

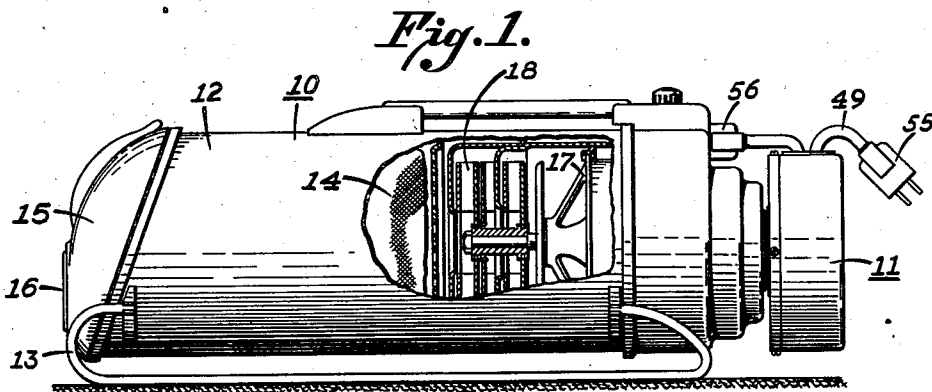
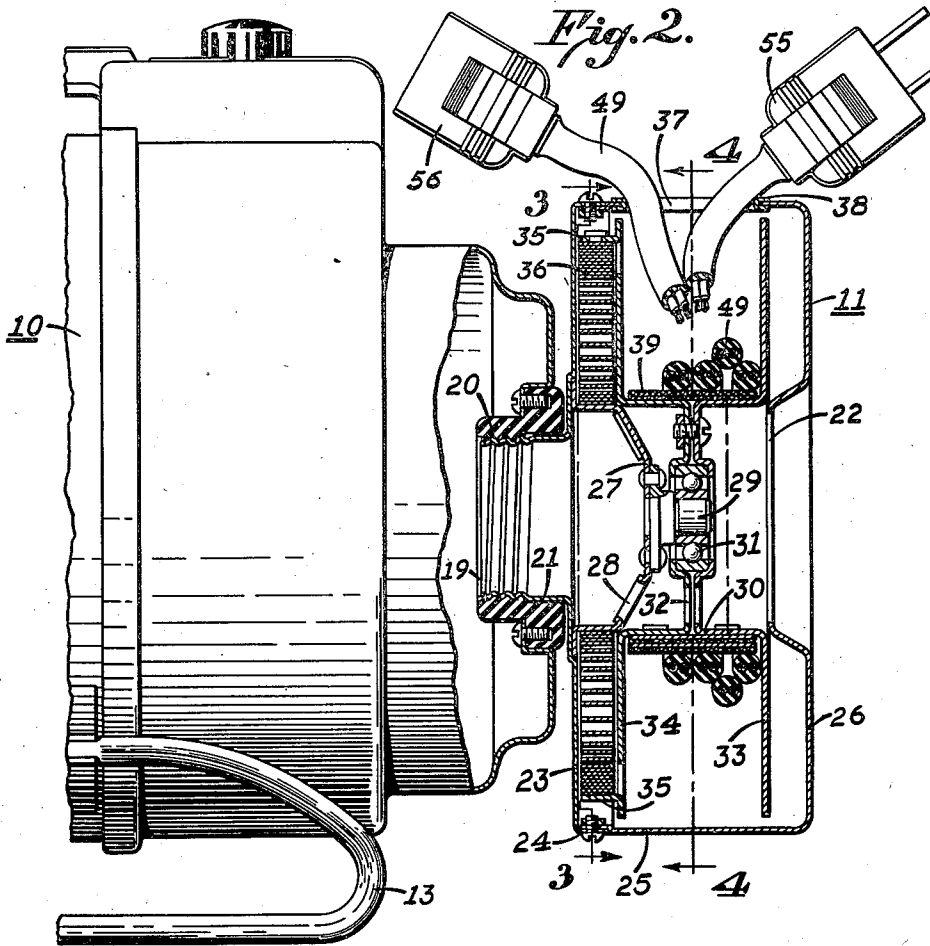
June 15, 1943.

