

July 12, 1966

C. E. CASADY
RECEPTACLE AND INTERLOCKING RESILIENT FLANGE
SUPPORT MEANS THEREFOR

3,260,038

Filed Oct. 16, 1962

2 Sheets-Sheet 1

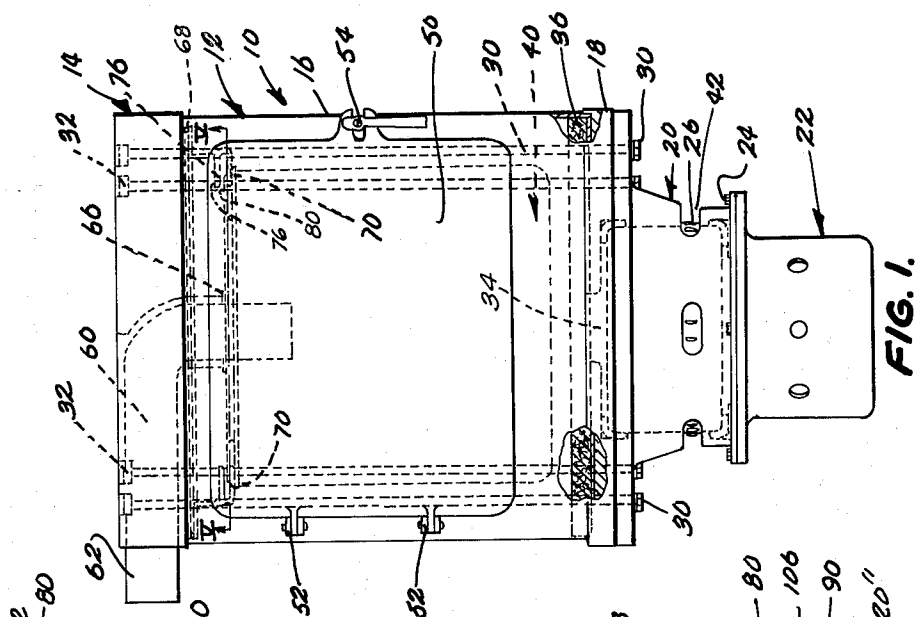


FIG. 1.

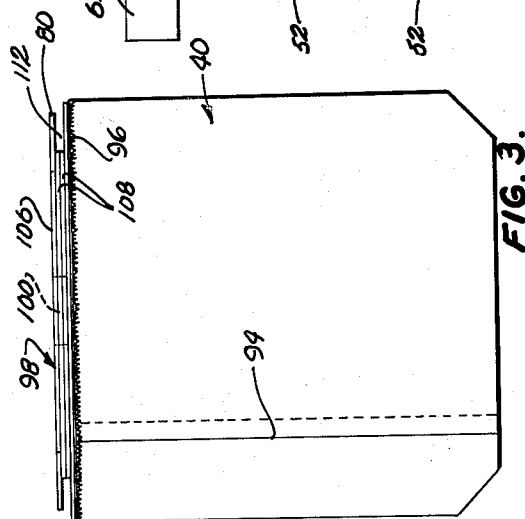


FIG. 3.

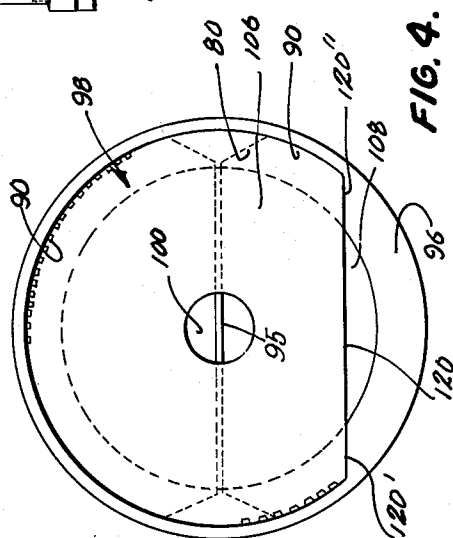


FIG. 4.

