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VACUUM CLEANER

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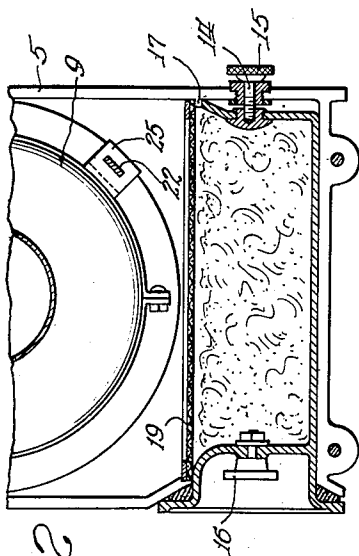
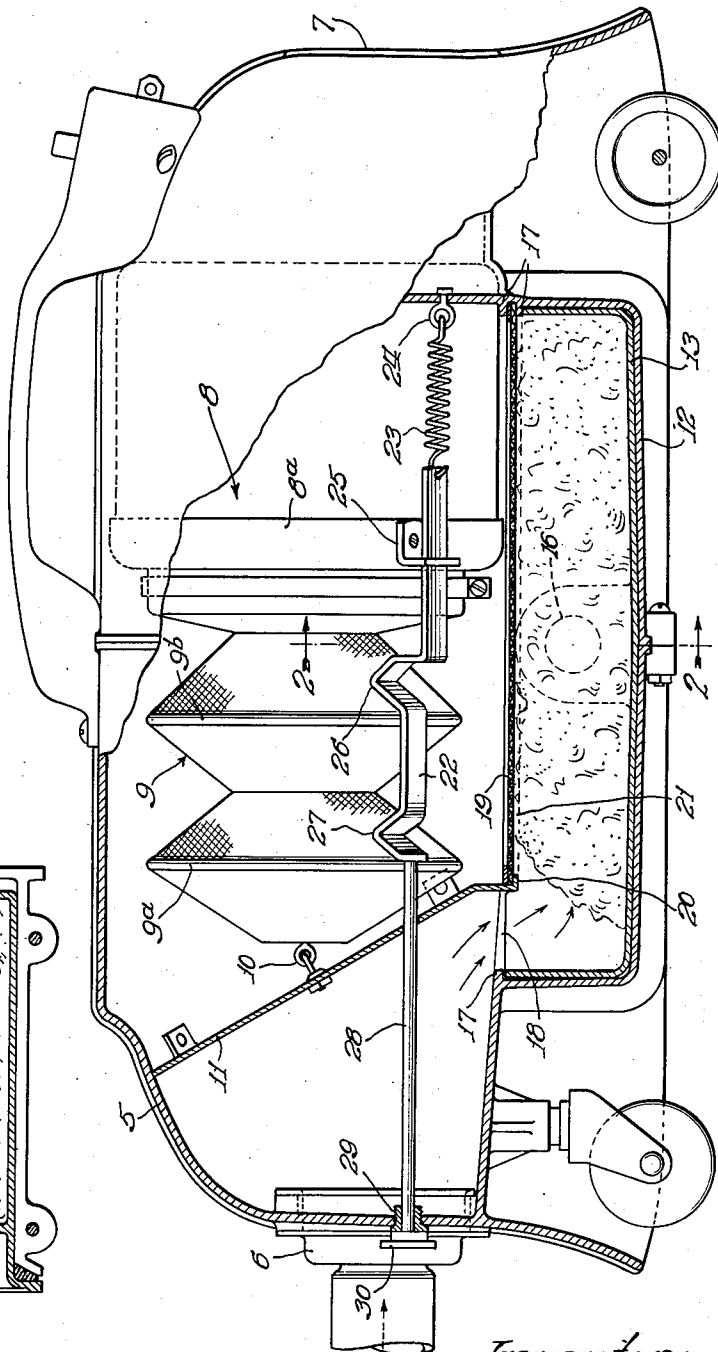


FIG. 2

FIG. 1



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VACUUM CLEANER

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5 Claims. (Cl. 183—37)

This invention relates to vacuum cleaners and particularly to that type of vacuum cleaner usually termed the "bagless" type. In this type of vacuum cleaner, the dirt is repelled before entering the fan which creates the suction. The particular repelling means may be in the nature of a cloth filter or some other type of separator that repels the dirt but permits the air to pass through it. In this type of cleaner, where cloth or other porous material is used as a filter, it is quite a problem to get sufficient filtering area to have a workable back pressure and sufficiently fine air passages to remove the dust and dirt from the air. To achieve the greatest area of porous filter in the smallest space, an angular filter is best. Such a filter, however, has the disadvantage of catching or holding lint and large dirt particles in the angles of the filter so as to make it difficult to dislodge. The lint in particular catches and retains a certain amount of fine dust, thus reducing the efficiency of the filter and eventually clogging it.

