July 1, 1952 N. C. CUDDEBACK 2,601,696

CONVERTER ATTACHMENT FOR SUCTION CLEANERS

Filed Sept. 2, 1949 2 SHEETS—SHEET 1

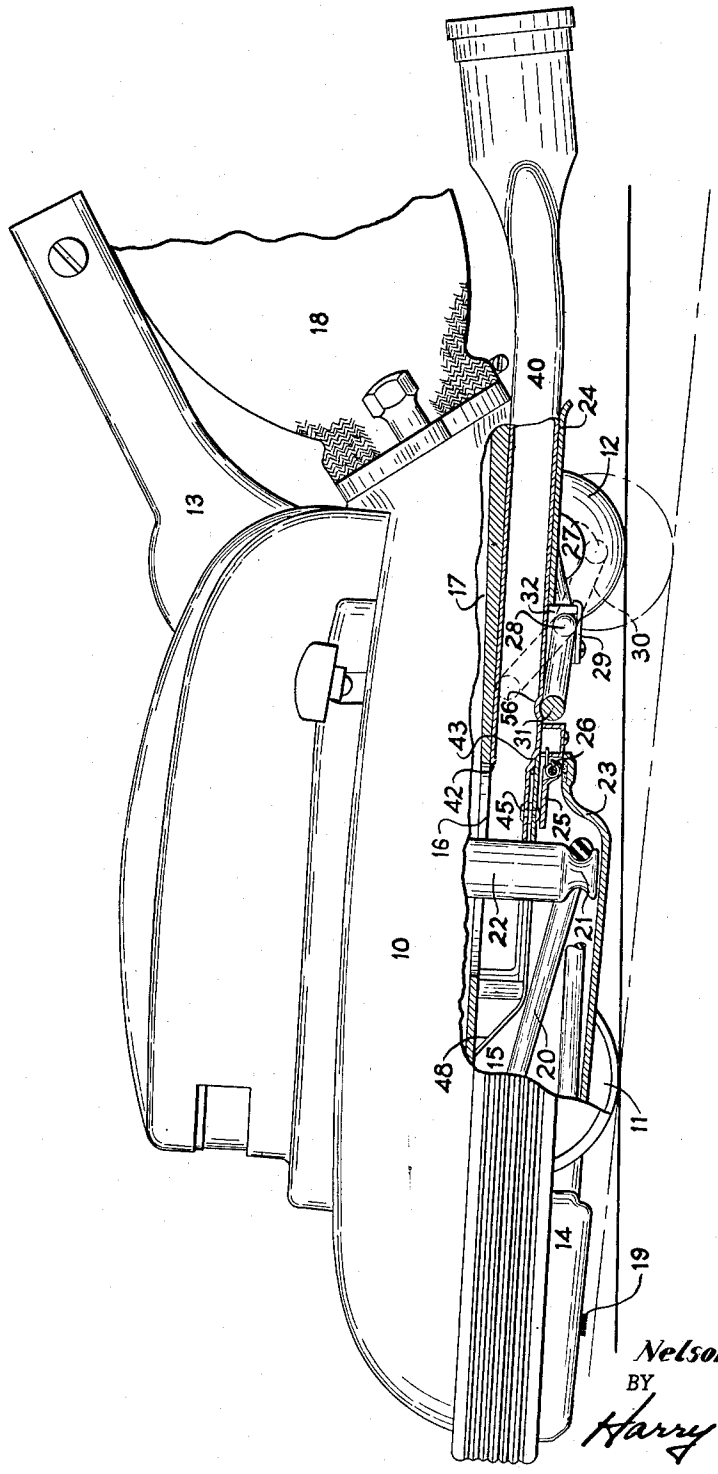

Fig. 1

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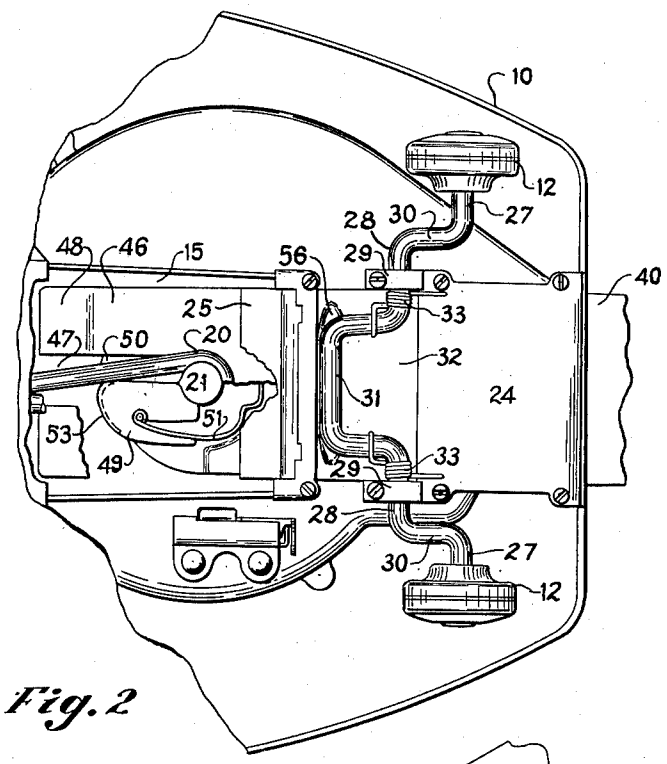

Fig. 2

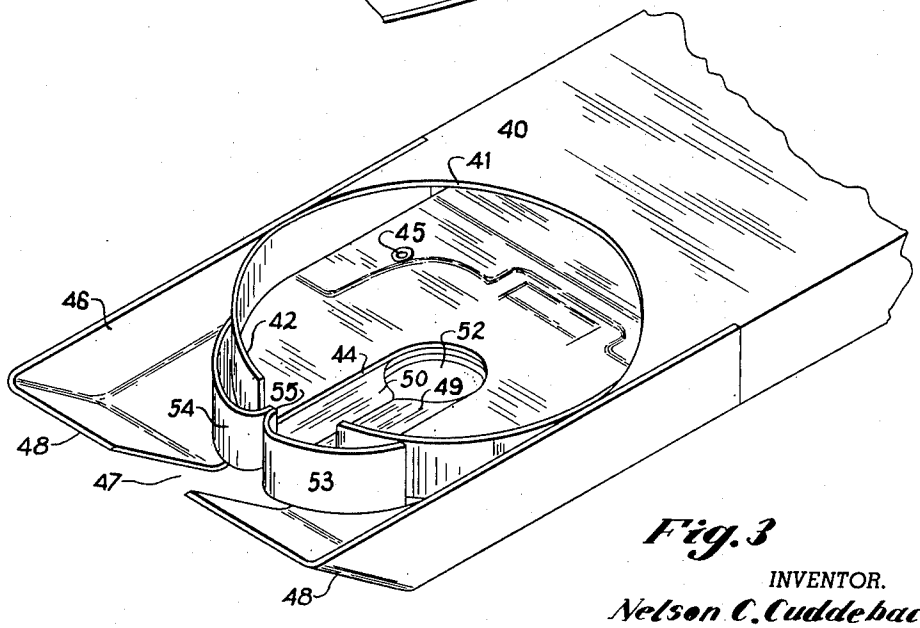

Fig. 3

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CONVERTER ATTACHMENT FOR SUCTION CLEANERS

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10 Claims. (Cl. 15—333)

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This invention relates to suction cleaners and more particularly to one which may be readily converted to off-the-floor cleaning operations by the insertion of a converter tube, attached to a cleaning tool by means of a flexible hose, into a converter passageway leading to the suction eye of the fan.

Specifically, according to this invention, a converter passage is provided beneath the exhaust passage and extends rearwardly from the fan eye between the rear supporting wheels of the cleaner. The converter passageway is positioned above the belt and pulley which drive the agitator from the fan shaft and the converter tube is so formed as to straddle the pulley shaft above the pulley and belt lengthwise of the belt from the pulley end thereof.

The converter passageway is normally closed off from the fan eye by a converter valve positioned immediately to the rear of the fan eye and is normally obstructed by a portion of the shaft which carries the rear wheels. The converter is so made that its insertion into the converter passageway will both raise the rear wheels and open the converter valve. Alternatively, the rear of the cleaner may be depressed to raise the wheels and remove the barrier from the converter passageway whereby the converter may be freely inserted. The rear wheels are normally spring-biased downwardly and after the converter tube is inserted the barrier locks the converter in place whereby the cleaner may be propelled rearwardly by pulling on the dusting tool hose.

