

May 24, 1960

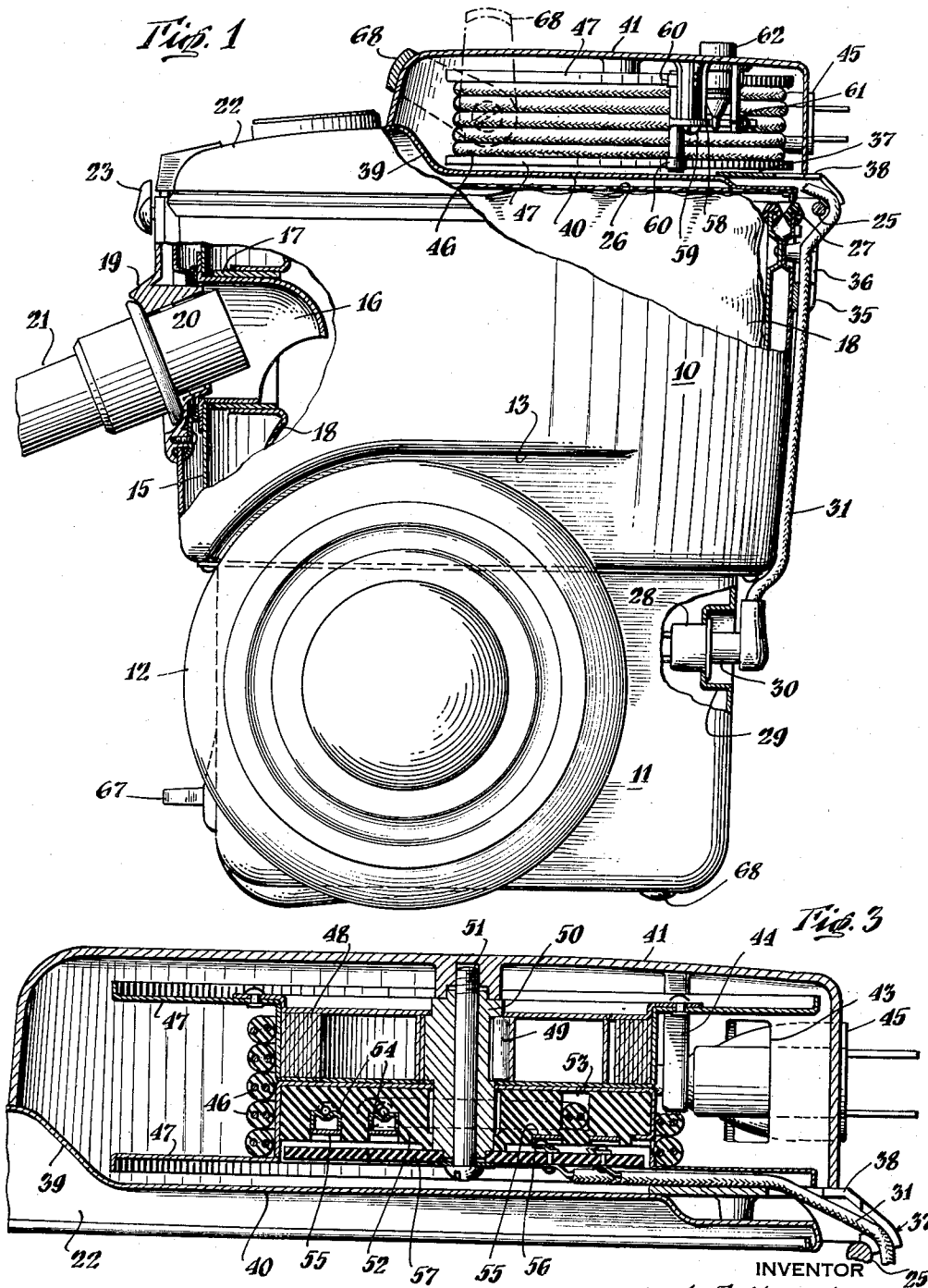
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VACUUM CLEANER ASSEMBLY

