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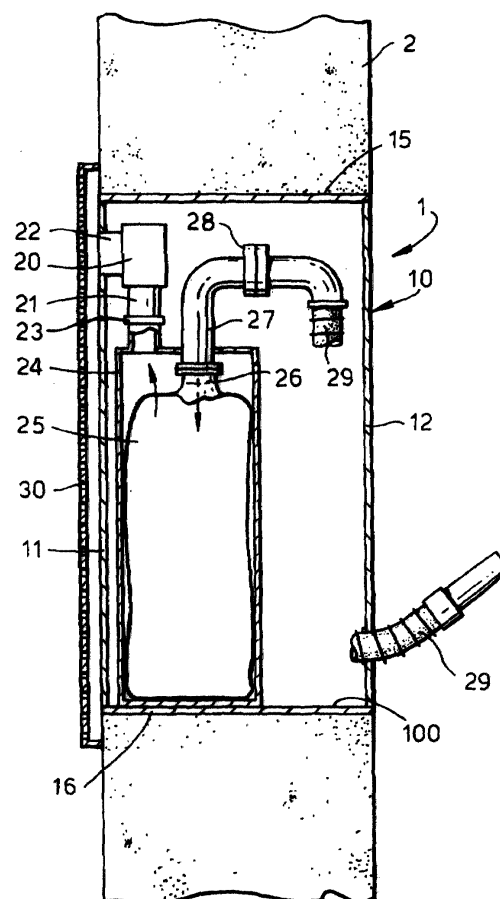
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(54) **Vacuum cleaner installations**

(57) A vacuum cleaner installation has a unit 1 with an outer housing 10 installed within the thickness of an outside wall 2 of a room 3. The housing 10 contains a blower 20, a bag 25 for waste material and a hose 29. The blower 20 is connected to draw waste material along the hose 29 and into the bag 25, the exhaust air venting externally of the room through a grille 30 on the outside wall.

Fig.3.



Description

[0001] This invention relates to vacuum cleaner installations of the kind including a room and a vacuum cleaner arrangement including a blower, a receptacle for waste material, an inlet and an air exhaust outlet.

[0002] Conventional vacuum cleaners are portable equipment including a blower, which draws dust into a container for disposal. The container may be a porous bag that acts as a filter so that the waste material remains in the bag and air passes through the wall of the bag and is exhausted into the room. Alternatively, the container may be a non-porous canister, the equipment including a separate filter to remove dust particles from air exhausted into the room. These forms of cleaner have several disadvantages. First, because the waste air is exhausted into the room, special precautions must be taken to ensure that small particles of dust, pollen and allergens are removed from the exhaust. This may be done by means of a HEPA filter but these are relatively expensive items that have to be replaced regularly by the user, adding to the cost and inconvenience of using the cleaner. Also, the presence of the filter provides a restriction to flow of air through the cleaner and, therefore, reduces its efficiency, especially as the filter becomes clogged during use. Another disadvantage with these cleaners is that the temperature of the outlet air is relatively high, which can lead to undesirable raising of the room temperature during use. A further problem inherent in these portable vacuum cleaners is that they are relatively heavy and cumbersome, which is a particular problem where the cleaner has to be moved between different floors in a building or where it has to be used by someone who is infirm or disabled.

[0003] An alternative vacuum cleaner system, which is less common in the UK, is the central vacuum cleaner system where the pump/ blower and dust container are fixed installations, usually in a basement or garage, and conduits connect the pump to various inlets at different locations throughout the building. The user connects a hose to the closest inlet and the waste material is sucked through the hose to the pump and container via the conduits. This arrangement has some advantages over the portable cleaners in that the user only has to carry the hose and the suction air exhausts into the room in which the pump is installed, not into the room being cleaned. These systems, however, have several problems. They are relatively expensive and cannot be installed in all buildings. Also, the conduits can be prone to blockage.

[0004] It is an object of the present invention to provide an alternative vacuum cleaner installation and arrangement.

[0005] According to one aspect of the present invention there is provided a vacuum cleaner installation of the above-specified kind, characterised in that the inlet opens into the room and the air exhaust outlet vents externally of the room.

[0006] The vacuum cleaner arrangement is preferably

bly mounted with a wall of the room and may be mounted in a hole in the wall. The vacuum cleaner arrangement preferably has a housing containing the blower and the receptacle, and the housing may be mounted within the thickness of a wall of the room. The vacuum cleaner arrangement may include a hose, the hose being retractable into a housing of the arrangement.

[0007] According to another aspect of the present invention there is provided a vacuum cleaner arrangement for installation, in a room, the vacuum cleaner arrangement comprising a blower, a receptacle for waste material, an inlet opening into the room and an air exhaust outlet venting externally of the room.

[0008] The arrangement preferably includes a housing adapted for mounting in a hole in a wall of the room, the blower and the receptacle being contained within the housing. The housing may be mounted within the thickness of the wall. The vacuum cleaner arrangement preferably includes a hose that is retractable into the housing.

[0009] A vacuum cleaner installation including a vacuum cleaner arrangement according to the present invention, will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a plan view of the installation in a building;

Figure 2 is a perspective view of the vacuum cleaner arrangement in more detail; and

Figure 3 is a sectional side elevation view of the arrangement.

[0010] The installation comprises a vacuum cleaner unit or arrangement 1 installed in a fixed position within the outside wall 2 of a room 3 in a building 4.

[0011] The vacuum cleaner unit 1 includes an outer casing 10 of generally rectangular section with a rear wall 11, a front wall 12, two side walls 13 and 14, a top 15 and a base 16. The front wall 12 is hinged about a vertical axis to provide an opening door enabling access to the interior of the unit and supporting various tools 18. Within the casing 10, the unit 1 has a pump or blower 20 with an inlet 21 and an outlet 22. The inlet 21 is connected via a coarse filter 23 to a rigid housing 24 containing a disposable, porous bag 25 the neck 26 of which is secured about one end of tubing 27. The other end of the tubing 27 extends to a rotatable coupling 28 to which is connected one end of a flexible hose 29. The outlet 22 of the pump opens through the rear wall 11 externally of the outside wall 2 and may be terminated by a grille 30, which may include a one-way flap valve of conventional kind. The unit 1 is fitted in a hole 100 cut in the outside wall 2 and is contained within the thickness of the wall, which is typically about 275mm. If the unit is deeper than the wall it may project externally or internally. Alternatively, the unit could be mounted on the in-

side surface of the wall.

[0012] The hose 29 is wound on a sprung reel (not shown) behind the front wall 12 and its free end projects through an opening 40 in the front wall so that the hose can be pulled out away from the unit 1 for use. The length of the hose 29 is selected such that it is sufficient to reach the furthest corner of the room 3 and may be sufficient to enable adjacent rooms 5 and 6 also to be cleaned.

[0013] In operation, the pump 20 is turned on, either by actuation of a manual switch or in response to pulling out the hose 29. This applies suction to the housing 24 containing the bag 25 so that this suction is also applied via the tubing 27 to the hose 29. Air, dust and other waste material, therefore, flows along the hose 29, along the tubing 27 and into the bag 25. Dust and larger particles are trapped in the bag 25 whereas air and small particles pass through the wall of the bag and flow through the pump 20 via the filter 23. This waste air and small particles are then exhausted via the outlet 22 outside the room 3. When the bag 25 is full, it is disposed of or emptied and replaced. The filter 23 does not need replacing regularly since it is only required to prevent passage of larger particles to the pump 20.

[0014] This installation has the advantage that all the waste air is exhausted externally of the room so there is no risk of even the smallest of particles, pollen or allergens being recirculated within the room, as with conventional vacuum cleaners. This makes the installation particularly suitable for use by people with asthma or allergies. There is also no need for expensive high efficiency filters of the kind that are used in some conventional vacuum cleaners. By venting the warm outlet gas outside the room, there is less unwanted heating caused by use of the equipment. Furthermore, the user only has to move the hose, so the equipment is easier to use especially by infirm or disabled people. The installation of the equipment can be carried out easily without the need to make extensive modifications to the building, as with central vacuum cleaner installations. Because the unit can be contained within the thickness of the wall, it takes up little or no space in the room, thereby reducing the need for storage space. This kind of installation is particularly suitable for use in bedsits, hotels or in buildings with several floors where there would be an installation on each floor.

[0015] It will be appreciated that the installation could be modified in various ways. For example, the hose could include an electrical wire to supply power to a beater head at the end of the hose. The hose need not be on a reel but could be stored separately and connected to a coupling on the unit when needed.

Claims

1. A vacuum cleaner installation including a room (3) and a vacuum cleaner arrangement (1) including a

blower (20), a receptacle (25) for waste material, an inlet (27, 28, 29) and an air exhaust outlet (22, 30), **characterised in that** the inlet (27, 28, 29) opens into the room (3) and the exhaust outlet (22, 30) vents externally of the room.

2. An installation according to Claim 1, **characterised in that** the vacuum cleaner arrangement (1) is mounted with a wall (2) of the room (3).
3. An installation according to Claim 2, **characterised in that** the vacuum cleaner arrangement (1) is mounted in a hole (100) in the wall (2).
4. An installation according to any one of the preceding claims, the vacuum cleaner arrangement (1) having a housing (10) containing the blower (20) and the receptacle (25), and **characterised in that** the housing (10) is mounted within the thickness of a wall (2) of the room (3).
5. An installation according to any one of the preceding claims, **characterised in that** the vacuum cleaner arrangement (1) includes a hose (29), and that the hose is retractable into a housing (10) of the arrangement.
6. A vacuum cleaner arrangement (1) for installation in a room (3), the vacuum cleaner arrangement comprising: a blower (20), a receptacle (25) for waste material, an inlet (27, 28, 29) opening into the room (3) and an air exhaust outlet (22, 30) venting externally of the room.
7. A vacuum cleaner arrangement according to Claim 6, **characterised in that** the arrangement includes a housing (10) adapted for mounting in a hole (100) in a wall (2) of the room, and that the blower (20) and the receptacle (25) are contained within the housing (10).
8. A vacuum cleaner arrangement according to Claim 7, **characterised in that** the housing (10) is mounted within the thickness of the wall (2).
9. A vacuum cleaner arrangement according to Claim 6, **characterised in that** the arrangement includes a housing (10) and a hose (29), that the blower (20) and the receptacle (25) are contained within the housing (10), and that the hose (29) is retractable into the housing (10).

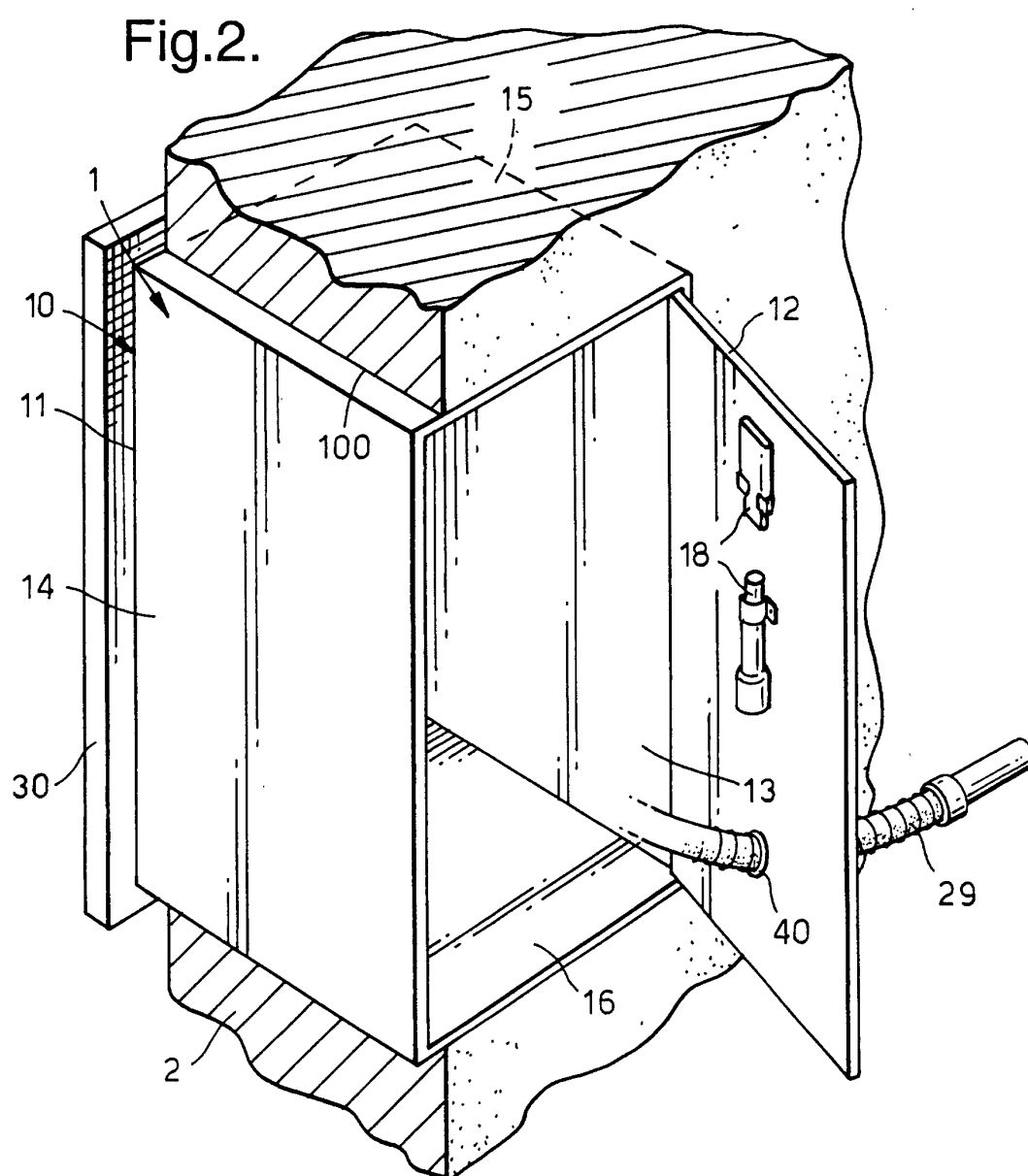
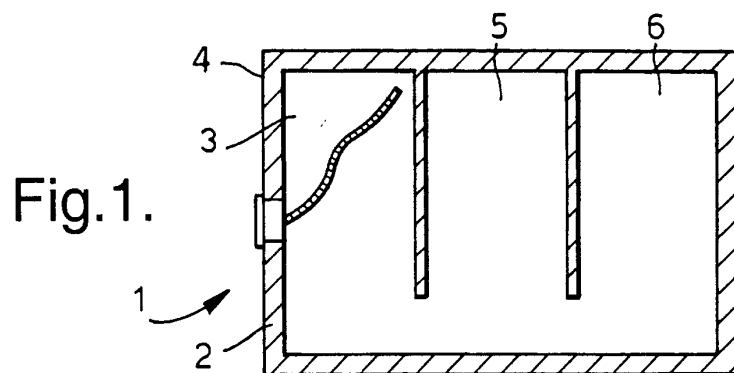
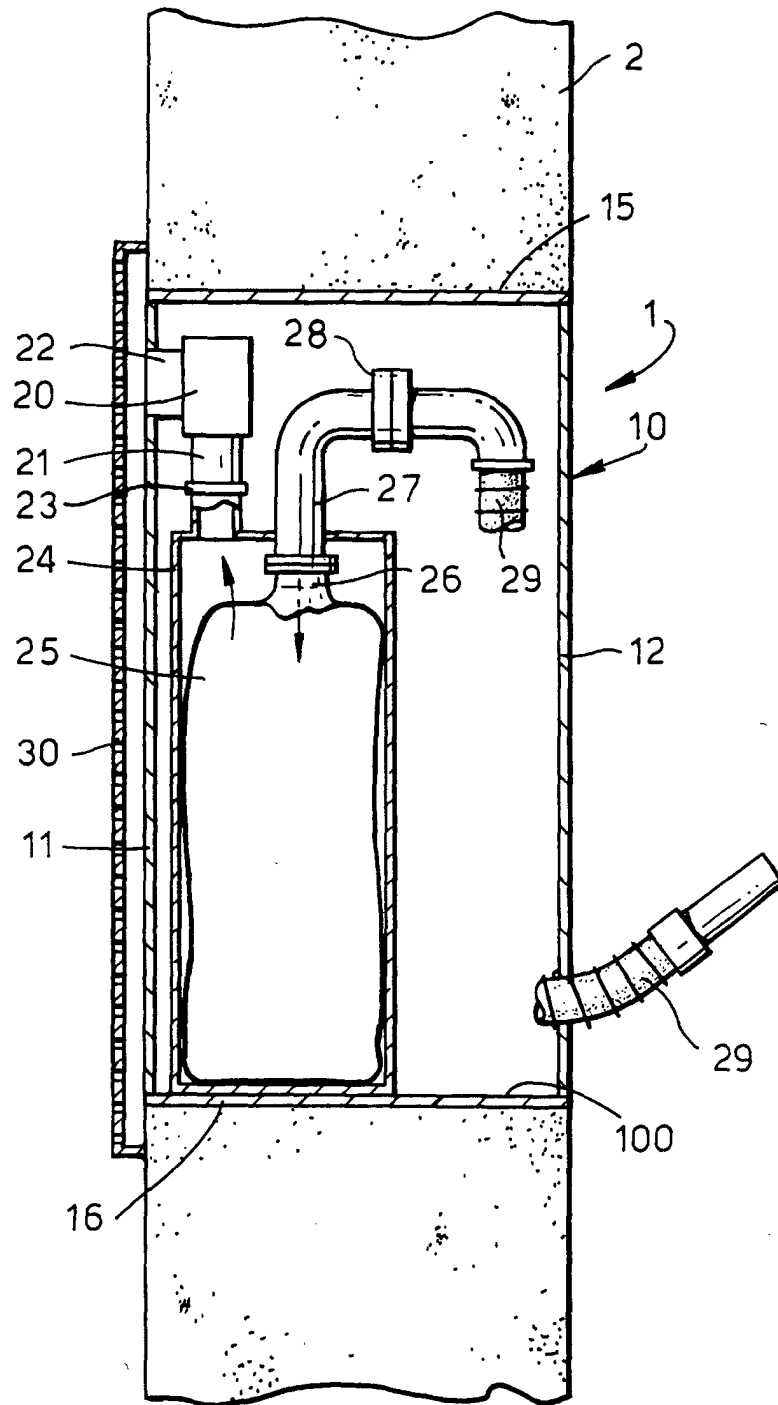


Fig.3.





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Application Number
EP 01 30 2280

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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