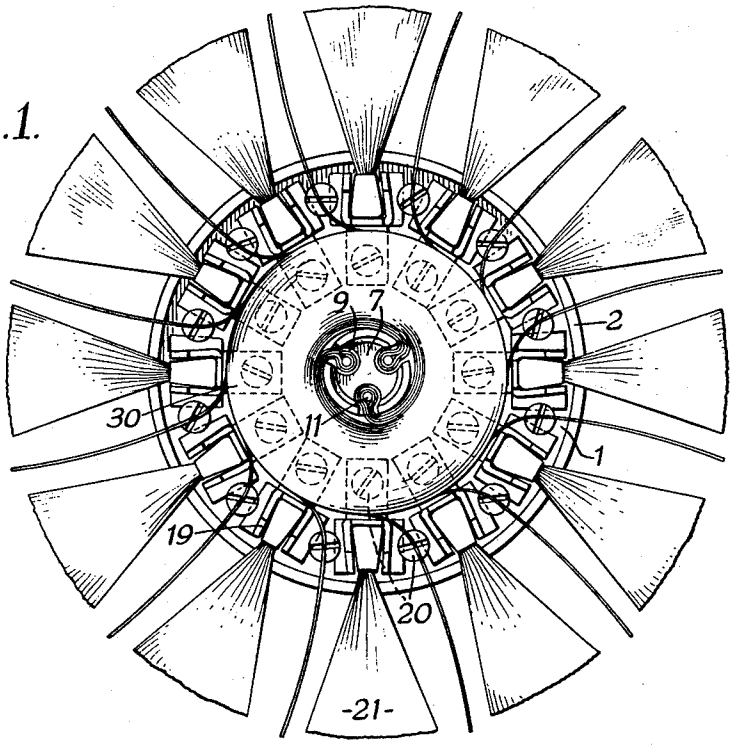
July 26, 1955 R. J. SWAN 2,713,759

ROTARY ABRASIVE HEADS

Filed March 23, 1953 2 Sheets-Sheet 1

Fig.1.



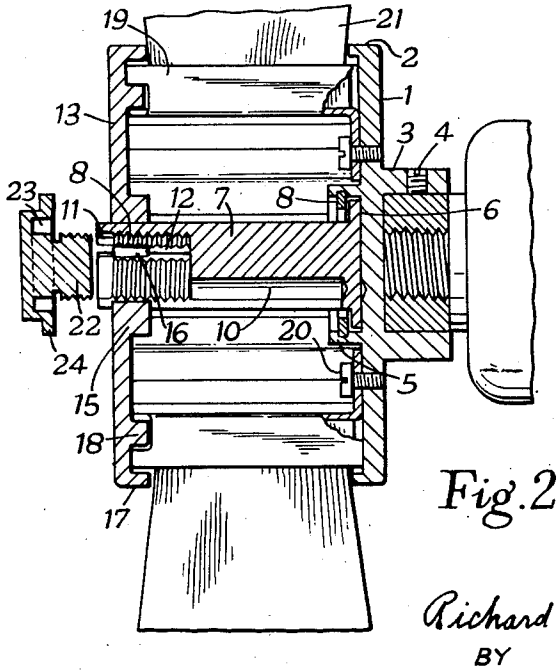


Fig.2.

INVENTOR
Richard J. Swan
BY
Ralph B. Stewart
ATTORNEY

July 26, 1955 R. J. SWAN 2,713,759

ROTARY ABRASIVE HEADS

Filed March 23, 1953 2 Sheets-Sheet 2

Fig. 3.

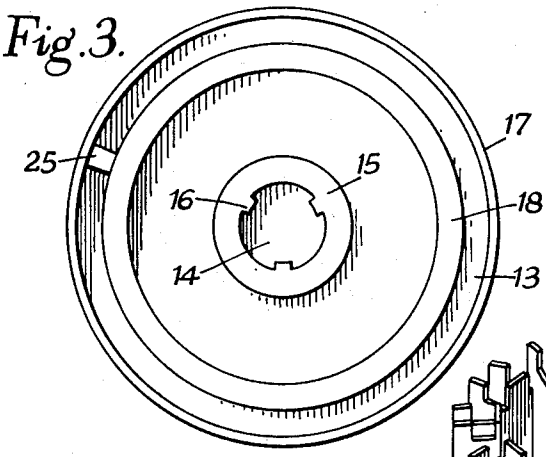


Fig. 4.

