July 21, 1953 L. J. MUNDO 2,645,802

SECTIONAL BRUSH ASSEMBLY

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FIG. 1.

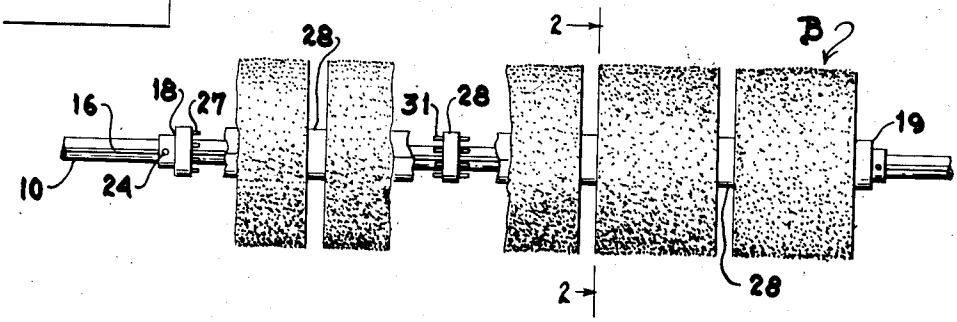
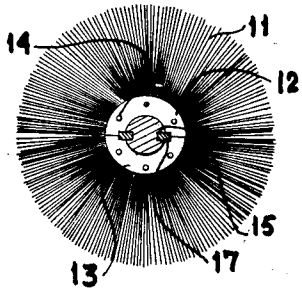
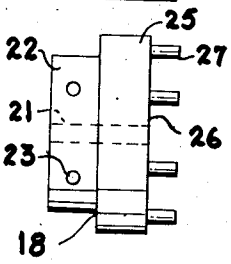


FIG. 2.

FIG. 4.

FIG. 3.





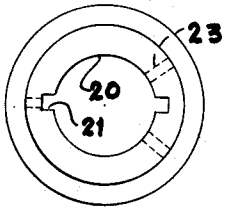
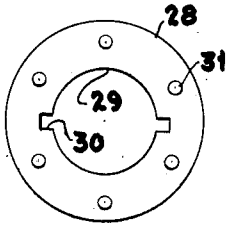


FIG. 5.



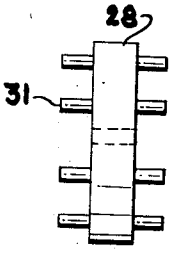


FIG. 6.

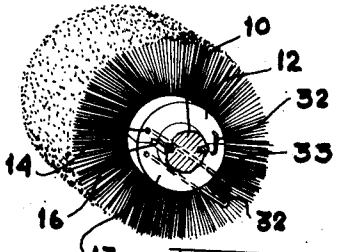


FIG. 7.

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SECTIONAL BRUSH ASSEMBLY

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9 Claims. (Cl. 15—181)

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The present invention relates to brush assemblies and is concerned primarily with that type of brush assembly which is used in car washing.

At the present time it is common practice to assemble a plurality of split brushes on a shaft for car washing purposes. Each brush comprises bristles which extend from a core which is formed as two complemental halves each having a semicircular recess which receives the shaft. These halves are clamped to the shaft by bolts. This arrangement presents certain features of disadvantage in that considerable difficulty is experienced in assembling the brushes on the shaft and also in replacing any brush elements which might become worn or damaged.

The present invention has in view as its foremost objective the provision of a brush assembly of the type indicated which consists essentially of the usual shaft and brush halves, together with plates and collars which maintain the brush elements in an assembled position on the shaft.

In more detail, the invention has as an object the provision of a brush assembly of the type indicated in which the end faces of the brush cores are formed with small openings or recesses. Ring-like plates are mounted on the shaft and outstanding from the opposite faces of each of these plates are pins which are received in the openings on the end faces of the core elements. Thus, these plates, with the interlocking pins, serve to maintain the brush halves assembled on the shaft.

Still another object of the invention is to provide, in a brush assembly of the type indicated, a pair of end collars which are located at the opposite ends of the assembly. Each of these collars carries inwardly extending pins which are received in complemental openings in the cores of the outermost brushes and each collar is provided with means for holding the same against longitudnial movement on the shaft. This means may take the form of one or more set screws.

