

April 27, 1943.

H. B. WHITE

2,317,570

SUCTION CLEANER

Filed April 28, 1941

2 Sheets-Sheet 1

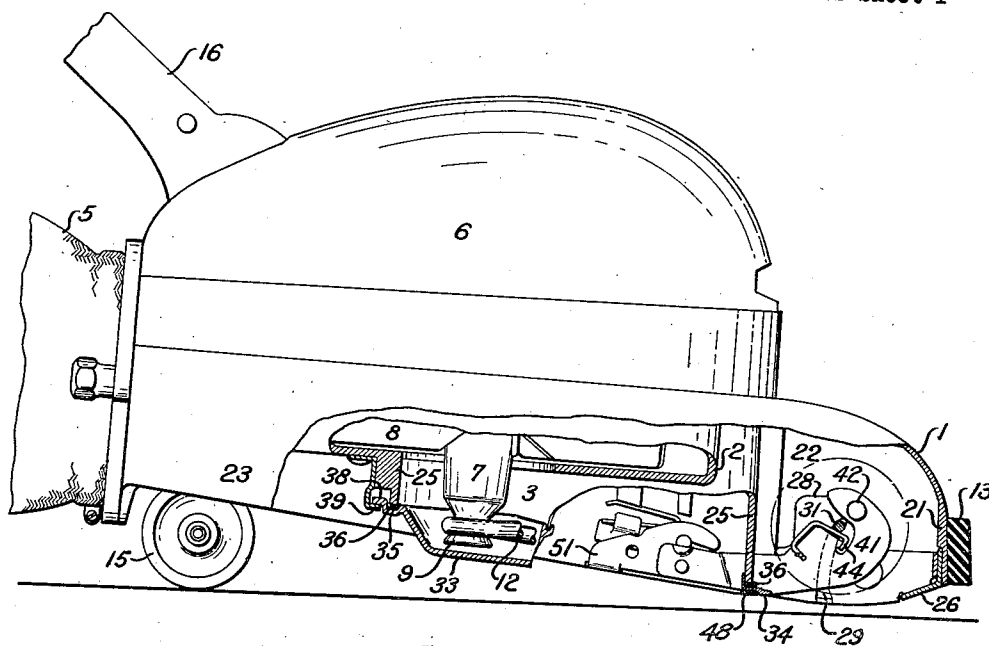


Fig. 1

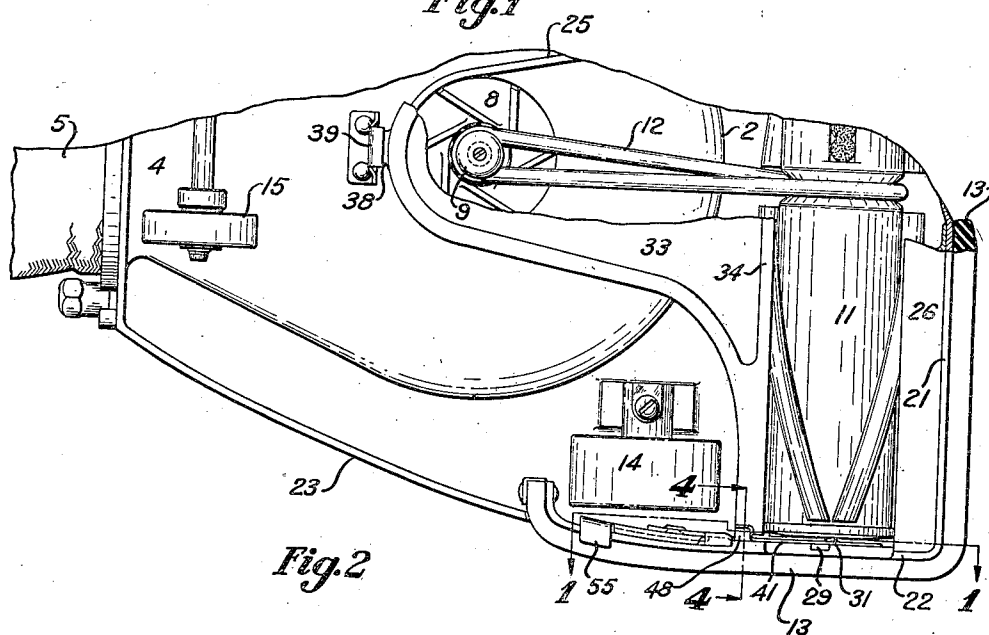


Fig. 2

INVENTOR
Harry B. White
BY
Harry S. Dumas
ATTORNEY

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H. B. WHITE

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2 Sheets-Sheet 2

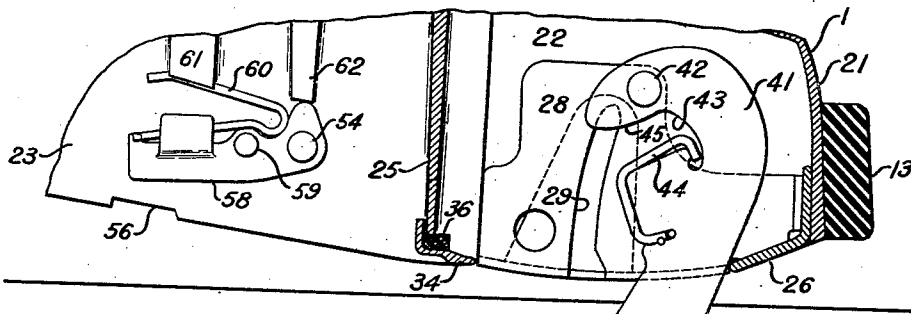


Fig.3

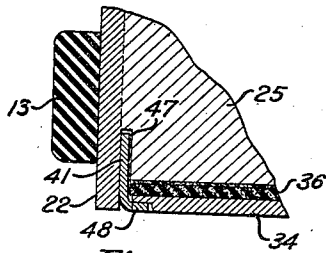
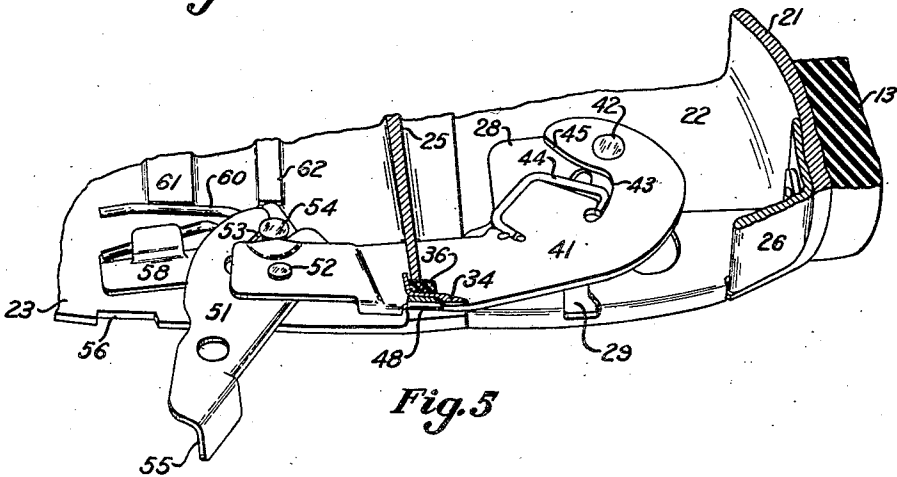


Fig. 4



INVENTOR

Harry B. White

BY

BY
Harry S. Demarest
ATTORNEY

ATTORNEY

UNITED STATES PATENT OFFICE

2,317,570

SUCTION CLEANER

Harry B. White, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio, a corporation of Ohio

Application April 28, 1941, Serial No. 390,662

6 Claims. (Cl. 15—6)

The present invention relates to suction cleaners in general and more particularly to a new and novel arrangement of parts in which the agitator is readily removable from the cleaner nozzle and access is more easily obtained to the interior of the machine. More specifically the invention comprises a suction cleaner which includes an agitator within the nozzle and a removable bottom plate upon the air passageway which connects the nozzle to the suction-creating fan, the retaining and latching means of the agitator and the bottom plate being combined in a simplified improved arrangement.

