

Oct. 3, 1967

L. J. SZABO
VACUUM CLEANER

3,344,588

Filed Oct. 21, 1965

3 Sheets-Sheet 1

Fig. 1.

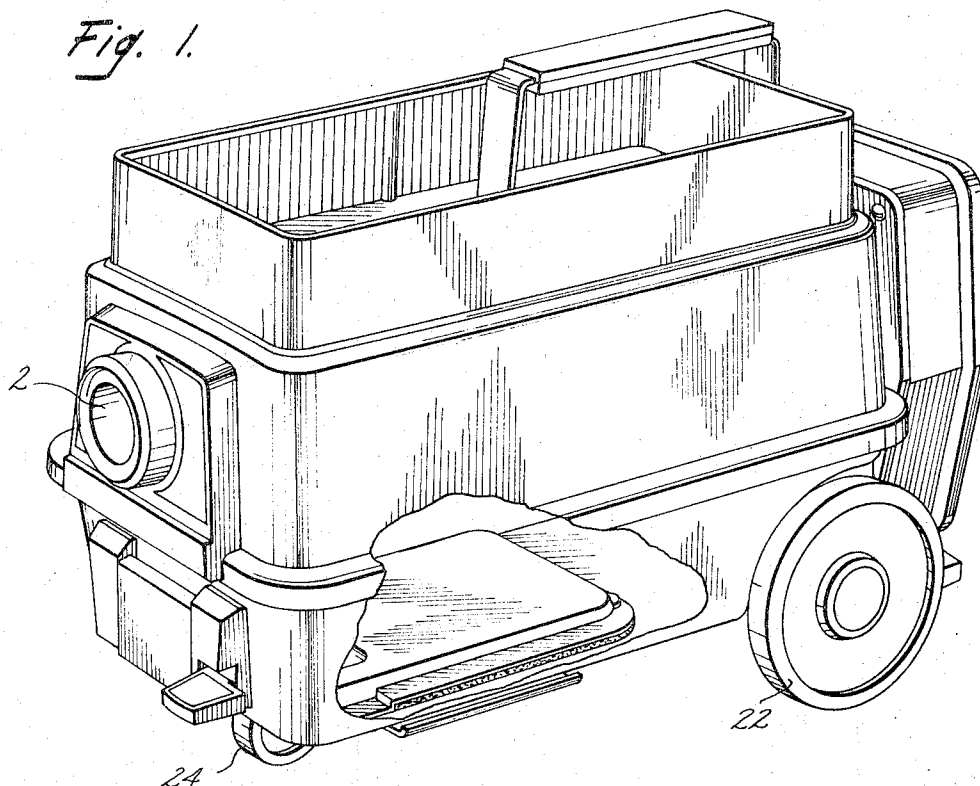
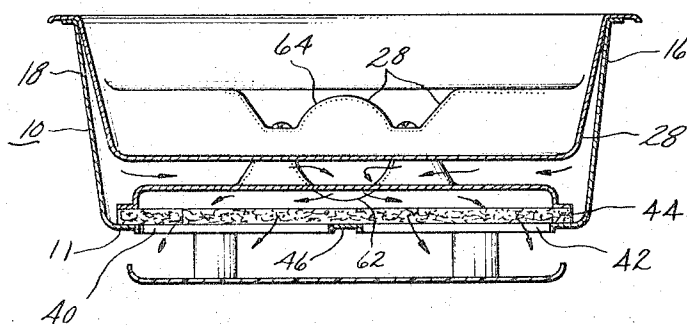


Fig. 3.



