Dec. 1, 1953 G. A. BRACE 2,661,077

PROPELLING HANDLE AND FILTER BAG ASSEMBLY FOR VACUUM CLEANERS

Filed Dec. 12, 1950 3 Sheets-Sheet 1

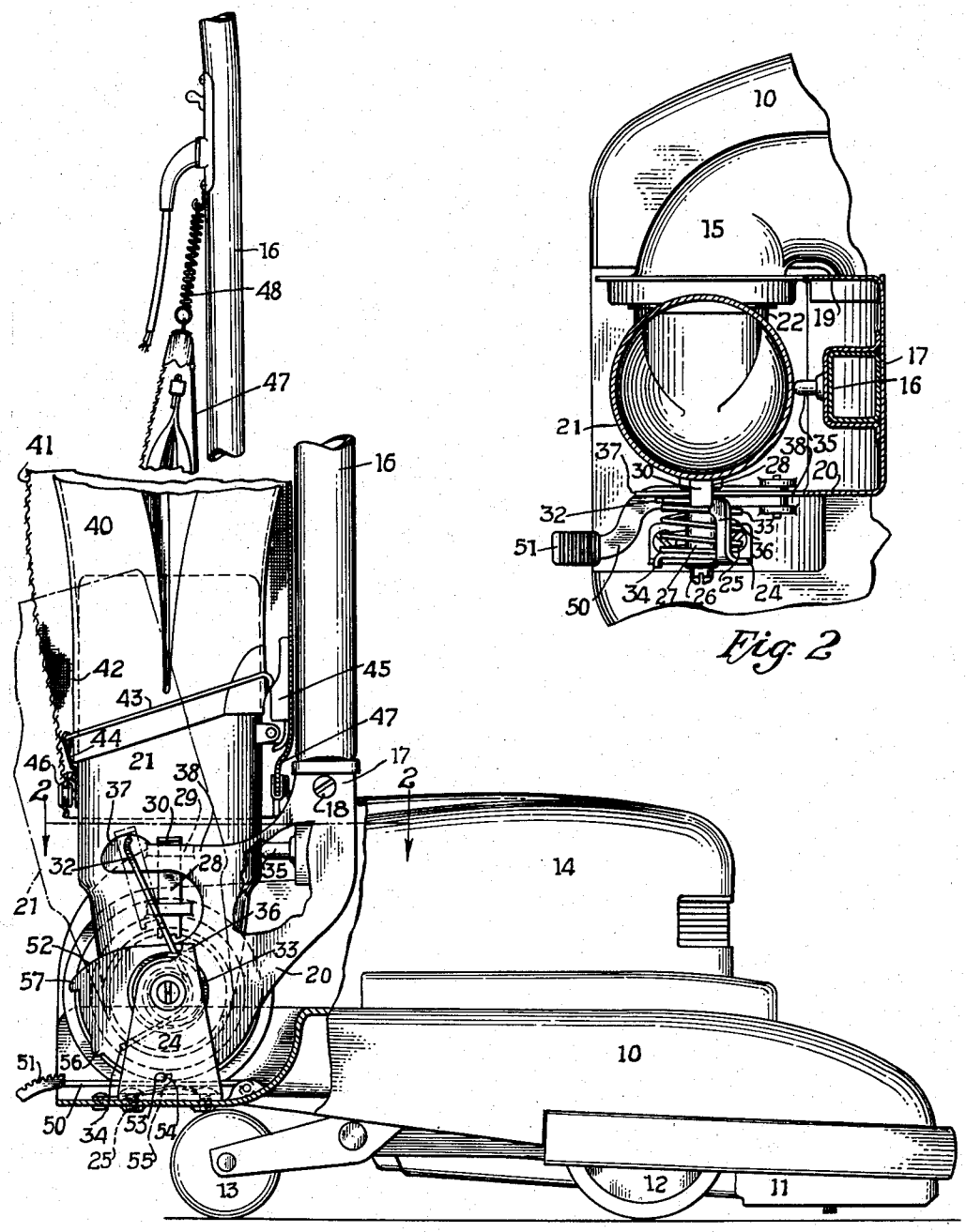


Fig. 1

Fig. 2

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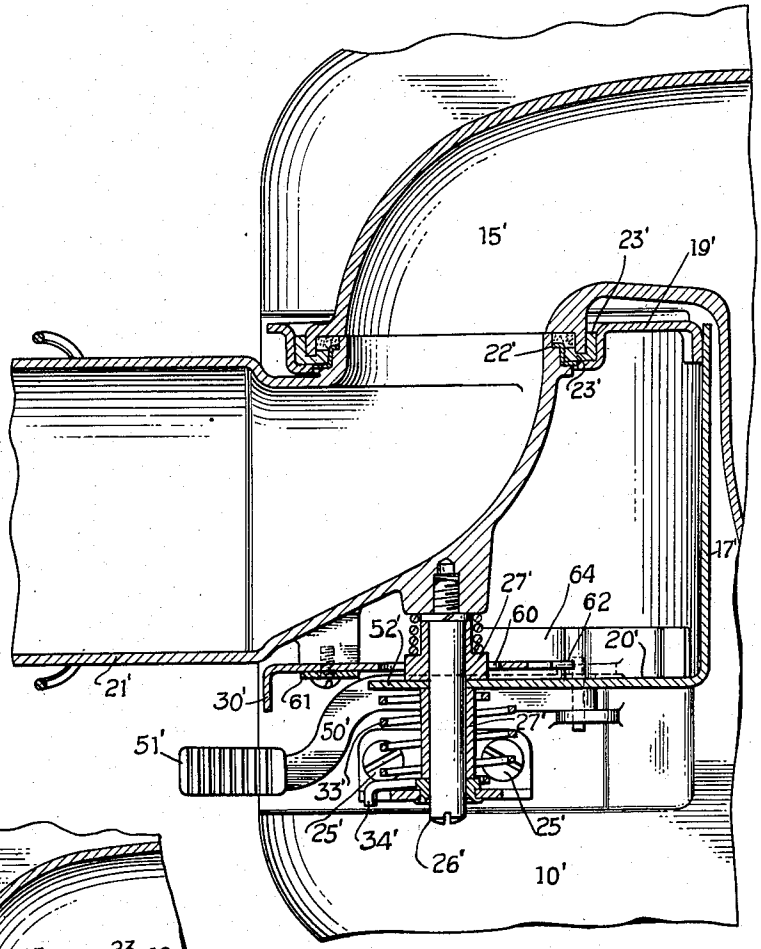


