July 8, 1941. O. A. ROSS ET AL 2,248,585

VACUUM CLEANER APPARATUS

Filed Aug. 19, 1937

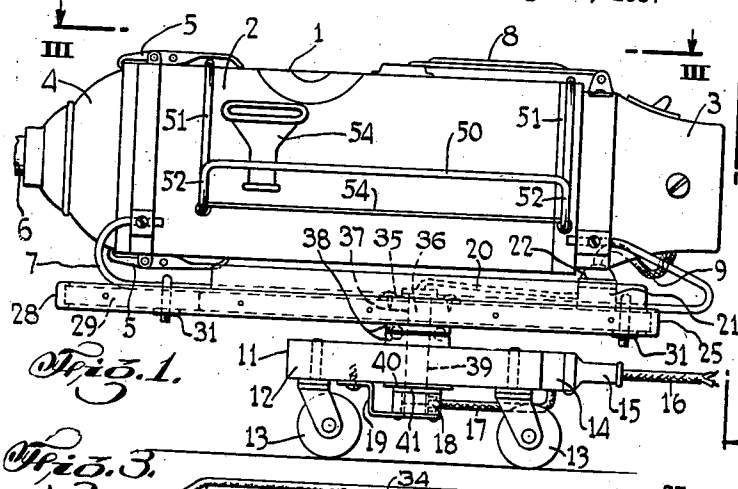


Fig. 1.

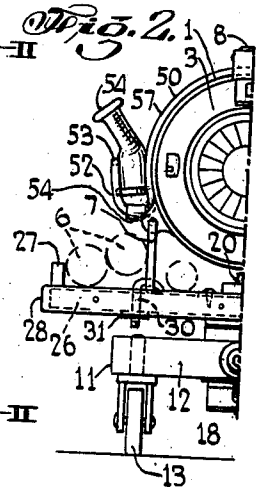


Fig. 2.

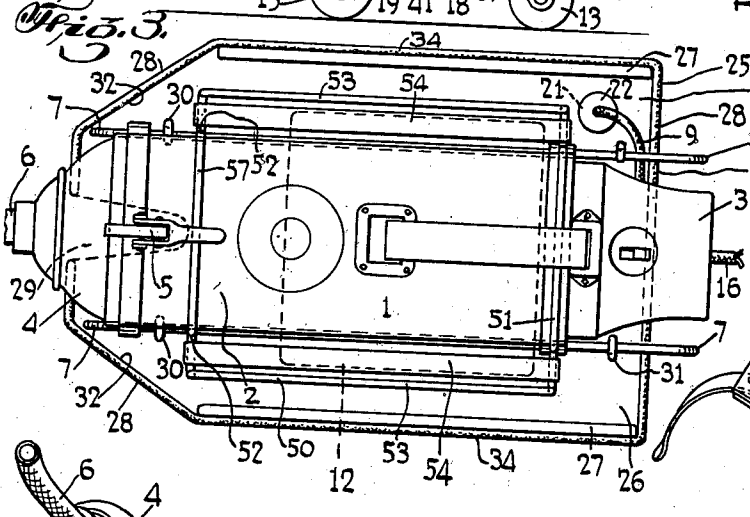


Fig. 3.

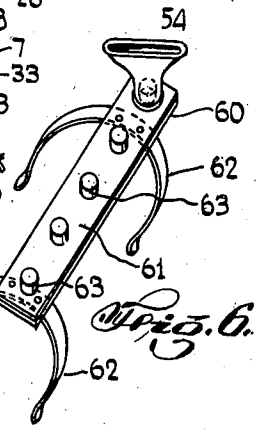


Fig. 6.

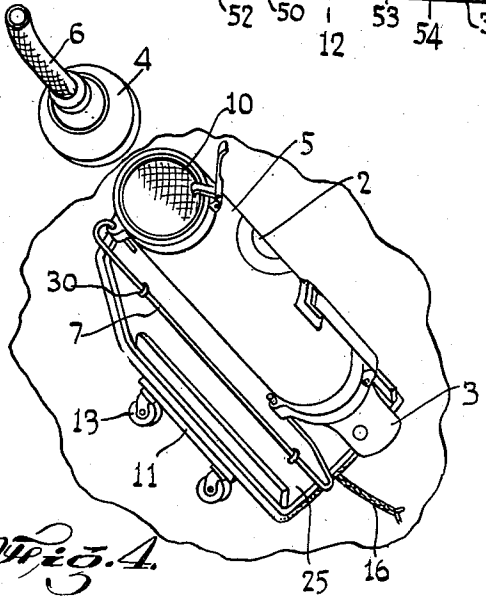


Fig. 4.

