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A. L. LE FEBVRE

2,402,333

PROCESS FOR FORMING BRUSHES

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Fig. 1

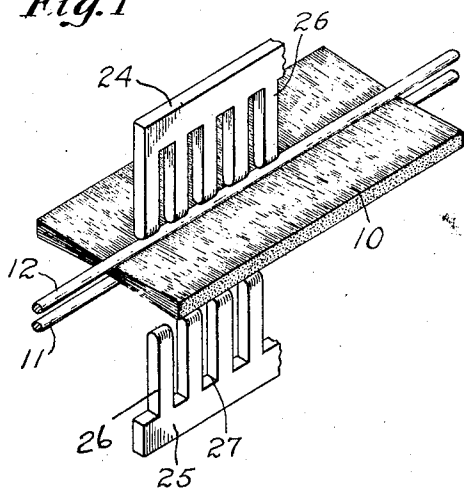


Fig. 2

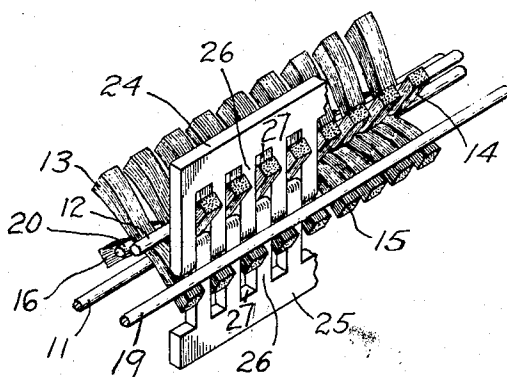


Fig. 3

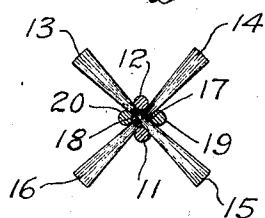


Fig. 4

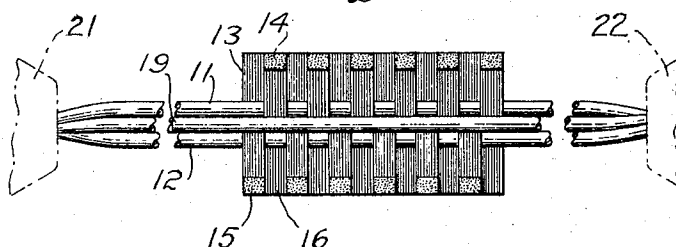


Fig. 5

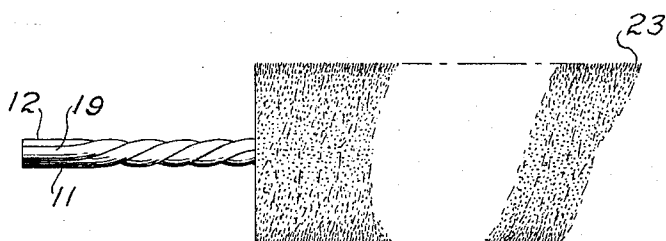


Fig. 7

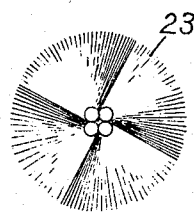
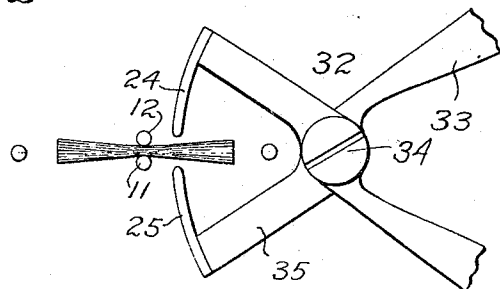


Fig. 6



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PROCESS FOR FORMING BRUSHES

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2 Claims. (Cl. 300—21)

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My invention relates to a process for forming brushes in which the bristles are held in a core composed of three or more wires twisted together to comprise a novel formation of twisted structure, and an object of my invention, among others, is to provide a simple process for assembling the core wires and the bristles for the twisting operation.

My improved process in the practice of which the objects herein contemplated are embodied is disclosed in the accompanying drawing in which—

Figure 1 is an isometric view illustrating the arrangement of the wires and brush material in a preliminary step in the process.

Figure 2 is a similar view illustrating an advanced step in the process.

Figure 3 is a view in cross section showing the relative position and arrangement of the wires and brush material after the operation disclosed in Fig. 2.

Figure 4 is a view in side elevation showing the operation of the combs in displacing the brush material for the final twisting operation.

Figure 5 is a side view of a portion of a brush created by this improved process.

Figure 6 illustrates a hand tool as one means for displacing the bristles as an alternative to the means shown in Fig. 4.

Figure 7 is an end view of the brush shown in Figure 5.

This invention is not limited to the use of bristles of any particular type, but contemplates the use of bristles of any of the various materials now employed in the making of any of the many types of brushes in common use, and the term "bristles" as employed herein will be understood to include any of the various kinds so used. The process herein disclosed is particularly applicable to the use of bristles composed of wire and the drawing is illustrative in particular of brushes composed of this type of bristles.