Fig. 5

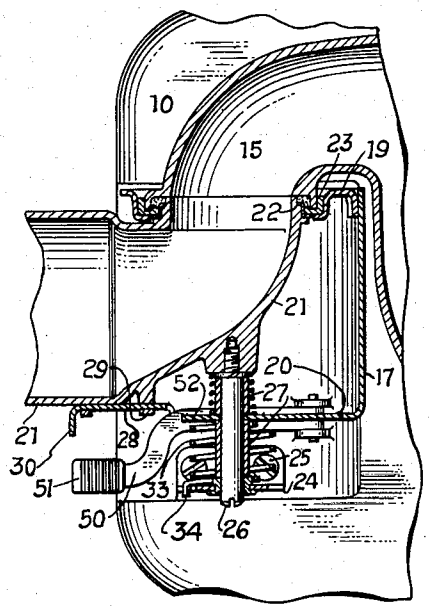


Fig. 3

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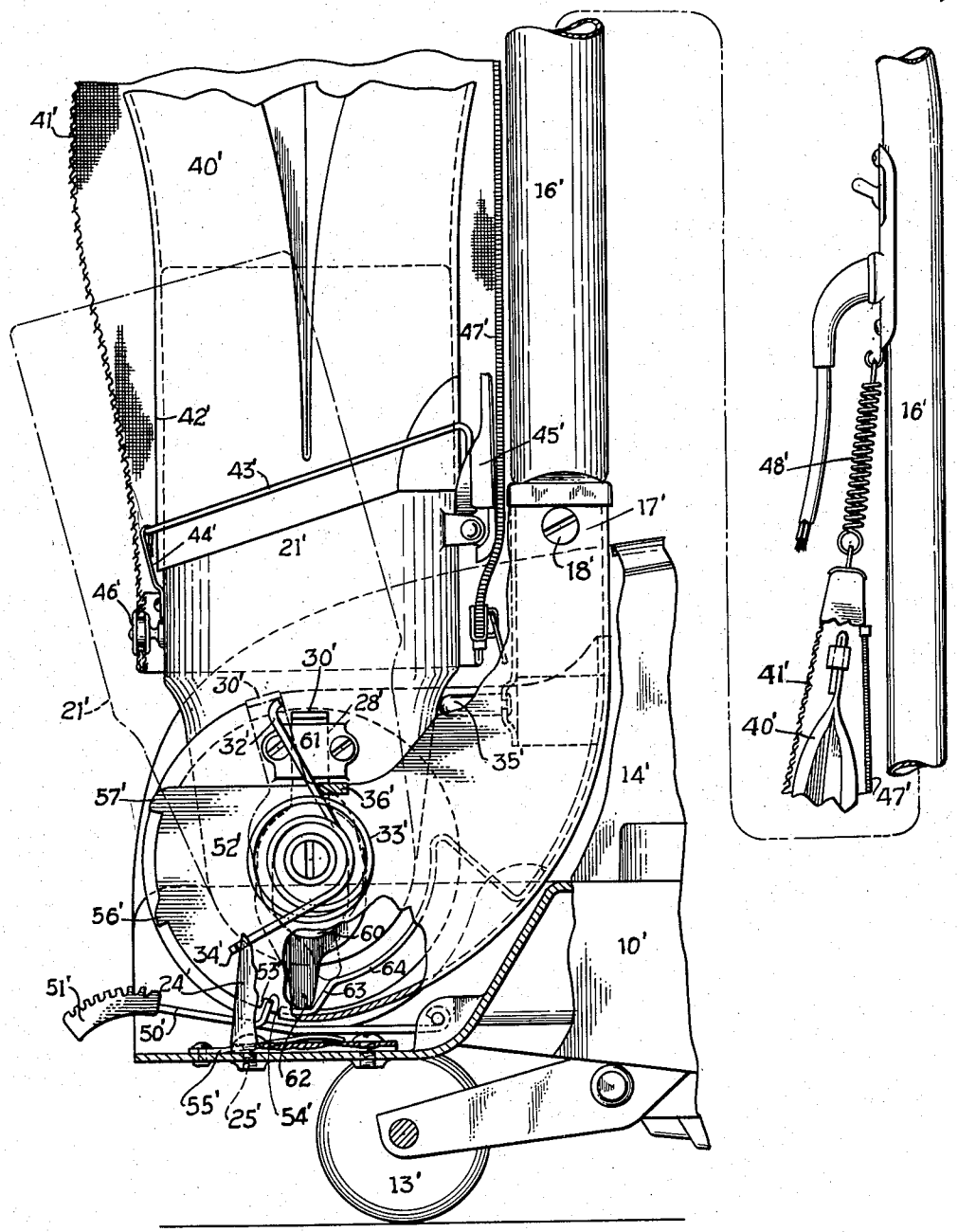


Fig. 4

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PROPELLING HANDLE AND FILTER BAG ASSEMBLY FOR VACUUM CLEANERS

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25 Claims. (Cl. 183—51)

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This invention relates to suction cleaners and more particularly to a novel arrangement therewith of the propelling handle and filter bag assembly.

Much difficulty has been encountered in providing a simple, convenient and satisfactory method of constructing a suction cleaner for use with low cost paper filters. Numerous attempts have been made to provide a flexible connection between the filter bag and the body of the cleaner proper so that the filter is entirely supported by and movable with the handle. The many constructions heretofore proposed for this purpose are subject to numerous short-comings and disadvantages. For example, some are too complex and costly for commercial acceptance. Others are bulky or present difficulties when removing and replacing the filter bag. Still others are only partially effective in preventing flexing of the filter bag as the handle is pivoted in propelling the cleaner during use. Repeated flexing of the filter results in premature rupture and failure of the filter necessitating the installation of a new one.

The present invention employs a unique construction and arrangement of parts which entirely circumvents the disadvantages of prior constructions and which is characterized by its simplicity, ease of operation, convenience in removing and replacing the filter and the complete absence of flexing of the filter under any and all conditions of use. These ends are accomplished by providing a swivel connection between the fan exhaust and the filter adapter, and counter-balancing the handle through this adapter. Consequently, the counter-balance spring requires the adapter to follow the pivotal movement of the handle precisely and without lag or lost motion. Moreover, it is unnecessary to use a rigid connection between the adapter and handle, as in prior constructions.

Another feature of the invention is the use of a novel lockout means for the resilient connection between the adapter and handle provided by the unique counter-balancing arrangement. Normally, and during all propelling positions of the handle, the counter-balance spring requires the filter adapter to follow the movement of the handle precisely and without play or lost motion. However, when the handle is elevated to a non-propelling position, the lockout functions automatically to free the adapter for movement independently of the handle and spring for greater convenience in removing the filter for cleaning purposes.

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Accordingly, a primary object of my invention is to provide a new and improved suction cleaner, and more particularly a cleaner having a novel handle and filter arrangement.

Another object is the provision of a suction cleaner with a propelling handle which is counter-balanced by means of the filter assembly.

A further object is the provision of a flexibly mounted filter adapter which is spring biased in a direction and manner to assist in supporting the weight of the propelling handle during normal use of the cleaner and at the same time to prevent flexing of the filter bag upon movement of the handle.

