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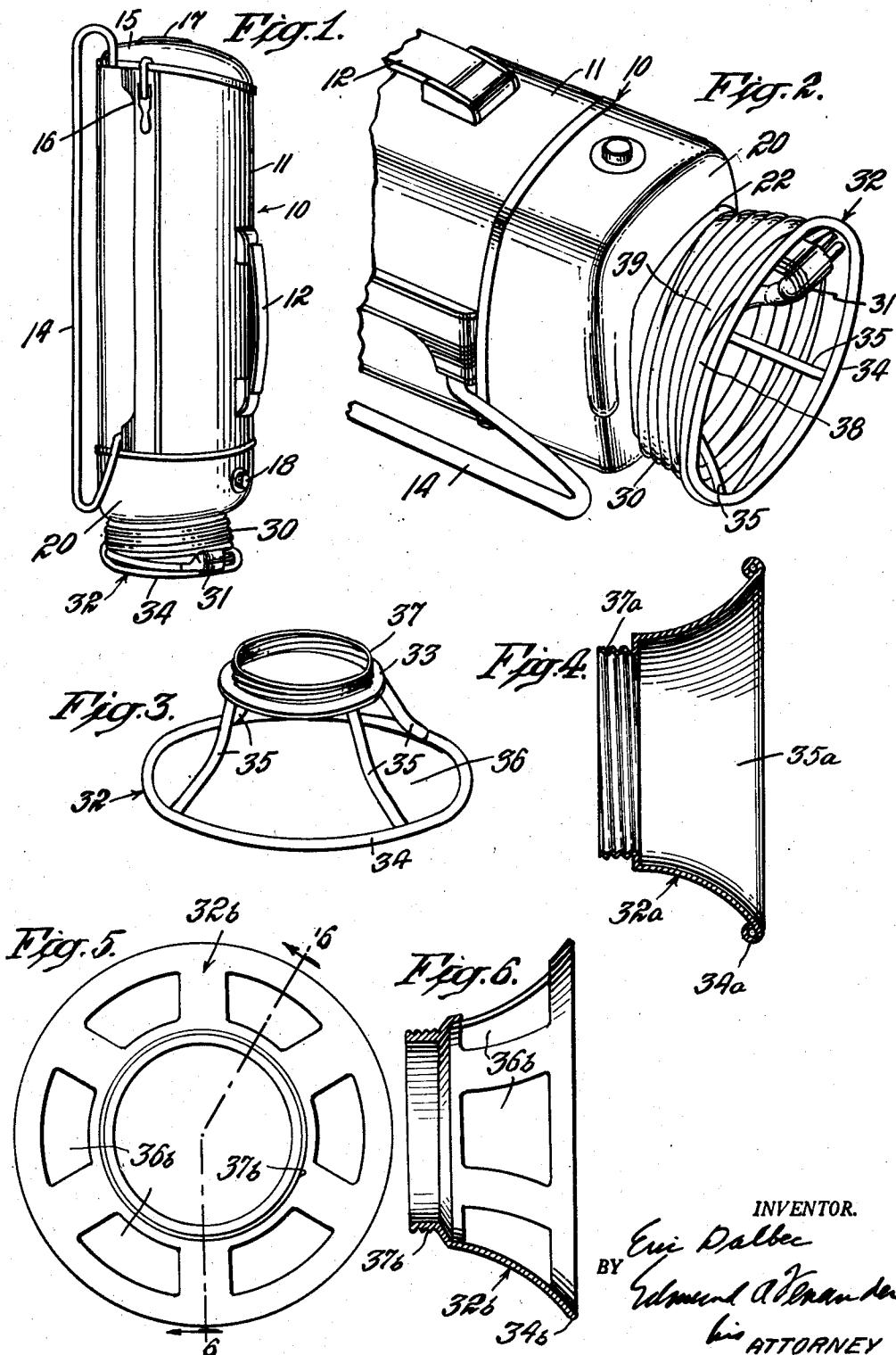
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2,893,045

