March 4, 1947. H. B. WHITE 2,416,786

SUCTION CLEANER

Filed May 12, 1943 2 Sheets-Sheet 1

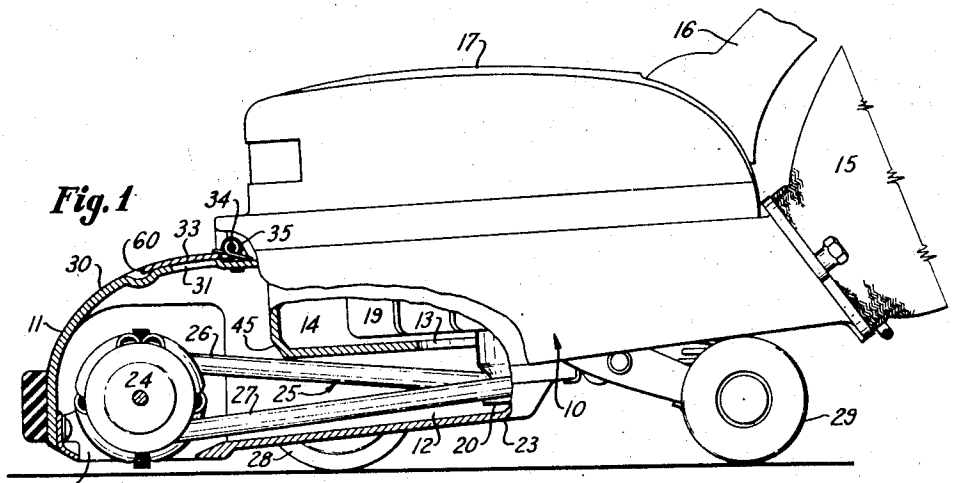

Fig. 1

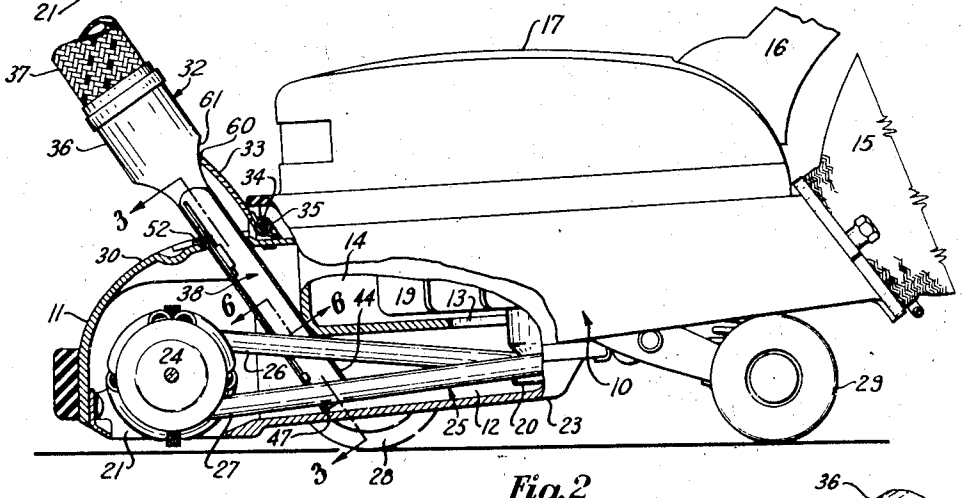

Fig. 2

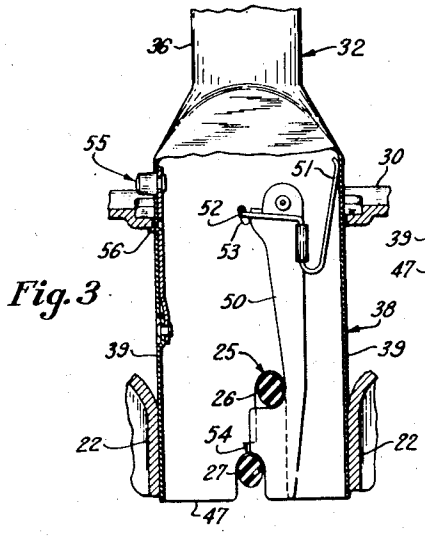

Fig. 3

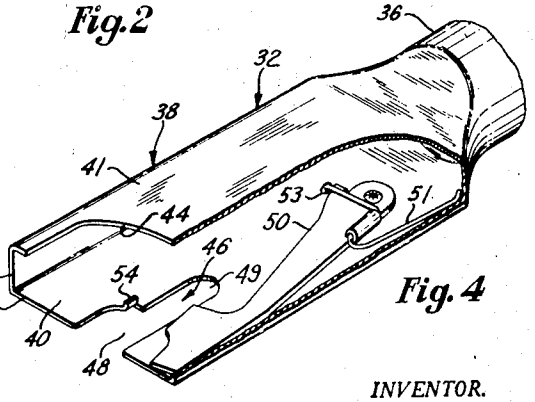

Fig. 4

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SUCTION CLEANER

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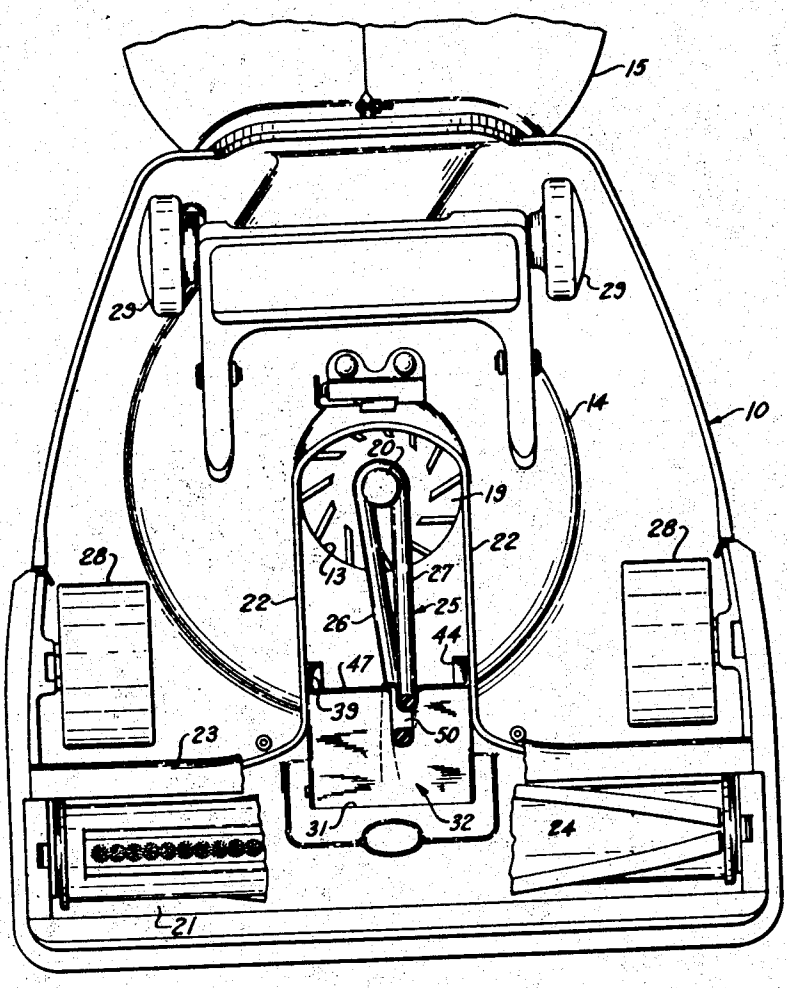

Fig. 5

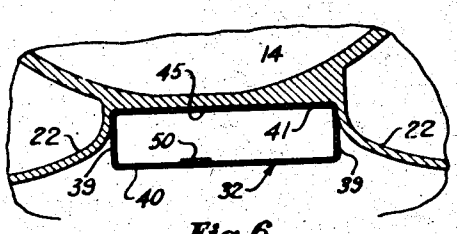

Fig. 6

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SUCTION CLEANER

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The present invention relates to suction cleaners generally and more particularly to a new and improved dusting tool converter and its connection to the suction cleaner for converting the cleaner from an on-the-floor unit to an off-the-floor unit.

An object of the invention is to provide a new and improved suction cleaner. Another object is to provide a new and improved dusting tool converter for off-the-floor cleaning. A further object is to provide a dusting tool converter with valve means for enclosing the power transmitting means in the cleaner suction air passageway. Another object is to provide a dusting tool converter with valve means actuated by connection with the cleaner body to seal the cleaner nozzle from the suction creating means. Other objects and advantages of the invention will be apparent from the following specification and drawings, wherein:

Figure 1 is a side elevation of the suction cleaner with parts broken away;

Figure 2 is a side elevation of the suction cleaner shown in Figure 1, but with the dusting tool converter in position for off-the-floor cleaning;

Figure 3 is a section along the line 3—3 of Figure 2 of the dusting tool converter;

Figure 4 is a perspective view of the converter with parts broken away to show the valve in its normal inoperative open position;

Figure 5 is a bottom plan view of Figure 2 with parts broken away, and

Figure 6 is a section along the line 6—6 of Figure 2.

