Feb. 6, 1951 L. H. SNYDER 2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Filed Sept. 29, 1945 8 Sheets-Sheet 1

Fig. 1

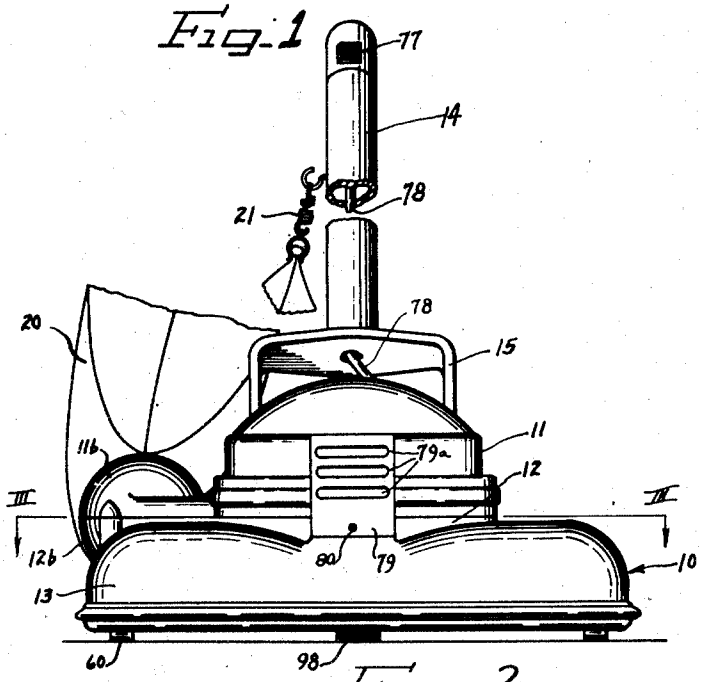
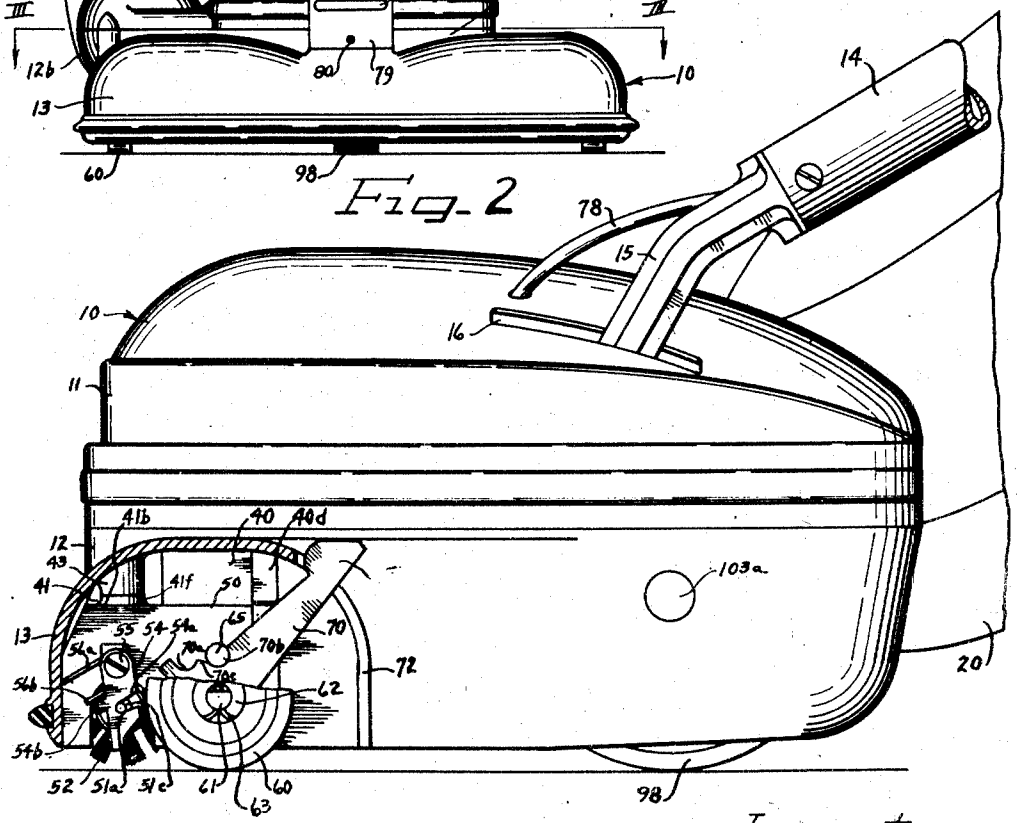


Fig. 2



Inventor
Leland H. Snyder

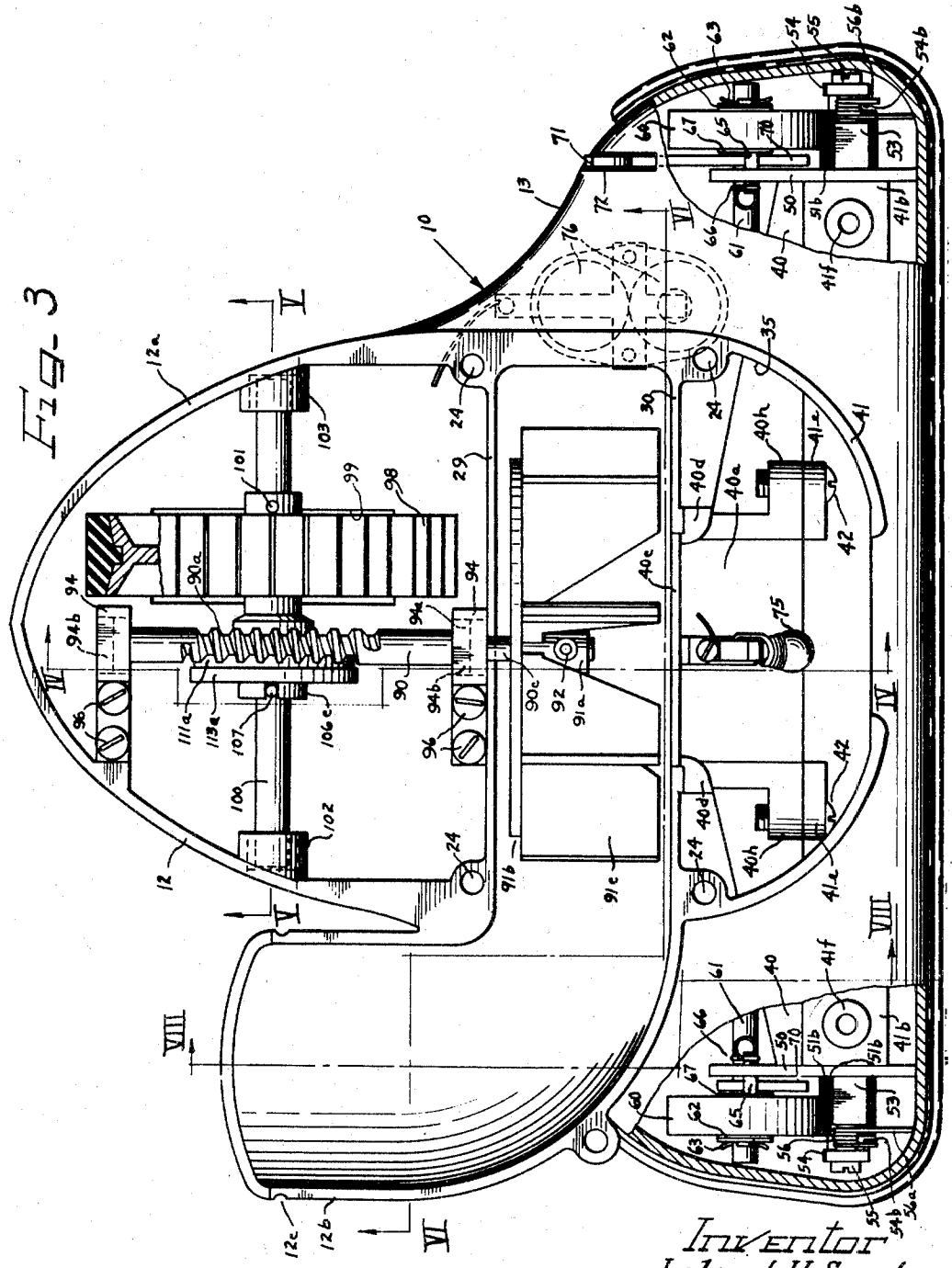
by Rue Siem & Charles Attys

Feb. 6, 1951 L. H. SNYDER 2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Filed Sept. 29, 1945 8 Sheets-Sheet 2

