

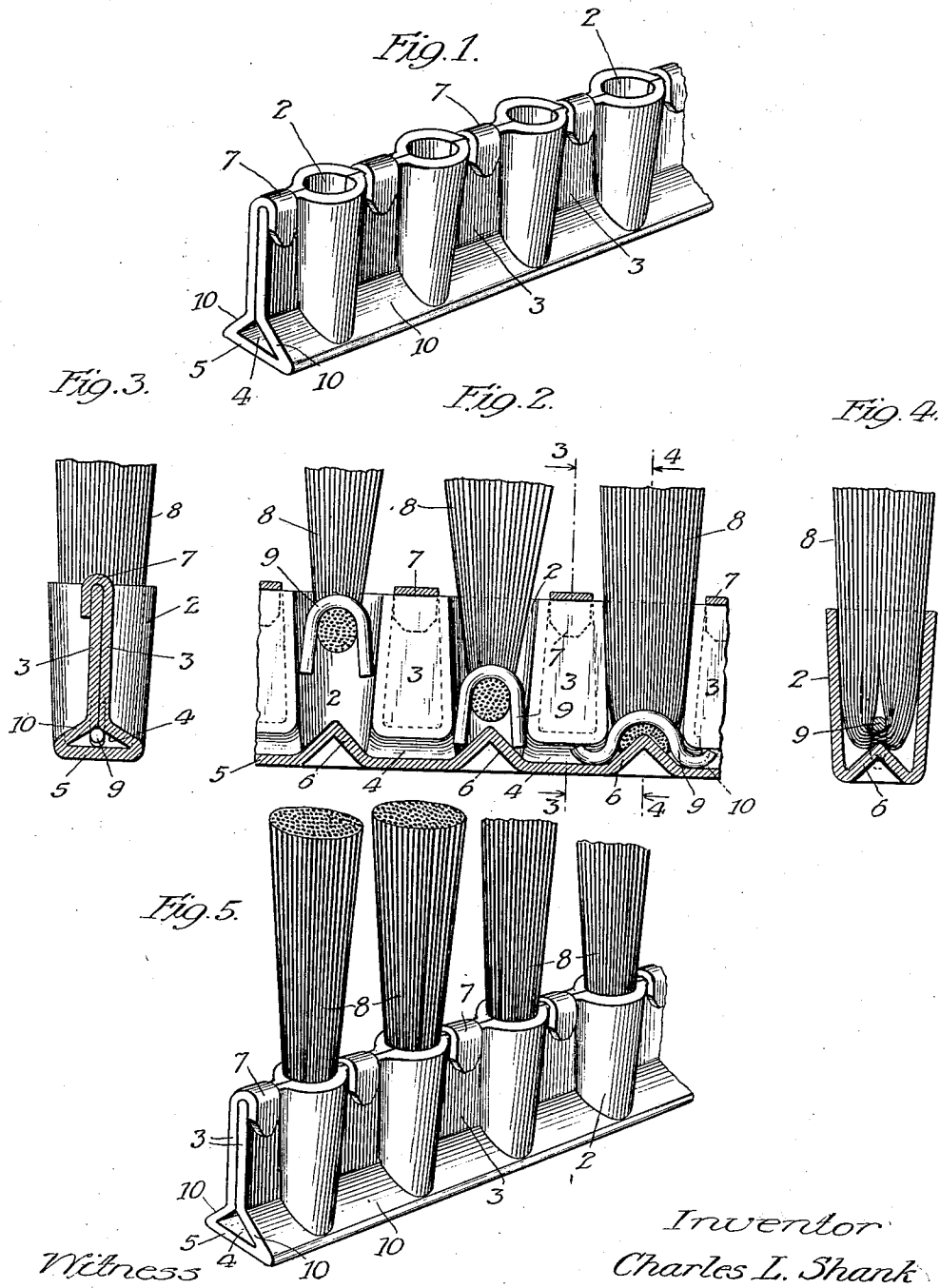
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BRUSH

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UNITED STATES PATENT OFFICE

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BRUSH

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This invention relates to brushes and more particularly to metal back tufted brushes and the method of stapling a bristle tuft therein.

In many applications it is desirable that a long brush of relatively small width and thickness be provided. Such uses are found in suction cleaners where a long brush of small transverse cross section and light weight is necessary in certain types of machines. In such uses brushes having wooden backs have proven inapplicable and the necessity of strength and lightness has required that brushes with metal backs be used. Efforts directed towards the production of this type of brush commercially have proved uneconomical in the past because of the necessity for special machines for stapling. In a brush constructed in accordance with the present invention the method of stapling the bristles is simple and the ordinary stapling machine can be adapted to perform the operation. The brush unit is composed of a minimum number of parts and is adapted to be manufactured commercially in large quantities.