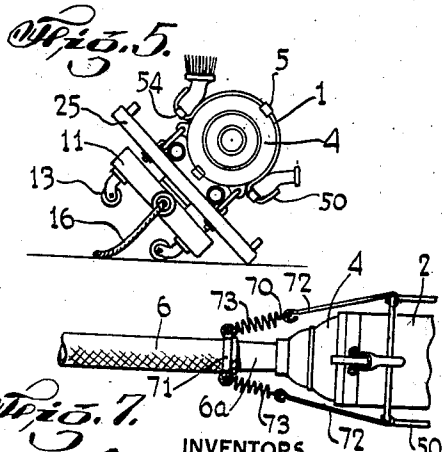


Fig. 5.

Fig. 7.

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VACUUM CLEANER APPARATUS

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12 Claims. (Cl. 15—16)

This invention relates to vacuum cleaner apparatus and more particularly to that form which is portable.

In the use of small vacuum cleaners, of the form which is slidable on the floor or carried by hand, it is generally necessary to impart an oscillatory or rotary movement of the cleaner when following the cleaning attachment connected therewith, these movements causing the electric cord, supplying energy to said cleaner, to become snarled upon itself or with said cleaner. A careful placement of the cord, each time the cleaner is moved, can usually prevent such snarling but requires much loss of time and energy, which it is obvious a vacuum cleaner is intended to overcome. Our invention overcomes this difficulty by providing a novel and peculiar support or carriage for vacuum cleaners wherein said cleaners may be oscillated or even completely rotated on a vertical plane without effecting any movement of the connecting cord, said cord being moved solely when said cleaner is bodily moved from place to place, and said bodily movement may be made at an angle to the plane of the cord or cable without excessive bending thereof, said cord moving in a sweeping motion without perceptible bend thereof.

Another feature of the invention comprises in so forming a carriage for vacuum cleaners, to which castors or wheels may be attached, whereby the accidental tipping over thereof will be limited to a comparatively small angle, and under ordinary circumstances will prevent said carriage from turning completely over, said carriage being made to incline or tip in a preferred direction for more ready access in removing the dust collecting bag.

Other novel features of the invention will be apparent as the description thereof progresses, and the novel and peculiar features thereof will be pointed out in the specification, claims and drawing, and wherein—

Figure 1 is a side elevational view of one embodiment of the invention. Fig. 2 is a part end view of the same taken on line 2—2 of Fig. 1. Fig. 3 is a top elevational view of the same taken on line 3—3 of Fig. 1. Fig. 4 is a perspective view of the same during use thereof on a floor or horizontal surface. Fig. 5 is another perspective view of the same similar to Fig. 4. Fig. 6 is a perspective view of a modified form of attachment support device. Fig. 7 is a part top view assembly of the apparatus.

Referring to Figs. 1, 2, and 3, a vacuum cleaner or cleaning unit 1 of known form, comprises cylindrical body 2, having motor housing 3, and detachable bag cover 4 latched in position by latches 5—5, into which one end of flexible hose 6 is plugged during use of said cleaner. Said body is supported by spaced rail members 7—7 secured thereto and may be carried by handle 8. The motor in housing 3 receives energy through cable, cord or conductor 9. Removal of cover 4 exposes dust collecting bag 10 (Fig. 4).