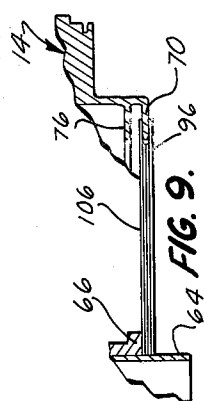
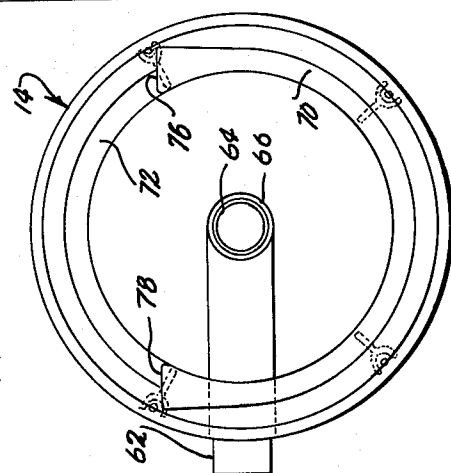


FIG. 9.



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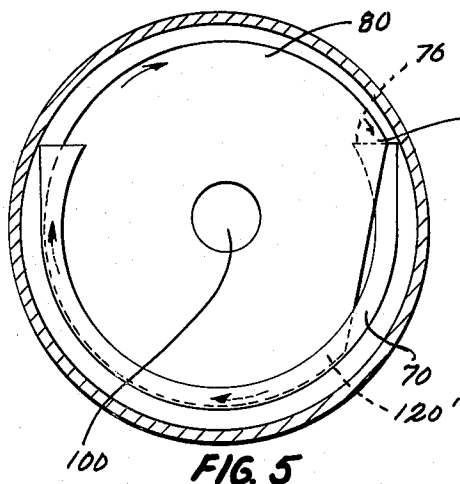


FIG. 5

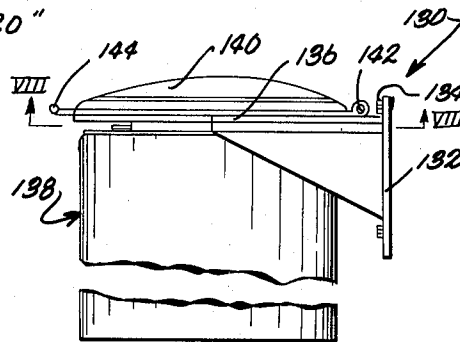


FIG. 6.

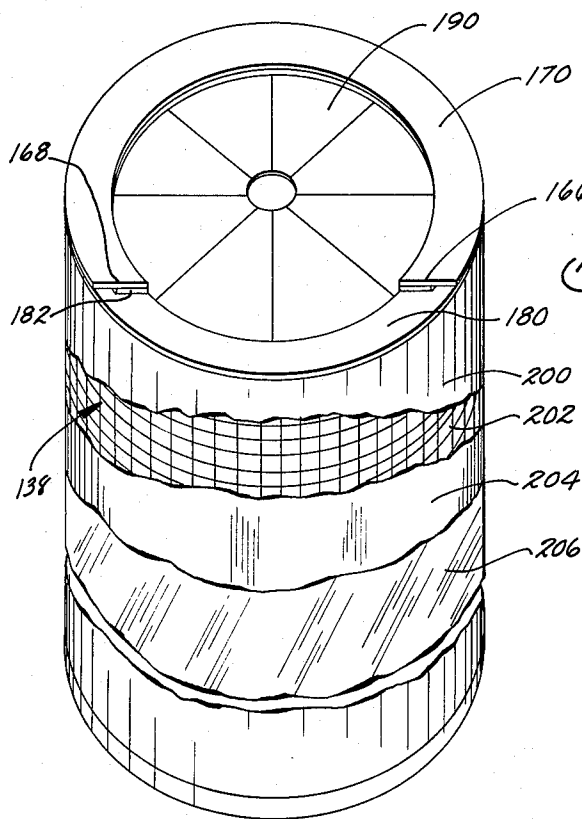


FIG. 7.

