W. E. SHERBONDY.

ROTARY BRUSH.

APPLICATION FILED NOV. 11, 1920.

1,425,906. Patented Aug. 15, 1922.

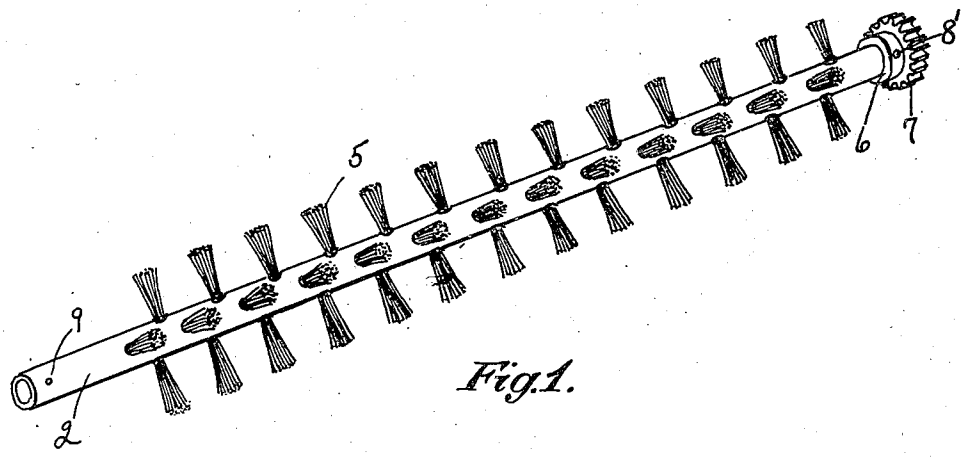


Fig. 1.

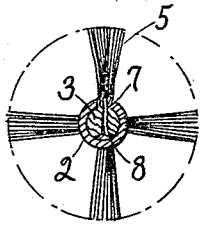


Fig. 2.

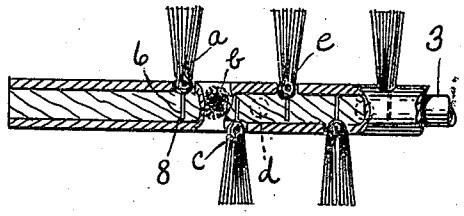


Fig. 3.

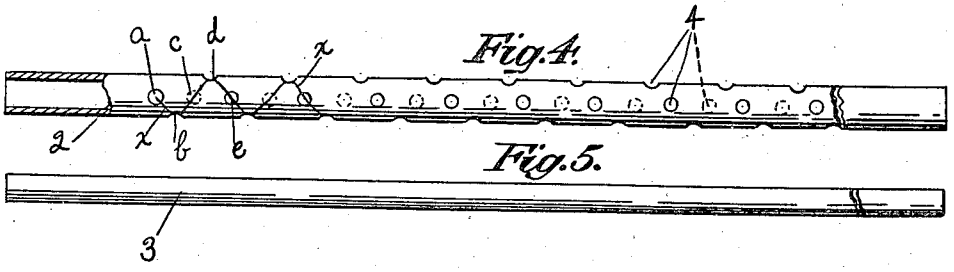


Fig. 4.

Fig. 5.



Fig. 6.

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ROTARY BRUSH.

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To all whom it may concern:

Be it known that I, WILLIAM E. SHERBONDY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Rotary Brushes, of which the following is a specification.

This invention relates to brushes, and particularly to a rotary brush adapted to be employed in connection with vacuum cleaner machines, carpet sweepers and the like.

One of the objects of this invention is to provide a device of this character which can be economically manufactured, easily constructed, durable in use, and effective for the various uses for which it is designed.

Another object of this invention is to provide a brush wherein the tufts of the brush are fastened into the rotatable spindle in a novel and facile manner. Heretofore it has been the practice to fasten the tufts into the spindle by wiring, but this has been found an unsatisfactory and uneconomical way of manufacturing the same. In order to do away with the wiring, I provide a hollow metal tube or spindle, into which is driven a wooden dowel or core, the shaft then being drilled and the tufts stapled in. This construction is found not only to be more readily and economically accomplished, but provides a firmer and more durable retaining means for the brush itself.

Another object of this invention is to provide a novel arrangement of the tufts of the brush so as to obtain maximum effectiveness in cleaning the surface, particularly in conjunction with a suction cleaner. Heretofore brushes of this class have been usually constructed either by arranging two rows of bristles 180° apart or having the bristle tufts radiate from the cylinder so as to form a cylindrical brush with all the bristles close together, or to provide several rows of bristles, each row positioned spirally about the cylinder and forming substantially a continuous spiral.

In use however, difficulty has been encountered in picking up particles, particularly large particles, as for instance, a continuous spiral brush tends to push the particles along the floor by following lengthwise the spiral and a cylindrical brush tends to roll over the particles or to push them ahead of the brush.

In my improved device, I avoid these disadvantages by locating the holes or apertures for the tufts in a plurality of straight rows 90° apart, the apertures or tufts of one row being spaced lengthwise and in alinement and none of the apertures or tufts of the several rows in transverse alinement, the placing of the apertures or tufts being such that they will form a single spiral around the brush. In other words every aperture or tuft in any one row will be spaced longitudinally of the brush from each adjacent tuft in another row and no aperture or tuft will be alined with or will overlap an aperture or tuft in any other row. Thus, having the tufts so positioned will allow any large particle to fall in between the rows, the suction carrying it on through the machine, and having the tufts placed close together but spaced as hereinbefore explained and on the order of a single spiral will allow the brush to cover every portion of the rug when the machine is run back and forth. Furthermore the spaced but spiral position of the apertures around the entire brush will permit the fastening of the various tufts into a wooden or other core without the interference of the apertures on the opposite side of the supporting spindle with the fastening means.

