

Oct. 12, 1965

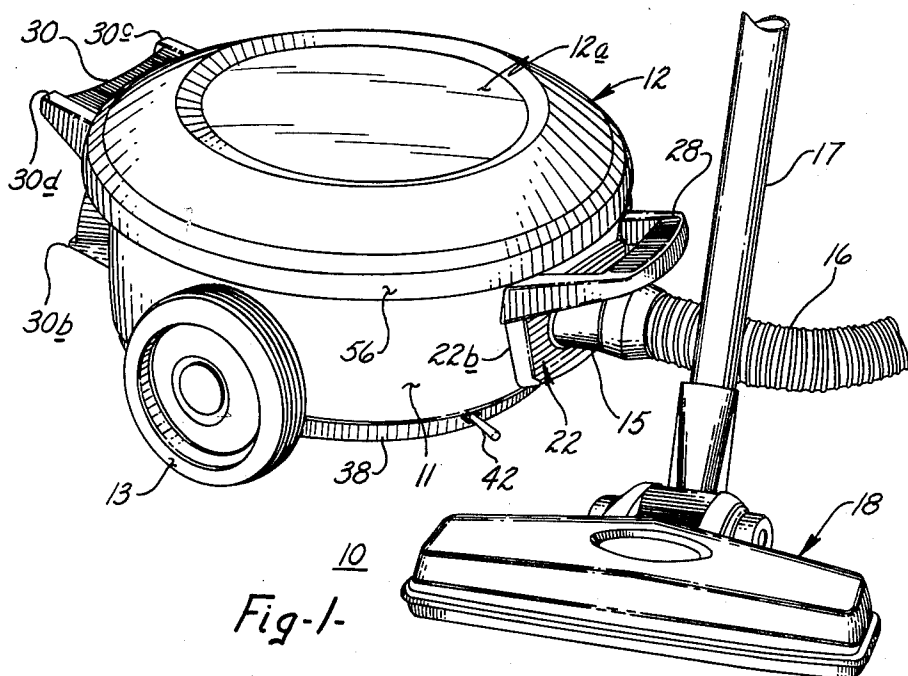
I. JEPSON

3,210,916

VACUUM CLEANER

Filed Jan. 2, 1962

4 Sheets-Sheet 1



Oct. 12, 1965

I. JEPSON
