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FASTENING DEVICE FOR ROTARY BRUSHES AND THE LIKE

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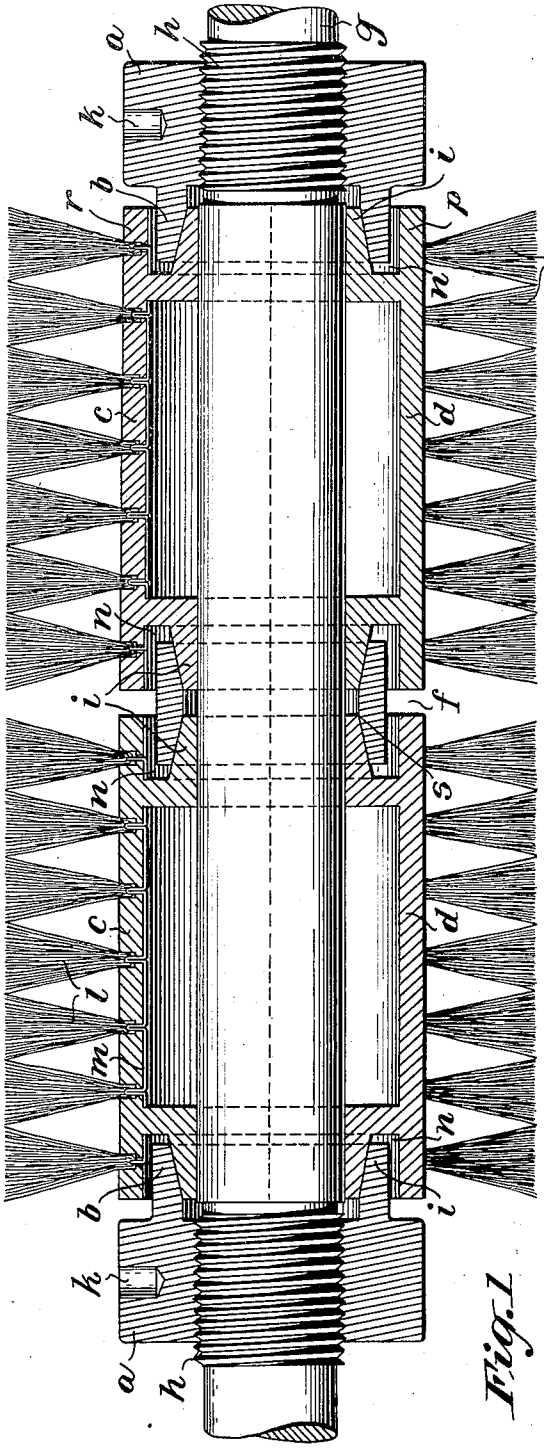


Fig. 1

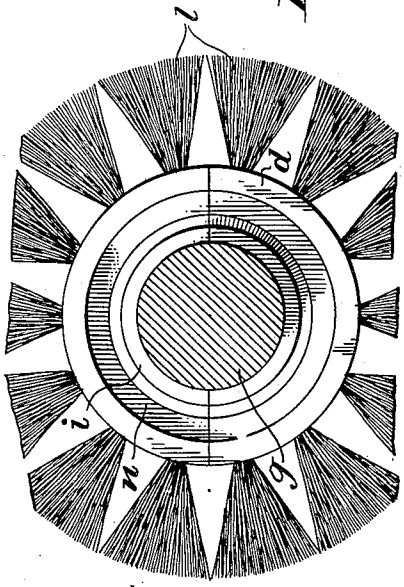


Fig. 2

Inventor:
Wilhelm Dossmann
BY
E. Guyer Murphy
ATTORNEY

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FASTENING DEVICE FOR ROTARY BRUSHES AND THE LIKE

Wilhelm Dossmann, Frankfort-on-the-Main, Germany

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The present invention relates to a device for fastening brush rollers, drums, and the like, to shafts, and more particularly for securing brush rollers and similar devices which may be of metal or any other suitable material to the shafts of finishing machines, polishing apparatus, and the like.

In machines of the class above indicated which require as a rule brush rollers of considerable length, compressed wooden rollers with bristles inserted therein are generally employed, but these latter rollers have proven uneconomical and their use is attended with the serious draw back that they have to be taken down and replaced by new rollers after the bristles thereon have been worn down or otherwise impaired, this latter result taking place within a relatively short period of actual operation.

