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MECHANISM FOR COLLECTING DUST

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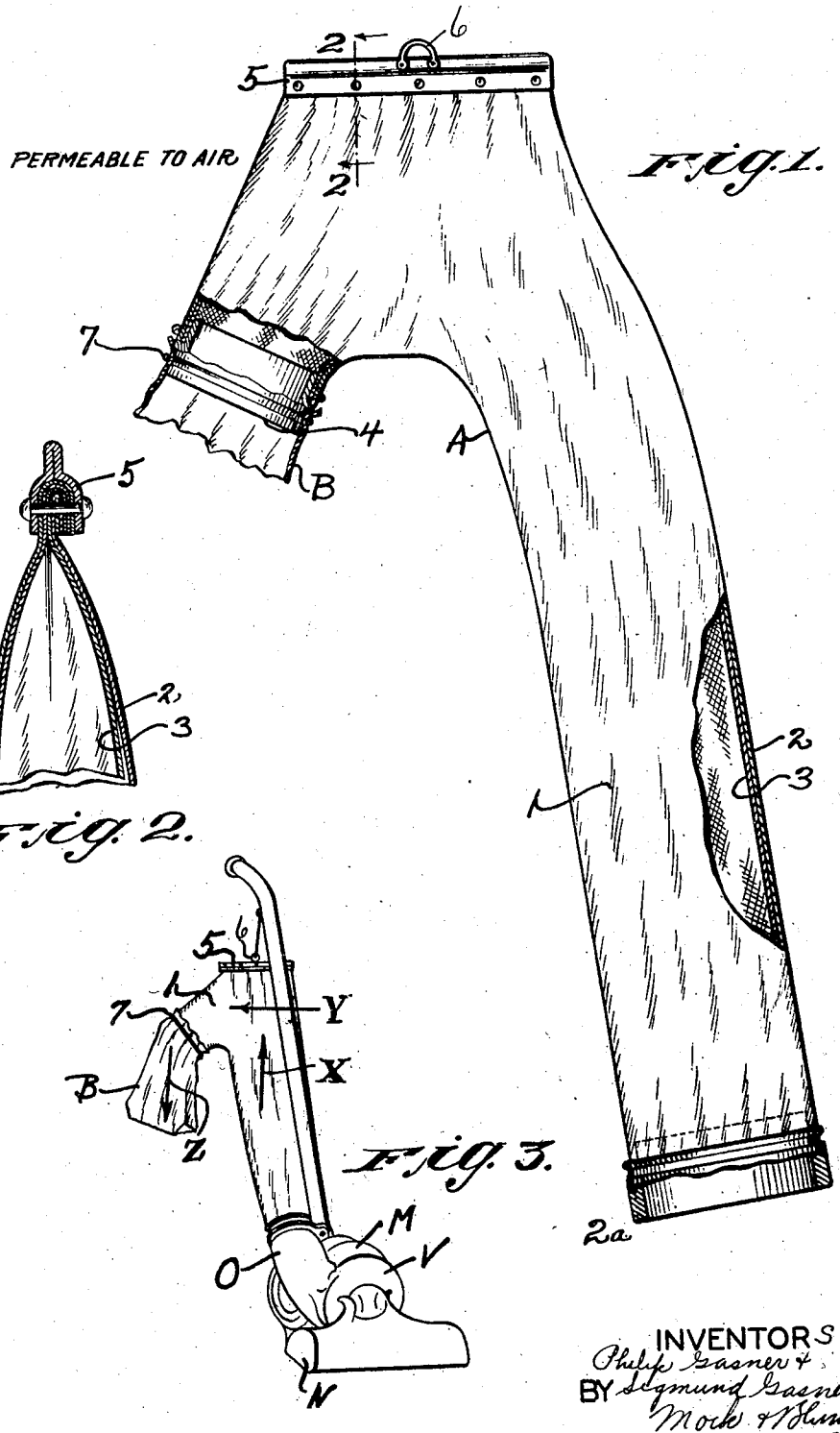


Fig. 1.

Fig. 2.

Fig. 3.

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MECHANISM FOR COLLECTING DUST

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Our invention relates to a new and improved mechanism for collecting dust.

One of the objects of our invention is to provide a vacuum cleaner attachment, which can be readily applied to any existing type of vacuum cleaner, and by means of which the dust and dirt can be collected in a receptacle which can be conveniently separated from the vacuum cleaner, so as to eliminate the necessity of dumping the dust and dirt out of the cloth filter bag which is now ordinarily employed for this purpose.

