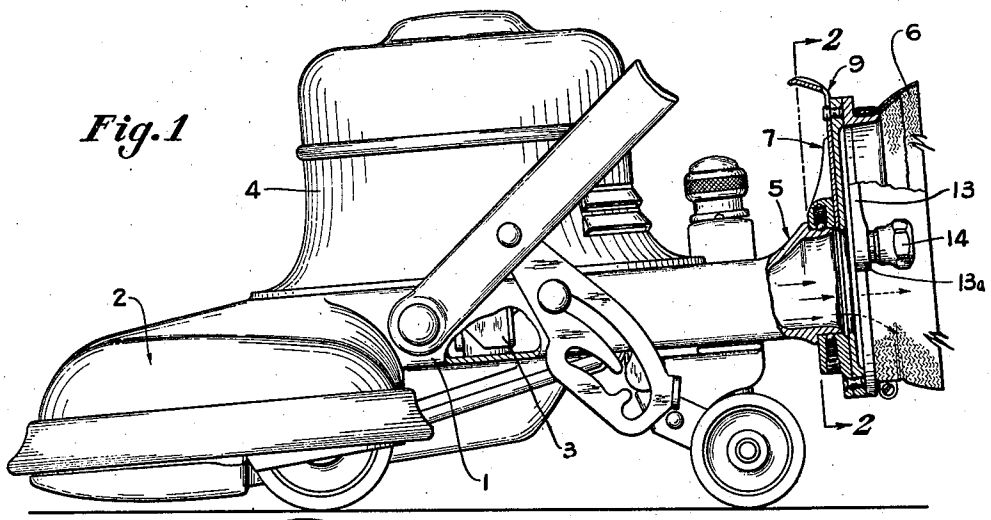
Oct. 15, 1940. W. F. HUDSON 2,218,169

SUCTION CLEANER

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Fig. 1



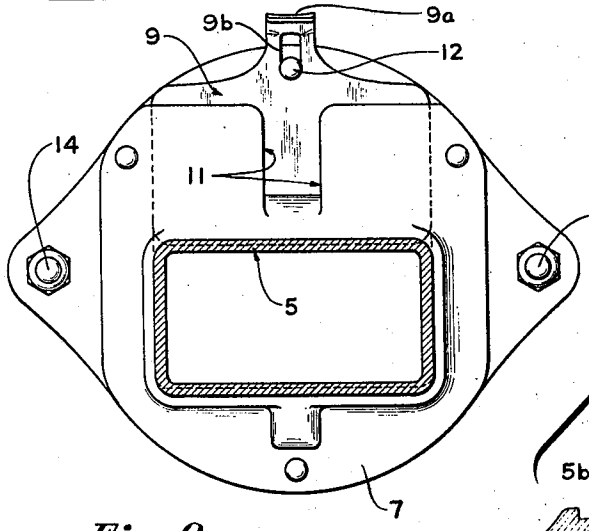


Fig. 2

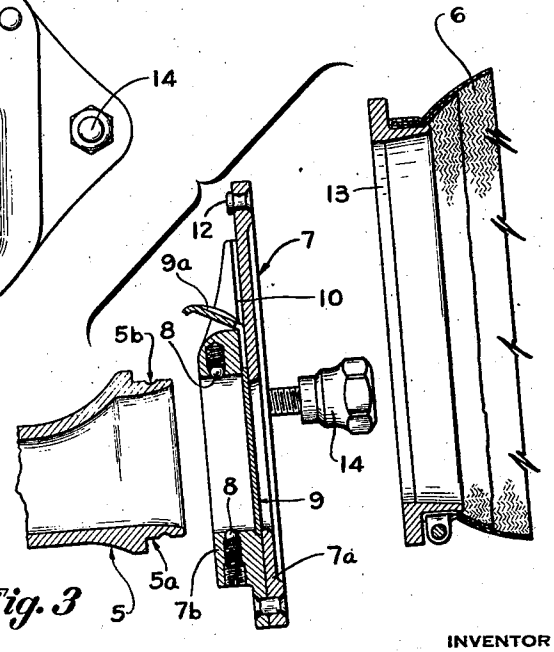


Fig. 3

INVENTOR

Willis F. Hudson

BY

Harry S. Dunarr

ATTORNEY

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SUCTION CLEANER

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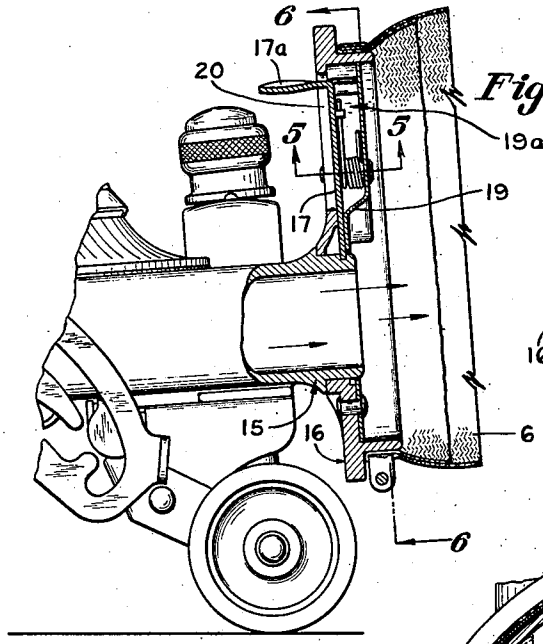


Fig. 4

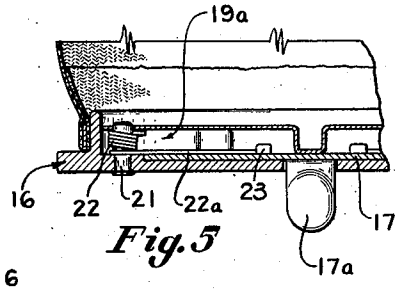


Fig. 5

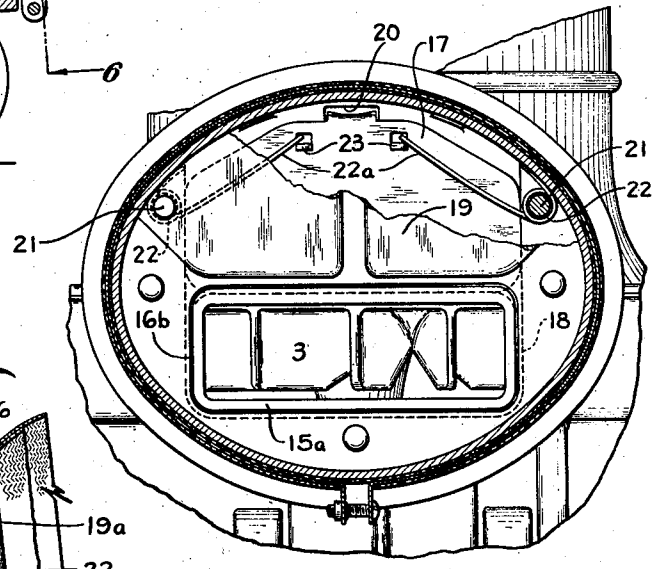


Fig. 6