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 new and improved mounting for the suction cleaner agitator. A further object of the invention is to provide an improved mounting for the air passageway bottom plate which connects the nozzle with the fan chamber. A still further object of the invention is to provide a new and novel arrangement of parts in which the cleaner agitator and the bottom plate are retained by the same manually operable securing means. A still further object of the invention is to provide in a suction cleaner a removable rotary agitator within the cleaner nozzle and a removable plate which forms the bottom of the air passageway connecting the nozzle with the cleaner fan chamber, the same manually operable latching means retaining both the agitator and the bottom plate in place. 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 invention is disclosed:

Figure 1 is a side view of a suction cleaner constructed in accordance with the present invention with certain parts broken away and shown in section;

Figure 2 is a partial bottom view of the cleaner illustrated in Figure 1 and with certain parts broken away;

Figure 3 is an enlarged view of the manually operable agitator-and-bottom plate-retaining means at one end of the cleaner nozzle in the open or unlatched position;

Figure 4 is a section upon the line 4—4 of Figure 2 and illustrates the manner in which locking plate at each end of the nozzle contacts the rear nozzle lip which is carried by the bot-

tom plate for the purpose of securing the bottom plate in place;

Figure 5 is an isometric view of the interior wall of the cleaner showing the agitator-and-bottom-plate-locking means in the last step of the movement to engaged position.

In the drawings a preferred embodiment of the invention is illustrated. A cleaner body is shown which includes a nozzle 1, a fan chamber 2 interiorly connected to the nozzle 1 by means of the air passageway 3, an exhaust outlet 4 to which is removably secured a dust bag 5, and a motor housing 6. A driving motor is positioned within the housing 6 and its shaft 7 extends downwardly through the fan chamber 2, where it carries the suction-creating fan 8, into the air passageway 3 where it is formed as a driving pulley 9. A rotary agitator 11 is rotatably mounted within the nozzle 1 and is connected by means of a power-transmitting belt 12 to the driving pulley 9. A furniture guard of rubber or similar resilient material, indicated at 13, surrounds the nozzle 1 and protects articles of furniture which may be contacted thereby. As in the usual cleaner, front and rear wheels 14 and 15 are provided which support the cleaner body for movement by force exerted by the operator through the handle 16 which is pivotally connected to the casing and the lower end of which is illustrated in Figure 1.

The front and end walls 21 and 22 of the nozzle 1 merge together in smooth contours, the end walls 22 being continued along the cleaner sides as skirts 23 to the rear end of the casing for appearance purposes. The air passageway 3, which connects the eye of the fan chamber 2 with the nozzle 1, is defined along its top by the underside of the fan chamber 2 and a portion of the top wall 21 of the nozzle 1. The sides of the air passageway are formed by a continuous side wall 25 which extends forwardly and then laterally toward the opposite ends of the nozzle to define the rear wall of the nozzle 1.

The front nozzle lip 26 is fixedly and permanently secured to the lower extremity of the front nozzle wall 21 in any suitable manner as by welding or riveting. Fixed to the inside face of each nozzle end wall 22 is an agitator-seating plate 28 which is formed with a downwardly opening slot 29 adapted to receive and seat at its upper end the projecting terminus of the stationary supporting shaft 31 which rotatably supports the agitator 11.

The bottom wall of the air passageway 3 is indicated by the reference character 33 and com-

prises a removable plate the forward transverse edge of which forms the rear nozzle lips 34. Around its entire periphery plate 33 is grooved at 35 and in that groove carries a seal 36 which seals against the lower edge of the air passageway wall 25 to provide an air tight joint. At its rear extremity the bottom plate 33 is formed with rearwardly extending lip 38 which hooks upon a support 39 carried by the underside of the fan chamber to receive it and to hold the rear of the plate in seating relationship relative to the passageway wall 25.

The agitator 11 and the bottom plate 33 at its forward end are retained in place by the same means at each end of the nozzle. These means are the same at the opposite ends of the nozzle and are best illustrated in Figures 3 to 5, inclusive. The means at each end of the nozzle is seen to comprise a locking plate 41, pivotally mounted on the nozzle end wall by a pivot pin 42, and which is formed with a slot 43 adapted to receive the agitator-supporting shaft 31. A wire spring 44 is carried by the plate 41 and is so constructed and arranged along one side of the slot 43 as to form a movable side thereof which functions as a take-up. As is illustrated in Figure 5 the agitator shaft end is clamped at the intersection of the slot 29 formed in the plate 28 carried by the nozzle end wall and the slot 43. As the shaft ends vary in size because of manufacturing tolerances and wear the spring 44 is most helpful in assuring a tight fit which it does by urging the shaft to the upper end of the slot 29. The side of the slot 43 opposite the spring 44 is formed as a cam face 45 which functions, when the locking plate 41 is pivoted downwardly from the nozzle, to force the agitator-supporting shaft downwardly in the fixed slot 29.