Fig. 3



Inventor
Leland H. Snyder

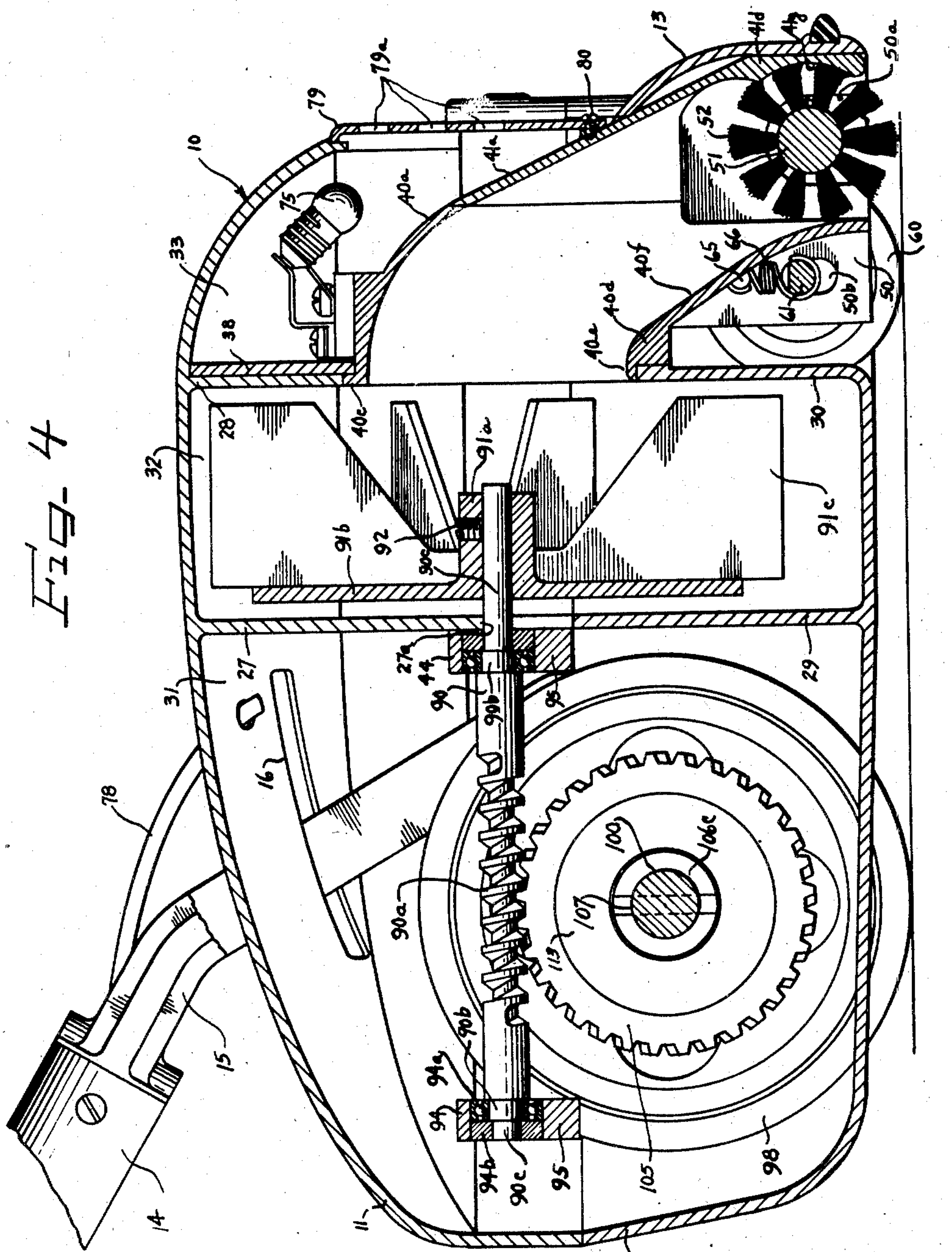
by McCann & Sperry & Charles A. Wilde Attys

Feb. 6, 1951 L. H. SNYDER 2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Filed Sept. 29, 1945 8 Sheets-Sheet 3

Fig. 4



Inventor
Leland H. Snyder

by [illegible] Attys

Feb. 6, 1951 L. H. SNYDER 2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Filed Sept. 29, 1945 8 Sheets-Sheet 4