A more specific object is the provision of novel means for counter-balancing the handle through the filter assembly in all propelling positions of the handle and for locking out the counter-balance when the handle is in a non-propelling position.

Yet another object is the provision of a flexibly mounted filter adapter which is constrained to move in unison with the handle in all cleaner propelling positions thereof and which is automatically released for independent movement when the handle is moved to a non-propelling position.

Numerous other objects and advantages of the invention will become apparent from the specification and drawings of illustrative embodiments of the invention wherein:

Figure 1 is a side view of a cleaner incorporating the invention showing portions of the filter and handle assembly in vertical section;

Figure 2 is a sectional view on line 2—2 of Figure 1;

Figure 3 is a horizontal sectional view through the handle pivot and showing the adapter pivoted rearwardly 90° from the position shown in Figure 1;

Figure 4 is a fragmentary view of a modified filter and handle assembly; and

Figure 5 is a view similar to Figure 3 of the embodiment illustrated in Figure 4.

The first described embodiment is incorporated in a floor type suction cleaner of any preferred design. For example, this cleaner may consist of a main body 10 having a suction nozzle 11 extending across its forward end and supported by a pair of front carrier wheels 12 and a pair of rear wheels 13. Hood 14 incloses a motor-fan unit, not shown, which is operative to suck air inwardly through the nozzle 11 and discharge it through a rearwardly extending exhaust air conduit 15.

The filter and propelling handle assembly has a common pivotal mounting at the rear of the cleaner body, as is clearly apparent from Figures 1 and 3. The novel construction and arrangement of this assembly, which assures that the filter and handle will pivot in unison during use of the cleaner and which permits the filter to move independently of the handle at other times, forms an important feature of this invention as will become apparent from the following detailed description thereof.

Handle 16 is removably secured to a stamped metal bail 17 by means of through bolt 18. Bail 17 is generally U-shaped and includes parallel legs 19 and 20. These bail members straddle and partially enclose filter adapter 21 which comprises an L-shaped conduit. The lower, shorter end 22 of this conduit extends crosswise of the rear end of the cleaner, and is journaled in the outermost end of exhaust air conduit 15. A bearing 23 of suitable construction is arranged between the mating ends of conduits 15 and 22, such as in the manner illustrated in Figure 3, so that adapter 21 is free to pivot in a vertical plane through an angle of approximately 90°. Figure 1 illustrates the position of the adapter in its upper extreme position, while Figure 3 illustrates the position of the adapter when pivoted rearwardly to a horizontal position.

Adapter 21 is held in position on bearing 23 by a stud and bracket construction located on the opposite side of adapter 21 from exhaust passage 15, as illustrated in Figure 3. This mounting comprises a bracket 24 secured to the cleaner body by screws 25. A pivot or stud pin 26 is journaled in the bracket and threaded into the side wall of adapter 21. Leg 19 of the handle bail is journaled upon the outer face of bearing 23 while leg 20 is pivotally supported on pin 26. Thimbles 27 are mounted on pin 26 at either side of leg 20 and cooperate with bracket 24 to hold both the adapter and the handle securely seated on bearing 23. It will thus be clear that both the filter adapter and the propelling handle have a common pivot and bearing axis. This axis extends crosswise of the cleaner at a point generally overlying rear wheels 13. It will also be evident that the adapter is free to pivot independently of the handle. However, it will be understood that, normally, the adapter and handle are interlocked to move in unison.

The interlock between the filter adapter and the handle includes a slide member 28 secured in place on the side of adapter 21 by retainer clips 29—29. These clips limit the movement of slide 28. The upper end 30 of the slide projects laterally from the side of the adapter into the path of the upper, hooked end 32 of the handle counter-balance spring 33. Spring 33 surrounds the outer end of pivot pin 26 and its lowermost end 34 bears against bracket 24. Spring 33 is of sufficient strength to substantially support the weight of handle 16 when the handle is in its inclined operating position. However, it is only effective to support the weight of the handle through the filter adapter. That is to say, the upper end 32 of spring 33 engages end 30 of slide 28 carried by the adapter and urges the adapter to pivot in a clock-wise direction as viewed in Figure 1 into contact with stud 35 carried by the lower end of handle 16. Thus, the energy stored in spring 33 is brought to bear on the handle in a manner to pivot the handle upwardly to its vertical storage position.

