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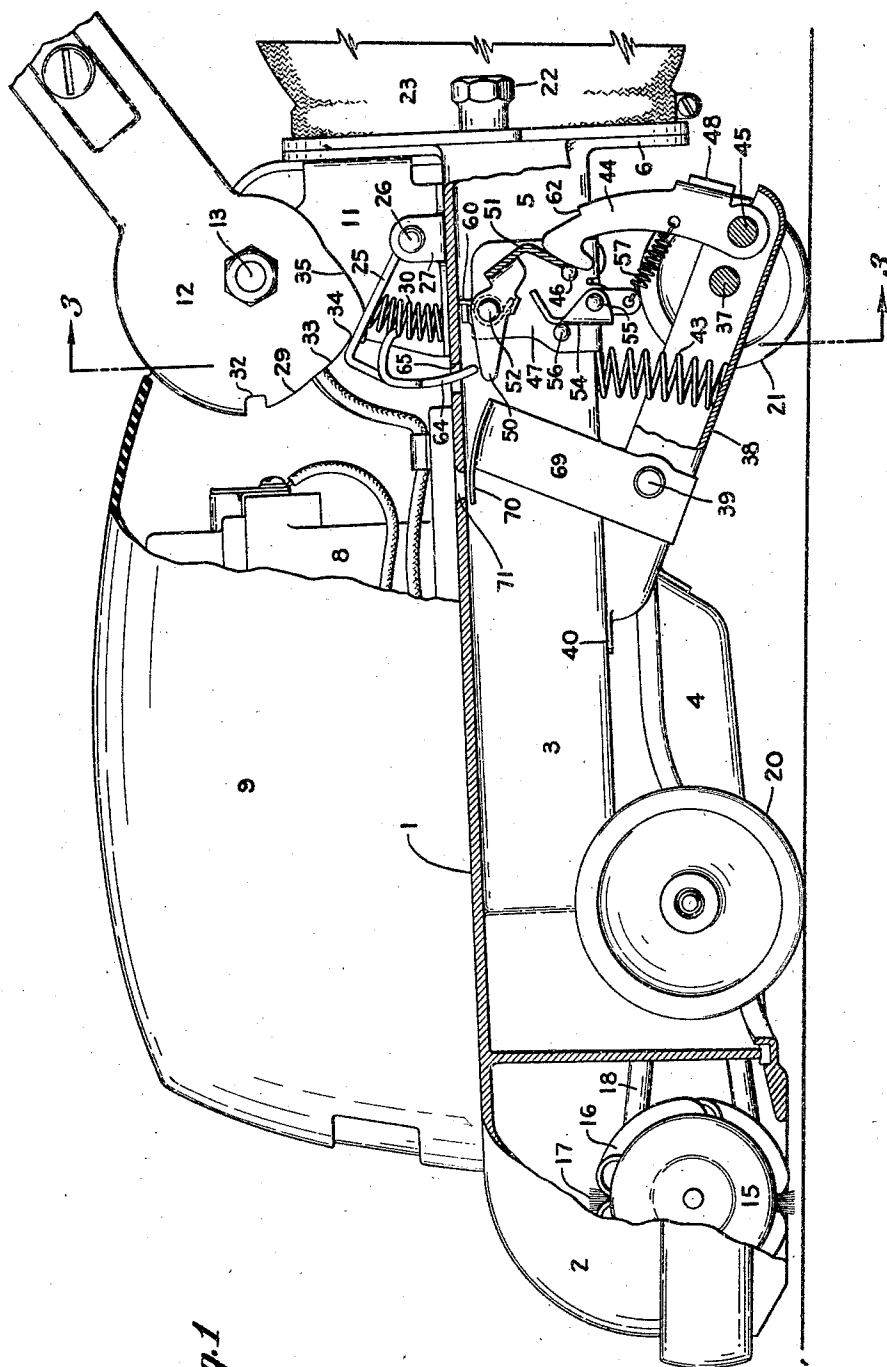
E. L. SNYDER

2,389,877

· SUCTION CLEANER

Filed May 4, 1942

5 Sheets-Sheet 1



INVENTOR
Eugene L. Snyder
BY
Harry S. Dewar
ATTORNEY

Nov. 27, 1945.