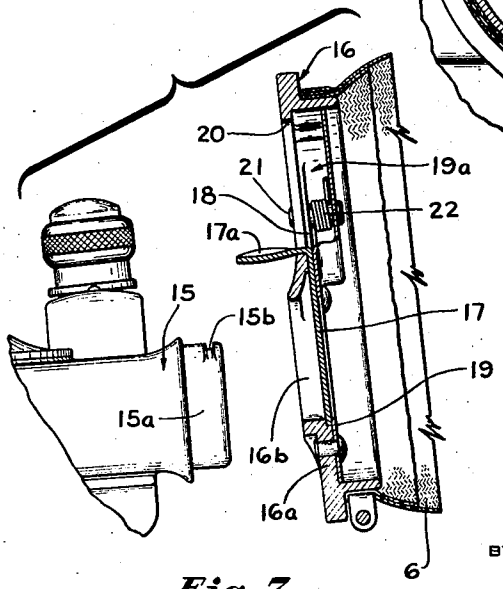


Fig. 7

INVENTOR

Willis F. Hudson

BY

Harry S. Dumasse

ATTORNEY

Patented Oct. 15, 1940

2,218,169

UNITED STATES PATENT OFFICE

2,218,169

SUCTION CLEANER

Willis Fenton Hudson, Riverside, Ill., assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio

Application March 20, 1937, Serial No. 132,008

9 Claims. (Cl. 15—257)

This invention relates to improvements in suction cleaners and more particularly to an improved mounting for the dust bag or receptacle including a closure valve in the inlet to the dirt bag and which may be closed preparatory to removing said bag for emptying.