It is one purpose of the present invention to provide, in a vacuum cleaner of this type having a dirt receptacle therein, a lint separator which will guide the air and dirt into the dirt receptacle and separate the lint and larger dirt particles from the air before the air reaches the angular filter. This lint separator must be of a type which does not, of itself, increase the back pressure to any substantial degree.

I have found, also, that in this type of cleaner the lint which is picked up and brought into the machine is quite bulky and if permitted to swirl about in the dirt separating channel, it piles up loosely in the dirt receptacle, requiring frequent emptying of the receptacle. I have found that it is possible by proper construction not only to remove the lint from the air before it reaches the filter, but to pack the lint in the dirt container by means of the air action. A second purpose of this invention, therefore, is to utilize the air stream through the dirt receptacle to pack the lint brought in with the air stream in the receptacle along with whatever dirt may be trapped with the lint. It is a further purpose of the invention to provide a lint separator and dirt receptacle which will cooperate to compress the lint in the removable part of the dirt receptacle, whereby it may be removed and disposed of.

The present invention contemplates the provision of a lint separator and dirt receptacle in the suction cabinet of a vacuum cleaner of the bagless type in which the dirt and lint are directed into the removable receptacle and the lint

is separated from the air before leaving the receptacle, the lint and dirt then being packed into the dirt receptacle at the most remote points from the direct line of air movement through the receptacle so as to cause the least interference with free air movement throughout the machine.

The present invention is also of particular advantage in preventing damage to the filter in the event any water is drawn into the machine. To this end, the invention contemplates the provision of suitable deflecting means causing the air to follow a tortuous passage that will deposit the water in the container and keep it from being carried to the filter.

The features and advantages of the present invention will appear more fully as the description proceeds, reference being had to the accompanying drawing wherein a preferred form of the invention is shown. It is to be understood, however, that the drawing and description are illustrative only, and are not to be taken as limiting the invention except insofar as it is limited by the claims.

In the drawing, Fig. 1 is a longitudinal sectional view through the suction cabinet of a vacuum cleaner embodying my invention, and

Fig. 2 is a fragmentary sectional view taken on the line 2—2 of Fig. 1.

Referring now to the drawing, the present invention is embodied in a vacuum cleaner of the bagless type wherein the dirt is removed from the air before it reaches the fan. As shown, my invention is embodied in the suction cabinet which comprises a casing 5 having a suction inlet at 6 adapted to be connected to a suitable suction nozzle. The casing has an air outlet indicated generally at 7, and contains a fan unit 8 which may include a suitable fan and motor, such as are well-known in the art. For an example of a suitable fan and motor construction, see my co-pending application Serial No. 121,807, filed January 22, 1937. In machines of this type, it is desirable to have a filter with as much surface area as can be obtained in the small space available. I provide an angular cloth filter 9 which intercepts the dust and dirt before it reaches the fan casing 8. The filter 9 is secured on the end of the fan casing 8 and has its other end secured by means of a removable eye bolt 10 to a deflector wall 11. The deflector wall 11 extends transversely across the casing 5 adjacent to the inlet opening 6. The casing 5 is provided beneath the filter 9 with a depression 12 which is adapted to receive a dust receptacle 13. The dust receptacle, as shown in cross section in Fig. 2, slides in from the side of

the casing and is locked in place by means of a screw bolt 14 having a knurled head 15. A handle 16 is provided on the receptacle 13 to withdraw it from the casing. The casing 5 has a rib 17 around the depression 12 to overlie the upper edge of the receptacle 13. The deflector wall 11, at its lower end, terminates inwardly from the rib 17 so as to provide an opening 18 into the receptacle 13. The air passage, therefore, is from the inlet 6 toward the wall 11, thence downwardly into the receptacle 13 and upwardly around the filter 9.