CORD-CARRYING STRUCTURE FOR SUCTION CLEANER

Filed June 24, 1954

2 Sheets-Sheet 1



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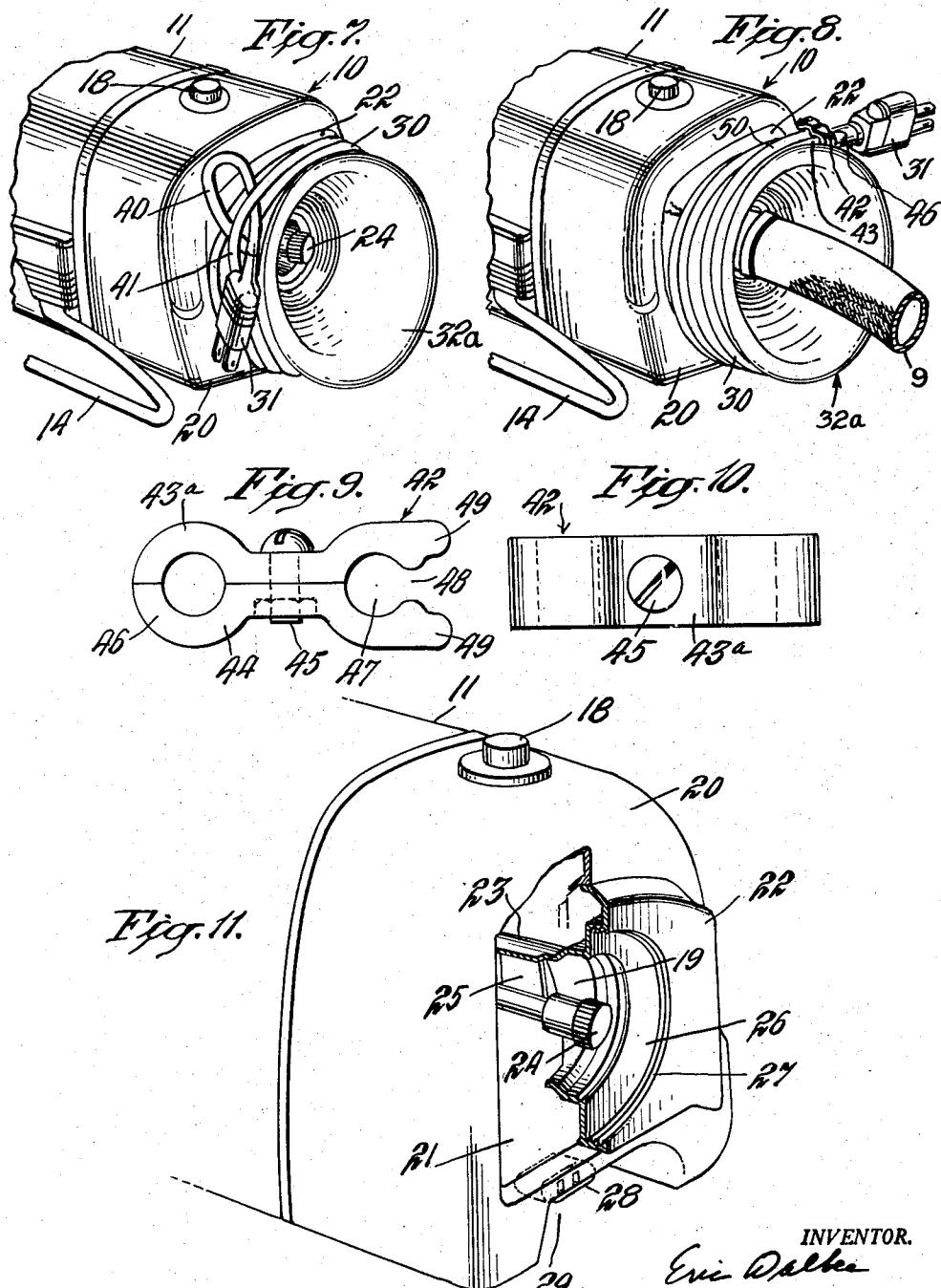
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CORD-CARRYING STRUCTURE FOR SUCTION CLEANER

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6 Claims. (Cl. 15—323)

My invention relates to cord reels for suction cleaners, and is especially concerned with such a cord-carrying structure or carrier for a horizontal tank-type suction cleaner, on which an electric cord may be manually wound when not in use.

