June 4, 1940. W. C. BELL 2,202,982

SUCTION CLEANER

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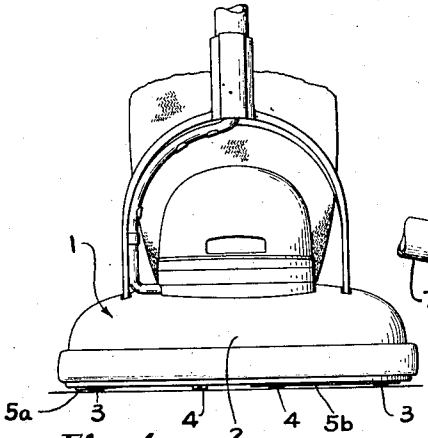


Fig. 1

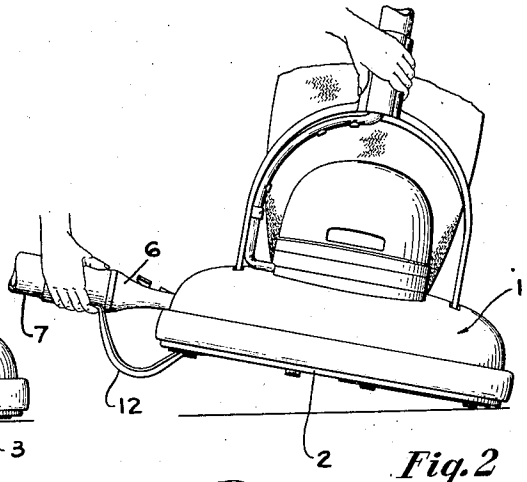


Fig. 2

Fig. 4

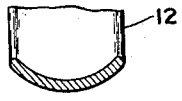


Fig. 3

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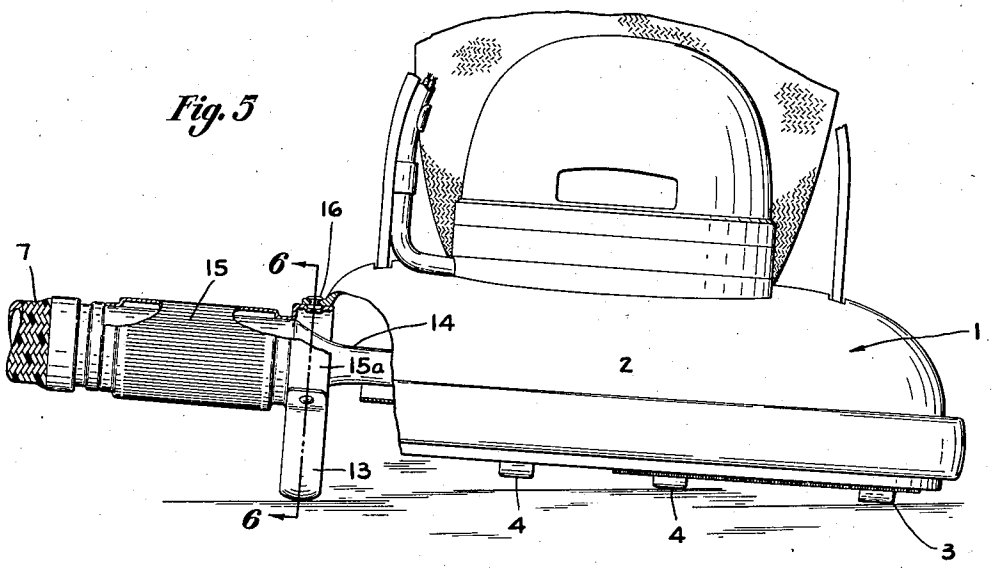
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SUCTION CLEANER

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Fig. 5



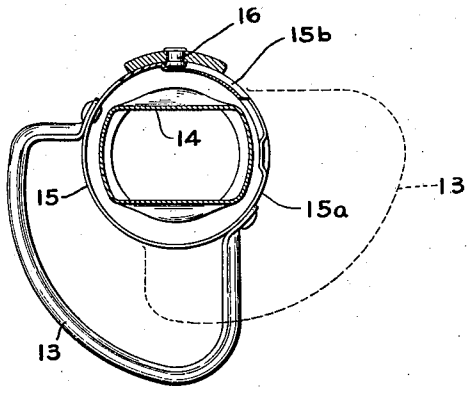


Fig. 6

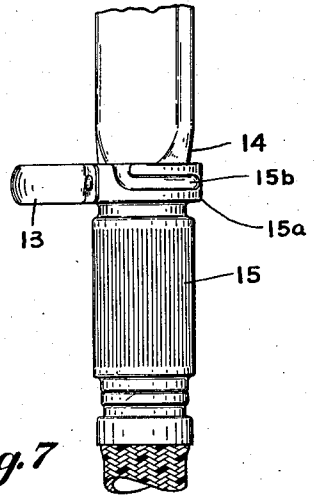


Fig. 7

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UNITED STATES PATENT OFFICE

2,202,982

SUCTION CLEANER

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Application June 20, 1938, Serial No. 214,652

4 Claims. (Cl. 15—9)

This invention relates to improvements in suction cleaners and more particularly to a suction cleaner adapted to be converted from floor cleaning operation to dusting tool operation through the medium of an auxiliary hose and connection.

