Nov. 2, 1937. C. BURKHARDT 2,098,028

SUCTION CLEANER

Filed March 26, 1936 2 Sheets-Sheet 1

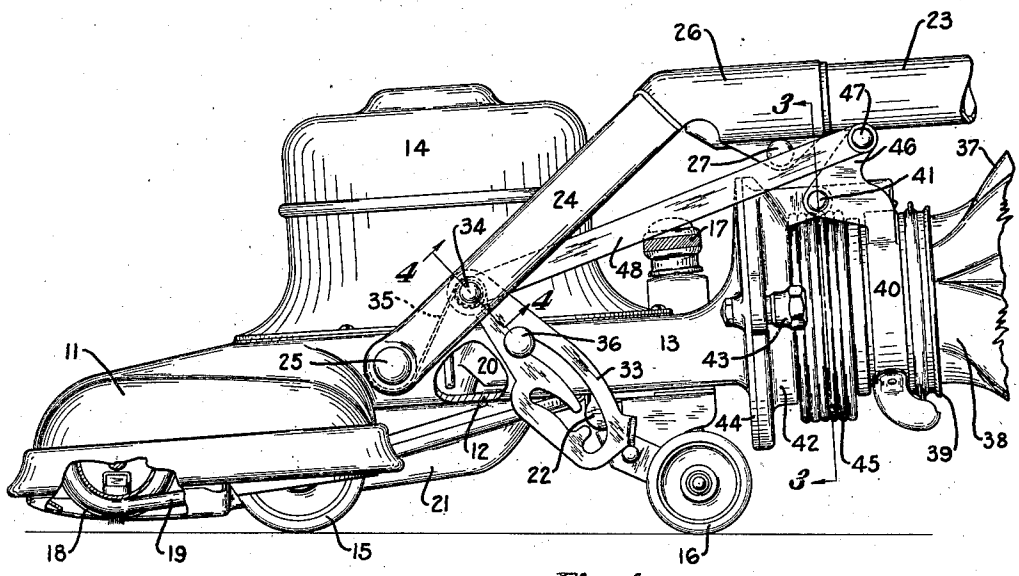


Fig. 1

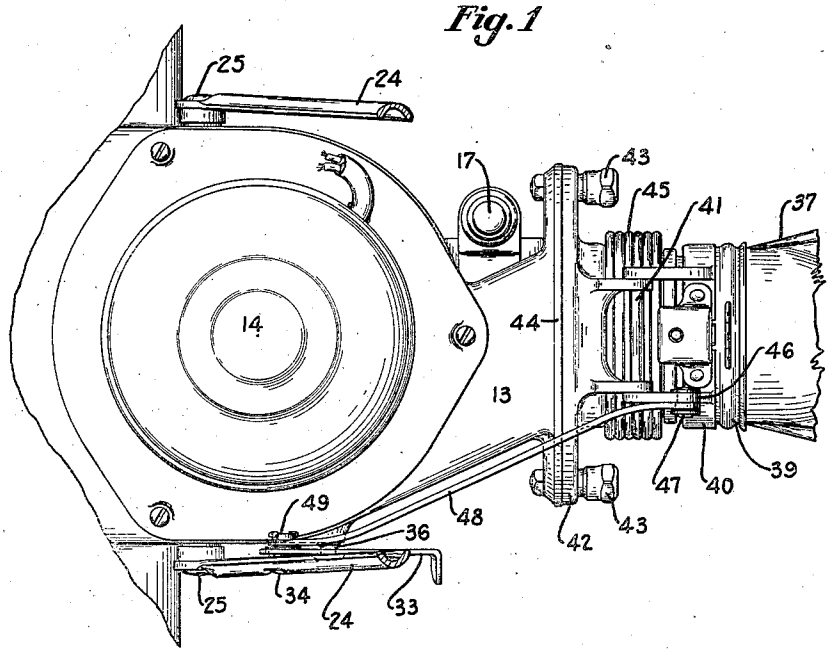


Fig. 2

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SUCTION CLEANER

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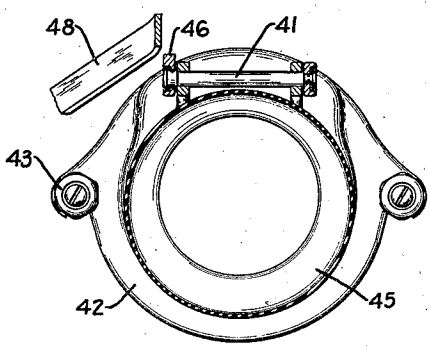