Filed Feb. 1, 1955

3 Sheets-Sheet 1



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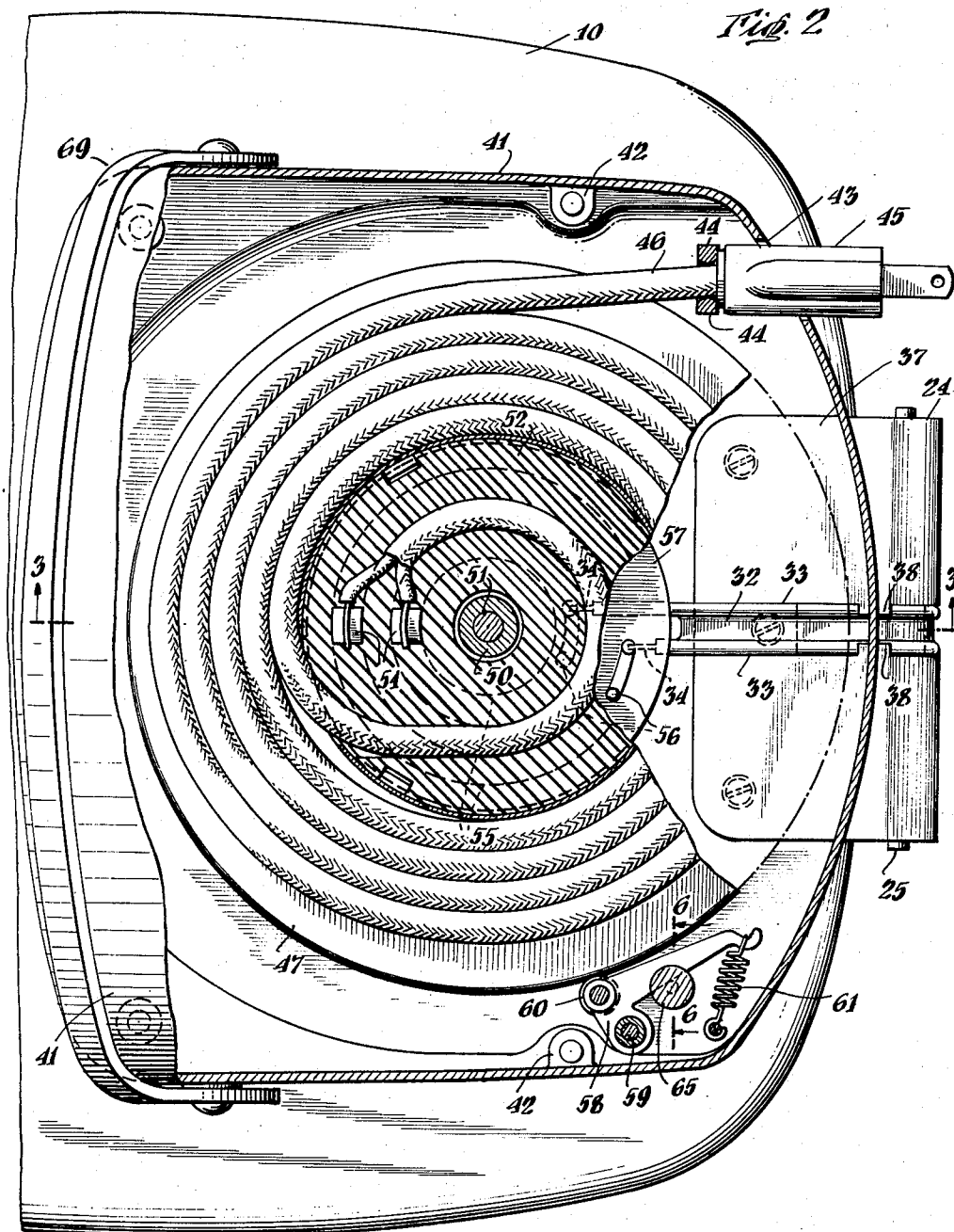
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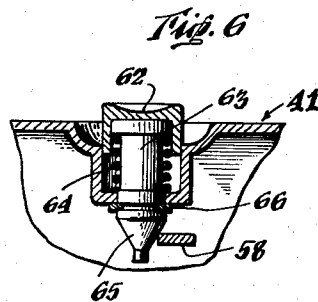
