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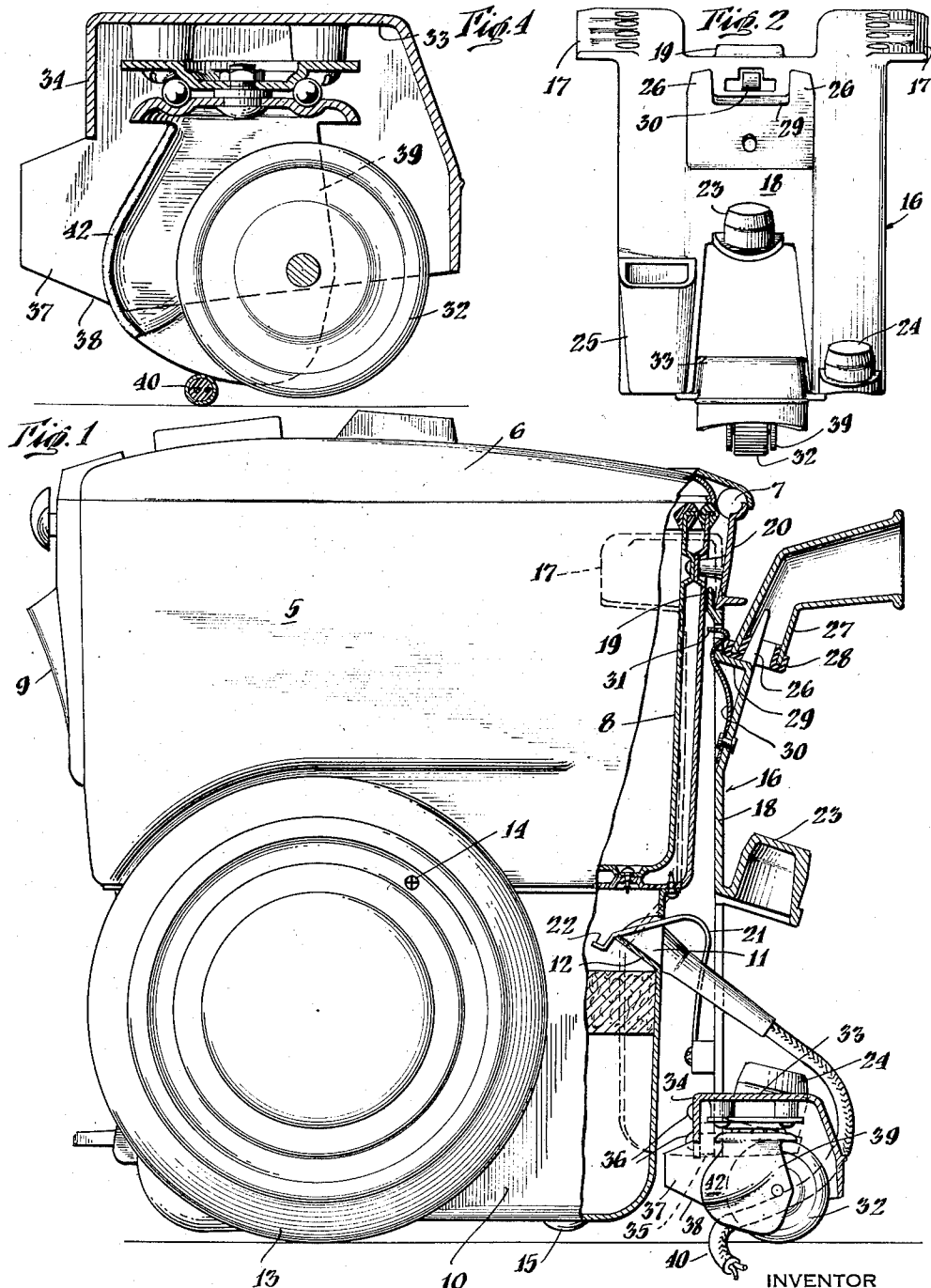
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VACUUM CLEANER ASSEMBLY AND CARRYING UNIT