Each agitator-locking plate 41 extends rearwardly adjacent the inner face of the side wall 22 of the nozzle and through a channel 47 in the air passageway wall 25. At that point the plate is provided with a turned-in lip 48 which functions to underlie and force upwardly the rear nozzle lip 34 and so the entire front end of the bottom plate 33.

To retain each locking plate 41 in its operative locking position in which it secures in place both the agitator and the bottom plate, there is provided at its rear extremity a manually operable latch 51. The latter is pivoted to the locking plate upon a pin 52 and is formed with a locking slot 53 which is adapted to seat and lock upon a retaining pin 54. The relationship between the locking pin 54 and the slot 53 of the latch is such that as the latch 51 is pivoted upwardly, after the pin 54 has just entered its slot 53, the plate 41 is cammed upwardly into its final locking position. The latch 51 is itself retained in locking position when the pin 54 has advanced to and finally seats in the recessed end of the slot 53 and the overturned lower edge 55 of the latch 51 finally seats within its notch 56 provided in the skirt 23.

The latch pin 54 is not fixedly carried by the skirt 23 but instead is mounted upon a pivoted plate 58 which is itself carried by a pin 59 on the inner face of the skirt. A wire spring 60 positioned between the plate 58 and a shoulder 61 upon the skirt at all times tends to pivot plate 58 in a direction to raise the latch pin 54, a second shoulder 62 being provided upon the skirt which limits the upward movement of the latch.

To remove the agitator from the cleaner is a very simple operation with the cleaner constructed as in accordance with the present invention. The entire cleaner is placed upon its side, or upside down, and the operator then pivots each latch 51 outwardly as by a force exerted upon the outer lips 55 thereof. This operation is duplicated at each end of the nozzle but will only be described for one end. As the latch 51 pivots outwardly, the slot 53 moves relative to the pin 54 until the position is substantially that illustrated in Figure 5 at which time the operator can pull the latch directly outwardly and change the position of the locking plate 41 from that illustrated in Figure 5 to that illustrated in Figure 3. At such time the bottom plate 33 can be removed by lifting it from the cleaner casing, the rear lip 38 thereon disengaging from its seating element 39 in an obvious manner. The agitator 11 can then be moved directly from the nozzle by sliding the stationary shaft 31 thereof outwardly from the slot 29 in which each end of it has been received, it being noted that the outward pivotal movement of the locking plate 41 has cammed the supporting shaft 31 a short distance from the upper end of the slot, as is clearly illustrated by the overlapping position of the cam face 45 and the slot 29 in Figure 3.

With the bottom plate 33 and the agitator 11 removed any necessary repairs in the air passageway or in either of those parts can be made, and if desired a new belt can be positioned upon the driving pulley 9. To replace and reassemble the machine the operator re-inserts the agitator-supporting shaft into the slots 29 at the opposite ends of the nozzle and advances the agitator into the nozzle so that it approaches the upper end of the slot. The operator then positions the bottom plate 33 with the retention lip 38 seating upon the supporting shoulder 39. The seal 36 around the periphery of the plate 33 is then in contact with the lower edge of the air passageway side wall 25. The operator then pivots each of the locking plates toward the cleaner, in a clockwise direction, as viewed in Figure 3, and moves the locking plate from substantially the position illustrated in Figure 3 to that illustrated in Figure 5. In the later position the retaining pin 54 is just entering the slot 53 in the latch 51. This pivoting movement of the locking plate 41 has caused the agitator shaft 31 to be forced upwardly to the end of its seating slot 29, the springs 44 carried by the locking plates resiliently and strongly holding the shaft against the upper end of the slot and inherently accommodating any manufacturing inaccuracies. The operator, with the construction positioned as illustrated in Figure 5, pivots each latch 51 in a clockwise direction and the pin 54 moves into the slot 53 to seat in the end thereof, the pivotal movement of the latch coming to a halt when the overturned end 55 thereof seats within a notch 56 in the side skirt 23 of the cleaner body. With the latch so positioned it is urged upwardly, together with the locking plate 41, by the spring-urged pin 54 to securely hold in place the bottom plate 33 and also the agitator. This spring-urged movable pin 54 not only allows for any manufacturing inaccuracies but also exerts the desired pressure upon the plate 33 to maintain the proper sealing relationship between it and the air passageway side wall 25. It is clear that the bottom plate cannot move downwardly at its forward end being retained by the turned-over lips 48 of the plate

