Nov. 19, 1935. W. EPP 2,021,768

ROLLER BRUSH

Filed Oct. 12, 1933

FIG.1.

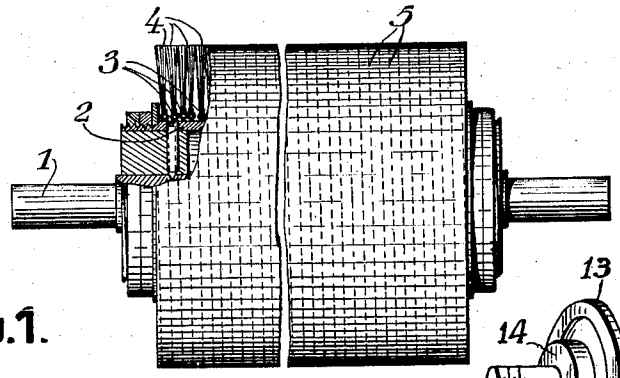


FIG.1b

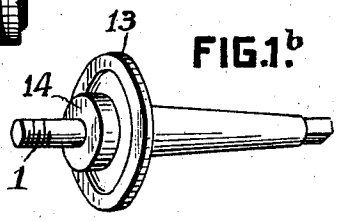


FIG.2.

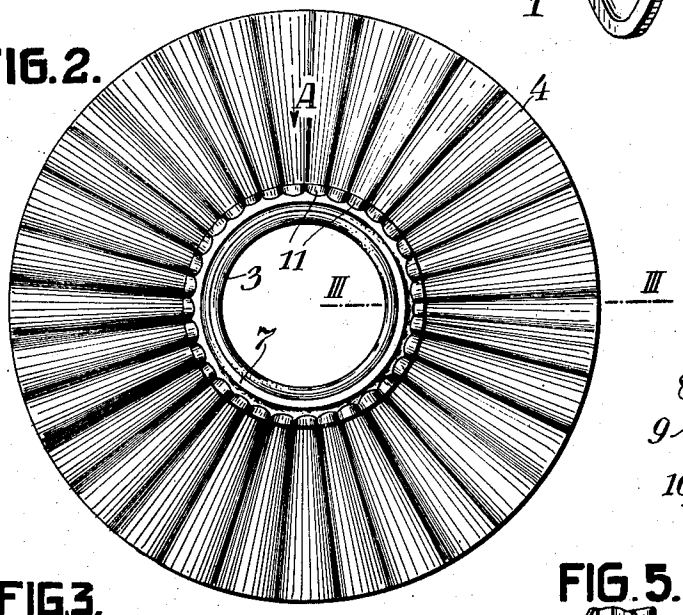


FIG.4.

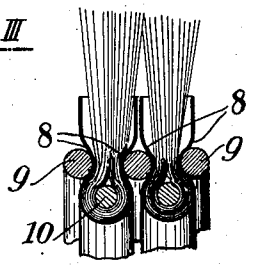


FIG.3.

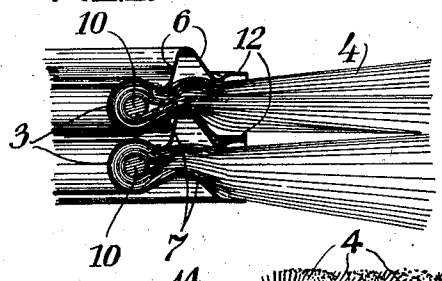


FIG.5.

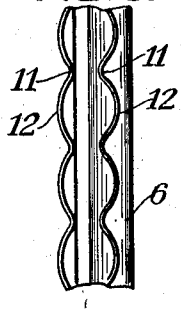


FIG.6.