The embodiment of the invention herein disclosed comprises a suction cleaner having a body 10 provided with a nozzle 11 interiorly connected through a suction air passageway 12 with the eye 13 of a fan chamber 14 from which rearwardly extends an unshown exhaust passageway for conveying dirt-laden air into a dirt-filtering bag 15 removably attached at its lower end to the cleaner body 10 and at its upper end supported from a handle 16 pivotally mounted on the body. A housing 17 encloses an unshown motor positioned on the cleaner body above the fan chamber 14 and its shaft extends downwardly through the chamber 14 where it carries a fan 19 which is provided at its lower end with a pulley 20 in the suction air passageway 12. The suction air passageway 12 extends from the nozzle mouth 21 to the fan eye 13 and is formed by a wall 22 depending from the cleaner body and a removable bottom plate 23. An agitator 24 is rotatably mounted in the nozzle 11 and is driven by a power transmitting belt 25 connected to the pulley 20. The power transmitting belt 25 is in the suction air passageway 12 and is provided with upper and lower strands 26 and 27, respectively. The cleaner body is movably supported on front wheels 28 and spring mounted rear wheels 29, the latter being provided with suitable unshown means for raising the agitator 24 out of engagement with the surface covering when the cleaner is used for off-the-floor cleaning.

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The top wall 30 of the nozzle 11 is formed with a converter receiving opening or port 31 which is adapted to receive and seat the elongated end of a dusting tool converter element 32. The converter opening 31 is normally closed by a cover plate 33 pivotally mounted at 34 on the cleaner body 10 and is pressed to closed position by a spring 35.

The converter element 32 which converts the cleaner for off-the-floor cleaning comprises a hollow body having at one end a tubular portion 36 to which is removably connected a flexible hose 37 provided at its opposite end with a suitable unshown cleaning tool for engagement with the surfaces to be cleaned. Adjacent the tubular portion 36 of the converter body is a hollow rectangular portion 38 formed with opposed side walls 39, 39, a front wall 40 and a rear wall 41. The rear wall 41 is provided with a marginal cut-away section defining an opening 44 substantially the width of the suction air passageway 12 and the length of the distance between the forward end 45 of the fan chamber 14 to the bottom plate 23, so that when the converter is inserted in the cleaner body the opening 44 will connect the converter 32 with the suction air passageway 12. The front wall 40 is provided with a slot 46 extending from the lower marginal edge 47 of the front wall and the slot 46 is relatively wide at its lower end 48 and of less width at 49, the slot portions 48 and 49, respectively, being adapted to receive the belt strands 27 and 26 when the converter is inserted in the suction air passageway 12.

A valve 50 is pivotally mounted on the converter front wall 40 at the upper end thereof and is contoured at its lower end to span the space in the slot 46 between the belt strands 26 and 27 and to close off the suction air passageway therebetween. The valve 50 is normally urged to open position by a spring 51 and has one end 52 projecting through an elongated opening 53 in the converter front wall 40 for engagement with the outer surface of the nozzle top wall 30 when the converter is properly seated to thereby move the valve 50 to its closed position, in which position

the valve 50 abuts a lip 54 on the converter front wall 40. In order to seat the converter element 32 in the suction air passageway 12, a hand-operated latch 55 is mounted on one of the converter side walls 39 and is provided with a lip 56 which engages the inner surface of the nozzle top wall 30 to hold the converter in proper position.

In normal on-the-floor cleaning, the cleaner body is moved over the surface being cleaned by the handle 16 and the rotating agitator 24 dislodges the dirt from the surface covering. The suction creating fan 19 draws the air and dirt through the nozzle mouth 21 and suction air passageway 12 and discharges the dirt-laden air into the dirt bag 15.

For off-the-floor cleaning the agitator 24 is raised out of engagement with the surface covering by the unshown nozzle adjusting means and the cover plate 33 is raised to expose the converter port 31. The converter element 32 is inserted through the port 31 and is of such size as to extend downwardly and rearwardly into sealing relation with the side walls 22, 22 of the air passageway 12, and the lower marginal edge 47 of the converter seats against the bottom plate 23. The marginal edge 60 of the cover plate 33 is urged by the spring 35 into engagement with the arcuate portion 61 of the converter rear wall 41 to guide the converter to its downwardly rearwardly inclined position, and the converter rear wall 41 contacts the flat forward edge 45 of the fan chamber 14. The converter is retained in proper position by the latch 55 engaging the inner surface of the nozzle top wall 30.

When the converter is inserted into the suction air passageway 12, the belt strands enter the slot 46 and when the projection 52 on the spring 51 contacts the outer surface of the nozzle top wall 30, the valve 50 is shifted to closed position whereby the valve closes the slot 46 and encloses the belt strands 26 and 27 and the space therebetween. In this position of the converter, the nozzle mouth 21 is cut off from communication with the fan chamber 14 and the dirt-laden air is drawn through the unshown dusting tool nozzle, hose 37 and converter 32 and that part of the suction passageway 12 between the converter and the fan chamber, and the dirt-laden air is discharged by the fan 19 into the dirt bag 15.