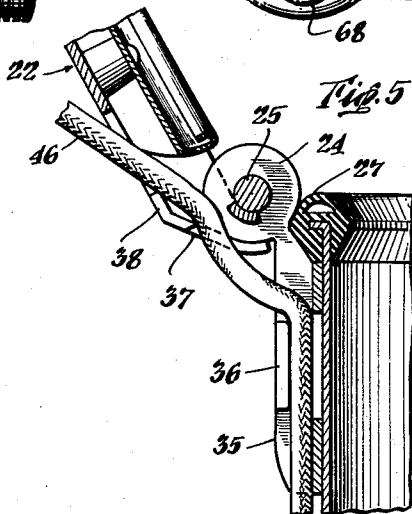
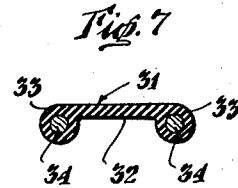
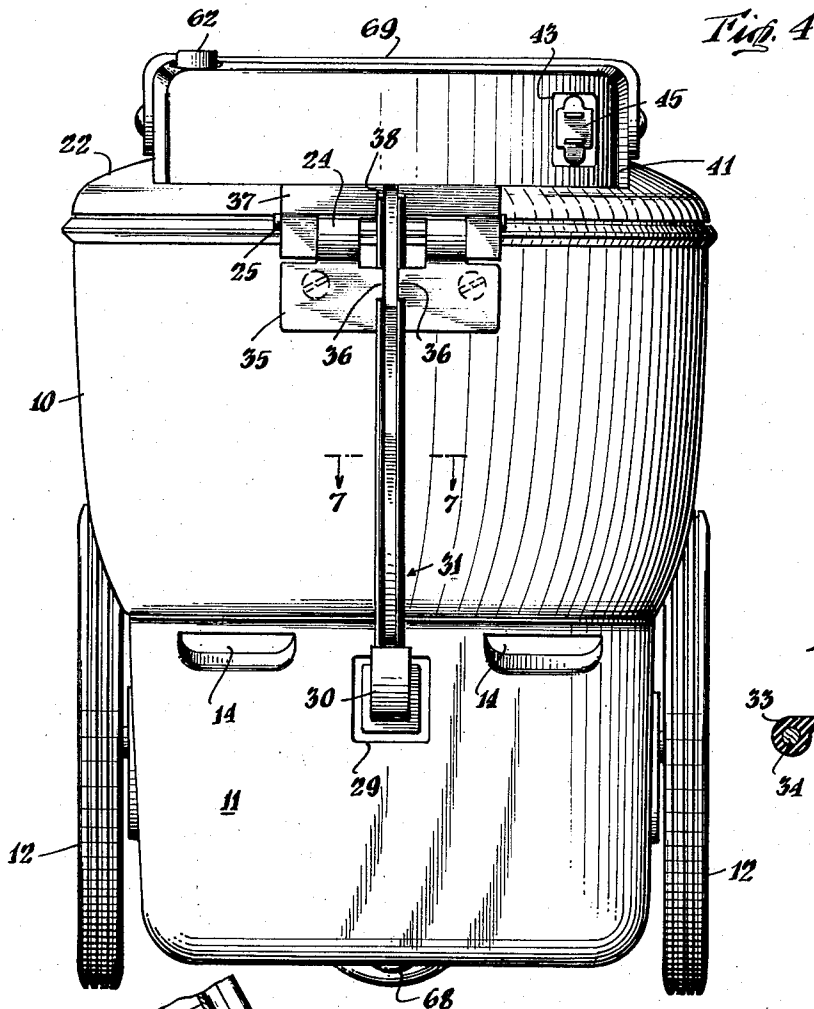
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3 Sheets-Sheet 3



