Oct. 29, 1963 D. C. HOUSE 3,108,311

VACUUM CLEANER SUCTION NOZZLES

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Fig. 1

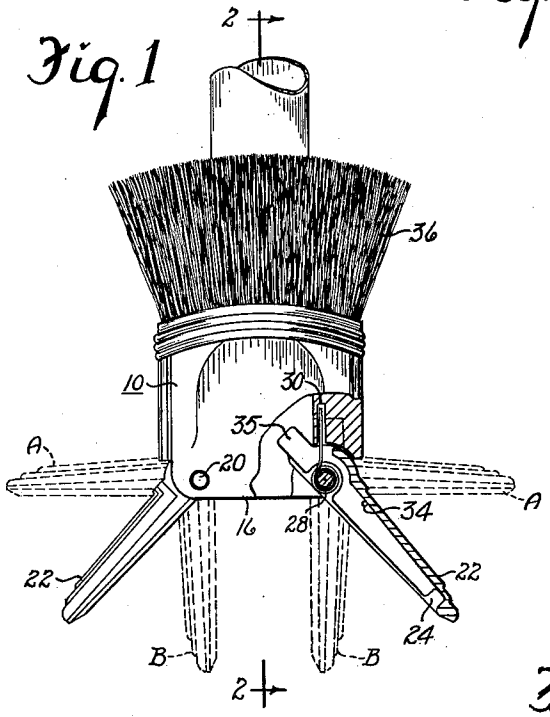


Fig. 2

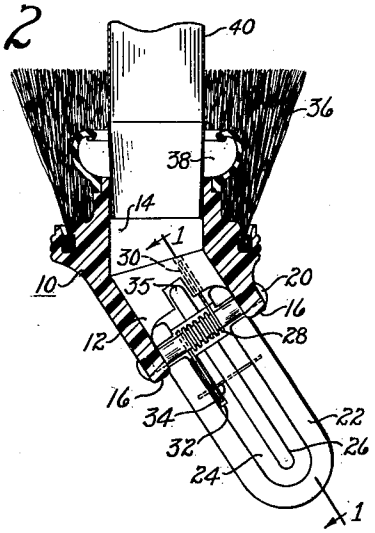


Fig. 5

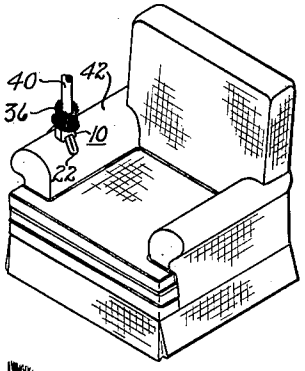


Fig. 3

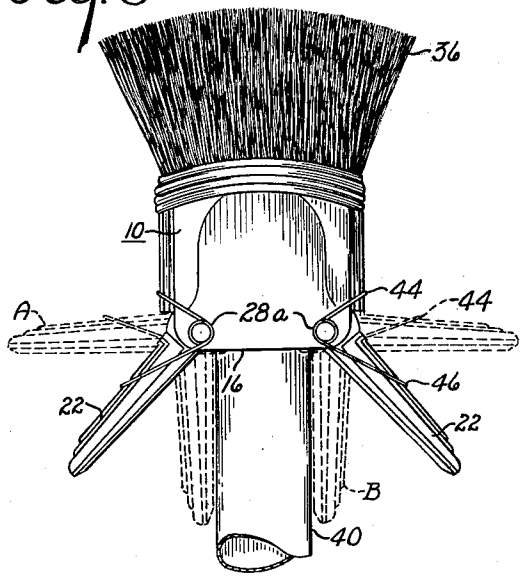
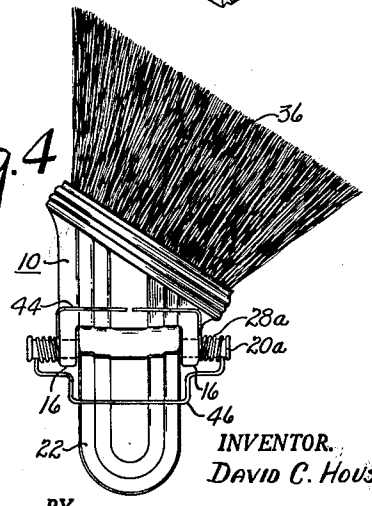


Fig. 4



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VACUUM CLEANER SUCTION NOZZLES

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My invention relates to vacuum cleaner nozzles and more particularly to nozzles adapted specially for cleaning objects having both flat and curved surfaces, such as upholstered furniture.

