

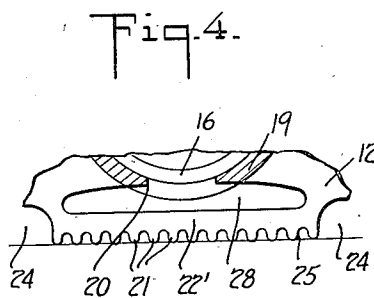
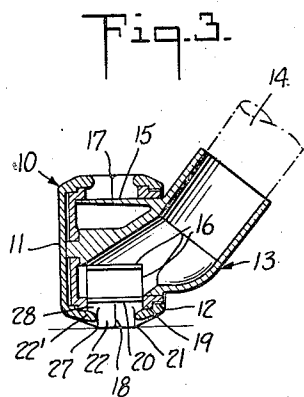
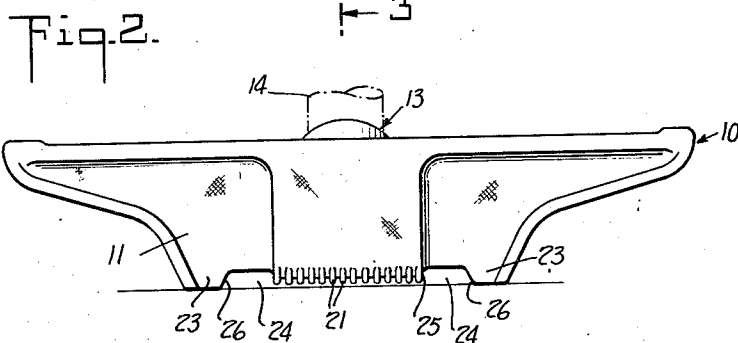
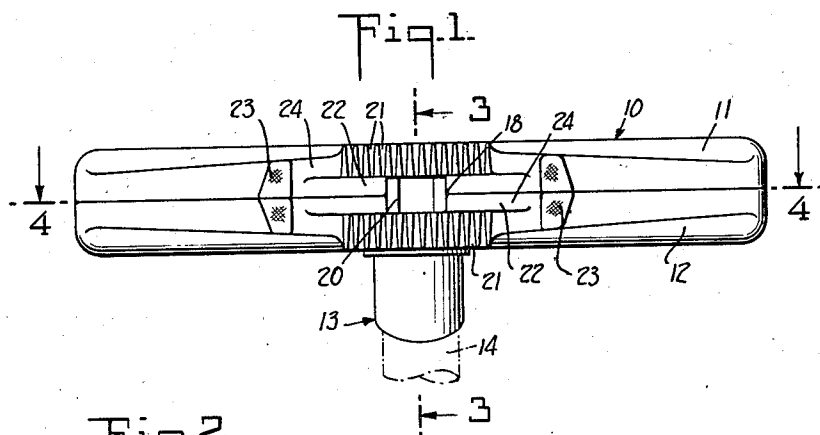
May 25, 1943.

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2,319,927

SUCTION NOZZLE

Filed Sept. 25, 1940



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2,319,927

SUCTION NOZZLE

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Application September 25, 1940, Serial No. 358,230
 In Sweden September 25, 1939

6 Claims. (Cl. 15—157)

My invention relates to nozzles for vacuum cleaners and especially to nozzles for picking up threads, dog hairs, and the like from carpets and other articles which are intended to be cleaned. The nozzle is provided with at least two rows of teeth, a suction opening between said rows and further with end extensions forming gliding surfaces and located in the longitudinal direction outside the rows of teeth. During operation the nozzle is adapted to be moved on said gliding surfaces, the threads and the like being loosened from the carpet by means of the teeth and sucked up through the opening arranged between the rows of teeth. The nozzle is connected through an outlet opening with a suction pipe leading to a suction cleaner or other suction producing apparatus.

One characteristic feature of the invention consists in the arrangement of recesses or depressions between the end extensions and the ends of the rows of teeth, these recesses being in communication with the outlet opening by a channel formed between the rows of teeth. Further objects of the invention will be apparent from the following description of a preferred embodiment of the invention illustrated in the enclosed drawing.

