INSTALLED SUCTION CLEANER SYSTEM

FIG. 1.

FIG. 2.

FIG. 3.

INVENTOR.
CLARENCE E. STEVENS

ATTORNEY
This invention relates to suction cleaning apparatus and more particularly to an improved suction cleaning apparatus adapted to be permanently installed in buildings generally and more particularly in dwellings.

Installed suction cleaner systems have been proposed heretofore, but have fallen into disfavor with users owing to their many shortcomings. In general, installed systems for household use have been so costly as not to be competitive with portable type cleaners. Furthermore, installed systems, as heretofore designed, have been bulky, labor intensive in operation, as well as in certain conveniences and flexibility of use.

By the present invention there is provided an improved inexpensive installed type cleaner system obviating the shortcomings of prior systems and so compact as to be installable in space not particularly suitable for other purposes, as for example, the upper portions of a closet or in the wall of the garage, and the like. The apparatus is constructed in one unitary assembly comprising as principal components a filter housing and a motor driven suction unit attached to the exterior side wall of the filter casing. By this arrangement, either the filter casing or the power unit readily accessible independently of the other. Additionally, the location of the power unit externally of the main casing isolates the moving parts of this unit from the dirty atmosphere existing inside the filter casing leaving the interior of the latter unobstructed and usually available for filtering purposes. Among the features of the assembly is the use of a closure for the access opening to the filter chamber which serves not only to clamp the filter bags in place but includes a dirty air duct coupling forming a readily separable junction with the installed suction duct system. This separable coupling also features a normally closed inlet adapted to seat a flexible suction hose found convenient in cleaning the area local to the cleaning apparatus.

Another feature of the design is the use of a hollow bracket interconnecting the motor power unit and the filter housing and serving additionally to support the power unit and to enclose a final filter for the clean air flowing to the suction fan chamber. Secured to the outlet of the discharge side of the fan chamber is an air diffuser unit featuring a normally closed discharge outlet to which a flexible hose can be connected in a manner to bypass the diffuser and direct pressurized air to a point of use, as for example, to clean by blowing or to supply pressurized air to operate a paint sprayer and the like auxiliaries.

Accordingly, it is a primary object of the present invention to provide an improved installed suction cleaner system for use in buildings and dwellings. Another object of the invention is to provide an installed type suction cleaner unit having a main filter casing to the exterior of which is secured a power driven suction unit and wherein said filter and suction unit are independently accessible for servicing.

Another object of the invention is the provision of a unitary suction cleaner assembly adapted to be permanently supported on the wall of a building and to have its inlet opening connected to suction ducts mounted in the building wall and opening into the various rooms to be cleaned.

Another object of the invention is the provision of improved suspension bracket means in combination with a unitary suction cleaning apparatus adapted to be stationarily supported on a building wall.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawings to which they relate.

In the drawings:

FIGURE 1 is a fragmentary schematic view of a portion of a dwelling showing the unitary suction cleaner apparatus of this invention installed in a closet thereof and connected through suction ducts to outlets in the different rooms;

FIGURE 2 is a top plan view on an enlarged scale of the suction cleaner apparatus proper;

FIGURE 3 is a fragmentary sectional view of the dirty air inlet coupling taken along line 3-3 on FIGURE 2;

FIGURE 4 is a fragmentary view on an enlarged scale, partly in section, showing details of the construction as taken along broken line 4-4 on FIGURE 2;

FIGURE 5 is a fragmentary view partly in section taken along line 5-5 on FIGURE 4 showing details of the air diffuser and the final filter;

FIGURE 6 is a fragmentary perspective view on an enlarged scale of the supporting bracket assembly; and

FIGURE 7 is a perspective view of one component of the bracket.

Referring more particularly to FIGURES 1 and 2 there is shown a preferred embodiment of an installed type suction cleaner apparatus according to the present invention, the apparatus proper being designated generally 10. This apparatus includes as principal components a filter casing 11 and a motor driven suction unit 12, the filter chamber being in communication with the different rooms to be cleaned by means of a built-in suction duct system 13 having normally closed outlets 14, 15 opening into each room to be cleaned. It will be understood that the suction duct 13 may extend through the walls of the building, under the floors, or through the attic space with branch lines extending through the walls to outlets at any convenient location, as the bracket assembly proper 10 is preferably rigidly secured to the building wall by means of a bracket assembly 15. This assembly includes a U-shaped bracket 16 having its opposite ends suitably secured by rivets, welding or the like to the exterior side wall 17 of the filter casing. Secured to the parallel short legs 18 of bracket 16, as by threaded fasteners 19, are mounting tabs 20, 21 having notches 21 opening upwardly from their lower edges, these openings being formed in part by a tang 22 having the configuration shown in FIGURE 6. Tangs 22 are integral with one vertical edge of opening 21 and, prior to assembly of the bracket parts, are bent outwardly away from tab 20 to provide full access to opening 21.

A pair of L-shaped brackets 24 have one leg provided with holes for screws 25 by which the brackets can be secured to studs or to other parts of a building wall. The other leg of brackets 24 carries a horizontally disposed rigid member, such as rods 26, held assembled to brackets 24 as by cotter pins 27, rod 26 having a length appreciably greater than the distance between tabs 20. Accordingly, it will be understood that the suction cleaning unit 10 can be easily and permanently suspended from the rigidly supported rod 26 by lowering openings 21 of tabs 20 over the opposite ends of rods 26. Thereafter, tangs 22 are bent to lie in the plane of tabs 20 thereby closing the outer ends of openings 21 and locking the cleaner in its suspended position. It will be recognized that the unit can thereafter be removed from the wall only with difficulty. This discourages demounting of the unit from its installed position by anyone except servicemen or other authorized personnel.
Referring now more particularly to FIGURES 3, 4 and 5, it will be seen that the cleaner unit proper includes an open topped filter housing 11 having an inner annular ledge 30 at its upper rim shaped to center and support thereon inner filter bag 31. This bag is provided at its open top with a gasketed supporting ring 32 held assembled to the bag by a clamping hoop 33. Filter 31 is preferably formed of suitable air pervious fabric and is so dimensioned as to leave a narrow annular air flow passage 34 between its side and bottom walls and the interior walls of casing 11. Desirably there is provided a less intensive throw-away paper filter bag 35 provided at its upper end with a mounting ring 36 of cardboard or the like adapted to rest against ring 32 of cloth filter 31.

A removable sheet metal cover 38 having a downwardly turned rim 39 is adapted to nest loosely over and close the access opening of the filter chamber. This closure may be held tightly compressed against filter mounting rings 32 and 36 in any suitable manner, as by a pair of toggle clamps 40, 41 mounted on diametrically opposed portions of filter casing side walls 17.

As is shown in FIGURE 3, suction duct system 13 opens into the upper portion of the filter chamber through an elbow fitting 44 rigidly secured to the side wall 17 of the filter housing with its tubular outlet end 45 opening vertically in closely spaced relation to the flanged rim 39 of closure 38. Fixed to the exterior of closure 38 is a U-shaped coupling duct 46 having its downwardly turned outer end 47 positioned to register with and telescope over elbow outlet 45. The other or outlet end 48 of coupling 46 opens downwardly into the inner filter bag 35, and is rigidly secured to closure 38 as by screws 49.

From the foregoing it will be clear that the suction duct system 13 communicates with the interior of the filter housing through the removable closure 38, and attached coupling 46, the gaskets provided between the filter bag and the interior rim of closure 38 forming an air tight seal between the filter housing and the duct system. Additionally, a thick soft rubber gasket ring 50 encircles outlet tube 45 of elbow 44 and forms an airtight connection between this elbow and the disconnectible air inlet duct 46.

Referring to FIGURES 4 and 5, it is pointed out that suction hose 12 comprises a suitable electric motor 53 having its shaft connected to a suitable multiple stage suction fan encased with housing 54. The inlet eye 55 of this fan opens downwardly into a hollow bracket 56 rigidly secured to side wall 17 of the filter unit and opening thereinto through a passage within the hollow bracket 56, the casing also serve to mount a U-shaped spacer clip 59 against the interior side wall of the filter housing and serve to prevent filter bag 31 from being sucked across opening 57 to block the flow of air. Bracket 56 has its outer end opposite inlet opening 57 normally closed by a plate 61 provided with a gasket 62 in sealing contact with the adjacent edges of bracket 56. Any suitable means, such as a clip 63, may be employed to hold closure plate 61 detachably assembled to the end of bracket 56. Frictionally supported within a cupped shell 64 secured to closure plate 61 is a final filter 65. As here shown, filter 65 comprises a tubular member of screening covered with flocking to provide fine passages through which the air-flows on its way to the fan inlet. Any remaining small particles of dust which may have escaped through filters 31, 35 collect on the flocking and are prevented from escaping from the cleaner.

The clean air discharging from multiple stage fan 54 passes through an outlet 68 (FIGURE 5) into a diffuser housing 69. The latter comprises a shallow annular ring having louvered air outlets 70 distributed about its annular side wall through which the air is dispersed into the closet space or other area in which the cleaner is located. A short tube 71 in axial registry with outlet 68 is normally closed by cap 72 hinged to tube 71 by hinge 73. If the user should wish to use pressurized air discharging from opening 68 to clean by blowing, or to operate a paint sprayer or the like auxiliary device using pressurized air, it is merely necessary to open cap 72 and insert the end of a flexible hose through tube 71 and into outlet 68. All air flow then takes place through the flexible hose to the point of use.

If it is desired to clean the closet or the local area adjacent the cleaner apparatus, the user may insert a suction cleaning hose into the tubular fitting 75 provided at the end of inlet coupling 46, care first being taken to open gasketed closure cap 76 normally closing the outer end of tube 75. Desirably cap 76 is pivoted to duct 46 by a hinge 77.

While the installed suction cleaner system herein shown and disclosed in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

I claim: 1. A permanently installed type suction cleaner comprising a main outer casing with means for securing the same to a building wall and having a removable cover for an access opening thereinto, said opening having a seating ledge, an air pervious filtering means secured on said ledge, said cover having tubular air duct means secured thereto and opening at one end into said filtering means and the other end of said duct means being shaped to open into and form an airtight seal with said air passage means exteriorly of said casing and leading through ducting installed in the walls of a dwelling to remote areas of a dwelling to be cleaned, a motor driven air suction unit and having an outlet opening into said suction unit, said filter means being supported and connected to one end of said duct system, said suction unit comprising means for communicating through duct lines installed in said walls to remote areas of a dwelling to be cleaned by a suction air stream; that improvement which comprises a hollow bracket secured to the exterior of said casing side wall, a unitary motor fan assembly mounted on said bracket having the inlet thereof to communication with the interior of said casing through said hollow bracket, said motor fan assembly having an air diffusing unit mounted on the air discharge portion thereof and said diffusing unit being connected by a hose thereto in a manner directing all discharging air flow through said hose for use as desired.

2. A suction cleaner system as claimed in claim 1 characterized in that said duct means has at least one inlet opening thereinto adapted to receive and seat a flexible suction cleaning hose, and means normally closing said inlet opening in an airtight manner.

3. In an installed type suction cleaner system having a casing adapted to be fixedly supported on a building wall and housing dirt and air separator means communicating through duct lines installed in the building walls with different rooms to be cleaned by a suction air stream; that improvement which comprises a hollow bracket secured to the exterior of said casing side wall, a unitary motor fan assembly mounted on said bracket having the inlet thereof to communication with the interior of said casing through said hollow bracket, said motor fan assembly having an air diffusing unit mounted on the air discharge portion thereof and said diffusing unit being connected by a hose thereto in a manner directing all discharging air flow through said hose for use as desired.

4. An installed type suction cleaning system for dwellings and the like, said system comprising a fixedly installed suction duct system concealed within the walls of the dwelling, and said unitary motor fan assembly being a unitary suction and filtering assembly fixedly supported and connected to one end of said unitary system.
said assembly including a filter housing and a motor-
driven suction unit mounted on the exterior side wall of
said filter housing and in communication with the interior
of the latter through tubular bracket means interconnect-
ing said housing and suction unit, and bracket means
fixed to said filter housing for supporting said unitary su-
tion and filtering assembly detachably from the dwelling
wall, said power driven suction unit including an air dif-
fuser connected to the air discharge portion of said unit,
and said air diffuser including means for detachably con-
necting thereto a hose for conveying to a point of use
pressurized clean air discharging from said unit.

5. An installed type suction cleaning system as defined
in claim 4 characterized in that said filter housing has a
normally closed filter access opening thereto and posi-
tioned to one side of said motor driven suction unit where-
by said filter housing and said motor driven suction unit
are each accessible for servicing independently of one
another.

6. An installed type suction cleaning system as defined
in claim 4 characterized in that said filter housing includes
an air inlet passage leading thereinto having normally
closed means to which a suction cleaning hose can be
detachably connected for use in cleaning areas local to
said unitary assembly.

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HARRY B. THORNTON, Primary Examiner.
WALTER BERLOWITZ, HERBERT L. MARTIN,
WESLEY S. COLE, SIDNEY JAMES, Examiners.