Fig. 3

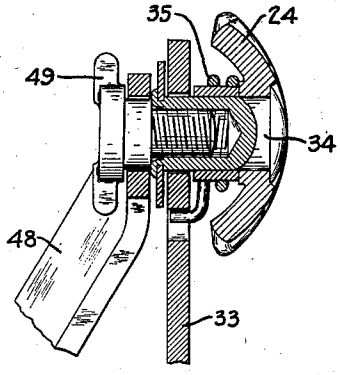


Fig. 4

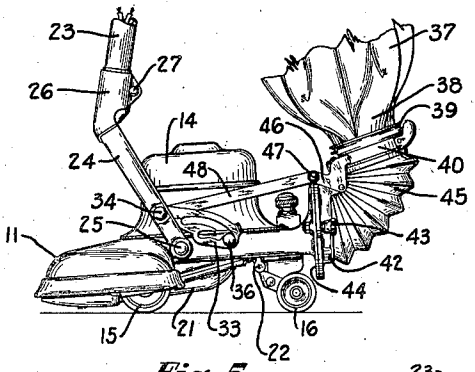


Fig. 5

Fig. 6

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UNITED STATES PATENT OFFICE

2,098,028

SUCTION CLEANER

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Application March 26, 1936, Serial No. 70,953

4 Claims. (Cl. 183—51)

The present invention relates to suction cleaners and more particularly to suction cleaners which are portable and are adapted to be moved about over the floor covering which is to be cleaned by means of a handle which is pivoted to the body of the cleaner, preferably substantially at the center of mass thereof, and extends normally upwardly and rearwardly therefrom. One of the important elements of a suction cleaner is a filtering dust collector or dust bag, into which the air stream, with the dust particles entrained therein, is discharged, the air being filtered through such bag while the dust particles are retained and collected thereby. Such dust bags are usually in the form of a bag of cloth or paper, or other suitable filtering medium, and are usually provided with a narrowed mouth which is detachably connected to the outlet from the body of the cleaner and suitably supported at the upper end from the handle of the cleaner.

In suction cleaners of this type the outlet is usually at the rear, or near the rear, of the main body of the cleaner and therefore spaced rearwardly from the point at which the pivoted handle is connected to the cleaner body. Because of this spacing, it will be appreciated that, if the bag is attached directly to the outlet of the cleaner, it will be subjected to both longitudinal tension and to bending, as the handle is swung up and down in use.

One of the objects of the present invention is to provide a suitable means for connecting and supporting a suction cleaner bag which will entirely relieve the bag of tension and bending due to the pivotal movement of the handle relative to the body of the cleaner. A further object of the invention is to provide means for connecting and supporting a suction cleaner bag which will relieve the bag of strains and which at the same time will permit relative movement of the bag with respect to the handle, and thereby lessen danger of injury to the bag when it is accidentally bumped against the body of the user, or furniture, or other objects. Further objects of the invention are to provide means for connecting and supporting a dust bag of this type which can be economically manufactured, which will be durable, and which can be readily installed upon cleaners already manufactured without material changes of such cleaner structure, and which will facilitate replacement of the bag or other parts. Still further objects of the invention and features of novelty will be apparent from the following specification when read with reference to the accompanying drawings, in which an embodiment of the invention is illustrated, and in which:

Figure 1 is a fragmentary view in side elevation of a suction cleaner embodying the invention, the handle being in its lowermost position;

Figure 2 is a fragmentary plan view, with parts of the handle and nozzle broken away, of the structure shown in Figure 1;

Figure 3 is a fragmentary view in vertical section, taken on the line 3—3 of Figure 1;

Figure 4 is a fragmentary view in vertical section, taken on the line 4—4 in Figure 1;

Figure 5 is a reduced fragmentary view in side elevation, similar to Figure 1, but showing the handle in its raised or storage position; and

Figure 6 is a reduced view in side elevation similar to Figure 5, but showing the handle in the lowermost position of the usual working range of handle positions.

