

June 4, 1968

SHIGEMI MORIOKU ETAL

3,386,118

RESILIENT BRUSH UNIT

Filed March 7, 1967

2 Sheets-Sheet 1

Fig. 1

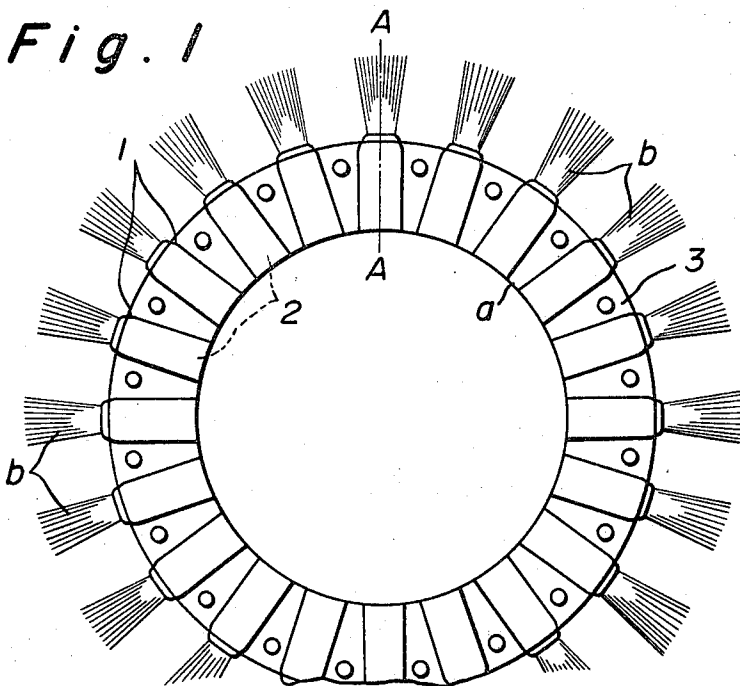
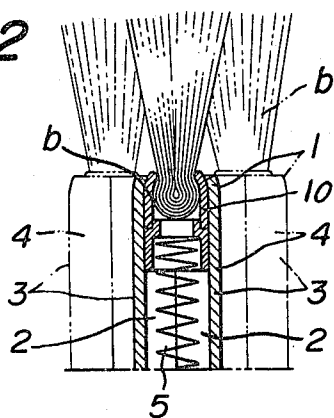


Fig. 2



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Fig. 3

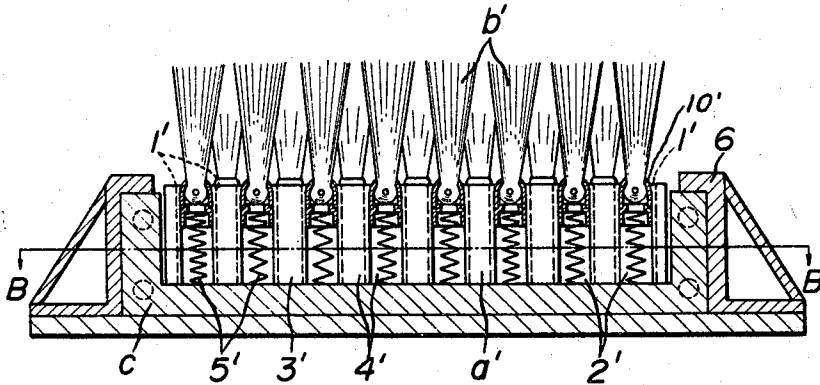
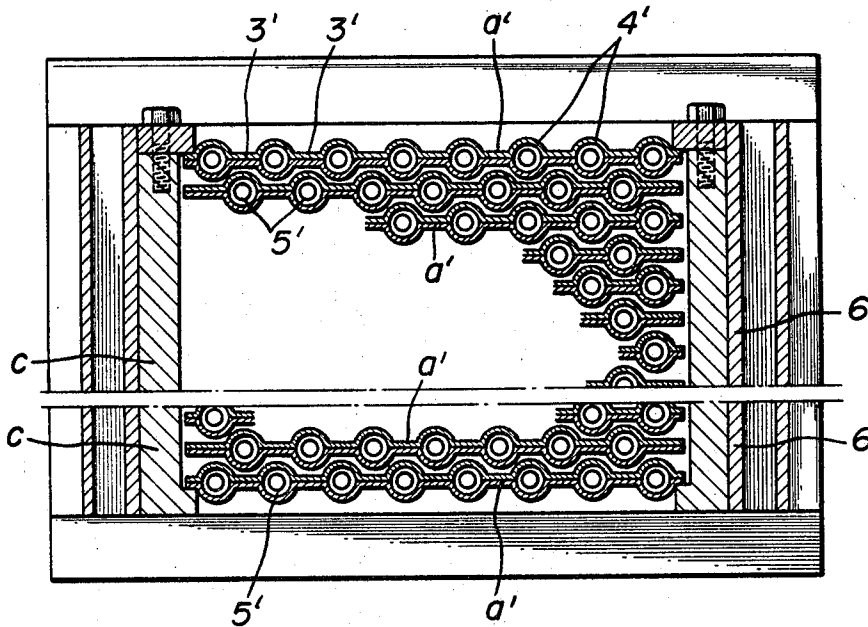