The foregoing conversion to off-the-floor cleaning can be made, if desired, while the agitator 24 and belt 25 are moving, and these parts remain in operation while the converter element is in use. In order to re-convert to off-the-floor cleaning the latch 55 is depressed and the converter removed. Upon removing the converter element, the valve spring 51 functions to shift the valve 50 to open position whereby the latter clears the belt strands.

I claim:

1. In a suction cleaner, a cleaner body having a nozzle, suction creating means, a suction air passageway therebetween, a port in said body opening into said suction air passageway for receiving a converter element, an agitator movably mounted in said nozzle, power transmitting means in said air passageway for moving said agitator, a converter element insertable through said port into said air passageway between said nozzle and said suction creating means, a slot in said converter spanning said power transmitting means, a valve on said converter for closing said slot in said converter and enclosing said power transmitting means when said converter is in position, and means on said valve engageable with the cleaner body to coact with the latter for moving said valve to slot closing position during said insertion of said converter into said suction air passageway to thereby seal said nozzle from said suction creating means.

2. In a suction cleaner, a cleaner body having a nozzle, suction creating means, a suction air passageway therebetween, a port in said body opening into said suction air passageway for receiving a converter element, an agitator movably mounted in said nozzle, a belt in said air passageway for moving said agitator, a converter element insertable through said port into said air passageway between said nozzle and said suction creating means, a slot in said converter spanning said belt, a valve on said converter element for closing said slot and the space between the belt strands of said belt, and means on said valve engageable with the cleaner body to coact with the latter for moving said valve to slot closing position during said insertion of said converter into said suction air passageway to thereby seal said nozzle from said suction creating means.

3. A dusting tool converter for suction cleaners having a nozzle provided with an agitator, suction creating means, a suction air passageway therebetween, power transmitting means in the air passageway for moving the agitator, and a port opening to the air passageway, comprising a conduit adapted to be inserted through said port into said passageway between the nozzle and suction creating means, said conduit having a slot to accommodate the power transmitting means, a valve on said conduit movable to close said slot about said power transmitting means, and means on said valve engageable with the cleaner body for moving said valve to slot closing position upon inserting said converter into the suction air passageway to seal said nozzle from the suction creating means.

4. A dusting tool converter for suction cleaners of the type having a nozzle provided with an agitator, suction creating means, an air passageway between the nozzle and suction creating means, a motor, a belt in the air passageway connected to the motor and agitator to drive the latter, and a port opening to the air passageway, comprising: a conduit adapted to be inserted in a rectilinear direction through the port into the air passageway between the nozzle and suction creating means, said conduit having an opening in one wall and a slot in an oppositely disposed wall through which the belt passes, said opening accommodating the belt and at all times communicating with the suction creating means, said slot receiving the belt, a valve movably mounted on said conduit to close said slot about the belt, and means on said valve engageable with the cleaner body to coact therewith during said rectilinear movement of said conduit for moving said valve to said slot closing position to seal the nozzle from the suction creating means.

5. In a suction cleaner, a cleaner body having a nozzle, suction creating means, a suction air passageway therebetween, a port in said body opening into said suction air passageway for receiving a converter element, an agitator movably mounted in said nozzle, power transmitting means in said air passageway for moving said agitator, a converter element insertable in a rectilinear direction through said port into said air passageway between said nozzle and said suction creating means, a slot in said converter spanning said power transmitting means, a valve mov-

ably mounted on said converter element for enclosing said power transmitting means, and valve actuating means on said converter engageable with the cleaner body, said actuating means being operated by said engagement with the cleaner body to move said valve to enclose said power transmitting means and seal said nozzle from said suction creating means during said rectilinear movement of said converter into said air passageway.

6. A dusting tool converter for suction cleaners having a nozzle provided with an agitator, suction creating means, a suction air passageway therebetween, power transmitting means in the air passageway for moving the agitator, and a port opening to the air passageway, comprising a conduit adapted to be inserted in a rectilinear direction through said port into said passageway between the nozzle and suction creating means, said conduit having a slot to accommodate the power transmitting means, a valve on said conduit movable to close said slot about said power transmitting means, and means connected to said valve engageable with the cleaner body during said rectilinear movement of said conduit to effect movement of said valve to said slot closing position.

7. In a suction cleaner, a cleaner body having a nozzle, suction creating means, a suction air passageway therebetween, a port in said body opening into said suction air passageway for

receiving a converter element, an agitator movably mounted in said nozzle, power transmitting means in said air passageway for moving said agitator, a converter element insertable through said port into said air passageway between said nozzle and said suction creating means, a slot in said converter spanning said power transmitting means, and valve means on said converter for closing said slot in said converter and enclosing said power transmitting means when said converter is in position in said passageway, said valve means including means engageable with the cleaner body and operative in response to such engagement to move said valve means to slot closing position during said insertion of said converter into said suction air passageway to thereby seal said nozzle from said suction creating means.

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