Oct. 31, 1939. G. D. WELLES ET AL 2,177,969

VACUUM CLEANER

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Fig. 2

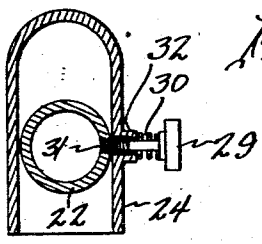


Fig. 1

Fig. 4

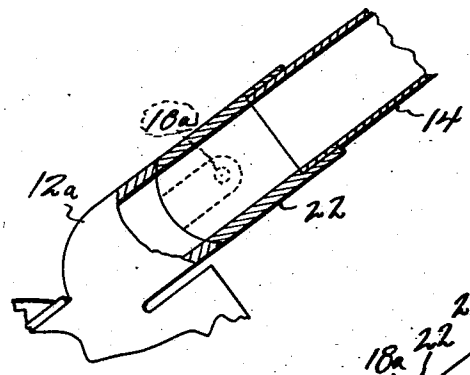


Fig. 3

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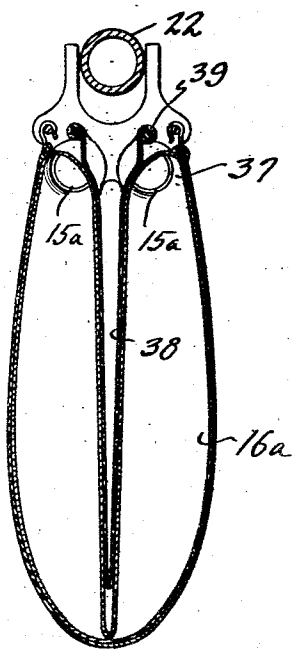
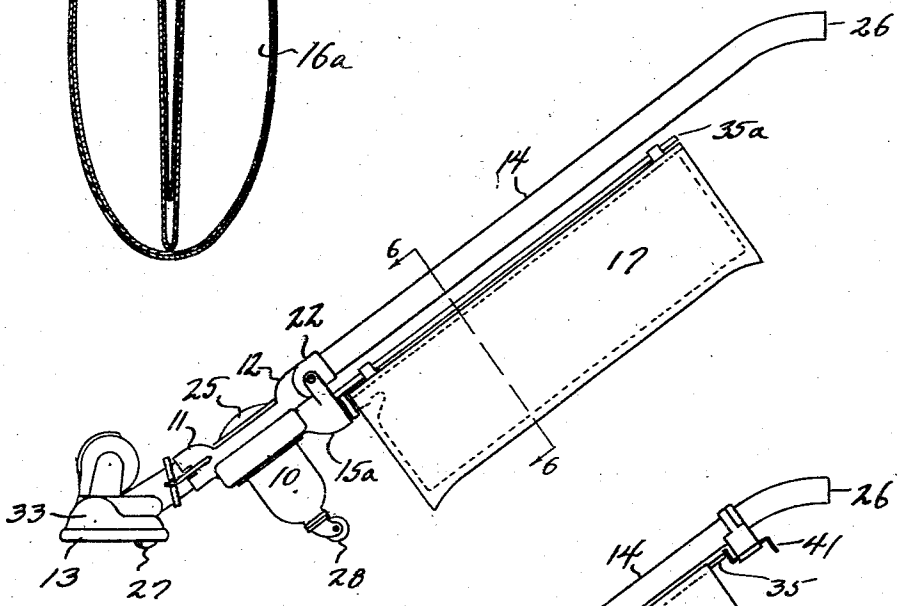