The invention eliminates the uneconomic features and other disadvantages resulting from the use of wooden brush rollers by providing brush rollers consisting of shells made from metal or other suitable material to which the bristles are detachably secured in any suitable manner, the shells or sections being adjustably and removably disposed on a coacting shaft to permit the replacement of worn bristles by new ones, and such substitutions of sizes as may seem desirable.

For example, two shells or semi-cylindrical sections of metal such as aluminum or any other suitable material, of any length desired and provided with bristles arranged in tufts on the periphery thereof, are assembled in pairs or joined in opposed relation to form a roller which latter is secured on a shaft provided at some convenient place, such as its ends, with threads *h* for the reception of adjusting or jam nuts to hold the said shells in operative position on the said shaft. The adjusting nuts are formed with wedge-shaped or cone-shaped openings adapted to receive corresponding wedge-shaped or conical bosses at the thickened ends or hubs of the shells for securing the latter in operative position on the shaft, as described more fully hereinafter. To prevent bending, distortion, undue strain, etc. of the rollers, which are often quite long, any number of semi-cylindrical sections in the lengths desired may be arranged on the shaft to form a roller of predetermined dimensions, as shown in Figure 1, the opposed pairs of sections being interconnected by an annular member more fully described below, the inner wall of the said annular member being formed with a circumferential, inwardly-protruding, bulged or wedge-shaped portion which provides in the said annular member two wedge-shaped openings for receiving the corresponding wedge-shaped bosses of the hubs of the said shells.

A preferred form of the invention is illustrated in the accompanying drawing in which

Fig. 1 is a longitudinal sectional view of an embodiment of my invention operatively secured to a coacting shaft.

Fig. 2 is an end elevational view of the device shown in Fig. 1, with one of the adjusting nuts removed.

For the purpose of illustrating my invention I have shown in the accompanying drawing one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

In the drawing wherein similar characters of reference indicate corresponding parts in the figures, *a* designates an adjusting or jam nut, the hollow stem *b* of which is formed internally with a wedge-shaped opening communicating with the bore of the nut. *c* and *d* are coacting shells or semi-cylindrical sections which may be of various lengths, forming, when joined together in opposed relation, the roller *r*. Each shell is recessed at either of its thickened ends to form a semi-annular pocket, which is arranged parallel to the longitudinal axis, and a wedge-shaped projection. When the shells or semi-cylindrical sections are joined in opposed pairs, as mentioned above, it will be seen that an annular recess *n* is provided in the hub *p* formed by the junction of the above-mentioned thickened ends, and also a wedge-shaped boss *i*, which, as illustrated in Figure 1, has a truncated conical configuration, the purpose of which will appear hereinafter.

The annular recess *n* in the hub *p* above referred to is positioned in parallelism to the longitudinal axis of the roller *r*. By further reference to Figure 1, it will be seen the inner wall of the stems *b* of the adjusting or jam nuts *a* is formed in shelving fashion for the purpose of coacting with a corresponding shelving surface on the wedge-shaped bosses *i* provided on the rollers *r*.

The pairs of shells *c* and *d* may now be coactingly joined by an annular member or ring *f* alluded to above. The annular member *f*, which is loosely or slidably mounted on the shaft *g*, has two wedge-shaped openings which are formed by

the circumferential shelving or wedge-shaped portion *s* protruding inwardly from the wall of said annular member or ring *f*. Each of the two wedge-shaped openings of the annular member *f* receives one of the wedge-shaped bosses *i* formed on each end of the two rollers *r* shown, thus locking the rollers to the annular member and clampingly securing them to the shaft *g* when the adjusting or jam nuts *a* are turned on the threaded portions *h* provided on the shaft *g*. As the adjusting nuts *a* advance on the said shaft *g*, their projecting stems *b* will be wedgingly received in the annular recess *n* in the adjacent end of each roller *r*, while the roller itself will be slid longitudinally towards the centre of the shaft *g*, thereby forcing a part of the wedge-shaped portion *s* into the recess at the other end of the said roller, while simultaneously forcing the wedge-shaped boss *i* into the adjacent wedge-shaped opening of the said annular member or ring *f*. A corresponding procedure with the other adjusting nuts *a* will slide or thrust the roller adjacent thereto into engagement with the other half of the annular member *f*, thus binding the latter to and between the two rollers *r* as illustrated. In the form disclosed I have provided the shells or semi-cylindrical sections *c* and *d* with small openings or recesses in the walls thereof which openings serve to receive tufts of bristles *l*, the latter as illustrated being drawn into the said openings by the wires *m*. If desired each tuft of bristles may be secured in the recesses or openings by any suitable kind of cement or wax, but I have found the present method of drawing tufts of wire bound bristles in the openings by the wires *m* to be a convenient way of securing them.