VACUUM CLEANER

3,210,916

Filed Jan. 2, 1962

4 Sheets-Sheet 2

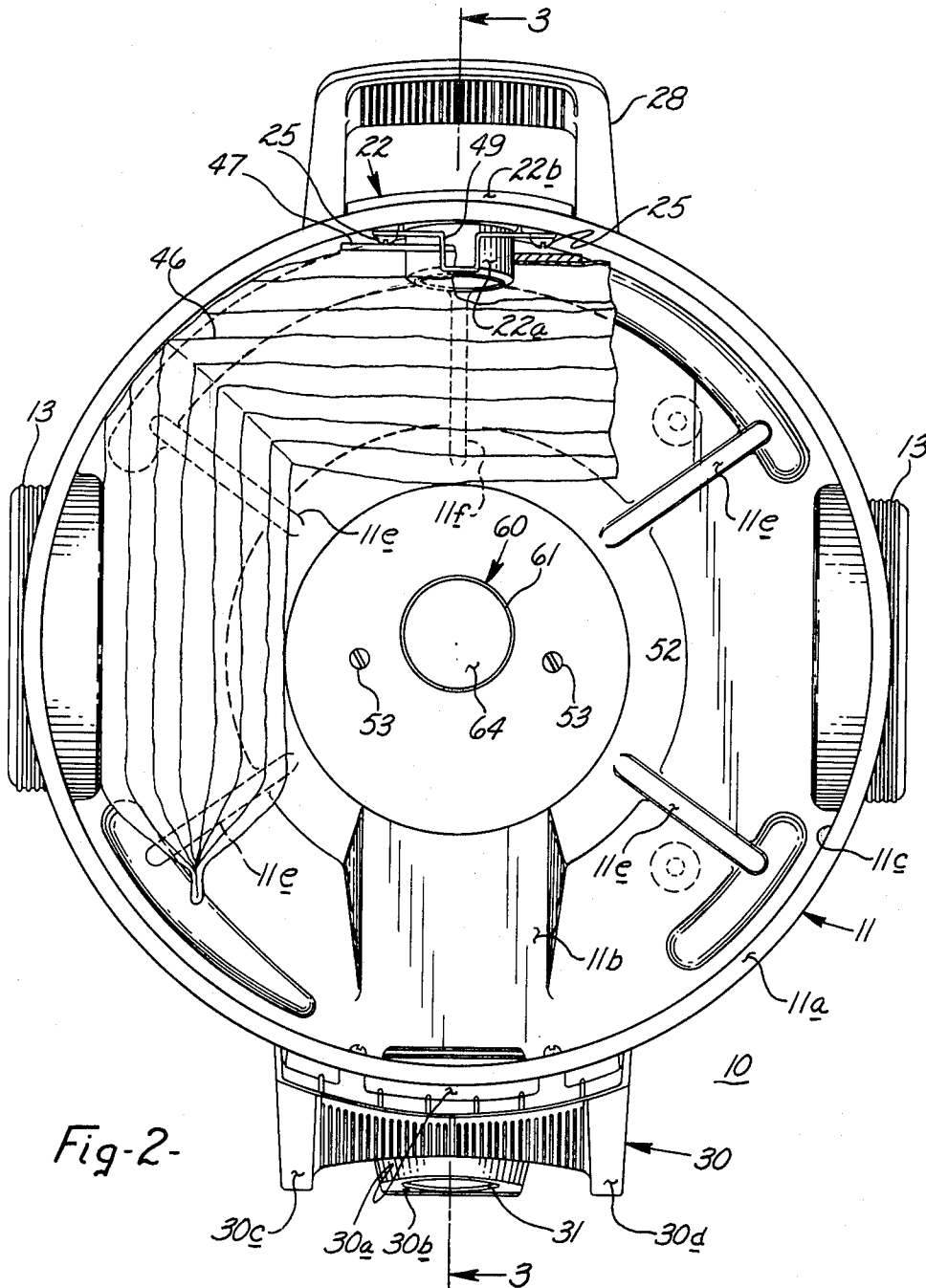


Fig-2-

INVENTOR
IVAR JEPSON
BY
George R. Clark
att'y:

Oct. 12, 1965

I. JEPSON
VACUUM CLEANER

3,210,916

Filed Jan. 2, 1962

4 Sheets-Sheet 3

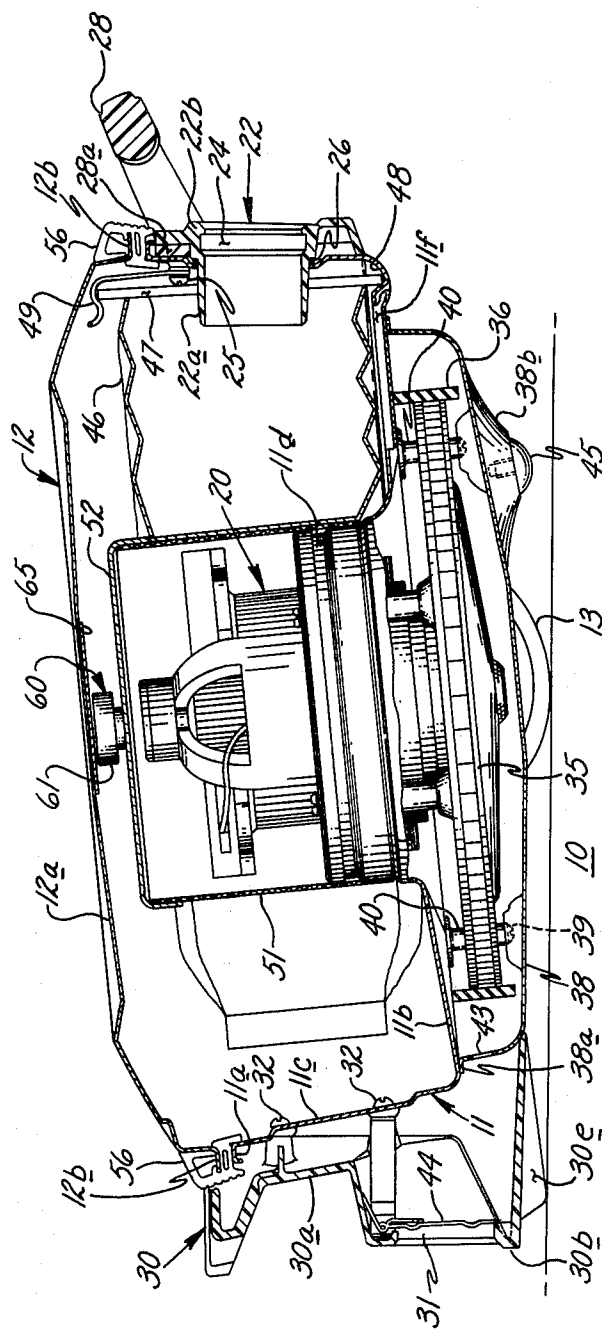


Fig-3-

INVENTOR.
IVAR JEPSON
BY
George R. Clark
att'y.

Oct. 12, 1965

I. JEPSON
VACUUM CLEANER

3,210,916

Filed Jan. 2, 1962

4 Sheets-Sheet 4

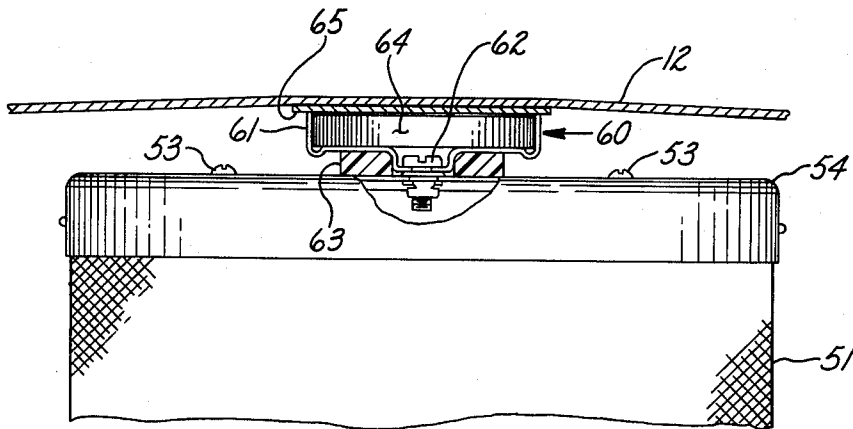


Fig-6.

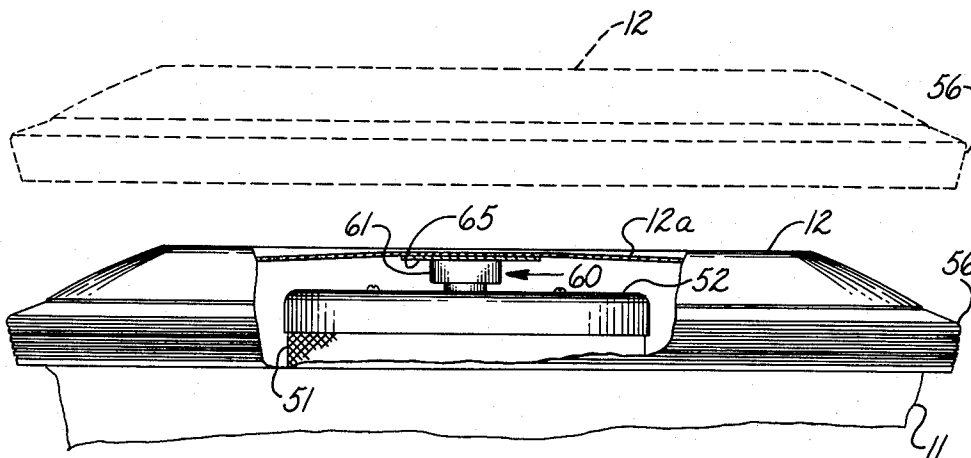


Fig-7.