Another object of our invention is to provide a vacuum cleaner attachment which will make it possible to use a receptacle for the dust which can be made of fragile material such as paper, without the necessity of supporting the fragile paper by means of fabric or the like.

Another object of our invention is to provide a vacuum cleaner attachment in which it shall be possible to use a receptacle for the dirt which can be made of celluloid, waxed paper, or other non-porous and translucent or transparent material. We can also use receptacles made of glass, rubber, metal, or any other material.

Another object of our invention is to provide an improved dust collecting receptacle suitably combined with a vacuum cleaner attachment, by means of which the resistance to the passage of air out of the device will be lowered so that the vacuum cleaner can exert a greater suction and can have greater efficiency.

Other objects of our invention will be set forth in the following description and drawings which illustrate a preferred embodiment thereof, it being understood that the above general statement of the objects of our invention is intended merely to generally explain the same and not to limit it in any manner.

Fig. 1 is an elevation of the essential part of the vacuum cleaner attachment.

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

Fig. 3 is a perspective view showing the device in position.

The vacuum cleaner V may be of any suitable type. The standard type of vacuum cleaner comprises a metal housing having a nozzle N, a motor M, and an outlet nozzle O. It is now customary to connect a bag made of porous fabric to this outlet nozzle. This bag permits the air to escape therefrom, but retains the dust. It has also been proposed to place a paper bag within said fabric bag, said paper bag being also connected to the outlet nozzle, in order to collect the dust in a paper bag which is readily removable.

However, in this construction it was necessary to firmly support the wall of the relatively fragile paper bag, by the wall of the cloth bag.

According to our invention, it is not necessary to locate the paper bag within any other receptacle, although this can be done without departing from our invention. However, if the paper bag is enclosed in a cloth bag or other receptacle, it is not necessary to support the wall of the paper bag by the wall of the cloth bag, or other receptacle.

A hose 1 is provided with a coupling member 2*a* by means of which it can be coupled to the outlet nozzle O of the cleaner. This hose 1 comprises an outer wall 2 made of a suitable fabric, and an inner lining 3. This inner lining 3 is not uniform throughout the length of the hose 1. Said lining is substantially air-tight up to about the point A of the hose 1. For example, said lining can be made of rubber or relatively tightly-woven fabric up to about the point A. The lining is made of relatively porous material in the lateral leg thereof and up to the coupling member 4. The object of this is to permit the air to escape sufficiently from the upper part of the hose 1. The top of the hose is provided with an ordinary clamp 5, having a hook which can be connected to the handle of the vacuum cleaner. However, it is not necessary that the hose 1 should be clamped or mounted as shown in Fig. 3, since the essential feature of our invention is to provide a hose which permits a sufficient escape of air therefrom.

While we prefer to have the air current travel through the relatively long straight portion of the hose up to about the point A,

without any substantial escape of air, so as to create a long air current of considerable velocity, it would not be departing from our invention if some of the air did escape prior to reaching the point A. A bag B is clamped to the coupling member 4. Any suitable coupling device can be employed. The bag or receptacle B can be made of ordinary relatively porous paper, or it can be made of waxed paper, or it can be made of celluloid, or other impermeable material. If a celluloid receptacle is used, it can be provided with a valve for removing the dust therefrom, and if desired, a receptacle made of impermeable material such as celluloid or the like, could have a panel or part made of porous cloth or the like. Since the air escapes between the point A and the mouth of the bag, it is clear that the air escapes from the connecting means in a portion of said connecting means which is non-aligned with the axis of the receptacle. For example, and as shown in Fig. 3, the axis of the receptacle B is substantially vertical. Likewise, it may be considered that the air escapes to some extent from the upper part of the vertical leg of the connecting means (namely, the hose 1), and that the air also escapes from the lateral branch of the connecting means, said lateral branch being directly connected to the receptacle B. The axis of the lateral branch may be considered as being substantially horizontal, so that this is non-aligned with the axis of the receptacle, and the axis of the top part of the vertical branch of the hose 1 (namely, above the point A), is also out of alignment with the axis of said receptacle B. The axis of the vertical leg of the connecting means is substantially defined by the arrow X shown in Fig. 3, the axis of the lateral branch of the connecting means is substantially defined by the arrow Y, and the axis of the receptacle B is substantially defined by the arrow Z.