The function and manner of operation of the device has been in a measure indicated above, but will be better understood from the following brief description:—

In assembling the device, assuming the shells *c* and *d* are already provided with the bristles as shown in the drawing, it will only be necessary to place the pairs of semi-cylindrical shells *c* and *d* on the shaft *g* substantially in the position shown in Figure 1, after which the adjusting nuts *a* are engaged with the threaded portions *h* of the shaft *g* until the shanks of the said nuts *s* are received in the recesses *n* formed in the ends of the said shells *c* and *d*. Further threading of the adjusting nuts *a* on the shaft *g* will cause the longitudinal movement of same towards the middle of said shaft thus engaging the ring or annular member *f* wedgingly with the bosses *i* at either ends of the shells *c* and *d*. It will now be seen that the latter may be applied almost instantly to the shaft *g* and then clampingly secured on the latter by merely turning the adjusting or jam nuts *a*.

When the bristles are worn down or otherwise impaired they may be quickly withdrawn from the openings or sockets shown, and new bristles where required inserted. The rotary or cylindrical brushes may thus be maintained in efficient condition for performing their functions without the necessity of discarding as heretofore the entire rollers or drums. The bristles, which may be wire wound or otherwise secured, can be obtained in standard sizes and units suitable for a given purpose, and may be fastened in position either by the wires *m* by sealing, or in any other suitable manner. It is, of course, understood that as many pairs of shells *c* and *d* as required and in various lengths may be applied to a shaft, each additional pair of shells merely requiring an additional ring or annular member *f*. The device as a whole, it will be noted, is of the most simple and elementary construction and is designed and adapted for use on practically any species of mechanism having a rotating shaft since the shells and ring of my invention may be had in various lengths and diameters. Merely providing threaded portions on the shaft will suffice for the operative attachment of my device.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. A device for securing brush holders and the like to a shaft, comprising a plurality of sectors clampingly secured together in groups to form brush-containing cylinders arranged end to end on said shaft, and means for binding the said cylinders operatively together, said means including members movable longitudinally on the shaft and having cone-shaped openings wedgingly receiving cone-shaped projections formed on both ends of said cylinders, means to urge said members towards each other and an annular member arranged between adjacent cylinders, said annular member having a bore tapering inwardly from each end thereof, said bore receiving the said projections on adjacent ends of the cylinders.

2. In a device of the kind described, a plurality of pairs of brush sections, each of said pairs of brush sections forming cylinders, said cylinders being arranged end to end on a shaft and being individually formed at each end with a cone-shaped hollow projection concentric with said shaft, and means arranged on said shaft for operatively clamping said brush sections together to form the said cylinders and to connect same together on the shaft, said means including a pair of nuts threadedly engaged on the shaft and formed with cone-shaped openings for receiving the hollow projections on outer ends of the two end cylinders, and an annular member between adjacent cylinders having a bore wedgingly receiving the hollow projections on adjacent ends of said adjacent cylinders.

3. A device of the character described for securing brush rollers and the like to a shaft, comprising a plurality of pairs of semi-annular brush-containing members joinable as pairs and arranged end to end on said shaft for forming brush rollers thereon of variable length, an annular recess concentric with the said shaft and a hollow cone-shaped boss formed in a hollow in each end of said pairs of roller sections, one of said bosses at one end of the roller being received in a cone-shaped opening formed in a nut threadedly engaged on the shaft, said opening being concentric with the shaft, another of said bosses at the other end of the roller being similarly received in a similarly shaped and positioned opening in another nut threadedly engaged on the shaft, and means for clampingly securing the said roller sections together, said means including an annular member slidably mounted on the shaft between adjacent pairs of roller sections and having a bore tapering inwardly from each end thereof and wedgingly en-

gaging the bosses at the adjacent ends of the pairs of roller sections.

4. A cylindrical brush, comprising a plurality of bristles carrying sectors placed around the shaft in groups to form cylindrical sections arranged end to end, and means for fastening said sectors together around the shaft, said means including an annular member surrounding the shaft between adjacent cylindrical sections, annular grooves in the adjacent ends of the cylindrical sections into which the annular member fits, and means to hold together the outer ends of the sectors at the ends of the brush and to prevent relative axial movement of the ends of the brush.

5. A brush as defined in the preceding claim, in which the bore of the annular member flares out at each end, the inner walls of the annular grooves slope towards the shaft forming a conical surface, and the last mentioned means are adapted to force the ends of the brush towards each other.

WILHELM DOSSMANN.