INVENTOR.
IVAR JEPSON
BY
George R. Clark
Atty:

1

3,210,916

VACUUM CLEANER

Ivar Jepson, Oak Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill., a corporation of Illinois
Filed Jan. 2, 1962, Ser. No. 163,543
3 Claims. (Cl. 55-471)

The present invention relates to suction or vacuum cleaners for removing dirt from floors, carpets, furniture, or the like, by virtue of the suction or vacuum produced by a motor-driven fan. Specifically, the present invention is in the nature of an improvement on copending Jepson and Wied application, Serial No. 39,865, filed June 30, 1960, now U.S. Patent No. 3,170,184, and assigned to the same assignee as the instant application.

In the above-entitled application, there is disclosed a vacuum cleaner of the tank or cannister type which has been extensively sold by applicant's assignee and which has been commercially successful due to many factors, among which is the very high suction produced by this vacuum cleaner, the compactness and lightness thereof, which make the device very easy to handle, and the simple way in which the dirt picked up by this cleaner may be disposed of. The vacuum cleaner of the aforementioned copending application comprises a low, compact housing of the shape of a shallow pan with a top cover having a circumference of the maximum diameter of the pan and gasket means between the cover and the remainder of the container which also defines a peripheral bumper for the cleaner. The cover is hingedly secured to the pan and latch means are provided for latching the cover to the pan. The vacuum cleaner of the copending application is supported on wheels and the powerful motor-driven fan is centrally mounted within the pan-shaped housing, so as to define an annular space for the reception of a disposable dust collecting bag of large surface area and volume. This cleaner also involved an improved motor-controlling switch means so that the vacuum cleaner could be actuated merely by pushing down on the top of a portion of the housing.

Although the aforementioned vacuum cleaner disclosed in the copending application has been very successful, there is a demand for a somewhat less expensive cleaner having some of the advantages of the above-mentioned cleaner, and the present invention is primarily concerned with such a cleaner which can be sold at a lower price.

Accordingly, it is an object of the present invention to provide an inexpensive tank or cannister-type cleaner which has many of the desirable features of more expensive cleaners.

It is another object of the present invention to provide a tank-type vacuum cleaner in which the cover for the tank is bodily removable and is held in closed position by magnetic means.

Still another object of the present invention resides in an improved gasket means for sealing the cover to the housing of a tank or cannister-type vacuum cleaner.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularly in the claims annexed to and forming a part of this specification.

For a better understanding of the present invention, reference may be had to the accompanying drawings in which:

FIG. 1 is a perspective view of the vacuum cleaner of the present invention, showing a portion of the hose and wand and one of several possible cleaning attachments;

FIG. 2 is a top plan view of the vacuum cleaner of FIG. 1 with the cover removed and with a portion of the dust bag cut away more clearly to illustrate features of the vacuum cleaner of the present invention;

2

FIG. 3 is a sectional view taken on line 3-3 of FIG. 2, assuming that FIG. 2 shows the complete structure including the cover disposed in sealed relationship with the rest of the vacuum cleaner;

FIG. 4 is a greatly enlarged sectional view of the cover sealing gasket of the vacuum cleaner of the present invention;

FIG. 5 is a side elevational view of the vacuum cleaner of the present invention, with the hose and attachments removed, shown in the position it assumes when stored and further illustrating how the power cord is supported for storage purposes;

FIG. 6 is an enlarged fragmentary view of a portion of FIG. 3 with, however, certain portions shown in section in FIG. 3 not shown in section, and with certain other portions cut away more clearly to illustrate the present invention; and

FIG. 7 is a fragmentary, side elevational view with certain portions cut away, illustrating how the cover is held in latched position and showing in dotted lines the cover completely removed from the remainder of the vacuum cleaner.

Briefly, the present invention is concerned with a tank-type vacuum cleaner similar in many respects to the vacuum cleaner of the aforesaid copending Jepson and Wied application comprising the same low, compact housing of the shape of a shallow pan with the top cover having a circumference of the maximum diameter of the pan and gasket means between the cover and the remainder of the container which also defines a peripheral bumper for the cleaner. The cleaner is supported on suitable wheels and a powerful motor-driven fan is mounted almost centrally within the pan-shaped housing so as to define an annular space for the reception of the disposable dust collecting bag of large surface area and volume. The cover of the vacuum cleaner is bodily removable from the pan and magnetic means are employed to hold the cover in sealed position with the remainder of the vacuum cleaner.