Inventor:
Louis J. Szabo
by Zeman J. Platt
Attorney

Oct. 3, 1967

L. J. SZABO

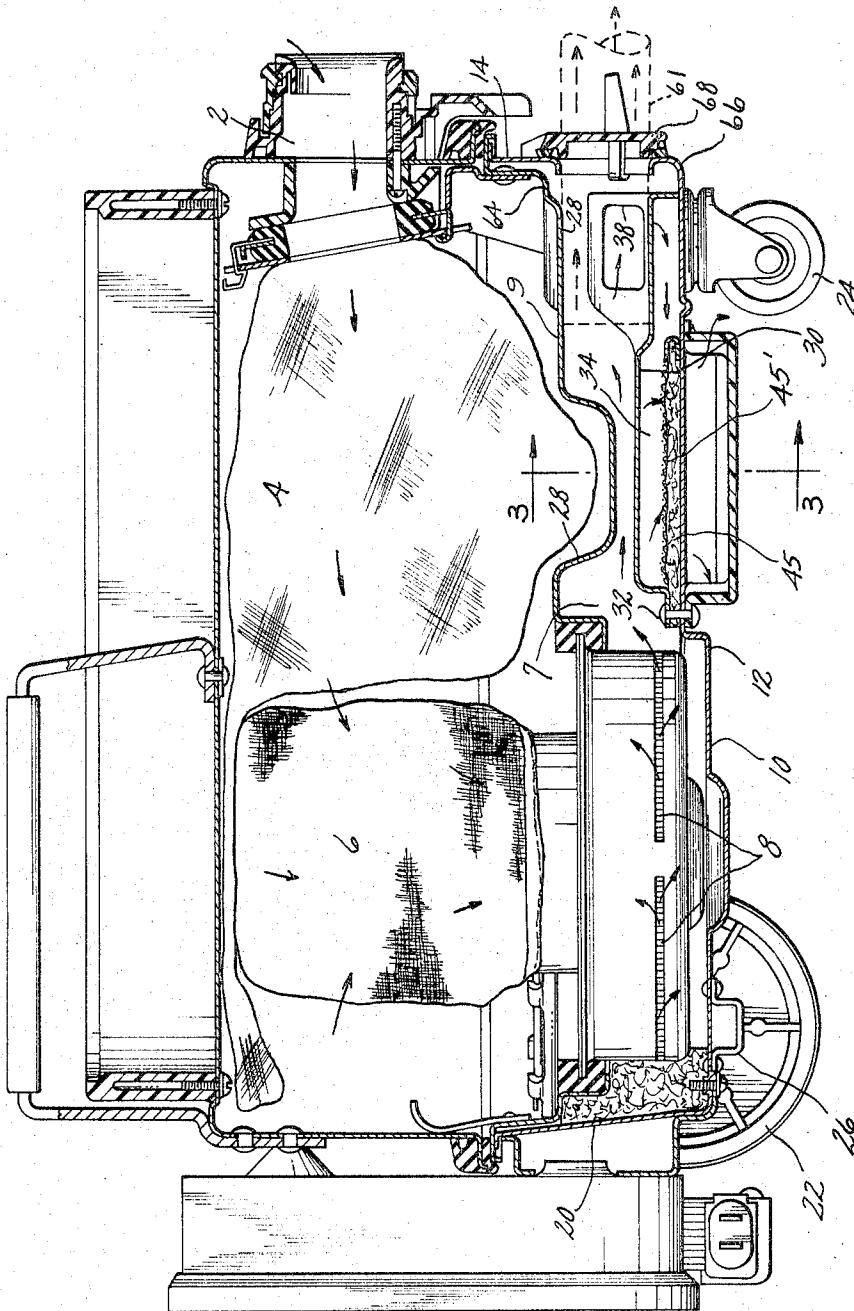
3,344,588

VACUUM CLEANER

Filed Oct. 21, 1965

3 Sheets-Sheet 2

Fig. 2.



