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SUCTION CLEANER NOZZLE

Filed April 11, 1963

Fig. 1.

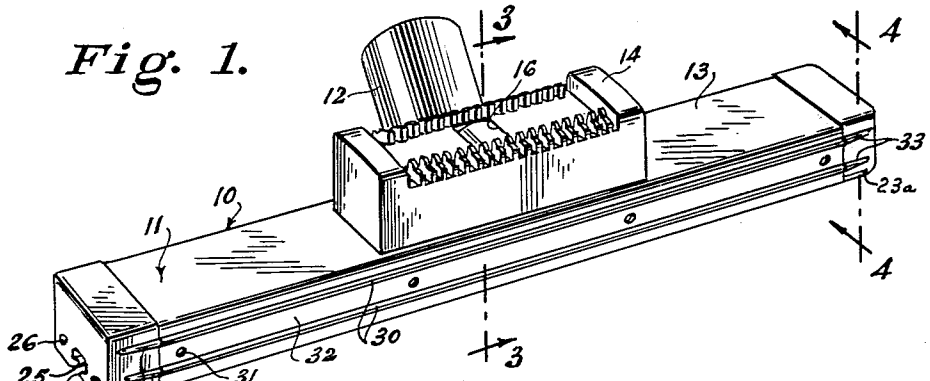


Fig. 2.

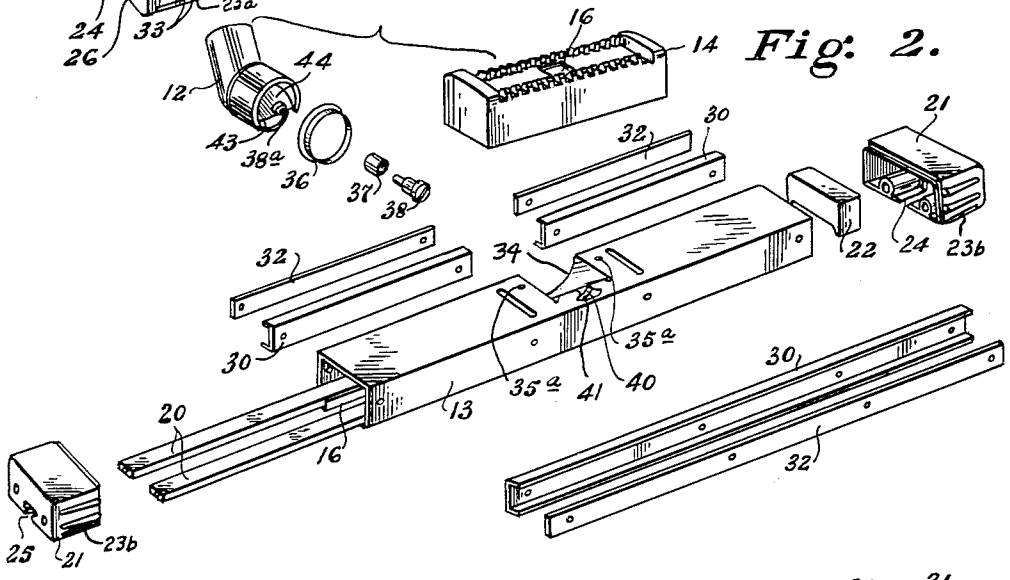
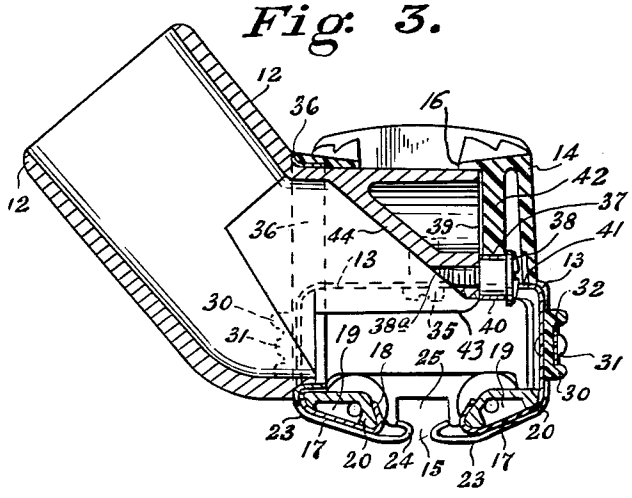


Fig. 3.



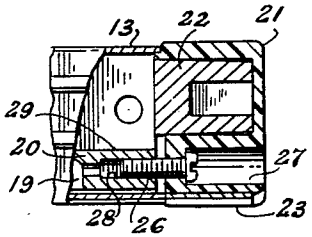


Fig. 4.

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SUCTION CLEANER NOZZLE

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10 Claims. (Cl. 15—325)

This invention relates to a suction cleaner nozzle of the type used for cleaning rugs, floors or other substantially large surfaces.

It is an object of my invention to provide an improved suction cleaner nozzle of the described character formed of a plurality of easily and relatively inexpensively manufactured parts which are simply and easily assembled together, thereby to permit the relatively low cost production of such nozzle.

Another object is to provide a suction cleaner nozzle with an elongated head having a suction opening extending therealong for use in removing dust from rugs, floors and other large, substantially flat surfaces, and wherein the opposite ends of the head are formed with end wall openings contiguous with the adjacent ends of the elongated suction opening, and permitting cleaning close to walls, furniture and the like.

Further objects and advantages of my invention will become apparent as the following description proceeds, and the features of novelty which characterize it will be pointed out with particularity in the claims annexed to and forming part of this specification.

For a better understanding of my invention, reference may be had to the following description taken in connection with the accompanying drawing, in which:

FIG. 1 is a perspective view of a suction cleaner nozzle embodying my invention;

FIG. 2 is an exploded perspective view on a smaller scale than that of FIG. 1, and illustrating the several elements which are assembled together to produce the suction cleaner nozzle of FIG. 1;

FIG. 3 is an enlarged sectional view taken along the line 3—3 on FIG. 1; and

FIG. 4 is an enlarged, fragmentary sectional view taken along the line 4—4 on FIG. 1.

Referring to the drawing in detail, and initially to FIG. 1, it will be seen that I have there shown a suction cleaner nozzle embodying my invention and which is generally identified by the reference numeral **10**. The nozzle **10** comprises an elongated hollow head **11** which, at a region intermediate its ends, is turnably connected to an upwardly inclined tubular member **12**, as hereinafter described in detail. The tubular member **12** serves as an outlet socket adapted to be connected to a suction line or conduit of a suction cleaner through which air is drawn during operation of the suction cleaner. The hollow interior of the head **11** provides a passage through which air is drawn toward the outlet socket **12** from the region of an elongated suction opening **15** (FIG. 3) extending along the length of the head **11** at the side of the latter which is lowermost in FIGS. 1 and 3. The elongated suction opening **15** is intended for removing dust and other finely divided dirt and the like from rugs, floors and other large substantially flat surfaces. The head **11** further has an auxiliary suction opening **16** at the side thereof which is uppermost in the position shown on FIGS. 1 and 3, that is, at the side opposed to the elongated suction opening **15**, and the auxiliary suction opening **16** is communicated with the outlet socket **12** so that air is drawn toward the latter from opening **16** for picking up fine threads and the like when the head **11** is turned or inverted with respect

to the outlet socket **12** so as to dispose the suction opening **16** at the bottom of the head **11**.

In accordance with my invention, the head **11** of the suction cleaner nozzle is formed of two main parts **13** and **14** which respectively define the suction openings **15** and **16**.

The part **13** is a relatively thin-walled, channel-like member of substantially U-shaped cross-section which is cut to suitable length from an elongated, sheet metal element bent so as to have the required cross-sectional configuration. The longitudinal edge portions of the channel-like member **13** are directed inwardly towards each other, as at **17**, and then upwardly, as at **18**, to define the opposite longitudinal margins of the elongated suction opening **15**. It will be noted that the inwardly directed portions **17** form slide surfaces, while the upwardly directed edge portions **18** cooperate with the inwardly directed portions **17** to define interior channels **19** extending along the opposite sides of the suction opening **15**.

Extending lengthwise in the channels **19** are elongated braces **20** which close the channels **19**, at the top of the latter, and thereby provide the interior of the channel-like member **13** with a shape which is most favorable for the flow of air from the suction opening **15**. The braces **20** also provide the channel-like member **13** with increased rigidity and strength at the portions thereof engageable with a floor, rug or other surface to be cleaned, and further are employed, as hereinafter described in detail, for the purpose of securing end walls **21** at the opposite ends of member **13**.

The end walls **21** are hollowed out to define inwardly opening cavities, as best seen on FIGS. 2 and 4, and are preferably formed of plastic so as to form bumpers for the sheet metal channel-like member **13**. A weight **22** is cast or loosely inserted in the hollow cavity of one of the end walls **21** so that, when the head **11** is lifted from the floor or other surface being cleaned, the head will turn on the tubular member or outlet socket **12** to a position where its weighted end is lowermost, from which position the head can be conveniently turned to dispose either the suction opening **15** or the auxiliary suction opening **16** against the surface to be cleaned.

In accordance with this invention, the end walls **21** each have a groove or slot **24** (FIGS. 1, 2 and 3) located so as to form an extension of the suction opening **15** and communicating with a relatively wider end opening **25** in the end wall. When the head **11** of nozzle **10** is positioned with its suction opening **15** against a rug, floor or other relatively large flat surface, the groove or slot **24** and the end opening **25** of each end wall permit effective cleaning of the rug or floor close to walls, furniture or other vertical surfaces.

When the end walls **21** are formed of plastic, wearing or scratching of the surfaces thereof at opposite sides of each groove or slot **24** by reason of sliding contact thereof with the surface to be cleaned is avoided by providing each end wall **21** with slide shoes **23** formed of metal strips bent so as to have a substantially C-shape (FIGS. 3 and 4). The inner ends of the slide shoes **23** engage in the groove **24** of the related end wall, and the outer ends **23***a* thereof engage in grooves **23***b* formed in the front and back surfaces of the end wall. As is best seen on FIG. 3, the slide shoes **23** extend below the portions **17** forming the slide surfaces of the channel-like member **13** so that, when the nozzle **10** is employed for cleaning of a hard surface, the nozzle will slide substantially only on the slide shoes **23** thereby to reduce the area of contact with the hard surface being cleaned for facilitating maneuvering of the nozzle.

The end walls **21** are secured at the opposite ends of the channel-like member **13** by means of screws **26** which pass through holes **27** formed in bosses of the end walls

21 and engage in tapped holes 28 provided in the opposite end portions 29 of the braces 20 which, as previously mentioned, are inserted in the channels 19 of member 13 (FIG. 4). Intermediate the end portions 29, the braces 20 are preferably grooved or hollowed out, as is apparent on FIG. 3, thereby to minimize the weight of the nozzle 10.

In order to avoid denting or marring of the sheet metal member 13 by contact with furniture or other obstructions, the front and back surfaces of member 13 are provided with elongated bumpers 30 perferably formed of extruded plastic having a U-shaped cross-section to define a longitudinal, outwardly facing recess. Each of the elongated bumpers 30 has a central metal rail 32 extending along its outwardly facing recess, and is clamped between the channel-like member 13 and the rail 32, for example, by means of rivets 31. The bumpers 30 extend along the member 13 to the opposite ends of the latter, and the front and back surfaces of the end walls 21 are formed with fairings or fillets 33 tapering from the ends of the bumpers 30 so as to avoid tearing away of the latter.

The part 14 of head 11 is preferably formed of plastic and secured, at a central location on top of the channel-like member 13, by means of screws 35 (FIG. 3) extending upwardly through openings 35a (FIG. 2) in the top wall of member 13 and engaging in tapped holes (not shown) opening at the bottom of part 14.

In accordance with this invention, the member 13 and part 14 cooperate to define seats for sleeve bearings by which the head 11 is turnably mounted on the outlet socket 12. More specifically, as shown on FIG. 2, the member 13 is formed with a central opening 34 having a substantially rectangular portion in its top wall between the openings 35a and extending to the back edge of such top wall where it is contiguous with a semi-circular portion in the back wall of member 13. The part 14 is hollow so as to provide a downwardly opening cavity communicating with the auxiliary suction opening 16, and the back wall of part 14 is provided with a semi-circular opening (not shown) which mates with the semi-circular portion of the opening 34 in member 13 to define a circular seat for a flanged bearing sleeve 36 in which the outlet socket 12 is turnably mounted, as best seen on FIG. 3. The front end of the outlet socket 12 is also turnably supported with respect to the head 11 by means of a screw 38 engaging in a tapped hole 38a formed in a central boss at the front end of outlet socket 12. A bearing sleeve 37 is turnable on the screw 38 and is, in turn, clamped in a cylindrical seat defined by mating semi-cylindrical recesses 39 and 40 formed at the bottom of part 14 and in the top wall of member 13, respectively. The head of screw 38 is diametrically larger than the bearing sleeve 37 and is engageable in a slot 41 formed in the top wall of member 13 immediately in front of semi-cylindrical recess 40 and also in front of a partition 42 of part 14 having the recess 39 therein, so that the head of screw 38 acts as a stop for preventing axial displacement of the outlet socket 12 relative to the head 11. It will be apparent that the screw 38 with the bearing sleeve 37 thereon and the bearing sleeve 36 are initially assembled on the outlet socket 12 and that the latter is then turnably connected with the head 11 merely by securing the part 14 on the member 13 with the outlet socket therebetween in the relationship indicated on FIG. 3.

In order to provide selective communication of the outlet socket 12 with either the suction opening 15 and the end openings 25, or with the auxiliary suction opening 16, the forward end portion of outlet socket 12 which is turnably mounted between member 13 and part 14, as described above, has its lower half cut away, as at 43 (FIG. 3) and further is provided with an obliquely arranged partition 44 extending across its upper half so that air can enter socket 12 only through the opening or cutout 43 at the bottom of its forward portion. When the head

11 is disposed with its suction opening 15 at the bottom thereof, the hollow interior of member 13 communicates through opening 34 with opening 43 of outlet socket 12 so that air may be drawn into the latter through the suction opening 15, while the auxiliary suction opening 16 is closed by the semi-cylindrical upper front portion of outlet socket 12, as shown on FIG. 3. However, when head 11 is inverted from the position shown on FIGS. 1 and 3, the central opening 34 of member 13 is closed by the semi-cylindrical upper front portion of outlet socket 12 and the interior of part 14 is placed in communication with opening 43 of the outlet socket thereby to permit air to be drawn into the latter through the auxiliary suction opening 16 which then faces downwardly for removing fine threads or the like from a surface to be cleaned.

Although a particular embodiment of the invention has been described in detail herein with reference to the accompanying drawing, it should be understood that the invention is not limited to that precise embodiment, and that various changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of the invention as defined in the following claims.

I claim:

1. A suction cleaner nozzle comprising a hollow head and an outlet socket extending from said head for coupling to a suction conduit of a vacuum cleaner, said head including an elongated channel-like member of substantially U-shaped cross-section having longitudinal edge portions defining an elongated suction opening therebetween, end walls at the opposite ends of said channel-like member, said longitudinal edge portions of the channel-like member being directed inward toward each other and forming slide surfaces at the opposite sides of said elongated suction opening, said longitudinal edge portions of the channel-like member being further directed upward at the opposite sides of said suction opening to form parallel channels within said member at said opposite sides of the suction opening, braces extending longitudinally in said channels, and means engaging the adjacent ends of said braces for securing said end walls to said channel-like member.

2. A suction cleaner nozzle as in claim 1; wherein said channel-like member is of sheet metal and said end walls are of plastic to form bumpers for said sheet metal member.

3. A suction cleaner nozzle as in claim 2; wherein said end walls have metal slide shoes thereon projecting beyond said slide surfaces of the channel-like member so that said slide shoes establish the area of sliding contact of said head with a hard surface to be cleaned.

4. A suction cleaner nozzle as in claim 3; wherein each of said end walls has a slot therein forming a continuation of the adjacent end of said elongated suction opening and grooves at the front and back of the end wall, and said slide shoes are of C-shaped configuration and engage, at their ends, in said slot and said grooves of the related end wall.

5. A suction cleaner nozzle as in claim 2; further comprising bumper strips extending along the front and back of said channel-like member and having outwardly facing recesses extending therealong, a central rail extending along said recess of each of the bumper strips, and fastening means securing each rail to said channel-like member for clamping the related bumper strip therebetween.

6. A suction cleaner nozzle as in claim 5; wherein each of said end walls has fairings at the front and back thereof registering with the adjacent ends of said bumper strips and tapering from the latter.

7. In a suction cleaner nozzle, an elongated open-ended hollow body having a top wall and spaced side walls extending downward therefrom and bottom walls which extend inward from the side walls toward one another and are separated by an elongated gap, the hollow body providing an air passage leading from the gap which serves

as an air inlet, the bottom walls having opposing edge portions which extend upward to provide a pair of parallel channels which extend lengthwise of the body at opposite sides of the gap, each of the channels having an elongated member therein which extends between the open ends of the body, end walls for closing the open ends of the body, and means including the elongated members for connecting the end walls to the body.

8. A suction cleaner nozzle as set forth in claim 7 in which each of the elongated members snugly fits in a different one of the channels and reinforces and strengthens the hollow body.

9. A suction cleaner nozzle as set forth in claim 8 in which the elongated members are hollow whereby the weight of the nozzle is kept at a minimum.

10. A suction cleaner nozzle as set forth in claim 7 in which the channels define open grooves and the elongated members cover the open grooves and define in part the air passage leading from the inlet.

References Cited in the file of this patent

UNITED STATES PATENTS

791,567	Moorhead	June 6, 1905
927,668	Moorhead	July 13, 1909
1,985,849	Allen	Dec. 25, 1934
1,994,872	Replogle et al.	Mar. 19, 1935
2,190,679	Replogle	Feb. 20, 1940
2,222,835	Gambardella	Nov. 26, 1940
2,310,554	Seyfried	Feb. 9, 1943
2,319,927	Hansson	May 25, 1943
2,332,234	Kircher	Oct. 19, 1943
2,333,409	Brown	Nov. 2, 1943
2,371,767	Lofgren	Mar. 20, 1945
2,520,942	Leslie	Sept. 5, 1950
2,622,263	Allen	Dec. 23, 1952
2,722,710	Allen	Nov. 8, 1955
2,822,061	Pettit et al.	Feb. 4, 1958
3,032,800	Anderson	May 8, 1962