April 9, 1929. K. M. BROWN 1,708,603

ABRASIVE AND POLISHING TOOL

Filed Feb. 28, 1927 2 Sheets-Sheet 1

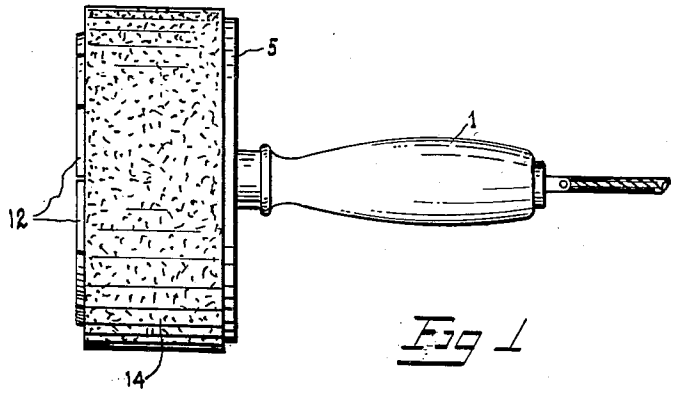


Fig. 1

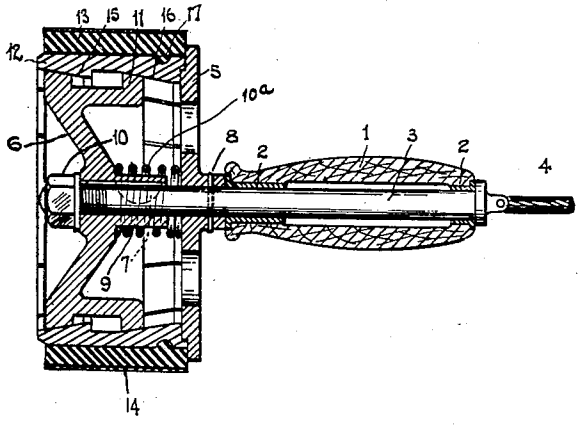


Fig. 2.

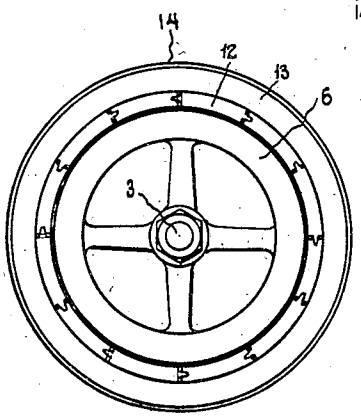


Fig. 3.

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ABRASIVE AND POLISHING TOOL

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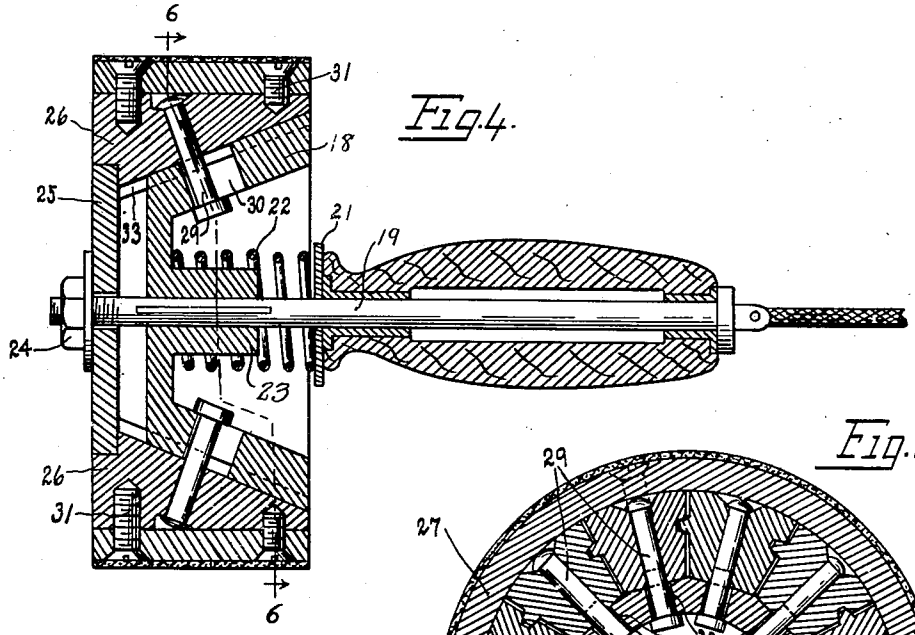


Fig. 4.