It is an object of my invention to provide an improved cord carrier of this type which is of simplified construction and can be mounted on the end of a horizontal tank-type suction cleaner in such manner that the electric cord can be conveniently wound and unwound on and from the carrier.

Another object is to provide such an improved cord carrier which is rigidly mounted on and projects from an end of the tank-type suction cleaner, the cord carrier on which the cord can be manually wound being readily accessible at a region removed from other parts of the suction cleaner so that the cleaner casing will not be cluttered up with the electric cord when not in use, and the handle will always be available for transporting the suction cleaner in a convenient manner.

A further object is to provide such an improved non-rotatable cord carrier at one end of a tank-type suction cleaner, on which the cord can be manually wound conveniently with a simple continuous circular motion while the cord is allowed to slip through the hand employed to effect such a circular motion, and from which the cord can be unwound by simply grasping the outer free end thereof and walking from the suction cleaner.

The above and other objects and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawings forming a part of this specification, and of which:

Fig. 1 is an elevation view of a horizontal tank-type suction cleaner provided with a cord-carrying structure or carrier embodying the invention, on which an electric cord may be wound;

Fig. 2 is an enlarged fragmentary perspective view of the suction cleaner and cord carrier illustrated in Fig. 1;

Fig. 3 is an enlarged perspective view of the cord carrier removed from the suction cleaner shown in Figs. 1 and 2;

Fig. 4 is a vertical sectional view of another form of cord carrier for a horizontal tank-type suction cleaner, illustrating a modification of the invention;

Fig. 5 is an end view of still another form of cord carrier for a horizontal tank-type suction cleaner, illustrating another modification of the invention;

Fig. 6 is a vertical sectional view taken on line 6—6 of Fig. 5;

Fig. 7 is a fragmentary perspective view of a horizontal tank-type suction cleaner provided with a cord of the form shown in Fig. 4, to illustrate another manner of securing the outer free end of the electric cord in place;

Fig. 8 is a view which is similar to Fig. 7, and illus-

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trates a clamp for fixing the outer free end of the electric cord in place;

Figs. 9 and 10 are end and top views, respectively, of the clamp shown in Fig. 8; and

Fig. 11 is a fragmentary perspective view, partly broken away and in section, of the suction cleaner shown in Figs. 1, 2, 7 and 8, to illustrate more clearly the manner in which the cord carriers of Figs. 3, 4 and 6 may be removably secured to the end of a horizontal tank-type cleaner.

Referring to the drawings, I have shown my invention applied to a horizontal tank-type suction cleaner 10 having a casing 11 which is provided with a handle 12 and runners 14 to facilitate movement thereof on a supporting surface. A front cover 13 is provided for the casing 11 to close an access opening of a space within which a dust bag (not shown) is adapted to be positioned.

The cover 15, which is removably secured at 16 to the casing 11, is formed with a central opening 17 to receive one end of a flexible suction hose (not shown) adapted to be removably secured in position in any suitable manner. In many cleaning operations a rigid hollow tubular member (not shown) is connected to the outer free end of the suction hose. Suitable cleaning tools, such as nozzles or brushes, for example, are connected to the hollow tubular member or directly to the suction hose, depending upon the nature of the cleaning operation to be performed.