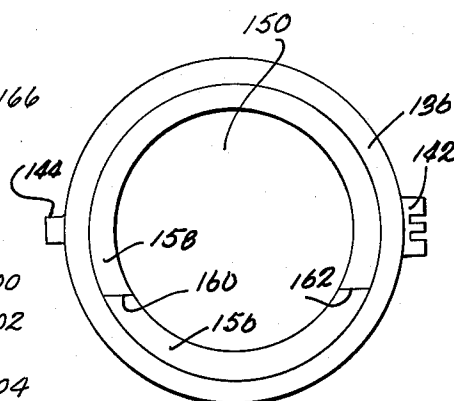


FIG. 8

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RECEPTACLE AND INTERLOCKING RESILIENT FLANGE SUPPORT MEANS THEREFOR

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3 Claims. (Cl. 55—373)

This invention relates to a novel disposable refuse container interfitted with a special support bracket, and more particularly to a novel connecting means engageable and readily disengageable between a disposable container and a support bracket. In one specific form of the invention, the interlocking disposable container and support assembly pertains particularly to porous dirt receptacle bags in vacuum cleaning apparatus. In another specific form of the invention, the interlocking disposable bag and support assembly pertains particularly to water-proof garbage containers.

Centralized vacuum cleaning systems are becoming very popular recently, especially in private dwellings, apartments, motels and smaller size commercial buildings, for reasons of convenience and economy, among others. Such centralized systems normally use one motor and blower for evacuation purposes, with capped air inlet valves at handy locations in each room, and airtight conduits extending between these sockets and the blower. Thus, a person need only plug a flexible hose into an inlet valve in the particular room concerned to vacuum clean that area. Such systems necessarily collect large amounts of dirt over a short time period in the dirt receptacle adjacent the blower. Consequently, this dirt receptacle must be replaced periodically with a clean receptacle.

It is an object of this invention to provide a novel disposable refuse receptacle supported on a unique suspension bracket assembly to enable simple, rapid removal of the dirt filled receptacle and replacement thereof with a clean one. No moving parts are involved or needed for the removable connection between the receptacle and bracket.

It is another object of this invention to provide a vacuum cleaning apparatus incorporating a suspension-type bracket supporting and interfitted with a removable, disposable bag-type container that uniquely provides an airtight fit on the bracket, without moving parts, to form the interfitting connection. Clean bags can be inserted merely with a twist of the bag.

In a related field of garbage and/or trash collection and disposal, the novel apparatus fulfills all requirements of a disposable container. Consequently, filthy, unsightly metal or plastic cans normally located around the house, apartment building, etc. to draw vermin and rodents, and unpleasant to the sight and smell, are eliminated. In their place is substituted an economical, practical, sturdy disposable garbage receptacle. Heretofore, as far as is known, no garbage container has simultaneously been (1) capable of withstanding moisture conditions from within and without, (2) strong enough to support heavy garbage with rough usage, (3) provided with upright support, (4) sufficiently inexpensive to be disposable, and (5) capable of incineration.

It is therefore another object of this invention to provide a disposable refuse container which can be supported upright, economical to manufacture and use, and practical because of its strength, its resistance to rodents, its external weather-proof qualities, its internal moisture-proof qualities, and its capacity to be incinerated. It can readily be disposed of when full, thereby not standing around uncleaned for months to draw pests. It is easy to use by the housewife. Moreover, due to the unique engagement construction between the disposable bag and the suspension-type support bracket, it can be readily en-

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gaged for sturdy support, without moving parts, merely with a twist of the bag. It is just as readily removed for disposal.