Carriage or dolly 11, comprises plate or body member 12, preferably rectangular in form, having wheels or caster units 13, attached adjacent each corner thereof for movement on a floor or other surface, said carriage having a universal movement on said floor. Attachment plug unit 14, secured to member 12, is arranged to receive correlated connecting plug 15, of known form, connected to cord or cable 16, which is plugged into an electric circuit for supplying energy to said cleaner unit 1. Energy from attachment plug unit 14, is carried through cord or cable 17, to contacting device 18, fixed on body 12, by support 19. Contacting device 18, may be of any one of known forms for suitably transferring energy from cord or cable 17 to cord or cable 20, relatively rotated therewith, said last named cord extending to fixed attachment plug unit 21, similar to unit 14, and to which correlated attachment plug unit 22 is attached, and forms the terminus of cord 9 supplying energy to the motor in housing 3. A contacting device as 18, usually comprises two slip rings, each connected to the conductors of one cable as 20, and two brushes slidably engaging said rings each connected to the conductors of a cable as 17.

Carrier 25 comprises body or plate member 26 of peculiar form, including side rails 27 and felt or resilient buffer strip or tape 28, extending around the edges thereof. Plate member 26 is formed with opening or slot 29 for access to latches 5 when removing cover 4. Plate member 26 is also supplied with hook bolt or securing devices 30, the upper hooked ends of which embrace rail member 7 at spaced portions thereof for locking cleaner unit 1 onto said carrier, said bolts 30 extending through said plate member and having threaded end for receiving lock nuts 31.

At a predetermined location on plate member 26, is secured annular member 35 having tubular member 36 fixed thereto, said tubular member extending downwardly through opening 37 in said plate member, thrust bearing 38 and body member 12 of carriage 11, being free to rotate in opening 39 thereof, body member 12 being rotatively supported on said tubular member between washer 40, and said thrust bearing 38 by lock washer 41.

Attachment holder or support 50, quick detachably clampably supported by body 2 of cleaner 1, comprises circular clamping portions 51, U-shaped or resilient connecting portion 52, forming a continuation or connecting means between said clamping portions and rail portions 53, said rail portions and rail portions 54 also

forming a connecting means between each pair of resilient U-shaped connecting portions 52. The space between the rail portions 53 and body 2 is preferably less than the dimension across the suction outlet end of a vacuum cleaner attachment, and therefore, when said attachments are inserted between said rail portions and said body, said rail portions are yieldably forced outwardly away from said body and therefore act to resiliently hold said attachments in place.

Referring to Fig. 6, showing a modified form of attachment support 60, said support comprises rail or plate member 61, to which are secured resilient material clamping members 62 adjacent each end thereof, for clampably engaging the body 2 of cleaner 1 similarly to clamping portions 51 of support 50. Projections or studs 63 secured to member 61, at spaced intervals, are preferably slightly tapered or conical in form, and of a size whereby the attachments as 54 which also have a tapered opening, will enter and frictionally lock said attachment thereunto to prevent accidental dislodgment therefrom.

Referring to Fig. 7, suction hose holding device 70, comprises split clamp member 71, embracing hose 6, and springs or resilient members 73, one end of which surrounds the clamping screws of clamping member 71, and the other end of which is pivotally connected to rod members 72, having hooked free end for hooking engagement onto member 50. Device 70, acts to hold hose 6, in suction tight engagement with the opening in dust bag cover 4, whereby said hose may be employed for pulling cleaner 1 to desired locations during a cleaning operation and without the necessity of touching said cleaner.

The location of opening 37 in carrier member or plate 26 and the location at which cleaner 1 is clamped onto carrier 25 by hooked bolts 30 is preferably such, that the axis of said opening is more adjacent the motor housing end of cleaner 1, but not beyond the center of gravity of said cleaner, said axis being preferably rearwardly of said center of gravity with respect to said motor housing, whereby carriage 11 and carrier 25 supported thereby, will more readily tip or incline toward the motor housing end, as shown in Fig. 4. This has two advantages, one being that the cleaner apparatus will remain tipped or inclined, as shown in Fig. 4, whereby the dust bag cover 4, may be more readily removed for withdrawing dust bag 10 and the replacement thereof including said cover. The other advantage comprises obtaining a longer reach with the cleaning hose when cleaning walls or articles of considerable height. The tipping angle sidewise has been found most satisfactory at an angle of approximately 45° as shown in Fig. 5, from which position it is readily righted.