E. L. SNYDER

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SUCTION CLEANER

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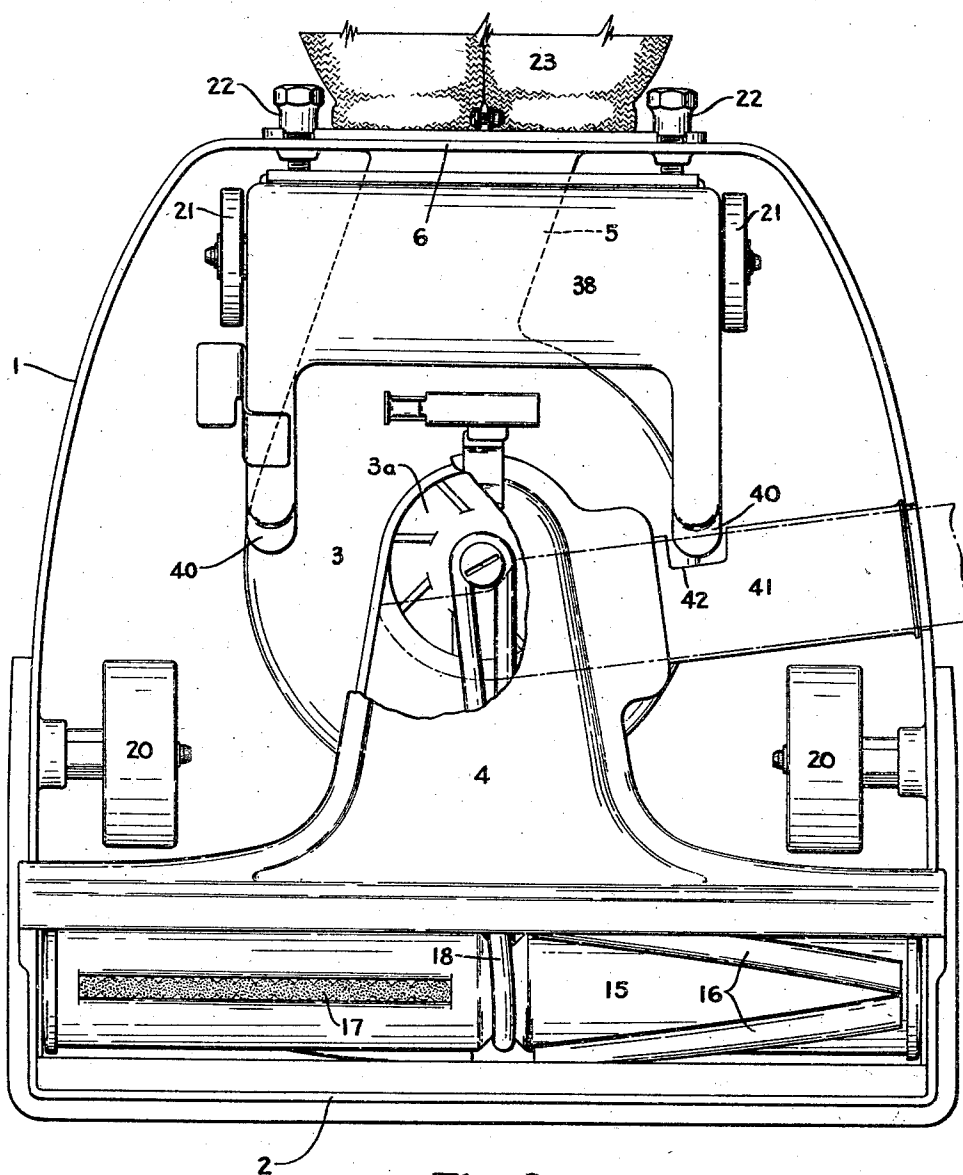


Fig. 2

INVENTOR
Eugene L. Snyder
BY
Harry S. Duane
ATTORNEY

Nov. 27, 1945.

E. L. SNYDER

2,389,877

SUCTION CLEANER

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Fig. 3

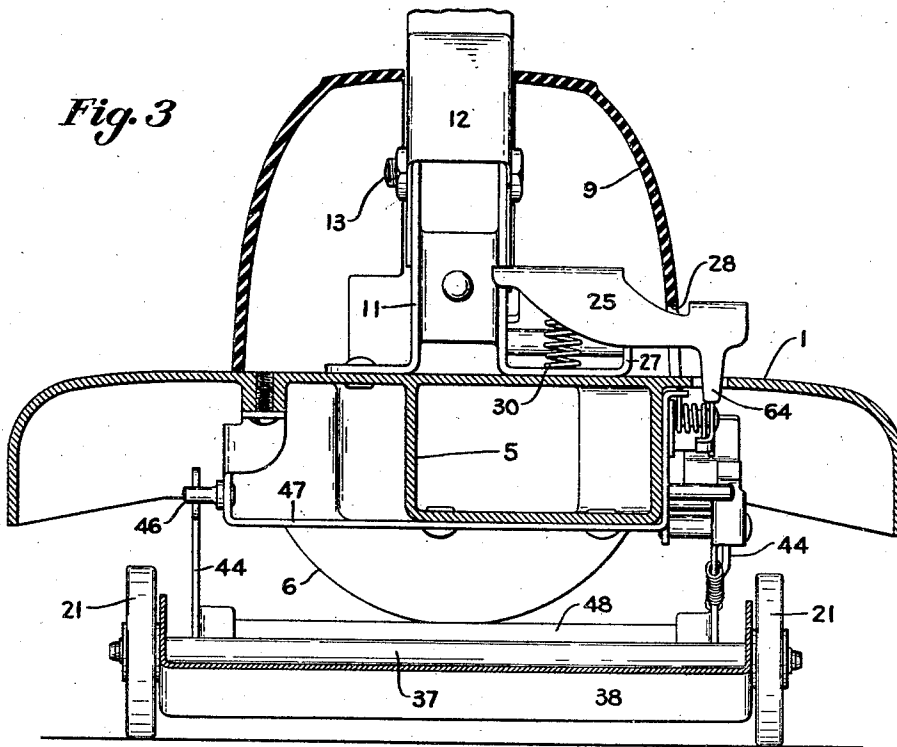
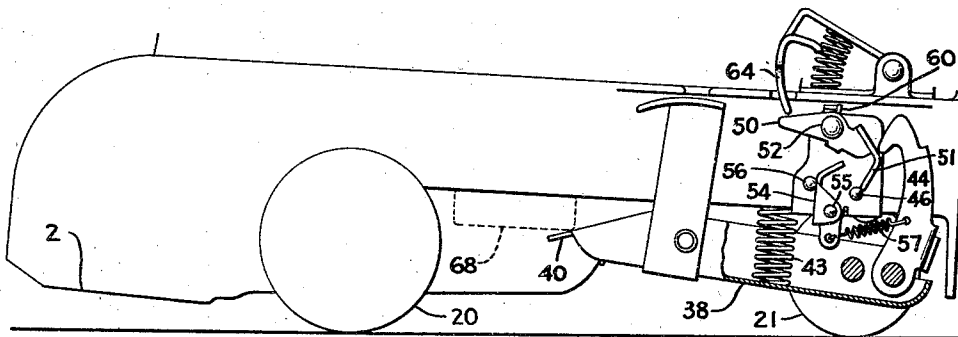


Fig. 4

INVENTOR
Eugene L. Snyder
BY
Harry S. Duvasse
ATTORNEY

Nov. 27, 1945.

