely decreased by the valve member **50**. For example, in one embodiment the apparatus is arranged so that when the valve member is in its first condition the flow of suction in the first passage is greater than it is when the valve member is in its second condition. In other embodiments the apparatus is arranged such that when the valve member is in its second condition the flow of suction in the second passage is greater than it is when the valve member is in its first condition and/or when the valve member is in its first condition the flow of suction in the first passage is greater than the flow of suction in the second passage.

[0052] It will be understood that the terms first and second conditions need not necessarily correspond to the hard floor or carpet floor modes of operation of the apparatus **10**. One or more aspects of the invention are applicable to apparatus which need not be arranged to be switchable between hard floor and carpet floor modes of operation. The terms first and second conditions are reference points by which to define the functional operation of the various components of the apparatus between intermediary or final stages of operation.

[0053] In certain embodiments, when the first and/or second base parts are moved between first and second conditions, the flow of suction may stay constant in one of the passages and the flow of suction be increased or decreased to the other of the passages. In alternative embodiments the apparatus may be arranged so that when the suction provided to the second passage is increased or decreased, the suction provided to the second passage is the other of increased or decreased.

[0054] The suction provided to the first and/or second passages may be increased or decreased. In alternative embodiments the apparatus need not have a valve. For example, respective suction motors may provide suction to the passages, and the amount of suction provided by the suction motors may be increased or decreased when the base part is moved between its first and second conditions.

[0055] In the present embodiment the cleaning member **20** is in the form of a motor driven agitator. In other embodiments other types of cleaning members such as non-motor driven agitators, e.g. turbine driven agitators, or static brushes may be used.

[0056] An aspect of the present invention is that the base assembly need not be made of two parts which are connected together or necessarily include a cleaning member. According to such an aspect of the present invention, the base assembly includes a base part having a first passage with a respective inlet and a second passage with a respective inlet. As the base part is moved between its first and second conditions by the device, the suction provided to the first and second passages is changed. The apparatus is configured so that movement of the base part causes a change in the suction provided to the first and second passages. In other embodiments the change in suction may occur before or after the movement of the base part.

[0057] When the base part is in its first condition the inlet of the first passage is positioned closer to a floor surface than it is positioned when the base part is in its second condition. When the base part is in its second condition the inlet of the second passage is positioned closer to a floor surface than it is positioned when the base part is in its first condition. In other embodiments the suction provided to one, rather than both, of the passages is changed.

[0058] An aspect of the present invention relates to the arrangement of the respective inlets **44**, **48**. According to this aspect of the present invention, the first and second inlets **44**, **48** are positioned in respective planes A, B. The planes A, B intersect about or close to the ground engaging portion **52** between the respective inlets **44**, **48**.

[0059] With reference to the figures, in particular FIG. 9, it will be seen that the respective plane A of the first inlet **44** is inclined at an angle β with respect to the respective plane B of the second inlet **48**. The first inlet **44** is spaced apart from the second inlet **48** in a generally vertical direction.

[0060] With reference to FIG. 10 the second base part **18** is pivotally moveable through an angle θ between its first condition (shown in dashed lines) and its second condition (shown in solid lines). The apparatus **10** has been configured such that the angles β and θ are equal or substantially equal, and in this embodiment are 6° .

[0061] It has been noted that an angle of 6° or 7° for β and/or θ leads to an unexpected improvement in suction/cleaning of the apparatus **10** when it is in the first condition. However, angles in the range of around 4° to 8° are also envisaged as being beneficial for cleaning.

[0062] This configuration is advantageous as it means that when the second base part **18** is in its first condition the inlet of the first passage **44** is positioned in a plane which is parallel or substantially parallel to the floor surface and when the second base part **18** is in its second condition the inlet of the second passage **48** is positioned in a plane which is parallel or substantially parallel to the floor surface. This reduces suction flow losses.

[0063] It will be seen that when the second base part **18** is in its first condition the second inlet **48** is positioned in a plane which is generally inclined with respect to the floor surface and when the second base part **18** is in its second condition the first inlet **44** is positioned in a plane which is generally inclined with respect to the floor surface.

[0064] In other embodiments, the respective planes are spaced from each other and/or spaced from each other, for example, in a generally vertical direction away from the floor surface. In the described embodiment, the respective planes intersect about the ground engaging portion **52** but in alternative embodiments the planes may not intersect about the ground engaging portion **52** of the base assembly **14**.

[0065] As shown in FIG. 11, the first inlet **44** has a length **64** and a width **66**, and the second inlet **48** has a length **68** and a width **70**. An aspect of the invention relates to the selection of the dimensions of the first and second inlets so as to provide an unexpected improvement in cleaning effectiveness and suction characteristics.

[0066] The first inlet **44** has a width of 17 mm and a length of 338 mm.

[0067] Other advantageous embodiments are envisaged for which the width **66** of the first inlet **44** is within the following ranges: 12 and 22 mm, or more preferably 15 and

19 mm; and for which the length **64** of the first inlet **44** is within the following ranges: 280 to 350 mm or more preferably 300 to 340 mm.

[0068] The second inlet **48** has a width of 41 mm and a length of 320 mm.