The principal object of this invention is, therefore, to provide a brush of a type that can be manufactured in small sizes yet which has a back of strength and rigidity. A second object is to provide a simple metal back brush of light weight which is adapted to be manufactured in large quantities. A still further object is to provide a simple metal back brush which requires only a simple stapling process.

Referring to the drawings in which like reference characters refer to like parts throughout the several views:—

Figure 1 is a view in perspective of a metal brush back constructed in accordance with this invention.

Figure 2 is a longitudinal cross section through a brush constructed in accordance with this invention showing the various steps in the stapling process.

Figure 3 is a transverse cross section on the line 3—3 of Figure 2.

Figure 4 is a transverse cross section on the line 4—4 of Figure 2.

Figure 5 is a view in perspective of a portion of a finished brush constructed in accordance with this invention.

In a brush constructed in accordance with the present invention the brush back is made of a single sheet-metal strip which has been bent, folded and deformed so that in its assembled relation the structure shown in Figure 1 is present, the particular method therefor forming no part of the present invention. In the assembled relation the brush back comprises spaced tuft seats 2 formed of opposing semi-cylindrical depressions in the opposite sides of the folded sheet strip which are separated by spaces 3 therebetween. Passageways 4, formed by converging side walls 10 above the bottom face 5, extend between successive tuft seats and under the contacting surfaces 3, as is clearly shown in Figure 2. The bottom face 5 of the brush back is of constant width throughout its length and is formed at intervals with pyramids 6 extending inwardly toward each tuft-seat. On one side of the folded strip forming the brush back lips 7 are provided which are adapted to overlie the adjacent surface 3 at the upper edge thereof and so hold the structure in its assembled relation. A section of a completed brush back prior to the stapling of bristles therein is shown in Figure 1.

The stapling operation in which a tuft of bristles is positioned and firmly secured in each tuft seat is, because the novel construction of the brush back, very simple. In stapling a folded tuft of bristles 8 having a double ended staple 9 linked therewith is inserted in its tuft seat and forced downwardly therein by means of pressure exerted upon the staple. This first position is illustrated in Figure 2 on the left. The staple and tuft are forced downwardly as shown in the central position of Figure 2, the staple legs coming into contact with the pyramid 6 in the bottom of the tuft-seat. At this juncture the staple legs are deflected laterally and, upon the driving downward force being continued, are forced into the passageways 4 as shown in the position at the right. The tuft and staple are forced downwardly until, as shown in Figure 2 on the right, the

tuft is clamped between the staple 9 and the pyramid 6 with the staple legs extending into the passageways 4 where they are frictionally and securely held. The frictional resistance of the staple to withdrawal from the tuft seat is greatly increased through the fact that the ends of said legs are permanently distorted through the wedging contact with the pyramid 6 and, in the passageway 4, their ends are tightly wedged between the junction of the converging walls 10, 10 and the bottom face 5.

From the foregoing it is seen that a brush of unusual simplicity and strength which permits of assembly by simple and economical methods has been provided. The brush back, being made of metal and designed with angularly disposed members, can be made of comparatively thin material and yet have the strength and rigidity necessary to resist bending moments. The method required to staple the brush bristles is unusually simple and when completed provides a structure in which the working loose of the bristles is impossible.

I claim:

1. A brush comprising a metal back having tuft seats, closed passageways connecting said tuft seats, tufts of bristles located in said tuft seats and individual securing means therefor comprising staples having legs wedged in said passageways.
2. A brush comprising a metal back having tuft seats, securing means between said tuft seats holding said back in assembled relation, closed passageways connecting said tuft seats, tufts of bristles located in said tuft seats, and securing means therefor frictionally held in said passageways.
3. A brush comprising a single strip of channelled sheet metal, tuft seats formed in said back, upstanding pyramids in the folded edge of said channel and at the bottom of said tuft seats adapted to deflect brush-securing staples forced into said tuft seats, contacting spacers between said tuft seats having securing means thereon adapted to hold the back in assembled relation, and passageways connecting said tuft seats adapted to receive the staples deflected by said pyramids.
4. A brush back comprising a folded and deformed strip of sheet metal having spaced tuft seats formed therein, closed passageways connecting said tuft seats adapted to receive the deflected ends of tuft-securing staples and upstanding deflectors in the bottom of said tuft seats over which the legs of brush-securing staples pass into said passageways.

Signed at North Canton, in the county of Stark and State of Ohio, the 11th day of Jan. A. D. 1929.

CHARLES L. SHANK