When the suction cleaner is being used, air is drawn through the cleaning tool into the interior of the casing 11 by a motor-fan unit (not shown) which is manually controlled by a switch having an operating button 18. Dust laden air is drawn into the interior of the casing 11 through the central opening 17 in the cover 15. Dust collects in the dust bag during a cleaning operation, and air free of such dust passes through the dust bag and flows through the casing 11 and is eventually discharged by the motor-fan unit through an end opening 19 in a rear hood 20.

As best shown in Fig. 11, the rear hood 20 is provided with a rectangular-shaped opening 21 which is closed by an end plate 22 having a hollow sleeve 23 extending inwardly therefrom which forms the discharge opening 19. A locking pin 24, which may be threadedly connected at its inner end to a part (not shown) within the casing 11, engages the inner edges of a number of flanges 25 extending radially inward from the sleeve 23, thereby securely holding the plate 22 in position at the outer end of the rear hood 20. The plate 22 is formed with a recess 26 of cylindrical form having an internally threaded groove 27 adjacent the outer face or surface of the plate.

A receptacle 28, which is provided at a recessed portion 29 at the bottom of the rear hood 20, is connected in a circuit which includes the motor of the motor-fan unit and the switch operated by the button 18. The receptacle 28 is of a conventional type and adapted to receive a plug (not shown) connected to one end of an electric cord 30, the opposite end of which is provided with a plug 31 adapted to be inserted in an outlet socket of a source of electrical energy.

In accordance with my invention, I provide a carrier or carrying structure for the electric cord 30, which is mounted at an end of the suction cleaner 10 and projects therefrom in the lengthwise direction of the casing 11. In the embodiment of Figs. 1, 2 and 3, the carrier 32 comprises an open frame having spaced-apart circular members 33 and 34, and connecting members 35 which are curved and extend radially outward from the small end to the large end of the carrier. Hence, when the car-

rier 32 is viewed in Fig. 2, in a direction axially of the cleaner 10, the connecting members are convex-shaped and have openings 36 therebetween.

The circular member 33 at the small end of the carrier 32 is provided with an externally threaded flange 37 which is adapted to be threadedly connected to the internally threaded peripheral wall or shoulder 27 of the recess 26 in the plate 22. When the electric cord 30 is wound on the carrier 32, as seen in Fig. 2, the turns of the cord initially wound on the carrier define a truncated pyramid. Each turn of the cord at the immediate vicinity of the connecting members 35 is of rectangular form, the turns adjacent the circular member 34 being of larger cross-section than those adjacent the circular member 33. However, when the cord 30 is wound in its entirety on the carrier 32, in external appearance the cord is more or less in the form of a cylindrical-shaped coil, with the end wall of the rear cover 20 serving as one outwardly extending side of a non-rotatable spool or holder for the cord, and the carrier itself serving as an axially extending hollow sleeve-like portion and also the other side of the spool or holder which also extends radially outward from the hollow sleeve-like portion. Since the end wall of the rear cover 20 serves as one outwardly extending side of the spool or cord-carrying structure, it may be stated that the one outwardly extending side at the end wall is substantially in the plane of such end wall.

Fig. 4 illustrates another embodiment of the invention, in which the carrier 32a is formed with a threaded tubular section 37a for mounting the carrier on the suction cleaner 10. The carrier 32a, which is bell-shaped or funnel-shaped, and flares outward from the small to the large end thereof, is imperforate and formed with a hollow bead 34a at its extreme outer end when mounted on the cleaner 10.

Figs. 5 and 6 illustrate a further embodiment of the invention, in which the carrier 32b is also provided with a threaded tubular section 37b for mounting the carrier on the cleaner 10. The carrier 32b is also bell-shaped or funnel-shaped, and differs from the embodiment of Fig. 4 in that it is formed with a number of openings or apertures 36b.

In view of the foregoing, it will now be understood that, when the carriers 32, 32a and 32b are threadedly connected to an end of the cleaner 10, the carriers are rigidly mounted on the rear hood or end cover 20 and form a unitary and stationary part of the cleaner. Hence, the carriers 32, 32a and 32b extend or project from the main body portion of the suction cleaner and are secured thereto more or less in cantilever fashion.