G. E. LOFGREN
CORD-WINDING DEVICE

2,322,038

Filed Dec. 12, 1940

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

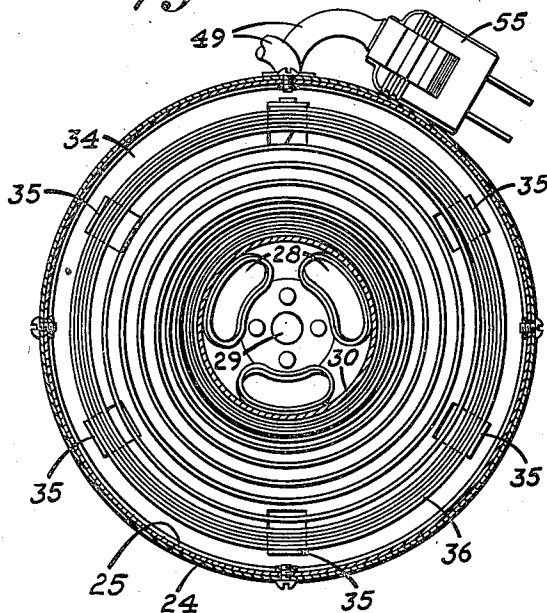


Fig. 4.

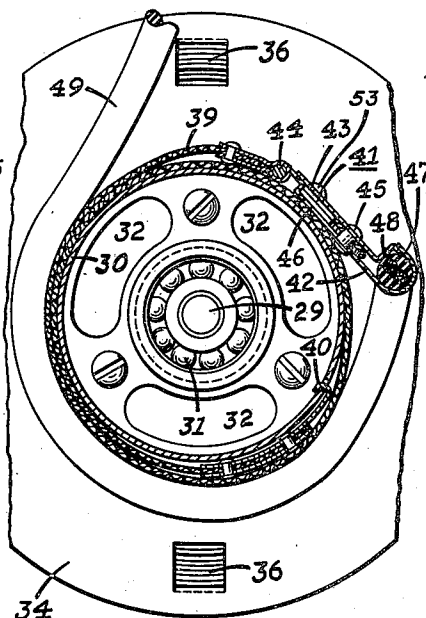


Fig. 5.

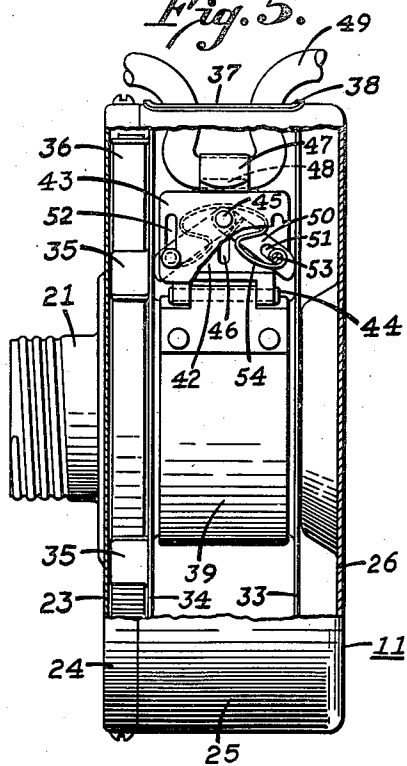
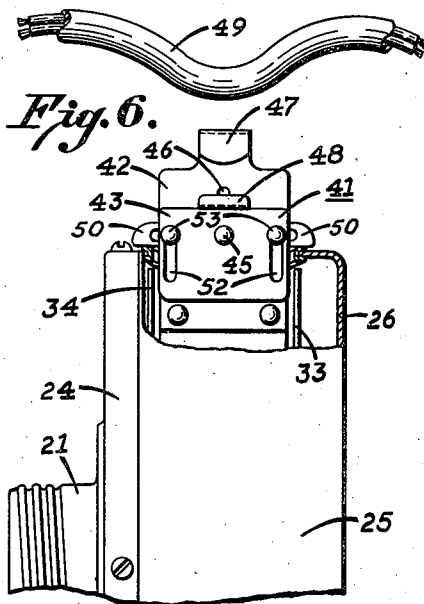


Fig. 6.



