March 23, 1954 W. O. LANGILLE 2,672,643

VACUUM CLEANER DUST BRUSH SUPPORTING MEANS

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Fig. 1.

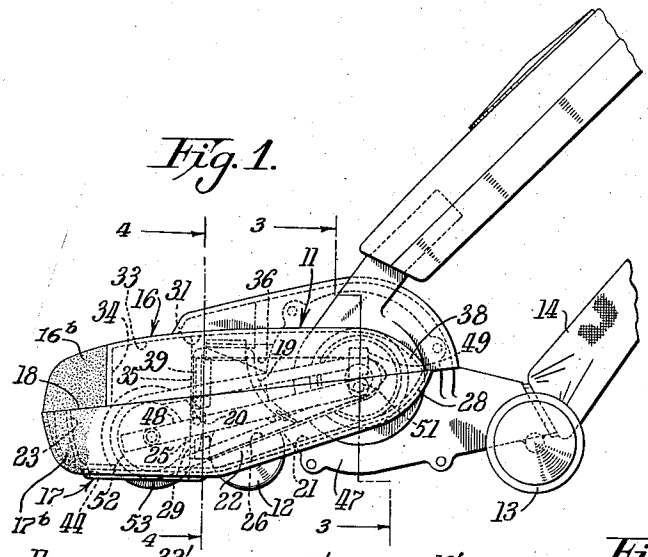


Fig. 3.

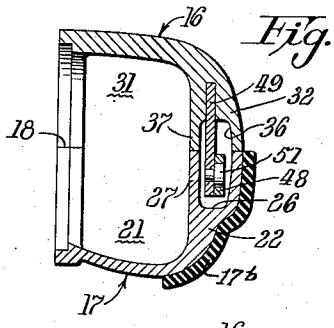
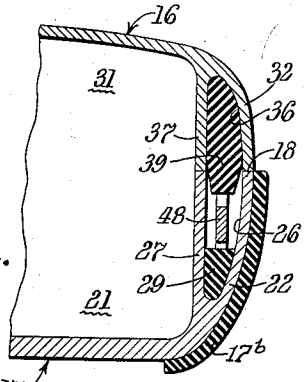


Fig. 4.