Fig. 4



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RESILIENT BRUSH UNIT

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5 Claims. (Cl. 15—181)

ABSTRACT OF THE DISCLOSURE

The construction of a brush holder is described in respect to two separate embodiments. In each embodiment the brush holder includes a pair of juxtaposed plates each having a plurality of spaced semi-cylindrical cavities which are aligned with the adjacent plate upon juxtaposition to define a cylindrical brush-receiving cavity. A brush having bristles which are formed into a U-shaped configuration are held with the inner bent end within the cavity by forming each cavity with an inturned edge which engages each brush element tightly. The brushes are advantageously biased outwardly away from the cavity by means of a spring element acting on the cavity for the brush.

The present invention relates to a resilient brush unit which is capable of polishing or cleaning the surface of an article uniformly in an efficient manner even when said surface is rugged and which is serviceable over a prolonged period and therefore is economical.

In general, polishing effect or cleaning effect of rotary brushes or polishing brushes is largely influenced by the force under which the brush is depressed against the surface of an article being polished or cleaned. In this connection, conventional brushes of the type described had the drawback that, since the hair of the brush comes to be bent in one direction permanently after frequent use and as a result the tip end of the hair is not effectively used for polishing or cleaning, not only is the polishing or cleaning effect reduced sharply but also the hair is cut or falls out of the brush, substantially shortening the service life of the brush proper. Nevertheless, these conventional brushes are still being used irrespective of such a drawback.

The object of the present invention, therefore, is to provide a resilient brush unit which overcomes the foregoing drawback possessed by the conventional brushes and which has a prolonged service life as well as a capability of polishing or cleaning even a rugged surface effectively.

In order that the present invention may be more clearly understood, reference may now be had to the accompanying drawings in which the present invention is illustrated by way of example and in which:

FIGURE 1 is a front elevation, partially broken away, of a rotary brush roller embodying the present invention;

FIGURE 2 is an enlarged cross section taken along the line A—A of FIGURE 1;

FIGURE 3 is a vertical cross section of a polishing brush wherein the inventive resilient brush units are arranged in a honey-comb state; and

FIGURE 4 is a cross section taken along the line B—B of FIGURE 3.

Referring first to FIGS. 1 and 2, illustrating an embodiment of the invention, a pair of annular members 3, each forming a plurality of radially arranged semicylindrical concaves 2, are put together tightly in such a manner that said semicylindrical concaves formed by one mem-

ber are confronted in registry by the corresponding semicylindrical concaves formed by the other member, so as to form an annular support body *a* defining a plurality of radial cylindrical cavities 4, the outer edge of each semicylindrical section of said members being flexed inwardly as shown at 1. A plurality of the annular support bodies *a* thus formed are combined side by side, with the radial cylindrical cavities arranged in staggered relation in a state of honey-comb, and are tightened together along with annular side plates 3 attached to the opposite sides thereof. A shaft (not shown) is provided extending through the central openings of the opposite side plates and the support bodies *a* to secure the same thereon. A brush assembly is composed of a brush and a brush carrier 10 for rigidly holding the root portion of the brush, is mounted in each cylindrical cavity 4. The brush carrier is slidably disposed in the cavity 4 and is urged outwardly under the bias of a spring 5 which is interposed between it and the bottom end of the cavity (not shown). The brush *b* is prevented from coming out of the cavity by the inwardly flexed edge 1 of the annular members 3.