The object of the invention is to provide a valved closure at the inlet end of the dirt bag adapted to prevent the escape of dust from one end of the bag during the process of emptying the dirt through the opposite end.

And a further object of the invention is to provide a separate valved fitting intermediate the outlet from the cleaner and the bag mouth and adapted to have detachable connection with both, so that it can either be removed with the bag or left on the cleaner depending on the end through which the bag is to be emptied.

Referring to the drawings, two embodiments of the invention have been illustrated and the following is a brief description of the several figures:

Figure 1 is a general view in side elevation of the suction cleaner with the exhaust outlet, the valve connecting member and a portion at the inlet end of the bag shown in cross section.

Figure 2 is an enlarged view in vertical cross-section through the bag connection as taken on line 2—2 of Figure 1.

Figure 3 is an enlarged detailed view of the dust bag connection with the bag and its connecting ring separated from the valved fitting and the latter detached from outlet connection of the cleaner.

Figure 4 is a view in side elevation of the rear end portion of a suction cleaner showing a modified arrangement of the bag attaching device and closure valve incorporated therein with the bag ring and parts associated therewith in section.

Figure 5 is a fragmentary detailed view in section as taken on line 5—5 of Figure 4.

Figure 6 is a view in vertical cross-section as taken on line 6—6 of Figure 4 and

Figure 7 is a view corresponding to Figure 4 showing the bag and its bag ring detached from the body of the cleaner.

Referring briefly to the suction cleaner shown in Figure 1, the same comprises a wheeled casing 1 provided with a nozzle portion 2 extending transversely of its forward end, said nozzle portion having a downwardly facing nozzle opening or mouth through which the dirt laden air is drawn by suction from the carpet or other floor covering under the force of suction created by a fan 3 rotating within a fan chamber located centrally of the casing and communicating with the nozzle portion 2 thereof. The fan is driven at high speed by a motor enclosed within a motor casing 4 surmounting the main casing 1 immediately above the fan chamber. Extending rearwardly from the fan chamber is a horizontal passage terminating in a slightly flared outlet connection 5, preferably rectangular in shape and to which a dirt bag 6 is detachably connected through an intermediate valved member or fitting 7.

The fitting 7 located intermediate the exhaust outlet from the cleaner casing and the mouth of the bag 6 consists of a flat plate-like member 7a having riveted to one face thereof a somewhat thicker frame section 7b forming a rectangular opening registering with a corresponding opening in the main portion of the fitting. This opening in the frame 7b is dimensioned to fit an external seat 5a formed at the outer end of the exhaust outlet connection 5 of the cleaner casing 1, and in order to make this connection fairly secure but yet permit the entire fitting to be detached from the cleaner casing, a pair of spring-pressed balls 8, 8 are located within cavities formed in the downwardly and upwardly facing edges of the opening in the frame 7b and adapted to engage rounded seats 5b, 5b formed in the corresponding faces of the shouldered end of the outlet 5.

Carried by the member 7 is a vertically slidable valve or gate member 9 consisting of a sheet metal plate of a rectangular shape slightly larger in size than the opening through its supporting member and having along its top edge a finger piece or handle 9a for sliding it upwardly and downwardly in vertical guideways 10 formed by grooving the inner edge faces of the frame section 7b, it being noted that said frame is slotted vertically at 11 immediately above the opening therethrough and in line with the finger piece 9a in order to permit the latter to slide the valve member to and from closed position. Incidentally, a vertical slot 9b is formed in the valve member immediately below the finger piece 9a, this slot being adapted to engage a rounded projection or head 12 located centrally of the upper edge of the plate 7a and acting as a stop member to limit the upward movement of the valve.

Thus with the valve fitting 7 mounted on the shouldered end of the exhaust outlet connection 5 of the cleaner casing and with the gate valve 9 in open position as shown in Figure 1, there is a substantial reproduction of a more or less standard type of dirt bag connection wherein the

exhaust outlet from the cleaner has the form of a relatively large flanged connection against which the bag ring 13, forming the mouth of the bag, has detachable sealing connection.

Much the same arrangement has been preserved in the present disclosure, except that the flanged portion of the outlet connection has been converted into a separate detachable valved member adapted to seat upon the end of the exhaust outlet and carrying a pair of clamping bolts 14, 14 for supporting the bag ring 13 by means of its laterally disposed bolt engaging ears 13a, 13a.