An automatic lockout is provided for the counter-balance spring which functions to disconnect the adapter from the spring just before the handle reaches its vertical position. This lockout comprises an arm 36 projecting horizontally from the upper end of bracket 24 into the path of end 32 of the counter-balance spring, as appears from Figure 1. Arm 36 is so positioned as to engage spring end 32 just before the handle reaches its vertical position. The cammed outer end 37 of the arm 38 is positioned just rearward of slide 28 and lies in the path of end 39 of the slide. As appears from Figure 1, the surface of cam 37 is slightly higher than end 32 of the counter-balance spring. Consequently, as the filter adapter is pivoted rearwardly, end 30 of the slide engages cam 37 raising the slide upwardly beyond the end of the counterbalance spring thereby permitting the adapter to be pivoted rearwardly to any desired extent. When the adapter is again pivoted upwardly, cam 37 lifts slide 28 over the end of the spring after which it falls by gravity to the full line position shown in Figure 1 ready to pick up spring 33 as soon as the handle is lowered.

The filter proper comprises an inner paper filter bag 40 and an outer enclosing appearance envelope 41. Filter 40 may be formed in any well known manner and includes an inlet neck 42 having an interior periphery somewhat greater than the exterior periphery of filter adapter 21 so as to telescope thereover readily during assembly. Surrounding the upper end of the adapter is a filter clamping device comprising a spring ring 43 supported on the under side of the adapter as by clip 44. The upper forward end of the ring is arranged to clamp inlet 42 of the filter tightly to the adapter as by a toggle-latch mechanism 45. The lower, rear edge of appearance envelope 41 is secured to the adapter below the end of filter 40 as by a snap fastener 46. A hookless fastener 47 extends substantially the full length of the appearance bag at a point directly beneath handle 16. This fastener opens upwardly to expose filter 40 and its clamping device 45. Filter 40 may be permanently closed at its upper end so that it is not reusable or, of preferred, its upper end may be releasibly closed by the usual removable closure clip. The upper end of the appearance bag is supported from the under side of the handle as by tension spring 48, which may be easily unhooked from the handle to facilitate changing and emptying the filter.

The assembly preferably includes a positive handle control for locking the handle in storage position. Such a control may comprise a foot lever 50 pivoted at its forward end to the cleaner body and having a pedal 51 at its rear end projecting slightly beyond the end of the cleaner body. The lower edge of leg 20 of the handle bail is provided with arcuate control sector 52 having a notch 53 to receive a detent 54 formed on control lever 50. A spring, such as leaf spring 55, is secured to the cleaner body and has its free end underlying lever 50 to urge it upwardly into engagement with sector 52 at all times. Sector 52 may also carry a cammed projection 56 shaped to interact with detent 54 of the control lever sufficiently to support the handle in an inclined rest position and yet allow the handle to override the detent when slight downward pressure is applied. A stop 57 at the end of the control sector prevents the handle from falling below its lowermost horizontal operating position.

Operation

The operation of the cleaner will be quite obvious from the foregoing description of its structure. Let us assume that the cleaner is assembled and that the handle is locked in storage position as shown in Figure 1. The cleaner may be placed in operation by connecting the service cord to a power source and pivoting the handle rearwardly after first stepping on control lever 51 to remove detent 54 from notch 53. After the handle has pivoted downwardly about 10°, tab 30 on slide member 28 will pick up the counter-balance spring by engaging end 32 thereof. Thereafter as the handle is lowered, the counter-balance spring acts through slide 28 and filter adapter 21 to support the weight of the handle and to maintain the filter adapter in fixed relation with respect to the handle. As a consequence, the entire filter assembly and filter adapter moves in unison with the handle with the result that there is no flexing in any part of filter bag 40. As the cleaner is moved back and forth across the floor, the dirty air stream passes through the suction fan, and through discharge air conduit 15, through adapter 21 and into the filter. At this point it is appropriate to note that the swivel connection between adapter 21 and the exhaust air conduit, though shown and described as constructed of rigid members, may comprise any of a variety of other types of flexible conduits such as a flexible hose, flexible metal tubing, telescoping members and the like which permit the filter assembly to pivot with respect to the cleaner body.

After a quantity of dirt has collected, the filter may be removed for cleaning or replacement by a new filter very simply. To remove the filter, the operator raises the handle to its vertical storage position where it is positively locked by engagement of detent 54 in notch 53. As the handle approaches the storage position, end 32 of the counter-balance spring engages lockout stop 36 on handle bracket 24 so that it is no longer effective to hold the filter adapter against stop 35 on the rear side of the handle. The operator may now detach the upper end of spring 48 from the handle whereupon the entire filter assembly, including adapter 21, pivots freely rearwardly. In so doing, tab 30 on slide 28 engages cam 37 and overrides end 32 of the spring. Hookless fastener 47 is then opened upwardly and latch 45 is unfastened releasing filter 40 for removal from the adapter. The cleaned filter or a new one may then be placed upon the adapter and locked in place by clamp 43—45. After closing the hookless fastener, spring 48 is hooked back in place as the filter adapter pivots upwardly. In so doing, cam 37 carries slide 28 over end 32 of the spring and allows it to drop by gravity to the full line position shown in Figure 1 in readiness to pick up end 32 of the spring as soon as the handle is again removed from its storage position.