In the drawings, a suction cleaner body, comprising a wide, forwardly-positioned nozzle 11, a fan chamber portion 12, having a discharge outlet 13 at the rear thereof, and a motor casing portion 14, is mounted on front wheels 15 and rear wheels 16, the latter wheels being provided with adjusting means 17 by which they may be moved up and down relative to the cleaner body in order to lift it, and so adjust the nozzle 11 to and from the underlying portion of the floor covering which is to be cleaned. A rotary agitator 18 is preferably provided and mounted in the nozzle 11, extending transversely therein, and driven by a belt 19 from a pulley, not shown, which is mounted on the shaft of a vertical axis motor which it will be understood is mounted in the motor casing portion 14, a fan 20 being also mounted on the motor shaft and positioned in the fan chamber 12. The bottom of the cleaner body is preferably formed with an opening through which access may be had to the motor shaft pulley and fan and for removing the belt, such opening being normally closed by a removable cover plate 21, held in place by a latch 22. A rigid handle 23, which is preferably tubular, is provided with a ball 24 at its lower end, which is pivotally connected to the sides of the suction cleaner body at the point 25, such point of connection being near the center of mass of cleaner body so that the cleaner will be substantially balanced when it is lifted by means of the handle. The ball 24 is preferably provided with a split socket 26, in which the lower end of the handle 23 may be clamped by a bolt 27, and the upper end of the handle is preferably provided with a curved grip portion 28, a conductor cable 29 for supply-

ing electric power to the motor being preferably attached to the handle 23, through a cover plate 30, adjacent the grip portion 26, and a suitable electric switch 31 being likewise carried by said plate, it being understood that suitable connections are provided and extend downwardly in the handle 23, to connect the cable 29 and the switch 31 to the motor. It is also preferable that clips 32 be provided on one side of the handle 23, upon which the cable may be wound and stored when the cleaner is not in use. Suitable means for controlling the position of the handle are provided, being shown herein as a slotted plate 33, pivoted at 34 to the inner side of one fork of the handle bail 24 and normally urged in a counter-clockwise direction by a spring 35, a stud 36 on the cleaner body being engaged in the slot in the plate 33. With such construction, it will be understood that the handle will be permitted free pivotal movement throughout a definite range upwardly from the position shown in Figure 6 and that when the plate member 33 is depressed, the handle may be moved to the horizontal position shown in Figure 1, or may be moved to the vertical or storage position shown in Figure 5, in which latter position it will be releasably held.

All of these parts, so far described, are of well known construction and are not shown or described in detail inasmuch as the specific construction thereof constitutes no essential part of the present invention. The parts may vary greatly as to detailed structure, relative size and location, and the present invention, which relates to the connection and support of the dust bag, may be embodied in any suction cleaner which comprises a main body portion having an outlet for dust laden air and having a handle pivoted to such main body portion at a point spaced from the outlet of the main body portion of the cleaner.

According to the present invention a dust bag 37, formed of porous paper, cloth, or other suitable material, is provided with a reduced mouth 38 at its lower end which is detachably connected to a ring 39, which in turn is detachably connected to a ring 40, having a portion thereof connected by a hinge 41 to a ring 42 which is detachably connected by nuts 43, or other suitable means, to a flange 44 on the outlet 13 of the body of the cleaner. The means for connecting the bag mouth 38 to the ring 39 preferably comprises an expansible clamping member mounted in the ring 39 for clamping the bag mouth against an inner concentric ring, such expansible member being contracted by a lever, the construction corresponding to that shown in U. S. Patent 1,919,001, Harry B. White, issued July 18, 1933. The ring 39 may be detachably secured to the ring 40 by a bayonet lock joint or by a simple latch, or by other suitable means. A flexible, extensible tubular member 45 is provided to connect the ring 42 to the ring 40 and allow for their relative swinging movement, such member being preferably formed of soft rubber with preformed corrugations and having its ends suitably secured in the rings 42 and 40 by expansible split rings, or other suitable means.