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UNITED STATES PATENT OFFICE

2,322,038

CORD-WINDING DEVICE

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Application December 12, 1940, Serial No. 369,765

5 Claims. (Cl. 15—16)

My invention relates to a cord-winding device, and more particularly to a device of this type which may be attached to a standard vacuum cleaner without the use of tools and without the provision of any special fastening means on the cleaner. Another object of my invention is to eliminate the necessity of slip rings or other relatively movable current-carrying parts in a cord-winding device. Further objects and advantages of my invention will be apparent from the following description considered in connection with the accompanying drawings which form a part of this specification, and of which:

Fig. 1 is a side view, partially in cross section, of a device in accordance with my invention secured to a vacuum cleaner;

Fig. 2 is a view on an enlarged scale of a portion of the apparatus illustrated in Fig. 1, the cord-winding device and a portion of the vacuum cleaner being in cross section.

Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is a cross-sectional view of the cord-winding device showing the cord entirely unwound, but still attached to the reel of the device; and

Fig. 6 is a view similar to Fig. 5, but with the cord detached from the reel.

Referring to the drawings, reference character 10 designates generally a vacuum cleaner unit, while reference character 11 designates the cord-winding device. The vacuum cleaner unit includes a casing 12 provided with runners 13 for supporting the unit horizontally upon a horizontal surface. A dust-separating member 14 is located within the casing and may be removed for emptying through an opening in one end of the casing which is closed by means of a removable cover member 15. Member 15 is provided with an inlet opening 16 to which may be connected a conduit leading to a suction nozzle or other dusting tool. Also located within the casing is an electric motor 17 driving a centrifugal fan 18. Rotation of the fan serves to cause a flow of air into the casing through opening 16. This air passes through the material of the dust-separating member 14 to the fan and flows therefrom through the electric motor and is discharged from the casing through an exhaust opening 19, shown in Fig. 2.

The exhaust opening is provided with any suitable coupling means, whereby if desired a hose may be connected thereto for using the cleaner

as a blower. As shown, this coupling means consists of screw threads 20. The cord-winding device 11 is provided with a hollow member 21 which is provided with screw threads adapted to engage the threads 20. The interior of the device 11 is hollow and the air discharged from the exhaust opening 19 passes through an opening 22 therein to the atmosphere. Obviously, the opening 22 could be provided with screw threads, or other suitable coupling means, so that the hose could be connected thereto for blowing.

The hollow member 21 is secured to or integral with a circular end wall 23. This wall is provided with a flange 24 to which is bolted a cylindrical wall 25. Member 25 is secured to or integral with another end wall 26 in which is formed the opening 22. Walls 23, 25 and 26 form the case of the cord-winding device.

Suitably secured to the end wall 23 is a spider 27 formed with a plurality of apertures 28 therethrough in order to permit air to flow through the central portion of the case. A spindle 29 is supported by spider 27 and a reel 30 is rotatably mounted thereon by means of a ball bearing 31. The hub portion of the reel is provided with openings 32 in order to permit flow therethrough of air. The reel includes spaced cord-retaining flanges 33 and 34. A plurality of lips 35 are struck from near the periphery of flange 34 and the outer end of a spiral spring 36 is riveted to one of these lips. The remaining lips serve to retain the outermost turn of the spring when the spring is completely unwound. The inner end of the spring is suitably secured to the spider 27.

The cylindrical wall 25 is formed with an opening 37 around the edges of which is preferably provided a gasket 38 of rubber or the like. The dimension of the opening 37 in axial direction is substantially the same as the distance between the reel flanges 33 and 34.