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VACUUM CLEANER ASSEMBLY

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2 Claims. (Cl. 15—323)

This invention relates to a structurally and functionally improved vacuum cleaner assembly embodying structures additional to those shown in my prior United States Patent 2,716,465, dated August 30, 1955.

It is an object of the invention to furnish a mechanism which may be embodied in an assembly as shown in my prior patent without detracting from or interfering with the proper functioning of that assembly.

By means of the present teachings, a mechanism is furnished in which the current-supplying cord will be maintained in a normally housed and inconspicuous condition; that cord being capable of immediate connection with an electrical outlet so that the apparatus may be energized. During the use of the apparatus, the cord will automatically be extended according to the distance that the apparatus is moved. At the same time, when the use has terminated, the operator, with minimum effort, will be able to disconnect the cord and cause it to be automatically retracted to housed condition.

Further objects of the invention are those of providing a reel in association with a vacuum cleaning apparatus, and which reel supports the electrical cord or cable in a manner such that there will be little danger of that element becoming entangled with the assembly as the latter is moved over the floor. Additionally, by the structure of this invention, the center of gravity of the assembly may be raised so that the latter will function in an improved manner; the apparatus maintaining its stability.

A still further object is that of furnishing a reel assembly combined with a vacuum cleaner, and which assembly includes relatively few parts, each individually rugged in construction and capable of economical manufacture, these parts being capable of being grouped together by relatively unskilled labor to furnish a unitary apparatus operating over long periods of time with freedom from all difficulties.

With these and other objects in mind, reference is had to the attached sheets of drawings illustrating one practical embodiment of the invention, and in which:

Fig. 1 is a side elevation of a vacuum cleaner and reel assembly with certain of the parts broken away to disclose underlying structures;

Fig. 2 is a somewhat enlarged plan view with certain of the parts shown in section;

Fig. 3 is a transverse sectional view taken along the line 3—3 in the direction of the arrows, as indicated in Fig. 2;

Fig. 4 is a rear elevation of the apparatus as shown in Fig. 1;

Fig. 5 is an enlarged sectional view showing, in detail, the arrangement of parts adjacent the hinge coupling;

Fig. 6 is a fragmentary enlarged sectional view taken along the line 6—6 in the direction of the arrows as indicated in Fig. 2; and

Fig. 7 is an enlarged transverse sectional view taken along the line 7—7 in the direction of the arrows, as indicated in Fig. 4.

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Referring primarily to Figs. 1 and 4, and as shown in my previous patent above referred to, a tub-type vacuum cleaning apparatus is illustrated. This includes a casing embracing an upper section 10 and a lower portion 11. Secured to the latter and extending to a point which is preferably slightly above and beyond the center of the casing are wheels 12. Their peripheries extend below the lower face of casing section 11 and the side faces of section 10 may be recessed, as indicated at 13, to overlap the upper edges of the wheels. Within the lower casing section 11, the major portion of a motor-blower unit (not shown) is disposed. This serves to exhaust air through openings, such as 14, located adjacent the lower end of casing section 10. Within the latter section a trough 15 is mounted. The forward face of that trough is defined by a fitting 16 which may be in the form of a deflector. The outer surfaces of the fitting may be frictionally engaged by a collar 17 forming a part of an air-porous paper filter bag 18. Conveniently, a collar 19 is associated with the adjacent face of casing section 10. That collar may have its axis inclined in a downward direction, as shown, and receive the rigid end portion 20 of a hose 21.

Access to the interior of casing 10 is afforded through a cover 22 mounted upon the same and normally secured against movement by a catch actuated by a knob 23. The cover is hingedly connected to the casing, as shown in detail in Fig. 5, by securing to the latter a hinge portion 24 through which a pintle 25 may extend to couple a corresponding part secured to cover 22. Within that cover, a filter assembly 26 is disposed; that assembly having its edges in sealing engagement with a gasket 27 carried by the wall providing casing 10.

With current supplied to the motor-blower unit, the latter will draw air through the collar 19 and fitting 16 into the interior of bag 18. Due to this inrush of air, the bag will tend to distend into firm contact with the inner faces of trough 15. To escape, air will have to pass through the wall of the bag, which will thus act as a filter to retain dust and other foreign material entrained in the air. After so passing through the wall, the air will flow upwardly through the filter assembly 26 into the space defined by the cover 22 and will then reverse its flow and pass downwardly through the passages or spaces existing between trough 15 and the inner face of casing section 10. That air will then pass to the blower unit and be discharged by the latter through openings such as 14.

To furnish a connection which will supply current to the motor operating the blower, the rear face of casing 11 defines an opening through which a plug 28 is accessible. That plug is preferably mounted in a dished-in portion 29 of the casing, which may also receive a co-operating coupling member 30 electrically connected to the leads existing within cable 31. The cable preferably extends immediately adjacent the rear face of casing 10 and, as shown in Fig. 7, includes a conveniently flat body 32 with raised edge portions 33, within which the leads 34 are embedded. Accordingly, the cable will not extend materially beyond the face of the casing and will present a not-unpleasing appearance in applied position. The hinge plate 35 affixed to casing 10 is formed with a groove of a width such that it will accommodate a cable of the character illustrated. This groove is overlain by wing or retaining portions 36, forming a part of the plate 35. These portions will thus frictionally engage the cable and maintain it in properly taut condition between the hinge and plug 28. The cover 22 is formed with a recess 37 and with similar wing or retaining portions 38, which overlie the cable, as illustrated in Fig. 5. Therefore, when the cover 22 is in open position, a small amount of slack on the part of the cable will exist be-

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tween parts 36 and 38. When the cover is in closed position, as especially shown in Fig. 1, there will be no slack on the part of the cable.