When the hollow reel sections are fixed to the end wall 20 of the cleaner in the manner illustrated in Figs. 2, 7 and 8, a generally spool-shaped cord-carrying structure is provided having a hollow center portion and end portions at opposite ends of the center portion extending transversely of and radially outward from the center portion. The annular region 27 of the end wall plate 22 forms a surface engaging part of annular form which encircles the axis of the exhaust port 19 and is of larger diameter than the exhaust port. The section of the cleaner end wall extending outwardly from the annular region 27 serves as one of the end portions of the cord-carrying structure. The hollow center portion and opposite end portion of the cord-carrying structure are formed by the hollow reel sections 32, 32a and 32b in the manner illustrated in Figs. 2, 7 and 8.

The smaller ends 37, 37a and 37b of the hollow reel sections in Figs. 3, 4 and 5, which are threaded, are threadedly connected and joined to the end wall of the cleaner at the annular region or surface engaging part 27 thereof.

Since one end of the cord 30 is connected to the receptacle 28 at the bottom of the rear hood or cover 20,

the cord normally extends lengthwise of the cleaner from the recessed bottom portion 29 thereof when the cleaner is being used. Hence, when it is desired to wind the cord 30 on the carriers 32, 32a or 32b, after the plug 31 is disconnected from an outlet socket, it is natural to start winding the cord on the small end of the carrier in a continuous circular motion, with the cord slipping through the hand employed to effect such circular motion and guide the cord, and to go back to the small end 10 of the carrier during a winding operation whenever a valley or depression starts to form in the coil at the vicinity of the end wall of the rear hood or cover 20. The cord 30 can readily be wound on the carriers 32, 32a and 32b because the carriers project from an end of the suction cleaner 10 and are removed from other parts thereof, so that the need for manipulating and guiding the cord through and around a number of parts of the cleaner in a particular path of movement is absent.

With the cord 30 wound on the carriers 32, 32a or 32b 20 and the suction cleaner 10 in a horizontal position, as shown in Figs. 2, 7 and 8, the cord 30 can be manually unwound without difficulty to connect the plug 31 to an outlet socket. When it is desired to operate the cleaner, it is only necessary to grasp the plug 31 and walk from 25 the cleaner 10 in a direction more or less in alignment with the casing 11. In this way, successive turns of the cord readily slip off the large end of the carrier, so that the cord can be unwound in a continuous manner and without the need to stoop down beside the cleaner and 30 unwind the cord in a piecemeal fashion.

When the carriers 32, 32a and 32b are threadedly connected to the internally threaded periphery 27 of the recesses in the end plates 22, as seen in Fig. 2, it will be 35 evident that the end opening 19 in the rear hood 20, through which air is discharged from the casing 11, is of smaller diameter than the threaded sections 37, 37a and 37b at the small end of the carriers.

In the event it is desired to use the suction cleaner 40 to operate an atomizer or sprayer, one end of a suction hose 9 may be removably secured in position in any suitable manner to the discharge opening 19 in the rear hood 20, as shown in Fig. 8. In this way, a strong blast of air is discharged from the cleaner through the suction hose 45 to the atomizer or sprayer which is connected to the outer free end of the hose. Since the diameter of the discharge opening 19 in the rear hood 20 is less than that of the threaded sections 37, 37a and 37b of the carriers, the suction cleaner 10 can be used for a spraying or atomizing operation, or for any other purpose requiring a positive blast of air, without the necessity of first removing the carriers 32, 32a or 32b. Hence, the reels can remain on the cleaner at all times irrespective of whether 50 the suction hose is connected to the front cover 15 or rear hood 20 of the cleaner. As seen in Figs. 2 and 8, for example, the smaller end of the hollow reel section 32a, at the region it is joined to the threaded surface engaging part 27, is spaced radially from the exhaust port 19 to form a passage through the hollow reel section 55 large enough for the hose 9 to be inserted therethrough and connected to the exhaust port 19.

