

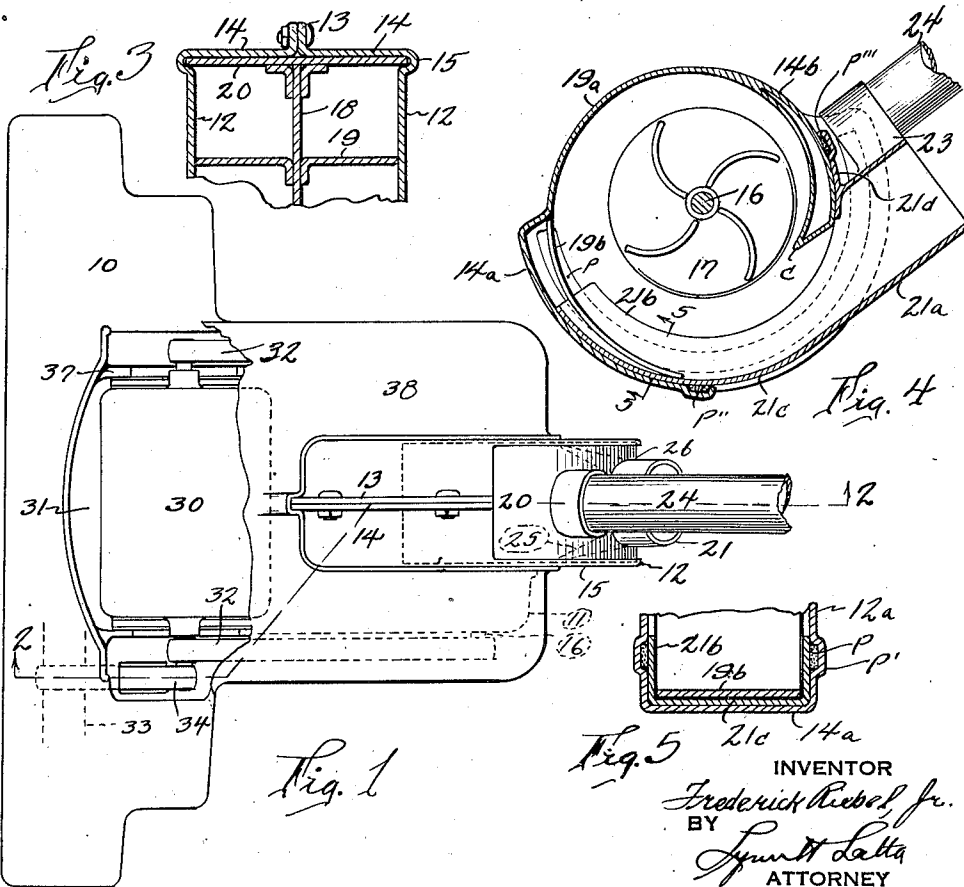
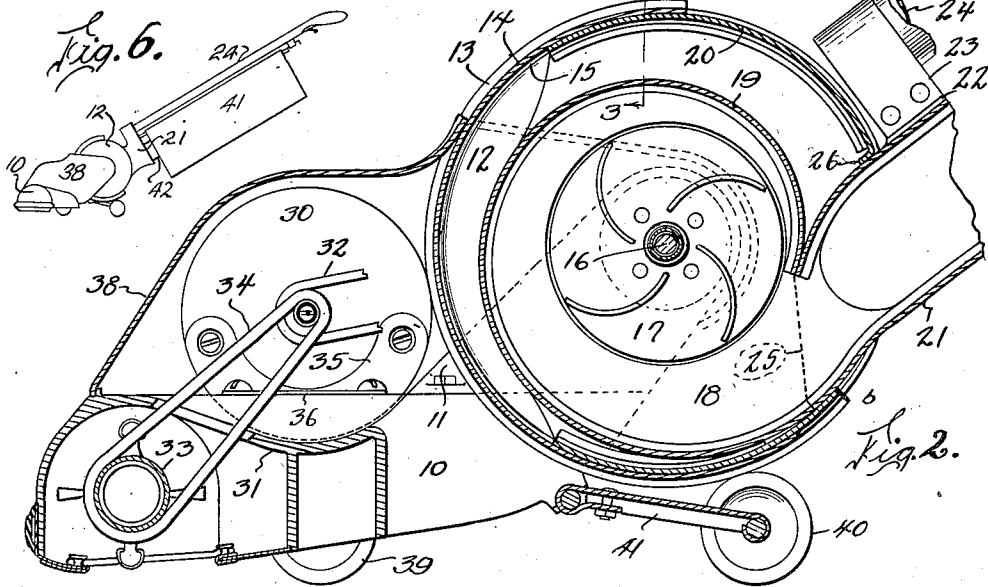
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VACUUM CLEANER

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VACUUM CLEANER

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This invention relates to vacuum cleaners and has as its object to provide a vacuum cleaner in which the fan casing is stationary and the fan outlet is mounted to slide relative to the fan casing around the axis of the fan and is rigidly attached to the handle so as to move as a unit therewith and with the bag which is supported beneath the handle and attached to the outlet.

