

Nov. 26, 1935.

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2,022,438

SUCTION CLEANER

Filed Jan. 26, 1935

3 Sheets-Sheet 1

Fig. 1.

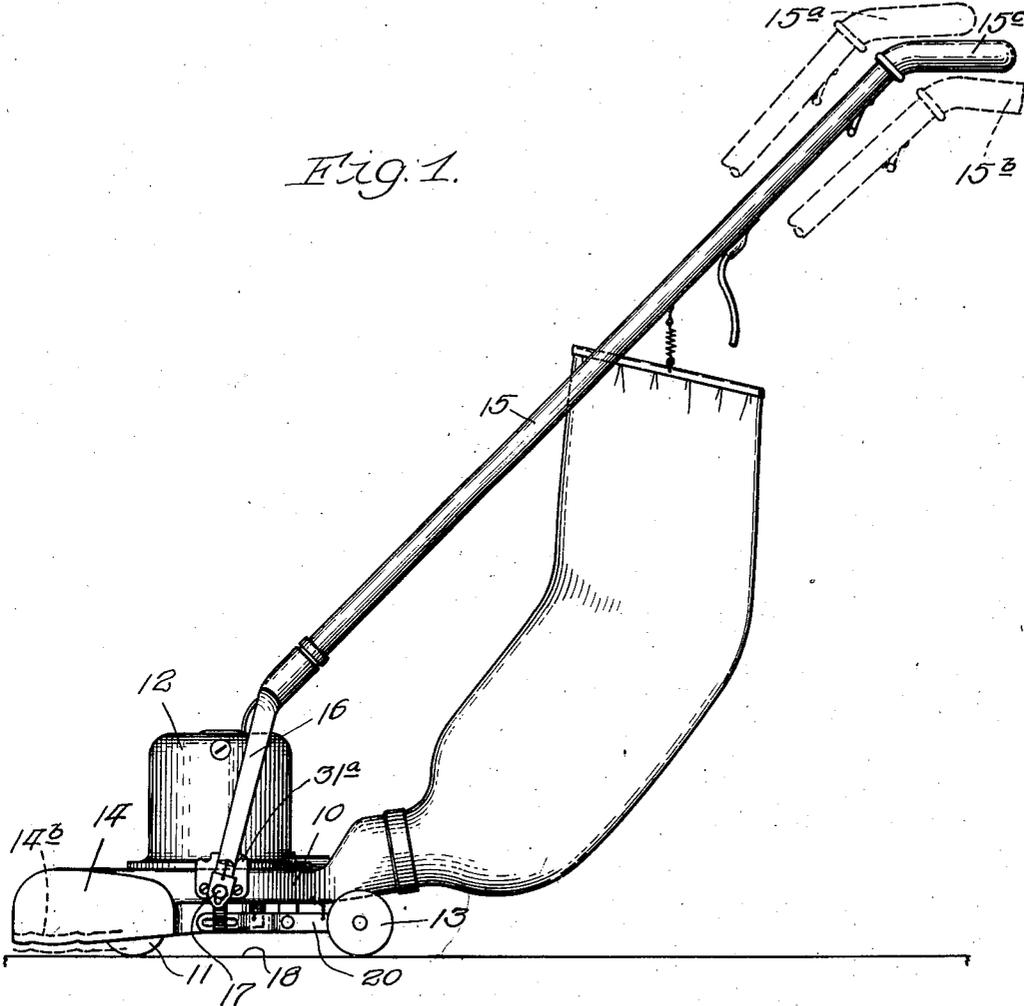
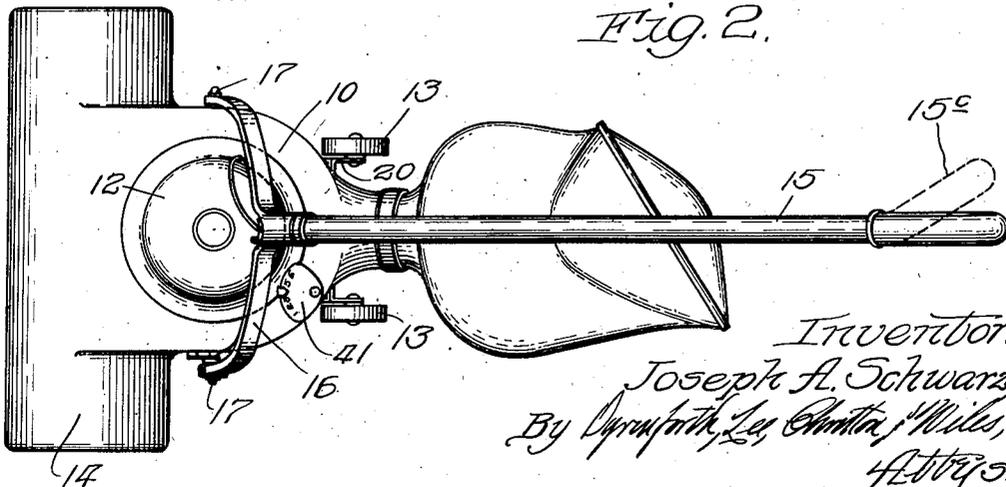