The converter tube is also formed with a slot for receiving the pulley shaft and with a sort of clam shell valve arrangement which engages with the pulley shaft as the converter is inserted to automatically move the two parts apart and when the converter is completely inserted the two parts close about the pulley shaft to completely seal the fan eye from the suction passageway and estabish suction communication between the fan eye and the dusting tool hose.

Other objects and advantages of this invention will become apparent as the description proceeds when taken in connection with the accompanying drawings in which:

Figure 1 is a plan view of a suction cleaner partly broken away to show the converter in place;

Figure 2 is a bottom view of the cleaner of Fig. 1 with the bottom plate removed and the end of the converter tube broken away to show how the valve elements fit about the pulley shaft; and

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Figure 3 is a perspective view of the valved end of the converter tube.

Referring to the drawings, the reference numeral 10 represents the body of a suction cleaner of conventional form except for the manner in which the converter passageway is positioned relative to the fan eye.

The body 10 is mounted for ambulatory movement by front wheels 11 and rear wheels 12. A propelling handle 13 is shown in Fig. 1 in the midposition of rest at about 45° to the horizontal.

In normal operation a motor driven fan (not shown) draws dirt-laden air into the nozzle 14, through a suction passageway 15, into a fan eye 16 and discharges it through an exhaust passageway 17 into a filter bag 18.

A surface contacting agitator 19 of usual construction is rotatably mounted in the nozzle 14 and is driven by a belt 20 extending over a pulley 21 formed on the lower end of a shaft 22 extending downwardly from the fan. A bottom plate 23 closes off the bottom side of the suction passageway 15 and is removable to provide easy access to the belt 20.

A converter passageway 24 extends rearwardly from the fan eye 16 below the exhaust passageway 17 and between the rear wheels 12. The converter passageway 24 is normally closed by a valve 25 which is spring-biased to closed position by a spring 26.

The rear wheels 12 are rotatably mounted on spindles 27 formed on the ends of a frame or shaft 28 pivotally secured to the bottom of the body 10 by clamping brackets 29. The spindles 27 are offset from the pivotal axis of the shaft 28 by crank arms 30. Centrally of the shaft 28 is a U-shaped crank arm 31 extending at an angle to the crank arms 30 on the opposite side of the pivotal axis of the shaft 28. The bottom wall of the converter passageway 24 is cut away at 32 to provide for the passage of crank arm 31 into the converter passageway 24 whereby the crank arm 31 normally forms a barrier across the converter passageway 24.

Springs 33 normally bias the shaft 28 so as to hold the crank arm 31 against the top wall of the converter passageway 24 and the rear wheels downwardly as shown in dot-dash lines of Fig. 1. The parts are so formed that in the dot-dash line position the nozzle 14 is positioned at the proper distance from the floor for maximum cleaning effectiveness.

The converter element is somewhat like that shown in Figs. 5 to 8, inclusive, of the patent to White 2,450,846 and comprises a converter tube

40 for attachment to one end of a dusting tool hose and shaped for insertion into the converter passageway 24. Near its forward end the top wall of the tube 40 is cut away at 41 in the form of a semi-circle of the same radius as the fan eye 26 and the side walls are bent inwardly at 42 to substantially complete the circle except for a central slot for receiving the shaft 22 as will presently appear.

The bottom wall of the tube 40 is bent upward slightly at 43 (Fig. 1) and slotted at 44. Secured to the bottom wall of the tube 40 by rivets 45 is an end piece 46 slotted at 47 and having upwardly inclined ends 48 for engagement with the crank arm 31. The end piece 46 is spaced from the bottom wall of the tube 40 to receive a pair of clam shell valve elements 49 and 50 pivoted at their rear outer corners by the rivets 45. The valve elements 49 and 50 are biased against each other by spring 51 (Fig. 2) to normally close the slots 44 and 47 except for the circular opening 52 of slightly larger diameter than the shaft 22. The valve elements 49 and 50 are provided with upturned ends 53 and 54 bent rearwardly as shown at 55. The bottom wall of the tube 40 is indented at 56 to cooperate with the crank arm 31 for a purpose which will presently appear.