Inventor:
Louis J. Szabo
by Zenard J. Platt
Attorney

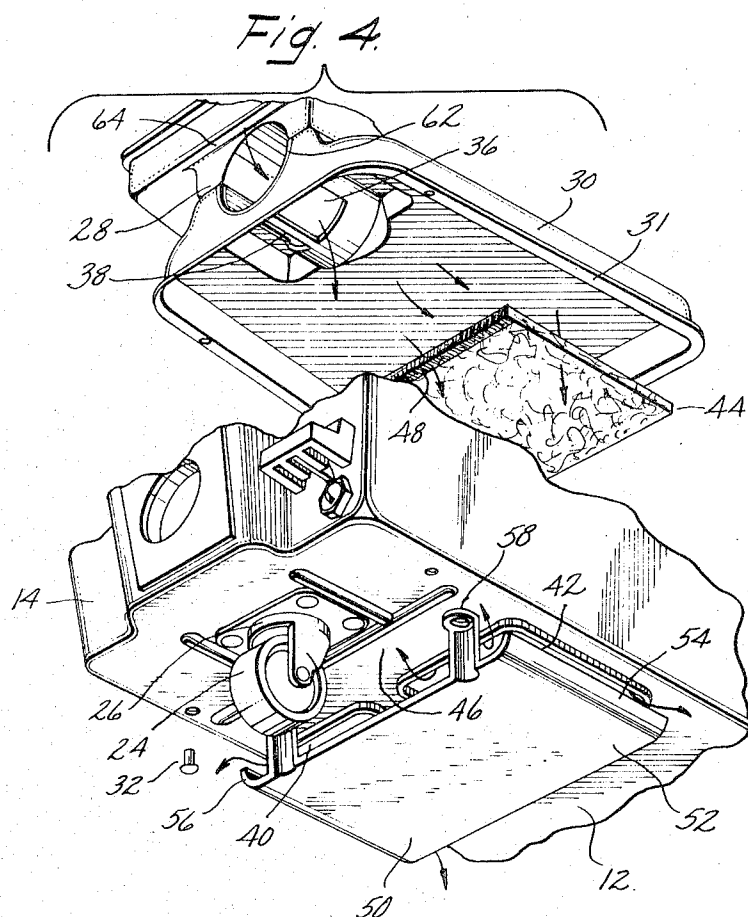
Oct. 3, 1967

L. J. SZABO
VACUUM CLEANER

3,344,588

Filed Oct. 21, 1965

3 Sheets-Sheet 3



Inventor:
Louis J. Szabo
by Leonard J. Platt
Attorney

1

3,344,588

VACUUM CLEANER

Louis J. Szabo, Fairview Park, Ohio, assignor to General Electric Company, a corporation of New York
Filed Oct. 21, 1965, Ser. No. 499,195
7 Claims. (Cl. 55-276)

ABSTRACT OF THE DISCLOSURE

An improved arrangement for muffling and controlling the flow of exhaust air from a vacuum cleaner. A muffler housing member is positioned on a generally flat bottom wall of a vacuum cleaner to form a muffler chamber therebetween. The muffler housing member is formed with a curved top wall for receiving a tubular coupling member, and openings are formed in the curved top wall of the muffler member for allowing air under pressure to enter the muffler chamber. When it is desired to use the vacuum cleaner as a blower, a tubular hose coupling or wand may be conveniently inserted into the cleaner on top of the openings in the curved top wall of the muffler member. By this arrangement, exhaust air is prevented from following its normal course to the muffler chamber and all of the air is directed into the tubular coupling for a blower tool.

This invention relates to vacuum cleaners and more particularly to an arrangement for muffling and controlling the flow of exhaust air from the vacuum cleaner.

In the manufacture of vacuum cleaners, it has been customary to provide some arrangement for muffling and controlling the flow of exhaust air from a vacuum cleaner so that a direct blast of air is not discharged on the surface to be vacuum cleaned or to any objects in a room which could be blown down or disarranged by a high pressure jet of exhaust air. It is also common practice to provide a vacuum cleaner with a blower air discharge port for receiving a vacuum cleaner tubular coupling when it is desired to use the cleaner as a blower. For example, when it is desired to connect a crevice tool to the vacuum cleaner in order to clean an article by blowing the dirt from the article to be cleaned. The provision of a vacuum cleaner air discharge construction which is capable of being manufactured at low cost and which may be quickly and easily converted from normal air discharge operation to blower operation is especially desirable.

Accordingly, it is a primary object of the invention to provide a reliable air discharge arrangement for a vacuum cleaner which is easy to use and which may be quickly converted for use as a blower.

Another object of the invention is to provide vacuum cleaner air discharge arrangement which is simple in structure, and capable of being manufactured at low cost. In this connection, it is a particular object of the invention to use a minimum number of parts which may be easily formed, and also to provide parts which perform more than one function.