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2 Sheets-Sheet 1



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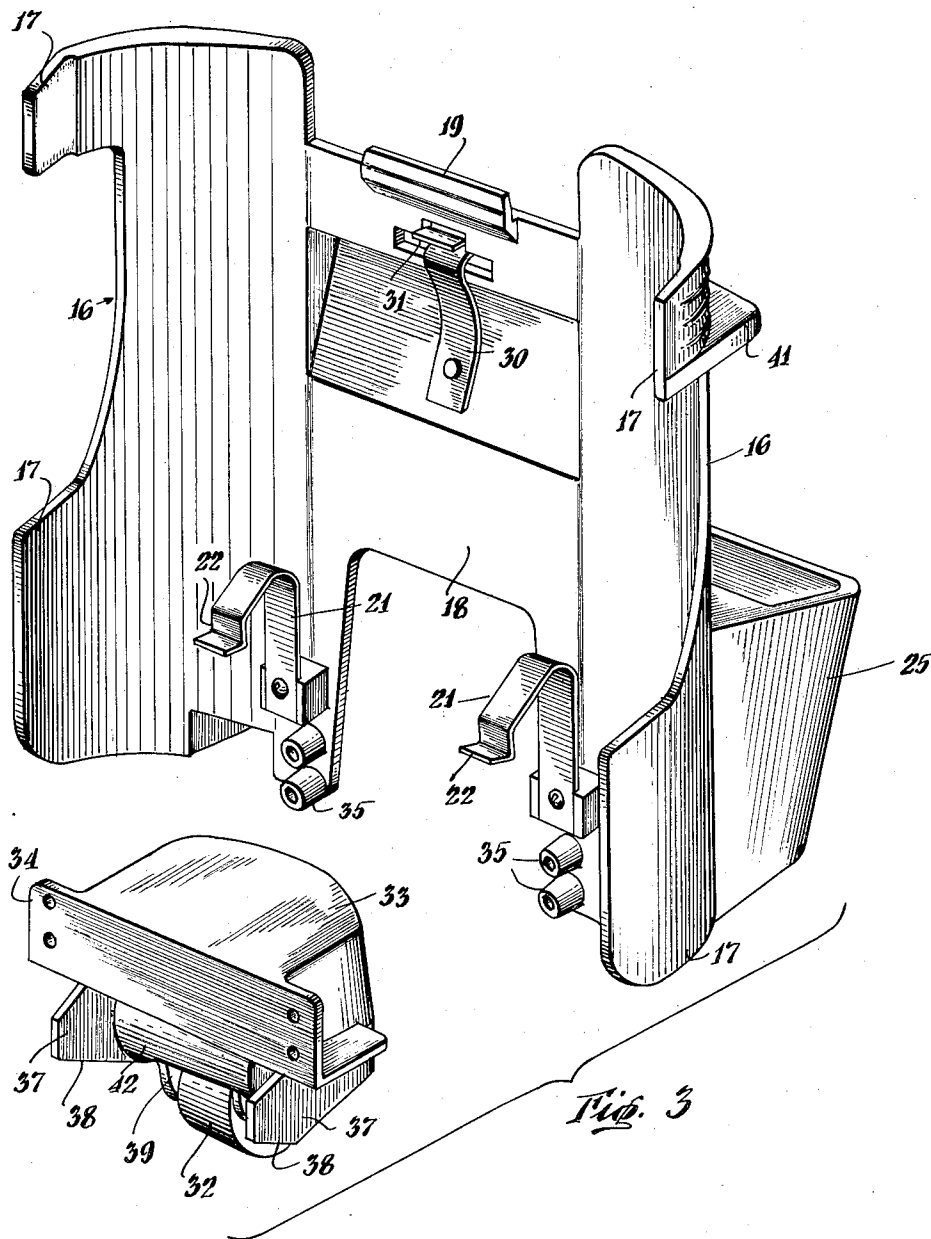
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VACUUM CLEANER ASSEMBLY AND CARRYING UNIT

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5 Claims. (Cl. 15—323)

This invention relates to a structurally and functionally improved vacuum cleaner assembly, as well as an accessory structure for association with that assembly; the present invention providing an improved and/or alternative structure to those disclosed in my prior United States Patent 2,716,465, dated Aug. 30, 1955 on Vacuum Cleaner Assembly.