Fig. 2.



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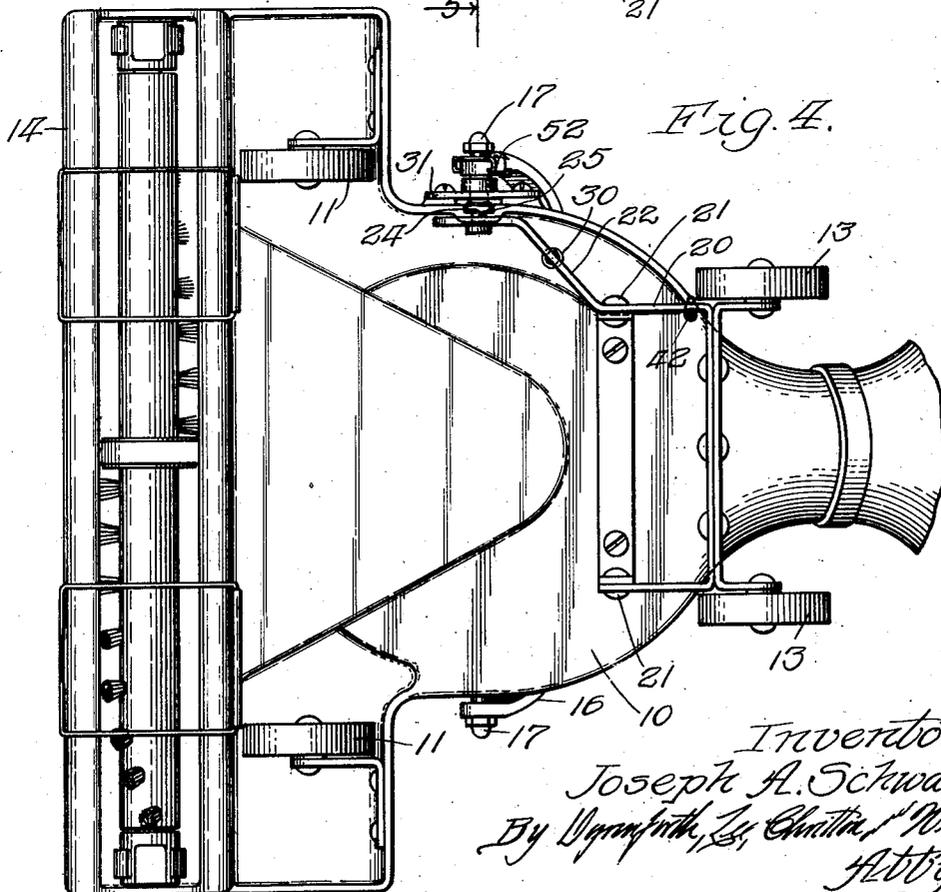
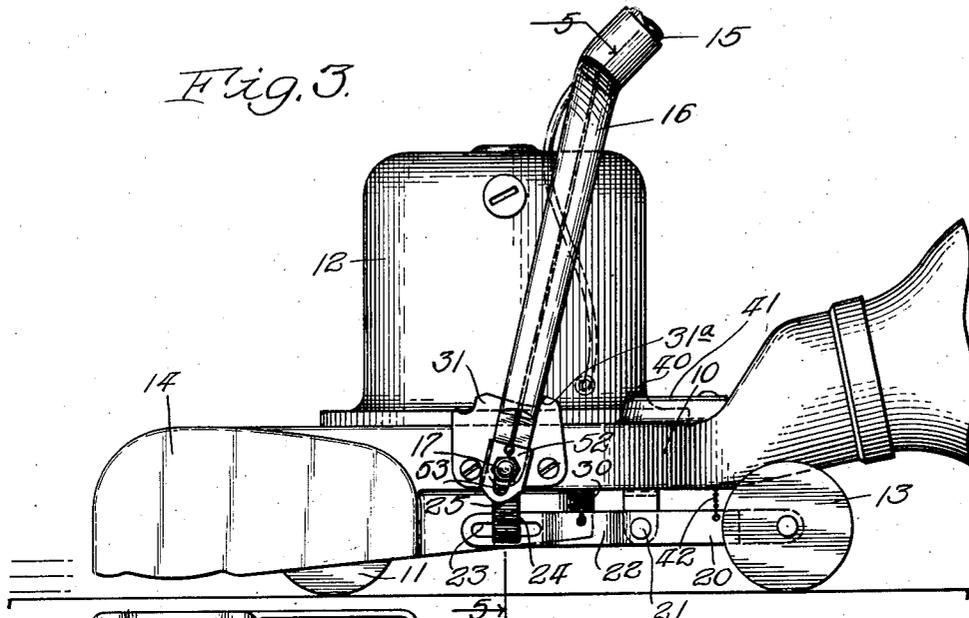
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3 Sheets-Sheet 2