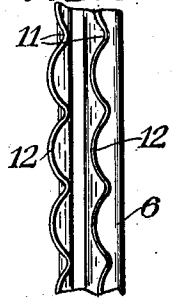
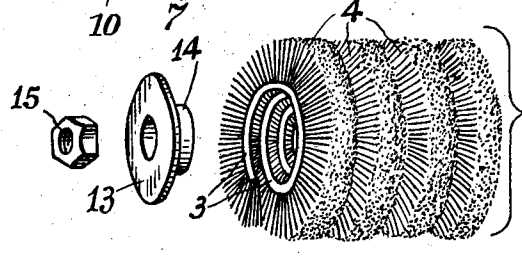


FIG.1a



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ROLLER BRUSH

Wilhelm Epp, Berlin-Pankow, Germany

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In Germany February 21, 1933

5 Claims. (Cl. 15—182)

This invention relates to a roller brush. Brushes of this kind, which are used for numerous purposes, run at comparatively high speeds, for example 2000 to 3000 turns per minute. It has been found that in spite of careful and uniform manufacture of the helical holding member for the bristles, individual convolutions of the holding member are flung outwards on account of the high centrifugal force and on this account the brush becomes useless. This throwing out of parts of the holding member cannot be avoided by the convolutions of the holding member being pressed together in axial direction.

Experience has shown that extremely high axial pressures are not sufficient to prevent a deformation of the holding member by centrifugal force.

It may further happen that with high speeds the holding element lying in the holding member and securing the working means, for example a wire holding the bristles, is thrown outwards by centrifugal action.

In order to avoid this disadvantage according to the invention, holding means, for example ribs or projections engaging in grooves in the convolutions of the holding member for the bristles, are provided which interconnect the individual convolutions and secure them against displacement in the radial direction and also reinforce the holding member and prevent the wire holding the bristles from being thrown outwards.

In the accompanying drawing several constructional examples of the invention are illustrated.

Fig. 1 is an elevation of a brush roller on a small scale partly broken away and shown in section,

Figs. 1*a* and 1*b* show details of a brush roller in another constructional form,

Fig. 2 is an end elevation of the spiral holding member according to the invention with bristles on a somewhat larger scale,

Fig. 3 is a section through two adjacent convolutions of the holding member in Fig. 2 on the line III—III on an enlarged scale,

Fig. 4 is a section similar to Fig. 3 but in a modified construction,

Fig. 5 is an elevation of a peripheral part of the holding member in the direction A (without bristles),

Fig. 6 is a similar elevation to Fig. 5 of a peripheral portion of the holding member in a somewhat different construction (without bristles).

In Fig. 1, 1 is a shaft with which a cylindrical base member 2 is connected. On this is mounted the roller brush proper which consists of the holding member 3 and the working means in the form of bristles 4. The working means may consist of the materials which are used for the cleaning, grinding, polishing, wetting with liquid and similar operations, such as bristles, wires, tongues and the like. The holding member 3 has a helical shape, as shown by the broken lines 5 in Fig. 1, and is made of a material, for example sheet metal, such that after being given a helical shape it will retain this shape independently of the base member 2. This retention of shape is an essential feature of the roller brush illustrated.

According to the invention the convolutions of the holding member 3 have on one side ribs or projections 6 and on the other side grooves 7 which are so arranged that the ribs and grooves interengage so that the individual convolutions interconnect and prevent radial displacement. With this construction of the holding member it is impossible for a convolution to become thrown outwards owing to centrifugal force even when the convolutions only lie loosely against one another.

The same effect can also be obtained in another manner, as shown, for example, in Fig. 4, the convolutions of the holding member being provided with grooves 8 on both sides and between the separate convolutions of the holding member a coupling member, for example a wire spiral 9, being provided which prevents displacement of the individual convolutions in the radial direction.

The constructions described and illustrated in Figs. 3 and 4 have the further object of reinforcing the holding member and preventing throwing out of the wire 10 holding the bristles. The same purpose is served by the radial depressions 11 provided according to the invention on both sides of the holding member 3, preferably at equal distances apart. The depressions can be turned towards one another as in Fig. 5 so that the distance between the two walls 12 varies or they may all face in the same direction as shown in Fig. 6 so that the distance between the walls is always the same. It will be recognized that by these depressions 11 the holding member is considerably stiffened and the throwing out of the wire 10 is made much more difficult. The depressions 11 also have the important object of giving the bristles a better hold. On account of the corrugated shape of the walls 12, the bristles are supported and held against displacement and bending in the tangential direction B in a much more effective manner than with the known smooth walls. By the enclosing of the bristles between corrugated walls they are very uniformly

distributed, especially in the construction according to Fig. 6 and on account of the corrugated arrangement the separate convolutions of the roller brush are pressed one into another so that when the roller brush is assembled the helical shape of the brush cannot be perceived.