The converting of a suction cleaner from one type of cleaning to the other is usually accomplished by inserting one end of the auxiliary hose into a port located at one side of the cleaner casing, the hose carrying an especially designed fitting or converter member which serves to transfer the source of suction from the main nozzle to the hose.

One desirable precaution in the dusting tool operation of a cleaner, is the raising of the nozzle above its normal level with respect to the carpet surface, this precaution being particularly important in the case where the cleaner is equipped with a rotary agitator having solid and non-yieldable carpet contacting elements. In ordinary carpet cleaning operations the beating action of the agitator progresses with the movement of the cleaner, but during dusting tool operation the cleaner may remain in a stationary position and consequently, the constant beating of the carpet at one point may cause undue carpet wear if carried on for an extended period of time. It is therefore advantageous to make provision for elevating the nozzle during converter operation and preferably by some means which functions automatically and as a part of the converter operation.

The object of the present invention is to provide a comparatively simple and yet effective means of insuring the elevation of the nozzle as a part of the converting operation, the nozzle elevation in this instance being in the nature of a sidewise tilting of the cleaner.

A preferred embodiment of the invention is clearly disclosed in the accompanying drawings, in which:

Figure 1 is a general view in front elevation, showing a suction cleaner of a standard type as it would appear during ordinary floor cleaning operation;

Figure 2 is a view in front elevation similar to Figure 1 but showing the cleaner tilted to permit the insertion of the converter member with its floor contacting prop;

Figure 3 is an enlarged somewhat more detailed view of the cleaner in front elevation with portions broken away to show the converter arrangement;

Figure 4 is a detail view in vertical section taken on line 4—4 through the floor contacting portion of the elevating prop carried by the converter member, as shown in Figure 3.

Figure 5 is a view similar to Figure 3 but showing the application of a slightly modified type of converter member and elevating prop in which the rotation of the latter tilts the cleaner body after the converter member has been inserted into its port;

Figure 6 is an enlarged detail view in cross section taken on line 6—6 of Figure 5; and

Figure 7 is a view in elevation of the converter member with its rotative prop.

Conforming to the arrangement of any standard cleaner of the portable handle-maneuvered type, the main casing or body 1 of the cleaner houses a motor-driven suction fan acting to create and maintain its suction within the nozzle 2 extending transversely across the forward portion of the cleaner body and having a downwardly opening suction mouth normally spaced a short distance above the plane of the carpet surface. The body of the cleaner is supported upon the floor by means of front and rear wheels 3 and 4, respectively, and as clearly shown in Figure 3, a rotative agitator 5 is housed within the nozzle and extends the full length thereof. This agitator consists of a cylindric shell having helically arranged beater bars 5a upon the surface thereof, as well as longitudinally arranged brush elements 5b, one of the latter being shown as projecting just below the plane of the suction mouth at the raising of the nozzle 2. Although not clearly shown, the beater bars 5a are arranged to also project a slight distance below the plane of the suction mouth and it is the continual beating contact of the bars with the carpet surface that is preferably to be avoided during converter operation and which can readily be accomplished by a tilting of the cleaner body either from the front or from one side as is the method employed in the present arrangement.

As heretofore explained, the conversion for dusting tool operation is accomplished by inserting a converter member or fitting 6, mounted at one end of the dusting tool hose 7, into a laterally opening port formed in one side of the cleaner body and leading directly into the inlet passage to the fan chamber through a port normally closed by a hinged valve or gate member 9, the forward end of the converter fitting or member being so designed as simultaneously to close off the normal air passage to the nozzle and to establish direct contact between the fitting and the fan eye 10 located centrally of the bottom wall

of the fan chamber. Once inserted, the converter member is frictionally held in place although it is sometimes desirable to provide a latch member 11 which acts to lock the converter member in place and capable of being pressed to release the converter member for withdrawal upon completion of the dusting tool operation. The method and means for converting the cleaner to and from dusting tool operation is already well known and therefore the means for accomplishing the converting operation per se forms no part of the present invention.

However, it will be noted that attached to the converter member is a U-shaped prop member 12 with one end fastened to the cylindric base portion of the converter member and its other end to the forward and somewhat flattened blade-like portion thereof. Moreover, the prop member projects radially from the connected fitting and actually is attached to the underside thereof, since conversion can take place only when the fitting is inserted in one way, namely, with the prop projecting downwardly, as in Figure 2. And finally, the extreme dimension of the prop 12 measured radially from the axial center line of the converter member 6 is somewhat greater than the distance from the imaginary center line of the converter port to the floor surface. As a consequence therefore, to insert the converter member into its port, it is necessary to tilt the cleaner slightly so that the prop will clear the floor. But upon lowering the cleaner the prop 12 supports it in a slightly tilted position on the two front and rear wheels on the far side.