E. L. SNYDER

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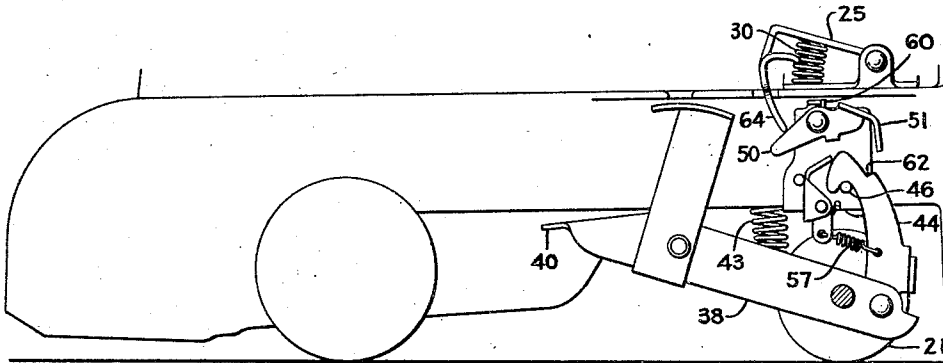


Fig. 5

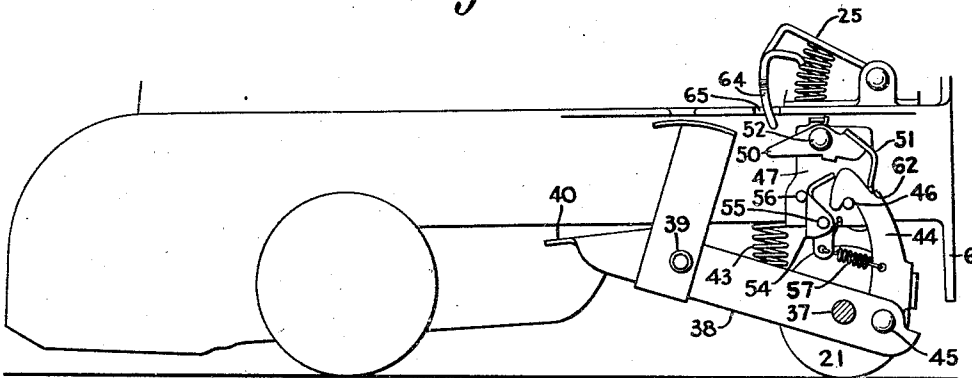


Fig. 6

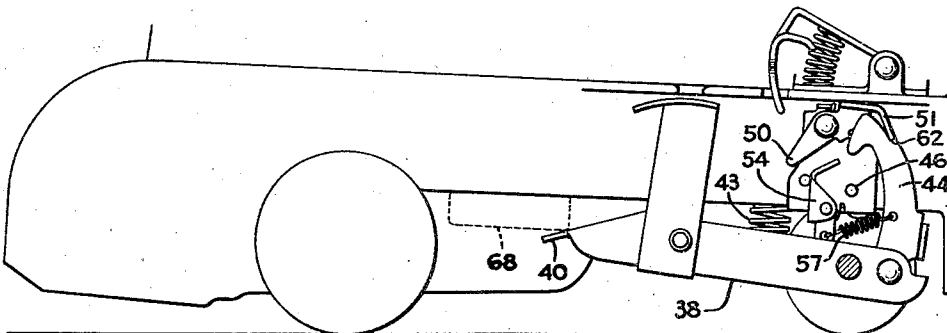


Fig. 7

INVENTOR

Eugene L. Snyder

BY

Harry S. Warner

ATTORNEY

Nov. 27, 1945.

E. L. SNYDER

2,389,877

SUCTION CLEANER

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5 Sheets-Sheet 5

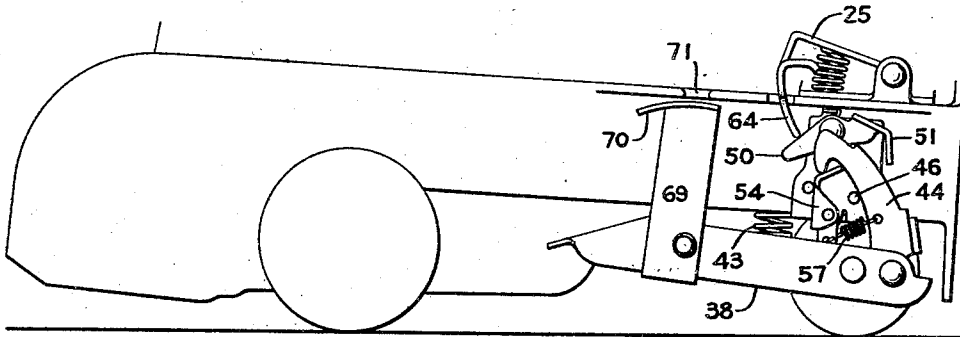


Fig. 8

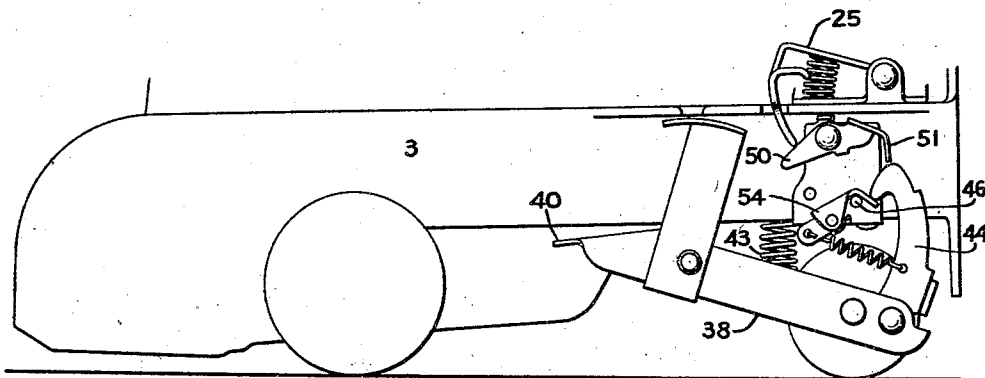


Fig. 9

INVENTOR
Eugene L. Snyder
BY
Harry S. Dunaway
ATTORNEY

UNITED STATES PATENT OFFICE

2,389,877

SUCTION CLEANER

Eugene L. Snyder, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio

Application May 4, 1942, Serial No. 441,631

6 Claims. (Cl. 15—9)

The present invention relates to suction cleaners in general and more particularly to improvements in nozzle-height-adjusting means in suction cleaners. More particularly, the invention comprises a suction cleaner in which the depressing of the rear part of the body performs selectively the functions of changing the nozzle height adjustment, removing the converter barrier, or performs both functions.

