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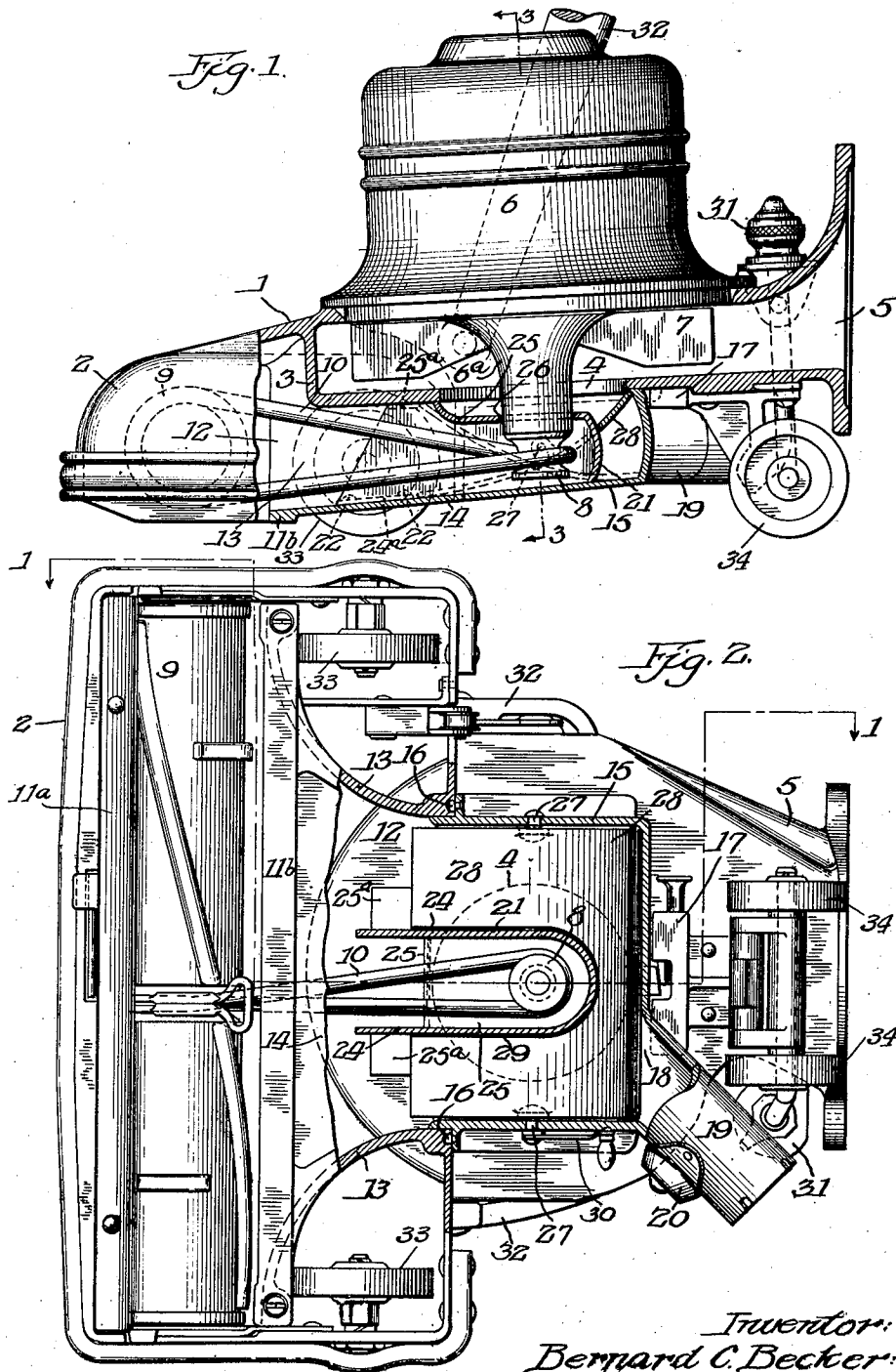
B. C. BECKER