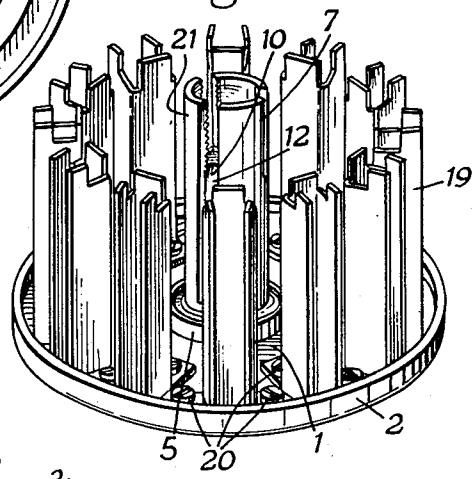


Fig. 5.

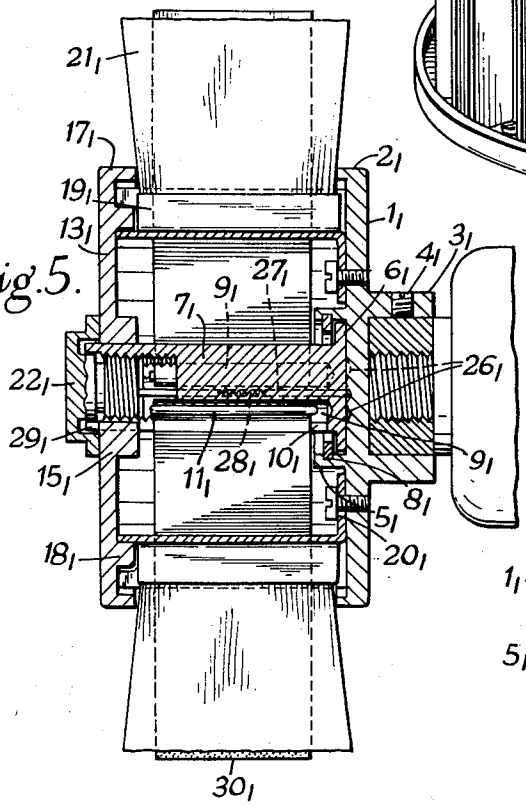
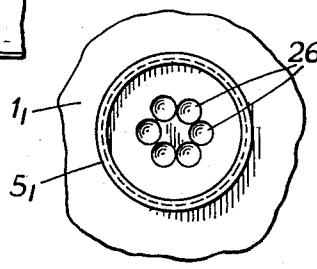


Fig. 6.



INVENTOR
Richard J. Swan
BY
Ralph B. Stewart
ATTORNEY

United States Patent Office 2,713,759 Patented July 26, 1955

2,713,759

ROTARY ABRASIVE HEADS

Richard James Swan, London, England, assignor, by mesne assignments, to Engis Equipment Company, Chicago, Ill., a corporation of Illinois

Application March 23, 1953, Serial No. 343,956

Claims priority, application Great Britain April 16, 1952

4 Claims. (Cl. 51—193.7)

The present invention relates to rotary abrasive heads of the kind comprising, when in use a plurality of brushes detachably mounted in sockets extending from a supporting plate in a direction parallel to the axis of rotation of the head, the sockets together forming a substantially cylindrical array, and abrasive-strips extending outwardly between the brushes, the inner portions of the abrasive strips being anchored and rolled upon each other within the space defined by the brush sockets to form a single spool concentric with the axis of rotation of the head.

An object of the invention is to facilitate the adjustment of such a head for the purpose of increasing or decreasing the lengths of the free end portions of the abrasive strips projecting between the brushes.

A further object of the invention is to provide a rotary abrasive head of simplified construction.

A still further object of the invention is to increase the number of angular positions in which the core can be fixed after adjustment, thus varying the length of the ends of the abrasive strips projecting outwardly beyond the circumference within fine limits.

Yet another object of the invention is to provide a rotary abrasive head in which the length of the abrasive strips projecting beyond the ends of the brushes may be adjusted without removing the clamping device and the end plate.

According to the present invention a rotary abrasive head of the kind referred to comprises a brush-carrying assembly including a supporting plate adapted for mounting on a driving shaft and a ring of individual brush holders each of which is fixed at one end to said supporting plate, an abrasive-strip anchorage assembly including a core and a plurality of anchorages for anchoring groups of abrasive-strips, the said abrasive-strip anchorage assembly having one of its ends rotatably mounted in said brush-carrying assembly, an end plate keyed on the free end of said core and having locating means for locating the adjacent ends of said brush holders, a screw-threaded clamping device engaging a screw-threaded portion on the free end of said core and locking means engageable and disengageable by axial displacement of said clamping device to lock and release respectively said brush-carrying assembly for rotation relative to said abrasive-strip assembly.

