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2,845,922

TOOL ASSEMBLY

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Fig. 1

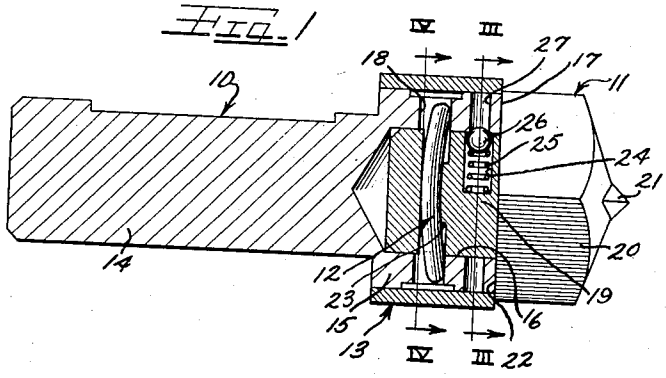


Fig. 2

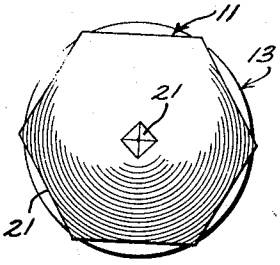


Fig. 3

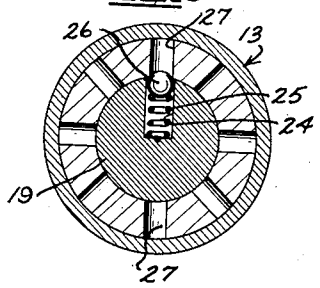


Fig. 4

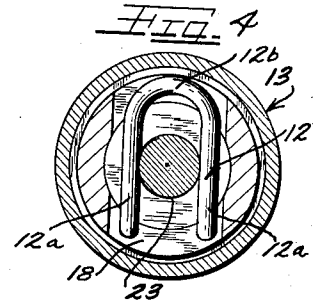
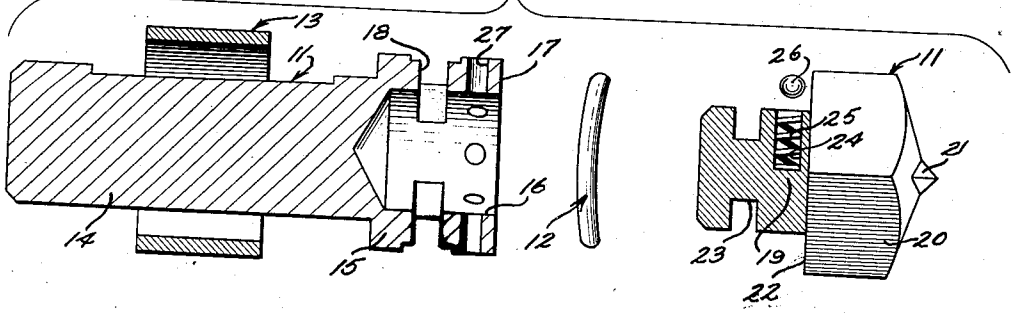


Fig. 5



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TOOL ASSEMBLY

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This invention relates in general to a new and improved type of tool assembly, and more particularly to a tool holder for use in dressing or trueing rotary work such as abrasive wheels or the like, and still more particularly to a diamond dressing tool assembly.

In the use of abrasive wheels and the like, the working faces of such wheels must be true and smooth which necessitates dressing them from time to time. The most common method of dressing an abrasive wheel is to traverse the surface of the wheel with a diamond tool as the wheel rotates about its avis. Continued use of a diamond dressing tool causes the surface of the diamond point to wear unevenly resulting in the dulling of the edge of the diamond which does not present a good cutting edge to the abrasive wheel surface. To overcome this difficulty, several types of rotatable diamond tool mountings have been developed so that the diamond point may be periodically rotated to present a new sharp edge to the working face of a wheel. However, in the past, these rotatable tool mountings have, in most cases, been constructed of several complicated parts and have required special tools or mechanisms for effecting their rotation.

Accordingly, it is an object of this invention to provide a tool assembly which obviates the above mentioned difficulties and is of simple and economical manufacture.

Another object of this invention resides in the provision of a dressing tool assembly, wherein the cutting end may be rotated by an ordinary wrench.

A further object of this invention resides in the provision of a diamond dressing tool assembly that may be incrementally rotated to present a new sharp edge of the diamond for dressing purposes by a simple wrench.

A still further object of this invention resides in the provision of a dressing tool assembly including a cutting tool rotatably mounted in a holder and shaped to receive a wrench enabling the cutting tool to be easily rotated by hand.

Other objects, features, and advantages of the invention will be apparent from the following detailed disclosure, taken in conjunction with the accompanying sheets of drawings, wherein like reference numerals refer to like parts, in which:

Figure 1 is an axial section view, with some parts in elevation, taken through a dressing tool assembly constructed in accordance with the invention;

Figure 2 is an end elevational view of the assembly shown in Figure 1 and looking at the cutting or dressing end of the assembly;

Figure 3 is a transverse sectional view, with some parts in elevation, taken substantially along line III—III of Figure 1;

Figure 4 is a transverse sectional view, with some parts in elevation, taken substantially along line IV—IV in Figure 1; and

Figure 5 is an exploded view of the tool assembly of the present invention showing its component parts.