The cord carriers 32 and 32b may also be effectively 60 used as a supporting base for the cleaner 10 when it is desired to maintain the cleaner in an upright position during a cleaning operation, as shown in Fig. 1. Although not shown, the suction hose would be connected to the opening 17 in the front cover 15 in such cleaning operation. Since the carriers 32 and 32b are formed with openings or apertures 36 and 36b, respectively, the air discharged from the opening 19 in the rear hood or 65 cover 20 can readily pass therefrom into the atmosphere, which would not be true if the carrier 32a, which is imperforate, were used as a supporting base for the cleaner in the manner shown in Fig. 1.

When the cord is wound on the carriers 32, 32a and

32b, the plug 31 at the outer free end of the cord may be fastened in position in any suitable manner. For example, in Fig. 2 the outer free end portion 38 of the cord, to which the plug 31 is secured, may be tightly held in place between the circular member 34 and a turn 39 of the coil immediately adjacent the circular member 34. In such arrangement, the portion 38 of the cord is pushed radially inward underneath the circular member 34 so that plug 31 will be positioned within the circular member at the large end of the reel.

In Fig. 7 the outer free end portion of the cord 30 is bent back upon itself to form a loop 40 which is drawn underneath a turn 41 of the coil. After the loop 41 is in the position illustrated in Fig. 7, such loop can be tightly drawn in place to clamp it between the turn 41 and other turns of the coil beneath it.

In Fig. 8 a holder 42 is employed to hold the outer free end portion 43 of the cord 30 in place. As shown in Figs. 9 and 10, the holder 42 comprises cooperating parts 43a and 44 removably secured together at 45. When the parts 43a and 44 are connected together, a ring-shaped end 46 is formed at one end of the holder in which the outer free portion 43 of the cord is clamped. A recessed part 47 is provided at the opposite end of the holder 42 to receive a region of the cord 30. While the diameter of the recess 47 is essentially the same as the diameter of the cord, the gap 48 between the spaced apart arms 49, through which the cord passes when inserted into the recess 47 and withdrawn therefrom, is slightly smaller in size than the cord, so that the region of the cord held in the recess 47 is held fairly securely in place.

As best shown in Fig. 8, the outer free end portion 43 of the cord is securely held in the ring-shaped end 46 of the holder 43. With the cord wound on the carrier 32a, one of the turns 50 is inserted in the recess 47 of the holder through the gap 48. When it is desired to unwind the cord from the carrier 32a, the holder 42 is moved from the coil turn 50 to cause the latter to move out of the recess 47 and release the outer free end portion 43 of the cord.

In view of the foregoing, it will now be understood that an improved carrier has been provided for a horizontal tank-type suction cleaner, which is simple and extremely convenient for manually winding and unwinding an electric cord thereon and therefrom. By mounting the carrier at one end of the suction cleaner, a compact arrangement is provided which occupies a minimum amount of space. Further, the electric cord is readily accessible at a region removed from other parts of the cleaner, and the main body portion of the cleaner will not be cluttered up with the electric cord, so that the handle will always be available for transporting the cleaner in a convenient manner.

Although I have illustrated and described particular embodiments of my invention, I do not desire to be limited to the particular arrangements set forth. For example, the carriers 32, 32a and 32b may be formed integrally with end plate 22 or rear hood or cover 20, the small ends of the carriers in such case being of larger diameter than the discharge opening 19 at the rear end of the cleaner. Therefore, I intend in the following claims to cover all modifications which do not depart from the spirit and scope of my invention.

