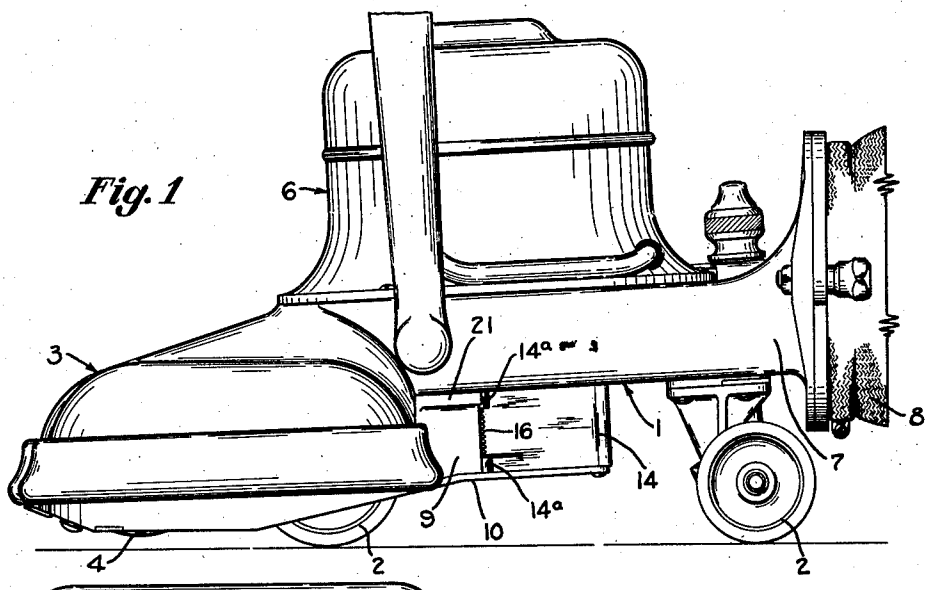
Sept. 12, 1939. W. G. KILPATRICK 2,172,960