Cover 22 is preferably dished or extended in a downward direction, as indicated at 39, to provide a somewhat flattened rearward deck portion 40. Positioned upon the latter is a casing 41. This is secured against detachment by any suitable fastening elements which pass through lugs 42 and are secured to cover 22. The side flange of casing 41 is formed with an opening 43. Inwardly of this opening, the casing may mount a stop provided by a pair of spaced pins 44. These serve to engage the base end of a plug 45 when the latter is wholly retracted. Such retraction normally occurs incident to the fact that plug 45 is coupled to the outer end of a cable 46. That cable is disposed upon a reel, as is especially shown in Figs. 1, 2 and 3.

The reel conveniently includes a pair of discs 47 which have opposed base portions connected to each other. One of these base portions houses a coil spring 48. The outer end of the latter is connected against movement with respect to the dished portion of the disc adjacent which it is disposed. Its opposite end is coupled as at 49 to a hub 50. That hub is secured against rotation with respect to casing 41 by, for example, a bolt 51. Within the dished portion of the lower disc a block of dielectric material 52 is mounted. That block is provided with a channel 53 which receives the inner end portion of cable 46. The channel is continued in the form of a pair of grooves within which are disposed terminal members taking the form of metallic casings 54. Secured one to each of these are the leads within cable 46. The lower faces of the casings are continued as contact rings 55 exposed within the base portions of the grooves. These are engaged one by each of brushes or fingers 56. Those brushes are connected to the ends of the leads within cable 31 and are maintained against rotation by being secured to plate 57, which is fixedly attached to hub 50.

Now, with a view to providing a structure which will prevent the reel from normally retracting the cable 46, a suitable detent or brake is furnished. This brake, as especially shown in Figs. 2 and 6, conveniently embraces a bell crank lever 58 pivotally supported within the reel housing as at 59 and carrying an engaging element 60, preferably in the form of a roller. A spring 61 is connected with the outer arm portion of this bell crank and normally tends to swing the same in a clockwise direction, as viewed in Fig. 2. So swung, the head portions of roller 60 will engage with a suitable portion of the reel and preferably the flanges extending from the discs 47.

The brake-releasing structure conveniently includes an actuating button 62 (see Fig. 6) thrusting against a stem 63 which is normally maintained in an elevated position by a spring 64. The lower end of the stem terminates in a conical portion 65 bearing against the adjacent edge of the longer arm of the bell crank lever 58. A lock washer 66 may conveniently be associated with the stem to prevent too great a retraction thereof. The button 62 is exposed upon the upper face of casing 41. When depressed by an operator, stem 63 will be projected downwardly and the conical or tapered portion 65 will function as a cam to shift arm portion 58 in a counter-clockwise direction, as viewed in Fig. 2. So shifted, roller element 60 will be moved out of engagement with the periphery of the reel to release the latter.

It is obvious that with plug 45 connected to a suitable socket, an operator using the vacuum cleaner will shift the casing of the latter away from that socket as a pull is exerted upon the hose 21. Plug 45 being anchored to the socket, it follows that a pull will be exerted upon cable 46 as the assembly is moved away from such outlet. This will result in the cable feeding through opening 43 and rotating the reel assembly. Such rotation

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is entirely permissible, because the roller element 60 will simply ride in contact with the periphery of the reel as the latter turns in a clockwise direction. As the reel turns, spring 48 will be increasingly tensioned. During such rotation, however, no interruption to the supply of electrical current will occur, because the fingers or brushes 56 will ride in engagement with the surfaces of rings 55 and these rings are connected to the inner end of the current-supplying cable 46. From these contact fingers or brushes, current will flow through the cable 31 to plug 30, the receptacle 28 and thence through the motor of the unit. The control of that motor is, of course, effected by means of a suitable switch mechanism and which is operated by, for example, a foot pedal 67. Assuming that the reel structure is not mounted on the cover 22, then, of course, a current-supplying lead, such as a cable, may be directly connected with the receptacle or coupling 28. When the reel is to rewind cable 46, then the operator, by simply striking or pressing against actuator 62, will release the brake. So released, spring 48 will act to rotate the reel and rewind the cable.