In accordance with one aspect of my invention, a vacuum cleaner base member includes a generally flat bottom wall and a muffler housing plate is positioned directly above the bottom wall to form a muffler chamber. The muffler plate is formed with a curved top wall portion for receiving a tubular coupling member and openings are formed in the curved top wall portion of the muffler for allowing air under pressure to enter the muffler chamber. When it is desired to use the vacuum cleaner as a blower, a tubular hose coupling or wand may be conveniently inserted into the cleaner on top of the openings in the curved top wall portion of the muffler plate. By

2

this arrangement exhaust air is prevented from its normal course to the muffler and all of the air is directed into the tubular coupling for a blower tool.

Other objects and attendant advantages of this invention will be apparent from the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of a vacuum cleaner embodying the invention with parts shown broken away for purposes of clarity in illustration.

FIG. 2 is a side elevational view of the vacuum cleaner shown in FIG. 1 with most of the parts broken away on an approximate center line of the cleaner.

FIG. 3 is a sectional view on the line and in the direction of the arrows 3-3 of FIG. 2.

FIG. 4 is a bottom exploded perspective view of the vacuum cleaner shown in FIG. 1 illustrating the improved air discharge arrangement.

Referring now to FIG. 1, there is shown a vacuum cleaner embodying my improved arrangement for muffling and controlling the flow of exhaust air from a vacuum cleaner. As shown, the front wall of the cleaner is provided with an inlet fitting 2 adapted to be connected to a suction tubular hose coupling which is not shown. Conventionally, the tubular hose coupling is in turn connected to appropriate suction cleaning attachments or tools.

As shown in FIG. 2, inside of the cleaner body a dust filter or bag 4 is connected to the inlet fitting 2, and a motor fan unit 6 is positioned at the rear of the cleaner for causing air to flow in the inlet fitting 2 through bag 4, through the motor fan combination 6, and into an exhaust air chamber 7, as shown by the arrows.

It is desired that the air discharged from the fan housing openings 8 be muffled, diffused and spread as it is exhausted from the cleaner so that it does not blow on the floor to be vacuum cleaned or against any objects in the room which could be disarranged.

In accordance with my invention, the vacuum cleaner is provided with an integral one-piece base member 10 which may be readily formed in a stamping operation. As shown, the base member 10 includes a generally flat bottom wall 12, an upwardly extending front wall 14, upwardly extending side walls 16 and 18, and a rear wall 20. The cleaner is supported by a plurality of wheels 22, 24 which are connected to suitable mounting plates 26 which are riveted or otherwise secured to the bottom wall 12 as shown in FIG. 4.

An intermediate plate 28 is positioned on top of the base member 10 for supporting the motor fan combination 6, and for providing a chamber between the base member 10 and the upper portion of the vacuum cleaner into which vacuum cleaner exhaust air is forced under pressure through fan housing openings 8.

As shown more particularly in FIG. 2, a uniquely formed muffler housing plate 30 is provided for performing a plurality of functions. The muffler plate 30 is positioned in the chamber between bottom wall 12 and motor support plate 28, and it is connected by means of rivets 32 or other suitable securing means to the bottom wall 12 of the base member. Exhaust air inlet to the muffler chamber 34 is achieved through generally rectangular openings 36 and 38 which are readily provided in the top wall portion of the muffler plate 30. With this construction, a muffler chamber 34 is readily formed using a minimum number of parts.

A low cost arrangement which may be easily manufactured is also provided for muffling the air which enters the muffling chamber, diffusing the air, and exhausting it outside of the cleaner. As shown more particularly in FIG. 4, two generally rectangular enlarged openings 40 and 42 are provided in the bottom wall 12 of the base member. Clearly, these openings may be readily formed

during the stamping of the base member. A filtering pad and screen assembly 44 is positioned inside of the muffling chamber 34 on top of the enlarged openings 40 and 42. As shown more particularly in FIG. 2, assembly 44 includes a piece of felt 45 and a screen 45' positioned on the bottom and top front portion of the felt 45. The muffling pad assembly 44 is held in position by simply sandwiching it between bottom flanges 31 which are formed on muffler plate 30 and the top surface of bottom wall 12. The same rivets 32 which hold the muffler plate 30 in position are also utilized for holding the muffling pad assembly 44 to the bottom wall 12. In forming the enlarged openings 40 and 42, an elongated metal strip 46 is provided in the bottom wall 12 of the base member 10 between openings 40 and 42 for supporting the central portion of the filter pad 44. With this arrangement, the rear and side edge portions of the filter pad 44 are securely held between the top surface of bottom wall 12 and the flanges 31 which are formed on the muffler plate 30. A suitable reinforcing material 48 may be directly applied to the front edge portion of the filter pad assembly 44 for holding the front portion of the pad in contact with the top surface of bottom wall 12.