SUCTION CLEANER

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Fig. 1



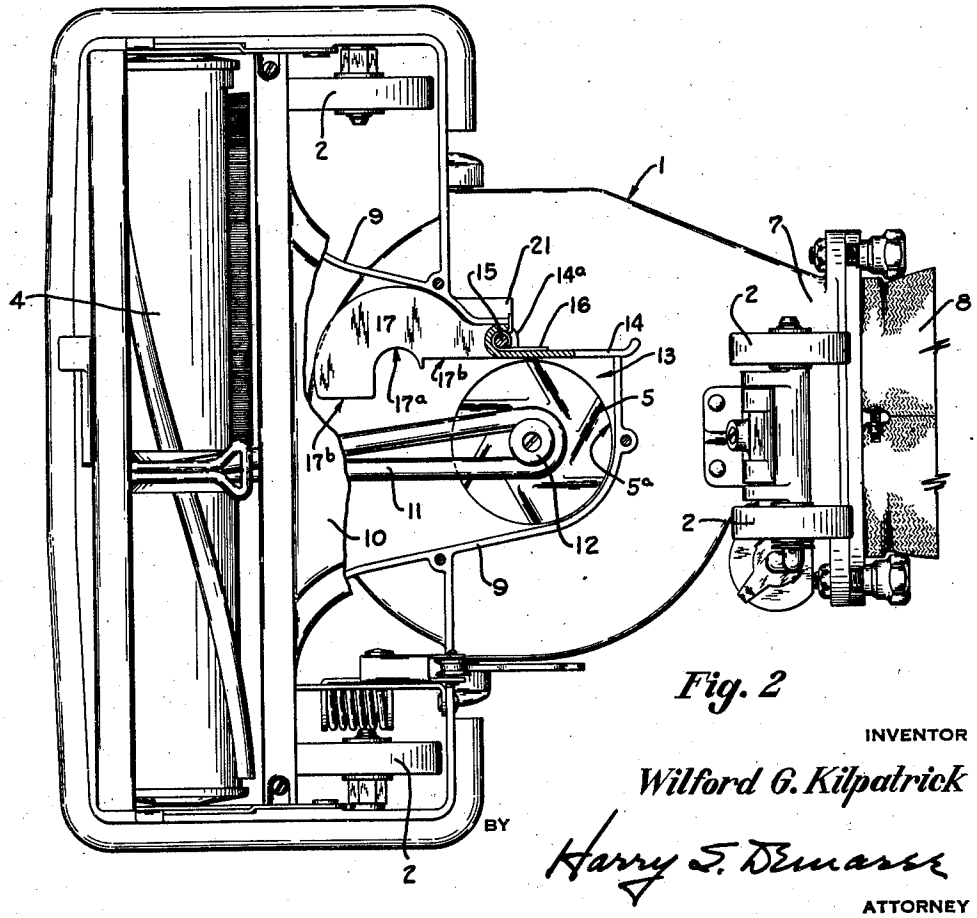


Fig. 2

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SUCTION CLEANER

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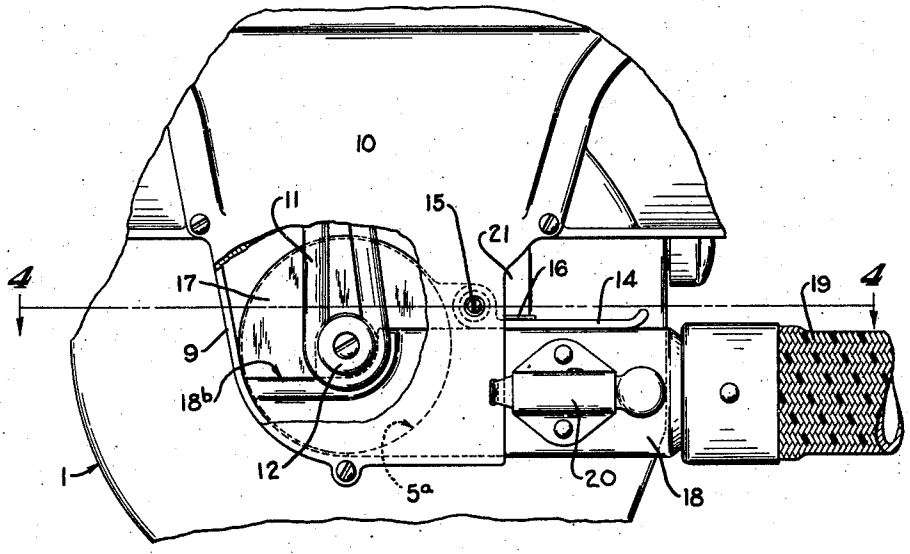


Fig. 3

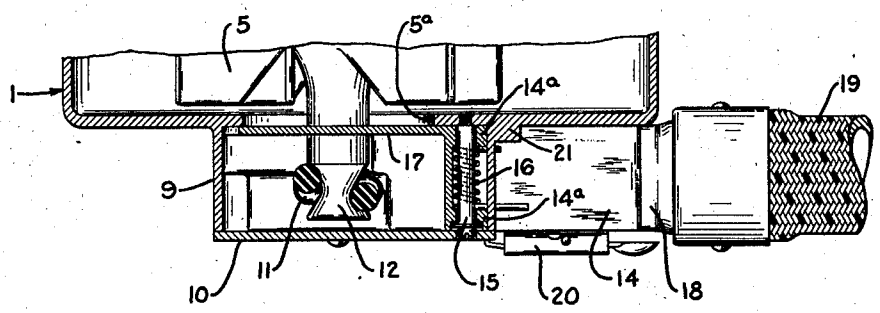


Fig. 4

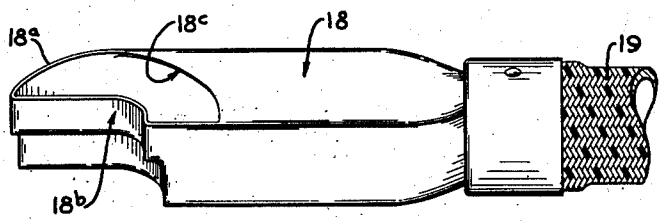


Fig. 5

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2,172,960

SUCTION CLEANER

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Application December 11, 1936, Serial No. 115,305

5 Claims. (Cl. 15—9)

This invention relates to improvements in suction cleaners and more particularly to cleaners of the portable handle maneuvered type adapted to perform its cleaning function through a main nozzle as it is moved bodily over the surface of the carpet to be cleaned and also designed for so-called "off-the-floor" operation whereby the cleaning is carried on through an extension hose and dusting tools.

The object of the present invention is to provide a simplified arrangement of the parts associated with the function of converting the cleaner to and from off-the-floor operation and characterized chiefly by the unitary assembly of a hinged valve member and a cover plate for the port into which a converter fitting at one end of the hose is inserted.

The novel features of the cleaner embodying the present invention will now be described in connection with the accompanied drawings in which:

Figure 1 is a general view in side elevation of a suction cleaner into which the nozzle converter arrangement has been incorporated.

Figure 2 is a bottom plan view of the cleaner with a portion of the bottom plate removed to show the arrangement of the converter valve and converter port cover.

Figure 3 is a fragmentary bottom plan view of the cleaner showing the converter member inserted into the converter port and the valve shifted into converted position.

Figure 4 is a fragmentary view in vertical section through the fan chamber as taken on line 4—4 of Figure 3 and

Figure 5 is a perspective view of the converter member carried at the end of the dusting tool hose.