The holding means (ribs 6 and grooves 7) provided according to the invention may also be duplicated or repeated several times with broad holding members. It is also possible to arrange the holding means on the holding member not continuously but at intervals in order to obtain the same effect.

It would of course also be possible to omit the base member 2 and arrange the brush spiral directly on the shaft 1.

The constructional form according to Figs. 1*a* and 1*b* differs from that in Fig. 1 only in that a separate cylindrical base member 2 is dispensed with as the holding member for the brushes and consequently the brushes themselves retain their cylindrical form quite independently of the base member. The holding member 3 for the brushes 4 in this case surrounds the shaft 1 at a distance and clamping discs 13 are provided with suitable extensions 14 by which the central position of the holding member 3 with the working means with respect to the shaft 1 is ensured. A nut 15 provides the necessary pressure for the clamping means 13.

The construction according to the invention of the roller brush or the holding member makes it possible to use extremely high speeds, for example 4000 or more revolutions per minute, without the slightest disadvantageous change in the roller brush.

What I claim is:

1. A roller-shaped brush, comprising a U-shaped holding member arranged in a plurality of helical convolutions, the separate convolutions retaining their helical shape after their manufacture and being adapted to have parts of the side surfaces of adjacent convolutions in contact with each other, working means held fast in the U-shaped holding member, and means on the side surfaces of the U-shaped holding member for connecting the neighbouring convolutions and preventing individual convolutions, from loosening radially on account of centrifugal force.

2. A roller-shaped brush, comprising a shaft, a U-shaped holding member arranged in a plurality of helical convolutions around the shaft, the separate convolutions retaining their helical shape independently of the shaft and having parts of the side surfaces of adjacent convolutions in contact with each other, working means held fast in the U-shaped holding member, means on the side surfaces of the U-shaped holding member for connecting the neighbouring convolutions and preventing individual convolutions from loosening radially on account of centrifugal force, and clamping means at the ends of the roller-shaped brush for pressing the connecting means of the convolutions together.

3. A roller-shaped brush, comprising a shaft, a U-shaped holding member arranged in a plurality of helical convolutions around the shaft, the separate convolutions retaining their helical shape independently of the shaft and having parts of the side surfaces of adjacent convolutions in contact with each other, a holding element inserted in the U-shaped holding member, working means held fast by the holding element, the side surfaces of the convolutions of the U-shaped holding member having concentric depressions and raised portions, neighbouring side surfaces being thereby interlocked for preventing individual convolutions from loosening radially on account of centrifugal force and clamping means at the ends of the roller-shaped brush for pressing the depressions and raised portions of the convolutions together.

4. A roller-shaped brush, comprising a shaft, a U-shaped holding member arranged in a plurality of helical convolutions around the shaft, the separate convolutions retaining their helical shape independently of the shaft and having parts of the side surfaces of adjacent convolutions in contact with each other, a holding element inserted in the U-shaped holding member, working means held fast by the holding element, the side surfaces of the convolutions of the U-shaped holding member having concentric depressions, a coupling member engaging simultaneously in the depressions of two neighbouring side surfaces of the convolutions, for preventing individual convolution from loosening radially on account of centrifugal force, and clamping means at the ends of the roller-shaped brush for pressing the convolutions on to the coupling member arranged between them.

5. A roller-shaped brush, comprising a shaft, a cylindrical base member on the shaft, a U-shaped holding member arranged in a plurality of helical convolutions around the base member, the separate convolutions retaining their helical shape independently of the base member and having parts of the side surfaces of adjacent convolutions in mutual contact, a wire inserted in the U-shaped holding member, bristles held fast by the wire, the side surfaces of the convolutions of the U-shaped holding member having concentric depressions, a helically-wound wire engaging in the depressions of two neighbouring side surfaces of the convolutions for preventing individual convolutions from loosening radially on account of centrifugal force and clamping means at the ends of the roller-shaped brush for pressing the convolutions on to the wire arranged between them.

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