Nov. 15, 1960 E. FABER 2,959,804

VACUUM CLEANER END ARRANGEMENT

Filed Dec. 24, 1957

Fig. 1

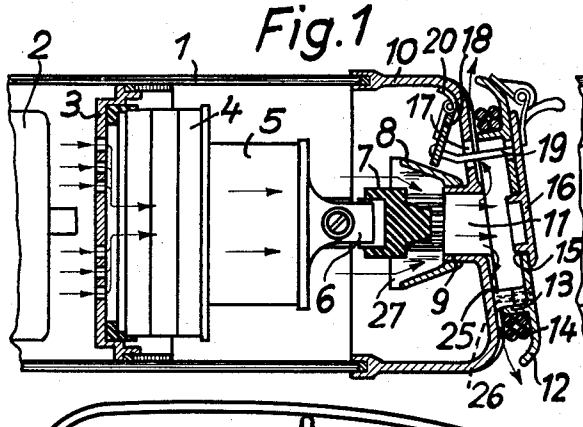


Fig. 2

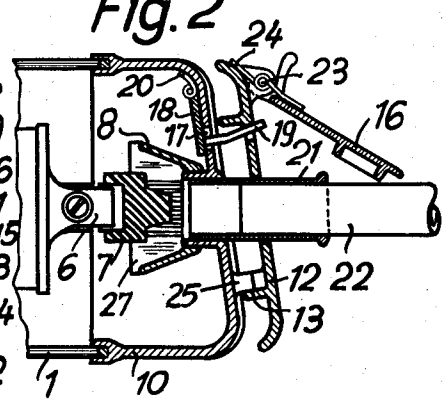


Fig. 4

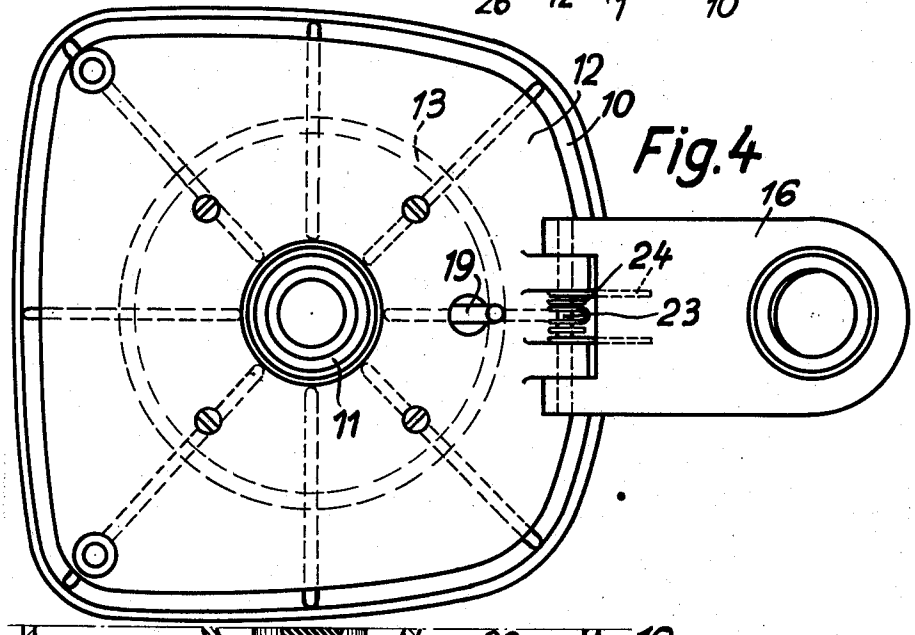
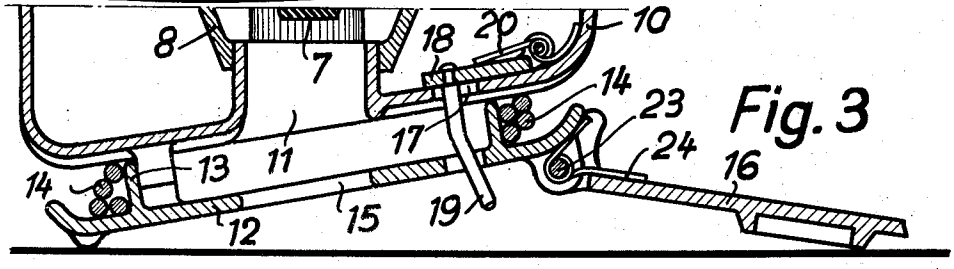


Fig. 3



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VACUUM CLEANER END ARRANGEMENT

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2 Claims. (Cl. 15—330)

The present invention relates to vacuum cleaners.