Still another object of the invention is to provide, in a brush assembly of the type indicated, a shaft, together with collars and plates of the character aforesaid, which are formed with complemental keyways. Keys pass through these keyways and serve to establish a non-rotative relation between the shaft and the collars and plates. These keys also cooperate with the brush halves to establish a driving relation between the shaft and the brushes.

A further object is to provide a somewhat modified form of means for holding the brush halves assembled on the shaft. In this form of the invention the ring-like plates are replaced by U-shaped holding elements, each of which has a pair of legs that fit in oppositely arranged openings in the core elements of the brushes.

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Various other more detailed objects and advantages of the invention, such as arise in connection with carrying out the above noted ideas in a practical embodiment, will in part become apparent and in part be hereinafter stated as the description of the invention proceeds.

The invention therefore comprises a brush assembly that is intended for use in car washing and which consists essentially of a shaft, a pair of end collars on said shaft, and a plurality of brushes arranged between the end collars. Each brush comprises a pair of complemental halves having core elements formed with recesses on their end faces. Each of the end collars carries inwardly extending pins which are received at the recesses on the outermost faces of the brushes at the opposite ends of the assembly. Between adjacent brushes additional holding means are employed. This holding means preferably takes the form of a ring-like plate having pins projecting from the opposite faces thereof and which pins are received in the openings in the core elements.

In a modified form of the invention, U-shaped holding elements are employed in place of these plates. The face, collar and plates are formed with complemental keyways which receive keys about which the brush halves are assembled to establish a non-rotative relation between the shaft and the brushes.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawing, wherein

Figure 1 is an elevational view of a brush assembly as designed in accordance with the precepts of this invention. In this view, certain parts of the brushes are broken away to permit of illustration of one of the collars and one of the plates.

Figure 2 is a transverse section taken about on the plane represented by the line 2—2 of Figure 1.

Figure 3 is a view in side elevation of one of the end collars per se.

Figure 4 is an elevation taken as an outside end view of the collar shown in Figure 3.

Figure 5 is an end elevation showing one of the plates, which is arranged between adjacent brushes.

Figure 6 is a view in side elevation of the plate shown in Figure 5; and

Figure 7 is a perspective view of a modified form of a holding means.

Referring now to the drawing wherein like characters denote corresponding parts and, first, more particularly to Figures 1 and 2, the brush assembly of this invention is shown as including as essential elements a shaft 10 and a plurality of brushes, each of which is referred to in its entirety by the reference character B.

As shown in Figure 2, each brush B comprises a plurality of bristles 11 which oustand from a pair of complemental core halves 12 and 13. The core elements 12 and 13 are ordinarily made of wood or comparable material and the end face of each core element is formed with a plurality of small openings or recesses 14.

The shaft 10 is formed with a pair of keyways 15 at diametrically opposite points and received in each of these keyways is a key 16. Each of the core elements 12 and 13 is formed at diametrically opposite points with a corner-shaped notch 17 which accommodates and receives the key 16 when the brushes B are assembled on the shaft 10.

The brushes B are embraced between a pair of end collars 18 and 19. These collars 18 and 19 are of substantially identical construction and only one of them is herein described in detail for the purposes of this specification.

Referring to Figures 3 and 4, the collar 18 which is therein illustrated will be described. This collar 18 is formed with a bore 20 which snugly receives the shaft 10. Communicating with the bore 20 are a pair of diametrically opposed keyways 21 which are arranged opposite to the keyways 15 in the shaft 10 and which receive the keys 16. The collar 18 includes a hub portion 22 which is formed with a plurality of threaded openings represented by the broken lines at 23 in Fig. 4 and each of which receives an Allen setscrew as shown at 24 in Figure 1. One of these openings 23 preferably communicates with one of the keyways 21, as illustrated in Figure 4, and the inner end of the setscrew 24 will then engage the outer edge of the key 16.

Outstanding from the hub 22 at one end of the collar 18 is a circular flange or enlarged portion 25 having an inner end face at 26 from which project a plurality of pins 27. The pins 27 on the collar 18 are received in the openings 14 on the outer end faces of the core elements of the brush which is located at that end of the assembly. In a similar manner the pins 27 on the collar 19 are received in the openings 14 on the brush B at the other end of the assembly.