Referring now to the drawings, there is illustrated a vacuum or suction cleaner, generally designated by the reference numeral 10, which comprises a suitable housing defined by a pan-shaped member 11 and a cover 12. The housing is mounted on suitable wheels 13. The housing 11 is furthermore provided with means for connecting thereto a suitable tube coupling 15 (FIG. 1) secured to one end of a flexible suction hose 16. The hose 16 is adapted to be connected by means not shown to one end of a wand 17, which, in turn, may be connected to various attachments, such as the rug cleaning attachment, generally designated by the reference numeral 18 in FIG. 1 of the drawings. Obviously, other attachments, such as an upholstery tool, a crevice tool, a dust brush or a turbine brush such as is disclosed and claimed in copending Jepson, Ernestberger and Wolter application, Serial No. 42,080, filed July 11, 1960, and assigned to the same assignee as the present application, may be employed.

The base shell or panlike member 11, which forms a major portion of the housing of the vacuum cleaner 10 comprises a panlike open top member of generally circular configuration having a rolled rim 11a surrounding the open top. The base shell 11 is very similar to that disclosed in the copending Jepson and Wied application, Serial No. 39,865, referred to above, and includes a relatively flat, annular bottom 11b (FIGS. 2 and 3) between a vertical cylindrical outside wall 11c and a raised central annular shelf 11d (FIG. 3) for receiving and supporting a motor-driven fan unit, generally designated as 20. The construction of the motor-driven fan unit 20 and the support thereof within the housing is not described herein, but may be identical with that in the aforesaid Jepson

3

and Wied application. For strengthening the annular bottom 11b, a plurality of raised or upstanding ribs 11e and an additional single rib 11f integrally formed with the bottom and radially disposed, as best shown in FIG. 3 of the drawings, are provided. The rib 11f is adjacent what might be termed the front of the housing. As best shown in FIGS. 2 and 3 of the drawings, the forward portion of this rib 11f may have a slight enlargement, the purpose of which will be described hereinafter. The wheels 13 are secured to the housing 11 in any suitable manner and preferably identical with that disclosed in the above-mentioned Jepson and Wied application, wherein they are recessed in the side walls of the housing so that the rolled rim 11a extends outwardly at least as far as the wheels.

The portion of the housing 11, which might be termed the front thereof, is provided with an inlet opening into which there is inserted the tubular portion 22a of a molded plastic inlet unit 22. The molded inlet unit 22 preferably includes a portion 22b having a curved configuration so as to conform with the outer periphery of the wall 11c of the base shell 11. Moreover, this outer portion preferably has a pleasing appearance to improve the aesthetic appearance of the vacuum cleaner 10. The tubular portion 22a, as will become apparent from the ensuing description, extends into the annular chamber within base shell 11 surrounding the motor-driven fan unit 20 and is adapted to make connection with the disposable dust bag, described hereinafter. The tubular portion 22a has a smooth, circular passageway therein to make a relatively close fit with the tube coupling 15 and includes an annular recess 24, whereby locking connection with suitable means on the tube coupling 15 can be made, thereby to lock the tube coupling in a releasable manner to the inlet unit 22. A plurality of fastening means 25 extend through the wall 11c of the base shell 11 to secure the inlet unit 22 thereto. To insure that no air leakage occurs at the opening in the housing wall 11c, through which the tubular portion 22a of inlet unit 22 extends, a suitable gasket 26 (FIG. 3) is interposed between a shoulder defined on the unit 22 and the exterior surface of the wall 11c of the base shell 11 surrounding the opening through which the inlet tube portion 22a extends.

In order that the user of the vacuum cleaner 10 may readily carry the same around, a suitable D-shaped handle 28 is provided which may have a portion 28a thereof interposed between the inlet unit 22 and the wall 11c of the housing or base shell 11 and which may be clamped securely to the base shell 11 by the same fastening means 25 that hold the inlet unit 22 in place.