Fig. 6

Fig. 5



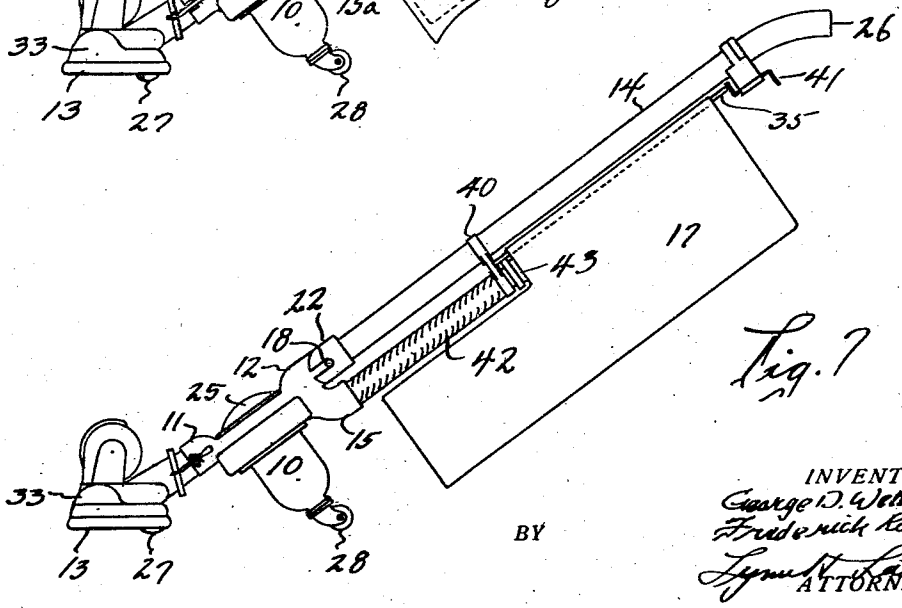


Fig. 7

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UNITED STATES PATENT OFFICE

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VACUUM CLEANER

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Application July 22, 1936, Serial No. 91,928

4 Claims. (Cl. 15—16)

This invention relates to vacuum cleaners of the type having two suction inlets, one communicating with the floor tool and the other communicating with a hollow suction handle adapted to swing vertically without imposing strain upon the dust collecting bag supported beneath it.

The invention contemplates the pivoting of the hollow handle on a transverse horizontal axis and the provision of a sliding joint between the end of the hollow handle and its suction inlet which sliding joint is disposed on an arc concentric with said pivotal axis, the parts being so arranged that the suction inlet and the opening in the end of the handle will register when the handle is in position for using the hollow handle as a suction tube.

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

Fig. 1 is a side elevation, partly in section, of one form of the invention,

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

Fig. 3 is a side elevation of a modified form of the invention,

Fig. 4 is a detail sectional view of the handle joint thereof,

Fig. 5 is a side elevation of another modification of the invention,

Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 5, and

Fig. 7 is a side elevation of a further modification of the invention.

The invention in its several forms comprises generally a suction producing unit 10 having the suction inlets 11 and 12 communicating respectively with the floor tool 13 and hollow handle 14. The unit 10 also has a discharge outlet 15 communicating with the dust collecting apparatus which latter comprises a porous paper inner bag 16 and a porous outer bag 17 of relatively strong material such as cloth or perforated composition material.

In the form shown in Fig. 1, the hollow handle 14 is provided with trunnions 18 pivoted in a pair of ears 19 formed on a bracket 20. The bracket 20 is secured to the upper end of the discharge delivery tube 21 which in turn is rigidly mounted in the exhaust outlet 15.

The lower end of the handle 14 is provided with a mouth member 22, the end of which is arcuately formed coaxially with the trunnions 18, and slidingly coacts with the inner face 23 of a hood 24 formed on the inlet 12. The face 23 also is coaxial with the trunnions 18.

Suction is applied to the floor tool 13 or to the hollow handle 14 selectively by means of a valve 25. Normally the suction is applied to the floor tool 13 and cut off from the handle, and the operator in moving the machine back and forth grasps the upper end 26 of the handle which may swing vertically to compensate for changes in the vertical position of the operator's hand during normal back and forth movement of the cleaner, the load being supported on front wheels 27 and rear wheels 28 during such operation.

Since the range of vertical movement required to accommodate the natural swing of the operator's arm is relatively small, the movement allowed to the handle by the hood 24 which exerts a limiting effect thereon will suffice.

The operator may, if she desires, rigidify the handle relative to the suction unit 10 by pushing in on the lock screw 29 against the action of the coil spring 30, and threading its inner end into a threaded opening 31 in the mouth member 22 of the handle. The screw 29 is slidably mounted in a boss 32 formed in one side of the hood 24. Normally the screw 29 is held in an inoperative position by the spring 30. This locking structure is applied as well to the modifications shown in Figs. 3, 5, and 7.