Fig. 5

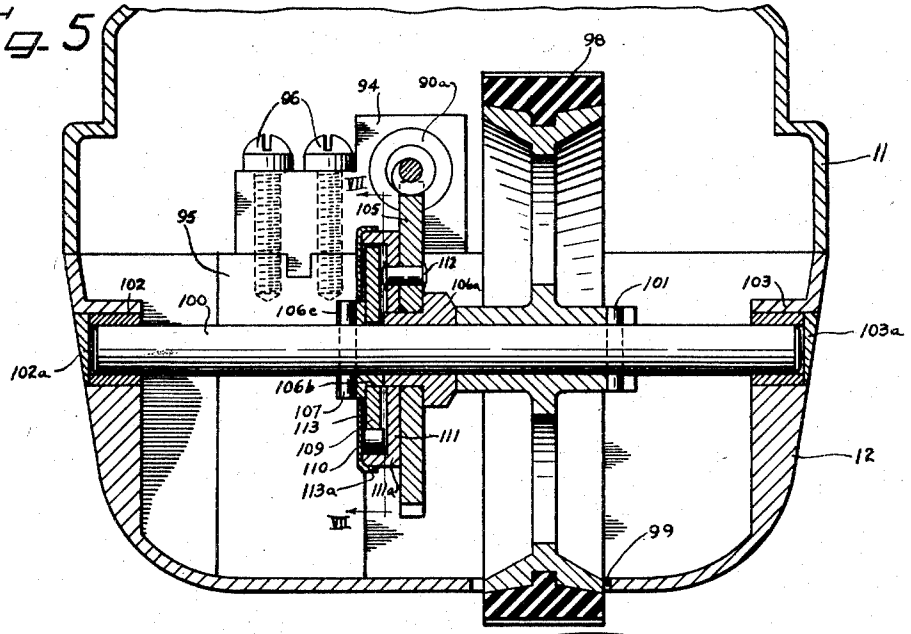


Fig. 6

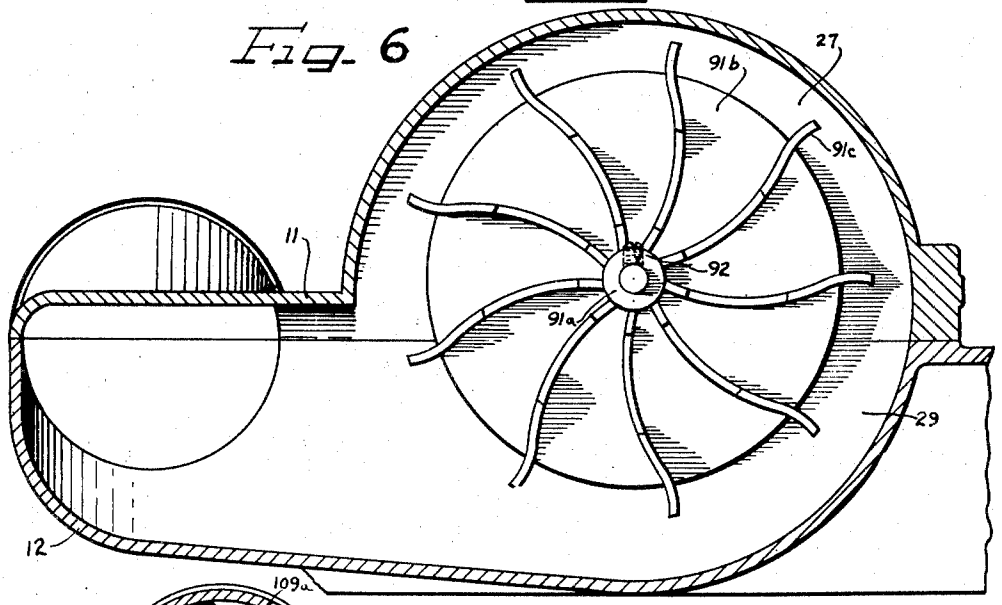
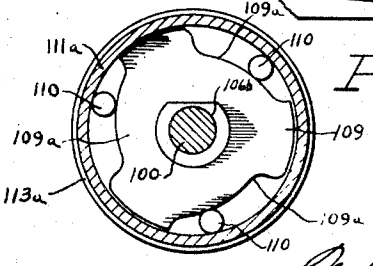


Fig. 7



Inventor
Leland H. Snyder

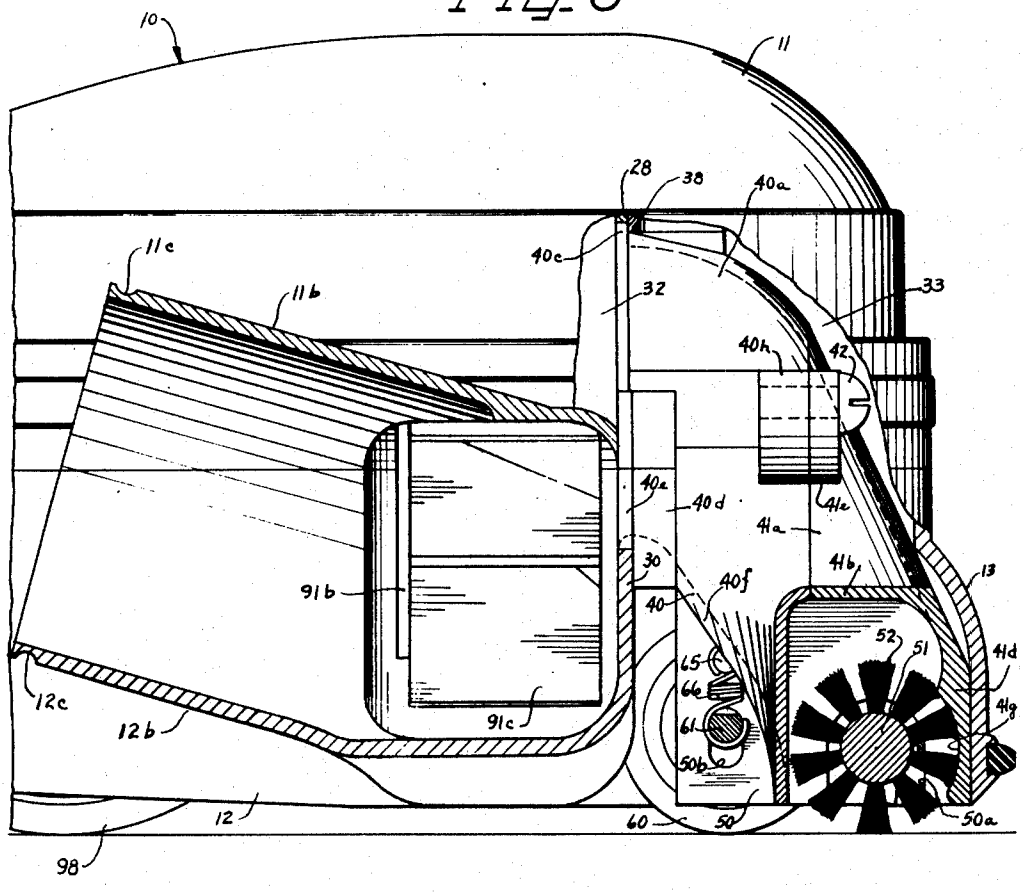
by McCann & Charles & Hill Attys

Feb. 6, 1951 L. H. SNYDER 2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Filed Sept. 29, 1945 8 Sheets-Sheet 5

Fig. 8



Inventor
Leland H. Snyder

by The Firm of Charles Hobbs Attys

Feb. 6, 1951 L. H. SNYDER 2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Filed Sept. 29, 1945 8 Sheets-Sheet 6

Fig. 9

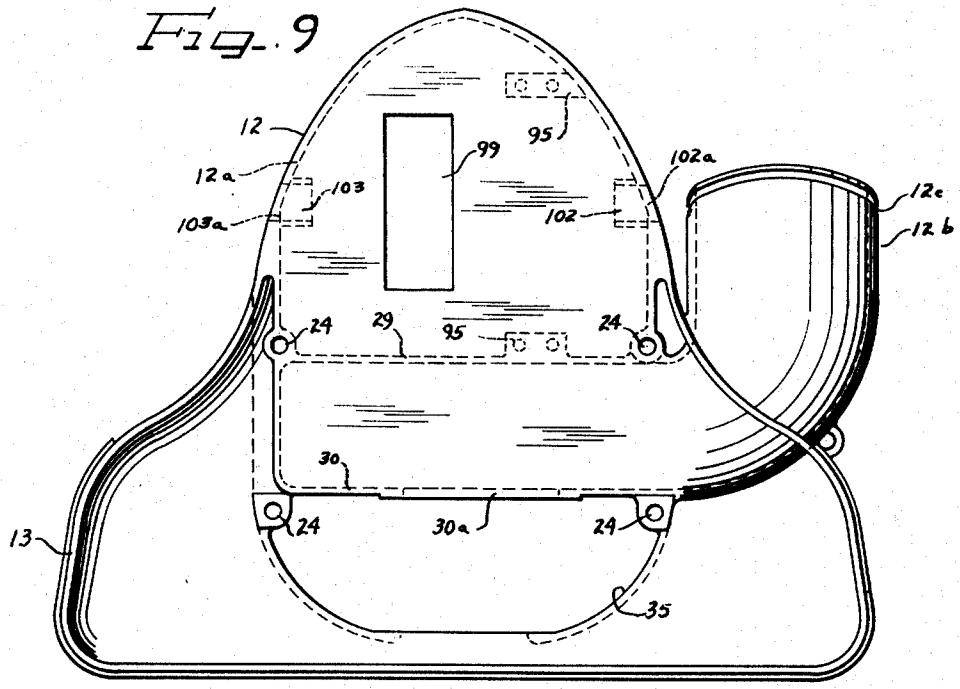
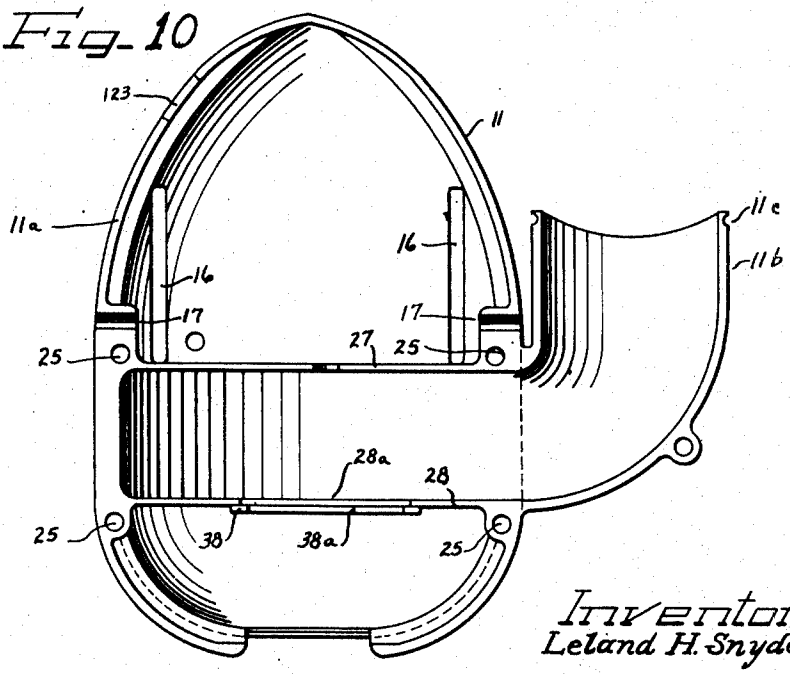


Fig. 10



Inventor
Leland H. Snyder

by The Firm of Charles A. Hill Attys.

Feb. 6, 1951 L. H. SNYDER 2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Filed Sept. 29, 1945 8 Sheets-Sheet 7

Fig. 11

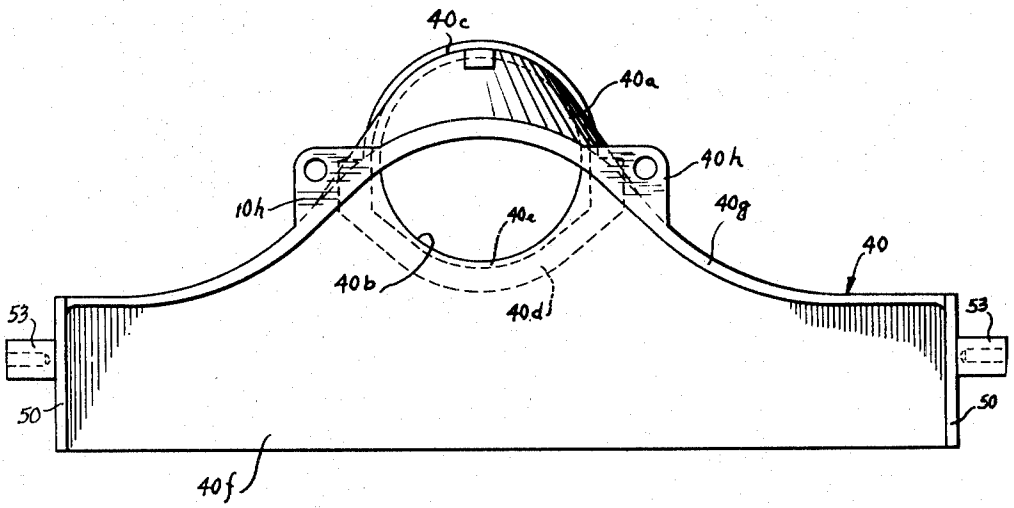
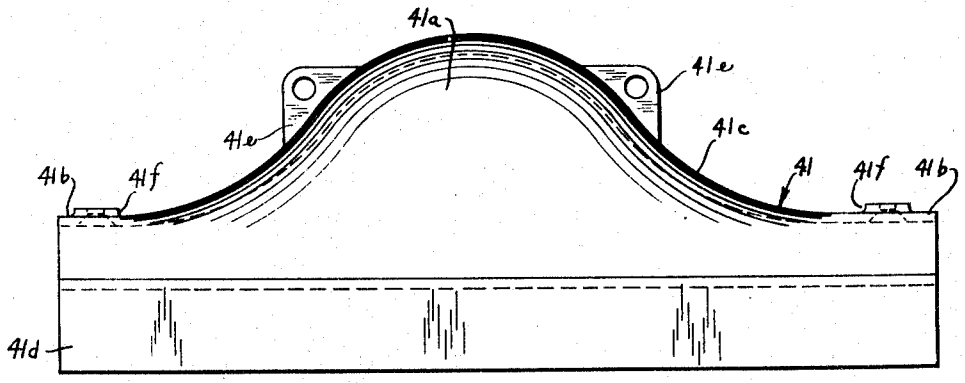


Fig. 12



Inventor
Leland H. Snyder

by The Firm of Charles A. Hills Attys

Feb. 6, 1951 L. H. SNYDER 2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Filed Sept. 29, 1945 8 Sheets-Sheet 8

Fig. 13

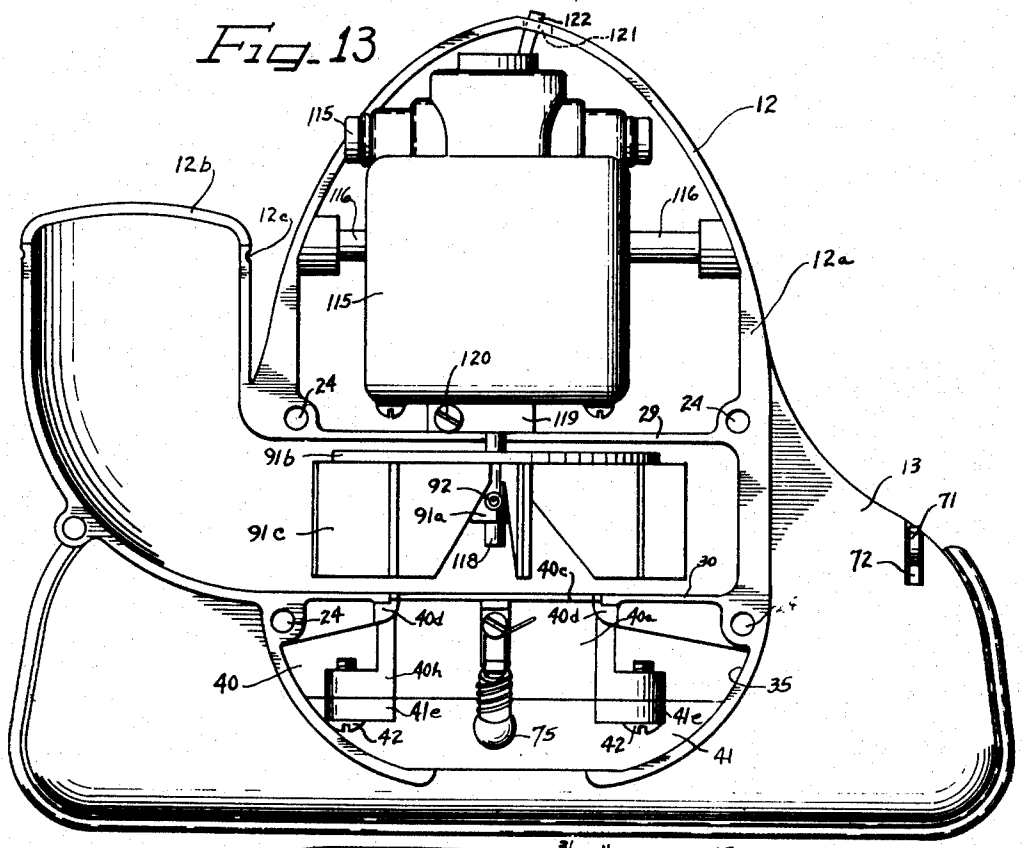
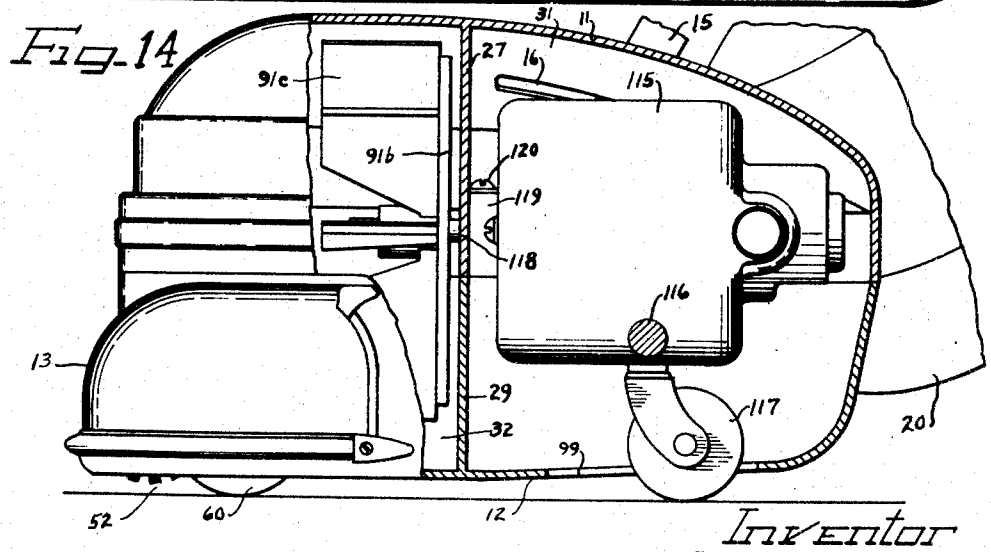


Fig. 14



Inventor
Leland H. Snyder

by Dick Brown of Charles Hall Attys

Patented Feb. 6, 1951 2,540,763

UNITED STATES PATENT OFFICE

2,540,763

VACUUM CLEANER CASING CONSTRUCTION

Leland H. Snyder, Chicago, Ill., assignor, by mesne assignments, to Knapp-Monarch Company, St. Louis, Mo., a corporation of Delaware

Application September 29, 1945, Serial No. 619,351

6 Claims. (Cl. 15—342)

1

This invention pertains to vacuum cleaners, and relates more particularly to a novel housing structure for a vacuum cleaner as well as to a vacuum cleaner having a suction mechanism which may be operated either mechanically or electrically.

According to the present invention, the housing for a vacuum sweeper is made up of upper and lower arcuate halves connected somewhat in the manner of a walnut shell. Transverse registering partition walls in the housing halves subdivide the space within the housing or casing into a rear compartment adapted to receive means for driving a suction fan, a middle compartment for housing a suction fan, and a front compartment for receiving the neck of a suction nozzle opening into the suction fan housing. The lower casing half is formed with a bottom aperture coinciding with said front compartment to afford entrance into said compartment for said suction nozzle neck. An arcuate downwardly open cover member integral with the lower casing half extends in front of and, wing-like, on both sides of the lower casing member and serves to receive a suction nozzle made up of a rear part defining the rear wall and neck of the suction nozzle together with a front part defining the front wall and the roof of the suction nozzle. A pair of front wheels are supported from the suction nozzle which also accommodates a rotary brush.

The two casing halves are provided with means for accommodating either electrical or mechanical means for driving the suction fan.

It is therefore an important object of the present invention to provide a vacuum cleaner having a housing made up of two complementary arcuate halves accommodating in separate compartments means for driving a suction fan, a suction fan and the neck of a suction nozzle, said lower casing half being further provided with a downwardly open cover member for receiving said suction nozzle that in turn accommodates a rotary brush and affords support for a pair of front wheels.

Another important object of the present invention is to provide a vacuum cleaner housing capable of accommodating either mechanical or electrical means for driving a suction fan.

Other and further objects and features of the present invention will become apparent from the following description, accompanying drawings and appended claims.

The drawings show, by way of an example of a vacuum cleaner according to the present invention, a vacuum cleaner identical with that shown in my copending applications Serial Nos.

2

619,350 and 619,352 entitled, respectively, "Adjustable Height Mechanism for Floor Cleaners" and "Vacuum Cleaner with Illuminating Device," filed of even date herewith. The first mentioned application issued January 9, 1951 as Patent No. 2,537,166. The second mentioned application is now abandoned. The first mentioned application contains claims drawn to the mechanism for varying the effective working height of the sweeper casing with respect to the floor, while the second mentioned application contains claims drawn to a battery supplied illuminating arrangement. Reference is made to said copending applications for features not disclosed or shown in the present application.

On the drawings:

Figure 1 is a fragmentary front elevation of a vacuum cleaner according to the present invention equipped with mechanical driving means for a suction fan;

Figure 2 is an enlarged fragmentary side elevation, with parts broken away, of the vacuum cleaner of Figure 1;

Figure 3 is a greatly enlarged horizontal cross-sectional view taken along the line III—III of Figure 1, with parts broken away and parts shown in plan view.

Figure 4 is a vertical longitudinal cross-sectional view taken along the line IV—IV of Figure 3, with parts shown in elevation;

Figure 5 is a fragmentary vertical transverse cross-sectional view taken along the line V—V of Figure 3, with parts shown in elevation;

Figure 6 is a fragmentary transverse vertical cross-sectional view taken along the line VI—VI of Figure 3;

Figure 7 is a detail sectional view taken along the line VII—VII of Figure 5 and showing a clutch member forming part of the driving means for the suction fan of the vacuum cleaner of Figures 1 to 6 and 8;

Figure 8 is a vertical cross-sectional view taken along the line VIII—VIII of Figure 3, with parts broken away and parts shown in elevation;

Figure 9 is a bottom plan view of the lower casing half;

Figure 10 is a bottom plan view of the top casing half;

Figure 11 is a front elevational view of the rear suction nozzle part;

Figure 12 is a front elevation of the front suction nozzle part;

Figure 13 is a horizontal cross-sectional view similar to Figure 3 but showing a vacuum cleaner

equipped with electrical driving means for a suction fan; and

Figure 14 is a side elevation, with parts broken away, of the suction cleaner of Figure 13.

In Figures 1 to 6 and 8, the reference numeral 10 indicates generally a vacuum cleaner according to the present invention equipped with mechanical driving means for the suction fan. This vacuum cleaner includes a body, housing or casing formed by an upper casing half 11 and a lower casing half 12 together with a cover member 13 integral with the lower casing half 12 and extending in front and on the sides of the latter to form lateral wings for the sweeper body. The vacuum cleaner 10 may be manually pushed over a floor surface by means of a generally tubular handle 14 pivotally connected to the sweeper body through a yoke having arms 15. Parallel longitudinal slots 16 through the roof of the casing half 11 admit the yoke arms 15 into the interior of the casing and permit swinging movement of the handle 14. Fulcra for the ends of the yoke arms 15 are provided in the form of pins or stub-shafts (not shown) accommodated or journalled in slots 17 extending upwardly from the lower rim of the upper casing half 11 near the front portion of the slots 16 (Figure 10).