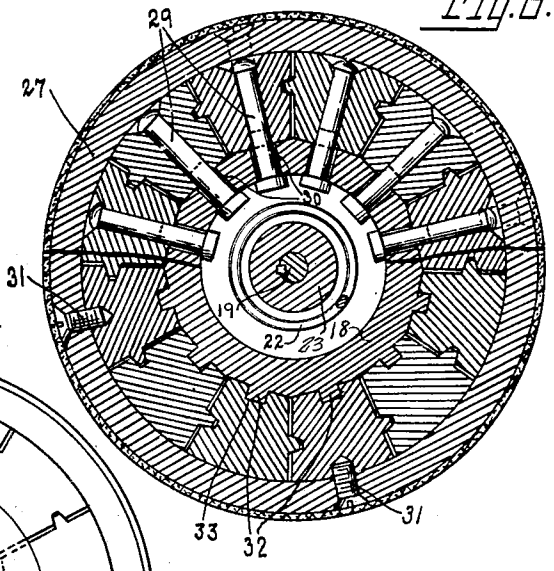


Fig. 6.

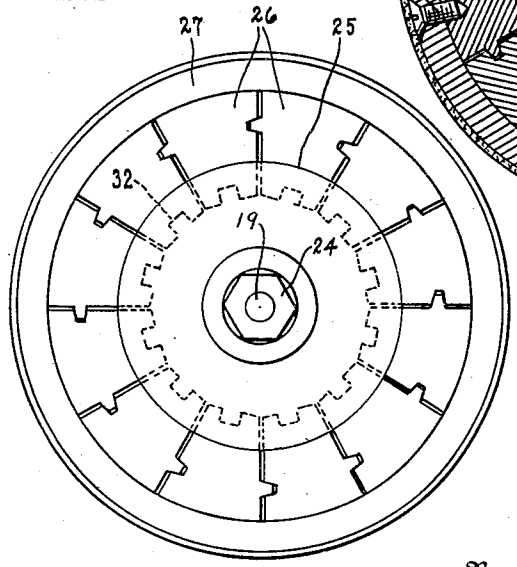


Fig. 5.

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UNITED STATES PATENT OFFICE.

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ABRASIVE AND POLISHING TOOL.

Application filed February 28, 1927. Serial No. 171,644.

This invention relates to abrasive and polishing tools, and particularly relates to rotary mountings for abrasive and polishing bands.

It is the object of the invention to provide a means for quickly expanding a rotary member to adapt said member to firmly mount an abrasive or polishing band.

In attaining this object, the invention contemplates the provision of a mounting comprising a substantially annular segmental member, and means within said member for spreading apart the segments thereof to increase the diameter of said member, and an elastic ring embracing said segments, holding them in proper relation and further forming a support for an abrasive or polishing band.

The above and various other objects the invention attains by the construction hereinafter described and illustrated in the accompanying drawings, wherein:

Figure 1 is a side view of the improved tool.

Figure 2 is an axial sectional view of the same.

Figure 3 is an end view of said tool.

Figure 4 is an axial sectional view of an alternative construction.

Figure 5 is an end view of this construction.

Figure 6 is a cross sectional view of the same taken upon the line 6—6 of Figure 4.

In these views the reference character 1 designates a tubular handle having inserted in its ends a pair of bearings 2 in which is journaled a shaft 3 extending through said handle. To one end of said shaft is connected a suitable flexible drive element 4 and said shaft extends beyond the opposite end of the handle to rigidly mount a disc 5 coaxial with the shaft and adjacent to said handle, and to further slidably mount a member 6. Said member is splined upon the shaft as indicated at 7, and said disc is secured fast upon said shaft by any suitable means, as for example, the pin 8. The member 6 has a hub 9 on which is coiled a spring 10^a compressed between the body of said member and the disc 5 urging said member from said disc and against a nut 10 threaded upon the shaft 3. By adjusting said nut lengthwise of the shaft, the spaced relation between the member 6 and disc may be regulated.