It should be understood that the term "refuse" when used herein, unless otherwise qualified, includes any unwanted substance or dross to be discarded, such as dirt, garbage, trash, etc.

These and other objects of this invention will be apparent upon studying the following specification in conjunction with the drawings in which:

FIG. 1 is a side elevational view of a vacuum-type cleaning apparatus incorporating a disposable container interlocked in the apparatus according to the first form of this invention;

FIG. 2 is a view of the underside of the cap and bracket forming part of the assembly in FIG. 1;

FIG. 3 is a side elevational view of the novel disposable porous dirt-collecting container bag used in the first form of this invention;

FIG. 4 is a top plan view of the bag illustrated in FIG. 3;

FIG. 5 is a sectional view taken on plane V—V of FIG. 1 and illustrating the first stages of the interlocking engagement action between the bag flange and bracket flange;

FIG. 6 is an elevational view of the inventive interlock between a unique, disposable, water-proof garbage bag and bracket assembly in the second specific form of the invention;

FIG. 7 is a perspective view of the disengaged disposable garbage bag;

FIG. 8 is a view taken on plane VII—VII of FIG. 6, of the bottom of a bracket in the apparatus in FIG. 6, i.e. interfitting with the bag in FIG. 7; and

FIG. 9 is a fragmentary sectional elevational view of the bag and bracket interfit shown in dotted lines in FIG. 1.

Basically, the inventive disposable container assembly comprises a support bracket of generally annular configuration including an annular supporting flange having a cutout section, a replaceable, disposable, container bag interfitting with and supported by the bracket, and having a slightly flexible, resilient annular support flange around a refuse-receiving central opening and having a cutout section at one portion thereof. One of the flanges is oriented radially outwardly, and the other is oriented radially inwardly, with the outer diameter of the outwardly directed flange being greater than the inner diameter of the inwardly directed flange for support of the bag on the bracket. Engagement of the flanges is achieved by deformation of a radial cutout edge of the flexible container flange to a position over the radial cutout edge of the bracket flange, and subsequent rotation of the bag to deform the flexible flange a little at a time over its extent to force the bag flange above the bracket flange for suspension thereon.

In the first form of the invention the disposable bag and bracket are embodied in suction cleaning apparatus including motor operated suction blower means and a housing adapted to receive the disposable porous bag receptacle. The housing includes a centrally positioned open end duct which is adapted to communicate with the area to be cleaned, is adapted to fit through a cover disc on the bag, and has an annular sealing surface around its periphery substantially co-planar with the bracket support flange so that the disc seals against it when the flanges are interengaged.

In the second form of the invention (FIGS. 6 through 8), the bag and bracket form a refuse collecting apparatus for garbage. The bracket includes a removable cover means interfitting therewith, and the bag comprises a laminated resin impregnated construction which is in-

ternally moisture-proof, non attractive to rodents, and externally weather-proof.

First form

Referring now specifically to the drawings, in the form of the invention illustrated in FIG. 1, the vacuum cleaning apparatus 10 there shown is especially intended for use in a centralized cleaning system. The housing 12 is composed of a cap portion 14 which includes an integral hanger bracket, a central housing shell 16 sealingly interfitted with cap 14, and receiving the bracket, a base plate 18 sealingly interfitted on the lower end of shell 16, a blower assembly 20 attached to the housing, and a motor means 22 secured beneath and operably connected to the blower. The motor means may be of any conventional high speed type such as an A.C. electrical motor. It is secured by bolts 24 to the blower assembly and is operably connected to the blower 26 by a shaft connection (not shown). The blower 26 may be of any conventional type used for creating a pressure differential and thereby creating a relative suction or vacuum less than atmospheric pressure within housing 12. The blower 20, base plate 18, housing shell 16 and bracket 14 are all secured together by elongated studs 30 extending therethrough and held by nuts 32 on the upper ends thereof.