By means of the present teachings a structure is furnished which will permit a vacuum cleaner assembly to readily traverse a floor or other supporting surface with minimum effort exerted by the user and even although that assembly may have associated with it accessory parts embodying weight, such that the apparatus would normally tend to be in substantially unbalanced condition, increasing the difficulty of shifting it over supporting media such as floors and surface obstructions such as thresholds and carpets.

A further object is that of providing an accessory structure which may readily be attached to or removed from a main vacuum cleaner assembly. When so attached it will furnish a freely movable support for that assembly to enhance the stability thereof as the latter is shifted from one to another position.

An additional object is that of furnishing a design by means of which the movement of the apparatus over a floor or other surface will not result in the danger of entanglement of the assembly and its supporting portions with obstructions such as electrical leads and other objects.

Additionally, by means of the present teachings a structure is furnished which will embody a relatively simple assembly of parts capable of economical manufacture and functioning 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:

Figure 1 is a side elevation of a complete assembly with certain of the parts broken away to disclose underlying structures and with other parts shown in section;

Figure 2 is a rear face view of a preferred form of accessory unit;

Figure 3 is a perspective view in enlarged scale of this unit and showing the supporting caster and bracket structure; and

Figure 4 is a sectional side view illustrative of the parts adjacent the caster.

Referring primarily to Figure 1, a vacuum cleaner assembly has been generally illustrated which embodies a preferred form of structure. This corresponds to that shown in my afore-identified patent. Such showing is to be regarded in an illustrative rather than a limiting sense in that the present invention is applicable to vacuum cleaners embracing structures and designs different from that shown in that application. Thus, the numeral 5 indicates the upper body portion of the assembly which is closed by a cover 6 hingedly secured thereto as at 7. Within this body a trough 8 is disposed which receives an

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air-porous paper filter bag. The latter is connected to the inlet 9 of the apparatus and to which the suction hose is to be coupled. The lower casing part 10 of the cleaner has positioned within it a motor-blower unit (not shown).

This serves to draw air through the inlet coupling 9 and the filtering structure and to discharge that air through one of a suitable number of ports 11 formed in the wall of housing 10.

A pair of these ports are preferably furnished, one at each side of the hinge portion 7 and below the same. They are conveniently defined by inwardly extending portions 12 which may form parts integral with the wall of casing 10. As described in my earlier patent, the entire assembly is preferably supported upon wheels 13 disposed one to each side of the housing and recessed with respect to the upper body portion 5 thereof. The axes of the wheels 13 are forwardly of the vertical axis of the entire assembly. Having in mind the weight of the motor-driven blower unit, the center of gravity of that assembly is approximately at the point indicated in Figure 1 by numeral 14. In other words it is above the axis of the wheels and to the rear of the same; the forward portion of the apparatus being defined by coupling 9. Therefore, the lower face of the tub portion 10 will within its rear zone tend to ride in contact with the supporting floor or other surface. To this end it is provided with a contact element 15 which normally engages that surface.

As is taught in my prior patent, the entire assembly may be shifted with minimum effort from one to another desired position. This is accomplished by the operator simply exerting a pull on the hose extending from coupling 9. That pull may be in a direct line in which case the apparatus will follow the operator and ride on the peripheries of the wheels 13 extending below the lower surface of the tub and the skid provided by the bearing portion 15 or its equivalent. Similar support of the parts occurs when the operator exerts a rotational pull in either clockwise or counterclockwise direction. In such event the entire apparatus will swivel with respect to the supporting surface with, for example, one wheel 13 moving in a forward direction while the opposite wheel moves in a reverse direction. Under both of these conditions the fact that the center of gravity is to the rear of the wheel axes, will assure that contact portion 15 or its equivalent is maintained in proper engagement with the supporting surface. If the operator exerts a violent pull on the hose and which tends to topple the apparatus in a forward direction, this will merely result in a tilting of the assembly in that direction and a subsequent reestablishment of the parts in proper positions.

An accessory or carrying structure may be mounted on the assembly. In general, the carrying structure includes a shield portion as shown especially in Figures 2 and 3, which embraces side panels 16 which are rearwardly curved as at 17 to provide what might be termed "wing portions." These side panels are connected by a center part 18 from which a tongue 19 extends upwardly. That tongue is disposable within the space existent between the outer face of casing 5 and an area of the inner face of plate 20 which forms a part of the hinge assembly 7.