In the drawing

Fig. 1 is a plan view of my improved nozzle,

Fig. 2 is a front view of the same article,

Fig. 3 is a sectional view taken along line III—III of Fig. 1, and

Fig. 4 is an enlarged sectional view taken along line IV—IV of Fig. 1.

Referring to the drawing, 10 indicates a nozzle body formed of two halves 11 and 12, which is rotatably arranged on a hollow connection piece or elbow 13. Said elbow is adapted to be connected with a pipe 14 leading to a suction cleaner or other suction producing apparatus. The horizontal part 15 (Fig. 3) of the pipe-shaped elbow 13 is provided with an opening 16 at its circumferential surface, which is adapted to connect the large suction opening 17 (Fig. 3) of the nozzle body or the small suction opening 18, respectively, with the suction conduit 14. This connection between either of the suction openings mentioned and the suction conduit 14 depends on the position of rotation of the nozzle body 10 with respect to the elbow 13. The horizontal part 15 of the elbow is journaled in a lining 19 manufactured from any suitable material, such as synthetic resin or the like, which lining is clamped between the halves 11 and 12 of the nozzle body. The lining, which is of general cy-

lindrical configuration, is provided at its cylindrical surface with two openings corresponding to the openings 17 and 18 of the nozzle body. The opening in the lining 19 corresponding with the opening 18 has received the reference character 20. As apparent from Fig. 1 of the drawing, the opening 20 is somewhat shorter than the opening 18, on account of which the effective size of the small suction opening of the nozzle is determined by the opening 20 in the lining 19. The large nozzle opening 17 is principally adapted to be used for normal suction operation, whereas the small opening 18 is to be used when threads, dog-hairs and other surface dirt are to be removed.

On each side of the small opening 18 there is arranged a row of teeth 21 arranged on inclined walls 22'. As is shown in Fig. 3, the surface-contacting faces of the teeth are inclined at a greater angle than the walls 22', the teeth projecting a maximum distance below the walls at their inner ends and a minimum distance at the outer ends of the teeth. As illustrated, this minimum distance is zero. Between the rows of teeth and the walls there is formed a channel 22 in the middle of which the small suction opening 18 is positioned. The bottom of the channel is preferably inclined from the ends towards the opening 18. Outside the ends in the longitudinal direction of the channel 22 end extensions 23 are located, which form gliding surfaces for the nozzle, when the opening 18 is to be used. Between the ends of the rows of teeth and the end extension 23 recesses or depressions 24 are formed. As is apparent from Figs. 2 and 4 the side surfaces 25 of the teeth 21 are as far as possible straight and vertical, which is also the case with the inner surface 26 of the end extensions 23 in order to prevent threads and the like from being clamped between these surfaces and the surface to be cleaned. In order to save the carpet or other article to be cleaned the corners 27 of the teeth pointing against the channel 22 are somewhat rounded, which is also the case with the top of the cross section of the teeth. The width of the channel 22 is preferably less than the width of the openings 16 and 20 in the elbow 13 and the lining 19, respectively. In order fully to utilize the openings 20 and 16 mentioned there is formed a lengthened depression 28 beneath the rows of teeth at the inside of the walls 22 which assures that the air coming from both sides of the channel 22 is not throttled when flowing in to the elbow 13 and suction pipe 14.

When the nozzle opening 18 is to be used for

thread-picking purposes the threads or the like are loosened from the surface to be cleaned by means of the teeth 21, when the nozzle is moved forwards and backwards over the carpet or the like on the gliding surfaces of the end extensions 23. At the same time air is sucked in through the recesses 24 and through the channel 22 into the openings 18 and 20 and further to the elbow 13 and the conduit 14 into the cleaner. When passing the channel 22, which is relatively narrow, the air obtains a high velocity due to the fact that the channel is relatively narrow, and impurities, which have been caught by the teeth, are removed therefrom and are carried by the air stream into the nozzle and to the suction cleaner. In this way the teeth are always kept clean, and the thread picking capacity of the nozzle considerably increased.