We prefer that the coupling provided by the member 7 should not be absolutely air-tight so that the air can escape to a limited extent from the top of the receptacle B. The operation of our device is as follows:—

If the hose or connecting member 1 was absolutely air-tight, then the air pressure created by the blower of the vacuum cleaner would burst a receptacle made of relatively fragile material such as paper. However, by permitting sufficient air to escape from the upper part of the connecting hose, a fragile paper bag can be used without bursting. The air has sufficient velocity when it reaches the point A to carry the dust around it, and to throw the same into the receptacle even though the air escapes from the lateral leg of the connecting member. Experience has shown that substantially all of the dust is collected in the receptacle B. If an impermeable collecting receptacle is used, then the slight escape of air at the top portion thereof enables the air current to throw the dust into the collecting receptacle B. It is not absolutely necessary to have a slight leak in the coupling between the dust collecting receptacle and the connecting member 1, although this is preferable. It will be noted that a substantial part of the air escapes in the first part or leg of the device while the air is not moving in the direction of the collecting receptacle.

Generally speaking, our invention covers any device whereby the air current is forced into a dust collecting receptacle connected to the outlet nozzle of the vacuum cleaner by means of an intermediate connecting member, enough air being allowed to leak out of the attachment or out of the receptacle to enable the dust to enter and to remain in the receptacle.

It will be noted that the air and dust move continuously in a current which follows the wall of the connecting means, so that the dust is deposited into the receptacle, without the necessity of forming a counter current. On the contrary, in prior devices such as shown in U. S. Patent No. 1,514,875, dated November 11, 1924, the air current was effective to force the dust into the receptacle, only if a counter current was formed in the air current, after it issued from the outlet nozzle of the vacuum cleaner.

We have shown a preferred embodiment of our invention, but it is clear that numerous changes and omissions can be made without departing from the spirit of our invention.

We claim:

1. In a vacuum cleaner having an outlet nozzle and a dust collecting receptacle, connecting means intermediate said receptacle and said outlet nozzle, said connecting means having a plurality of non-aligned branches so that an air current moving in said connecting means is caused to change its direction of movement at the junction of said non-aligned branches, said connecting means being permeable to air at said junction and said junction being anterior to said receptacle, the last branch of said connecting means being connected to said receptacle, so that if a current of air and dust is caused to move in said connecting means towards said receptacle, some of the air in said current is caused to leak out of said current before the dust is finally moved towards said receptacle.

2. In a vacuum cleaner having an outlet nozzle and a dust collecting receptacle, a connecting means intermediate said receptacle and said outlet nozzle, said connecting means having a plurality of non-aligned and successive branches and having its outer end portion connected to said receptacle so that if dust is caused to move in said connecting means by an air current the dust is projected into said receptacle, said connecting means being

permeable to air in a portion thereof which is directly adjacent to and which is anterior to and which is inclined to said receptacle.

3. In a vacuum cleaner having an outlet nozzle and a dust collecting receptacle, connecting means intermediate said outlet nozzle and said receptacle, said receptacle being connected to said connecting means at the outer portion of said connecting means so that a current of air and dust which traverses said connecting means directly enters said receptacle to leave the deposited dust therein, said connecting means having a portion thereof which is substantially aligned with said outlet nozzle, said connecting means having the next portion thereof anterior to said receptacle and laterally inclined to said first portion and permeable to air.

4. In a vacuum cleaner having an outlet nozzle and a dust collecting receptacle, connecting means intermediate said receptacle and said outlet nozzle, said connecting means having an opening at the end portion thereof which is remote from the outlet nozzle and to which the receptacle is connected, said connecting means being shaped to cause dust which is aspirated into said connecting means by an air current to move into said receptacle without the formation of a counter current anterior to said receptacle, so that the receptacle serves to positively check the forward movement of the dust, said connecting means having a portion thereof which is anterior to said receptacle and which is permeable to air, the axis of said permeable portion being non-aligned with the axis of said receptacle.

5. In a vacuum cleaner having an outlet nozzle and a dust collecting receptacle made wholly of paper and which is free from external supporting means for the wall thereof, upwardly inclined connecting means intermediate said receptacle and said outlet nozzle, said connecting means being shaped to cause a current of air and dust moving therein to progress free from a counter current therein and in a direction towards said receptacle so that the dust is directly projected into said receptacle, said connecting means having an opening at the end portion thereof which is remote from said outlet nozzle and to which said receptacle is detachably connected with its mouth upwards, so that the dust is directly deposited in said receptacle by the air current, said connecting means being sufficiently permeable to air to prevent the rupture of said paper receptacle, under the pressure of said air current.

In testimony whereof we affix our signatures.

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