While the air which is exhausted through the enlarged openings 40 and 42 has been substantially diffused and muffled during its passage through the muffling chamber 34 it is also desirable to provide additional diffusion and means for deflecting the air so that it does not impinge upon the surface to be vacuum cleaned. In order to achieve this, a readily formed baffle plate 50 is spaced below the enlarged openings 40 and 42. As shown more particularly in FIG. 4, the baffle plate 50 is integrally formed with a generally flat bottom wall 52, two curved upwardly extending side walls 54 and 56, and four integrally formed fingers 58 for connecting the baffle plate to the bottom wall 12 of the base member 10. The baffle plate may be formed of plastic or other suitable material; and the same rivets 32 which hold muffler plate 30 in position are also used for securing the fingers 58 of baffle plate 50 to the bottom wall 12 of base member 10.

With this construction, it can be appreciated that the exhaust air which flows out of fan housing opening 8 passes through the cleaner in the direction of the solid line arrows shown in FIG. 2. The air passes through muffler plate openings 36, 38, into the muffler chamber 34, through the filtering and muffling screen assembly 44, through enlarged openings 40, 42, and is then deflected by baffle plate 50 laterally to the sides, front and rear of the cleaner thereby preventing exhaust air from blowing directly on the rug to be cleaned.

The previously mentioned parts are also uniquely formed to receive a tubular hose coupling 61, shown in dotted lines in FIG. 2, for permitting the vacuum cleaner to be used as a blower. As shown in FIGS. 3 and 4, the front top portion of the muffler plate 30 is provided with a generally semicylindrical wall 62 for receiving a tubular coupling member for a blower attachment. In like manner, a forward portion of the intermediate motor support plate 28 is formed with a generally semicylindrical wall portion 64 which is positioned to mate with the generally semicylindrical wall 62 which is formed in the muffler plate 30. With this arrangement, the two semicylindrical wall portions 62 and 64 provide a cylindrical recess for receiving a tubular hose coupling for a blower.

With reference to FIG. 2, it can be seen that a circular aperture 66 is provided in the upwardly extending front wall 14 of the base member 10, and suitable blower plug 68 is provided for closing the circular aperture 66 during normal operation of the vacuum cleaner. The circular aperture 66 is axially arranged with respect to the generally semicylindrical walls 62 and 64 which are formed in the muffler plate 30 and intermediate plate 28, respectively. With this arrangement, when it is desired to use the vacuum cleaner as a blower the blower plug 68 is simply removed from the aperture 66 and a

suitable tubular hose coupling 61 for a blower tool, shown in dotted lines in FIG. 2, is inserted through aperture 66 and into the cylindrical recess formed by semicylindrical walls 62 and 64. It can be appreciated that when the tubular hose coupling 61 is in this position, it covers openings 36 and 38 in order to prevent flow of exhaust air into the muffler chamber 34. All of the air is diverted to the tubular hose coupling for the blower tool and flows in the direction of the dotted line arrows shown in FIG. 2.

In view of the foregoing, it can be appreciated that my improved arrangement for controlling the flow of exhaust air from a vacuum cleaner utilizes a minimum number of parts which may be easily formed and assembled to each other. The base member 10 including its upstanding walls and enlarged openings 40 and 42 is formed in a simple stamping operation. The muffler plate housing 30 which functions as both a muffler housing and an arrangement for converting the vacuum cleaner for use as a blower has all of its portions including openings 36 and 38, semicylindrical wall 62 and flanges 31 formed in a simple stamping operation. In like manner, the semicylindrical wall 64 is readily provided in motor support plate 28 while it is being formed. Thus, an exceedingly simple and inexpensive arrangement is provided for muffling and controlling the flow of exhaust air from a vacuum cleaner.