In order that the vacuum cleaner 10 may be supported on a suitable support of shelf 29, in the manner shown in FIG. 5 of the drawings, which is characterized as the storage position, there is provided a base stand 30, preferably formed of a molded plastic, which base stand also defines an air exhaust opening 31 (FIG. 3). As illustrated, the base stand 30 includes an arcuate portion 30a generally conforming to the exterior circular configuration of the pan wall 11c and is secured to the base shell 11 by any suitable fastening means 32 (FIG. 3) extending through the wall in a well-understood manner. The lower portion of the base stand 30, which defines the opening 31, is provided with a longitudinal extending rib 30b. Furthermore, the upper part of the base stand 30 includes a pair of projecting legs 30c and 30d which together with the rib 30b provide a sort of tripod support.

As in the above-mentioned Jepson and Wied application, the motor-fan unit 20 is mounted within the vacuum cleaner 10 in a slightly off-center position so that the center of gravity is slightly to the rear of the axis of the wheels 13. Consequently, the vacuum cleaner normally assumes the position shown in FIG. 3 of the draw-

4

ings. The base stand 30 is provided with a pair of depending spaced parallel integral ribs 30e (FIG. 3) for engaging the surface upon which the vacuum cleaner 10 is supported due to the fact that the center of gravity is to the rear of the wheels and effectively provide parallel skids or runners.

As in the above-mentioned Jepson and Wied application, and as best shown in FIG. 3 of the drawings, a diffuser 35 is provided to convert the kinetic energy of motion of a large volume of air to a desired static pressure. This diffuser is actually disposed beneath the housing 11 and is supported from the motor-driven fan unit 20. For the purpose of muffling the air escaping from the periphery of the diffuser unit 35, there is provided a muffler 36 which is preferably formed from a strip of foam plastic, such as a polyester urethane foam. It will be apparent that the exhaust air from the fan unit passes through the muffler 36, which is below the bottom of base shell 11. In order to house or enclose the diffuser unit 35, there is provided a base shell pan 38, which is secured by suitable screws 39 to flanged tubular members 40, which are welded at spaced points to the bottom of the base shell 11, two of which are closely shown in FIG. 3 of the drawings. The bottom of pan 38 is preferably provided with a peripheral flange 38a for engaging with the underside of the annular surface 11b of base shell 11. Preferably the pan 38 is provided with suitable openings through which a power cord 41 (shown only in FIG. 5 of the drawings) may enter the motor chamber and another opening for a toggle switch 42 (shown only in FIG. 1 of the drawings) which is in the power circuit to the motor-driven fan unit 20. The portion of the bottom pan 38 adjacent the base stand 30 is provided with an opening 43 through which the air exhausted from the motor-driven fan unit 20 may pass into the base stand 30 and exhaust through the opening 31. If desired, a suitable deflector 44, pivotally mounted within the base stand 30, may be provided to normally close the major portion of the opening 31 and deflect the exhausting air in a desired manner. It will be understood that if it is desired to use vacuum cleaner 10 for a blowing operation, the coupling 15 and associated hose 16 will be connected to exhaust opening 31.

In use, the user of the vacuum cleaner may pull it around by the hose 16 and this force will tend to tip the vacuum cleaner down at the forward portion thereof so that the ribs 30e are raised from the supporting surface. In order that there may be provided a resting point for the forward portion of the vacuum cleaner 10, the pan 38 is provided with a depending portion 38b of somewhat conical shape at the apex of which is provided a plastic skid button 45, preferably formed of nylon or the like. This plastic skid button 48 defines a suitable skid which will not mar or scratch any surface with which it engages.

It will be apparent that the handle 28 and the projecting toe portions 30c and 30d of the base stand 30 provide projections about which the power cord 41 can readily be wound for storage purposes, as clearly indicated in FIG. 5 of the drawings.

The vacuum cleaner 10 described above employs a disposable paper bag 46 which, when expanded, is an elongated tubular member closed at both ends. At the center of the bag there is provided a rectangular cardboard stiffener member 47 having an opening therein of a size to receive the tubular extension 22a of inlet 22. There is, of course, also an opening in the disposable bag 46 aligned with the opening in the cardboard member 47. The cardboard member 47 is of such size that the bottom edge thereof is receivable within a recess 48 in front of the upstanding rib 11f in the annular bottom of base shell 11. The top of the cardboard member 47 is held in position by a dust bag spring 49 of somewhat U-shaped configuration which is secured to the inside of the vertically disposed wall 11c of the base shell 11 by the fastening means 25 which secure the inlet 22 and the handle 28 in