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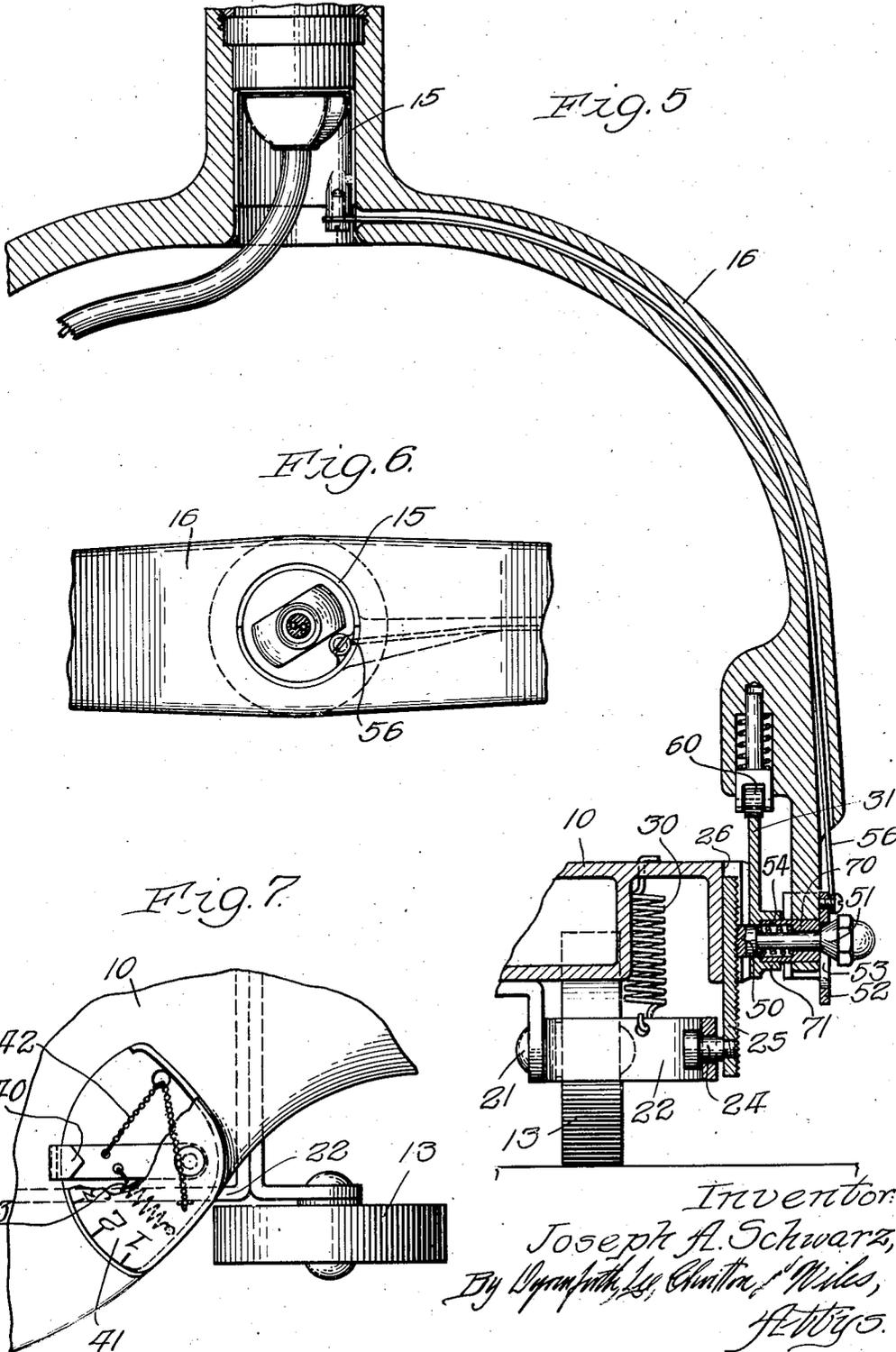
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SUCTION CLEANER