It is an object of the present invention to provide a new and improved suction cleaner. It is another object of the invention to provide a new and improved nozzle-height-adjusting means in a suction cleaner. A further object of the invention is to provide a new and novel cooperative relationship between the converter barrier and the nozzle-height adjusting means in a suction cleaner. A still further object of the invention is to provide a suction cleaner in which the converter barrier is moved to inoperative position by depressing the rear of the cleaner and in which the nozzle height is also adjusted by depressing the rear of the cleaner. A still further object of the invention is to provide a suction cleaner in which nozzle height may be adjusted between a plurality of positions by pressing downwardly upon the rear of the cleaner and in which the converter barrier is moved to inoperative position by pressing down upon the rear of the cleaner, it being possible selectively to return the cleaner to its original nozzle height adjustment or to a new nozzle height adjustment. A still further object of the invention is to provide a suction cleaner in which a new and novel relationship is provided between the nozzle-height-adjusting mechanism and the handle-controlling mechanism. Another object of the invention is to provide a suction cleaner in which the nozzle-height adjusting mechanism and the handle-controlling mechanism have in common the same operator-propelled actuating lever. These and other more specific objects will appear upon reading the following specification and claims, and upon considering in connection therewith the attached drawings to which they relate.

Referring now to the drawings in which a preferred embodiment of the present invention is disclosed, and in which the same reference character refers to the same parts throughout:

Figure 1 is a side elevation of the suction cleaner constructed in accordance with the present invention with certain parts broken away and shown in section and with the nozzle in its "low" operating position;

Figure 2 is a bottom view of the cleaner illustrated in Figure 1;

Figure 3 is a vertical section upon the line 3—3 of Figure 1 and illustrates the operating lever common to the nozzle height adjustment and to the handle-positioning mechanism;

Figure 4 is a somewhat diagrammatic illustration of the position of the parts of the nozzle-height-adjusting mechanism and of the converter barrier when the rear of the machine has been depressed from the position illustrated in Figure 1 to move the barrier to inoperative position;

Figure 5 illustrates the position of the parts at one step in the transition from the "low" nozzle position of Figure 1 or from the barrier inoperative position of Figure 4, to a "raised" nozzle position;

Figure 6 is a view of the relationship of the parts in the "raised" or "high" nozzle position;

Figure 7 illustrates the relative positions of the parts with the converter-barrier moved to inoperative position with the nozzle-height-adjusting parts previously positioned in their "high" nozzle relationship as shown in Figure 6;

Figure 8 is an illustration of the relationship of the parts in a first step in the transition from a high nozzle adjustment as illustrated in Figure 6, or from the barrier inoperative position of Figure 7 to a low nozzle adjustment as illustrated in Figure 1; and

Figure 9 is an illustration of the relationship of parts in the second step of the transition of the nozzle-height-adjustment from the high nozzle position of Figure 6, or from the barrier inoperative position of Figure 7, to the low nozzle position of Figure 1.

The modern suction cleaner embodies a multiplicity of cooperating parts and related functions. Its primary function is to clean surface coverings but it also has the important secondary function of cleaning articles of furniture, etc., which are positioned above the plane of the surface covering. In order that it can perform its floor-cleaning function most effectively it is desirable to provide the cleaner with nozzle-height-adjusting means by which it can be adjusted to surface coverings of different textures, thicknesses, porosity, etc. The well designed cleaner can accomplish completely satisfactory cleaning with but two nozzle adjustments, and the preferred way of initiating these adjustments is for the operator to exert a depressing force upon the rear of the machine which automatically shifts the cleaner from one adjustment to another.

In off-the-floor cleaning it is desirable that

the nozzle be raised above the surface covering into an inoperative position in order that rotating or positively actuated parts therein will not remain in contact with the surface covering when the machine stands in one position. To insure this result, barrier means have been provided which prevent the insertion of dusting tools into converting relationship with the cleaner until the cleaner nozzle has been raised to the desired inoperative position. This result also can be obtained by the forcing of the rear of the machine downwardly. In its use as an on-the-floor cleaner it is desirable that the operator propel the machine about and upon the surface covering undergoing cleaning. To enable this to be done there is provided a pivoted cleaner handle and it is an established fact that suction cleaner handles are most acceptable when they are adapted to operate within a given normal range of operating positions, and additionally are adapted to retain themselves in the usual vertical position. Simple handle-controlling mechanisms including a body-carried pivoted control lever have been found to be acceptable in the control of the handle-positions.

In the suction cleaner embodying the new and novel relationship of parts characterizing the present invention, the cleaner nozzle-height-adjusting means, the converter-barrier means, and the handle-control means are interconnected and inter-related in a new and novel manner. One actuating lever controls the handle movement and also determines whether or not the depression of the rear of the cleaner functions solely to move the converter barrier to inoperative position or functions to change the nozzle height adjustment.

Referring now to the drawings there is illustrated a preferred embodiment of the present invention which may take many equivalent forms. A modern suction cleaner is seen to comprise a main casing 1 which includes the nozzle 2, a fan chamber 3 connected to the nozzle by an air-passageway 4, and an exhaust outlet 5 which leads rearwardly from the fan chamber 3 and is formed at its end with a vertical flange 6. A motor 8 within an appearance housing 9 is positioned upon the main casing immediately above the fan chamber 3 and drives a suction-creating fan 3a positioned therein. A handle-supporting bracket 11 is fixedly carried by the top of exhaust passageway 5 within the housing 9 and pivotally supports the lower end 12 of the cleaner handle by the pivot pin 13.