Whereas the carrier 25, is of greater length than width, the portion thereof corresponding to the length of guard or side rails 27, is substantially equal to the width of said carriage, this also being found to be the most convenient proportion. Said carriage is formed with tapering edge portions 32, and are so positioned with respect to center of gravity that upon accidental tipping of the apparatus to engage edge portion 32, with the floor, said apparatus will inherently right itself without assistance, this being due to the fact that the center of gravity of said apparatus lies inwardly of a vertical plane meeting said edge portion 32, when in contact with a floor. In other words, if the apparatus is accidentally or wilfully inclined onto the edge 33 or side edges 34, it is not self-restoring, but if inclined onto either of edge portions 32, it is self-restoring. Assume cleaner 1 is to be employed for vacuum cleaning, the cord or extension 16, is plugged into correlated attachment unit 14, the other end being plugged into a source of electric energy. Hose 6 is also plugged into cover 4, and the apparatus may then be rolled over a floor by pulling on said hose, the holding device 70 preventing said hose from disconnecting with the cleaner unit while in use.

Under conditions of vacuum cleaning the floor, walls and contents of the average present rooms in dwellings, the apparatus is placed in the middle of the floor of said room, the operator walking around said cleaner during the cleaning of said floor, walls and contents. Owing to the various angles at which a vacuum cleaner attachment must be placed during vacuum cleaning, the flexible connecting hose 6, generally assumes a wave or oscillatory movement, which movement is partially or wholly imparted to cleaner unit 1 and therefore carrier 25 will also oscillate on carriage 11 whereas said carriage will remain stationary, and since the cord or connecting cable 16, is connected to said carriage, it will also remain stationary and prevent snarling thereof, in fact, the operator may move completely around the room without movement of carriage 11. In large rooms the apparatus may be initially placed in one corner thereof and then moved successively adjacent each wall portion thereof, whereby said cord or connecting cable 16 will be required to move in a comparatively large sweeping motion thereby again preventing snarling of said cord or connecting cable.

When cleaner 1 is to be stored, all the small attachments may be placed between rail portions 53 and body 2 of said cleaner. The extension tubes may be placed under the body 2 and between skids 7—7 as shown dotted in Fig. 2, and the hose 6 may be wound completely around cleaner 1 therebetween and rails 27, as shown dotted in Fig. 2, thereby making a compact package for storage in a wardrobe or similar storage space.

Attachment support device 50 is also supplied with a rail portion 54 extending between connecting portions 52 and secured at the lower bend thereof for acting as a stop to limit the downward movement of said attachments when inserted between rail portions 53 and said cleaner.

Whereas said rail portions 53 have been described as yieldably supported with respect to cleaner 1 for clampably urging said attachments against the side of said cleaner, said rail portions may be fixed with respect to said cleaner body and spaced sufficiently therefrom to permit free entry of said attachments therebetween and may include panel portions extending downwardly from said rail portions and then inwardly towards said cleaner body for forming a trough-like chamber or receptacle into which said cleaner attachments may be loosely placed.

What we claim is:

1. In vacuum cleaner apparatus, a vacuum cleaner, a carrier including means for fixedly securing said cleaner thereto, a dolly including castors for movement on a floor or horizontal surface, and means pivotally connecting said carrier and dolly for providing rotation of said carrier on said dolly about a substantially vertical axis whereby said vacuum cleaner may be rotated to desired positions without bodily movement of said dolly.

2. In vacuum cleaner apparatus, a vacuum cleaner including an operating motor and a first electrical conductor for supplying energy thereto, a carrier including means for fixedly supporting said cleaner thereon, a carriage including means for movably supporting said carriage on a floor or horizontal surface, a second electrical conductor for supplying energy to said motor connected to said carriage, and means including a contacting device for rotatively supporting said carrier on said carriage and connecting said conductors whereby said cleaner and said first electrical conductor may be rotated to desired positions without movement of said carriage and said second electrical conductor.

3. In vacuum cleaner apparatus, a vacuum cleaner, a carrier including means for fixedly securing said cleaner thereto, a dolly for movement on a floor or horizontal surface including means providing rotation of said carrier about a substantially vertical axis on said dolly, edge portions on said carrier positioned with respect to center of gravity of said apparatus whereby it may be inclined to rest on certain of said edge portions on said floor or horizontal surface without turning completely over.