Referring to the construction and design of the suction cleaner in its general aspects, the same comprises a main casing 1 supported upon wheels 2, 2 located adjacent the forward and rear end thereof and including, as an integral part thereof, a nozzle casing 3 extending transversely across its forward end said nozzle portion including a nozzle chamber having a downwardly facing slot or suction mouth and housing a rotating agitator 4 equipped with solid beater and flexible brush elements intended to produce a combined beating and brushing action upon the carpet.

Formed within the main casing 1 is a fan chamber in which is located a fan 5 having driving connection with a motor, not shown but enclosed within a dome-like casing or cover 6 supported on top of the main casing 1. The motor-driven suction fan 5 is visible (Figure 2) through an annular opening or "eye" 5a in the bottom wall of the main casing 1 and forming the air inlet to the fan chamber, the latter having an exhaust outlet 7 at the rear end of the main casing 1 and to which a dirt receptacle or bag 8 is removably attached.

Immediately surrounding the "eye" or air inlet opening 5a to the fan chamber is the rear end of a passage extending forwardly and communicating with the nozzle chamber, said passage being formed by short side walls 9 formed integral with and depending from the bottom wall of the main casing and a removable bottom plate 10. Aside from forming the passageway for the air from the suction nozzle to the fan chamber, this passage also houses a driving belt 11 extending from a driving pulley at the lower end of an axial extension 12 of the fan 5, to a centrally disposed annular pulley groove on the agitator 4.

Referring now to the converter arrangement, it may be stated that the function of conversion consists generally in closing off the normal air passage to or from the fan chamber and at the same time connecting the dusting tool hose with the fan chamber, so that the air enters or leaves the fan chamber through the hose. In other words, the conversion may be for suction or blower cleaning depending on whether the converting operation takes place on the suction or pressure side of the fan chamber. Moreover, the conversion may be accomplished in a number of different ways, one being the shifting of a valve or gate member crosswise of the air passage leading to or from the fan chamber. Another method is to insert a converter member, preferably attached to the end of the dusting tool hose, through a port located immediately adjacent the inlet to the fan chamber. In the present disclosure, the conversion is preferably confined to suction cleaning operations and is accomplished by combining a hinged valve member and an insertable converter fitting or member each acting to close off one-half the area of inlet opening to the fan chamber. Moreover, the port through which the converter member is inserted is normally closed by a swinging gate member or cover which carries the converter valve, so that when the said gate is swung into open position to admit the converter fitting the converter valve is simultaneously swung into converting or closing position, and vice versa.

Referring now to the detailed arrangement

whereby this conversion is brought about, there is provided immediately adjacent the air inlet opening or "eye" 5a to the fan chamber, a converter port 13 opening laterally toward one side of the cleaner and formed by omitting a section of the side wall 9 of the passage connecting the nozzle chamber with the fan chamber and further, by straightening a section of the wall 9 at the rear of the fan eye, so that the port entrance is parallel with the longitudinal center line of the casing 1, as clearly shown in Figure 2. Extending over the port entrance is a hinged cover plate 14 pivotally mounted on a vertical pivot pin 15 located at the forward edge of the port opening and arranged to swing outwardly and forwardly through an angle of substantially 90° but normally held in its closed position by a torsion spring 16 coiled around the pivot pin 15 between a pair of bearing ears 14a, 14a on the cover plate.

Integral with the hinged cover plate 14 is a flat substantially semi-circular horizontally arranged valve member 17 extending beyond the hinge pin mounting and located wholly within the passage leading from the nozzle chamber to the fan chamber. Moreover, this valve member normally assumes a position just forwardly and on the same side of the fan eye 5a as the port 13, with its rear curvilinear edge in substantially abutting contact with the side wall 9 of the passage. In fact, the portion of the side wall 9 immediately adjacent the converter valve member 17 is curved immediately beyond the hinge pin 15 in order to conform to the curvilinear contour of the valve member. Generally speaking the shape and area of the valve member 17 conforms to that of the forward half of the circular fan eye 5a, that is to say, it has an outer semi-circular edge of substantially the same radius as the fan eye and an irregular diametrically extending edge consisting of a somewhat semi-circular recess 17a concentric with its outer edge interposed between two parallel straight edges 17b, 17b offset from each other on opposite sides of the geometric center of the two concentric edges. And finally, the valve member 17 is located in a plane parallel with and just below the plane of the fan "eye" 5a, so that, assuming that it is swung inwardly toward the fan eye in a counter-clockwise direction from its position in Fig. 2, it seals and closes off substantially the entire forward half of the fan eye with the centrally disposed semi-circular recess 17a embracing the pulley extension 12 of the fan.