A strap member 39 has one end secured to the hub of reel 30, as by being provided with a hook 40 engaging an opening formed in the hub. The strap is of such length as to permit of its being wound about two turns around the hub and the other end of the strap is secured to a cord-retaining clamp designated generally by reference character 41. This clamp includes a pair of parallel plate-like members 42 and 43. Member 42 is pivotally secured to the end of the strap by means of a pin 44. A rivet or the like 45 is rigidly secured to plate 43 and engages a slot 46 formed in plate 42, whereby the plates may be slid relative to each other in a direction parallel to the slot 46. Plate 42 is formed with a hook-like

member 47 which co-operates with a projection 48 formed on plate 43 to clamp therebetween an electric cord 49 when the plates are in the position shown in Figs. 4 and 5. When the plates are slid relative to each other to the position shown in Fig. 6, sufficient space is provided between the hook 47 and the projection 48 to remove the cord.

Two arms 50 are pivoted on the rivet 45 and each arm is provided with a slot 51 adjacent to its outer end. Plate 43 is provided with a slot 52 near either edge and pins or the like 53, which are fixed to plate 42 as by riveting, extend through the slots 51 in the arms and the slots 52 in plate 43. Pins 53 are engaged by a spring 54, the midpoint of which passes over the rivet 45. The tendency of spring 54 is to move the pins 53 through the slots 52 from the position shown in Fig. 5 to that illustrated in Fig. 6. Such movement of the pins 53 causes the arms 50 to pivot about the rivet 45 so that the ends of the arms project beyond the sides of the cord clamp 41, the slots 51 in the arms permitting such pivoting. Inasmuch as pins 53 are secured to plate 42, the pins can move in this manner only when the plate 42 is slid upwardly with respect to plate 43. When the parts are in the position shown in Fig. 5 the pull of the cord on hook 47 cannot slide the plate upwardly relative to plate 43, inasmuch as the pins 53 engage the slots 52 in arms 50 and the latter cannot pivot upwardly about rivet 45 because their outer ends are restrained by flanges 33 and 34 of the reel. Hence, the cord cannot be accidentally released while the clamp 41 is within the case. However, when the clamp is pulled through the opening 37, the arms 50 are free to pivot outwardly and hence the plate 42 may be slid upwardly with respect to plate 43 to the position shown in Fig. 6 in order to release the cord. Spring 54 acting on pins 53 tends to slide the plates apart and is aided by the pull of the cord on hook 47.

The above-described device operates as follows. The cord 49 is initially wound on the spool 30 with the ends of the cord extending through the opening 37. The plugs 55 and 56 are sufficiently large so that they will not pass through this opening. To unwind the cord, the plugs 55 and 56 are grasped and the cord is pulled outwardly through the opening 37. This causes the reel 30 to rotate and wind up the spring 36. The cord is thus pulled out through the opening until it is completely unwound from the reel. When this occurs, the cord-holding clamp attached to the end of strap 39 is likewise pulled through the opening. The pull of the cord on the hook 47, together with the force exerted by spring 54 is now able to move the parts to the position shown in Fig. 6, where the arms extend beyond the edges of the opening 37 and thus prevent the retraction of the clamp into the casing by the force exerted by the spring 36. In this position the plate 42 has been slid upwardly with respect to the plate 43 so as to release the cord from the hook 47. With the parts in this position, which is illustrated in Fig. 6, the arms 50 cannot be accidentally retracted to within the clamp inasmuch as the pins 53 prevent downward pivoting of the arms as long as plate 42 is slid upwardly with respect to plate 43.

The plug 56 of the cord may then be inserted in a suitable receptacle of the vacuum cleaner unit, while the plug 55 may be connected to a convenient outlet.

When it is desired to again wind the cord, the central part thereof is placed underneath the

hook 47, the clamp 41 is pulled outwardly a slight distance to permit pivoting of the arms, and the plate 42 is slid downwardly so as to clamp the cord in place and to retract the arms sufficiently so that they will pass through the opening 37. Sliding of the plate 42 downwardly with respect to plate 43, causes such retraction due to the engagement of the pins 53 with the slots 51 in the arms. The spring 36 thereupon causes the spool 30 to rotate and thus wind the cord upon the hub and between the flanges 33 and 34.