As shown particularly in Figure 3, a pair of springs 21 are mounted one to each side of the central recess existing in the shield and adjacent the lower end of the latter. These springs are in the form of strips and generally hook-shaped with their inner ends providing bent portions 22 which function as detents.

The height of the shield is such that with tongue 19 associated with hinge plate 20 each one of the springs 21 will ride into one of the exhaust openings or louvers 11. As they so shift they will override upwardly inclined surfaces of parts 12 and cam against the same. As the

shield occupies a position immediately adjacent the outer faces of body portions 5 and 10 at a point opposite coupling 9, the detent portions 22 will ride over the inner edges of angular portions 12 and thus latch over these edges. The interengaging action of the parts is adequate to assure a retention of the caddy in proper position. So applied, adequate space is present for the escape of filtered exhaust air through the pair of passages 11 in the rear face of tub portion 10. By simply exerting a forceful pull in a rearward direction, the detent portions 22 will cam over the edges of parts 12. Thereupon, by shifting the shield downwardly, tongue 19 will be withdrawn from the recess defined by plate 20. Under these circumstances the carrying unit may readily be freed from association with the main assembly. Thus, a structure is furnished which may readily be mounted upon or removed from the main body of the cleaner. Also when so mounted it conforms closely to the exterior configuration of the assembly, a pleasing appearance is presented and the bulk of the apparatus is increased to only a very minor extent.

The lower edge of the shield terminates preferably just above the lower face of tub portion 10. The outer face of the shield, as especially shown in Figure 2, may provide a central mounting portion 23 to receive, for example, the collar of a dusting brush. To one side and below this part a second mounting portion 24 may provide a support for the collar or coupling part of a crevice tool or radiator nozzle. A pocket 25 adjacent the opposite side of the caddy may receive in supporting relationship the end of a floor brush. Adjacent its upper end a pronged support 26 may furnish mounting for an upholstery brush or tool.

The latter has been indicated by the reference numeral 27 in Figure 1. Conveniently it has a nozzle defined by an outward extending bead 28. As shown, the prongs 26 and the supporting portion 29 adjacent thereto are preferably inclined rearwardly so that no difficulty will be experienced in swinging the cover to a fully open position, even with brush 27 mounted upon the unit. Adjacent the upper end of the shelf a detent spring 30 may be affixed to the inner face of the shield as shown in Figure 3. This spring has a projecting end portion 31 extending through an opening formed in the caddy adjacent surface 29. Therefore, as the tool 27 is rocked or shifted to occupy a position in which it will be retained on prongs 26, its bead 28 will move past the projecting portion 31 of the spring so as to latch and be retained against accidental detachment from the unit.

With the center of gravity being located approximately at the point indicated at 14 it will be understood that the force of engagement between contact portion 15 or its equivalent and the supporting floor will be so light that no difficulties will be experienced in traversing the cleaner over that floor or other supporting surface. This is true despite the fact that the assembly will include stability such that it will not upset. However, when the carrying unit is mounted on the rear portion of the cleaner and especially when it is loaded with its full complement of tools then an increasing weight is presented to the rear of the center of gravity. This causes increasingly frictional engagement between contact portion 15 and the surface upon which the assembly is disposed. That engagement results in a distinct and perceptible drag as the cleaner is shifted by means of the hose. This objectionable feature is overcome by the present teachings.

More particularly and as shown in Figures 3 and 4, an anti-friction support is furnished preferably by employing a relatively small wheel or caster 32. This is swiveled on a vertical axis. The outer caster assembly conveniently embraces a shielding member 33 terminating in a vertical wall 34 which may be brought into firm bearing engagement with boss portions 35 extending from the rear face of the shield with the parts being coupled by, for example, bolts 36. Thus, a rearward extension is furnished for the unit and which extension in effect is

a permanent part of the latter. Side walls 37 extend one beyond each side face of caster 32 and may be integral with member 33. These side walls are defined adjacent those ends which lie in closest proximity to housing portion 10, by downward and outwardly inclined edges 38. Forming a part of the caster swivel assembly and riding between the member 32 thereof and side walls 37 are walls 39 which extend below the lowermost edges 38 of walls 37. The walls 39 are preferably inclined towards each other adjacent their forward ends to define a slot of desired width. Thus, in effect the lower surfaces of the assembly edges 38 of the outer walls and the similar edges of walls 39 present a structure which will divert and cam against any underlying object as the assembly is moved over the floor. Additionally that object cannot ride into entangling engagement with the upper zone of the unit 32. Also the lower edge zone of the anti-friction element or roller 32 will extend into a plane slightly below skid 15 when the caddy is in mounted position.