The invention further contemplates a cleaner of this type wherein the air collecting and directing means are arranged to move along with the outlet.

Further objects will appear in the perusal of the following detailed description of the invention in connection with the accompanying drawing, in which:

Fig. 1 is a plan view of the invention, parts being broken away to better illustrate the construction.

Fig. 2 is a vertical longitudinal sectional view through the fan taken on the line 2—2 of Fig. 1.

Fig. 3 is a detailed sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a detailed sectional view through a fan of a modified form of the invention, and

Fig. 5 is a detailed sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a side elevation of a suction cleaner embodying the invention.

The invention provides a suction chamber comprising a body casting 10 and suction elbows 11 projecting upwardly therefrom and secured thereto. The elbows 11 communicate with the opposed inlets in the side walls 12 of the fan casing. The latter is formed in two sections which are secured together by overlapping flanges 13 and together form the peripheral wall 14. The peripheral wall 14 is cut away from the point *a* to the point *b*. In the corner formed between the peripheral wall 14 and the side walls 12 are annular channels or grooves 15.

The peripheral wall 14 and channels 15 are concentric with the axis of revolution of the fan shaft 16 on which is mounted the fan impellers 17. The fan impellers 17 operate in chambers which are formed between the side walls 12, a central partition wall 18, and a scroll wall 19 which is formed in two halves (Fig. 4) secured to the partition wall 18 as by welding. The periphery of the partition wall 18 at least for a considerable portion of its circumference is concentric with the axis of the shaft 16, and is secured to a closure plate 20 the edge regions of which are slidably engaged against the inner surface of the peripheral wall 14. The closure plate 20 serves

to seal off the fan casing against the escape of dust and at the same time allows the partition wall 18 and scroll 19 to rotate around the axis of the shaft 16.

Mounted upon the partition wall 18 are the two halves of a discharge outlet 21. Secured to an extension 22 of the partition wall 18 is a handle socket 23 in which is mounted the handle 24. The discharge outlet 21 connects with the scroll wall 19 to form a discharge continuation of the fan chamber, and its side walls are flared outwardly as at 25 and snugly slidable against the side walls 12 of the fan casing. The discharge outlet 21 extends through the closure plate 20 and is secured therein as at 26.

It will now be seen that the handle 24, the discharge outlet 21, the closure plate 20 and the scroll 19 and partition wall 18 may rotate as a unit around the axis of the shaft 16, the closure plate sliding in the channels 15 and against the inner surface of the peripheral wall 14 and thereby maintaining a closed relation with the fan casing.

The scroll 19 directs the air which is acted upon by the impellers 17 into the outlet 21 from whence it is discharged into the bag (not shown) which is suspended below the handle 24. The handle may be moved from a horizontal position in which the outlet 21 is limited against movement downwardly below the point *b* to a vertical position in which the outlet 21 is limited against movement forwardly of the point *a*. The cover plate 20 is extended sufficiently to maintain the fan casing closed at any position of the discharge outlet intermediate the points *a* and *b*.

The fan shaft 16 is driven by the motor 30 mounted in a depression 31 in the body 10. Belts 32 connect the motor 30 to the shaft 16. The rotary agitator, 33 mounted in the suction chamber, is driven by a belt 34 from the motor 30.

The motor 30 is mounted on the body 10 by rubber sandwich resilient mounting 35 including angle brackets 36 secured upon the ledge 37 which defines the lateral limits of the depression 31.

The motor is covered by a cover 38 which is fitted against the top of the body 10 and around the fan casing.

The body 10 is supported upon front wheels 39 and rear wheels 40, the latter being mounted in adjustable brackets 41.

A dust collecting bag 41 is suspended below the handle 24, and communicates with the outlet 21 by means of a coupling 42.