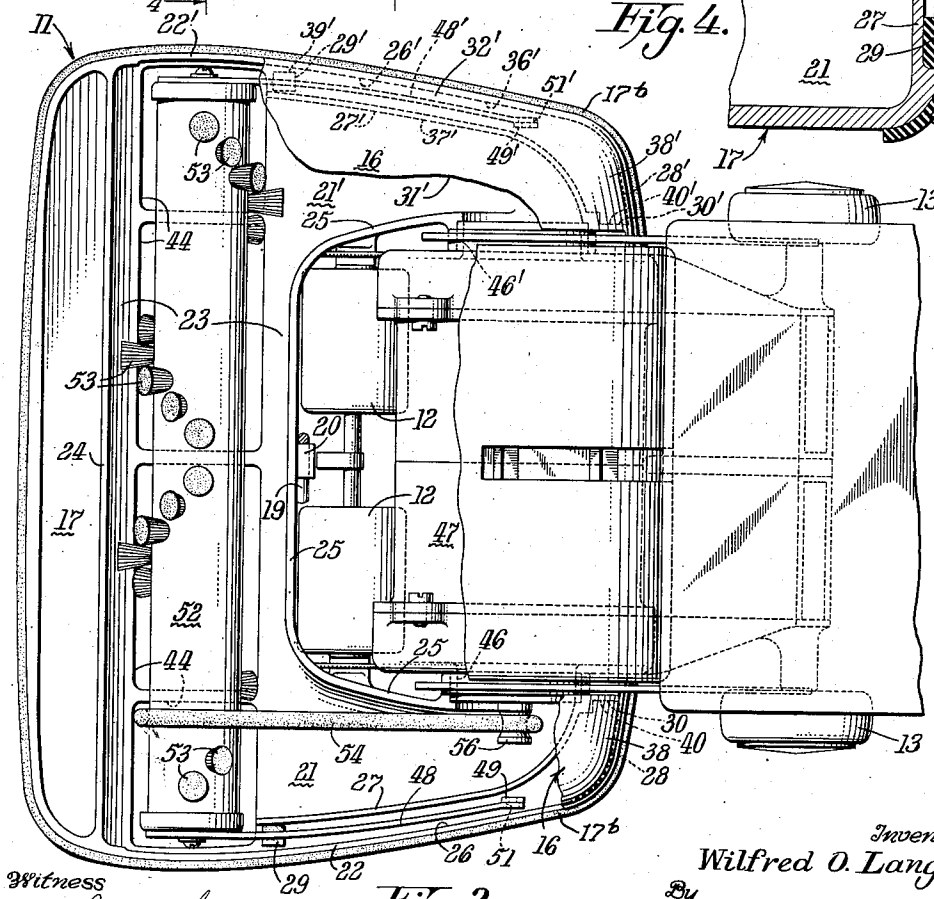


Fig. 2.

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VACUUM CLEANER DUST BRUSH SUPPORTING MEANS

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5 Claims. (Cl. 15—372)

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This invention relates to ambulatory type vacuum cleaners, and more particularly to vacuum cleaners constructed from upper and lower casing shells joined together to house and support a rotary dust-brush and other operative elements of the cleaner.

Patent application, Serial No. 80,634, filed March 10, 1949, now Patent No. 2,649,609, relates to an ambulatory type vacuum cleaner having an upper casing shell and a lower casing shell joined together to house a rotary dust-brush carried by the free ends of a pair of pivotally mounted arms, and the present invention has for one of its primary objects to provide an improved vacuum cleaner of the type shown in Patent No. 2,649,609, supra.

Another object of the invention is to provide means for pivotally mounting the brush supporting arms of a vacuum cleaner in such a manner as to assure free floating movement of the arms and the brush supported thereby.

A further object of the invention is to provide improved cushioning means for limiting the upward and downward movement of a floating dust brush and the arms supporting said brush.

Another object of the invention is to provide a means for preventing dirt and dust from collecting at the pivot points of a pair of vacuum cleaner brush supporting arms.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings, which form a part of this specification:

Fig. 1 is a side elevational view of an ambulatory type vacuum cleaner embodying the present invention;

Fig. 2 is an enlarged plan view of the vacuum cleaner shown in Fig. 1, portions of the upper casing shell being broken away to disclose features of internal construction;

Fig. 3 is an enlarged fragmentary sectional view taken on the line 3—3 of Fig. 1; and

Fig. 4 is an enlarged fragmentary sectional view taken on the line 4—4 of Fig. 1.

A vacuum cleaner, embodying the present invention, is illustrated in the accompanying drawings and comprises a main body portion 11 propelled on front and rear supporting wheels 12 and 13, and the vacuum cleaner has a dust bag 14 into which dirt is discharged. The main body

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portion 11 includes an upper casing shell 16 and a lower casing shell 17, the two shells being joined on a slightly inclined plane indicated by the numeral 18. The lower casing shell 17 is removably held to the upper casing shell 16 by a releasable latch mechanism 19 and keeper 20, both of which are fully illustrated and described in a patent application Serial No. 16,716, filed March 24, 1948, now Patent No. 2,532,432. The lower casing shell 17, is substantially U-shaped in its general, plan view outline and has an upfacing dust-conveying cavity, consisting of a pair of upfacing, dust-conducting leg cavity portions 21 and 21', extending substantially parallel to outer side-walls 22 and 22' of the lower shell 17, and an upfacing, dust conducting and brush housing cavity portion 23 extending along the front wall 24 of the shell 17 and connecting the forward ends of the cavity portions 21 and 21'. The cavity portions 21—23—21' are bounded inwardly by a U-shaped inner wall 25. In addition to the above, the lower casing shell 17 is provided with a pair of upfacing brush-arm housing cavity portions 26 and 26' which are substantially parallel to the cavity portions 21 and 21' respectfully. The cavity portion 26 is bounded on one side by the side wall 22 and on the other side by an upstanding partition or wall 27 formed integral with the lower casing shell 17. The rear end of the cavity portion 26 is closed by a continuation of the wall 22, which continuation is designated as 28 and by a continuation of the partition 27, which continuation is designated as 30. The front end of the cavity 26 is open except for a resilient bumper 29 and a portion of a resilient bumper 39, presently to be described. In like manner the cavity portion 26' is bounded on one side by the side wall 22' and on the other side by an upstanding partition or wall 27'. The rear end of the cavity portion 26' is closed by a continuation of the wall 22', which is designated as 28', and by a continuation of the partition 27', which continuation is designated as 30'. The front end of the cavity portion 26' is open except for a resilient bumper 29' and a portion of a resilient bumper 39' presently to be described.