The operator, after having rigidified the handle, may lift the wheels 28 off the floor and tilt the overhanging nozzle portion 33 of the floor tool 13 toward or from the carpet as may be desired for facilitating the cleaning effect.

When the handle is locked, the mouth 22 is in registry with the inlet 12. The locking means may also be advantageously used therefor when suction is applied to the handle 14, enabling the operator to use the latter as a suction tube for cleaning corners, etc., or for the attachment of an auxiliary tool such as a wall cleaning tool or a flexible extension hose.

In the form shown in Fig. 3, the trunnions 18a are mounted directly on the mouth portion 22. The sliding joint between the mouth and the inlet 12a in this case will be curved on a much shorter radius. The bag in this case is not attached to the handle, but is supported on rods 35 in the upper edges of the outer bag 17 which rods are adapted to be clipped into spring clips 36 mounted on the delivery tube 21a. Thus the handle may be swung while the bag remains in a fixed position relative to the suction unit 10.

The form shown in Fig. 5 is similar to that just described except that in this case the bag is

supported upon two rods 35a which are directly mounted in the outlet 15a of the fan case. The inner bag 16a (Fig. 6) is doubled back upon itself to form two attached bag sections each of which has its own inlet neck 37. The exhaust outlet 15a branches into two separate outlets to which the necks 37 are respectively attached.

The sections of the bag 16a are separated by a V-shaped separator 38 of foraminous material such as wire screen so that air may escape from both sides of each section of the bag. The separator 38 is mounted on rods 39 which are mounted in the outlet 15a. The rods 39 are spaced sufficiently to allow the handle 14 to move downwardly between them, so that the bag does not interfere with normal vertical swinging of the handle.

In the form shown in Fig. 7, the bag 17 is supported on rods 35 which are mounted in a bracket 40 on the handle and a retractable latch 41 also mounted on the handle. The bracket 40 also serves to carry the free end of a flexible tube 42 which provides communication between the exhaust 15 and the inner bag 16. The neck of the bag 16 is coupled to the tube 42 by means of a coupling 43.

It will now be seen that in this form of the invention the bag swings with the handle, strains on the neck of the bag being relieved by the bracket 40 which forces the coupling 43 to move in unison with the handle, all flexing being taken up in the tube 42.

The sliding joint between the handle and inlet 12 may be successfully used in connection with a suction inlet where it would not be successful in connection with a discharge outlet. Leakage in the one case would result only in slight loss of suction owing to the air entering the inlet through the joint, whereas, leakage in the other case would result in blowing dust into the atmosphere.

We claim as our invention:

1. In a vacuum cleaner, a suction producing unit including an inlet and an outlet, both directed rearwardly, a handle pivoted to said unit for swinging in a vertical longitudinal plane, and having an arcuate sliding connection between its lower end and said inlet concentric with the handle pivot, and dust collecting mechanism attached to said outlet, means to rigidly support said collector on said unit, said dust collector including two side-by-side sections separated at their upper edges to form a space in which said handle may be received, said arcuate sliding connection permitting the swinging of the handle relative to said collector without flexing the latter.

2. In a vacuum cleaner, a suction producing unit having an exhaust outlet and having a handle swingably attached to the suction producing unit, dust collecting mechanism connected to said outlet and supported on said unit, said mechanism including two spaced sections between which the handle may move downwardly.

3. A dust collecting bag for a vacuum cleaner comprising two upwardly projecting sections integrally connected by a bottom fold, each section having in its upper forward corner, remote from the fold, an inlet neck, said two necks lying adjacent each other and adapted to be connected to the adjacent plural outlets of the fan case of the cleaner.

4. In a vacuum cleaner, a fan case having side-by-side plural outlets, and a dust collecting bag comprising two upwardly projecting sections integrally connected by a bottom fold, each section having in its upper forward corner, remote from the fold, an inlet neck, said two necks lying adjacent each other and adapted to be connected to the adjacent plural outlets of the fan case of the cleaner.

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