41 in contact with the rear nozzle lip 34. It is also clear that the agitator cannot be removed until the plates 41 have again been pivoted from the nozzle.

It is to be understood that the embodiment herein described and set forth is a preferred construction which is subject to modification and variation.

I claim:

1. In a suction cleaner, a body including a nozzle, a suction-creating fan chamber, an air passageway connecting said nozzle and said fan chamber, and an exhaust outlet; an agitator positioned in said nozzle, a removable bottom plate forming one side of said air passageway and the rear nozzle lip, a pivoted locking plate at each end of said nozzle underlying said agitator and said bottom plate to secure each in place, and manually operable means to secure each locking plate in place.

2. In a suction cleaner, a body including a nozzle having front and side walls, a fan chamber, an air passageway connecting said nozzle and said fan chamber and having side walls curved forwardly and laterally; said nozzle side walls being formed with downwardly facing agitator seats; a rotary agitator positioned in said nozzle and including a stationary part extended into said stationary seats, a removable bottom plate closing the underside of said air passageway and making sealing contact with the lower edge of the side wall thereof, and a pivoted locking plate at each end of said nozzle securing said agitator therein and said bottom plate in position, and manually operable latching means to retain releasably each of said locking plates in position.

3. In a suction cleaner, a body including a nozzle having front and side walls, a fan chamber, an air passageway connecting said nozzle and said fan chamber and having said walls curved forwardly and laterally, a removable bottom plate extended between the side walls of said air passageway in air tight relationship therewith and forming the rear nozzle lip, a rotary agitator positioned in said nozzle and including a stationary supporting shaft, a locking plate pivotally mounted on each end wall of said nozzle contacting said shaft and said plate and forcing them into said nozzle and against said air passageway

side wall respectively, and a manually operative latch to secure said locking plate in locking position.

4. In a suction cleaner of the type having a body including a nozzle with front and side walls, a fan chamber, an air passageway connecting said nozzle and said fan chamber and formed with side walls curved forwardly and laterally; a plate secured to the inner surface of each nozzle side wall and formed with a downwardly opening slot, a locking plate pivotally mounted to said plate and formed with a slot adapted to extend across the said downwardly opening slot except in the unlocked position of said locking plate, said locking plate extended rearwardly through a slot in the laterally extending portion of said air passageway wall, a latch pivotally mounted near the rearward end of said locking plate formed with a pin seating slot, and a spring-urged pin adapted to seat within the slot in said latch and to urge said latch and said locking plate into locking position.

5. The construction defined in the preceding claim characterized in that a bottom plate seats upon the lower edge of the air passageway side walls and forms the rear nozzle lip, a rotary agitator including a stationary shaft is positioned in said nozzle with each end of said shaft positioned within the downwardly opening slot in the plate secured to the inner surface of the adjacent nozzle end wall, and in that said locking plate underlies said shaft and said bottom plate and secures each in place.

6. In a suction cleaner, a casing including a nozzle having a fixed front lip and air passageway extending rearwardly from said nozzle, a rotary agitator in said nozzle including stationary means extended to the sides of said nozzle, a downwardly facing seat at each end of said nozzle to receive said stationary means, a removable bottom plate forming the underside of said air passageway and the rear lip of said nozzle, a pivoted locking element at each end of the nozzle to hold said stationary means in said seat and said bottom plate in place, and cooperating manually operable latch means including spring-urged means to exert a retaining force on said locking plate.

HARRY B. WHITE.

CERTIFICATE OF CORRECTION.

Patent No. 2,317,570.

April 27, 1943.

HARRY B. WHITE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 25, for "whels" read --wheels--; page 3, first column, line 40, for "said" second occurrence, read --side--; and second column, line 22, for "posiion" read --position--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of July, A. D. 1943.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.