2,053,316

SUCTION CLEANER

Original Filed Feb. 6, 1931

2 Sheets-Sheet 1



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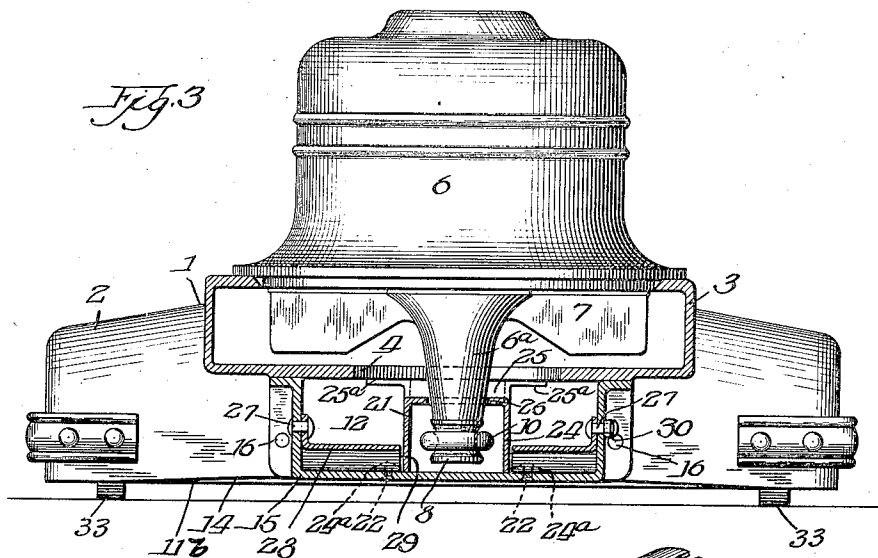
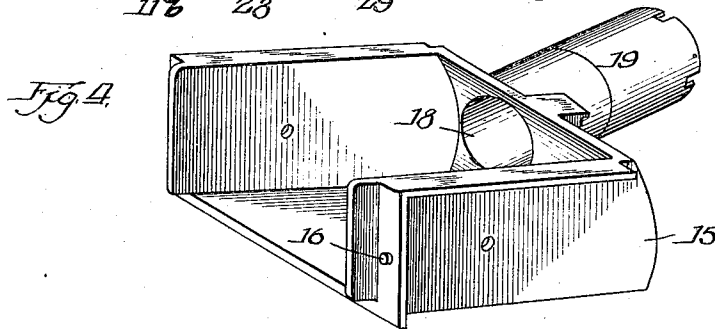
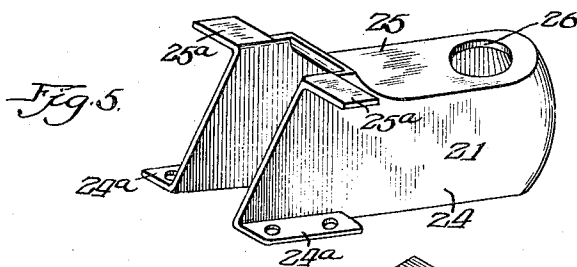
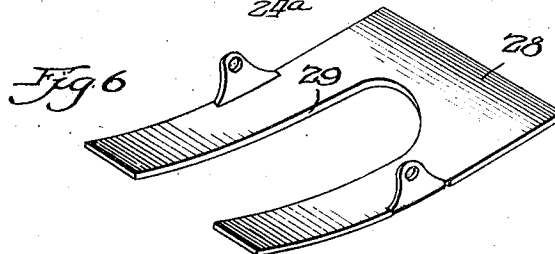
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2,053,316

SUCTION CLEANER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SUCTION CLEANER

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8 Claims. (Cl. 15—9)

The present invention relates to suction cleaners in general and particularly to improvements to be embodied in a suction cleaner which makes easier the physical alterations necessary to change the cleaner functionally from a unit adapted for "on the floor" cleaning to a unit adapted for "off the floor" cleaning. The invention comprises specifically a new and novel permanently attached convertor member in a suction cleaner.

The modern day suction cleaner adapted to remove foreign matter from a surface covering is, if properly constructed for the function it is to perform, rather too heavy for the user to make use of as a hand tool. Likewise the agitating element which is provided within the nozzle of the modern suction cleaner, while of great effectiveness when used upon a rug or carpet, is not needed in the cleaning of articles such as drapes and curtains which are positioned above the floor. It is extremely desirable, therefore, to provide what is known as dusting tools for use with a suction cleaner which comprise means which may be attached to the machine to make use of the suction created thereby and which may be easily moved about by the operator. Such dusting tools usually consist of an elongated flexible hose member which is provided with a nozzle at one end and with a connecting member at the other which is adapted to be secured to the suction cleaner. In the usual suction cleaner of the agitating type it is necessary, in attaching the dusting tool hose to the cleaner, to remove a certain member from the eye of the fan chamber, where it forms a continuation of the air passage between the nozzle mouth and said chamber, and to replace that member with a new member carried at the end of the dusting tool hose. This operation successfully converts the cleaner from a cleaner adapted for "on the floor" cleaning to a machine adapted to create suction for use with dusting tools in "off the floor" cleaning but, through involving the disconnecting of one member and the attaching of another, involves a certain amount of manual labor. It is towards an improved construction in which the effort necessary to convert the cleaner from one type of cleaning unit to the other is materially decreased that the present invention is directed.