Now, assuming that the cleaner is being operated with the dirt bag attached to the intermediate valve member 7 and the latter fitted on to the shouldered outlet 5, the dirt-laden air stream will enter the dirt bag in the usual manner and in time the bag will become filled to such an extent to require cleaning. This operation of cleaning the bag involves first; its removal from the cleaner, which is accomplished by detaching its upper end from the handle and disconnecting its lower end from the exhaust outlet connection. If the dirt bag is permanently closed at its upper end, the only outlet for the dirt is through the lower or bottom end opening and hence it would perhaps be more convenient to simply loosen the clamps 14, 14 and remove the bag without disturbing the valve member 7 or even closing the sliding valve member 9 preparatory to removing the bag, inasmuch as the bag would be emptied through the same opening through which it is filled, and since this opening would be directed downwardly during the emptying operation there would be no particular advantage in closing the entrance to this bag before removing it from the cleaner.

However, should the bag be so constructed that it would be possible to empty it through the upper end, then there would be a decided advantage in closing the lower end while emptying the bag. Thus assuming that the bag 6 could be emptied through its upper end, then instead of detaching the bag at the bag ring 14 by releasing the clamping bolt 13, 13, this connection would be kept intact and the operator would first slide the gate valve 9 into closed position and then remove the intermediate valve member 7 from the end of the outlet connection as a part of the bag. The bag would now be open at one end only during the cleaning operation, and the operator thus protected against the ascending clouds of dust which otherwise would escape through the open bag mouth.

Figures 4 to 7 inclusive, illustrate a modified adaptation of the closure gate or valve at the inlet or mouth to the dirt bag, wherein the valve member is incorporated in the bag ring and the latter having direct connection with the shouldered outlet of the cleaner casing. Moreover, the valve member is spring-actuated and serves as the latch member for holding the bag ring in position on the cleaner.

The outlet connection 15 at the rear end of the cleaner casing is the same as before, having a slight outward flare and a relatively wide shoulder 15a to provide a support for the dirt bag and ring assembly. However, in the top surface of the shoulder 15a is a narrow locking groove or notch 15b extending transversely adjacent the outer edge thereof.

The bag ring 16 carrying the same cloth bag 6, is of the same general shape and dimensions as the ring in the preceding disclosure, although distinctly of an oval or elliptical shape. Moreover, the ring is partially closed by an integral web 16a in which is formed a rectangular opening surrounded and defined by a flange 16b.

The opening in the bag ring 16 is dimensioned to fit the shoulder 15a of the cleaner outlet connection 15 and, as clearly shown in Figure 6, is somewhat longer and narrower than the corresponding opening in the previously described arrangement. Supported by the bag ring is the spring-actuated valve or gate member 17 already mentioned, the same consisting of a flat metal plate conforming generally to the shape and size of the opening through the bag ring 16 and supported in guide grooves 18, 18 formed between the inner face of the web 16a and a thin metal retaining plate 19 riveted thereto. The top edges of the valve plate 17 taper upwardly and converge in a finger piece 17a bent outwardly at right angles and riding in a vertical slot 20 formed in the web 16a immediately above the opening therethrough.

Located on either side of the gate valve and above the opening is a pair of transverse pins 21 upon which are coiled torsion springs 22, 22 having relatively long spring fingers 22a extending inwardly toward each other with their ends bearing downwardly on a pair of lugs 23, 23 stamped out of the valve plate 17 near its upper edge as clearly shown in Figure 6. These spring fingers 22a obviously exert a downward pressure upon the valve plate and normally act to hold the valve in its closed position. Moreover, these torsion springs 22 and their supporting pins 21 are enclosed within chambers 19a, 19a formed by spacing the upper portions of the retaining plate 19 outwardly as shown in Figure 7.

Referring to the manipulation of the latter type of valved bag attaching means, the bag ring 16 normally seats on the shouldered end of the outlet connection 15 as clearly shown in Figure 4, with the gate valve 17 not only raised in its open position, but with its lower edge engaging the locking groove 15b. Thus with the tension of the springs 22 acting on the valve plate this connection between the gate member 17 and the locking groove 15b securely holds the bag ring in place and the cleaner is operated in the usual way.