In Patent No. 2,815,525 issued December 10, 1957 to G. E. Lofgren there is disclosed a suction nozzle of this type, the ends of which are in the form of pivotally mounted wings which may be extended in a straight line for cleaning flat surfaces or may be pivoted towards each other so as to closely embrace a curved surface, such as the arm of a chair. In that patent the pivoted wings tend to remain in any position in which they are placed, and consequently when cleaning an object the surface of which has different curvatures, it is necessary for the operator to continuously apply a squeezing pressure to the wings in order to cause them to follow the changing curvature of the surface as the nozzle is moved thereover.

In accordance with my invention I provide resilient means for urging the wings towards each other in order to cause them to closely contact such a surface. However, the resilient means should not pivot them all the way to a position of mutual parallelism, inasmuch as this would make it impossible to spread them towards a straight line position by merely pressing the nozzle against a flat surface when it is desired to clean such a surface.

I have found that if the wings are pivoted by the resilient means through approximately 45° from their straight line position, they may be pivoted back to the latter position by merely pressing their ends against a flat surface, and at the same time this 45° position is sufficient to cause the wings to closely contact practically any curved surface occurring in furniture.

According to one embodiment of my invention the resilient means are arranged to pivot the wings to the 45° position from either their straight line or parallel positions, whereas in another embodiment the resilient means merely pivots the wings from their straight line position to their 45° position.

In the above patent a nozzle of this type is shown in combination with a dusting brush nozzle, the arrangement being such that when it is desired to use either nozzle, a suction conduit may be inserted into the suction opening of the other nozzle. My improvement is particularly applicable to a dual nozzle of this type inasmuch as the resilient means, while tending to pivot the wings towards the aforesaid 45° position, permits them to be pivoted to the position of parallelism when the suction conduit is inserted into this end of the nozzle so that they will lie closely adjacent to the sides of the conduit and hence will be out of the way.

Further objects and advantages of my invention will be apparent from the following description considered in connection with the accompanying drawings of which;

FIG. 1 is a view, partially in cross-section, of the first embodiment of my invention, the cross-sectional portion being taken on the line 1—1 of FIG. 2;

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

FIG. 3 is an elevational view of a nozzle in accordance with the second embodiment of my invention;

FIG. 4 is a side view of the nozzle shown in FIG. 3, and

FIG. 5 is a view on a greatly reduced scale showing

either of the above nozzles applied to the arm of an upholstered chair.

Referring more particularly to FIGS. 1 and 2, reference character 10 designates a hollow member having a suction passageway extending therethrough. This passageway is composed of two portions, 12 and 14, respectively, which are disposed at an angle to each other. Preferably formed integral with the member 10 on one side thereof is a pair of parallel nozzle lips 16. These lips are disposed on opposite sides of the portion 12 of the passageway and are of greater length than the diameter thereof so that the ends of the lips extend therebeyond, as is shown in FIG. 1. Extending transversely of the lips adjacent to the ends thereof are a pair of pivot pins 20 on each of which is pivotally mounted an elongated wing member 22. Each wing member is formed with a channel 24 in one surface thereof, which channel may be divided by a centrally extending rib 26. The center of each wing member is relieved in the neighborhood of pin 20 and in the space thus provided a spring 28 is wrapped around the central portion of each pivot pin 20, one end of the spring being received within a recess 30 formed in the body 10, while the other end is received within a groove 32 formed in the bottom of the channel 24, where it is locked by means of a pin 34 extending transversely of the wing 22 and received in a suitable bore.

The wing members may be pivoted about the pins 20 between the dotted line positions A and B shown in FIG. 1, and the channels 24 face each other when the wings are in the latter position. However, the springs 28 are so designed as to tend to pivot the wings 22 to the intermediate position shown in full lines, which is approximately half way between the two dotted line positions. The springs are unstressed when the wings are in this intermediate position, and are stressed by pivoting of the wings in either direction therefrom.

The inner ends of the wings 22 are formed with narrow extensions 35 which extend into the passageway 12 when the wings are in any position other than position B, as will be seen from FIG. 1.

Secured to the end of member 10 at the side thereof opposite to the lips 16 is a circular brush member 36, which surrounds the end of passageway 14. Member 10 may be provided with an outwardly flared bell-shaped member 38 which tends to support the bristles 36.