position. As is best shown in FIGS. 2 and 3, the dust bag spring 49 maintains the rectangular cardboard stiffener member 47 in the position shown in FIGS. 2 and 3 of the drawings. If desired, a suitable gasket may be employed surrounding the tubular extension 22a, against which gasket the cardboard stiffener member 47 may be held by the recess 48 and the dust bag spring 49. As is indicated in FIGS. 2 and 3 of the drawings, the disposable dust bag 46 is preferably pleated so that it may be folded into a very small, flat package for storage purposes. Obviously, the dust bag 46 will be made of a paper having the desired porosity to permit air flow therethrough and at the same time retain therein the dust and dirt collected. The dust bag 46 may be essentially identical with that employed in the vacuum cleaner disclosed in the above-mentioned Jepson and Wied application.

As in the above-mentioned Jepson and Wied application, a permanent dust screen for protecting the motor-fan unit 20 is provided should anything happen to the disposable bag 46, and to this end there is provided a cylindrical filter screen 51, which is suitably secured to brackets or other means forming a part of the motor-fan unit 20. The filter screen 51 actually includes a cylinder formed of steel screen wire which has been rayon flocked both on the inside and the outside. The upper part of the filter screen 51 is closed by a filter cover 52 which may be stapled or otherwise secured to the filter screen 51. Suitable screws 53 (FIGS. 2 and 6) secure the filter screen in position in the vacuum cleaner 10.

The cover 12 has a cross section, as best shown in FIG. 3 of the drawings, including a flat, generally circular central portion 12a and a peripherally extending flange 12b. In order to prevent the escape of air at the junction between the cover 12 and the base shell 11, there is provided a cover sealing gasket 56, best shown in cross section in FIG. 4 of the drawings. The sealing gasket 56 is an annular or circular member which serves both as a sealing gasket and a protective resilient bumper. The cross section of this gasket is best shown in the greatly enlarged view thereof in FIG. 4 of the drawings and includes the narrow annular opening 57 on the inside thereof for receiving the peripheral flange 12b of the cover 12. Sealing gasket 56 is preferably an extruded vinyl resin gasket which is in the form of an endless loop. The gasket 56 includes a sort of U-shaped cross section at the bottom defining a recess 58 (FIG. 4) for receiving therein the rolled rim 11a of the base shell 11, as best shown in FIG. 3 of the drawings. A compressible loop portion 56a defines one wall of the recess 58 and can readily be compressed to provide the desired seal between the gasket 56 and the base shell 11. Furthermore, the gasket 56 has an outside dimension which extends beyond the exterior of the wheels 13 and, hence, acts as a bumper to preclude the wheels or other parts of the vacuum cleaner 10 from marring furniture or walls that might be engaged by the same.

It will be apparent from FIG. 7 of the drawings that the cover 12 may be bodily lifted from the base shell 11. In accordance with the present invention, the cover 12 is secured to the base shell 10 in sealed relationship therewith by means of a magnetic latch, generally designated at 60, and best shown in FIGS. 2, 3, 6 and 7 of the drawings. As illustrated best in FIG. 6 of the drawings, there is provided a sort of dish-shaped magnet retainer 61, which is secured to the top 52 of the filter 51, as by a fastening means 62. A suitable foam rubber washer 63 is interposed between the magnet retainer 61 and the cover 52. Disposed within the magnet retainer 61 is a magnet 64 preferably formed of a rubber bonded barium ferrite material so as to give a somewhat compressible magnet. The magnet 64 is magnetized in a vertical direction, as indicated in FIG. 6 of the drawings. It will be apparent that the magnet 64 is mounted just underneath the cover 12 and the resilient foam washer 63 normally tends to bias the magnet upwardly so that when the cover is placed

on the vacuum cleaner 10 the depressed center 12a of the cover will tend to engage the magnet 64. If desired, a suitable circular plate 65 may be spot welded or otherwise secured to the inside of the cover 12 which plate is attracted by the magnet 64. Due to the fact that the magnet 64 is deformable by virtue of the rubber bonded material, contact with the plate 65 over the entire area is assured. In a device built in accordance with the present invention, the magnet retainer assembly 60 was designed to support a force of sixteen pounds. When the cover 12 is placed on the vacuum cleaner, the plate 65 secured to the inside center thereof engages the magnet 64 which effectively latches the cover in position with a sufficient force to provide the desired seal at the peripheral gasket.