Between the adjacent ends of each pair of brushes B there is a holding plate 28. One of these holding plates is illustrated in detail in Figures 5 and 6. Each holding plate 28 has a bore 29 which receives the shaft 10. Communicating with this bore 29 are a pair of diametrically opposed keyways 30 which are complemental to the keyways 15 in the shaft 10 and which receive the keys 16. Outstanding from the opposite end faces of the plate 28 are pins 31 which are in every respect identical to the pins 27. These pins 31 are received in the openings 14 in the end faces of the core elements of the adjacent brushes.

While the mode of assembling the brushes B on the shaft 10 is believed to be obvious from the description of the parts given, it may be briefly outlined by noting that one of the end collars 18 or 19 is first positioned on the shaft 10 with the keys 16 being received in the keyways 21. The Allen setscrews 24 are then tightened to lock this

end collar in position. A brush B is then assembled about the shaft and slid up in abutting relation within the end collar so that the openings 14 receive the pins 27. A plate 28 is then slid over the shaft and up against the end face of the core of the brush which has just been assembled so that the pins 31 are received in the openings 14.

As many brushes B as are required for each assembly are added in this manner. After the last brush B has been assembled about the shaft, the other end collar is added and locked in position by the Allen setscrews 24.

Should any of the brushes B at any time become so worn or damaged that they should be replaced, all that is required is to loosen the setscrews 24 for one of the end collars to permit of a certain amount of axial movement on the part of the damaged brush and the brushes at one side thereof. The brushes are moved sufficiently far to clear the pins 31 of the recesses 14 and the particular brush which is to be replaced. That brush, or one-half thereof, may then be taken out and replaced with a new one. The brushes and collars are then slid together in the manner above outlined and the end collar again locked in position.

Modification

A somewhat modified form of the invention is illustrated in Figure 7. In this form of the invention the plates 28 are dispensed with. Instead of using these plates, a pair of U-shaped holding elements 32 are employed for each end of each brush. Each holding element 32 has a pair of legs 33 which are received in the openings 14 in the brush cores 12 and 13. Thus, there is a holding element 32 at one side for two of the openings 14, one in the core member 12 and the other in the core member 13, and another element 32 is positioned in the pair of openings at the opposite side. Two of these elements 32 at each end of each brush is sufficient to maintain the brush halves assembled on the shaft 10.

With several of the brushes B assembled in end-to-end abutting relation it is of course impossible for these holding elements to become displaced. This relation of the brushes is maintained by employing a pair of the end collars 18 and 19 in the manner above outlined.

While preferred specific embodiments of the invention are hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact constructions, mechanisms and devices illustrated and described because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

What is claimed is:

1. In a brush assembly of the character described, the combination of a shaft, a pair of end collars mounted on said shaft in spaced relation, means for holding each of said end collars against longitudinal movement on said shaft, a plurality of brushes confined between said end collars, each of said brushes consisting of bristles which outstand from a pair of complemental core halves, each of said core halves having end faces formed with openings therein, a ring-like plate encompassing said shaft and arranged between adjacent brushes, pins outstanding from the opposite faces of said plate and slidably received in the openings of said core halves, and a key establishing a nonrotative relation between said shaft and said brushes.

2. In a brush assembly of the character described, a shaft, an end collar fixedly mounted on said shaft, pins extending inwardly from the end face of said collar, a brush comprising two complemental halves each having a core element the opposite end faces of which are formed with openings which correspond in number and arrangement to the pins on said end collar, the openings at one end of said brush slidably receiving said pins on said end collar, holding means at the other end of said brush fixedly mounted on said shaft and cooperating with the openings in the end face thereat and with said end collar to confine said brush, and a key establishing a nonrotative relation between said shaft and said brush.

3. In a brush assembly of the character described, a shaft, an end collar fixedly mounted on said shaft, pins extending inwardly from the end face of said collar, a brush comprising two complemental halves each having a core element the opposite end faces of which are formed with openings which correspond in number and arrangement to the pins on said end collar, the openings at one end of said brush slidably receiving said pins on said end collar, a ring-like plate disposed about said shaft, pins projecting outwardly from the face of said plate and slidably received in the openings in the core of said brush at the end remote from said end collar, holding means fixedly mounted on said shaft and cooperating with said end collar to confine said brush and plate on said shaft, and key means establishing a nonrotative relation between said brush and shaft.

