April 8, 1941. G. H. CRANMER 2,237,726

SUCTION NOZZLE

Filed Jan. 23, 1939

Fig. 1.

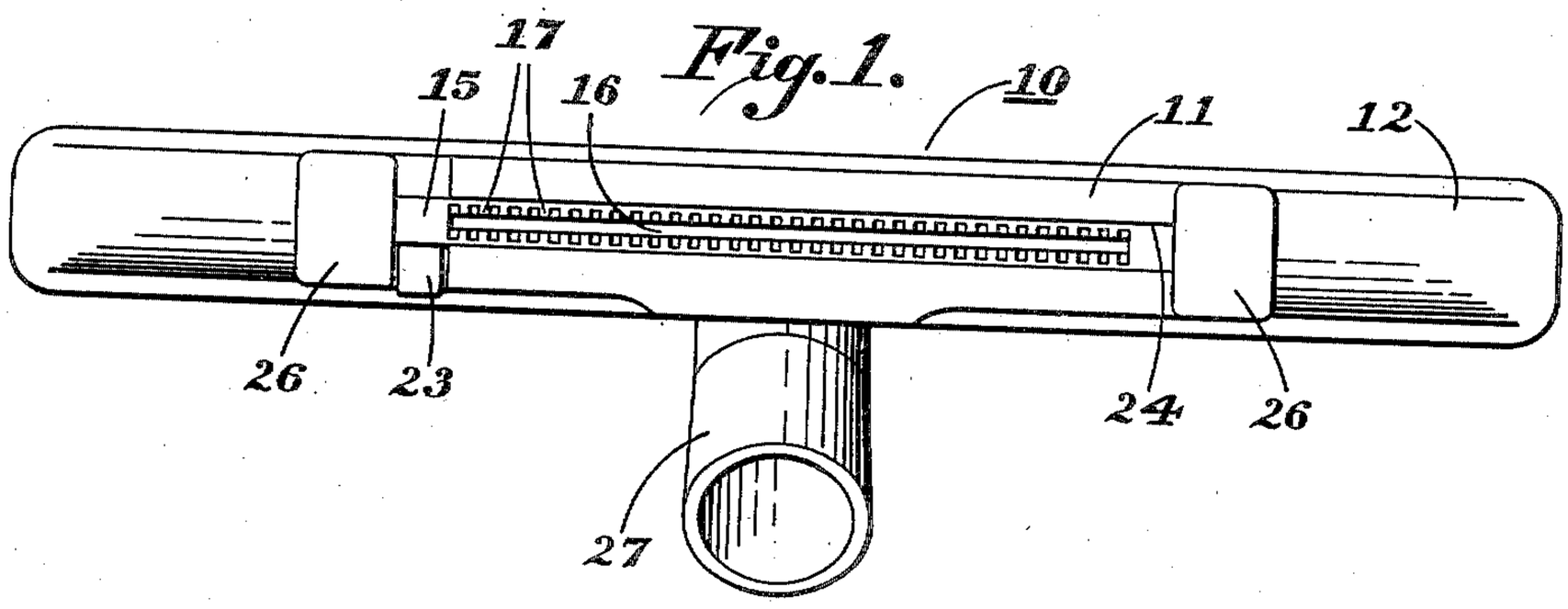


Fig. 2.

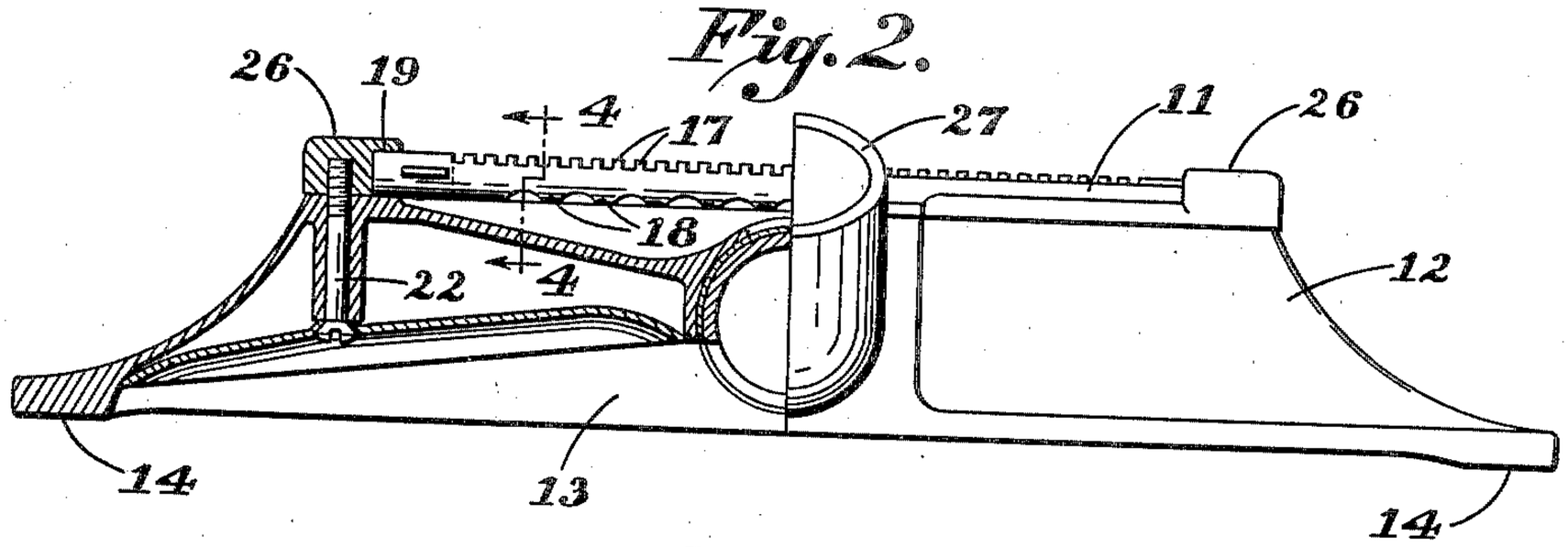


Fig. 3.

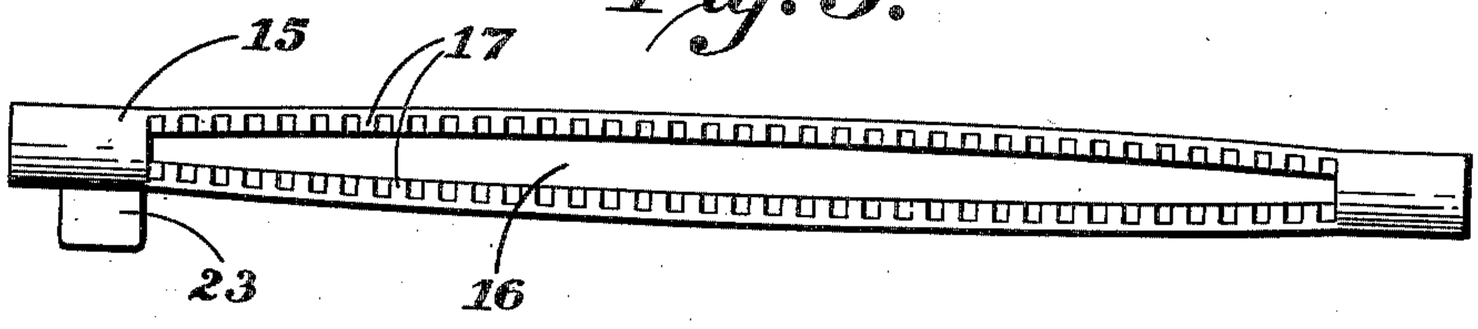


Fig. 4.

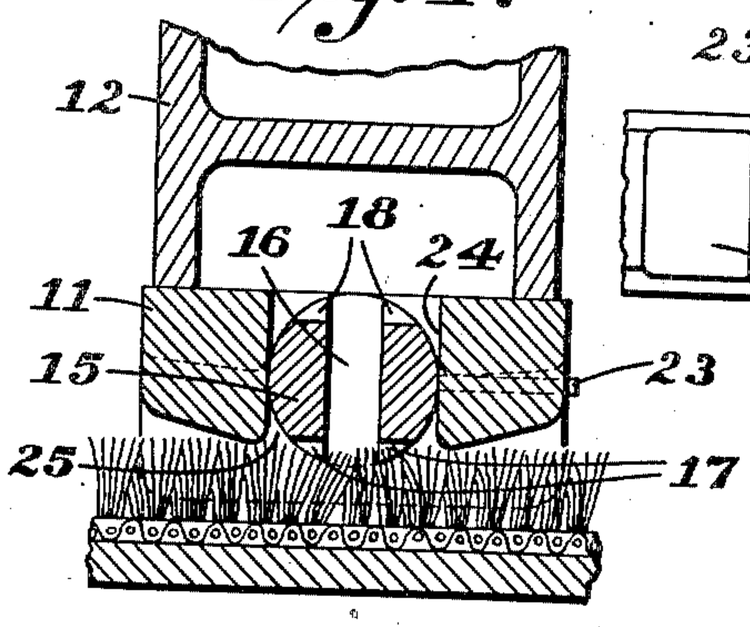
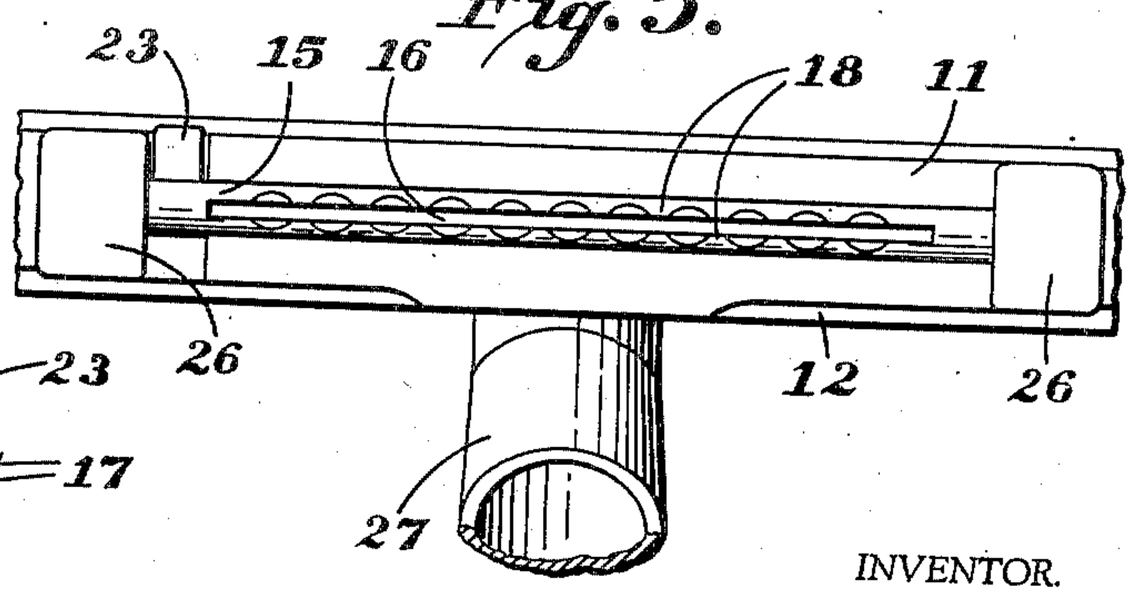


Fig. 5.



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UNITED STATES PATENT OFFICE

2,237,726

SUCTION NOZZLE

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Application January 23, 1939, Serial No. 252,278

8 Claims. (Cl. 15—157)

My invention relates to suction nozzles and more particularly to suction nozzles for cleaning rugs.

In cleaning rugs there are different conditions to be met depending upon the type of rug to be cleaned and also the type of dirt to be removed by a suction nozzle.

Dirt embedded in the pile of a rug is most conveniently removed by a suction nozzle having smooth lips and producing a flow of a large volume of air through the rug pile. In removing surface dirt including hairs, threads, and the like, it is desirable to produce a high velocity of air flow along the rug surface. An agitator for separating or loosening hairs, threads, etc. tenaciously adhering to the surface of the rug is desirable especially in the case of high pile rugs, such as Oriental rugs.

An object of my invention is to provide an improved suction nozzle with an agitator for quickly and efficiently removing surface dirt.

Another object of my invention is to provide a suction nozzle with a two position agitator with different surfaces for cleaning different types of rugs.

What I consider to be novel and my invention may be better understood by reference to the following specification and appended claims when considered in connection with the accompanying drawing, in which

Fig. 1 is a top plan view of my improved suction nozzle;

Fig. 2 is a side elevation partly in section;

Fig. 3 is an enlarged detail view of the agitator;

Fig. 4 is an enlarged cross-sectional view taken along the line 4—4 of Fig. 2 with the nozzle in reversed position and engaging a rug; and

Fig. 5 is a top plan view showing the agitator in an alternate position.

Referring to the drawing 10 indicates a suction nozzle body having a top surface 11 and a bottom surface 12. The bottom surface 12 is provided with an elongated suction opening 13 surrounded by smooth lips 14. Suction opening 13 is used for the general cleaning of rugs and for removing dirt embedded in the rug pile. The smooth lips 14 seal against a rug surface and so cause air to pass through the rug pile. For removing surface dirt, hairs, threads, and the like, the top surface 11 is provided with a rod 15 having a central passage 16. Passage 16 communicates with the interior of the body 10 and provides a suction opening smaller than the suction opening 13 and sufficiently small to produce a high velocity flow of air when connected to a vacuum cleaner. Rod 15 is provided with spaced lugs 17 located at each side of the passage 16. Lugs 17 may be formed by milling the rod 15 at right angles to the passage 16. The height of the lugs 17 is greatest adjacent the passage 16 forming a sharp edge at the passage 16. Spaced lugs 18 are provided on the reverse side of rod 15 adjacent each side of the passage 16. The lugs 18 are longer, wider, and spaced farther apart than the lugs 17. The spaces between lugs 18 are curved producing smooth side edges on the lugs 18 for a purpose that will be pointed out below.

The formation and location of the lugs 17 and 18 are not covered by this application but are the subject of another application filed concurrently herewith.

The ends of the rod enter recesses 19 in top part 11 as shown at the left in Fig. 2. Top 11 and rod 15 are secured to bottom 12 by a plurality of screws 22. A finger grip 23 is connected to rod 15 for rotating it from one position presenting lugs 17 to a second position presenting lugs 18 and vice versa. To hold the rod 15 in either of its two positions the sides of the rod forming the passage 16 are bowed out as shown in Fig. 3 though somewhat exaggerated therein. The bowed out sides of the rod 15 increase the effective width of the rod transverse to the passage 16. When the rod 15 is in either of its selected positions the sides of the rod frictionally engage the side walls 24 of the opening 25 of top 11 in which the rod 15 is located. The side walls 24 are so spaced as to straighten the sides of rod 15 when it is in one of its operating positions, as shown in Figs. 1 and 5. As the rod 15 is rotated by its finger grip 23 from one position to another the frictional engagement between the rod 15 and side walls 24 decreases to a minimum when the passage 16 is perpendicular to the side walls 24 and then increases to a maximum when the rod 15 reaches its second position. This frictional engagement is sufficient when the rod 15 is in one of its selected positions to hold the rod against accidental rotation by engagement with a surface being cleaned. Adjacent the extremities of rod 15, two gliding surfaces 26 extend outwardly from the top surface 11 and serve the dual functions of facilitating the movement of the nozzle along a rug surface and locating either the lugs 17 or the lugs 18 at the surface of the rug. A pivoted elbow 27 communicates with the interior of the body 10 and may be connected to a vacuum cleaner, not shown, through the intermediary of a suc-

tion conduit. When elbow 27 and body 10 are in the relative positions shown in Fig. 2, the suction produced by a vacuum cleaner is communicated to the suction opening 13. By rotating the body 10 about the elbow 27 through an angle of 180 degrees communication is established with the passage 16.

When the nozzle body 10 is to be used for cleaning a rug it is connected to a vacuum cleaner as by means of the connection of a suction conduit to elbow 27. The embedded dirt is removed from the rug by traversing it with the bottom 12 in contact with the rug surface. When it is desired to remove surface dirt, hairs, threads, and the like, the nozzle body 10 is rotated on the elbow 27 to a position with the top surface 11 in contact with the rug. With the rod 15 in the position shown in Figs. 1 to 3, the lugs 17 engage the rug surface. The end extensions 26 serve to position the lugs 17 at the surface of the rug pile. Air entering the passage 16 travels along the surface of the pile and due to the relatively small cross-sectional area of the passage 16 attains a high velocity. As the nozzle is moved across a rug the high velocity air flow will carry the surface dirt including the loose hairs, threads, etc. into the passage 16. Hairs, threads, or the like which are adhering tenaciously to the surface of the rug pile are loosened by the lugs 17. The forward edges of the lugs 17 adjacent the rear of the passage 16, determined by the direction of movement of the nozzle, serve to loosen the threads and the like. The lugs 17 on the opposite side of the passage 16 serve to guard the sharp edges of the other lugs 17 and prevent them from becoming deeply embedded in the rug pile. Regardless of the direction of movement of the nozzle one set of lugs 17 serve to loosen the threads and the other set on the opposite side of passage 16 serve as guards for the first set. The spaces between the lugs 17 permit a flow of air right at the surface of the pile from both sides into the passage 16. The passage 16 being of uniform cross-section throughout its extent the velocity of the air is maintained in its passage therethrough and there is no tendency for dirt picked up by high velocity air being precipitated again due to a reduction in the velocity as the air enters the nozzle. An important advantage obtained from the location of the lugs 17 on each side of the central passage 16 is the equal facility with which surface dirt may be removed upon movement of the nozzle in a forward or reverse direction.

In cleaning hooked rugs which have looped threads at the surface instead of the free ends of a pile, as do other rugs, there is a possibility that the lugs 17 may catch in the surface threads. The lugs 18 are wider and do not have the sharp side edges of the lugs 17 due to the curved surfaces between the lugs 18. The lugs 18 will not catch in looped surface threads and so may be used for cleaning hooked rugs. The lugs 18 perform the same function as the lugs 17 and if desired may be used for the surface cleaning of other rugs especially low pile rugs.

What I claim is:

1. A suction nozzle comprising a body having an elongated opening, a rod secured to said body within said opening having a central diametric passage with a plurality of radially spaced openings forming a suction opening and communicating with the interior of the body, means to rotate said rod to selectively present one of said openings in cleaning position, and means engaging opposite sides of said rod to frictionally hold said rod in a selected cleaning position.

2. A suction nozzle comprising a body having an elongated opening, a rod secured to said body within said opening having a central diametric passage with a plurality of radially spaced openings forming a suction opening and communicating with the interior of the body, means to rotate said rod to selectively present one of said openings in cleaning position, said rod being bowed out transversely to the passage through said rod, and abutment means engaging opposite sides of said rod to frictionally hold the rod in a selected cleaning position.

3. A suction nozzle comprising a body having an elongated opening, a rod secured to said body within said opening having a central diametric passage with a plurality of radially spaced openings forming a suction opening and communicating with the interior of the body, means for rotating said rod to selectively present one of said openings in cleaning position, said rod normally having a greater diameter in a plane perpendicular to the passage through said rod, and abutment means engaging opposite sides of said rod to frictionally hold the rod in one or the other of the cleaning positions.

4. A suction nozzle comprising a body having an elongated opening, a rod secured to said body within said opening having a central diametric passage with a plurality of radially spaced openings forming a suction opening and communicating with the interior of the body, a finger grip connected to said rod and adapted to move the rod to selectively present one of said openings in cleaning position, said rod being preformed with a greater diameter perpendicular to the passage through said rod, and walls formed in said body in each side of said rod engaging said rod to frictionally hold the rod in either of the cleaning positions.

5. A suction nozzle comprising a body having an elongated opening, a rod secured to said body within said opening having a central diametric passage with a plurality of radially spaced openings forming a suction opening and communicating with the interior of the body, means to rotate said rod to selectively present one of said openings in cleaning position, said rod tending to expand outwardly in a direction transverse to said passage, and walls formed in said body at each side of said rod engaging said rod to overcome the tendency of the rod to expand, whereby a frictional engagement is produced between said rod and said body opposing rotation of said rod from one or another cleaning position.

6. A suction nozzle including a bottom part, a top part with recesses adjacent the ends of a central elongated opening, said recesses opening inwardly toward said central opening and toward said bottom part, a rod secured within the opening of said top having a central passage forming a suction opening with ends extending into the recesses in said top and abutting said bottom part, an elbow rotatably connected to said bottom part, and means securing said top and bottom part together whereby said rod is locked in position.

7. A suction nozzle including an hollow bottom part having a side opening, a top part having a central opening, and end recesses opening inwardly toward said central opening and toward said bottom part, a rod having a central diametric passage communicating with the interior of

said bottom part and extending into said end recesses of said top part and abutting the bottom part, a tubular member extending through the side opening of said bottom part, and means to secure said top part to said bottom part.

8. A suction nozzle including a bottom part having a side opening, a top part having a central opening and end recesses opening inwardly toward said central opening and toward said bottom part, a rod located within the central opening of said top part with its ends extending into said recesses and abutting said bottom part, said rod having a central diametric passage forming a suction opening communicating with the interior of said bottom part, an elbow extending through the side opening of said bottom part, and screws extending through said bottom part and in threaded engagement with said top part.

GEORGE HORACE CRANMER.