In the modified form of the invention shown in Figs. 4 and 5, the fan casing approaches more nearly a conventional design, a scroll wall 19a

forming a part of the periphery of the fan casing and being integral with the side walls 12a thereof. The portion 14a of the peripheral wall of the fan case is concentric with the fan shaft 16 and is separated from the fan chamber by a tongue 19b which forms a continuation of the wall 19a. The tongue 19b is however separated from the side walls 12a and its side edges are spaced therefrom just sufficiently to receive the side flanges 21b of the arcuate extension 21c of the discharge outlet 21a. The extension 21c lies in the pocket formed between the peripheral wall 14a and the tongue 19b and the flanges 21b extend inwardly into the spaces between the tongue 19b and the side walls 12a and are sealed in slidable engagement with the side walls by means of arcuate packing strips p that are mounted in grooves p' in the side walls 12a. The extension 21c is sealed against the peripheral wall 14a by a cross strip of packing material p'' mounted in the wall 14a. The discharge outlet 21a has an upper extension 21d which is slidably fitted against a peripheral wall portion 14b, concentric with the shaft 16 but located on a lesser radius than that of the wall 14a, merging with the scroll wall 19a near the upper limit of movement of the member 21d. A packing p''' in the member 21d seals the fan against the peripheral wall 14b.

It will now be seen that the handle may be moved from a horizontal position wherein the extension 21c is almost completely telescoped in the pocket between the wall 14a and tongue 19b, to an upstanding vertical position wherein the extension 21c is almost but not quite withdrawn from beneath the tongue 21b. During normal operation, of course, there will be only a slight variation in the relation of the discharge outlet 21a to the cut-off c which defines the outlet from the fan chamber, and that efficiency of functioning of the fan will not be thereby impaired. The fan may operate when the handle is in the lowered horizontal position, although with somewhat less efficiency owing to the change in the position of the cut-off point relative to the outlet. Likewise, the fan may operate when the handle is in an upstanding position if desired, the discharge outlet in this case being simply farther removed from the cut-off point.

It will be understood that the appended claims, where they refer to the sealing of the discharge outlet relative to the fan casing, are intended to cover either the packing seal just described or a metal to metal sealing relationship without packing.

I claim as my invention:

1. In a vacuum cleaner, a fan casing including side walls and a peripheral wall cut away for a portion of its circumference, said casing having an inlet; a handle, a discharge nozzle, a closure wall and scroll wall secured together as a rigid unit which is rotatably mounted on said casing, said closure wall being rotatably slidable in engagement with said peripheral wall and extending across the space where said peripheral wall is cut away and forming a continuation of said peripheral wall, an impeller mounted within the fan

casing inside the space defined by said scroll wall, the latter serving to direct the discharge from said impeller into said discharge outlet, and a bag supported beneath said handle and fixedly associated with said discharge nozzle.

2. In a vacuum cleaner a fan casing including side walls and a peripheral wall cut away for a portion of its circumference said casing having an inlet; a handle, discharge nozzle and closure wall secured together as a rigid unit which is rotatably mounted on said fan casing so that said closure wall forms a continuation of the peripheral wall across the space thereof which is cut away, and a bag supported beneath said handle and fixedly associated with said discharge nozzle.

3. In a vacuum cleaner, a fan casing comprising side walls and a peripheral wall which is cut away for a portion of its circumference said casing having an inlet; a handle, discharge nozzle, partition wall, closure wall and scroll wall all secured together in a rigid unit, said closure wall forming a continuation of said peripheral wall and slidably rotatable in engagement therewith, said scroll wall forming together with said partition wall and the side walls of the casing a pair of fan chambers, a pair of fan impellers rotatable in said chambers, and a bag supported beneath said handle and fixedly associated with said discharge nozzle.

4. In a vacuum cleaner, a fan casing including side walls, said casing having an inlet; a handle, discharge nozzle, and scroll wall secured together as a rigid unit which is mounted for oscillation around the axis of the fan casing, the side edges of said scroll wall meeting the inner surfaces of said side walls so as to form a fan chamber, a fan impeller mounted in said chamber for rotation on the aforesaid axis of the fan casing, and a bag supported beneath said handle and fixedly associated with said discharge nozzle.

5. In a vacuum cleaner, a fan casing including side walls and a cylindrical peripheral wall which is cut away for a portion of its circumference, said casing having an inlet, a fan shaft disposed concentric with said peripheral wall, a fan impeller mounted thereon; a handle, discharge nozzle and scroll wall secured together as a rigid unit which is mounted for oscillation around the aforesaid axis, the side edges of said scroll wall meeting the inner surfaces of said side walls so as to form a chamber in which said impeller revolves, and a bag supported beneath said handle and fixedly associated with said discharge nozzle.

6. In a vacuum cleaner, a fan casing including side walls and a peripheral wall said casing having an inlet; a handle and discharge nozzle secured together as a rigid unit which is mounted for oscillation around the axis of the fan casing, said discharge nozzle having a slidable connection with said casing allowing the handle to move through a substantial range of movement and maintaining closed communication at all times with the interior of the fan casing, and a bag supported beneath said handle and fixedly associated with said discharge nozzle.

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