4. In vacuum cleaner apparatus, a vacuum cleaner, a carrier including means for fixedly supporting said cleaner thereon, a dolly for movement on a floor or horizontal surface including means providing rotation of said carrier about a substantially vertical axis on said dolly, a plurality of edge portions on said carrier, certain of said edge portions being positioned with respect to center of gravity of said apparatus whereby it may be inclined to rest certain of said edge portions on said floor or surface and remain so inclined without restoration to normal position, and certain other of said edge portions being positioned with respect to center of gravity of said apparatus whereby it may be inclined to rest said other edge portions on said surface or floor and will inherently restore said apparatus to normal position.

5. In vacuum cleaner apparatus, a vacuum cleaner having a removable dust bag cover at one end thereof, a carrier including means for fixedly securing said cleaner thereto, means for movably supporting said carrier a predetermined distance above a floor or horizontal surface, edge portions on said carrier positioned with respect to center of gravity of said apparatus and said dust bag cover end portion whereby said apparatus may be tipped or inclined to rest one of said edge portions on said surface or floor and will inherently remain tipped or inclined to elevate said dust bag cover end portion for more ready removal thereof.

6. In vacuum cleaner apparatus, a vacuum cleaner including a removable dust bag cover at one end thereof, a carrier including a plate shaped member for fixedly supporting said cleaner thereover, a dolly for movement on a floor or horizontal surface including means providing rotation of said carrier about a substantially vertical axis on said dolly, and an opening formed on said carrier below said dust bag cover for access thereto during the removal and replacement thereof.

7. In vacuum cleaner apparatus, a vacuum cleaner including a cylindrical body portion and a flexible hose for connection thereto, a plate-shaped carrier having a width greater than the diameter of said cleaner body portion, means for fixedly securing said cleaner substantially mid-way between the edges of said carrier whereby the edge portions thereof extend beyond the sides of said body portion, upstanding rail portions formed at the outer edges of said edge portions for providing a storage space for said hose in coiled form, and a dolly pivotally supporting said carrier thereover including means providing rotation of said carrier about a substantially vertical axis on said dolly for more readily coiling said hose into said storage space upon rotation of said carrier.

8. In vacuum cleaner apparatus, a vacuum cleaner, a carrier including means for fixedly securing said cleaner thereover, a carriage including means for movably supporting the same on a floor or horizontal surface, means including pivotally connected members providing rotation of said carrier on said carriage about a substantially vertical axis spacedly thereabove, and a thrust bearing in the space between said carrier and carriage surrounding said pivotal connecting member.

9. In vacuum cleaner apparatus, a vacuum cleaner, a carrier including means for fixedly securing said cleaner thereover, a carriage including a body member having an opening, means including a pivotal connecting member fixed on said carrier extending downwardly through said carriage opening for providing rotation of said carrier about a substantially vertical axis on said carriage, a thrust bearing between said carrier and carriage body surrounding said connecting member, and means for movably supporting said carriage body on a floor or horizontal surface.

10. In vacuum cleaner apparatus, a vacuum cleaner, a carriage including a body member, a plurality of castors on said body member for movement thereof over a floor or horizontal surface, a carrier including means for fixedly securing said vacuum cleaner thereover, and means rotatively supporting said carrier on said carriage for rotation without movement of said carriage on said surface.

11. In vacuum cleaner apparatus, a vacuum cleaner including an operating motor and a flexible conductor for supplying energy thereto, a carriage including means for readily moving said carriage over a horizontal surface or floor, a carrier including means for fixedly securing said cleaner thereover, means including a tubular member for rotatively supporting said carrier on said carriage, another flexible conductor connected to said carriage for supplying energy to said first-named conductor and means including sliding contacts for conducting the energy from one of said conductors to the other, one of said conductors passing through said tubular member.

12. In vacuum cleaner apparatus, a vacuum cleaner including an operating motor and an energy supply conductor therefor, a carriage including a body member, means for supporting said body member for ready movement thereof over a floor or horizontal surface, a carrier including means for fixedly securing said cleaner thereon, means rotatively supporting said carrier above said carriage, another energy supply conductor connected to said carriage movable with respect to said first-named energy supply conductor, and means including relatively movable contacts for conducting the energy from one conductor to the other.

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