Conventional vacuum cleaners have several disadvantages. For example, the cable through which the vacuum cleaner is connected with a source of electricity presents a problem since it usually must be stored somewhere separately from the rest of the vacuum cleaner. Furthermore, the air issued from the vacuum cleaner produces an annoying noise. Also, vacuum cleaners of the elongated cylinder type are difficult to stand in a stable fashion on one end.

The object of the present invention is to provide a vacuum cleaner which is capable of stably standing on one end.

An additional object of the present invention is to provide a structure capable of accomplishing the above object and composed of simple rugged elements which are reliable in operation and easy to assemble and disassemble.

With the above objects in view, the present invention includes in a vacuum cleaner an elongated housing having a rear end wall formed with an opening through which air discharges from the interior to the exterior of the housing. A deflector plate is carried by this end wall of the housing at the exterior thereof in spaced relation to the end wall so that air issuing through the opening thereof will be deflected by the deflector plate toward the periphery of the end wall and in this way the noise of the vacuum cleaner is greatly reduced. A flange extends between the end wall and the deflector plate and the cable of the vacuum cleaner can be conveniently wound on this flange.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary axial sectional view showing the rear end portion of a vacuum cleaner provided with the structure of the present invention;

Fig. 2 shows the right end portion of Fig. 1 in an enlarged scale with the parts in a different position and associated with a hose through which air is blown from the vacuum cleaner;

Fig. 3 shows in a fragmentary elevational view the lower portion of the vacuum cleaner as supported on a floor or the like in an upright position; and

Fig. 4 is a plan view of the structure of Fig. 3 as seen from below Fig. 3 with the floor omitted.

Referring now to the drawings, the vacuum cleaner includes an elongated housing **1** having in its interior a dust collector **2** one end of which is visible at the left part of Fig. 1. This collector **2** is located at the left of a partition **3** fixed in the housing **1** and separating the motor-blower assembly from the filter assembly, the partition **3** being formed with openings through which the filtered air travels to the blower **4**, this blower being driven by a motor **5** which forms a unit therewith, and the air passing through the blower-motor unit **4**, **5**. This unit is provided at its right end, as viewed in Fig. 1, with a bearing **6** supported by an intermediate elastic member **7** on a tubular member **8** of frustoconical configuration through which the air passes during its movement to the exterior of the housing. The housing **1** has a rear end wall **10** carrying a tubular portion **9** which defines a discharge opening **11** of the rear end wall **10** through which the air passes to the exterior, and the opening **11** is arranged substantially centrally of the rear end wall **10**. The tubular member **8** is fixedly carried by the tubular portion **9** of the end wall **10**.

In accordance with the present invention a deflector plate **12** is carried by the rear end wall **10** of the vacuum cleaner at the exterior thereof in spaced and substantially parallel relation to the rear end wall **10**. As is apparent from Figs. 1 and 4, the rear end wall **10** is provided at its exterior with a plurality of bosses **25**, only one of which is shown in Fig. 1, formed with threaded bores which receive screw members **26** passing through the deflector plate **12** so that the latter is fixed in this way to the wall **10** in spaced relation thereto. Fixedly connected to the deflector plate **12** is an annular flange **13** extending toward the rear wall **10**, and when the cable **14** is not in use it may conveniently be wound on the flange **13**, as indicated in Figs. 1 and 2. The end wall **10** is provided at its exterior with a plurality of ribs extending substantially radially from the opening **11** to the outer periphery of the end wall **10**, and the free edge of flange **13** distant from plate **12** engages these ribs so that there are provided between these ribs, the free edge of flange **13**, and the exterior surface of end wall **10** passages of relatively small width through which the air issuing through opening **11** escapes to the outer atmosphere, and this arrangement greatly reduces the noise of the vacuum cleaner.