The prop 12 is preferably a strip of thin metal stamped the desired bowed shape and with a slightly convex cross sectional contour, as clearly shown in Figure 4, although its precise construction is of minor importance.

Inasmuch as it is practically necessary to tilt the cleaner to insert the converter member because the prop 12 prevents the direct entrance of the converter member to its port, this sometimes inconvenient maneuver suggests the possibility of a modified arrangement which will permit the converter member to be inserted in the usual manner and then by rotating a radially disposed prop or cam member to tilt the cleaner body and at the same time to lock the converter member into its port.

Such a modified arrangement is disclosed in Figures 5 to 7, inclusive, in which all of the parts are the same as heretofore described except the form and mounting of the prop. Thus, as clearly shown in Figure 6, the prop 13 has the form of a loop-shaped eccentric cam arranged transversely and projecting radially from the converter member 14 which is provided with an outer rotative sleeve or collar 15 surrounding the cylindric base portion lying exteriorly of the converter port. At the forward end of the collar 15 is an annular flange 15*a* to which the ends of the prop 13 are riveted. This annular flange is also designed to fit into the entrance to the converter port and as clearly shown in Figure 7 is provided with a bayonet groove 15*b* in its outer surface adapted to coact with a projecting lug 16 mounted at the entrance to the converter port.

Now, with this modified arrangement, the converter member would be presented to the converter port in the cleaner casing while the latter is resting normally on the floor surface and with the rotative collar 15 turned to a position such that the cam-like prop 13 occupies the dotted line position, shown in Figure 6, with the entrance to the bayonet slot 15*b* registering with the lug 16. In this position, the prop does not prevent the direct insertion of the converter member into its port, so that when the insertion has been completed, it is only necessary to rotate the collar 15 on the converter fitting through a quarter turn to tilt the body of the cleaner into the position shown in Figure 5, and simultaneously to complete the locking of the converter member into its port by the bayonet joint.

The second or modified arrangement involves a somewhat more complicated and costly construction, but it has the two-fold advantage of eliminating the necessity for tilting the cleaner by hand before inserting the converter member and secondly, the locking of the converter member in place as the tilting movement takes place.

However, either arrangement provides a simple and effective means for tilting the cleaner sufficiently to raise the agitator out of contact with the carpet surface during off-the-floor cleaning operations.

Having disclosed a preferred embodiment of the invention as well as a practical modification thereof, I claim:

1. In a suction cleaner adapted to be converted to and from off-the-floor cleaning, the combination of suction-creating means, a nozzle communicating with said suction-creating means, an agitator mounted in said nozzle for contact with the surface being cleaned during off-the-floor cleaning, said cleaner being provided with a port also adapted to communicate with said suction-creating means during off-the-floor cleaning operation and opening laterally outward and in relatively close proximity to the floor surface, and a converter member adapted to be fitted into said port during off-the-floor cleaning operation and having a radially disposed prop member adapted to contact the floor and tilt the cleaner sufficiently to raise the agitator out of active contact with the carpet surface.

2. In a suction cleaner adapted to be converted to and from off-the-floor cleaning, the combination of a casing including suction-creating means and a nozzle communicating with said suction-creating means, a rotative agitator mounted in said nozzle, said casing being provided with a port opening laterally from one side thereof at a point adjacent said nozzle and in relatively close proximity to the floor surface, and a converter member adapted to be inserted in said port in the act of converting said cleaner to off-the-floor cleaning operation and having a radially disposed prop member adapted to project downwardly therefrom a distance in excess of the height of said port above the floor surface, whereby the cleaner is tilted sufficiently to raise the agitator out of active contact with the carpet surface during off-the-floor cleaning operation.

3. In a suction cleaner adapted to be converted to and from off-the-floor cleaning operation and having a nozzle and a rotary agitator mounted in said nozzle for contacting the carpet during normal floor cleaning operation, the combination of a converter fitting mounted at one end of a dusting tool hose and adapted to be inserted into a port located in one side of the cleaner body to complete the converting operation, said port opening laterally and relatively close to the floor surface, and a prop member carried by said converter member and comprising a cam adapted to be manually rotated after

said converter fitting has been inserted into its port to contact the floor and thereby tilt the cleaner sufficiently to lift the agitator out of contact with the carpet.

4. In a suction cleaner adapted to be converted to and from off-the-floor cleaning operation and having a nozzle and a rotary agitator mounted in said nozzle, the combination of a converter fitting adapted to be inserted into a port in the body of said cleaner to complete the converter operation, said port being located adjacent said nozzle and opening laterally at a relatively short distance above the floor level, and a prop member rotatively mounted on said converter fitting and adapted to be shifted manually into contact with the floor surface after the insertion of said converter fitting into its port to tilt the body of the cleaner and raise the nozzle sufficiently to prevent contact between the agitator and the carpet during converter operation.

WILLIAM C. BELL.