While there has been shown and described a particular embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications can be made therein without departing from the invention, and therefore, it is aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A vacuum cleaner comprising:
 - (a) a casing having an air inlet opening;
 - (b) an electric motor and suction fan mounted within said casing for causing suction air to flow into said casing through said air inlet opening;
 - (c) a filter positioned within said casing between said air inlet opening and said suction fan;
 - (d) exhaust air passage means within said casing, said exhaust air passage means being positioned adjacent to said suction fan to receive air which is exhausted from said suction fan;
 - (e) said casing including a base member having a generally flat horizontal bottom wall having an outlet opening therein; a vertical end wall extending upwardly from said bottom wall, an opening formed in said end wall;
 - (f) a muffler member having a generally flat top wall and depending side wall means, said muffler member being positioned on top of the bottom wall of said base member to form a muffler chamber between the top wall of said muffler member, the side wall means of said muffler member, and said generally horizontal flat bottom wall;
 - (g) said muffler member also being formed with a curved top wall portion, said curved top wall being generally aligned with the opening formed in said end wall;
 - (h) said muffler member forming part of the lower wall of said exhaust air passage means, and being provided with opening means formed in its curved top wall portion for permitting exhaust air from said exhaust air passage means to enter said muffler chamber; and
 - (i) tubular coupling means selectively insertable through the opening in said end wall and positionable on top of said curved top wall portion of said muffler member for covering said opening means thereby preventing exhaust air from entering said muffler chamber.

5

2. A vacuum cleaner as defined in claim 1 wherein a filtering and muffling screen is sandwiched between the muffler member and the flat bottom wall of said base member for filtering and muffling exhaust air before it is discharged through said outlet opening, said filtering and muffling screen being securely held in position without the use of securing means other than that required to hold the muffler member to the base member.

3. A vacuum cleaner as defined in claim 1 wherein a baffle plate is positioned below said outlet opening for directing exhaust air under relatively low pressure laterally to the sides, front and rear of the cleaner thereby preventing exhaust air from blowing directly on the surface to be cleaned.

4. A vacuum cleaner as defined in claim 1 wherein said vacuum cleaner further comprises a plurality of support wheels having mounting plates attached thereto, said mounting plates being fixed to the bottom wall of said base member; and a baffle plate positioned below said wheel mounting plates for directing exhaust air under relatively low pressure laterally to the sides, front and rear of the cleaner thereby preventing exhaust air from blowing directly on the surface to be cleaned.

5. A vacuum cleaner as defined in claim 1 wherein a blower plug is removably positionable in the opening formed in the end wall of said base member.

6. A vacuum cleaner as defined in claim 1 wherein an intermediate plate is positioned above the base member and muffler member to form the top wall of said exhaust air passage means.

7. A vacuum cleaner as defined in claim 6 wherein a

6

curved wall is formed in the forward portion of said intermediate plate to mate with the curved wall formed in said muffler plate to provide an exhaust air duct for receiving said tubular coupling means.

References Cited

UNITED STATES PATENTS

2,372,007	3/1945	Kroenlein	55—467 X
2,403,970	7/1946	French et al.	55—472
2,744,585	5/1956	Kelly	55—373
2,759,659	8/1956	Hansen	15—330 X
2,778,441	1/1957	Herriott	55—357
2,854,686	10/1958	Hansen	15—327
2,889,570	6/1959	Duff	15—327
2,930,446	3/1960	Momborg et al.	55—356
2,978,732	4/1961	Hansen	15—327 X
3,002,215	10/1961	MacFarland	15—327
3,003,179	10/1961	Des Carries	15—327
3,048,961	8/1962	Kemnitz	55—472 X
3,172,743	3/1965	Kowalewski	55—473 X
3,254,480	6/1966	Rideout	55—471
3,279,157	10/1966	Andersson-Sason et al.	55—410 X

FOREIGN PATENTS

1,102,203	5/1955	France.
812,886	5/1959	Great Britain.

HARRY B. THORNTON, *Primary Examiner.*

D. TALBERT, *Assistant Examiner.*