When it is desired to use the nozzle for cleaning an upholstered surface, the end of a suction conduit 40 may be inserted into the passageway 14, as shown in FIGS. 1, 2 and 5. The springs 28 normally maintain the wings 18 in the inclined positions shown in FIG. 1 and consequently if the nozzle is pressed against a flat surface, the wings will be pivoted outwardly against the force of the springs to their straight line position A. The application of suction through the conduit 40 will cause the air to flow between the surface being cleaned and the wings 22 through the channels 24 therein to the passageway 12 and the nozzle thus serves to clean the surface in well known manner. Should the nozzle then be moved to a curved surface, such as the arm 42 of the chair shown in FIG. 5, the springs 28 cause the wings to pivot towards each other so as to closely embrace the curved surface.

If it is desired to use the brush end of the nozzle, as for cleaning hard surfaces, the conduit 40 is removed from the passageway 14 and inserted into the passageway 12. In so doing the end of the conduit strikes the extensions 35 of the wings 22, thus causing the wings to pivot against the force of springs 28 to the position B where the wings lie closely adjacent to the sides of conduit 40. When the hose is again removed from the passageway 12, the springs return the wings to the full line position

shown in FIG. 1, from which position the wings may readily be pivoted outwardly when the nozzle is pressed against a flat surface.

In the embodiment shown in FIGS. 3 and 4, the pins **20***a* are extended beyond the outer edges of the lips **16** and a spring **28***a* encircles the extending ends of each pin and has one portion **44** which extends around the outer surface of body **10**, and another portion **46** which extends across the face of wing **22** which is opposite from the face in which is formed the chanenl **24**. In this embodiment the action of the springs **46** is merely to pivot the wings from the dotted line position A to the full line position shown in FIG. 3, in which latter position the springs are unstressed and hence do not tend to move the wings to the dotted line position B. The wings may be pivoted by hand to this position, as when the hose **40** is inserted in this end of the nozzle, and they will remain in this position when the hose is removed. Thereafter, they must be pivoted to about the full line position in order that they may be spread further when the nozzle is forced against a flat surface. Pivoting of the wings to position B does not stress the springs, inasmuch as the latter merely bear against the surfaces of body **10** and the wings and hence the springs have no tendency to move the wings from position B to the intermediate position. The advantage of the second embodiment is that the springs **46** are disposed entirely outside of the air passage and hence there is no tendency for dirt to become caught thereon.

While I have shown two more or less specific embodiments 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 from the appended claims.

What I claim is:

1. A suction nozzle comprising a hollow member having a suction passageway therethrough terminating in a suction opening, a pair of surface engaging wings pivoted on said hollow body closely adjacent to opposite sides of said suction opening in a manner to conform more closely to surfaces to which the nozzle is applied, said wings having air channels communicating with said suction opening so that when applied to a surface to be cleaned the latter may be subject to suction through said air channels, said wings being pivotable from a first position in which they are disposed in a substantially straight line to a second position in which the wings are substantially parallel to each other and their respective channels are in confronting relation, and resilient means tending to pivot said wings from both said first and second positions to an intermediate position approximately half way therebetween.

2. A suction nozzle comprising a hollow member having a suction passageway therethrough terminating in a suction opening, a pair of surface engaging wings pivoted on said hollow body closely adjacent to opposite sides of said suction opening in a manner to conform more closely to surfaces to which the nozzle is applied, said wings having air channels communicating with said suction opening so that when applied to a surface to be cleaned the latter may be subject to suction through said air channels, said wings being pivotable from a first position in which they are disposed in a substantially straight line to a second position in which the wings are substantially parallel to each other and their respective channels are in confronting relation, and resilient means tending to pivot said wings from both said first and second positions to an intermediate position approximately half way therebetween, the pivoted ends of said wings having narrow projections extending at least part way into said passageway when said wings are in any position other than said second position whereby the insertion of a suction conduit through said suction opening into said passageway pivots said wings to said second position against the action of said resilient means.

3. A suction nozzle comprising a hollow member having a suction passageway therethrough terminating in a suction opening, a pair of pivot pins mounted in said body closely adjacent to opposite sides of said suction opening, a pair of surface engaging wings pivotally mounted on said pins, said wings having air channels communicating with said suction opening, so that when applied to a surface to be cleaned the latter may be subject to suction through said air channels, said wings being pivotal from a first position in which they are disposed in a substantially straight line to a position in which the wings are substantially parallel to each other and their respective channels are in confronting relation, and a spring encircling each of said pins, one end of each spring being fixed to said hollow member and the other end fixed to one of said wings, said springs tending to retain said wings in an intermediate position approximately midway between said first and second positions.

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