The rotary agitator 15 positioned within the cleaner nozzle 2 is of the usual well-known type embodying rigid beater elements 16 and brush elements 17. In normal cleaner operation the agitator 15 is rotated by a belt 18 which is suitably connected to the lower end of the shaft of motor 8. The cleaner is movably supported upon front wheels 20 and upon rear wheels 21, the latter being mounted for vertical adjustment in a manner hereinafter described in order that the cleaner nozzle can be raised or lowered by pivoting the machine about the front wheels as an axis.

As in the usual suction cleaner a removable dust bag 23 is attached by means of manually operable nuts 22 to the flanged end 6 of the exhaust outlet 5 and is adapted to receive and filter foreign material from the dirt-laden air stream which is exhausted thereinto.

Experience has shown that it is desirable to provide handle-position-controlling means which

provide for the retention of the handle in a vertical position, within a range of operating positions, and which will permit the handle to be lowered into a horizontal position in order that the machine can be propelled under relatively low articles of furniture. The handle control in the present invention comprises a spring-pressed lever or pedal 25 which is pivotally mounted at 26 upon a bracket 27 fixedly carried upon the top surface of the exhaust outlet 5 and which as shown in Figure 3 has one side in common with the handle-carrying bracket 11. Lever 25 extends transversely through a slot 28 in the housing 9 to form a pedal extremity adjacent the side wall thereof. Upon its inner end pedal lever 25 is pressed, by means of a coil spring 30, into contact with the contoured seating surface 29 of the handle 12.

The contoured surface of the socket of handle 12 is seen to comprise a recessed seat 32 of relatively limited width into which the detent at one end of lever 25 is adapted to extend to position the handle in the "vertical" position substantially without movement. Immediately adjacent seat 32 is an elongated sloping surface 33 which ends in an abutment shoulder 34. With the lever detent positioned between abutment shoulder 34 and seat 32 the handle can pivot freely, the contoured surface defining what can be called the "operating range" of cleaner handle movement. If the cleaner handle is moved into the "vertical" position the lever detent 25 slides into and catches within the seat 32. Thereafter the handle can be displaced only by the operator depressing the lever to remove it from the seat. If the operator lowers the handle until the lever 25 contacts the abutment shoulder 34 he has reached the lower end of the operating range. He must then depress the control lever 25, if he desires to lower the handle further, to enable the detent to reach the top of the shoulder 34. The sector surface 29 is contoured, as indicated at 35, from the top of the abutment shoulder 34 so that the lever 25 can ride therealong as the handle is lowered into the "horizontal" position. Also, from this "horizontal" position the handle can be pivoted back into the "operating range" without operation of lever 25 because of the contouring 35.

Returning now to the rear supporting wheels which are vertically adjustable relative to the cleaner body it is seen that they are mounted upon an axle 37 which is itself carried by a bracket 38 pivoted to the underside of the cleaner at 39. Bracket 38 is formed with abutments 40 at its forward ends which are adapted to abut the underside of fan chamber 3 to fix the lowermost position of the wheels 21. One of the abutments 40 extends into a cut-out portion 42 in the transversely extending converter-receiving passageway 41 into which the converter dusting tools are adapted to be inserted when the machine is to be used for off-the-floor cleaning. When the abutment 40 is in contact with the underside of the fan chamber 3 and extends into the passageway 41 it functions as a barrier to prevent the insertion of the dusting tools. In order to connect the dusting tools it is necessary that the rear end of the machine be forced downwardly sufficiently to move the abutment 40 downwardly and out of the passageway 41. This is effected by forcing the rear of the machine down which in turn causes the wheels 21 to move toward the body and the abutment 40 to move therefrom. This downward movement of the rear of the machine is opposed by a coiled spring 43 positioned

between the underside of the air passageway 5 and the bracket 38. Spring 43 is sufficiently strong to hold the wheels 21 in their lowermost position in normal operation.

In the cleaner illustrated as embodying the invention the nozzle is adapted to have two surface-contacting floor-cleaning adjustments. The lower adjustment illustrated in Figure 1, is that in which the angular position of the bracket 38 is determined by the abutment 40 contacting the underside of the fan chamber 3. There is also a raised or higher surface-contacting floor-cleaning adjustment, illustrated in Figure 6, and additional means are required thereby. The means which are adapted to retain the rear wheels 21 in their upper position, the nozzle raised position, comprise a pair of latches 44 positioned at the opposite sides of the rear wheel supporting bracket 38 and are pivotally mounted on the latter by pins 45. The latches 44 are mounted for conjoint pivotal movement on the bracket 38 by an interconnecting bar 48. Each latch 44 is formed at its upper end with a downwardly facing hook portion which is adapted to engage and seat upon a fixed pin 46. These pins are carried by and extend laterally from a U-shaped bracket 47 which is fixedly connected to the underside of the cleaner main casing 1 in any suitable manner as by means of rivets. With the latches hooked upon the pins 46 the wheel-carrying bracket 38 is held above its lowermost position and the wheels 21 are positioned closer to the underside of the cleaner body. Obviously this results in the nozzle being supported at a higher elevation. The mechanism for positioning the latches 44 will now be described.

The cooperative means which enables the operator to position the latches 44 relative to their retaining pins 46 comprise two principal parts both located upon one side of the cleaner. The first part or member comprises a lever 50 centrally pivoted at 52 and which carries a guide plate 51 at its rearward end. The second important part or member is a release dog 54 which is centrally pivoted at 55 for pivotal movement between limits defined by the aforementioned pin 46 and a second or stop pin 56. The upper end of dog 54 is angularly disposed and with the dog in contact with the pin 46 forms, in effect, an inclined protecting shelf which prevents the engagement of the latch 44 with the pin and which additionally cams the latch to the side of the pin. A tension spring 57 connects release dog 54 to adjacent latch 44 and exerts a force which tends at all times to hold the release dog against the stop pin 56 and to draw the latches 44 into contact with their pins 46. The function of release dog 54, as is indicated from the foregoing, is to permit and to prevent the engagement of the adjacent latch 44 with the pin 46. As the latches 44 upon the opposite side of the exhaust outlet are positioned conjointly by virtue of their fixed connection through the interconnecting bar 48, the single dog controls both of the latches. When release dog 54 is in the vertical position and against its stop pin 56, its upper sloping end is clear of the pin 46, and at least so far as it is concerned, the latch 44 can engage the pin 46.