The base plate 18 includes a central opening 34 for air passage. Over this passageway 34 and supported by base plate 18 is a filter 36 of conventional construction to prevent any dust passing through the dirt collecting porous walls of the receptacle bag 40 from being blown out the orifices 42 of the blower.

On the front of the housing shell 16 is a door 50 mounted on a pair of hinges 52 and latchable into a closed position by latch 54. This door provides access to the interior of the housing where the porous disposable bag 40 is located.

In the sealed cap 14 is formed an integral conduit 60 which communicates on the upper end through a tubular insert 62 with the complex ducted system extending throughout the building. On its lower end, conduit 60 includes a tubular insert 64 which projects downwardly into the housing and into the bag 40. It includes an annular sealing surface 66 on its periphery, formed by the lower surface of an integral flange of conduit means 60.

The cap 14, sealed to housing portion 16 by annular seal 68, extends downwardly inside the housing, with the lower terminal portion thereof being a suspension bracket means for bag 40. The most important element of this suspension bracket means is the lower, annular, inwardly-directed, radial flange 70 adapted to suspendably support the upper slightly flexible, resilient, radially-outwardly extending flange 80 (FIG. 3) on bag 40. If desired, a second upper flange 72 may be located parallel to, and just above lower annular flange 70 to limit upward movement of bag flange 80.

In FIG. 2, looking at the bottom of cap 14 and its bracket assembly, it will be noted that lower flange 72 includes an arcuate, cutout portion which extends radially over the width of the flange. The edge surfaces 76 and 78 of the cutout extend in a chord-like fashion and include a radial component. The particular angle of this surface with respect to the center of the circle may vary greatly.

Referring to FIGS. 3 and 4, the disposable porous bag 40 includes walls formed of a suitable folded, porous, paper or plastic construction adhered at the seams 94 and 95 along the side and bottom respectively to form a structure having a circular top and tapering to a linear bottom. The particular construction and configuration of the porous bottom and walls of this bag may vary within the principles as taught herein, as long as the dirt is retained and the air is passed. The upper end has tiny radial slits all around its periphery to form a series of adjacent small tabs 90 to be adhered to the disc 98 that

caps and seals the bag. Disc 98 includes a circular central opening 100 through which tubular section 64 of duct means 60 protrudes. The edge portions of opening 100 fit tightly against surface 66 when the bag is connected, as will be explained hereinafter. Positioned above the lower member 96 is a second generally annular shaped portion 106 preferably with a slightly smaller outer diameter than the lower portion 96 and spaced therefrom by a pair of intermediate spacers 108 forming a neck portion with a smaller diameter. These annular portions may be formed of a paper stock or cardboard material, a plastic material or any other suitable substance which has slight flexibility to allow limited deformation in a vertical direction, resiliency to return to the original position after the pressure of deformation is removed, sufficient strength against bending to support a bag load of refuse, and sufficient economy to be disposable. It is also preferably combustible. These annular portions are adhered together with a suitable resin such as an epoxy resin or any other equivalent adhesive. They form an annular groove 112 into which flange 70 of bracket means can fit and support the bag. Referring to FIG. 4, it will be noted that the top portion 106 includes an arcuate cutout portion which is most economically produced by die cutting the edge of portion 106 on a chord before assembly. This forms chordal surface 120 including edges 120' and 120'' on peripheral flange 80. Each of these edges includes a radial component, i.e., extends more or less radially inwardly toward the central area of the disc, and may vary at different angles to the disc center. The cutout portion may be of varying size depending upon the characteristics of the flange material, and ease of manufacture, etc.