Now, assuming that it is desired to remove the bag for emptying, it is only necessary to lift up slightly on the finger piece 17a, thus releasing the latching connection between the lower edge of the plate and the locking groove 15b and allowing the bag ring to be slipped off of the retaining shoulder and, having released the finger piece 17a, the valve plate 17 is shifted automatically into closed position over the opening, thus completely sealing the mouth of the bag. If the bag has an opening at the opposite end then it can be emptied without opening the valve opening at the mouth of the bag. But if it should be necessary or desired to empty the bag through its inlet end, then it is possible to hold the valve member 17 in open position for this purpose, although this is not a very convenient method of emptying the bag, because of the somewhat restricted opening. In any case, to replace the bag after it has been emptied, it is only necessary to shift the valve plate to its extreme upward position, thus allowing the bag ring to slide onto the shoulder 15a, and upon releasing the plate it automatically reengages the locking groove 15b and holds the bag assembly in place until it is necessary to again empty the bag. Having set

forth a preferred embodiment of my invention in two possible and practical arrangements:

I claim:

1. A closure device for the inlet end of a dirt bag of a suction cleaner, comprising a substantially flat frame supporting one end of said bag and having a flanged aperture forming the inlet to said bag and adapted to be removably mounted upon a seat formed at the end of the exhaust outlet from said cleaner, and a valve member mounted on said frame and adapted to be shifted endwise to close said aperture therein and thereby to permit the removal of said bag completely closed.

2. A closure device for the inlet end of a dirt bag of a suction cleaner, comprising a substantially flat frame supporting the open end of said bag and having a flanged aperture forming the inlet to said bag and a seat for the detachable mounting of said frame on the end of the exhaust outlet from said cleaner, and a valve member mounted in said frame and adapted to be shifted endwise to close said aperture in the process of removing said bag from said cleaner.

3. A closure device for the inlet end of a dirt bag of a suction cleaner, comprising a substantially flat frame to which the open end of said bag is attached and having a flanged aperture substantially smaller than the open end of said bag and forming the inlet thereto, said inlet aperture being adapted to be mounted at the end of the exhaust outlet of said cleaner, and a valve member having the form of a sliding plate mounted in said frame and positioned to close said aperture in its sliding movement and thereby permit the removal of said bag from said cleaner with its inlet end completely closed.

4. A closure device for the inlet end of a dirt bag of a suction cleaner, comprising a substantially flat frame to which the open end of said bag has detachable clamping connection and having an aperture substantially smaller than the open end of said bag forming the inlet thereto and having a flanged portion surrounding the same adapted to be detachably fitted onto a shouldered seat at the end of the exhaust outlet of said cleaner, and a valve member having the form of a plate mounted on said frame to slide endwise over said aperture thereby to permit the removal of said bag from said cleaner with its inlet end completely closed.

5. A closure device for the inlet end of a dirt bag for a suction cleaner, comprising a frame adapted to be detachably mounted at the exhaust outlet of said cleaner, said frame having a port therethrough and a valve member comprising a slidable plate shiftable to and from port closing position, a handle on said plate for moving the same in one direction, and tension means for shifting said plate in the other direction.

6. A closure device for the inlet end of a dirt bag for a suction cleaner, comprising a frame adapted to be mounted at the exhaust outlet of the cleaner and having detachable connection with the adjacent end of said bag, said frame having a port therethrough and a valve member consisting of a slidable plate adapted to open and close said port, tension means acting on said plate to shift the same into closed position, and means for holding said valve member in open position while said frame is mounted on said exhaust outlet.

7. A closure device for the inlet end of a dirt bag for a suction cleaner, comprising a frame adapted to be detachably mounted upon the exhaust outlet portion of the cleaner and having detachable connection with the adjacent end of said bag, said frame having a port therethrough and a valve consisting of a slidable plate number mounted adjacent said port and slidable into and out of port closing position, and tension means acting on said plate to shift the same in closed position, said valve being normally held in open position by contact with said outlet portion.

8. A closure device for the inlet end of a dirt bag of a suction cleaner, comprising a frame adapted to seat on the outlet connection of said cleaner and having a port therethrough, a valve member operative to open and close said port and adapted when open to have marginal latching engagement with a notch formed in the surface of said outlet connection, and tension means acting on said valve to shift the same automatically into port closing position upon the detachment of said frame from said outlet connection.

9. A closure device for the dirt bag of a suction cleaner having a tubular outlet connection, comprising a frame having a portion adapted to have detachable mounting on said outlet connection and a portion supporting the inlet end of said bag with a connecting port therebetween, and a valve member consisting of a slidable plate operative to open and close said port and adapted when open to have marginal latching engagement with a notch formed on the surface of said outlet connection, and tension means acting on said valve to shift the same automatically into port closing position upon the demounting of said frame from said outlet connection.

WILLIS FENTON HUDSON.