In the operation of converting the cleaner to off-the-floor cleaning, the converter valve is actually swung into closing position, but since it is an integral part of the hinged port cover 14, these two members must necessarily swing together about the hinge pin 15 as an axis. Thus, as the port cover 17 is swung into open position, the valve member swings into its operative or closed position and vice versa, that is to say, between the positions shown in Figures 2 and 3.

Manifestly, with the port cover swung forwardly the port is open to receive a converter member, the insertion of which completes the conversion. Figure 5 shows a suitable form of converter member 18 which is carried at the end of the extension or dusting tool hose 19.

Briefly, the converter member 18 consists of a hollow metallic body, flattened to a rectangular cross-sectional contour with a curved forward end 18a describing an arc of slightly less than ninety degrees (90°) and thence merging abruptly into a laterally facing L-shaped recess 18b. And finally, in the uppermost flat side wall of the converter member, is a substantially semi-circular shaped opening 18c adapted to register with the remaining uncovered area of the fan eye after the valve member 17 has been swung into closing position. In short, the entire forward end of the converter member is fashioned to conform with the space surrounding the rear half of the fan eye, so that when converter member is inserted endwise through the port 13 with the open side thereof facing upwardly to register with the fan eye and the L-shaped recess facing toward the converter valve 17, the closing off of the fan chamber from the nozzle is completed and the air must then enter the fan chamber through the hose.

If desired, a finger operated latch member 20 may be carried by the converter member 18, whereby it may be held against accidental displacement during converted operation. Moreover, a boss 21 may be located just outwardly from the hinge pin 15 serves as a stop member to limit the outward swinging movement of the port cover, so that in inserting the converter member 18 the pressure exerted by one against the other aids in holding the parts in place.

It may be added in connection with the present disclosure, that the closing off of an air passage by means of a converter member has been utilized heretofore as a means of converting a suction cleaner to either suction or blower operation and hence the novelty of the present arrangement may be said to reside chiefly in so connecting the converter valve with a hinged cover for the converter port that in swinging the latter into open position to admit the converter member, the converter valve is simultaneously swung into its operative position. Such an arrangement, although comparatively simple is nevertheless advantageous since it reduces the converting operation to a sequence of more or less natural movements, namely, that of opening a hinged closure with one hand and inserting a hose connection into the open port with the other hand.

Therefore, having set forth a preferred embodiment of my invention,

I claim:

1. In a suction cleaner, the combination of a casing including a nozzle and a fan chamber having an air inlet opening communicating with said nozzle through a passage provided with a port opening from the exterior thereof adjacent said inlet opening, a port closure member hinged to swing outwardly to permit a converter member to be inserted into said port and a converter valve connected with said hinged closure member and adapted to swing therewith into a position within said passage to coact with said converter member to close off said opening into said fan chamber.

2. In a suction cleaner, the combination of a casing including a nozzle and a fan chamber having an air inlet opening communicating with said nozzle through a passage provided with a port opening from the exterior thereof adjacent said inlet opening, a port closure member hinged to swing outwardly to permit a converter member to be inserted into said port and into a position to register with a portion of the area of said air inlet opening, and a converter valve integral with said hinged closure member and adapted to swing therewith into a position within said passage to complete the closure of said opening to said fan chamber.

3. In a suction cleaner, the combination of a casing including a nozzle and a fan chamber having an air inlet opening communicating with said nozzle through a passage provided with a port opening into the same from the exterior thereof and adjacent said inlet opening into said fan chamber, a hinged closure member for said port adapted to be swung outwardly into port opening position to permit the insertion of a converter member within said port to establish communication with a portion of the opening to said fan chamber, and a converter valve member located within said passage and connected to said closure member to swing into a position to close the remaining portion of the opening to said fan chamber when said closure member is swung open to receive said member.

4. In a suction cleaner, the combination of a casing having a fan chamber and a nozzle communicating with said fan chamber through an air inlet passage opening to said fan chamber, said inlet passage having an externally opening port in the wall thereof to receive a converter member adapted to close off a portion of the passage to the fan chamber, an external port closure member adapted to swing outwardly to admit said converter member, and a separate internal converter valve member integral with said closure member and adapted to swing therewith to and from a position to close off the remaining portion of said inlet passage to the fan chamber.

5. In a suction cleaner, the combination of a casing having a fan chamber and a nozzle communicating with said fan chamber through an air inlet passage, said casing having a port communicating with said air passage adjacent said fan chamber and adapted to receive a converter member carried at one end of a hose and acting to close off a portion of said passage to said nozzle, a closure plate hinged to swing outwardly to and from an open position to admit said converter member, a valve member integral with said closure plate and movable therewith to and from a position to close the remaining portion of said passage, and tension means acting on said closure plate and valve member to hold the same in their closed and open positions respectively.

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