Figures 4 and 5 illustrate a second embodiment of the invention. This embodiment is generally similar to the first described arrangement and for this reason similar reference characters distinguished by a prime have been employed to describe like parts. Substantially the only change from the first embodiment concerns the lockout mechanism for counter-balance spring 33'.

Slide 28' is enlarged intermediate its ends and provided with an elongated slot 60 to receive the enlarged end of thimble 27'. The upper end of the slide is secured to adapter 21' by a strap 61 so as to leave strip 28' free for limited lengthwise movement. The lower end of strip 28' includes a rounded projection 62. Normally, strip 28' falls by gravity into the full line position shown in Figure 4. However, if adapter 21' is pivoted rearwardly when the handle is in its vertical locked position, projection 62 engages cam surface 63 on guide-member 64 carried on the rear lower face of handle bail 17' causing the slide to be elevated so that tab 30' at the top end of the slide overrides end 32' of the counter-balance spring. So long as the adapter is pivoted rearwardly, end 62 on strip 28' rides along guideway 64 so that the adapter may be returned to its vertical position without interference from portion 32' of the counter-balance spring. After the upper end of the slide by-passes the end of the spring, however, the slide falls by gravity to its original position. Hence, when the handle is unlocked and pivoted rearwardly, tab 30' engages the end of the spring so that the spring is effective to hold adapter 21' into firm engagement with stop 35' on the lower end of the handle.

Operation of second embodiment

Little need be said in describing the operation of the second embodiment since it is so similar to the first embodiment. The handle control mechanism operates exactly the same as that described above. When the handle is in its vertical storage position and locked there by the control means, arm 36' holds end 32' of the counter-balance spring out of engagement with end 30' of strip 28'. Hence, the adapter is free for pivotal movement rearwardly independently of the handle. This is accomplished merely by unhooking spring 48' from the handle and allowing the filter and adapter to pivot backwardly. As it starts to pivot, strip 28' is moved vertically by the engagement of projection 62 with cam 63 on the lower end of the handle bail. This causes the slide to override the end of the counter-balance spring and to be held in this raised position so long as the adapter is swung backwardly.

The appearance bag may then be opened and the filter removed and replaced as described above. After this operation is completed, the adapter is swung upwardly and spring 48' is hooked to the propelling handle.

From the foregoing description of two illustrative embodiments of the invention, it will be clear that this invention provides an unusually simple cleaner construction having a filter assembly which interlocks to pivot with the handle in all cleaner propelling positions of the handle. However, as soon as the handle is moved out of a cleaner propelling position, the filter is automatically disconnected for movement independently of the handle and into a position providing free and unobstructed access to the filter, the filter clamp and the adapter. Moreover, the handle is locked in its vertical position where it is completely out of the way and where it does not interfere in any way with the removal and replacement of the filter. At all other times the closure for the appearance bag is concealed beneath the handle and is not accessible for tampering by children. It will also be obvious that the arrangement provides a safety feature for the filter clamp. In other words, it is impossible for the clamp to open accidentally or to be opened unintentionally except when the adapter has been pivoted rearwardly in accordance with the intended mode of operation.

While I have shown but two embodiments of my invention, it is to be understood that these are to be taken as illustrative only and not in a limiting sense. I do not wish to be limited to the particular structure shown and described but to include all equivalent variations thereof except as limited by the scope of the claims.

I claim:

1. In combination with a suction cleaner of the floor type, a propelling handle pivoted to said cleaner having a non-propelling storage position and an inclined cleaner propelling range of movement, a filter assembly for said cleaner including a filter adapter pivotally connected to said cleaner adjacent the lower end of said handle, counter-balance means for substantially counterbalancing said filter assembly and said handle when said cleaner is being propelled, said means including a spring interposed between said cleaner and said assembly and handle so as to urge the same upwardly and including means for rendering said spring ineffective on said handle as said handle approaches said non-propelling storage position whereby said counter-balance means acts to move said filter assembly in unison with said handle when the latter is in its inclined cleaner propelling range of movement.

2. The combination defined in claim 1 wherein said means for rendering said spring ineffective on said handle includes means for disconnecting said spring from said filter assembly and permitting said filter adapter to be pivoted independently of said handle.