[0069] Advantageous embodiments are envisaged for which the width **70** of the second inlet **48** is within the following ranges: 30 to 50 mm, more preferably 35 to 45 mm, yet more preferably 40 to 45 mm; and for which the length **68** is within the following ranges: 280 to 350 mm, more preferably 290 to 340 mm, yet more preferably 310 to 330 mm and yet more preferably 290 to 300 mm. Other advantageous specific values of the length **68** are 293 mm and 294 mm.

[0070] It will be understood that the one or more features of the base assembly of one or more of the embodiments described hereinbefore in relation to upright cleaners can also be incorporated as part of a floor tool for a suction cleaner. For example a floor tool for connection to a cylinder or canister type cleaner. Such a floor tool **101** is shown in FIG. 12a and FIG. 12b which embodies various aspects of the invention.

[0071] Features in common with the embodiments described above have been given the same reference number with the addition of **100**.

[0072] An aspect of the present invention relates to the floor tool **101** including a base assembly **114** which has a first base part **116** and a second base part **118** which is positioned forwardly of the first base part **116**. The base assembly **114** has a first passage **142** with a respective inlet **144** and a second passage **146** with a respective inlet **148**. The base assembly **114** has a cleaning member **120** and a device **122** for effecting movement of the first and second base parts **116**, **118** relative to each other. The cleaning member **120** is positioned in the second passage **146** and its respective inlet **148**.

[0073] The first base part **116** includes a rearwardly extending connection member for connection with a suction hose (not shown) of a suction cleaner so as to provide fluid communication between the source of suction of the suction cleaner and the first and second passages **142**, **146**. The first base part **116** includes a turbine **170** having a rotor which is drivingly connected to the cleaning member by a belt **154**. The turbine **170** is positioned within the suction flow path and rotates during use so as to correspondingly drive rotation of the cleaning member **120** in a known manner during use. A motor could be used instead or in addition to the turbine **170**.

[0074] The general arrangement, and operation, of the floor tool and its various components is similar to that described in relation to the previous embodiments and so will not be described in any more detail here. It will be understood that the aspects of the present invention related to the apparatus **10** are similarly applicable to the floor tool **101**.

[0075] When used in this specification and claims, the terms “comprises” and “comprising” and variations thereof mean that the specified features, steps or integers are included. The terms are not to be interpreted to exclude the presence of other features, steps or components.

[0076] The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process

for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

We claim:

1. An apparatus for cleaning a floor surface including: an upright part including a user graspable handle; a base assembly, connected to the upright part, including a base part having: a first passage with a respective inlet; and a second passage with a respective inlet; a device for effecting movement of the base part between respective first and second conditions; a suction source for providing suction to one or both of the first and second passages; wherein as the base part is moved between its first and second conditions by the device, the suction provided to one or both of the first and second passages is changed.
2. An apparatus according to claim 1 wherein the suction provided to the first passage is increased or decreased.
3. An apparatus according to claim 1 wherein the suction provided to the second passage is increased or decreased.
4. An apparatus according to claim 2 wherein when the suction provided to the first passage is increased or decreased, the suction provided to the second passage is the other of increased or decreased.
5. An apparatus according to claim 2 wherein when the suction provided to the second passage is increased or decreased, the suction provided to the first passage is the other of increased or decreased.
6. An apparatus according to claim 1 wherein when the base part is in its first condition the inlet of the first passage is positioned closer to a floor surface than it is positioned when the base part is in its second condition.
7. An apparatus according to claim 1 wherein when the base part is in its second condition the inlet of the second passage is positioned closer to a floor surface than it is positioned when the base part is in its first condition.
8. An apparatus according to claim 1 including a valve for controlling the flow of suction in one or both of the first and second passages, including a valve member moveable between respective first and second conditions.
9. An apparatus according to claim 8 wherein the first and second conditions of the base part correspond respectively to the first and second conditions of the valve member.
10. An apparatus according to claim 9 wherein when the valve member is in its first condition the flow of suction in the first passage is greater than it is when the valve member is in its second condition.
11. An apparatus according to claim 9 wherein when the valve member is in its second condition the flow of suction in the second passage is greater than it is when the valve member is in its first condition.
12. An apparatus according to claim 8 wherein the device for effecting movement of the base part is configured for effecting movement of the valve member between its first and second conditions.
13. An apparatus according to claim 12 wherein as the base part is moved to its second condition by the device, the valve is caused to decrease the flow of suction in the first passage.
14. An apparatus according to claim 12 wherein as the base part is moved to its first condition by the device, the valve is caused to decrease the flow of suction in the second passage.
15. An apparatus according to claim 12 wherein as the base part is moved to its second condition by the device, the valve is caused to increase the flow of suction in the second passage.
16. An apparatus according to claim 12 wherein as the base part is moved to its first condition by the device, the valve is caused to increase the flow of suction in the first passage.
17. An apparatus according to claim 1 the base part includes a ground engaging portion about which the base part is pivotally moveable as it moves between its first and second conditions, preferably the ground engaging portion is positioned between the inlets of the first and second passages.
18. An apparatus according to claim 1 wherein the inlet of the second passage is positioned rearwardly of the inlet of the first passage and preferably is positioned in between the inlet of the first passage and the connection of the base assembly to the upright part.
19. An apparatus according to claim 1 wherein the base assembly includes a cleaning member.
20. An apparatus according to claim 1 wherein the base part includes: a first base part connected to the upright part; a second base part connected to the first base part, which second part includes a cleaning member; and wherein the device effects movement of the first and second base parts relative to each other.

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