In the drawings in which a preferred embodiment of the present invention is disclosed and in which the same reference characters refer to the same parts throughout:

Fig. 1 is a side view of a suction cleaner embody-

ing the present invention with certain parts shown in section upon the line 1—1 of Fig. 2.

Fig. 2 is a bottom view of a cleaner shown in Fig. 1 with certain parts broken away and shown in section.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a view of a detail.

Fig. 5 is a detailed view of the pulley housing.

Fig. 6 is a view in perspective of the convertor valve embodied in the present invention.

Referring now to the drawings in general, a suction cleaner is disclosed which comprises a main casing 1 which is so constructed as to include a nozzle 2, a fan chamber 3 having an inlet 4, and an exhaust outlet 5. Mounted upon the main casing 1 immediately over the fan chamber 3 is a motor casing 6 which encloses a suitable driving motor for the cleaner which is not shown but the shaft 6a of which projects through the fan chamber 3, where it carries the suction-creating fan 7, and on through the inlet 4 below which a suitable driving pulley 8 is carried which is adapted to convey by means of the belt 10, a rotating torque to the agitator 9 rotatably mounted within the nozzle 2. Formed in the casing 1 and extending from the nozzle mouth, which is defined by the front and rear nozzle lips 11a and 11b, is an air passageway which is indicated generally by the reference character 12 and which is defined at its top by the top of the nozzle 2 and further along by the fan chamber 3; at its side by the downwardly and rearwardly extending walls 13, 13 which are formed integrally with the main casing 1; and at its bottom by the removable bottom plate 14 which extends rearwardly to the forward edge of the eye 4 of the fan chamber.

In the usual suction cleaner an ordinary detachable housing or well member serves to complete the air passageway from the nozzle mouth to the eye 4 of the fan chamber and is usually a detachable open-topped shell, the open forward side of which coincides with the dimensions of the air passageway as defined by the side walls 13, 13 and the bottom plate 14. The well-member, which is provided in the cleaner constructed in accordance with the present invention, distinctly resembles the ordinary member used in the common cleaner construction and is indicated by the reference character 15. Member 15 is detachably held in position below the eye 4 of the chamber 3 by means of projecting lugs 16, 16 on the forward faces of its side walls which seat within suitable recesses formed in the rear faces of the side walls 13, 13 of the air passageway 12.

while a spring-pressed detent, indicated generally by the reference character 17, clamps the member 15 at its rear end. With the well-member constructed in accordance with the present invention a second passageway or conduit is provided which is defined by an inlet 18 in the rear wall of the well-member and which is continued beyond the confines of the well-member 15 proper by a tubular member 19 which is provided with suitable retaining means 20 near its end adapted to secure in place the cleaner end of the dusting tools when attached thereto.

Extending within the confines of the well-member 15, when in position upon the suction cleaner, is what may be called a pulley housing member 21 comprising an enclosing side wall 24 and a top wall 25. Housing 21 is rigidly secured to the bottom plate 14 at its forward end as by rivets 22, 22 through the ears 24a, 24a and, when bottom plate 14 is in position as the underside of the air passageway 12, the housing is forced against the bottom of the fan chamber 3 immediately forward of the inlet 4 the outwardly extending ears 25a, 25a serving to prevent tilting or relative movement. The upper wall 25 of housing 21 at its forward end 25 is tilted downwardly and rearwardly from its contact with the underside of fan chamber 3 immediately forward of the eye 4 so that the housing immediately below the eye is of reduced height, though entirely enclosing the driving pulley 8, and presents but slight obstruction to the air entering the eye. The upper wall 25 is also provided with a circular opening 26 which closely encloses the depending motor shaft 6a so as to prevent the passage of an appreciable quantity of air therebetween. Housing 21, in the operation of the machine, performs the useful function of substantially removing the driving pulley 8 and the driving belt 10, at their point of contact, from the dirt-laden air stream which passes through the cleaner, through providing a dead air space thereabout thereby eliminating the fouling hazard usually present.