By having the reel preferably mounted on the upper end of the assembly, it is obvious that the amount of cable which will be resting on the floor will be minimized. In this connection, it will be understood that under ordinary manipulation of the parts that cable will not contact the floor for quite some distance beyond the casing. With the adjacent cable portions maintained in an elevated condition, there will be little danger of that cable becoming entangled in the wheels 12 and other supporting media of the assembly. Additionally, with the weight of the reel disposed at an upper position, the center of gravity of the assembly is raised. With the reel dismounted that center of gravity would be approximately in the area of the lower part of the upper casing section 10 and spaced rearwardly of the wheel axis a distance approximately one-fourth the distance between the axis and the rear edge of the casing section 11. With the reel mounted, this center of gravity is shifted slightly rearwardly beyond that point. Also, it is elevated. That elevation is not enough to render the apparatus unstable. In fact, as tractive force is exerted on hose 21, the shifting of the apparatus over the floor may be achieved with minimum effort. Any contact between the floor and a skid or supporting portion 68, extending from the lower face of casing section 11, is not aggravated to an extent such that a marring of the floor occurs.

The axis of the reel, being vertical, it is in a plane normal to the pull exerted upon hose 21 as the assembly is advanced by the operator. Therefore, only minimum effort will be necessary to have cable 46 unwind; this occurring without any conscious effort on the part of the operator as the assembly is traversed over the floor. The inner end of the hose being just below the plane of the reel, the cable, though exerting some degree of tension, will minimize any tendency of the apparatus to topple in a forward direction. At the same time, however, and as brought out in the prior patent, a violent pull on the hose, such as would cause the apparatus to tend to overbalance in a forward direction, will be immediately counteracted by that hose having its slack portion come into contact with the floor and thus act as a strut or support for the assembly.

Finally, it will be noted that a carrying and lifting handle may form a part of the present apparatus. This has been indicated at 68 as preferably including a strap with ends bent to overlie and be pivotally connected to the side faces of casing 41. When this handle is in the position shown in dot and dash lines in Fig. 1, it will obviously serve its intended purpose. When shifted to the position shown in full lines, it will lie adjacent the forward casing face and merge inconspicuously with that face.

Thus, among others, the several objects of the invention as specifically aforementioned are achieved. Obviously,

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numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. A vacuum cleaner assembly including in combination a casing formed with front, rear, side and base faces, a pair of wheels mounted to lie adjacent said side faces and extending below said base face to movably support said casing at two points upon a surface, said wheels having their axes positioned between the casing center and its front face, means for supporting said casing upon a surface at a third point adjacent its rear face, said front face being formed with an inlet opening for connection with a hose at a point above the axes of said wheels, so that as traction is exerted upon the hose, the means providing the third point of casing support will tend to elevate above the supporting surface and the assembly will move in the direction of the hose, a cable for supplying current to mechanism within the interior of said casing, a cover hingedly connected to said casing for closing the upper end of the same, a cable-carrying reel mounted upon said cover whereby as the latter is swung around its hinge to allow access to the casing interior, said reel will be shifted to a non-obstructing position, a second casing enclosing said reel, said second casing being formed with an opening in the direction of the rear face of the first casing and said cable passing through such opening for connection with an electrical wall outlet.

2. A vacuum cleaner assembly including in combination a casing formed with front, rear, side and base faces, a pair of wheels mounted to lie adjacent said side faces and extending below said base face to movably support said casing at two points upon a surface, said wheels having their axes positioned between the casing center and its front face, means for supporting said casing upon a surface at a third point adjacent its rear face, said front face being formed with an inlet opening for

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connection with a hose at a point above the axes of said wheels, so that as traction is exerted upon the hose, the means providing the third point of casing support will tend to elevate above the supporting surface and the assembly will move in the direction of the hose, a cable supplying current to mechanism within the interior of said casing, a cover hingedly connected to said casing at a point adjacent the upper edge of its rear face, a cable-carrying reel mounted upon said cover, said cable extending from said reel past said hinge and adjacent the rear casing face and means for retaining said cable substantially in contact with parts of the hinge connection in all positions to which said cover is swung.

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