3. In combination with a suction cleaner having a body provided with an exhaust air outlet, a propelling handle pivoted to said body having a non-propelling storage position and an inclined cleaner propelling range of movement, a filter assembly including flexible conduit means connecting said assembly to said exhaust air outlet and being arranged to pivot with said handle as well as independently thereof, and means including a spring mounted between said flexible conduit means and said cleaner, said spring cooperating to move said filter assembly in unison with said handle when said handle is in said cleaner propelling range of movement.

4. The combination defined in claim 3 including means for rendering said spring means ineffective on said filter assembly when said handle is in said non-propelling position whereby said assembly can be moved independently of said handle.

5. The combination defined in claim 3 wherein said spring means is of sufficient strength to require said filter assembly to move in unison with said handle and in addition to substantially counter-balance the weight thereof when said handle is in said inclined range of movement.

6. The combination defined in claim 3 including handle control means operable to lock said handle in said non-propelling position while leaving said filter assembly free for movement independently of said handle.

7. The combination defined in claim 3 wherein the pivotal axis of said handle traverses said flexible conduit means interconnecting said filter assembly and said exhaust air outlet in said cleaner body.

8. The combination with a suction cleaner of the floor type having a main body provided with an exhaust air outlet, of a filter assembly including a filter adapter flexibly connected to said outlet so as to be movable through an arcuate path, said adapter being constructed to support a dirt receiving filter on the outer end thereof, means including a spring mounted on said cleaner between the body thereof and said adapter for urging said filter assembly upwardly away from the floor, and a propelling handle pivotally connected to said body on an axis traversing said adapter, said handle being free of a direct mechanical connection with said adapter but having a portion thereof for contacting said adapter and moving the same downwardly toward the floor in opposition to said spring when said handle is pivoted to an inclined cleaner propelling position whereby said spring is effective to make said adapter follow the movement of said handle in all inclined operating positions thereof.

9. The combination defined in claim 8 including lock-out means for said spring, said lock-out means being operable to disconnect said spring from said adapter when the latter is elevated to a predetermined position and to thereafter permit said adapter to be pivoted freely independently of said spring.

10. The combination defined in claim 9 wherein said lock-out means includes a stop carried by said body for engaging said spring and disconnecting the same from said adapter as said adapter reaches said predetermined position, a movable member carried by said adapter normally positioned to engage said spring as the adapter is pivoted downwardly, and means carried by said handle operable to move said member out of the path of said spring when said adapter is pivoted downwardly independently of said handle.

11. The combination with a suction cleaner having a wheel supported body, an exhaust air conduit and a propelling handle pivotally mounted on said body, of a filter assembly for said cleaner having its upper end detachably supported on said handle, a filter adapter at the lower end of said assembly communicating with and flexibly connected to said exhaust air conduit, and means including a spring supported on said cleaner at the lower end of said filter assembly for normally constraining said adapter to pivot with said handle so long as the handle is in an inclined cleaner propelling position, means for holding the handle in a non-propelling storage position, and means permitting said adapter to be swung away from said handle and out of engagement with said spring means said means normally constraining said adapter to pivot with said handle so long as said handle is held in said non-propelling position.

12. The combination defined in claim 11 wherein said spring is sufficiently strong to substantially counter-balance the weight of said handle and said filter assembly when said handle is pivoted away from said non-propelling position into said inclined cleaner propelling position.

13. The combination defined in claim 11 in which said filter assembly includes a filter bag mounted on said adapter, clamping means for detachably holding said filter in place thereon, manual means for opening said clamp positioned between said adapter and said handle and being inoperable to open said clamp so long as said handle is in said inclined cleaner propelling position.

14. The combination defined in claim 13 including an appearance envelope for said filter bag, said envelope having a filter access opening extending lengthwise of and immediately behind said handle whereby the same is normally

concealed from view by said handle, and closure means for said opening which is accessible for operation when said handle is held in said non-propelling position and said filter assembly is swung away therefrom.

15. The combination with a suction cleaner having a wheel supported body, an exhaust air conduit in said body having a discharge end offset from the longitudinal center line of said body, a filter adapter having its inlet swivelly connected to the discharge end of said exhaust conduit, a propelling handle having a housing at its lower end extending across the forward side of said adapter and along the opposite sides thereof, pivot means for the sides of said handle connecting the same to said cleaner body, said pivot means having an axis traversing the swivelled end of said adapter, and means for counter-balancing said handle, said counter-balancing means being directly effective on said adapter and indirectly effective on said handle by way of said adapter.