It will thus be seen that I have provided a cord reel which may be easily attached to a standard vacuum cleaner unit, and more specifically to one of the air flow openings in the casing of such a unit. The details of the reel itself, which are disclosed here but not claimed, constitute the claimed subject matter of my divisional application Serial No. 392,405, filed on May 8, 1941.

While I have shown and described one more or less specific embodiment of my invention, it is to be understood that this has been done for purposes of illustration only and is not to be considered as limiting the scope of my invention, which is to be determined by the appended claims.

What I claim is:

1. In apparatus of the class described, a vacuum cleaner having a casing formed with an opening therein for the passage of air and coupling means for connecting a hose to said opening, a cord-winding device including a case, means carried by said case and engageable with said coupling means for removably securing said device to said opening, said case being formed with a centrally disposed passage therethrough communicating with said means carried by said case, a cord-winding reel having a hub portion and a cord-retaining portion, and means extending transversely of said passage for rotatably mounting said hub portion within said case, said last-mentioned means and said hub portion being formed with apertures for flow of air.

2. In apparatus of the class described, a vacuum cleaner having a casing formed with an opening therein for the passage of air and coupling means for connecting a hose to said opening, a cord-winding device including a casing having spaced parallel walls, means carried by one of said walls and engageable with said coupling means for removably securing said device to said opening, the other of said walls having an aperture substantially in alignment with the second-mentioned means, a cord-winding reel having a hub portion and a cord-receiving portion, the inner diameter of said cord-receiving portion being substantially the same as the diameter of said aperture, and means disposed between said walls for rotatably supporting said hub portion within said case, said last-mentioned means and said hub portion being formed with apertures for the flow of air.

3. A portable vacuum cleaner comprising anti-friction means for supporting the cleaner making said cleaner easily movable over a flat surface, a casing having an opening therein, electric means producing when in operation a flow of air through said opening, said casing having coupling means quickly manually connectable and releasable for connecting an air conduit to said opening in such a manner as to cause air flowing through the opening to flow through the conduit, means including an electric cord for connecting said electric means to a source of elec-

tric power, means for winding up said electric cord comprising a cord-winding device, said device having coupling means quickly manually connectable and releasable for engaging at least a portion of said first mentioned coupling means to support said device wholly from said cleaner in such a position that when the cleaner is resting on a flat surface supported on said antifriction means, the device is out of contact with the flat surface, and means providing a path for the flow of air through said opening in said casing to the atmosphere when said device is supported on said cleaner as aforesaid.

4. In apparatus of the class described, a vacuum cleaner having a casing formed with an opening therein for the passage of air and coupling means for connecting a hose to said opening, a cord winding device including a casing having spaced walls roughly parallel to one another, means carried by one of said walls and engageable with at least a part of said coupling means for removably securing said device to said opening, the other of said walls having an aperture substantially in alignment with the second mentioned means, a cord-winding reel having a cord-receiving portion, the inner diameter of said cord-receiving portion being substantially the same as the diameter of said aperture, and means

disposed between said walls for rotatably supporting said reel within said case, said last mentioned means and said reel being formed with apertures providing means through which air can flow through said device between said opening in the vacuum cleaner casing and the atmosphere.

5. A portable electric vacuum cleaner comprising a casing having an opening, an electric-cord winding-reel having a casing with an opening therein, two open ended tubes, one of said tubes being carried by each of said casings and each having a mouth coincident with the opening in the casing on which it is carried, said tubes being of such size as to fit one within the other, means including said tubes for quick-detachably supporting said winding-reel casing wholly upon said vacuum cleaner casing, means including said opening in the vacuum cleaner casing and the tube coincident therewith for quick-detachably coupling a hose to said opening in the vacuum cleaner casing, said winding-reel casing having a path through the center thereof substantially parallel to the axis of said reel and in substantial alignment with the tube carried thereby for the flow of air between the interior of the vacuum cleaner casing and the atmosphere through said winding-reel and said tubes.

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