Other objects of this invention will appear as the description proceeds, reference being had to the accompanying drawings forming a part of this specification, wherein like reference characters indicate corresponding parts throughout the several views, and wherein Fig. 1 is a perspective view of my improved brush; Fig. 2 is a transverse section showing the method of retaining the tufts in position; Fig. 3 is a detail view, partly in section and parts broken away for the sake of clearness; Fig. 4 is a perspective view of the cylinder with the tufts removed; Fig. 5 is a view of the core; and Fig. 6 is a detail view of a staple and corresponding tuft.

In my improved brush for use particularly in connection with the nozzle of vacuum cleaners, I provide a hollow spindle, cylinder or body 2, preferably of metal, having inserted therein a wooden dowel or core 3 for retaining or holding the tufts of the brush in position. In order to fasten the tufts of the brush into the spindle or cylinder, a series of holes 4 are drilled through the metal portion of the spindle and extend-

ing into the core. The tufts 5 are then inserted in these holes and stapled into the wooden dowel or core. This is accomplished by interlocking the staple 6 with the central looped portion 7 of the tuft, (see Fig. 6) and then driving the staple through the hole 4 into the wooden dowel or core. The staples are of such length that upon being driven into the core they will strike the opposite metal surface of the cylinder or body, and the ends will thus be spread as shown at 8 and will firmly retain the tufts in position. Hence, due to the spreading of the staples in the apertures by thus clinching their ends, they will be held firmly in position.

In order to be more effective in the cleaning operation, I provide a novel arrangement of the tufts of the brush so that all particles on the surface to be cleaned will be picked up and drawn into the suction cleaner. In accomplishing this, I provide a plurality of rows of tufts 90° apart, the tufts of each row spaced apart, but in alinement and none of the tufts of the several rows in transverse alinement. Each tuft of each row is therefore located between those of the adjacent rows, and no tuft with reference to its point of fastening is opposite, in whole or in part, another tuft.

In other words, commencing at the left at the tuft marked *a*, it will be seen that the tuft *b* is to the right of it, while the tuft *c* is still further to the right of the tuft *b*, and the tuft *d* is also still further to the right of the tuft *c*. Coming to the tuft *e*, therefore, which is in alinement with the tuft *a*, and in the same row, it will be seen that this tuft is still further to the right of the tuft *d*. Hence, there are no tufts in the several rows in transverse alinement with each other around the entire spindle, although the tufts in each row are all in alinement longitudinally of the brush.

Furthermore commencing with the tuft marked *a*, it will be noted that a line connecting each adjacent tuft drawn around the cylinder will conform substantially to a single spiral as shown by line *x* in Fig. 4. Adjacent each end of the cylinder small holes 9 are drilled and a sleeve 6 provided with a small gear 7 is slipped over the ends of the cylinder and retained in place by a pin 8.

One of the essential features involved is the locating of the rows of tufts or bristles 90° apart, but placed in a spiral fashion around the brush, and having them spaced lengthwise. Thus in having the rows 90° apart, any large particles may be picked up, whereas in a continuous spiral brush there is a tendency to push the particle along the floor by following lengthwise the spiral. A continuous row of bristles with a spiral brush or a brush having the tufts radiating from all parts of the cylinder and as closely together as possible, used in the nozzle of a vacuum cleaner machine, will not allow large particles to enter into the nozzle. As hereinbefore stated, the machine and brush will either roll over them or push them along toward one end or the other of the nozzle. My improved brush however, having the rows 90° apart, will allow any large particle to fall in between the rows, and the tufts placed close together on the order of a spiral, covers every portion of a rug when the machine is run back and forth. The tufts are placed as closely together as the shaft can be drilled, and it will be noted that it is impossible to place them closer together, as in such case one hole would run into the next adjacent hole. If the tufts were further apart, as in the case if the rows were more than 90° apart, they would not cover during the rotation of the brush the entire surface of the floor or carpet.

It is due to this spiral arrangement with the rows 90° apart, that I obtain maximum effectiveness in cleaning the surface of the carpet or floor, and in picking up all particles whether small or large.

Although I have described my invention in a present preferred form, I desire it understood that I do not limit myself to the exact form described and illustrated, but may make such changes as will come within the scope of the appended claims.

I claim as my invention:

1. In a device of the class described the combination of a hollow body provided with a series of apertures, a wooden core, bristle tufts having looped portions adapted to be inserted into said apertures, and clinching means engaging said core and bristle for retaining said tufts in position.

2. In a device of the class described the combination of a hollow rotatable body and a non-perforated wooden core held therein by frictional engagement with the inner surfaces thereof, and means for clinching a plurality of bristle tufts to said core.

3. In a device of the class described, a rotatable spindle provided with four straight rows of tuft receiving apertures, the adjacent rows thereof being 90° apart, and the successive oppositely located apertures being spaced apart longitudinally of the spindle a distance at least as great as the diameter of the adjacent apertures of the adjacent rows, tufts located in said apertures and forming a single spiral about the spindle.

Signed at Cleveland, county of Cuyahoga and State of Ohio this 25th day of October, 1920.

WILLIAM EDWIN SHERBONDY.