The invention will now be described with reference to the accompanying drawings in which:

Fig. 1 is an end elevation of an abrasive head with a detachable end plate and clamping screw removed,

Fig. 2 is an axial cross-section of the abrasive head, with certain parts shown in elevation,

Fig. 3 is an end view of an end plate of the abrasive head,

Fig. 4 is a perspective view of a rotatable supporting plate with brush holders and a central core in position but other parts removed for the sake of clarity,

Fig. 5 is an axial cross-section of an alternative construction of abrasive head, with certain parts shown in elevation, and

Fig. 6 is an elevation of a fragment of the supporting plate of the second abrasive head shown in Fig. 5.

In the abrasive head shown in Figs. 1–4, a main supporting plate 1 takes the form of a circular disk having a flange 2 and a hollow boss 3 concentric with the disk 1. The boss 3 serves to accommodate a driving shaft and has two tapped holes 4 (only one shown) accommodating set screws. On the opposite side of the supporting plate, a concentric short cylindrical socket 5 is provided for the reception of a flange 6 on one end of a cylindrical core member 7. The cylindrical socket is grooved internally to receive a circlip 8 by means of which the flange 6 of the core 7 is restrained from axial displacement.

The core member 7 is formed with three uniformly spaced axial bores 9 which communicate with the outside of the core member 7 through axial slots 10. The bores 9 and slots 10 extend from the free end of the core member to points within the core member 7 just short of the end held in the cylindrical socket 5. Each of these main axial bores 9 is adapted to house an anchoring pin 11 and the looped inner end of an assembly of abrasive-strips, which strips pass out from the core member through the corresponding slot 10 and pass between peripheral brushes in known manner. The portion of the core member 7 at its free end is of substantially hollow cylindrical form. Three end plate locating slots 12 are in line with the abrasive-strip guiding slots 10 and are thus likewise equally spaced about the circumference of the core 7. The hollow cylindrical portion of the core is formed with an internal screw-thread.

A removable end plate 13 has a central aperture 14 (Fig. 3) with a hub portion 15 having three splines 16 adapted to engage the locating slots 12. The splines 16 on the hub 15 have a length such that a clamping screw 22 may be slackened, a projection 25 disengaged and the brush assembly rotated with respect to the core assembly without removing the end plate completely. The end plate 13 is also provided with a peripheral flange 17 similar to that of the supporting plate 1, and an inner flange 18 a short distance from and coaxial with the peripheral flange 17. The flanges 17 and 18 are disposed with their inner and outer edges respectively fitting closely to the free ends of a ring of brush socket members. Twelve dovetail socket members 19 are equally spaced round the periphery of the supporting plate and are rigidly fixed to the plate by means of screws 20. Brushes 21 are removably fitted in the socket members 19 and may be firmly held by means of the end plate 13. The free ends of the brush socket members 19 are partly cut-away in order to accommodate the flange 18 of the end plate.

The end plate 13 is clamped to the remainder of the abrasive head assembly by means of a clamping screw 22 having a knurled head. This screw has an annular recess 23 which is adapted to fit over the end of the core 7 when screwed down. The peripheral flange 24 outside the recess 23 engages the radially inner portion of the end plate 13 and when the clamping screw 22 is screwed down the flange 24 holds the end plate firmly against the ends of the brush socket members.

When it is necessary to adjust the length of abrasive strip 30 projecting beyond the ends of the brushes, the clamping nut 22 is slackened and the end plate 13 displaced axially until the projection 25 is disengaged. The edge of the end plate 13 which is preferably knurled, is held in one hand and turned with the core assembly with respect to the supporting plate 1. The outside of the driving boss 3, may also be knurled in order to provide a hand grip. After adjustment has been completed the clamping screw 22 is tightened thus causing the projection 25 to engage the free end of a fresh brush socket

member or a fresh space between two adjacent socket members.

The alternative construction shown in Figs. 5 and 6 differs from one construction according to Figs. 1–4 only as regards the locking means and similar parts to those in the first described embodiment are denoted by the same reference numerals but with the addition of a suffix.