What is claimed is:

1. In combination, a horizontal tank-type cleaner including a transverse wall having an exhaust port to which a hose is adapted to be connected for blowing air therethrough, an electrical cord, means for connecting one end of the cord to the cleaner, a generally spool-shaped cord-carrying structure about which the cord is adapted to be wound, said cord-carrying structure being disposed lengthwise of the cleaner at one end thereof and having a hollow center portion and end portions at opposite

ends of the center portion extending transversely of and radially outward from the center portion, said transverse wall of the cleaner, from an annular region which encircles the axis of the exhaust port and is of larger diameter than the exhaust port, having an outwardly extending portion which serves as one of the end portions of said cord-carrying structure, said hollow center portion and opposite end portion of said cord-carrying structure being formed by a hollow wheel section which is generally in the form of a truncated cone whose smaller end is at the vicinity of the transverse wall of the cleaner, the smaller end of the hollow reel section being joined to said transverse wall of the cleaner at the annular region of the wall and being spaced radially from the exhaust port to form a passage through the hollow reel section large enough for the hose to be inserted therethrough and connected to the exhaust port, and said hollow reel section forming a base for supporting the cleaner on end.

2. Apparatus as set forth in claim 1 in which said hollow reel section is apertured.

3. In combination, a horizontal tank-type cleaner including an end wall having an exhaust port to which a hose is adapted to be connected for blowing air therethrough, an electrical cord, means for connecting one end of the cord to the cleaner, a generally spool-shaped cord-carrying structure about which the cord is adapted to be wound, said cord-carrying structure being disposed lengthwise of the cleaner at one end thereof and having a hollow center portion and end portions at opposite ends of the center portion extending transversely of and radially outward from the center portion, said end wall of the cleaner, from an annular region which encircles the axis of the exhaust port and is of larger diameter than the exhaust port, having an outwardly extending portion which serves as one of the end portions of said cord-carrying structure, said hollow center portion and opposite end portion of said cord-carrying structure being formed by a hollow reel section which flares in a lengthwise direction from one end thereof at the vicinity of said end wall of the cleaner, said one end of the hollow reel section being joined to said end wall of the cleaner at the annular region thereof and being spaced radially from the exhaust port to form a passage through the hollow reel section large enough for the hose to be inserted therethrough and connected to the exhaust port, and said hollow reel section forming a base for supporting the cleaner on end.

4. Apparatus as set forth in claim 3 in which said connecting means connects said one end of the cord to the cleaner at the vicinity of said end wall.

5. Apparatus as set forth in claim 3 in which the cross-sectional areas of successive regions of the hollow reel section are progressively larger in an axially extending direction from the one end thereof at the vicinity of said end wall of the cleaner.

6. In combination, a horizontal tank-type cleaner including an end wall having an exhaust port to which a hose is adapted to be connected for blowing air therethrough, an electrical cord, means for connecting one end of the cord to the cleaner, a generally spool-shaped cord-carrying structure about which the cord is adapted to be wound, said cord-carrying structure being disposed lengthwise of the cleaner at one end thereof and having a hollow center portion and end portions at opposite ends of the center portion extending transversely of and radially outward from the center portion, said end wall of the cleaner having a surface-engaging part of annular form which encircles the axis of the exhaust port and is of larger diameter than the exhaust port, the section of said cleaner end wall extending outwardly from said surface engaging part serving as one of the end portions of said cord-carrying structure, said hollow center portion and opposite end portion of said cord-carrying structure being formed by a hollow reel section which flares

in a lengthwise direction from one end thereof at the vicinity of said end wall of the cleaner, said one end of the hollow reel section having a surface portion which is joined to the surface engaging part of said end wall of the cleaner and is spaced radially from the exhaust port to form a passage through the hollow reel section large enough for the hose to be inserted therethrough and connected to the exhaust port, and said hollow reel section forming a base for supporting the cleaner on end.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,893,045

July 7, 1959

Eric Dalbec

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 66, after "cord" insert -- carrier --; column 4, line 44, for "spraver" read -- sprayer --; line 51, for "reels" read -- carriers --; line 66, for "opeiing" read -- opening --; column 6, line 9, for "wheel" read -- reel --.

Signed and sealed this 22nd day of December 1959.

(SEAL)

Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents