April 22, 1941. E. O. H. HANSSON 2,239,384

SUCTION NOZZLE

Filed March 12, 1936

Fig. 1.

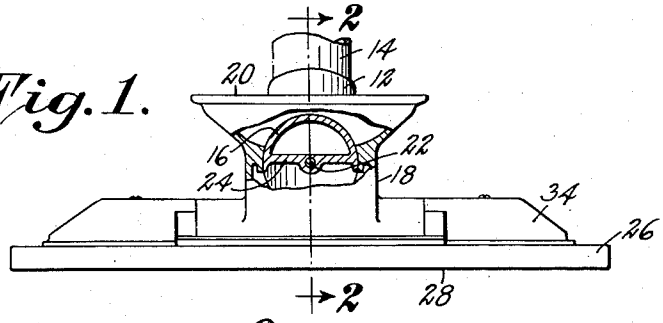


Fig. 2.

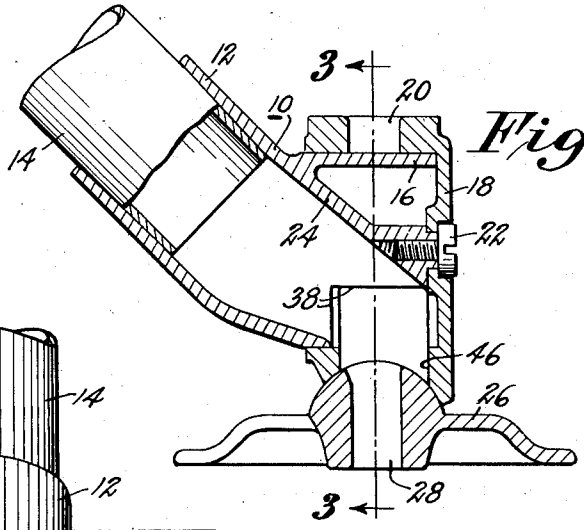
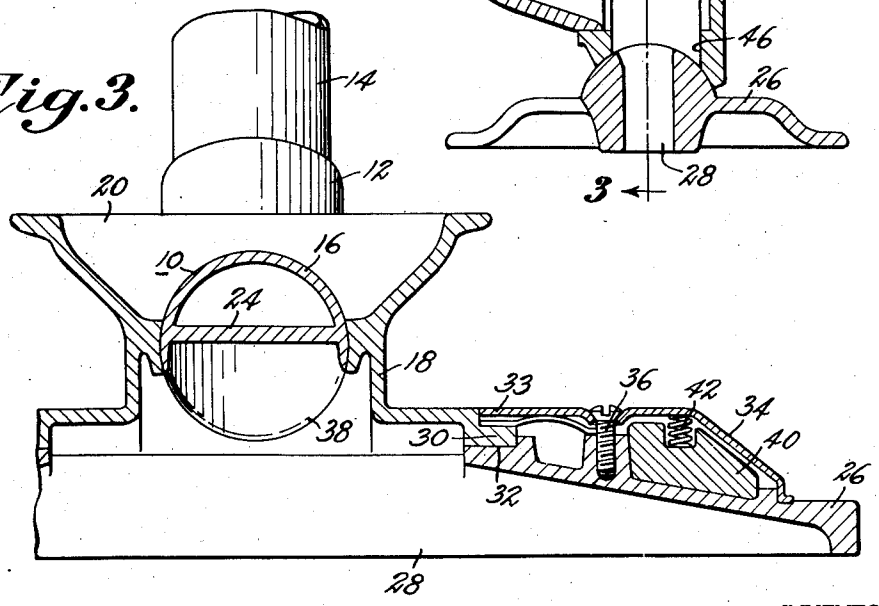


Fig. 3.



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SUCTION NOZZLE

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12 Claims. (Cl. 15—156)

My invention relates to suction nozzles and more particularly to duplex nozzles of the type shown in Patent No. 1,849,515, issued March 15, 1932, to Lars Ell.

The nozzle shown in the above identified patent includes a hollow member adapted to be connected to a handle, and upon which is rotatably mounted a nozzle body provided with two suction openings. These openings are of different types and are adapted to do different kinds of cleaning. The nozzle openings may be selectively brought into operative position by rotating the nozzle body, and for ease in effecting this rotation the body is preferably unbalanced so that it will automatically start to rotate as soon as it is lifted from the surface undergoing cleaning. Rotation of the nozzle body automatically establishes communication between the nozzle in operative position and the suction pipe, communication with the other, inoperative nozzle being cut off.

As shown in the Ell patent, the rigid handle member connected to the nozzle extends upwardly in an inclined direction so as to be normally held in the hand of the operator standing erect. However, it is often desirable to clean under low pieces of furniture, and in order to do this, the handle must be lowered to a more or less horizontal position adjacent to the floor. With an ordinary rigid nozzle, this results in lifting the forward lip from the floor, thus breaking the seal between the nozzle and the floor and impairing to a great extent the cleaning ability of the nozzle. In the device shown in the patent to Ell, the handle may be lowered toward a horizontal position by rotating it in the nozzle body. However, it cannot be lowered all the way to a horizontal position without establishing communication with the upper nozzle which is in an inoperative position. Such communication reduces the suction at the operative nozzle, thus reducing the cleaning effect.

The chief object of my invention is to provide a nozzle of the above type, but so arranged that the handle member may be lowered to a substantially horizontal position without possibility of establishing communication with the inoperative suction opening.

Further objects and advantages of my invention will be apparent from the following description considered in connection with the accompanying drawing, which form a part of the specification, and of which:

Fig. 1 is a front view, partially in cross-section, of a preferred embodiment of my invention;

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1; and

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

Referring to the drawing, reference character 10 designates an angular tubular member having a branch 12 adapted to receive a rigid hollow handle member 14. The other branch 16 of member 10 is provided with an outer cylindrical surface upon which is rotatably mounted a structure 18 formed with a small suction opening 20. Structure 18 is rotatably secured to member 10 by means of a bolt 22 having threaded engagement with a wall 24 formed within branch 16.

A structure 26 formed with a large suction opening 28 is pivotally secured to structure 18 on the side thereof opposite from suction opening 20. Structure 26 is pivotable with respect to structure 18 about an axis which is at substantially right angles to the axis of rotation of structure 18 about branch 16. Inasmuch as structure 26 is secured to structure 18, it is also pivotable with structure 18 about branch 16. In other words, structure 26 has universal movement with respect to branch 16, and consequently, with respect to member 10 and handle 14 secured thereto.

Structure 18 is formed with arcuate flanges 30 which are received between an arcuate surface 32 formed on structure 26 and the inner sides of arcuate tongues 33 formed on cap members 34 which are secured to structure 26 by means of bolts 36.

Lower side of branch 16 is cut away, as is shown at 38, so as to form an opening for establishing communication between the interior of member 10 and either of the suction openings 20 or 28. In the position shown in Fig. 2, suction opening 28 is in communication with member 10. If the nozzle structures 18 and 26 are rotated through 180 degrees about branch 16, the suction opening 20 will be below the branch 16 and communication will be established between opening 20 and the interior of member 10 through opening 38.

In order to cause the nozzle structures to rotate in this manner automatically upon lifting them from the floor, a weight 40 is positioned adjacent one end only of structure 26. As shown, this weight is placed in a space between the structure 26 and the cap 34. If desired, a spring 42 may be disposed between the weight and the cap to prevent rattling of the former. Obviously, other means may be employed to keep the weight in place and it may be fastened by being poured

in molten state and allowed to harden and adhere to the structure 26.

The operation of the above described nozzle will be largely apparent. If handle member 14 is connected to a source of suction, such as a vacuum cleaner unit, air will be drawn in through suction opening 28, opening 38, and member 10 to the interior of handle 14, with the parts in the position shown in Fig. 2. In this position, the nozzle may be passed back and forth over a floor or other surface, the operator standing erect and grasping the upper end of handle 14. If it is desired to clean underneath a piece of furniture, this may be done by lowering handle 14, the structure 18 pivoting about structure 26, while the latter remains flat on the floor. Such pivoting in no manner affects the communication between opening 28 and member 10, inasmuch as the opening 46 is of sufficient size so that the upper end of suction opening 28 cannot be closed. Moreover, such pivoting of structure 18 about structure 26 has no tendency whatsoever to establish communication between member 10 and suction opening 20, nor to lift the forward edge of structure 26 from the floor.

If while cleaning a rug, for instance, articles are encountered which the large suction opening 28 is unable to pick up, the operator lifts the entire nozzle from the floor, whereupon weight 40 causes the nozzle structure to rotate about branch 16 sufficiently so that the nozzle can be again placed on the floor with the small suction opening 20 in contact therewith. As previously described, suction opening 20 is now in communication with the interior of member 10 and the higher suction resulting from the smaller nozzles enables this nozzle to pick up articles which resisted the suction of the larger opening.

Wall 24 in branch 16 not only provides an anchorage for bolt 22, but also makes the line of flow from the nozzle opening to branch 12 smoother, thus reducing the chance for the formation of eddy currents.

It will be understood that many different forms of nozzle openings may be employed in the duplex nozzle above described. The present invention is not concerned with the specific form of such openings, but merely with their arrangement in a duplex nozzle for accomplishing the purposes set forth.

While I have described one more or less specific embodiment of my invention, it is to be understood that this has been done for the purpose of illustration only and that the scope of my invention is not to be limited thereby, but is to be determined by the appended claims when interpreted as broadly as the prior art will permit.

What I claim is:

1. In a suction cleaning device, a hollow member adapted to be connected to a rigid handle, and elongated nozzle structure carried by said member in substantially air-tight relation therewith, said structure being rotatable with respect to said member through a limited arc about a first axis parallel to the lengthwise extent of said structure and continuously rotatable with respect to said member about a second axis at right angles to said first axis and to the lengthwise extent of said structure.

2. In a suction cleaning device, a hollow member adapted to be connected to a rigid handle, elongated nozzle structure carried by said member, said structure being rotatable with respect to said member through a limited arc about a first axis parallel to the lengthwise extent of said structure and continuously rotatable with respect to said member about a second axis at right angles to said first axis, and means for initiating rotation of said structure about said second axis when said structure is lifted from the floor by said handle.

3. In a suction cleaning device, hollow means adapted to be connected to a handle member, hollow structure including a first suction nozzle rotatably mounted on said means for communicating therewith in substantial air-tight relation, and hollow structure including a second suction nozzle rotatably mounted on the first mentioned structure for communication therewith in substantial air-tight relation.

4. In a suction cleaning device, hollow means adapted to be connected to a handle member, hollow structure including a first suction nozzle mounted for rotation about said means and arranged for communication therewith in substantial air-tight relation, and hollow structure including a second suction nozzle mounted for rotation about the same axis as the first mentioned structure and about an axis at an angle thereto and arranged for communication in substantial air-tight relation with said first mentioned structure.

5. In a suction cleaning device, hollow means adapted to be connected to a handle member, hollow structure including a first suction nozzle mounted for rotation about said means and arranged for communication therewith in substantial air-tight relation, and structure including a second suction nozzle angularly disposed with relation to said first suction nozzle and mounted for rotation about the same axis as the first mentioned structure and about an axis at substantially right angles thereto and arranged for communication in substantial air-tight relation with said first mentioned structure.

6. In a suction cleaning device, a hollow member adapted to be connected to a source of suction, a hollow body rotatably mounted on said member and arranged for communication therewith in substantial air-tight relation and having a small suction nozzle, and hollow structure having a large suction nozzle pivotally secured to said hollow body and arranged for communication therewith in substantial air-tight relation, said hollow structure being pivotal about an axis substantially at right angles to the axis of rotation of said hollow body about said hollow member, said structure being disposed on the side of said hollow body opposite from said small nozzle.

7. In a suction cleaning device, hollow means adapted to be connected to a handle member, hollow structure including a first elongated suction nozzle rotatably mounted on said means about an axis substantially at right angles to the lengthwise extent of said nozzle and being arranged for communication therewith in substantial air-tight relation, and hollow structure including a second elongated suction nozzle pivotally mounted on the first mentioned structure and being arranged to communicate therewith in substantial air-tight relation, the second mentioned structure being pivotal about an axis substantially parallel to the lengthwise extent of said second nozzle.

8. In a suction cleaning device, a tubular member adapted to be connected to a source of suction, hollow structure rotatably mounted on said member with a first suction nozzle arranged to communicate with said tubular member in one position and an arcuate portion bounding an

opening arranged to communicate with said tubular member in another position, hollow means including a second suction nozzle arranged to communicate with the opening bounded by the arcuate portion in substantial air-tight relation therewith and having an arcuate surface and a member secured to said means and having an arcuate surface parallel with and spaced from the first mentioned surface, said arcuate portion of said structure being rotatably received between said surfaces whereby said means is rotatably secured to said structure.

9. In a suction cleaning device, a tubular member adapted to be connected to a source of suction, hollow structure rotatably mounted on said member with a first suction nozzle arranged to communicate with said tubular member in one position and an arcuate portion arranged to communicate with said tubular member in another position, means including a second suction nozzle and an arcuate surface arranged to communicate with said arcuate portion in substantial air-tight relation therewith, a cap member secured to said means and having an arcuate surface parallel with and spaced from the first mentioned surface, said arcuate portion of said structure being rotatably received in said space whereby said means is rotatably secured to said structure, a weight disposed between said cap member and said means adjacent to one end of the latter for unbalancing said means and said structure with respect to the axis of rotation about said tubular member, and spring means for holding said weight in place.

10. A nozzle for a suction cleaner comprising a tubular member for attachment to a hollow handle and a source of suction, and a pair of flexibly connected body members rotatably mounted on said tubular member and having spaced suction orifices constructed to be alternately brought into communication with the source of suction and when one nozzle is in communication with suction the other is shut off, each of said pair of flexibly connected body members having spaced bearing surfaces for cooperation with complementary bearing surfaces on the other body member thereby providing relative angular movement between said body members and unobstructed flow of air, said body members being swingable about said tubular member and one of the body members being swingable substantially at right angles to the path of movement about the tubular member to permit the handle to be swung from side to side and up and down while the device is in use without interrupting the suction.

11. A nozzle for a suction cleaner comprising a tubular member for attachment to a hollow handle and a source of suction, and a pair of suction orifice-containing flexibly connected body portions rotatably mounted on said tubular member with the suction orifices arranged for communication with the source of suction one at a time while the other is shut off from suction, said orifice-containing body portions having relative angular movement, one being movable about an axis at right angles to that about which they are both movable together so that the handle may be swung laterally and raised or lowered while the device is in use without interrupting the suction.

12. A suction cleaner comprising a tubular member for connection to a source of suction, a body portion rotatably mounted on said tubular member and provided with a first suction orifice arranged to communicate with said tubular member in one position and a second suction orifice having an arcuate portion and arranged to communicate with said tubular member in another position, and means defining a second suction nozzle provided with an arcuate portion for cooperation with the arcuate portion of the second suction orifice whereby relative movement between the nozzles is provided and full suction may be had and maintained through either nozzle, and means for fastening the second suction nozzle to the first comprising a holding member carried by one of the last mentioned members and movably confining a portion of the other last mentioned members therebetween.

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