Pivotally mounted within the well-member 15 upon a horizontal axis provided by the pivot-members 27, 27 carried by the side walls of the member 15, is a valve 28 which extends the entire width of the member 15 being provided with a cutaway portion, indicated by the reference character 29, to accommodate the pulley-housing 21. Valve 28 is adapted to assume, upon being pivoted by means of handle or actuating lever 30, which is mounted upon one of the pivot members 27 outside of well 15, one of two positions. In one position valve 28, as shown partially in full lines in Figure 1, serves to provide a sloping continuation of bottom plate 14 to the rear of inlet 4 of the fan chamber, while at the same time completely sealing the inlet 18 of conduit 19 from said chamber. In the second position, or that entirely shown in dotted lines in Figure 1, the valve is tilted in the opposite direction and has completely closed the air passageway 12 from the inlet 4 through contacting the underside of the fan chamber 3 at the sides of the housing 21 near the forward edge of the upper wall 25, and has opened to the eye 4 of the fan chamber the inlet 18 of the second passageway or conduit 19.

In the operation of the suction cleaner constructed in accordance with the present invention with a machine adapted for "on the floor" cleaning the valve 28 is pivoted by the operator through the use of the actuating lever 30 to the position shown partially in full lines in Figure 1. In that position the dirt-laden air entering

through the mouth of the nozzle 2, as defined by the nozzle lips 10 and 11, passes through the air passageway 12 and enters the inlet 4 of the fan chamber 3 at the sides of the pulley housing 21, being directed upwardly by the curved contour of the valve member 28; substantially no air passing through the housing 21 there being no sufficient opening at the rear thereof. With the valve in this position the second passageway leading to the fan chamber is entirely closed therefrom as the valve 28 has, through cooperating with the walls of the member 15 and the housing 21, entirely sealed the inlet 18 from the inlet 4. If the operator desires to convert the machine for use with dusting tools it is only necessary to tilt the valve 28 to the dotted line position shown in Figure 1 by pivoting the actuating lever 30. With the valve 28 in the second position the air passageway 12 will be entirely closed from the fan chamber it being clear that substantially no air passes through the housing 21. It then remains only necessary for the operator to attach the cleaner-end of the dusting tools to the conduit 19 where they are retained by the means 20 carried thereby.

As in the usual cleaner the present is provided with supporting means 33, 33 at its forward end and 34, 34 at its rear end. Suitable means 31 are also provided, as in the ordinary cleaner, to raise and lower nozzle 2 relative to the supporting surface for use with carpets of various thicknesses, and there is also provided a pivoted handle, indicated by the reference character 32, by which the machine may be propelled over the surface covering when used in "on the floor" cleaning.

I claim:

1. In a suction cleaner of the vertical axis type, a casing having a nozzle, a fan chamber, and an air passageway therebetween, a substantially vertical driving shaft extended thru said fan chamber into said passageway, a horizontal rotating agitator in said nozzle, power-transmission means extending substantially horizontal and connecting said shaft to said agitator, a housing in said passageway enclosing said shaft and power-transmission means at their point of contact, a conduit open to said fan chamber at the junction of said passageway therewith, and a plate valve pivoted about a horizontal axis within said passageway and at said junction and extended from the sides of said housing to the sides of said passageway, and means to manually pivot said valve to selectively seal said passageway or said conduit from said fan chamber.

2. In a suction cleaner of the vertical axis type, a casing having a nozzle, a fan chamber and an air passageway therebetween, a substantially vertical driving shaft extended thru said fan chamber into said passageway, a horizontal rotating agitator in said nozzle, power-transmission means extending substantially horizontal and connecting said shaft to said agitator, an elongated housing mounted in said passageway and enclosing said shaft and power-transmission means at their point of contact, a conduit open to said fan chamber at the junction of said passageway therewith, and single valve means at said junction pivoted about a horizontal axis and extended transversely from the sides of said passageway to the sides of said housing to selectively seal said passageway or said conduit from said fan chamber, and manually operable means to actuate said valve.