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3 Sheets-Sheet 3



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# UNITED STATES PATENT OFFICE

2,022,438

## SUCTION CLEANER

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Application January 26, 1935, Serial No. 3,653

14 Claims. (Cl. 15—8)

This invention relates to improvements in suction cleaners and, more especially, portable suction cleaners.

My invention relates more particularly to that type of cleaner having a vertically adjustable nozzle. It has been found that it is necessary or desirable to adjust the height of the nozzle of a cleaner of the type referred to in order to adapt it to various kinds of surfaces to be cleaned. For example, if working over a rather thick soft carpet, it may be desirable to raise the height of the nozzle, because on such a surface the wheels sink in so that the nozzle will contact too much with the surface of the carpet if it is not raised. If working on a bare floor, however, it is desirable to lower the nozzle.

It has been customary heretofore to provide means for adjusting the height of the nozzle of a cleaner but such means have ordinarily been provided on the carriage of the cleaner itself, so that the operator was required to stoop or bend over in order to operate the adjusting means.

Cleaners of the character in question are ordinarily provided with pivoted handles. It has been found that a pivoted handle is much more serviceable than a fixed handle. One of the features of my invention is to provide means for adjusting the height of the nozzle without stooping or bending over. All the adjustment can be made by the operator while standing erect. In the construction shown, the nozzle is vertically adjustable and means are provided on the handle for locking the nozzle in any of its adjusted positions. Any means may be provided for adjusting the nozzle prior to the locking. For example, the adjustment itself may be accomplished by manipulation of the handle by the foot, or in other ways, without stooping. When the correct position is reached, the nozzle is locked in its adjusted position, and the locking means is located on the handle within easy reach of the operator while standing erect. The locking means on the handle is so constructed that it does not affect the swinging of the handle on its pivot. Besides this, the construction is so made that the swinging of the handle on its pivot does not affect said locking means. Among the features of my invention, therefore, it may be stated generally, is the provision of a suction cleaner with a pivoted handle and a vertically adjustable nozzle and means on the handle for locking the nozzle in its adjusted position, said means not affecting or affected by swinging of the handle on its pivot.