A dust bag 20 has its free end attached to the distal portion of the handle 14, for example, by means of a spring and hook arrangement 21 (Figure 1).

As best shown in Figures 9 and 10, the upper casing half 11 as well as the lower casing half 12 are of generally teardrop-shaped configuration and their rims are formed, respectively, with abuttting surfaces 11*a* and 12*a* capable of registering one with another. On each side of the lower casing half 12, the abutting or mating surfaces are locally enlarged and the wall of the casing corresponding thickened, being further pierced by threaded vertical bores 24. The upper casing half 11 has its wall correspondingly enlarged and tapped from below by upwardly closed threaded bores 25 adapted to register with the bores 24, so that said two casing halves 11 and 12 may be rigidly connected by means of screws or bolts (not shown) threaded into the bores 24 from below and extending upwardly into the bores 25.

The upper casing half 11 is provided with a rear transverse partition wall 27 and a forward transverse partition wall 28. The lower casing half 12 is provided with a rear partition wall 29 and a front partition wall 30 adapted to mate with the upper partitions 27 and 28 to subdivide the interior of the casing into a rear compartment 31 for suction fan driving means, a middle impeller space 32 for the suction fan and a front compartment 33 adapted to receive the neck of a suction nozzle.

The front compartment 33, unlike the rear compartment of the impeller space, is not enclosed on all sides, for the bottom of the lower casing half 12 extends only up to the partition 30. Forwardly of the partition wall 30 an aperture 35 co-extensive with the front compartment 33 leaves the same open with respect to the space encompassed by the cover 13. Further, the curved front wall of the lower casing half, ahead of the partition 30, extends downwardly only to the roof of said cover so as to leave the space therein unobstructed.

The front partition walls 38 and 30 have their free rims each formed with an arcuate recess (as at 28*a* and 30*a* respectively), and these recesses register to define a circular entrance to the impeller space 32. On one side of the impeller space 32, an exit duct is provided in the form of an elbow shaped, rearwardly bent duct made up of two mating parts 11*b* and 12*b* formed, respectively, integrally with the upper casing half 11 and the lower casing half 12. The ends of the members 11*b* and 12*b* are formed with outer grooves 11*c* and 12*c* whose ends register to form a circumferential groove around the outside of the exit duct, so that the lower end of the dust bag 20 can be tied or otherwise attached about the end of the exit duct.

A plate 38 is affixed to or integral with the partition 28 in front thereof and has a lower rim configured similarly to the lower rim of the partition 28 but extending a short distance therebelow. Thus, the plate 38 is formed with a semicircular recess 38*a* concentric with the recess 28*a*. The plate 38 terminates laterally a short distance past each side of the recess 28*a*.

As shown in Figures 3, 4 and 8, a suction nozzle extends within the front compartment 33 and the cover 13 and is formed by a rear part 40 and a front part 41. This suction nozzle may be generally described as including a central neck 40*a* and a nozzle proper extending transversely of the sweeper within the cover 13 with its lower rim on the level of the casing bottom. The nozzle is generally bent downwardly ahead of the neck and expanded laterally so that the opening of the nozzle lies in a horizontal plane and extends over the greater part but not the whole width of the sweeper. The exact form and the arrangement of the two nozzle parts 40 and 41 are disclosed hereinbelow, as is also the manner in which the suction nozzle provides communication between the impeller housing 32 and the space encompassed by the cover 13.

The circular aperture formed by the recesses 28*a* and 30*a* affords communication between the impeller space 32 and the front compartment 33 in the sweeper housing. Communication between the front compartment 33 and the space within the cover member 13 is provided by the aperture 35. The above disclosed suction nozzle serves to regulate the flow of air from the open bottom of the cover member 13 up through the aperture 35, through the front compartment 33 and through the aperture defined by the recesses 28*a* and 30*a* into the impeller space 32. As best shown in Figure 11, the rear part 40 of the suction nozzle includes a constricted middle neck portion 40*a* tapering rearwardly to define a circular orifice 40*b* adapted to register with the entrance aperture into the impeller space 32 defined by the recesses 28*a* and 30*a*. The upper rear half of the neck 40*a* is formed with an upstanding terminal lip or flange 40*c* that hooks into the rabbet-like groove formed by the lower end of the partition wall 28 and that part of the plate 38 projecting therebelow. The lower part of the neck 40*a* around the aperture 40*b* is thickened, as at 40*d*, and formed with a rearwardly directed lip 40*e*. The lip 40*e* overlies the upper rim of the recess 30*a*, while the thickened portion 40*d* presents an extended surface abutting against the margin of the partition wall 30 around the aperture 30*a*.

As shown in Figure 4, the roof of the rear suction nozzle part 40 is bent downwardly ahead of the aperture formed by the recesses 28*a* and 30*a*, and, as shown in Figure 11, this roof is also flared laterally and slopes downwardly from the neck 40*a* so as to present in front elevation a generally dome-shaped appearance. The roof terminates

forwardly in a generally arcuate edge formed with an extended vertical abutting surface 40*g*. As shown in Figures 3 and 8, the rear wall 40*f* of the rear nozzle part 40 is flared laterally and downwardly from the thickened lips 40*d* so that its lower rim extends in a straight line transversely of the sweeper within the cover 13 and the level of the bottom of the lower casing half 12 and a short distance behind the abutting surface 40*g*. The lateral end portions of the rear wall 40*f* extend vertically and merge with the very gently sloping narrow lateral end portions of the roof of the part 40, while the middle of the rear wall 40*f* curves upwardly and rearwardly to merge with the thickened lips 40*d* and with the wider, domed center of the roof.

The front nozzle part 41 extends ahead of the rear part 40 as a cover therefor with its lower rim extending in a straight line in front of the lower rim of the rear nozzle part 40. The middle upper portion 41*a* is arched or bulged forwardly and gradually merges with the outer upper portions 41*b* that extend horizontally. The upper rear rim is formed with an extended arcuate abutting surface 41*c* adapted to lie against the abutting surface 40*g* of the rear nozzle part 40. The lowest front part 41*d* extends vertically in a straight line in abutment against the inside lower margin of the front of the cover 13.

Apertured ears or lobes 40*h* project upwardly from the front of the rear nozzle part at each side of the neck 40*a*, and correspondingly located apertured ears 41*e* project upwardly from the rear of the front nozzle part 41. Screws 42 threaded into the ear apertures hold the two nozzle parts together.

Apertured lugs 41*f* are formed on top of each horizontal part 41*b*. Registering lugs 43 tapped from below depend from the inside of the cover 13. Screws (not shown) threaded into the lugs 41 from the inside of the suction nozzle extend into the threaded bores of the lugs 43 to hold the suction nozzle in place within the cover 13.

Plates 50 integral with the rear nozzle part 40 close off the lateral ends of the suction nozzle and extend behind the latter. The plates 50 are formed at their forward ends with downwardly opening slots 50*a* that freely accommodate a rotary brush shaft 51 carrying brushes 52 arranged in spiral lines about the brush shaft 51. As shown in Figures 4 and 8, the brushes 52 are of such a length as to be bent slightly when contacting the curved inside 41*g* of the front nozzle part 41*d* on counterclockwise rotation of the brush shaft 51. As a result, when the brushes are rotated clear of the curved inside 41*g* of the front nozzle part 41*d*, the brushes will tend to throw off particles of dust and lint adhering thereto.