4. In a brush assembly of the character described, a shaft formed with a keyway, a key in said keyway and projecting beyond the periphery of said shaft, a brush comprising bristles outstanding from a pair of complemental core elements, each of said core elements being formed with a semicircular recess which receives said shaft and a notch at one end of said recess which receives said key, the opposite ends of said core elements being formed with openings, a member encircling and fixedly mounted on said shaft at opposite ends of said brush, each of said members being formed with a keyway accommodating said key, and pins projecting from said members and slidably received in said openings to maintain said brush assembled about said shaft.

5. In a brush assembly of the character described, a shaft formed with a keyway, a key in said keyway and projecting beyond the periphery of said shaft, a brush comprising bristles outstanding from a pair of complemental core elements, each of said core elements being formed with a semicircular recess which receives said shaft and a notch at one end of said recess which receives said key, the opposite ends of said core elements being formed with openings, a pair of U-shaped holding members at each end of said brush with each holding member having a pair of legs which are slidably received in openings in said core elements, one leg of one holding member being slidably received in an opening in one core element, and the other leg being slidably received in the opening of the other of said core elements, and a pair of end collars fixedly mounted on said shaft and confining said brush therebetween.

6. In combination, a shaft formed with a pair of diametrically opposite keyways, a key in each of said keyways projecting beyond the periphery of said shaft, a pair of end collars each formed with a pair of keyways receiving said keys, said collars being mounted on said shaft in spaced relation, releasable means carried by each collar for locking said collars against longitudinal movement on said shaft, a plurality of pins carried by the inner face of each collar and which pins extend in a direction axially of said shaft, a plurality of brushes between said collars, each of said brushes comprising bristles which extend outwardly from a pair of complemental core elements, each of said core elements being formed with a semicircular recess which receives said shaft and the ends of which terminate in notches which accommodate said keys, said core elements being formed with openings in the opposite end faces thereof, the openings in the outer faces of the outermost brushes slidably receiving said pins on said end collars, and means cooperating with the openings at the other ends of said outermost brushes and with the openings in the other of said brushes to maintain said core elements assembled about said shaft.

7. In combination, a shaft formed with a pair of diametrically opposite keyways, a key in each of said keyways projecting beyond the periphery of said shaft, a pair of end collars each formed with a pair of keyways receiving said keys, said collars being mounted on said shaft in spaced relation, releasable means carried by each collar for locking said collars against longitudinal movement on said shaft, a plurality of pins carried by the inner face of each collar and which pins extend in a direction axially of said shaft, a plurality of brushes between said collars, each of said brushes comprising bristles which extend outwardly from a pair of complemental core elements, each of said core elements being formed with a semicircular recess which receives said shaft and the ends of which terminate in notches which accommodate said keys, said core elements being formed with openings in the opposite end faces thereof, the openings in the outer faces of the outermost brushes slidably receiving said pins on said end collars, and a ring-like plate assembled on said shaft between each pair of adjacent brush ends, each of said plates having pins projecting from the opposite faces thereof and which pins are slidably received in the openings in the end faces of the core elements of the adjacent brush ends.

8. In a brush assembly, a shaft, a pair of brushes arranged in end to end relation with respect to each other and mounted on said shaft, each of said brushes comprising two complemental core halves formed with a plurality of spaced openings in their ends, a pair of end collars fixedly mounted on said shaft adjacent the outer ends of said brushes, a plurality of pins extending from the face of said end collars adjacent said brushes and said pins being slidably received in said openings, a ring plate mounted on said shaft between the meeting ends of said brushes, and a plurality of pins extending from both faces of said ring plate and being slidably received in the adjacent openings in said core halves, and key means establishing a nonrotative relation between said brushes and said shaft.

9. In a brush assembly, a shaft, a pair of brushes arranged in end to end relation with respect to each other and mounted on said shaft, each of said brushes comprising two complemental core halves formed with a plurality of spaced openings in their ends, a pair of end collars fixedly mounted on said shaft adjacent

the outer ends of said brushes, a plurality of pins extending from the face of said end collars adjacent said brushes and said pins being slidably received in said openings, and two pairs of U-shaped holding elements at the meeting ends of said brushes and one pair of holding elements being positioned in one end of one brush and the other pair of holding elements being positioned in the adjacent end of the adjacent brush, each holding element having a pair of legs and one leg of one holding element being slidably received in an opening in one core half of one brush and the other leg being slidably received in an opening in the other core half of the same brush, and key means establishing a nonrotative relation between said brushes and said shaft.

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