Other features and advantages of my invention

will appear more fully as I proceed with my specification.

In that form of device embodying the features of my invention shown in the accompanying drawings—

Figure 1 is a view in side elevation; Fig. 2 is a top plan view; Fig. 3 is a fragmentary view similar to Fig. 1, on an enlarged scale; Fig. 4 is a bottom plan view, on an enlarged scale; Fig. 5 is a view taken as indicated by the line 5—5 of Fig. 3; Fig. 6 is a bottom view of a portion of Fig. 5; and Fig. 7 is a top plan view of the indicator showing the height of the nozzle.

As shown in the drawings, the cleaner comprises in general the usual carriage 10 provided with two front wheels 11, 11; the motor 12; the two back wheels 13, 13; and the nozzle 14 in front of the front wheels. 15 indicates the handle provided with a ball 16 pivoted to the carriage at 17, 17.

Since the nozzle 14 is in front of the front wheels 11, it will be seen that by raising or lowering the back wheels 13, the carriage will pivot on the front wheels to raise or lower the nozzle 14 with respect to the supporting surface 18.

To permit raising and lowering of the back wheels 13, they are mounted on a frame 20 pivoted at 21, 21. This frame is provided with a forwardly extending lever 22 provided with a slot 23 in which is inserted a pin 24 carried at the lower end of the rack bar 25 vertically slidable in the guide 26 on the carriage 10.

The back wheels 13 are yieldingly urged downwardly by a tension spring 30 between the carriage 10 and the arm 22. This spring will operate, therefore, to yieldingly hold the nozzle 14 in its lowermost position. The spring, however, will permit adjustment of the nozzle vertically against its tension. Such adjustment may be accomplished in a variety of ways. For example, the handle 15 in its lowermost position with respect to the carriage has a wheel 30 engaging a stop 31<sup>a</sup> on the plate 31, as shown in Fig. 1. If the nozzle-adjusting means is not locked, the spring 30 will urge the back wheels 13 downwardly to lower the nozzle and hold the handle 15 in an elevated position, as indicated by 15<sup>a</sup>. It will be possible, therefore, by merely manipulating the handle, to adjust the nozzle 14 to any position. For example, the handle may be moved into the position indicated by solid lines in Fig. 1 to hold the nozzle in the position shown by the solid lines or it may be depressed further into the position shown by 15<sup>b</sup> to raise the nozzle to the height indicated by 14<sup>b</sup>. In speaking of raising and lowering the han-

die above, it is to be understood that the handle is not raised and lowered with respect to the carriage 10, but always remains against the stop 31<sup>a</sup>, so that manipulating or rocking of the handle up and down serves to rock the carriage and thus vertically adjust the height of the nozzle 14.

Means are provided for visually indicating the adjustment of the nozzle. Such means include an indicator 40 traveling over a quadrant dial 41 and operated by a bead chain 42 having its lower end connected to the frame 20 near the back wheels. A spring 43 holds the indicator 40 against the tension of the bead shown. As the nozzle is moved vertically, the indicator 40 travels across the gage 41 to indicate visually the height of the nozzle.

I have explained above how the nozzle may be moved vertically by manipulation of the handle. It is to be noted, also, that it can be done in other ways. For example, by placing the foot on the carriage 10 back of the front wheels 11, the same can be depressed to raise the nozzle to any desired height.

I have explained above how the nozzle can be moved vertically. I shall now describe means that are provided on the handle for locking the nozzle in any of its adjusted positions. Such locking means, it is to be particularly noted, is not affected by swinging of the handle on its pivot and such swinging of the handle on its pivot does not affect the locking means. In describing vertical movement of the nozzle by manipulation of the handle above, it was stated that the handle lies against the stop 31<sup>a</sup>. This makes adjustment of the nozzle by manipulation of the handle very easy. The nozzle can be adjusted by manipulation of the handle, however, when it is not against the stop 31<sup>a</sup>. For example, the handle can be in a more or less vertical position and used to push the carriage (back of the front wheels 11) downwardly to raise the nozzle 14. It will be seen that no matter how the nozzle is moved or adjusted vertically, with such adjustment the rack bar 25 will slide vertically in the guide 26 on the carriage 10. The locking means operates on this rack bar 25 to hold the same against vertical movement and thus lock the nozzle in any of its adjusted positions.

Such locking means includes a spring-pressed toothed locking member 50 adapted to engage the rack bar. The outer end of this member or pin is provided with a frusto-conical head 51 adapted to be engaged by a plate 52 with a tapered slot 53. The edges of the slot engage the frusto-conical surface. As the plate 52 is pulled upwardly, the narrowing slot operates on a conical surface 51 to move the pin 50 away from the rack bar and out of engagement. When the plate 52 is moved downwardly, the spring 54 presses the pin 50 inwardly to cause its teeth to engage the rack bar to hold the same against vertical movement and thus lock the nozzle in its adjusted position. For the purpose of moving the plate 52, I provide a flexible wire 56 with its lower end joined to the plate and its upper end leading through a suitable cavity in the bail 16 to the lower end of the handle 15. The latter is rotatable so that when it is twisted, as shown by the dotted lines in Fig. 2, the plate 52 is pulled up to release engagement between the pin 50 and the rack bar 25. When in this position, the nozzle may be adjusted vertically by manipulation of the handle, by use of the foot or by any other means desired, and its position can be noted by reference to the indicator 40. When in any position, the handle 15 can be rotated to push on the wire

56 to lower the plate 52, allowing the pin 50 to go in and engage the rack bar 25 and thus lock the nozzle in any desired position.

It is to be noted that the locking member 50 is axially aligned with the pivoting axis of the pivoted handle. The pivotal support of the handle is accomplished by providing the sleeve 70 with its inner end inserted in the hub 71 carried by the plate 31, the latter being attached to the carriage 10. The lower end of the bail 16 pivots on the outer end of this sleeve 70. The locking member 50 operates inside of the sleeve 70.

The upper end of the handle 15 is somewhat curved, as indicated by 15<sup>c</sup>, in order to facilitate the twisting thereof to engage or disengage the mechanism that locks the nozzle in its adjusted position.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as permissible, in view of the prior art.

What I claim as new, and desire to secure by Letters Patent, is:

1. A suction cleaner, including; a carriage with a nozzle vertically adjustable with respect to the surface being cleaned; a pivoted handle; nozzle-adjusting means on the carriage including a vertically adjustable wheel; a vertically slidable member on the carriage operated by vertical adjustment of said wheel; and means for locking said slidable member against sliding movement, said means including a locking member axially aligned with the pivoting axis of the pivoted handle and means on the handle for retracting said locking member.

2. A suction cleaner, including; a carriage with a nozzle vertically adjustable with respect to the surface being cleaned; a pivoted handle; nozzle-adjusting means on the carriage including a vertically adjustable wheel; a vertically slidable member on the carriage operated by vertical adjustment of said wheel; and means for locking said slidable member against sliding movement, said means including a locking member axially aligned with the pivoting axis of the pivoted handle and means on the handle for retracting said locking member, said means being operable by twisting of the handle.

3. A suction cleaner, including; a carriage; a nozzle vertically adjustable with respect to the surface being cleaned; means on the carriage for locking the nozzle in its adjusted position; and means on the handle for actuating the locking means.