To assure proper seating of the gasket 56 into sealing engagement with rim 11a of the pan-like member 11, the magnet 64 may be spaced below the cover 12 so that a slight amount of flexure of the cover 12 is necessary to achieve engagement between the plate 65 and the magnet 64. The resilience of the depressed center 12a of the cover urges the gasket 56 into engagement with rim 11a. The amount of spacing of the cover 12 from magnet need only be on the order of $\frac{1}{32}$ " to obtain a satisfactory biasing force.

It should be understood that the reduced pressure created by the motor-driven fan unit 20 within the base shell 11 increases the retaining force exerted upon the cover 12 when the motor is operating. The primary function of the magnetic latch 60 is to seat the gasket 56 against the rim 11a initially and retain the cover 12 in place when the motor-driven fan unit 20 is not operating.

In view of the detailed description included above, the operation of the suction cleaner of the present invention will be readily understood and no further discussion is included herewith. It will furthermore be appreciated that there has been provided a very inexpensive vacuum cleaner with a simple and foolproof means for securing the cover 12 to the base shell 11 in a sealed manner and yet in a readily removable manner.

While there has been shown and described a particular embodiment of the present invention, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the invention in its broader aspects and it is, therefore, contemplated in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A suction cleaner comprising an open top panlike circular housing, means defining inlet and exhaust openings in said housing, a circular cover for the open top of said housing, a sealing gasket interposed between said cover and said housing, said cover being bodily removable from said housing and having a central flexible portion, said central flexible portion including a magnetically susceptible portion, means for supporting said housing, a suction creating motor driven fan member supported by said housing, a part of said member being disposed within said housing and centrally thereof and extending upwardly toward the open top of said housing thereby to define an annular chamber within said housing surrounding said part, a filter member surrounding said part of said motor driven fan member, an elongated porous dust collecting means connected to said inlet opening and substantially filling said annular chamber, magnetic means secured to one of said members and disposed adjacent said magnetically susceptible portion but spaced therefrom when said cover is placed in position to close said access opening without compressing said gasket, said magnetic means being rendered effective to maintain said gasket in compressed condition and effectively to latch said cover in sealed relationship with said housing upon applying an external force to said flexible portion of said cover to

7

move the same sufficiently to cause said magnetically susceptible portion to engage said magnetic means.

2. A vacuum cleaner comprising an open top circular panlike housing having inlet and exhaust openings defined in said housing, a circular disklike cover member for the open top of said housing, said cover member having a flexible central portion, a compressible sealing gasket interposed between said cover member and the portion of said housing defining said open top, a suction creating member supported by said housing and at least partially disposed within and centrally of said housing to define an annular chamber within said housing surrounding said suction creating member, magnetic means disposed within said housing and secured to one of said members adjacent the central portion of said cover member, a magnetically susceptible element secured to the other of said members adjacent said magnetic means but spaced therefrom when said cover member closes said opening but said gasket is uncompressed, said magnetic means and said magnetically susceptible element being engageable only upon flexing said central portion of said cover member sufficiently to apply a predetermined biasing force to said gasket to insure a seal between said cover member and

8

said housing whereby said magnetic means effectively latches said cover in sealed relationship with said housing.

3. The suction cleaner of claim 1 wherein said magnetic means comprises a dish-shaped magnet retainer secured to said filter member, resilient washer means interposed between said retainer and said filter member, and a magnet secured by said retainer.

References Cited by the Examiner

UNITED STATES PATENTS

2,734,594	2/56	Meeker	55—473 X
2,761,717	9/56	Mahlke	292—251.5
2,844,402	7/58	Hughes	292—251.5
2,959,832	11/60	Baermann	252—62.5
3,039,803	6/62	Stoll et al.	292—251.5
3,050,921	8/62	Seyfried	15—327 X

FOREIGN PATENTS

631,523	11/49	Great Britain.
---------	-------	----------------

HARRY B. THORNTON, *Primary Examiner.*