In effecting my improved process a layer 10 of bristles, said layer being of a length substantially that of the twisted brush to be formed in generally round shape, is arranged with two wires 11—12 that may be termed core wires on opposite sides thereof extending along the center of the layer and midway between the ends of the bristles, these two wires extending beyond the opposite ends of the layers sufficiently to enable them to be grasped by chucks and twisted by the operation thereof.

This layer of bristles is then separated into two parts on each side of the wires 11—12, thereby

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producing the portions 13—14—15—16. The members of each portion of bristles on each side of the wires 11—12 are disposed at an angle to adjacent portions lying on opposite sides thereof, thereby forming throats 17—18 between the members of portions of bristles on each side of the wires.

When thus arranged a second set of core wires comprising wires 19—20 is placed in the throats 17—18 as shown in Fig. 3 and the ends of the four wires are then secured in chucks 21—22 either or both of which may be rotated to twist the wires thus positioned and thereby produce a brush 23 as shown in Figs. 5 and 7.

In disposing the bristles in the form of parts or portions hereinbefore described a pair of combs 24—25 may be employed, these combs being of a length substantially that of the layer of bristles 10. Each of the combs is formed with a set of flat teeth 26, all of the teeth in each set being preferably of the same width and separated to produce spaces 27 substantially of the same width as that of the teeth. To separate the layer of bristles two combs are positioned upon opposite sides of the layer on one side of the core wires with the ends of the combs substantially even with each other and with the ends of the bristle layer, the ends of the teeth in each comb being placed opposite the spaces in the other comb. The two combs are then moved together, the teeth on each comb passing into the spaces between the teeth of the other comb and carrying with it a portion of bristles substantially the width of the spaces between the teeth. As the portions of bristles are displaced by the combs as described, the opposite ends of each portion from the part thus pressed downward or upward are, owing to some stiffness inherent in the bristles, displaced in the opposite direction, that is, upward or downward, the displacement of the portions 13 resulting in creating the parts 15 and the displacement of the portions 14 creating the parts 16, thereby disposing the bristles in the positions shown in Fig. 4 of the drawing and in position to receive the wires 19—20 hereinbefore explained.

In the operation of arranging the bristle layer the wires 11—12 are secured at one end within one of the chucks 21 or 22, and the opposite end of the lower wire 11 is secured in the other chuck. The free end of the wire 12 is raised and a bundle of bristles is placed between the two wires, and the free end of the wire 11 is now secured in a chuck. The tie or cord securing the bundle of bristles is removed and the bristles are then manually evenly spread and arranged in the condition

shown in Fig. 1. Both ends of the wires being now secured in the chucks to retain the bristles in this condition, the combs are closed together thereby dividing the layer into the portions or parts hereinbefore referred to, each portion constituting one end of a bristle or bristles being forced in one direction and the opposite end of said portion being forced in the opposite direction, positioning the bristles in the form shown in Fig. 3.

The wires 19—20 are now placed in the throats 17—18 formed by the angularly arranged bristle portions, the wire 19 being preferably threaded into the throat behind the combs 24—25, or said wire may be placed in front of said combs as shown in Fig. 2 and as the combs are opened apart the rod 19 may be pushed toward the center and into the throat 17. All of the core wires 11—12—19—20 being now secured in the chucks 21—22 one of the chucks is rotated with the result that a brush round in form and dense as to its surface is produced, as shown in Figs. 5 and 7.

As an alternative means in separating the layer into portions or parts a hand tool as shown in Fig. 6 may be employed, this tool 32 comprising an instrument in the form of tongs with handles 33 rotatably connected by a pivot 34, the handles being closed together after the manner of a tongs structure to close jaws 35 together. The jaws 35 at their ends are provided with combs 24—25 secured to the jaws in any suitable manner. Upon closing the handles the combs are operated to cause the teeth to intermesh as above described with respect to the combs 24—25, as shown in Figs. 1 and 2, thereby creating the bristle portions or parts hereinbefore set out.

While the process hereinabove described sets out the separation of a single layer of strands or bristles comprising the brush material separated into two portions or parts on opposite sides of the core wires, I contemplate that this process need not be so limited and need not be confined

to the number of parts herein shown and described, but that such number of parts may be varied to such extent as may be desired. It is similarly contemplated that the portions or parts may be varied as to the number of bristles therein to such extent as may be desired.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out within the scope of the appended claims.

I claim:

1. A process for forming a brush comprising a core of wires twisted together to secure brush strands therein, said process including placing a single layer of brush strands between two wires, separating the layer on opposite sides of the wires into a plurality of portions spaced apart and relatively angularly disposed on said opposite sides of the wires, placing wires in the throats formed by said angular arrangement, and then twisting the several wires together to secure the strands in place.

2. A process for forming a brush comprising a core of wires twisted together to secure brush strands therein, said process including placing a single layer of brush strands between a set of wires comprising two wires, separating the layer on opposite sides of the wires into a plurality of portions by forcing the members of each of said portions on each side of the wires alternately in opposite directions to dispose them in substantially even angular arrangement, placing a second wire in each of the rows of throats formed by said angular arrangement, and then twisting the several wires together to secure the strands in place.

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