4. A suction chamber, including; a nozzle vertically adjustable with respect to the surface being cleaned; a handle; a connection between the nozzle and handle for adjusting the nozzle by manipulation of the handle; means for locking the nozzle in its adjusted position; and means on the handle for actuating the locking means.

5. A suction cleaner, including; a nozzle vertically adjustable with respect to the surface being cleaned; a handle; a connection between the nozzle and handle for adjusting the nozzle by manipulation of the handle; means for locking the nozzle in its adjusted position; and manually

operable means on the handle for actuating the locking means.

5 6. A suction cleaner, including; a pivoted handle swingable in a vertical plane; a nozzle vertically adjustable with respect to the surface being cleaned; means for locking the nozzle in its adjusted position; means on the handle for actuating the locking means; and a connection between the locking means and the actuating means free from interference by swinging of the handle on its pivot in a vertical plane.

15 7. A suction cleaner, including; a pivoted handle swingable in a vertical plane; a nozzle vertically adjustable with respect to the surface being cleaned; a connection between the nozzle and handle for adjusting the nozzle by manipulation of the handle; means for locking the nozzle in its adjusted position; means on the handle for actuating the locking means; and a connection between the locking means and the actuating means free from interference by a swinging of the handle on its pivot in a vertical plane.

25 8. A suction cleaner, including; a nozzle vertically adjustable with respect to the surface being cleaned; means for yieldingly holding the nozzle at one limit of its vertical adjustment; means for locking the nozzle in its adjusted position; and means on the handle for actuating the locking means.

30 9. A suction cleaner, including; a pivoted handle; a nozzle vertically adjustable with respect to the surface being cleaned; means for yieldingly holding the nozzle at one limit of its vertical adjustment; means for locking the nozzle in its adjusted position; means on the handle for actuating the locking means; and a connection between the locking means and the actuating means free from interference by swinging of the handle on its pivot.

40 10. A suction cleaner, including; a carriage with a nozzle vertically adjustable with respect to the surface being cleaned; a handle; nozzle adjusting means on the carriage including a vertically adjustable wheel; means on the carriage for locking the wheel in its adjusted position; and means on the handle for actuating the locking means.

45 11. Apparatus as claimed in claim 10, with means for yieldingly urging the wheel to one end of its vertical adjustment.

12. A suction cleaner, including; a carriage with a nozzle vertically adjustable with respect to the surface being cleaned; a pivoted handle; nozzle adjusting means on the carriage including a vertically adjustable wheel; a vertically slidable member on the carriage operated by vertical adjustment of said wheel; and means for locking said slidable member against sliding movement, said means including a locking member axially aligned with the pivoting axis of the pivoted handle and means on the handle for actuating the locking means, whereby actuation of said locking member will be free from interference by swinging of the handle on its pivot.

15 13. A suction cleaner, including; a carriage with a nozzle vertically adjustable with respect to the surface being cleaned; a pivoted handle; nozzle adjusting means on the carriage including a vertically adjustable wheel; a vertically slidable member on the carriage operated by vertical adjustment of said wheel; and means for locking said slidable member against sliding movement, said means including a locking member and means for retracting said locking member, said locking member being axially aligned with the pivoting axis of the pivoted handle, and means on the handle for actuating the locking means, whereby actuation of said locking member will be free from interference by swinging of the handle on its pivot.

30 14. A suction cleaner, including; a carriage with a nozzle vertically adjustable with respect to the surface being cleaned; a pivoted handle; nozzle adjusting means on the carriage including a vertically adjustable wheel; a vertically slidable member on the carriage operated by vertical adjustment of said wheel; a locking member adapted for locking engagement with the vertically slidable member, said locking member being axially aligned with the pivotal axis of the handle, whereby said locking member will be free from interference by swinging of the handle on its pivot; a frusto-conical head on said locking member; a slidable plate on the handle with a tapered slot, having its edges in engagement with the frusto-conical surface of said head, whereby said locking member may be retracted by sliding movement of said plate; and means on the handle for sliding said plate.

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