3. In a suction cleaner, a casing having a nozzle, a fan chamber, and an air passageway there-

between, a valve chamber at the end of said passageway which opens at its top to said fan chamber, a dusting tool conduit open to said fan chamber at said valve chamber, the openings of said passageway and said conduit being spaced in the sides of said valve chamber, a drive shaft extending from said fan chamber into said valve chamber, a driven belt extending from said shaft through said passageway to said nozzle, a rotatable agitator in said nozzle driven by said belt, a housing in said valve chamber enclosing said belt and said shaft at its connection therewith, a valve extended across said valve chamber and pivoted upon an axis between the openings of said passageway and said conduit and shaped to accommodate said housing, said valve being shaped to simultaneously contact the top of said valve chamber adjacent said passageway and the bottom of said valve chamber adjacent said conduit, and vice versa, and means to manually control the position of said valve to selectively connect said passageway or said conduit to said fan chamber.

4. In a suction cleaner, a casing having a nozzle, a fan chamber, and an air passageway therebetween, a driving shaft extended through said fan chamber into said passageway, a rotating agitator in said nozzle, power-transmission means connecting said shaft to said agitator, a housing in said passageway enclosing said shaft and power-transmission means at their point of contact, a conduit open to said fan chamber at the junction of said passageway therewith, and a plate valve pivoted centrally of itself within said passageway at said junction and extended from the sides of said housing to the sides of said passageway, said valve being of such size that it can be pivoted to contact opposite sides of the opening into said fan chamber, and means to manually pivot said valve to selectively seal said passageway or said conduit from said fan chamber.

5. In a suction cleaner, a casing having a nozzle, a fan chamber, and an air passageway therebetween, a valve chamber at the end of said passageway which opens into said fan chamber, a dusting tool conduit open to said fan chamber at said valve chamber, the openings of said passageway and said conduit being spaced in the sides of said valve chamber, a drive shaft extending from said fan chamber into said valve chamber, a driven belt extending from said shaft through said passageway to said nozzle, a rotatable agitator in said nozzle driven by said belt, a housing in said valve chamber enclosing said belt and said shaft at its connection therewith, a valve extended across said valve chamber and pivoted upon an axis between the openings of said passageway and said conduits and shaped to accommodate said housing, said valve being shaped to simultaneously contact the side of said valve chamber adjacent said passageway and the opposite side of said valve chamber adjacent said conduit, and vice versa, and means to manually control the position of said

valve to selectively connect said passageway or said conduit to said fan chamber.

6. In an accessory for a suction cleaner of the type including a fan chamber having an inlet, a nozzle spaced from said inlet, and a passageway connecting said nozzle to a point adjacent the inlet of said fan chamber, there being a motor drive shaft extended through said chamber and therebelow, a power-transmitting belt connected to said shaft and extended into said passageway, and a narrow housing open to said passageway and extending rearwardly under said inlet and enclosing the end of said shaft and said belt adjacent thereto; a removable casing shaped to conform to the end of said passageway and to form a continuation thereof to direct air to said inlet, said casing enclosing said housing, a conduit in said casing spaced from said passageway, and a valve carried solely by said casing being pivoted at the sides of said housing upon an axis between said conduit and said passageway, the axis of said valve being positioned between said fan chamber inlet and the casing wall opposite thereto, said valve being shaped to extend across said casing to close said passageway or said conduit from said inlet, and manually operable means carried by said casing to position said valve.

7. In an accessory for a suction cleaner of the type including a fan chamber having an inlet, a driving shaft extended thru said fan chamber and inlet, a fan on said shaft in said chamber, a nozzle spaced from said inlet, agitating means in said nozzle, a passageway connecting said nozzle to a point adjacent the inlet of said fan chamber, a power transmission belt extended thru said passageway and connecting said agitating means to said shaft, and a belt housing opening toward said passageway proper and having an opening opposite said inlet thru which said shaft extends; a casing shaped to conform to the ends of said passageway and to form a continuation thereof to direct air to said inlet, a conduit in said casing spaced from the point of contact with the end of said passageway proper, a valve carried solely by said casing upon opposite sides of said housing adapted to seal selectively said passageway or said conduit from said fan chamber, and manually operable means to actuate said valve.

8. An accessory for a suction cleaner of the type including a nozzle, a fan chamber, an air passageway from said nozzle to said fan chamber ending short thereof, a drive shaft extended from said fan chamber through the eye thereof, means connected to said shaft and extended through said passageway to said nozzle and into operative relationship with an agitator therein; comprising a removable housing member connecting said passageway to said fan chamber and formed with a conduit opening interiorly thereto, and a rotatable valve positioned in and mounted solely on said housing, said valve being movable to seal said passageway or said conduit from said fan chamber.

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