Operation

With the parts in the dot-dash line position of Fig. 1 the converter tube 40 may be inserted into the converter opening 24 in either of two ways. Pressure may be applied to the rear of the body 10 by means of the handle 13 or otherwise to remove the crank arm 31 from the passageway 24 and the tube 40 simultaneously inserted into the passage 24 or the tube may be inserted into the passageway without depressing the rear of the cleaner. In the latter case the cam surfaces 48 will engage the crank arm 31 and cam it downwardly out of the passageway 24 against the bias of springs 33. In either event the shaft 26 will be pivoted counterclockwise so as to raise the rear wheels 12 relative to the body 10 and permit the body to pivot about the front wheels 11 and raise the nozzle 14 to such an extent that the surface covering will not be drawn upwardly against the nozzle. It is to be noted that in either case the converter tube 40 cannot be inserted until the nozzle is raised.

As the tube 40 is slid into passageway 24 the ends 48 will engage the valve 25 and move it to the position shown in Fig. 1 and the shaft 22 will engage the rearward turned ends 55 of the valve elements 49 and 50 and cam them outwardly against the bias of the spring 51 until the opening 52 is in alignment with the shaft 22 at which time the elements 49 and 50 will return to the position shown in Fig. 3 and close off the fan eye 16 from the suction passageway 15 except for the slight clearance between the shaft 22 and the opening 52.

Simultaneously the crank arm 31 will snap into the recess 56 under the bias of springs 33 and lock the converter tube 40 in place whereby the cleaner may be pulled about by pulling on the dusting tool hose.

To remove the converter tube 40 a sharp pull may be applied thereto to remove the crank arm 31 from the recess 56 or pressure may be simultaneously applied to the rear of the body 10 to remove the crank arm 31 from the recess 56. In any event shaft 22 will engage the arcuate recesses in the valve elements 49 and 50 and bias them outwardly during the removal of the converter tube 40.

The positioning of the converter opening between the rear wheels beneath the exhaust passageway has a number of advantages. In propelling the cleaner by pulling on a dusting tool hose the pull is applied at a low point on the cleaner whereby the cleaner is not liable to be tipped over. Additionally, the converter occupies a space not ordinarily utilized and the converter opening is normally out of sight so that no closure is necessary. Furthermore, the converter passageway by being located between the rear wheels is in a convenient location for utilizing the converter for raising the rear wheels and thus raising the nozzle for conversion cleaning and also for utilizing the converter when in inserted position for locking the rear wheels in their normal raising position. The converter is also located in a convenient position for utilizing the rear wheel nozzle adjustment for locking the converter in place whereby the cleaner may be moved about by merely pulling on the dusting tool hose.

While I have shown and described but a single embodiment of my invention it is to be understood that this embodiment is to be taken as illustrative only and not in a limiting sense. I do not wish to be limited to the particular structure shown and described but to include all equivalent variations thereof except as limited by the scope of the claims.

I claim:

1. A suction cleaner comprising; a body including a suction nozzle; front and rear supporting means for mounting said body for ambulatory movement over a surface to be cleaned with said nozzle positioned above the surface whereby the surface covering will be drawn upwardly against said nozzle during normal cleaning; a fan chamber including a fan eye formed in said body; said body having a suction passageway extending between said nozzle and fan eye, an exhaust passageway extending from said fan chamber to the rear of said body and a converter passageway beneath said exhaust passageway and extending from said fan eye to the rear of said body; said rear supporting means comprising a frame pivoted between its ends to the underside of said body on opposite sides of said converter passageway, spaced wheels carried by the rear end of said frame on opposite sides of said converter passageway and a barrier carried by the front end of said frame; said frame being biased to normally maintain said wheels downwardly relative to said body and said barrier extending transversely across said converter passageway and being movable to raise said wheels relative to said body to permit said body to pivot about said front supporting means to raise said nozzle above the surface being cleaned and simultaneously remove said barrier from said converter passageway.