While I have shown and 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 thereto, but is to be determined by the appended claims.

What I claim is:

1. In a vacuum cleaner suction nozzle, an elongated body member including a pair of lengthwise extending spaced walls providing surface-contacting lips, said lips being formed with transversely extending grooves, said body member having its end portions providing gliding surfaces spaced from the ends of the grooved lips, and means for connecting the channel between said walls with a source of suction, said body member being formed with recesses in said lips of a size to provide flow of a larger volume of air than can pass through said grooves when the nozzle is in operative position, said recesses being located between the ends of said grooved lips and said gliding surfaces for providing relatively unrestricted communication between the atmosphere and the ends of said channel when the lips and gliding surfaces are in contact with an object to be cleaned.

2. In a vacuum cleaner suction nozzle, an elongated body member formed with a lengthwise extending channel, inclined walls extending towards each other from opposite sides of said channel, said walls being formed with transversely extending grooves, said body member having its end portions providing gliding surfaces at the opposite ends of said channel, the ends of said walls terminating short of said gliding surfaces so as to provide relatively unrestricted openings into said channel from the atmosphere when the walls and gliding surfaces are in contact with an object to be cleaned, and means for connecting said channel with a source of suction.

3. In a vacuum cleaner suction nozzle, an elongated body member including a pair of lengthwise extending spaced walls providing surface-contacting lips, said lips being formed with transversely extending grooves, said body member having its end portions providing gliding surfaces spaced from the ends of the grooved lips, and means for connecting approximately the center of the channel between said walls with a source of suction, said body member being formed with recesses between the ends of said

grooved lips and said gliding surfaces for providing relatively unrestricted communication between the atmosphere and the ends of said channel when the lips and gliding surfaces are in contact with an object to be cleaned, the surface forming the back of said channel being inclined from both ends towards the center so that said channel is deepest at the center.

4. In a vacuum cleaner suction nozzle, an elongated body member formed with a longitudinal channel, means for connecting a central point of said channel to a source of suction, said body member having its end portions forming gliding surfaces at each end of said channel, said gliding surfaces serving to close the ends of said channel, and wall members formed with transverse grooves located on either side of said channel, the ends of said wall members being spaced from said gliding surfaces to provide passage for a greater air flow than can normally pass through said transverse grooves when the device is in operative position, whereby air may enter the channel through these spaces when the wall members and gliding surfaces are in contact with an object to be cleaned and flow through the channel at right angles to said transverse grooves.

5. A nozzle for a suction cleaner comprising an elongated body with a work engaging portion having adjacent its extremities gliding surfaces for engagement with work to be cleaned, said body between said gliding surfaces having spaced longitudinally disposed walls providing a suction opening and said walls being provided with comb means having portions extending inwardly into said suction opening, the teeth of said comb means terminating short of the plane of said gliding surfaces, said body having its work engaging portion recessed adjacent said gliding surfaces beyond the ends of said comb means to a greater depth than the depth of the recesses between the comb teeth to make possible a relatively greater airflow through said recesses than through said comb means.

6. In a nozzle for a suction cleaner, an elongated body having a work engaging portion with a channel leading therefrom and means whereby the nozzle may be connected to a source of suction in order that suction may be had through said channel, said work engaging portion having inwardly of but near each extremity a gliding surface for engagement with work to be cleaned with the working portion being of a relatively long narrow configuration and having spaced substantially parallel walls with their edges forming surface contacting lips, said lips having teeth along the greater portion of their length and intermediate their extremities, said teeth extending inwardly and substantially horizontally, and terminating short of the plane of said gliding surfaces, each of said toothed lips having a recess beyond each end of the toothed portion of a size sufficient to provide a relatively greater airflow through said recesses than through said teeth when the nozzle is in operation and air is sucked therethrough, and providing accelerated or high velocity airflow through said recesses into the nozzle and over said horizontal portion of the teeth.

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