The end plates 50 further carry above the slot 50*a* outstanding lugs 53 from which are pivotally suspended plates 54 whose rear sides are inwardly and downwardly slotted, as at 54*a*, to receive the constricted ends 51*a* of the brush shaft 51. More particularly, the plates 54 are suspended from the outer terminal surfaces of the lugs 53 by means of screws 55, and the ends of the screws 55 as well as the plates 54 are spaced from the outer terminal surfaces of the lugs 53 by torsion springs 56 having upper longer arms 56*a* whose ends lie against the front wall of the lower casing 12 and whose lower ends 56*b* abut against inwardly projecting spurs 54*b* on the plate 54 at about the level of the bottom of the slots 54*a*. The torsion spring 56 thus urges the pivotable plate 54 backward so that serrated surfaces 51*b* on the rotary shaft 51 are urged into frictional engagement with front wheels 60 for driving the rotary shaft 51. Inside the plates 54 the rotary shaft 51 is formed with shoulders 51*c* abutting against the plates 54 for preventing lengthwise displacement of the shaft.

The front wheels 60 are freely rotatable on a shaft 61 extending transversely of the sweeper behind the suction nozzle through slots 50*b* in the plate 50 that permit only upward and downward movement of the shaft with respect to the sweeper body. Washers 62 and cotter pins 63 at the ends of the shaft 61 outside the wheels 60 serve to keep these wheels on the shaft 61. Above the slots 50*b* a pin 65 is affixed in each end plate 50 so as to project laterally on both sides of each plate 50. On the inside of each plate 50 the free ends of a tension spring 66 are hooked around the shaft 61 and the inside end of the pin 65, so as to bias the shaft 61 upwardly as far as permitted by the slot 50*b*.

The front wheels 60 are kept in spaced relationship to the outside of the plate 50 by washers 67 affixed to the shaft 61. Between each washer 67 and each plate 50 a cam member 70 is rigidly attached to the shaft 61 which thus acts as a rock shaft to synchronize movements of the two cam members 70. The members 70 are generally of V-shape, and the crotch of said V is formed with a camming surface adapted to contact that part of the pin 65 outside the plate 50 to depress or elevate the shaft 61 with respect to the sweeper body. As shown in Figure 2, the forward end of the crotch of the cam member 70 is formed with a recess 70*a* adapted to receive and hold the shaft 61 at a certain distance from the pin 65. Adjacent the other and rear leg of the V-shaped member 70, the latter is formed with another recess 70*b* adapted to receive and hold the shaft 61 at a smaller distance from the pin 65, as shown in Figure 2. Between these two recesses, the crotch of the V is provided with a curved surface 70*c* permitting swinging movement of the member 70 so as to lodge the pin 65 in either of the recesses 70*a* and 70*b*. One of the cam members 70 is provided with a rearwardly directed arm 71 forming a continuation of the rear leg of the V-shaped member movable in a slot 72 in the rear of the lower casing member 13 for manual actuation of the cam member 70.

It will be apparent that movement of the arm 71 and thereby of the two members 70 (through the agency of the shaft 61 acting as a rocking shaft) will cause a camming or wedging action of the surfaces 70*a*, 70*b* and 70*c* functioning to space the shaft 61 at a greater or smaller distance from the pin 65, thus elevating or depressing the front wheels (which are freely rotatable about the shaft 61) with respect to the sweeper body. The rotary brush shaft being spaced with respect to the sweeper body, it is evident that the height of the brush shaft above the surface being swept can be regulated at will for more or less severe brush action and for correlation with the height of the nap of any rug being cleaned.

Besides the suction nozzle, the front wheels and the rotary brush, the front part of the sweeper body also carries illuminating means. An electric bulb 75 is socketed on the suction nozzle neck 40*a*, being energized by batteries 76 suspended within the cover 13 behind and inside the front wheels. A switch 77 is provided at the distal end of the handle 14, which latter is hollow and accommodates a cord 78 forming

part of the circuit including the bulb 75, the batteries 76 and the switch 77. To direct the light from the bulb 75 forwardly of the sweeper, both the upper and the lower casing halves 11 and 12 are slotted in front and a shield 79 is affixed, as by means of a screw 80, to the lower casing half so as to close the resulting slot. The shield 79 is transversely slotted, as at 79a, to allow penetration of the light from the bulb 75.

The rear compartment 31 holds driving mechanism for a suction fan. A worm shaft 90 having a double threaded worm 90a extends lengthwise of the sweeper body within the compartment 31 for driving a suction fan 91 within the impeller housing 32. The partition 27 is apertured, as at 27a, and the front end of the shaft 90 extends into the impeller housing 32 for receiving the hub 91b of the fan which is held thereon by means of a set screw 92. The suction fan 91 further includes a circular plate 91b integral with the hub 91a and carrying impeller blades 91c.

The worm shaft 90 is journaled in combined radial and thrust bearings 94. The two bearings are removably held by screws 96 on lugs 95 formed on the inside of the lower casing half 12. As shown in Figure 4, the bearings 94 include inner ball bearings 94a of smaller diameter than the main portion of the shaft 90 and facing the worm 90a and outer sliding bearings 94b of smaller inner diameter. The shaft 90 is constricted, as at 90b, to fit the ball bearings, and still more constricted, as at 90c, to fit the sliding surface bearings, and formed with shoulders between the constrictions that coact with the bearings to prevent axial shaft displacement.

The worm shaft 90 is driven from a rear wheel 98 (having an outer serrated rubber thread) operating through a slot 99 in the bottom casing half 12 and carried by a shaft 100 extending transversely through the rear compartment 31. The wheel 98 may be rigidly affixed to the shaft 100 by means of a pin 101. The ends of the shaft 100 are journaled in bearings 102 and 103, respectively, formed integrally with the lower casing half 12. These bearings 102 and 103 open to the outside of the lower casing half 12, and are protected by removable caps 102a and 103a.

A worm gear 105 engaging the worm 98 from below is loosely mounted on a collar 106 on the shaft 100 with its inner margin abutting against a terminal flange 106 on said collar 106 which in turn abuts against the hub of the wheel 98. The collar 106 extends over the shaft 100 away from the wheel 98 beyond the worm gear 105. A short distance past the worm gear 105 the collar 106 is constricted, as at 106b, and further away, the collar terminates on a radial flange 106c, removably affixed to the shaft 100 by means of a pin 107. The worm gear 105 is driven from the collar 106 by means of a one-way roller clutch comprising an annular member 109 (Figures 5 and 7) whose inner margin is interlocked with the restricted collar portion 106c (see Figure 7) and whose periphery is recessed to provide a plurality of inwardly sloping tracks 109a distributed about said periphery. A roller 110 is mounted in each recess and is adapted, when the member 109 is rotated forwardly, to move outwardly in said recess and to engage an axial flange 111a on an annular member 111 affixed to the worm gear 105, as by means of headed pins 112. An annular shield 113 having an axial flange 113a peened over the flange 111a extends inwardly therefrom into closely spaced relationship with the collar 106 to protect the clutch against the entry of dirt and the like.

Due to the provision of the one-way clutch, rotation of the shaft 90 and the fan 91 will be effected by actuation of the traction wheel 90a only when the sweeper is moved forwardly.

It will be noted that after removal of the upper casing half 11, the whole driving mechanism for the suction fan can be removed from the sweeper. The bearings 94 are disengaged from the supports 95 by removal of the screws 96. The bearing caps 102a and 103a are removed, and the shaft 100 is disengaged from the collar 106 and from the hub of the wheel 98 by removal of the pins 107 and 101 and pulled out from the housing. The shaft 90 may then be lifted out of the casing, along with the wheel 98, the worm gear 105, the collar 106 and the clutch 109, 111, 113.