In Figs. 5 and 6 a ring of six holes 26_1 are shown in the inside of the supporting plate 11. Each of these holes 26_1 is countersunk until its edges meet the corresponding edges of the countersunk holes on each side of it. Between two of the main axial bores 9_1 in the core 7_1, a smaller bore is provided and accommodates a plunger 27_1 (shown in broken lines in Fig. 5) formed in two parts 27_1 and having between the two parts a compression spring 28_1 which acts in a direction tending to engage the end of the plunger with one of the holes of the above-mentioned ring of holes 26_1. The end of the plunger 7_1 remote from the supporting plate is engaged by one end of the clamping screw 22_1 which co-operates with the internally screw threaded upper portion of the core 7_1. The upper portion of the core also has a longitudinal external groove 29_1 which is adapted to co-operate with a spline formed in the inside of the hub 15_1 of the end plate 13_1. Thus when the clamping screw 22_1 is slackened the spring acting in the plunger bore allows the lower end of the plunger 27_1 to be disengaged from its co-operating hole 26_1 in the supporting plate 13_1 and the core assembly may be rotated with respect to the supporting plate assembly. The core assembly may be reclamped when the desired length of abrasive strip 30_1 has been wound in or unwound by re-engaging the plunger 27_1 in another hole 26_1 and locking it in position by retightening the clamping screw 22_1.

In either of the above described embodiments, to remove and replace one or more of the abrasive strip assemblies, after loosening the clamping screw **22** or 22_1 removable end plate **13** or 13_1 is turned to rotate the core member **7** or 7_1 until the abrasive strips **30** or 30_1 are fully unwound from the core member **7** or 7_1. The clamping screw **22** or 22_1 and the removable end plate 13_1 are now completely removed and the required abrasive strip assembly with the corresponding anchorage pin **11** or 11_1 or each such assembly and pin, is removed endwise. After a fresh assembly has been slipped over the pin, this fresh assembly is replaced endwise together with the pin into the bore and slot in the core member. The removable end plate 13_1 is next replaced and turned until the desired proportion of abrasive strip **30** or 30_1 is wound up on the core member **7** or 7_1. Finally the clamping screw **22** or 22_1 is replaced and screwed tight to retain the core member **7** or 7_1 against further relative rotation while at the same time clamping the anchoring pins **11** or 11_1 tight and clamping the end plate **13** or 13_1 against the sockets for the brushes and against the backs of the brushes **21** or 21_1 in said sockets **17** or 17_1.

I claim:

1. A rotary abrasive tool, comprising a main end plate adapted to be detachably mounted on a driving shaft, a plurality of closely spaced dovetail brush socket elements each secured at one end to said main end plate adjacent the circumference thereof and extending parallel to the rotary axis of said main end plate, said socket members together forming a substantially cylindrical array, a plurality of closely spaced outwardly extending brushes detachably mounted respectively in said socket members, a spool attached at one end to said main end plate for relative rotation with respect thereto about said rotary axis, a plurality of abrasive strips wound upon each other on said spool with the free ends thereof extending outwardly between adjacent brushes, an adjustable end plate keyed for sliding movement on the other end of said spool and provided near its circumference with at least one projection adapted for selective engagement with the free ends of said brush socket members, and a screw-threaded clamping member having a shank screw connected to the other end of said spool and a head engageable with the side of said adjustable end plate remote from said main end plate, said clamping member being adjustable between a clamping position in which the adjustable end plate and spool are locked by the projection against rotation relatively to the main end plate and brush socket members and a released position in which the adjustable end plate is axially movable to a position to disengage said projection and thereby permit such relative rotation.

2. A rotary abrasive tool as claimed in claim 1, wherein said projection is selectively engageable in the free ends of individual brush socket members as well as between the free ends of adjacent socket members.

3. A rotary abrasive tool as claimed in claim 2, wherein the free ends of the brush socket members are cut away and the adjustable end plate is formed with an annular ridge on the side thereof adjacent said brush socket members, said ridge being positioned to extend into the cut-away spaces of said cut-away ends.

4. A rotary abrasive tool as claimed in claim 1, wherein the head of the clamping member is formed with an annular recess positioned to receive a part of the free end of the spool projecting through the adjustable end plate when said clamping member is in the clamping position.

References Cited in the file of this patent

UNITED STATES PATENTS

2,125,460	Plengemeier	Aug. 2, 1938
2,194,577	Vonnegut	Mar. 26, 1940
2,430,099	Bradley	Nov. 4, 1947
2,474,063	Newton	June 21, 1949
2,522,920	Baltes	Sept. 19, 1950
2,533,619	Pokras	Dec. 12, 1950
2,600,613	Brunner et al.	June 17, 1952
2,601,499	Bruner	June 24, 1952