In order that the ring 40, and consequently the bag mouth which is attached thereto, may be moved with the handle 23, an arm 46 is provided on the ring 40 and is connected pivotally at 47 to a link 48, the forward end of such link being detachably connected by a wing headed screw 49 to the stud 34 upon which the slotted handle-positioning plate 33 is pivoted to the bail 24. From consideration of Figures 1, 5, and 6, it will be apparent that the rings 39 and 40 will be swung upwardly as the handle is swung upwardly and will generally follow the movement of the handle, remaining substantially perpendicular thereto at all positions of the handle between the horizontal positions shown in Figure 1 and the vertical position shown in Figure 5. The upper end of the bag 37 is preferably open, as manufactured, the material of the bag adjacent such end being gathered and folded over, and then held closed and supported by a clip 50 which is slid laterally upon the folded portion and which is detachably secured to a hook 51 engaged therewith and carried by a tape 52 or other suitable supporting means, the upper end of which is attached to the handle 23.

It will be apparent that with this structure the bag will remain at all times substantially parallel to the handle, with the bag mouth at all times substantially perpendicular to the handle, while, at the same time, the upper end of the bag is loosely supported from the handle so that it can yield laterally and to some extent in other directions upon contact with the body of the user, furniture, or other objects. The bag will thus be relieved almost entirely from bending strain due to movements of the handle and it will likewise be relieved from endwise tension. It will also be apparent that the bag can be readily replaced or removed for cleaning, and that the bag supporting structure, comprising the rings 39, 40 and 42, together with the flexible tube 45 and operating link 48 and wing headed screw 49, may be readily attached to cleaners heretofore manufactured, as a substitute for the bag and bag ring usually attached by nuts such as nuts 43 to the outlet flange 44, no alteration being necessary except the substitution for the usual stud 34 of a stud which is threaded to receive the wing headed nut 49.

It will be understood that many changes may be made in the details of construction and in the size and shape of parts within the scope of invention which is defined in the following claims.

What is claimed is:

1. A suction cleaner comprising a body provided with a discharge outlet and having an upwardly extending handle provided with bail arms pivoted to said body, a ring carried by said outlet and pivotally connected thereto at a point spaced from the pivot of said handle bail arms, a flexible tubular member connecting said ring and said outlet, a dust bag having its mouth connected to said ring, said ring having an arm rigid therewith, and power-transmitting means operatively connecting said arm and one of said bail arms.

2. A suction cleaner comprising a body provided with a discharge outlet and having an upwardly extending handle pivoted thereto, a ring carried by said outlet and pivotally connected thereto at a point spaced from the pivot of said handle, a coupling ring detachably connected to said ring, a dust bag having its mouth detachably secured to said coupling ring and supported at its upper end from said handle, said ring having an arm rigid therewith, and a link pivotally connected at its rear end to its said arm and extending forwardly and pivotally connected at its forward end to said handle at a point adjacent the pivot of the handle.

3. A suction cleaner comprising a body provided with a discharge outlet and having an upwardly extending handle pivoted thereto, means controlling the position of the handle comprising

a member pivoted to said handle, a ring carried by said outlet and pivotally connected thereto at a point spaced from the pivot of said handle, a flexible tubular member connecting said ring and said outlet, a dust bag having its lower end detachably secured to said ring and its upper end supported from said handle, and power-transmitting means for moving said ring with said handle connected to said handle at the point at which said handle positioning member is secured to said handle.

4. In a suction cleaner, the combination of a body provided with a discharge outlet and a handle pivotally mounted thereon remote from said outlet, a dirt bag adapted to communicate with the said discharge outlet, a support for the mouth of said bag having pivotal connection with said body at said discharge outlet, and a link pivotally connected at one end to said bag mouth supporting member at a point radially offset from its pivotal point and at its other end with said handle adjacent its pivotal mounting on said cleaner body whereby the mouth of said bag will move substantially with said handle.

CHANDOS BURKHARDT.