2. A suction cleaner according to claim 1 including a converter tube insertable into said converter passageway having means thereon to engage said barrier and pivot said frame to move said wheels upwardly relative to said body.

3. A suction cleaner according to claim 1 including a converter tube insertable into said converter passageway having means thereon to engage said barrier to pivot said frame and remove said barrier from said converter passageway and raise said wheels upwardly relative to

said body, said converter tube and said barrier cooperating with each other to lock said converter tube in place and to lock said wheels in their raised position.

4. A suction cleaner comprising; a body formed with a nozzle at its front end, with a central fan chamber including a fan eye, with a suction passageway extending between said fan eye and nozzle, with an exhaust passageway extending from said fan chamber to the rear of said body and with a converter passageway below said exhaust passageway and extending between said fan eye and the rear of said body; supporting means for mounting said body for ambulatory movement over a surface to be cleaned; said supporting means including a pair of wheels positioned on opposite sides of said converter passageway at the rear of said body and pivotal means for securing said wheels to said body including a barrier on the opposite side of the pivot for said pivotal means than said rear wheels; said pivotal means normally maintaining said wheels in downward position relative to said body and said barrier in obstructing relationship to said converter passageway and being movable to raise said wheels relative to said body and simultaneously move said barrier out of obstructing relationship to said converter passageway.

5. A suction cleaner according to claim 4 including a converter tube insertable into said converter passageway and having means thereon to engage said barrier and move said pivotal means to move said wheels upwardly relative to said body.

6. A suction cleaner according to claim 5 in which the lower wall of said converter passageway is cut away forwardly of said pivotal means and through which said barrier extends when in obstructing relationship to said converter passageway whereby upon insertion of said converter tube the barrier and tube will coact with each other to lock said wheels in their raised position.

7. A suction cleaner comprising; a body formed with a front nozzle, with a central fan chamber including a fan eye communicating with said nozzle and with a converter passageway extending from said fan eye to the rear of said body; supporting means for mounting said body for ambulatory movement; said supporting means including a frame pivoted to the rear of said body and carrying a pair of wheels on opposite sides of said converter passageway and means on said frame on the opposite side of the pivot for said frame from said wheels for obstructing said converter passageway until said wheels are raised upwardly relative to said body to raise said nozzle from a surface being cleaned.

8. A suction cleaner according to claim 7 including a converter tube insertable into said converter passageway having means thereon for engaging said obstructing means to remove it from obstructing relationship to said converter passageway and simultaneously raise said wheels relative to said body.

9. A suction cleaner comprising; a body formed with a nozzle at its front end, with a central fan chamber including a fan eye, with a suction passage extending between said fan eye and nozzle, with an exhaust passage extending from said fan chamber to the rear of said body and with a converter passage beneath said exhaust passage and extending between said fan eye and the rear of said body; supporting means for mounting said body for ambulatory movement over a surface to be cleaned; said supporting means including a pair of wheels on opposite sides of said converter passage; means for attaching said wheels to said body for vertical movement relative thereto to position said nozzle at an optimum height above said surface for optimum cleaning effectiveness or at a height above said optimum; and barrier means normally obstructing the insertion of a converter tool into said converter passage; said attaching means being connected to said barrier means and operable thereby so that when said nozzle is at said optimum height said barrier means is in obstructing relation to said converter passage and said barrier means being so associated with said attaching means and converter passage in such manner that insertion of a converter tool into said converter passage will lock said attaching means in a position to hold said nozzle above said optimum height.

10. A suction cleaner comprising; a body formed with a front nozzle, with a central fan chamber including a fan eye communicating with said nozzle and with a converter passage extending from said fan eye to the rear of said body; supporting means for mounting said body for ambulatory movement; said supporting means including a rock shaft pivoted to said body beneath said converter passage adjacent the rear end thereof, crank arms normally extending backwardly and rearwardly from the pivot points of said shaft on opposite sides of said converter passage and having rear wheels journaled to their rear ends, and a U-shaped portion normally extending forwardly and upwardly from the pivot points of said shaft through an opening in the bottom wall of said converter passage; and a converter tool insertable into said converter passage and engageable with said U-shaped portion to move it downwardly out of said passage to cause said rear wheels to be moved upwardly toward said body.

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