In use of the rotary brush unit of the construction described above, the brush unit is rotated by way of the shaft and is moved on an article to polish the surface thereof. When the surface is rugged, the brush carrier of each brush element *a* mounted in the cylindrical cavity 4 slidably moves axially of said cavity, as the tip end of the brush travels on the rugged surface, under or against the bias of the spring 5, whereby the brush is not subjected to an unreasonable force and the tip end of the brush is maintained in good contact with the rugged surface, thus enabling a uniform polishing or cleaning to be obtained.

Referring now to FIGS. 3 and 4, illustrating another embodiment of the instant invention, a pair of rectangular members 3', each forming parallel semicylindrical concaves 2', are put together tightly in such a manner that said semicylindrical concaves formed by one member are confronted in registry by the corresponding semicylindrical concaves formed by the other member, so as to form a rectangular support body *a'*. The support body *a'* defines a plurality of parallel cylindrical cavities 4', with the outer edge of each semicylindrical section of said members being flexed inwardly as shown at 1'. A brush assembly comprising a brush *b'* and a brush carrier 10' for rigidly holding the root portion of said brush is mounted in each cylindrical cavity 4'. The brush carrier 10' is slidably disposed in the cavity 4' and is urged outwardly under the bias of a spring 5', interposed between it and the bottom end of the cavity. The carrier 10' and brush *b'* are prevented from coming out of said cavity by the inwardly flexed edge 1' of the rectangular members 3'. A plurality of the support bodies *a'*, with the brush elements mounted therein, are combined side by side, with the cylindrical cavities 4' arranged in staggered honey-comb relation; the bodies *a'* are fitted in a frame structure *c* and secured in said frame structure by way of holding members which are fixed to said structure by means such as of bolts.

In use of the polishing unit thus formed, the unit is suitably mounted on a polishing machine and moved on an article for polishing the surface thereof. When a surface to be polished or cleaned is rugged, the brush carrier of each brush element *b* mounted in the cylindrical cavity 4 slidably moves axially of said cavity, as the tip end of the brush travels on the rugged surface, under or against the bias of the spring 5, whereby it is possible to uniformly polish or clean said surface. In the figures, numeral 6 designates an outer frame structure by which the frame structure *c* carrying a plurality of the support bodies *a* is mounted on the polishing machine.

According to the present invention, since the brush elements *b* mounted in the support bodies *a* are spring biased as described above, the tip ends of the brush elements are always maintained in elastic contact with the surface being polished or cleaned during the polishing or cleaning operation, the brushes are not subjected to an unreasonable force and, therefore, it is possible to avoid drastic reduction in polishing or cleaning effect, which would result from permanent bending or cutting of the brush. Another advantage of the inventive resilient brush unit is that it is economical owing to the prolonged service life of the brush elements proper and it is capable of polishing or cleaning the surface of an article uniformly at high efficiency even when said surface is rugged. Still another advantage of the inventive brush unit is that replacement of the brush element as necessitated by an excessive wear may be attained easily by removing the brush element from the cylindrical cavity 4 together with the spring 5.

What is claimed is:

1. A brush holder comprising a support body including first and second juxtaposed flat plates each having a plurality of spaced semi-cylindrical cavities, the cavities of said first and second plates being aligned to define a plurality of cylindrical brush-receiving cavities having an opening at their one ends, a brush for each cavity each having one end disposed in a respective cavity and having an opposite end projecting outwardly through the opening, each of said cavities being formed with an inwardly directed portion adjacent the open end preventing

said brush one end from coming out of said opening and means biasing said brush one end in a direction toward the opening of the associated cavity.

2. A brush holder according to claim 1, wherein each of said juxtaposed plates is of annular configuration.

3. A brush holder according to claim 1, wherein each of said plates is of substantially rectangular configuration.

4. A brush holder according to claim 3, including a frame surrounding a plurality of pairs of said juxtaposed plates and clamping said plates in position with the cavities of adjacent pairs of said plates being offset.

5. A brush holder according to claim 1, wherein said plates are of substantially annular configuration and including a plurality of pairs of first and second plates arranged in axially spaced relationship with the cavities of each adjacent pair of plates being radially offset from the next adjacent pair.

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