16. The combination defined in claim 15 wherein said counter-balancing means includes a strong spring, and lockout means for said spring effective to disconnect said spring from said adapter when said handle is pivoted upwardly beyond a predetermined point.

17. The combination defined in claim 15 including means operative when said handle is retained above said predetermined point to permit said adapter to be swiveled away from said handle freely and independently of said handle counter-balancing spring.

18. The combination with a suction cleaner having a pivoted filter assembly extending generally parallel to and closely adjacent said handle, means including a strong spring on said cleaner for urging said assembly and said handle upwardly toward a vertical position whereby said handle and assembly move in unison when said handle is in an inclined cleaner propelling position, stop means for rendering said spring ineffective on said adapter when said handle is elevated beyond a predetermined point, and means including a cam member and a movable member operable to permit said assembly to be pivoted independently of said handle and of said spring, one of said members being carried by said assembly, and the other member being carried by said handle in such manner that movement of said assembly away from the handle causes said movable member to be moved out of the path of said spring.

19. The combination with a suction cleaner having an ambulatory body provided with an exhaust air outlet at the rear thereof and a propelling handle pivotally connected thereto adjacent said outlet, of a filter assembly for said cleaner adapted to use an inexpensive disposable paper filter incapable of withstanding repeated flexing, said filter assembly comprising a rigid tubular conduit swivelly connected at its lower end to said exhaust air outlet, means on the upper end of said conduit adapted to seat and clamp the inlet of a paper filter bag, said upper end being located behind said handle and in abutting relation therewith, an air pervious envelope for enclosing said filter clamping means and having its upper end supported on the upper portion of said handle, and spring means interposed between said cleaner body and said tubular conduit for biasing said conduit upwardly into abutting engagement with the rear side of said handle so that the entire filter assembly pivots in unison with said handle in all inclined cleaner propelling positions thereof.

20. A suction cleaner as defined in claim 19 including disconnect means operatively associated with said spring means and responsive to the movement of said handle as the same is raised above a predetermined position for rendering said spring means ineffective to bias the adapter against said handle whereby the one may be pivoted independently of the other to facilitate the servicing of said filtering means without interference from said handle.

21. A suction cleaner as defined in claim 20 wherein said disconnect means includes means for re-establishing the connection between said spring means and said tubular conduit as said handle is pivoted rearwardly below said predetermined position.

22. In combination, a suction cleaner having an ambulatory body provided with a rearwardly directed exhaust air outlet, a filter adapter having a flexible connection with said outlet so that the discharge end thereof can be pivoted through an arc of approximately 90°, a propelling handle pivotally connected to said cleaner body and having a portion thereof positioned forwardly of and closely adjacent the discharge end of said adapter, filter clamping means for clamping a filter bag to the discharge end of said adapter, manually operable means for closing and opening said clamping means, said manually operable means being disposed between the forward side of said adapter and the rear side of said handle, and means for normally holding said adapter so closely spaced from said handle that said clamping means cannot open.

23. A suction cleaner as defined in claim 22 including a paper filter bag having an inlet adapted to telescope over the discharge end of said adapter and to be clamped thereon by said clamping means, an outer protective envelope for said filter bag having its lower rear end connected to the rear side of said adapter at a point below said filter inlet, an opening in the forward side of said envelope closed by an upwardly opening hookless fastener positioned behind and normally concealed by said handle, said means for normally holding said adapter closely spaced from said handle being releasable to permit said adapter to be pivoted rearwardly away from said handle whereby said hookless fastener and said clamping means are rendered freely accessible to facilitate the replacement of said filter bag.

24. The combination with a suction cleaner having an ambulatory body provided with an air discharge passage opening at the rear of said body, an L-shaped filter adapter conduit having one end swivelly connected to said discharge passage so that the other end thereof can swing through a vertical plane extending longitudinally of said cleaner, a propelling handle having a bail straddling said adapter from the forward side thereof, means pivotally connecting said bail to said body on an axis coinciding with the axis of said swivel connection for said adapter, counter-balancing means for said handle including a spring having one end reacting against said body and the other end reacting against said adapter so as to urge the same upwardly against the rear side of said handle, said spring being sufficiently strong to substantially counter-balance the weight of said adapter and of said handle when the same are in an inclined operating position, and said spring being effective to hold said handle in all inclined operating positions thereof

whereby said adapter pivots in unison with said handle.

25. A suction cleaner as defined in claim 24 including a stop on said cleaner body positioned in the path of said spring and operative to disengage said spring from said adapter as the handle is raised above a predetermined position, and operator controlled means for retaining said handle above said predetermined position until it is desired to use the cleaner for cleaning purposes.

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