The deflector plate **12** is formed with an opening **15** aligned with the opening **11**, and a closure means is carried by the deflector plate and is movable between a closed position closing the opening **15** and an open position opening the latter. This closure means is in the form of a member **16** pivotally connected to the deflector plate **12** and covering the opening **15** when the closure means is in the closed position illustrated in Fig. 1. A wire spring **24** is coiled about the pivot pin of the member **16** and engages the plate **12** and the member **16** for urging the latter to the closed position shown in Fig. 1. When it is desired to use the device for blowing air, the member **16** is moved to the open position shown in Fig. 2, and a tubular member **21** fixed to the flexible hose **22** is passed through the opening **15** and pressed into the opening **11**, as indicated in Fig. 2, the left end of the tubular member **21** as well as the tubular part **9** of the wall **10** being slightly tapered.

In order to facilitate the discharge of air from the interior of the vacuum cleaner, the rear wall **10** of the housing **1** is formed with a second opening **17**. A substantially flat disc or plate **18** is pivotally carried by the rear wall **10** in the interior of the housing and is urged by a spring **20** to the closed position shown in Fig. 2 closing the opening **17**. A rod **19** is fixed to the substantially flat plate **18** and extends through the opening **17** as well as an additional opening formed in the deflector plate **12** and aligned with the opening **17**. The spring **24** is stronger than the spring **20**.

Elements **18**—**20** thus form a closure means for closing the opening **17** when the closure means **16**, **24**, **23** is in its open position uncovering the opening **15** as shown in Fig. 2. Element **23** is a pivot pin supporting the member **16** for turning movement. On the other hand, when the closure means **16**, **23**, **24** is in its closed position closing the opening **15**, the member **16** by engagement with

the rod 19 maintains the closure means 18—20 in its open position uncovering the opening 17, as indicated in Fig. 1.

In order to set the vacuum cleaner up on one end in an upright position, the closure means 16, 23, 24 is turned to the fully opened position shown in Fig. 3 where it bears against the floor or the like on which the vacuum cleaner is supported, and the deflector plate 12 has a pair of bosses or the like engaging the floor at points distant from the part of the floor engaged by member 16 in the position of the parts shown in Fig. 3, so that in this way the deflector plate and the closure means carried thereby form a stable support for the upright vacuum cleaner. It will be noted that in the position of Fig. 3 the member 16 forms substantially an extension of the deflector plate 12. The parts in position of Fig. 3 engage the floor at widely spaced areas to guarantee a stable support.

The frustoconical member 8 is fixed at its smaller end to the opening 11 and is provided in its interior with a plurality of substantially radial ribs 27 which are spaced from each other to define narrow passages through which the air flows to the opening 11, and the elastic member 7 is directly supported by these radial ribs of the tubular member 8.

The positioning of the vacuum cleaner in the upright position shown in Fig. 3 makes it easier for the operator to open the housing at the part thereof which includes the dust collector. In this way the emptying of the dust collector is simplified.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of vacuum cleaners differing from the types described above.

While the invention has been illustrated and described as embodied in cylinder vacuum cleaners, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a vacuum cleaner, in combination, an elongated housing having a rear end wall formed with a first opening through which air discharges from the interior of the housing and with a second opening spaced from said first opening; a deflector plate carried by said end wall at the exterior of said housing in spaced relation to said end wall for deflecting air issuing through said first opening, said deflector plate being formed with an opening aligned with said first opening so that a tube may be inserted into the latter through said plate opening, said deflector plate being also formed with an additional opening in substantial alignment with said second opening in said rear end wall; first closure means carried by said plate for movement between a closed position closing said plate opening, when a tube is not inserted in said first opening, and an open position uncovering said plate opening, said first closure means including a closure member turnably carried by said plate and located next to said plate over said additional opening thereof when said first closure means is in its closed position; and second closure means including a substantially flat plate turnably carried by said end wall in the interior of said housing adjacent said second opening, spring means acting on said substantially flat plate for urging the latter to a closed position covering said second opening, and a rod fixed to said substantially flat plate and extending therefrom through said second opening and said additional opening of said deflector plate, said closure member of said first closure means engaging said rod when said first closure means is in its closed position for holding said substantially flat plate in an open position away from said second opening against the force of said spring means, and said spring means automatically moving said substantially flat plate to its closed position closing said second opening when said closure member of said first closure means is turned away from said additional opening of said deflector plate upon movement of said first closure means to its open position.

2. An arrangement as defined in claim 1, in which said closure member of said first closure means is turnable with respect to said deflector plate to an open position where said closure member and deflector plate cooperate to provide a stable base for supporting said housing in an upright position.

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