Referring now specifically to the lever 50 it is seen that this element is normally spring-urged downwardly at guide plate 51 by a coil spring 60 at its pivotal axis 52. The lower end of the guide plate 51 is adapted to abut the stop pin 46 in its lowermost position, illustrated in Figure 4, and when so positioned functions in somewhat the

manner of dog 54, to prevent the hooked upper end of the latch 44 from engaging the pin 46 in its downward movement when the machine is changed from its off-the-floor relationship. In its upper position, however, as illustrated in Figure 5, the guide plate 51 of the lever 50 overhangs the latch 44 and there is room for the latch 44 to pass between it and pin 46 as shown in Figure 8. Also the lower end of the guide plate 51 is adapted to engage a notch 62 formed upon the back edge of the latch.

To control the position of lever 50 there is provided upon the handle-controlling foot-operated pedal 25 a downwardly extending abutment projection 64 which passes through an opening 65 in the casing 1 to a point adjacent lever 50. Projection 64 is normally retained out of contact with the lever 50, as is illustrated in Figures 1 and 4, but can be lowered, by the physical depression of the pedal 25, downwardly through the opening 65 to pivot the lever 50 against the force exerted thereon by its coil spring 60 to a position as illustrated in Figure 5 in which the lower end of guide plate 51 is spaced from the latch 44 and from the notch 62 thereon.

The physical mechanism which is capable of accomplishing the positioning of the nozzle in a low operating position, a high operating position, and in an inoperative position and in which the converter passageway-obstructing abutment is removed has now been described and the operation of that mechanism and the transition of the cleaner from one relationship to another will now be related.

Transition from low nozzle position to inoperative nozzle position, and reverse

The relationship of the nozzle-positioning mechanism with the nozzle positioned at its low operating position is illustrated in Figure 1. In Figure 4 the relationship of the parts with the nozzle in its inoperative or off-the-floor cleaner operation position upon the rear of the cleaner having been depressed when the parts were related as illustrated in Figure 1 is shown. Referring to Figure 1 specifically it is seen that the rear supporting wheels 21 are in their lowermost position and the bracket 38 is retained from further downward pivotal movement by the contact of the abutments 40 with the underside of the fan chamber 3. When so positioned one of the abutments 40 extends into the opening 42 in the converter-receiving passageway 41 and so prevents the connection of the dusting tools to the machine.

It being desired to convert the machine to off-the-floor cleaning it is necessary to displace abutment 40 from its obstructing relationship to the passageway 41 and this is accomplished by forcing downwardly the rear of the cleaner, as by a force exerted upon the cleaner handle or upon the rear of the casings 1 or 9. This force is sufficiently great to overcome the resisting force of compression spring 43 and the rear of the machine moves downwardly resulting in the movement of the bracket 38 and wheels 21 upwardly. This of course results in the latches 44 advancing upwardly relative to their retaining pins 46 with which they have not been engaged when the cleaner is in its lowermost position, as is illustrated in Figure 1.

With the rear end of the machine forced completely downwardly the converter can be inserted into the passageway 41 and when so inserted the rear of the machine can be released

and thereupon the abutment 40 which previously contacted the underside of the fan chamber 3 now contacts the underside of the converter element, as is indicated in Figure 4 in dotted lines by the reference character 68. Its presence prevents the bracket 38 from pivoting to its original position illustrated in Figure 1 and instead retains it in the position illustrated in Figure 4. With the rear wheels so positioned the machine is tilted rearwardly about the front wheels as an axis and the cleaner nozzle and all parts therein are positioned at a distance above the supporting surface and are entirely out of operative relationship therewith. So long as the converter element 68 remains in place the parts will remain as illustrated in Figure 4. Normally the converter cannot be removed until the rear of the machine is again forced slightly downwardly to release the pressure of the abutment 40 upon the converter element 68 of the dusting tools.

It being desired to return the cleaner to on-the-floor use, the rear of the machine is again slightly depressed and the converter 68 withdrawn. Thereupon upon the release of the pressure upon the rear of the machine the coil spring 43 again forces the wheel-carrying bracket downwardly and the parts reassume their position as illustrated in Figure 1 and the nozzle 2 has its original low position as before conversion. As the latch 44 moved downwardly engagement of its upper end with pin 46 was prevented by the presence of the guide plate 51 which was spring held into overlying relationship to the pin 46 by its coil spring 60. It is seen, therefore, that the cleaner can be converted from low nozzle height cleaning position to its off-the-floor cleaning relationship at will, and that the cleaner can return to the same nozzle position as that which it initially had.

Transition from low nozzle position to high nozzle position

The relationship of the nozzle-positioning parts in the low nozzle position is illustrated in Figure 1 and in the high nozzle position in Figure 6. Figure 5 illustrates a step in the transition between the low and the high nozzle position.