Therefore, and as shown especially in Figure 1, this caster will cause portion 15 to be elevated above the supporting surface engaged by the peripheries of wheels 13. It will furnish a proper movable support underlying the rear end of the cleaner. Accordingly, the latter may be freely moved over a supporting surface with no drag being perceptible. The caster being preferably swiveled no difficulty will be encountered when the cleaner assembly is rotated or swung in one or the other directions. Due to the continuity of guiding surfaces provided by the edges 38 of plates or walls 37 and the similar edges of parts 39 it will be apparent that if, for example, the power supplying lead 40 for the apparatus is lying upon that surface and the operator pulls the apparatus over this lead, no difficulties will be experienced.

Owing to the large diameter of wheels 13 they will, of course, freely ride over any obstruction such as the cable 40. The edges of the caster assembly first prevent any possibility of the cable loops becoming hooked or entangled at any point in the upper zone of that assembly. Such entanglement is liable to occur when the assembly is riding over a rug and especially a deep pile rug. In that case the caster 32 would penetrate towards the base of the rug while a lead would lie in the plane of the top surface of the rug. Secondly, especially when the apparatus is riding over a bare floor and encounters a lead the cam surfaces furnished by the walls of the caster swivel assembly will cause them to override an obstruction such as the cable and thus lift the caster wheel 32 into a plane in which it will—despite its small diameter—freely ride over the cable. As soon as it has cleared the latter that cable may either be lifted from a position resting upon the floor or rug, or else may be shifted as desired. In any event no obstruction is furnished by units such as this passage thereover of the entire assembly. Moreover, such an obstruction and especially the power lead will not become entangled into the supports for the assembly. When the cleaner is not in action and as taught in my previous applications, the supporting projections 41 extending from the upper face of the unit shield may provide rests for the convolutions of the lead when the latter is wrapped around the cleaner.

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

What is claimed is:

1. In combination, a vacuum cleaner comprising a vertically extending tub-shaped casing having an air-intake opening in its side wall, a pair of wheels having their axes transverse of the axis of the casing and between that axis and the intake-opening, the peripheries of such wheels extending below the lower face of the casing and the center of gravity of the vacuum cleaner being beyond that side of the wheel axis which is opposite said opening whereby said casing tends to assume

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a position in which its axis is tilted rearwardly away from such opening, a tool-mounting plate, an anti-friction member presenting a peripheral portion, means for securing said member to said plate adjacent the lower end of the latter, means for removably securing said plate to an outer face of the casing side wall at a point substantially opposite said opening and with its member extending below the lower face of the casing and obstruction-diverting means also secured to said plate and extending below said casing to a point short of the lower periphery of said member.

2. In the combination, as specified in claim 1, said member comprising a caster, said diverting means comprising spaced walls having downwardly inclined edges and said caster being rotatably mounted between said walls.

3. In the combination as specified in claim 2, a shielding member enclosing the upper ends of said caster and walls, means for pivotally supporting the latter for swiveling movement with respect to said shielding member and downwardly inclined edge portions forming a part of said member, and overlapping the edges of said spaced walls.

4. In the combination as specified in claim 1, a cover, an assembly comprising a hinge for securing said cover to said casing adjacent its upper edges and presenting a space between its inner face and said casing, an extension

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at the upper end of said plate projecting into such space and means adjacent the lower end of said plate and cooperable with said casing for retaining the latter against movement such that said extension will withdraw from said space and said assembly providing the means for removably securing said plate to said casing.

5. In the combination as specified in claim 4, said retaining means including an exhaust louver in said casing, an inwardly inclined extension within said louver and a hook-shaped spring secured to such plate and overlapping said extension to bear against the edges thereof.

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