The upper casing shell 16 has a downfacing U-shaped dust conducting cavity which is complemental to the upfacing U-shaped cavity 21—23—21' of the lower shell 17, the said downfacing cavity consisting of a pair of downfacing dust conducting leg cavity portions 31 and 31' extending substantially parallel to respective outer side walls 32 and 32' of the shell 16 and a downfacing, dust conducting and brush housing cavity portion 33 extending along the front wall 34 of the upper shell 16 and connecting the for-

ward ends of the leg cavity portions 31 and 31'. The cavity portions 31—33'—31' are bounded inwardly by a U-shaped inner wall 35, that is complemental to the U-shaped inner wall 25. In addition to the above, the upper casing shell 16 is provided with a pair of downfacing brush-arm housing cavity portions 36 and 36' which are parallel to the cavity portions 31 and 31' respectively; the cavity portion 36 is bounded by the outer side wall 32 and on the other side by a depending partition 37. The rear end of the cavity portion 36 is closed by a continuation of the side wall 32 which continuation is designated as 38, and by a continuation of the partition 37, which continuation is designated as 40. The front end of the cavity portion 36 is closed by a resilient bumper 39 presently to be described. In like manner the cavity portion 36' is bounded on one side by the outer side wall 32' and on the other side by a depending partition 37'. The rear end of cavity portion 36' is closed by a continuation of the wall 32', which continuation is designated as 38', and by a continuation of the partition 37', which continuation is designated as 40'. The front end of the cavity portion 36' is closed by a resilient bumper 39' presently to be described.

When the lower casing shell 17 is secured or latched to the upper casing shell 16, the complemental U-shaped cavity portions 21—23—21' of the lower casing shell 17 and the U-shaped cavity portions 31—33—31' of the upper casing shell 16 combine to form a U-shaped cavity which has an open mouth 44 for ingress of dust laden air, and a pair of concentric egresses 46—46' through which the dust laden air passes to the bag 14 by way of a motor driven dual fan unit, indicated generally by 47 and fully described in a patent application Serial No. 784,165, filed November 5, 1947, now Patent No. 2,540,178. Also the cavity portions 26 and 36, as well as the cavity portions 26' and 36', combine to form a pair of spaced tubular shaped cavities 26—36 and 26'—36' for respectively housing a pair of brush supporting arms 48 and 48' which are similar to the brush supporting arms set forth in the Patent No. 2,649,609 supra. As fully set forth in the Patent No. 2,649,609, the rear ends of arms 48 and 48' are supported from a pair of offset brackets 49—49' the upper ends of which are secured in recesses provided in the opposite side walls 32—32' of the upper shell 16. The lower end of each bracket 49 and 49' is apertured to accommodate a pivot pin 51 or 51', which pivotally mounts the rear ends of the brush support arms 48—48'. Also, in the manner fully set forth in Patent No. 2,649,609, the forward ends of the arms 48—48' rotatably carry a rotary dust brush 52 having a plurality of bristles 53. A belt 54, driven by a shaft pulley 56 of the motor-fan unit 47 drives the rotary dust brush 52.