In the operation of the cleaner if it is placed upon a different surface covering the operator may observe that a higher nozzle position would be desirable. The low nozzle position which he had been using found the nozzle-height-positioning parts inter-related as illustrated in Figure 1. The rear wheels 21 were in their lowermost position and the latches 44 were not seated at their upper ends upon their retaining pins 46 and instead the bracket 38 was positioned by the contact of the abutments 40 at their forward ends with the underside of the fan chamber. In the raised nozzle position, which the operator now desires, the latches 44 should be seated at their upper ends upon their retaining pins 46 as illustrated in Figure 6. As has been pointed out, however, the latch 44 can move upwardly and downwardly upon the depression and raising of the rear of the machine without its upper end hooking over the pins 46 when the guide plate 51 contacts the pin. It is necessary, therefore, for the operator to displace the guide plate 51 from the pin and this is accomplished by exerting a downward pivoting force upon the handle control pedal 25. This force causes the abutment 64 to move downwardly into contact with the lever 50 which carries guide plate 51 and results in the pivotal movement of the lever so that the guide

plate 51 is raised from the pin 46, that is from the position illustrated in Figure 1, to that illustrated in Figure 5. In practice the operator can exert the entire force which he exerts upon the rear of the machine through this pedal 25, or, he can force the rear of the machine downwardly and merely exert a supplemental or a secondary force through the foot pedal.

With the lever 50 pivoted so that the guide plate 51 is raised from the pin 46 it is then necessary only for the operator to force the rear of the machine downwardly to a sufficient extent to permit the latches 44 to pass upwardly so that their hooked ends can be drawn by the constantly acting spring 57 over and into hooking relationship with the retaining pins 46, as shown in Figure 5. The release of the downwardly exerted force upon the foot pedal 25 results in that element being forced upwardly by its compression spring 30 and the withdrawal of its abutment 64. Thereupon the guide plate 51 moves downwardly under the force of the coil spring 60 acting upon its lever 50 and at its lower end contacts the rear side of the latch 44 adjacent the hook 62 thereon. The relationship of the parts in the final raised or higher nozzle position is clearly illustrated in Figure 6.

Transition from high nozzle to off-the-floor nozzle position, and reverse

The operator may desire to convert the machine to off-the-floor cleaning when the nozzle is in the high position just described. This involves a change in the position of the nozzle position-controlling parts from that illustrated in Figure 6 to that illustrated in Figure 7.

To accomplish this adjustment the operator merely forces downwardly the rear of the machine as in conversion from the low nozzle position to off-the-floor cleaning and without exerting any pivoting force upon the foot pedal 25. As the rear of the machine is forced downwardly the latch 44 is forced upwardly and the notch 62 thereon engages the lever 50 at the lower end of guide plate 51 causing the latch to be pivoted rearwardly to the position illustrated in Figure 7. The contact of abutment 40 with the converter 68 then inserted into passageway 41 holds the parts in the described position and the wheel-carrying frame as illustrated in Figure 7. The nozzle is then raised so high as to be entirely out of contact with the surface covering undergoing cleaning as it was in Figure 4.

Upon the withdrawal of the converter, the machine being first slightly depressed downwardly to disengage the abutment 40 from the converter, the bracket 38 will again move downwardly under the force exerted by its coil spring 43 and the upper hooked end of each latch 44 will, as it moves downwardly, engage pin 46. In this movement the holding action of the guide plate 51 in the notch 62 of the latch has performed the function of preventing the latch from being drawn against the pin 46, under the action of spring 57, until it had moved downward a sufficient distance to make it impossible for it to engage the upper end of dog 54. Had this occurred the dog would have prevented the latch 44 from seating upon the pin 46, as is necessary for the raised nozzle position and instead would have caused the hooked end of the latch to pass the pin in a manner clearly evident in Figure 9 and the nozzle would have finally arrived in the low nozzle position instead of the high.

Transition from high nozzle position to low nozzle position

The operator may desire that the adjustment of the nozzle be changed from its high operating position, as illustrated in Figure 6, to its low operating position, as illustrated in Figure 1 in order that the cleaner can operate more effectively upon a surface covering. A first step in the change in position of the parts from that illustrated in Figure 6 to that illustrated in Figure 1 is to be found in Figure 8 and a subsequent second step is shown in Figure 9.

As in all adjustments of the nozzle height it is necessary to force downwardly the rear of the machine. Additionally as in the change from low nozzle position to high nozzle position, it is necessary to exert a downward force upon the foot pedal 25.

Referring to Figure 6 specifically it is seen that the guide plate 51 at its lower end is so positioned as to engage the notch 62 upon the rear of the latch 44 should the rear of the machine be forced downwardly. Assuming that occurrence, the operation described immediately above in the conversion from high nozzle position to off-the-floor cleaning position would result and upon the release of the rear of the machine the adjustment would return to the high nozzle adjustment.

To accomplish the desired change in adjustment, therefore, the operator must force downwardly the rear of the machine and also the foot pedal 25, the latter action causing abutment element 64 to pivot the lever 50. With the rear of the machine forced downwardly and the lever 50 pivoted so that the guide plate 51 is out of contact with the latch 44, as is clearly shown in Figure 8, the coil spring 57 draws latch 44 against pin 46 and it moves upwardly into an overhanging relationship with the upper contoured end of the dog 54. The operator now removes the downward force upon the rear of the machine and thereupon the compression spring 43 forces the bracket 38 downwardly, the latch 44 of course moving downwardly therewith. The upper hooked end of the latch pulls the upper contoured end of dog 54 downwardly with it from the position illustrated in Figure 8 to that illustrated in Figure 9 in which the dog overlies the pin 46 and prevents the hooked upper end of the latch from engaging the pin. As a result the upper end of the latch slides downwardly past the pin rather than into engagement therewith, the latch continuing its movement downwardly until the pivotal movement of the bracket 38 is stopped by the contact of the forward abutments 40 with the underside of the fan chamber in the position illustrated in Figure 1.

It is seen that the nozzle height control comprising the present invention makes possible the raising of the nozzle to inoperative position and the removal of the converter barrier for purposes of converting the machine to off-the-floor cleaning when the nozzle is positioned in either its low or high operating positions and merely by a downward force upon the rear of the cleaner. It is also seen that the machine can be returned to its original nozzle adjustment after conversion or can be returned to the other operating nozzle position at the election of the operator. It is also seen that the nozzle adjustment can be changed by forcing downwardly the rear of

the machine provided the foot pedal is also depressed.