The member 6 is formed with two spaced annular outwardly projecting ribs 11, the peripheral faces of which are similarly coned. Seated upon said ribs and embracing the member 6 is an annular series of segments 12 which form a mounting for a ring 13 of rubber or similar elastic material. Said ring seats upon said segments snugly enough to hold the same firmly seated upon the ribs 11. Upon the ring 13 is adapted to be mounted a flexible band 14 of sand paper or of some other abrasive or polishing material. The inner faces of the series of segments 12 which seat upon the ribs 11 are conically fashioned as indicated at 15 and 16 to correspond to the conical inclination of said ribs.

17 indicates an annular bead interiorly formed upon the elastic ring 13 which engages in an annular groove jointly formed exteriorly in the segments 12.

In the use of the described tool, the nut 10 is outwardly adjusted upon the shaft 3 prior to mounting the band 14 upon the ring 13. When said band is in place, the nut 10 is adjusted inwardly upon the shaft shifting the member 6 toward the disc 5 and thereby spreading the segments 12 and increasing their joint diameter owing to the co-action of the coned ribs 11 with the coned faces 15 and 16 of said segments. The described expansion of said segments produces a corresponding expansion of the elastic ring 13 causing the latter to snugly engage the abrasive or polishing band 14 and secure the latter in firm driven engagement with the tool.

In that form of the invention shown in Figures 4, 5, and 6, a coned expander 18 is splined upon a shaft 19, or otherwise slidably secured upon said shaft in driven relation therewith. Adjacent to the handle 20 is which said shaft is journaled, a washer 21 is loosely mounted upon said shaft providing an abutment for a spring 22 coiled upon the hub 23 of said expander and urging the expander from the washer. Upon the free end with the shaft 19 there is engaged a nut 24 against which abuts a disc 25 slidable upon said shaft.

Upon the conical peripheral face of the expander is mounted a circular series of segments 26 (preferably metallic) which jointly provide a cylindrical outer surface engaged by an elastic ring 27, upon which a sanded or other annular polishing band 28 is detachably mounted. The outer edge portion

of the disc 25 engages the forward ends of the segments 26 holding the latter upon the expander 18. By tightening or loosening the nut 24 the disc 25 may be advanced more or less toward the handle so as to tighten or loosen the elastic ring 27 (through expansion or contraction of the segments 26). In this form of the invention the segments are each secured to the expander 18 by bolts, or the like, 29 passing through suitable slots 30 in said expander, said slots being elongated in the approximate direction of the axis of the tool to permit of the desired axial movement of the segments relative to the expander. It is also preferred to secure the elastic ring to one or more of the segments 26 as by screws 31.

In this construction the spring 22 serves to maintain any desired expansion of the segments 26 and ring 27 and the degree of this expansion is regulated by the nut 24. Removal of the polishing band is accomplished by simply loosening the nut 24 to allow the necessary contraction of the ring 27 and segments 26.

It is preferred to form upon the exterior face of the expander 18 a series of splines 32 extending from front to back, each of said splines engaging freely in a corresponding groove 33 formed in the inner face of one of the segments. Thus said segments are positively guided when undergoing a sliding forward and back motion and the segments are driven without resulting strain on the bolts 29.

A feature of this alternative construction is the establishment of such a connection between the expanding segments 26 and the expander 18 that the segments cannot be thrown from the tool in case of breakage of the ring 27, and a further feature is the provision of a permanent fastening means between the latter ring and said segments.

The described provision for securing an abrasive or polishing band upon a rotative tool presents the advantage that it is of a simple construction, is quickly operable to either engage or disengage a band, and causes the band to be held quite firmly in driven relation to the tool.

It is to be noted that the elastic ring 13 exercises a number of functions. Thus it maintains the segments 12 expansively engaged with the expander 11, constitutes an expansible mounting for the abrasive or polishing band, and because of its elastic nature it permits such band to be slightly distorted from its normal circular form at the point of contact with the work so as to better conform to the engaged surface of the work.

What I claim is:

The combination with an elastic ring, of an annular segmental member, interiorly engaging and supporting said ring and having a substantially conical interior surface, each segment of said member being formed with a rib upon one lateral face elongated in substantial parallelism with said conical surface and with a groove in its other lateral face receiving the rib of an adjoining segment, an exteriorly coned member interiorly engaging and carrying said segmental member, and means for moving said exteriorly coned member axially of said segmental member to expand the latter.

In witness whereof I hereunto set my hand.

KINGSLEY M. BROWN.