As best seen in Figs. 2 and 3, the bracket 49, the pivot 51 and the more than half of the length of the arm 48 are housed in the cavity 26—36, the forward end of the arm 48 extending forwardly through an aperture provided between the lower end of the bumper 39 and the upper end of the bumper 29. In like manner, the bracket 49', the pivot 51' and the greater part of arm 48' are housed in the cavity 26'—36' and the forward end of the arm 48' extends through an aperture located between the bumpers 29'—39'. From this it can be seen that the brackets 49 and 49', and the pivoted ends of the arms 48 and 48' are housed in the tubular cavities 26—36 and 26'—36' respectively, thus being shielded from the dust laden air which is picked up by the mouth 44 and carried to the bag 14. It will also be seen that the vertical movement of the arms 48 and 48' and thus the vertical movement of the rotary dust brush 52 are limited by the resilient bumpers 29—39 and 29'—39'. These bumpers are cemented into the cavity portions 26, 36, 26', or 36' as the case may be by adhesive and thus may be removed and replaced in the event they become worn from long usage.

In order to prevent the vacuum cleaner from marring furniture, certain outer surfaces of the main body portion 11 are covered with resilient material, thereby providing bumpers 15[b] and 17[b]; these bumpers being more fully described in U. S. Patents Nos. 2,540,178 and 2,575,554.

From the above description and the attached drawings, it will be evident that the pivots 51 and 51' and the major portion of the arms 48 and 48' are housed in tubular cavities. The rear ends of the two tubular cavities are closed and, since the forward ends of these cavities are substantially closed by the bumpers, it is evident that very little if any dirt or dust, that may be picked up by the vacuum cleaner, will get into the cavities to interfere with the movement of the arms 48 and 48' or to foul the pivots 51—51'. Furthermore, the upward and downward movements of the arms 48 and 48', and thus the movements of the dust brush 52, are limited by the size of the rubber bumpers 29—39 and 28'—39'. Changing the size of the bumpers, allows greater or less vertical movement of the brush 52.

Having thus set forth the nature of the invention, what I claim herein is:

1. A vacuum cleaner, comprising, a cavitied upper casing shell; a cavitied lower casing shell attached to said upper casing shell, said lower casing shell being provided in its lower portion with a suction-mouth opening, and each of said shells being provided with a front wall, spaced outer side walls, an inner wall and a partition wall, the latter being located adjacent to one of said outer side walls, said front walls and portions of said inner walls defining a nozzle cavity portion, one set of said outer side walls and said partition walls defining a side cavity portion, the forward end of said side cavity portion being in communication with the nozzle cavity portion, said partition walls and portions of said inner walls defining a dust conducting cavity portion of which the forward end is in communication with said nozzle cavity portion; a motor-fan unit supported by said casing shells; means connecting said dust conducting cavity portion with the fan of said motor-fan unit; a pair of pivots of which one is located in said side cavity portion; a pair of support arms carried by said pivots and having at least one arm extending along said side cavity portion and into said nozzle cavity portion; a rotary dust-brush located in said nozzle cavity portion adjacent to said mouth opening and rotatably supported by the free ends of said support arms; bumpers carried adjacent to the forward end of said side cavity portion, said bumpers being engaged by one of said arms; and means for driving said brush from the motor of said motor-fan unit.

2. A vacuum cleaner, comprising, a cavitied upper casing shell; a cavitied lower casing shell secured to said upper casing shell, said lower casing shell being provided in its lower portion with a suction-mouth opening, and each of said shells being provided with a front wall, spaced outer

side walls, an inner wall and partition walls, the latter being located adjacent to said outer side walls, said front walls and portions of said inner walls defining a nozzle cavity portion, said outer side walls and said partition walls defining side cavity portions, the forward ends of said side cavity portions being in communication with the nozzle cavity portion, said partition walls and portions of said inner walls defining dust conducting cavity portions of which the forward ends are in communication with said nozzle cavity portion; a dual-fan motor-fan unit supported by said casing shells; means connecting each of said dust conducting cavity portions with one of the fans of said motor-fan unit; a pair of pivots located in said side cavity portions; a pair of support arms carried by said pivots and having arms extending along said side cavity portions and into said nozzle cavity portion; a rotary dust-brush located in said nozzle cavity portion adjacent to said mouth opening and rotatably supported by the free ends of said support arms; bumpers carried adjacent to the forward ends of each of said side cavity portions, said bumpers being engaged by said arms; and means for driving said brush from the motor of said motor-fan unit.