To insert a clean disposable refuse bag 40 into the assembly illustrated in FIG. 1, the handle on the latch means 54 is rotated and the door 50 is swung open on its hinges. The lower part of bag 40 is then inserted through the opening. The bag is then moved up vertically so that tubular projection 64 fits snugly through corresponding opening 100 in the top of the bag. Then, the bag is tilted slightly so that edge 120'' of flange 80 is inserted above the edge 76 of the lower flange 70 on the bracket. The insertion is illustrated graphically in FIG. 5 (looking down at the flanges on the plane V—V in FIG. 1). Then the bag is simply rotated or twisted one revolution. As the bag is rotated, the slightly flexible flange 80 is temporarily deformed at each portion as it passes over edge 76 of flange 70. As soon as this portion is above flange 70, its resiliency returns it to its original undeformed condition while the subsequent section is being temporarily deformed. After one revolution of the bag and disc assembly, the complete flange 80 is above flange 70 as illustrated in FIG. 1, and supports the bag structure in a suspended manner. It is an important feature of this form of the invention that it achieves an airtight connection around tube 64, in spite of the utter simplicity of construction. Since the upper surface of flange 70 is substantially coplanar with sealing surface 66 or slightly above it, the disc element fits tightly against surface 66. If the tube 64 did not have to seal to the bag top, the bag could be tilted at a large angle to install it. However, the bag must be moved directly up without any large tilt since any slight distortion of the top, except on the edges would break the center seal and allow a loss of vacuum i.e. negative pressure through the bag. The total combination of parts and its total uniqueness therefore become apparent. The pressure differential caused by the blower 26 creates a negative pressure with respect to atmospheric inside the housing and above upper disc 98 to force the disc tightly against surface 66 and completely seal it against significant leakage. In use, air and dirt will be sucked by blower through the complex duct work (not shown) into conduit 60, into the bag. Dirt will be retained in the bag while the carrying air will pass through the porous bag, through the blower 26, and out outlets 42.

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When the bag is full of dirt after a period of usage, it is rotated clockwise or counterclockwise after the edge 120' or 120" is slightly deformed (e.g. with one's finger) to cause it to pass below the leading edge 76 or 78 of flange 70. Twisting the bag one revolution removes it from the bracket for disposal. A new bag is then inserted as before.

Second form

The same interlocking principle between the removable bag and the bracket assembly is utilized in a slightly different environment in the apparatus illustrated in FIGS. 6, 7 and 8. Referring to FIG. 6, the unique refuse disposal apparatus 130 there illustrated includes a support 132 adapted to be mounted by bolts 134 to the wall, to a post, or to other supporting structures. This device may be supported to any suitable rigid element such as a post, a beam, etc. It may use a variety of fastening means instead of bolts 134 to mount it, e.g. clamping brackets. Basically, the support 132 suspends hanger bracket 136, which in turn supports the disposable garbage bag 138. A cover 140 is mounted to bracket 136 by hinge 142 and includes a lifting handle 144. The cover interfits with bracket 136 to normally close the container, and to alternately enable insertion of garbage through central opening 150 in annular bracket into bag 138. As before, the bracket includes an upper flange 156 and lower flange 158 (viewed from the bottom in FIGURE 8). The lower flange 158 has an arcuate cutout portion with edge surfaces 160 and 162 for cooperation with cutout edge surfaces 166 or 168 on upper flange 170 of garbage bag 138 (FIG. 7). Between upper bag flange 170 and lower flange 180 is an annular peripheral groove 182 formed adjacent a spacer between these two flanges similar to the structure shown in FIG. 2. The walls and bottom of the bag are secured to the upper disc by adhering it thereto with a suitable adhesive such as epoxy materials or the like.

The central opening in this form of the invention is preferably formed in a semi-closed fashion by a plurality of radial, pie-shaped, deformable resilient paper or plastic sections 190 around the top of the bag. By pressing garbage against these flaps 190, they move apart and downwardly to allow the garbage to pass through, and then spring back up again. Obviously, this structure may be varied greatly as desired.

The interfitting of upper flange 170 with lower flange 158 on the bracket means is exactly the same as that described with respect to the first embodiment of this invention.