When the above described mechanical driving means for the suction fan have been removed, the same may be replaced by electrical driving means, as illustrated in Figures 13 and 14. As there shown, an electrical motor 115 may be inserted into the rear compartment 31. Stub-shafts 116 inserted into apertures provided in the sides of the motor are journaled in the bearings 102 and 103. A caster wheel 117 depending from the bottom of the motor projects through the slot 99 to support the rear of the sweeper. A shaft 118 projects forwardly from the motor through the aperture 27a into the impeller housing 32 and has the hub 91a of the impeller affixed thereto by means of the set screw 92. The shaft 118 is journaled in a bearing 119 held in place on the block 95 by means of a screw 120. The lower casing half 12 is suitably apertured, as at 121, to admit a cord 122 carrying electric current to the motor. The upper casing half 11 is suitably apertured, as at 123, to accommodate a projecting brush housing 115a on the motor.

The motor 115 may easily be removed from the compartment 31 (after removal of the upper casing half 11) by removal of the journal caps 102a and 103a, pulling out the stub shafts 116 through the open journals 102 and 103, removal of the screw 120 so as to loosen the bearing 119 from the box 95 and lifting out the motor 115 along with the shaft 118.

It will thus be seen that I have provided a vacuum sweeper having a housing adapted to receive both mechanical and electrical driving means and also characterized by a novel and improved structure adapting the same to receive a suction nozzle as well as to shield illuminating means disposed therein. Many details of construction may be varied within a wide range without departing from the principles of this invention, and it is therefore not my purpose to limit the patent granted on this invention otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A sweeper housing comprising upper and lower halves subdivided by registering partitions into a rear compartment for accommodating driving means for a suction fan, a middle compartment for housing a suction fan, and a forward compartment for receiving the neck of a suction nozzle, a cover integral with the lower housing half and extending in front of and, as wings, on both sides thereof, the space encompassed by said cover being unobstructed by said housing and communicating with said front

compartment through an aperture in the lower casing half large enough to accommodate the neck and middle portion of a suction nozzle, the partition between the forward compartment and the middle compartment being formed with an aperture for receiving the terminal portion of a suction nozzle neck and having in front of said aperture a rabbet-forming projection along the upper edge of said aperture, a suction nozzle extending transversely of said sweeper within said cover and having a neck extending up into said front compartment into communication with the impeller housing through said aperture and having a terminal portion provided with an upstanding flange adapted to hook into said rabbet on said partition wall, said suction nozzle extending within said cover transversely of said sweeper and being rigidly affixed to the inside of the roof of said cover, means for supporting a rotary brush within said suction nozzle, means for supporting front wheels from said suction nozzle, and means for supporting driving means for said suction fan in said rear compartment.

2. A sweeper housing comprising upper and lower halves subdivided by registering partitions into a rear compartment for accommodating driving means for a suction fan, a middle compartment for housing a suction fan, and a forward compartment for receiving the neck of a suction nozzle, a cover integral with the lower housing half and extending in front of and, as wings, on both sides thereof, the space encompassed by said cover being unobstructed by said housing and communicating with said front compartment through an aperture in the lower casing half large enough to accommodate the neck and middle portion of the suction nozzle, a suction nozzle made up of a rear part forming a neck and a front part forming jointly with said rear part a suction nozzle proper extending transversely of said sweeper within said cover as well as a tapering duct communicating with said suction nozzle neck, said neck and duct extending up into said front compartment into communication with the impeller housing through an aperture in the forward partition, means defining a rabbet groove in front of the upper edge of said last mentioned aperture, an upstanding terminal flange on said suction nozzle neck hooked into said rabbeted groove, means for rigidly connecting the lateral ends of said suction nozzle with the inside of the roof of said cover, means rigidly connecting said two suction nozzle parts, and plates closing the end of said suction nozzle and means for suspending front wheels from said plate.

3. A sweeper housing comprising upper and lower halves subdivided by registering partitions into a rear compartment for accommodating driving means for a suction fan, a middle compartment for housing a suction fan, and a forward compartment for receiving the neck of a suction nozzle, a cover integral with the lower housing half and extending in front of and, as wings, on both sides thereof, the space encompassed by said cover being unobstructed by said housing and communicating with said front compartment through an aperture in the lower casing half large enough to accommodate the neck and middle portion of the suction nozzle, a suction nozzle extending transversely of said sweeper within said cover and having a neck extending up into said front compartment into communication with the impeller housing

through an aperture in the forward partition, said aperture having a rabbeted groove in its upper edge and said suction nozzle neck having an upstanding terminal flange hooked into said rabbeted groove, means rigidly connecting the ends of said suction nozzle to the inside of the roof of said cover, said suction nozzle flaring from said neck and being bent forwardly so that its lower edge defines a rectangular opening large enough to accommodate a rotary brush and extending within said cover at the level of the lower edge thereof, said suction nozzle being made up of a front part and a rear part rigidly connected to said front part, the rear part including plates closing the lateral ends of the suction nozzle and adapted to support front wheels.

4. A vacuum cleaner comprising a housing subdivided by a partition into a forward and a rear compartment, a suction fan disposed in said forward compartment, driving means disposed in said rear compartment, a shaft operatively connected between said driving means and said suction fan and extending lengthwise of said housing from said rear compartment into said forward compartment, a pair of journals formed in the walls of said housing, transversely and oppositely disposed with respect to said rear compartment, the base of said rear compartment having an aperture therethrough, said driving means having transversely projecting shaft portions respectively engageable in said journals to position said driving means in said rear compartment, said driving means also having a floor engaging wheel disposed substantially centrally in said housing and projecting downwardly through said aperture to support the rear end of said housing.

5. A vacuum cleaner comprising a housing having upper and lower halves subdivided by registering partitions into a forward and a rear compartment, a suction fan disposed in said forward compartment, driving means disposed in said rear compartment, a shaft operatively connected between said driving means and said suction fan and extending lengthwise of said housing from said rear compartment into said forward compartment, bearing means for said shaft removably affixed to said partition in the lower housing half, a pair of open ended journals formed in the walls of said lower housing half, transversely and oppositely disposed with respect to said rear compartment, the base of said rear compartment having an aperture therethrough, said driving means having transversely projecting shaft portions axially insertable respectively in said journals to position said driving means in said rear compartment, and said driving means also having a floor engaging wheel disposed substantially centrally in said housing and projecting downwardly through said aperture to support the rear end of said housing, whereby said driving means may be conveniently disassembled from said housing upon removal of said upper housing half.

6. A sweeper housing comprising upper and lower halves subdivided by registering partitions into a rear compartment, a middle compartment and a forward compartment for receiving the neck of a suction nozzle, a cover integral with the lower housing half and extending in front of and, as wings, on both sides thereof, the space encompassed by said cover being unobstructed by said housing and communicating with said forward compartment through an aperture in the

lower casing half large enough to accommodate the neck and the middle portion of the suction nozzle, the partition between the forward compartment and the middle compartment being formed with an aperture for receiving the terminal portion of the suction nozzle neck, and a suction nozzle extending transversely of said sweeper within said cover with its said neck extending up into said forward compartment into communication with said middle compartment through said aperture, said suction nozzle extending within said cover transversely of said sweeper and being rigidly affixed to the inside of the roof of said cover.

LELAND H. SNYDER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,635,821	Daddio	July 12, 1927
1,727,922	Adams	Sept. 10, 1929
1,903,855	Townsend	Apr. 18, 1933
2,028,090	Frantz	Jan. 14, 1936
2,099,172	McCabe	Nov. 16, 1937
2,258,740	Carlson	Oct. 14, 1941
2,300,938	Lang	Nov. 3, 1942
2,330,621	Radke	Sept. 28, 1943
2,355,183	Snyder	Aug. 8, 1944

FOREIGN PATENTS

Number	Country	Date
4,001	Great Britain	1914