3. A vacuum cleaner, comprising, a cavitied upper casing shell; a cavitied lower casing shell secured to said upper casing shell, said lower casing shell being provided in its lower portion with a suction-mouth opening, and each of said shells being provided with a front wall, spaced outer side walls, a U-shaped inner wall and partition walls, the latter extending substantially parallel to and inside of said outer side walls, said front walls and portions of said inner walls defining a nozzle cavity portion extending along the front of the vacuum cleaner, said outer side walls and said partition walls defining side cavity portions extending along the side of the vacuum cleaner, the forward ends of said side cavity portions being in communication with the nozzle cavity portion, said partition walls and portions of said inner walls parallel thereto defining dust conducting cavity portions of which the forward ends are in communication with said nozzle cavity portion; a dual-fan motor-fan unit supported by said casing shells; means connecting each of said dust conducting cavity portions with one of the fans of said motor-fan unit; a pair of pivots located in said side cavity portions; a pair of support arms carried by said pivots and having arms extending along said side cavity portions and into said nozzle cavity portion; a rotary dust-brush located in said nozzle cavity portion adjacent to said mouth opening and rotatably supported by the free ends of said support arms; resilient bumpers carried adjacent to the forward ends of each of said side cavity portions, said bumpers being engaged by said arms; and means for driving said brush from the motor of said motor-fan unit.

4. A vacuum cleaner, comprising, a cavitied upper casing shell; a cavitied lower casing shell secured to said upper casing shell, said lower casing shell being provided in its lower portion with a suction-mouth opening, and each of said shells being provided with a front wall, spaced outer side walls, an inner wall and partition walls, the latter being located adjacent to said outer side walls, said front walls and portions of said inner walls defining a nozzle cavity portion, said outer side walls and said partition walls defining side cavity portions, the forward ends of said side

cavity portions being in communication with the nozzle cavity portion, said partition walls and portions of said inner walls defining dust conducting cavity portions of which the forward ends are in communication with said nozzle cavity portion; a dual-fan motor-fan unit supported by said casing shells; means connecting each of said dust conducting cavity portions with one of the fans of said motor-fan unit; a pair of pivots carried by said upper casing shell, one being located in each of said side cavity portions; a pair of support arms of which the ends are carried by said pivots and arms of which the free ends extend along said side cavity portions and into said nozzle cavity portion; a rotary dust-brush located in said nozzle cavity portion adjacent to said mouth opening and rotatably supported by the free ends of said support arms; a pair of resilient bumpers carried in the forward ends of each of said side cavity portions, in each case one of said bumpers being below said support arm and the other of said bumpers being above said support arm; and means for driving said brush from the motor of said motor-fan unit.

5. A vacuum cleaner, comprising, a cavitied upper casing shell; a cavitied lower casing shell secured to said upper casing shell, said lower casing shell being provided in its lower portion with a suction-mouth opening, and each of said shells being provided with a front wall, spaced outer side walls, a U-shaped inner wall and partition walls, the latter extending substantially parallel to and inside of said outer side walls, said front walls and portions of said inner walls defining a nozzle cavity portion extending along the front of the vacuum cleaner, said outer side walls and said partition walls defining side cavity portions extending along the sides of said vacuum cleaner, the forward ends of said side cavity portions being in communication with opposite ends of the nozzle cavity portion, said partition walls and portions of said inner walls parallel thereto defining dust conducting cavity portions of which the forward ends are in communication with opposite ends of said nozzle cavity portion; a dual-fan motor-fan unit supported by said casing shells; means connecting each of said dust conducting cavity portions with one of the fans of said motor-fan unit; a pair of pivots carried by said upper casing shell, one being located in each of said side cavity portions; a pair of support arms of which the ends are carried by said pivots and arms of which the free ends extend along said side cavity portions and into said nozzle cavity portion; a rotary dust-brush located in said nozzle cavity portion adjacent to said mouth opening and rotatably supported by the free ends of said support arms; a pair of resilient bumpers carried in the forward ends of each of said side cavity portions, in each case one of said bumpers being below said support arm and the other of said bumpers being above said support arm; and means for driving said brush from the motor of said motor-fan unit.

WILFRED O. LANGILLE.

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