The novel garbage bag has a special laminated construction as illustrated in FIG. 7, that enables it to withstand the rigors of a garbage retainer and yet be disposable, and actually subject to incineration. The walls and bottom of the bag have an exterior resin coat 200 of a water-proof resin such as a polyester, a polyepoxy or other water-proof material to render the bag exterior water-proof and therefore weather-proof. Inside this resin coat is a plastic mesh or screen material forming the second layer 202 to provide suspension strength and to help keep rodents and vermin out of the bag. Inside this mesh or web layer 202 is a resin impregnated paper, a polyester impregnated paper, or other reinforced paper or equivalent material to form the main body support with strength and water repellancy, yet sufficient flexibility for easy disposal, and with economy of fabrication to be disposable. Inside the bag a suitable liner 206 of polyethylene, polyvinyl, or other suitable plastic water-proof material is included to render the interior moisture-proof from the inside so that wet refuse will not penetrate the bag and weaken it. Thus, briefly, the materials include a resin to make it water-proof from the outside, a plastic inner-lining to make it water-proof from the inside, an impregnated paper material for strength and economy, and a plastic or metal

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web or mesh for supplemental strength and rendering it rodent-proof and vermin-proof. The flexible bag is also sturdy, economical, practical, simple to install and remove, and simple to use, relatively clean and thus extremely advantageous for apartment buildings, homes, etc. It can be installed in a few seconds time. When removed, it is thrown into an open truck in the contained condition, without dumping. It is then thrown as a bag into an incinerator and completely combusted in a neat dry operation. Various other advantages may occur to those in the art upon studying the foregoing forms of this invention. Also, various modifications within the principles of the invention as taught may occur to those in the art to suit a particular use. These obvious modifications are deemed to be part of this invention, which is to be limited only by the scope of the appended claims and the reasonably equivalent structures to those defined therein.

I claim:

1. Suction cleaning apparatus comprising: a hollow tubular housing having first and second opposite ends; said tubular housing including first and second closing head members at said first and second ends respectively; a motor operated blower means attached to said second head member and fluidly communicating with said second end of said housing; said housing having an inlet duct extending into said housing at said first end, opposite said blower means, and having an outer periphery; said first head member at said first end having a radially inwardly extending annular support flange element having inner and outer peripheral diameters and a flat upper surface; said outer peripheral diameter being connected to said first head member at all points; said flange element having a cutout formed by cutting a chord across it, with the perpendicular distance from the chord to the center of said flange element being less than the inner radius of said flange element; a porous disposable dirt receptacle bag in said housing; said bag having a top end and having said top end supported on said annular support flange element to suspend said bag therefrom; said top end of said bag having a first flat annular element having an inner peripheral diameter forming a central opening receiving said duct, said opening and said duct being constructed and arranged so that the entire periphery of said opening contacts the entire outer periphery of the exterior of said duct, thus creating an airtight seal between the periphery of said opening and the exterior of said duct, said annular element also having an outer peripheral diameter greater than the inner peripheral diameter of said housing support flange element and smaller than the outer peripheral diameter of said housing support flange element; said bag having a second annular element spaced from said first annular element forming an annular outer groove sealingly receiving said housing support flange element; the outer periphery of said second element sealingly secured at all points to all points of the periphery of the top end of said bag; said first annular element of said bag also having a cutout formed by cutting a chord across it, with the perpendicular distance from the chord to the center of said first annular element of said bag being greater than the radius of the inner periphery of said first annular element of said bag and less than the outer peripheral radius of said first annular element of said bag.
2. The apparatus in claim 1 wherein said duct includes an annular member therearound having a flat surface generally in the plane of said flat surface of said annular support flange element, sealingly engaging said first flat annular element of said bag.
3. The apparatus in claim 1 wherein said first flat annular element on said bag has sufficient flexibility to temporarily flex the thickness of said annular support flange element for connection and disconnection of said bag.

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