I provide a lint separator 19 over the receptacle 13. This lint separator comprises a reticulated member, such for example as a rather large mesh metal screen. It is slidably mounted upon the rib 17 at one edge and upon a flange 20 provided at the lower edge of the wall 11. When the receptacle 13 is removed the lint separator 19 can be withdrawn to permit ready access to the space around the filter 9. This lint separator 19 causes the particles of lint and larger particles of dirt to be taken out of the air and forced back away from the passage 18 toward the most remote side of the receptacle 13. Since the force of the air is against the deposited lint at this remote side of the receptacle, the lint and dirt are gradually packed tightly in the receptacle, thus greatly increasing the amount of lint and dirt that can be placed in the receptacle. When the receptacle is withdrawn from the casing, its upper edge, shown at 21, rides along the surface of the lint separator and thus prevents the lint and dirt from falling into the depression 12.

I have shown herein means whereby the filter 9 can be vibrated or shaken to remove dust accumulated thereon. This means comprises a bar 22 which is secured to a spring 23, one end of which is fixed at 24 to the casing. The bar 22 is guided by a bracket 25 that is mounted on a motor support 8a which supports the motor and the unit 8. This bar has two angular portions 26 and 27 adapted to engage the filter 9. The bar 22 when actuated engages the filter and causes it to rise sharply upward while the angular portions are passing beneath the rims 9a and 9b of the filter and to snap down against the bar 22. This causes a violent shaking of the filter for each reciprocation of the bar 22. An actuating stem 28 is fixed to the end of the bar 27 and projects through the casing at 29 where it is provided with a single piece 30 for operation thereof.

From the above description it is believed that the construction and operation of the present invention will be readily apparent to those skilled in this art. Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a bagless type vacuum cleaner of the type wherein the dirt is repelled by a filter before the air enters the fan, a filter, a casing enclosing said filter, a dust receptacle in said casing below the level of the filter, said casing being open from the filter downwardly into the receptacle whereby dirt repelled by the filter may fall into the receptacle, said casing having an air inlet to said receptacle, and a lint separator, comprising a reticulated member over the receptacle and across the passage between the receptacle and the filter,

said casing having a slanting air deflecting wall extending upwardly from the lint separator between the air inlet and the filter to direct air toward the receptacle.

2. In a bagless type vacuum cleaner of the type wherein the dirt is repelled by a filter before the air enters the fan, a filter, a casing enclosing said filter, a dust receptacle in said casing below the level of the filter, said casing being open from the filter downwardly into the receptacle whereby dirt repelled by the filter may fall into the receptacle, said casing having an air inlet to said receptacle, a lint separator, comprising a reticulated member over the receptacle and across the passage between the receptacle and the filter, said receptacle being slidable out of the casing in a direction parallel to the lint separator, and having a back wall extending up to the lint separator, said back wall being operative to wipe lint from the separator as the receptacle is removed from the casing.

3. In a bagless type vacuum cleaner of the type wherein the dirt is repelled by a filter before the air enters the fan, a filter, a casing enclosing said filter, a dust receptacle in said casing below the level of the filter, said casing being open from the filter downwardly into the receptacle whereby dirt repelled by the filter may fall into the receptacle, said casing having an air inlet to said receptacle, and a lint separator, comprising a reticulated removable member over the receptacle and across the passage between the receptacle and the filter.

4. In a bagless type vacuum cleaner of the type wherein the dirt is repelled by a filter before the air enters the fan, a filter, a casing enclosing said filter, a dust receptacle in said casing below the level of the filter, said casing being open from the filter downwardly into the receptacle whereby dirt repelled by the filter may fall into the receptacle, said casing having an air inlet to said receptacle, a lint separator comprising a reticulated member over the receptacle and across the passage between the receptacle and the filter, said casing having a slanting air deflecting wall extending upwardly from the lint separator between the air inlet and the filter to direct air toward the receptacle, said receptacle being slidable out of the casing in a direction parallel to the lint separator, and having a back wall extending up to the lint separator, said back wall being operative to wipe lint from the separator as the receptacle is removed from the casing.

5. In a bagless type vacuum cleaner having a casing provided with an air inlet and an air outlet and having a fan therein with a filter adapted to repel dirt from air drawn through the air inlet before it enters the fan, means for protecting the filter against accumulation of lint drawn through the air inlet, said means comprising a dust receptacle slidably mounted in the casing directly beneath the filter, a partition across said casing between the air inlet and the filter, said partition extending down to the top of the dust receptacle, a portion of the dust receptacle being on the air inlet side of the partition and a portion being on the filter side of the partition, and a horizontally extending reticulated sheet overlying the top of the receptacle between the receptacle and the filter.

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