The operation can be summarized by stating that the cleaner nozzle will always return to its original adjustment after the rear of the body has been depressed, and including a case in which conversion has taken place in the interim, unless a downward force has also been exerted upon the foot pedal. When the depression of the body is simultaneously accompanied by a downward pivoting force upon the foot pedal 25 the nozzle may assume an operating position other than its original one. If the nozzle is in its low position, as shown in Figure 1, the lever 25 should be depressed and the rear of the machine simultaneously depressed sufficiently for the latch 44 to engage the pin 46. This new adjustment immediately prior to the release of the pedal 25 by the operator, is shown in Figure 5. If the nozzle is in its high position, as shown in Figure 6, the lever 25 should be depressed and the rear of the machine simultaneously depressed sufficiently for the latch 44 to engage the dog 54, as shown in Figure 8. Upon the release of the downward force the adjustment passes through the relationship shown in Figure 9 finally to assume the low adjustment of Figure 1.

That the operator can at all times be informed as to the adjustment of the nozzle the bracket 38 carries an arm 69 which is formed at its upper end with quadrant 70 which is provided with suitable markings such as "High" and "Low" which are visible from the top of the machine through an aperture 71 in casing 1.

It is to be understood that the disclosed embodiment is a preferred structure which inherently embodies the functional operation of the invention but that the invention is susceptible of many structural modifications.

I claim:

1. In a suction cleaner of the type having suction-creating means, a nozzle connected to said means, a secondary inlet connected to said means, and a barrier normally preventing the connecting of dusting tools to said inlet, adjustable nozzle-supporting means connected to said barrier and movable to move said barrier to inoperative position, and means to fix the position of said supporting means relative to said nozzle in cleaner operation comprising engageable means some of which are fixed relative to said nozzle and some of which are movable with said supporting means, means controlling the movement of said engageable means to effect their return to their initial relationship upon the movement of said barrier to and from inoperative position, and operator-operated means to effect the movement of said engageable means to a different relationship upon the movement of said barrier to and from inoperative relationship.

2. In a suction cleaner, a body including a nozzle, supporting wheels, means mounting said wheels for movement toward and from said body including a frame, spring means urging said frame from said body to exert a lifting force on the latter, cooperating means on said body and said frame engageable to restrain the movement of said frame from said body under the force of said spring and disengageable upon the movement of said frame toward said body under a spring-compressing force, means to contact-and-to-prevent the re-engagement of said cooperating means upon the withdrawal of said spring-compressing force, and operator-controlled

means carried by said body to position said means to-contact-and-prevent.

3. In a suction cleaner, a body including a nozzle, and a converter seat, supporting wheels, a bracket pivotally connecting said wheels to said body, a converter barrier connected to and movable with said bracket, spring means urging said bracket from said body to raise it on said wheels, said barrier being adapted to contact said body to limit the movement of said bracket under said spring force to provide one body position, and being adapted to contact a converter element inserted between itself and said body to provide a second body position, a pin carried by said body, a latch carried by said bracket and engageable with said pin in the movement of said bracket from said body to provide a third body position and adapted to avoid engagement with said pin, and means controlling the movement of said latch relative to said pin in the outward pivotal movement of said bracket, and operator-operated means to vary said controlling means.

4. In a suction cleaner, a body including a converter seat and a nozzle, front and rear supporting wheels for said body, a frame pivotally mounting one of said wheels, resilient means urging one side of said frame and said one wheel from said body, a converter barrier carried by said frame upon the opposite side of its pivotal axis from said one wheel, said barrier extending into said seat and adapted to contact a converter seated therein or to contact said body with no converter seated therein to give two angular positions to said frame and two positions to said one wheel, said frame and barrier being positionable by a downward force on said cleaner to overcome said resilient means, and means to position said frame at a third angular position and said one wheel at a third position and comprising a latch adjustable between inoperative and frame-securing positions, operator-operable means operable under a downward force to effect the positioning of said latch in either of its positions, characterized in that the same downward force can selectively depress the cleaner body only to position said frame and barrier or can depress said cleaner and operate said operator-operable means.

5. In a suction cleaner, a body including a nozzle, a supporting wheel adjustably connected to said body to selectively support said body with said nozzle at one of a plurality of heights with respect to an underlying surface, and means to position said wheel with respect to said body including spring means urging said wheel from said

body, said spring means being collapsible under a downward force on said body forcing said body toward said wheel and into a lowered inoperative position, first means requiring no judgment on the part of the operator to limit the extent of the separation of said body and said wheel to one position upon the removal of a downward force on said body and the upward movement thereof from a lowered position, second means requiring no judgment on the part of the operator to limit the extent of separation of said body and said wheel to a second position upon the removal of a downward force on said body and the upward movement thereof from a lowered position, means to direct the control of the wheel position to said first or to said second means depending upon which exercised control at the time the body was depressed, and operator-operated means to change the position of said last-mentioned means to change the control of the wheel position to that means, either the first or the second, which was inoperative in the preceding adjustment, characterized in that said operator-operated means is adapted to be actuated by the same force which depresses the cleaner and in that said operator-operated means is not actuated when the nozzle is to be returned to the same height it had in the preceding adjustment.

6. In a suction cleaner, a body including a converter seat and a nozzle, front and rear supporting wheels for said body, a frame pivotally mounting one of said wheels, resilient means urging one side of said frame and said one wheel from said body, a converter barrier carried by said frame upon the opposite side of its pivotal axis from said one wheel, said barrier extending into said seat and adapted to contact a converter seated therein or to contact said body with no converter seated therein to give two angular positions to said frame and two positions to said one wheel, said frame and barrier being positionable by a downward force on said cleaner to overcome said resilient means, and means to position said frame at a third angular position and said one wheel at a third position and comprising a frame-carried latch adjustable between inoperative and body-restricting paths of travel upon the release of said downward force, operator-operable means to position said latch under a downward force, characterized in that the same downward force can selectively depress the cleaner body only to position said frame and barrier or can depress said cleaner and operate said operator-operable means.

EUGENE L. SNYDER.