In Figure 1, the tool assembly of the present invention is seen to generally comprise a holder 10, a cutting

or dressing tool 11, a locking and resilient thrust member 12 in the form of a U-shaped spring, and a sleeve 13.

The holder 10 includes a shank 14 adapted to be received in a conventional slide for supporting and adjustably positioning the assembly in relation to an abrasive wheel, and a diametrically enlarged tool receiving portion 15. This tool receivin portion includes an axial pilot bore 16, a radial bearing surface or face 17 at the inlet end of the bore, and a transverse slot 18 extending through the tool receiving portion 15 in the vicinity of the pilot bore and spaced inwardly from the radial bearing face 17.

The dressing or cutting tool 11 includes a cylindrically shaped pilot 19 sized to be rotatably received in the pilot bore 16, and an enlarged head portion or dressing end 20 mounting a cutting member 21, such as a diamond point. A radial bearing surface or face 22 is defined between the pilot 19 and the diamond carrying head 20 which bearingly contacts the bearing face 17 of the holder. As seen most clearly in Figure 2, the enlarged head portion 20 of the dressing tool 11 is polygonally-shaped, in this instance hexagonal in shape, to accommodate a conventional wrench for rotating the tool relative to the holder 10. The pilot 19 is provided with a circumferential annular groove 23 in spaced relation from the bearing surface 22 and in substantial alignment with the slot 18 of the holder 10.

As seen most clearly in Figures 1 and 4, the U-shaped lock and thrust spring 12 includes legs 12*a*, 12*a* connected together by a bight or yoke 12*b*, wherein the legs 12*a* are curvate in order to define the member as a spring. The spring 12 is forcibly inserted into the slot 18 of the holder with the convex side of the spring facing towards the shank 14 of the holder 10, wherein the spring engages the diamond tool at the annular groove 23. As seen in Figure 1, the sides of the spring bight 12*b* and the very free ends of the legs 12*a* facing the enlarged head portion 20 of the tool 11 and bear against the forward side of the slot 18, while the intermediate portions of the spring legs 12*a* on the opposite side bear against the rear side of the annular groove 23 of the tool 11. Thus, the spring 12 forces the tool 11 rearward relative to the holder 10 so that the bearing surfaces 17 and 22 are resiliently urged together. While the spring 12 serves to resiliently thrust the tool 11 against the holder 10, it also serves to lock the tool and holder together.

The sleeve 13 is forcibly pressed on the tool receiving portion 15 of the holder 10 to maintain the spring 12 in locking position.

As best shown in Figure 1, means is provided to control the rotation of the tool 11 relative to the holder 10 so that uniforming indexing of the tool may be accomplished, which includes a transverse bore 24 formed in the pilot 19 of the tool 11. The bore 24 receives a spring 25 and ball detent 26, wherein the ball detent is biased radially outward to engage the inner end of an aligned radial hole 27 formed in the tool receiving portion 15 and leading from the pilot bore 16. In order to provide equal indexing of the tool 11 with respect to the holder 10, a plurality of these holes 27 are formed in the holder 10 in equal circumferentially spaced relationship.

In operation, when one facet of the diamond point 21 becomes worn, the diamond tool 11 may be rotated relative the holder 10 by merely applying a wrench to the hexagonal head 20 of the tool and rotating the tool until the ball detent indexes in the next succeeding radial hole 27, wherein a new dressing edge is presented by the diamond point to the abrasive wheel.

In assembling the dressing tool of the present invention, the spring 25 and ball detent 26 are inserted in the bore 24 of the pilot 19 and the tool 11 is rotatably asso-

ciated with the holder **10** so that the annular groove **23** substantially aligns with the transverse slot **18**. Then the spring member **12** is forcibly inserted through the transverse slot **18** and over the tool pilot **19** to lock the tool and holder together and bias the tool rearwardly against the holder. Next, the sleeve **13** is forcibly pressed on the tool receiving portion **15** of the holder **10** for housing the assembled parts.

From the foregoing, it is appreciated that the present invention provides a dressing tool assembly having a minimum of parts that may be easily and economically assembled, wherein manual rotation of the diamond tool by means of a conventional wrench is permissible.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention, but it is understood that this application is to be limited only by the scope of the appended claims.

I claim as my invention:

1. In a tool assembly for use in the dressing of rotary work such as grinding wheels or the like, a holder having an axial pilot bore, a tool having at one end a pilot rotatably journaled in said bore and having at the other end a polygonally-shaped head for receiving a wrench, said holder including radially disposed holes, rotary index control mechanism between the periphery of said pilot and said holder comprising a radially urged resilient element carried by said pilot for cooperation with the adjacent ends of said radial holes of said holder, resilient thrust resisting and locking means in cooperation with a slot in said holder aligned with a groove in said pilot, and a sleeve fitted over said slot in the holder retaining said parts in assembled relation.

2. A tool assembly for use in the dressing or trueing of rotary work such as grinding wheels or the like, which comprises a holder having an axial pilot bore at one end, a transverse slot through said holder in the vicinity of the bore, a radial bearing surface at said one end, a cutting tool having a pilot rotatably received in said bore and an enlarged head portion extending from said pilot for carrying a cutting member, said pilot having an annular groove therearound in alignment with the slot in said holder, a radial bearing surface defined between the pilot and the head portion of said cutting tool and bearingly contacting said bearing surface of said holder, a U-shaped spring member received by said slot and said groove for resiliently locking said holder and said cutting tool together, and a sleeve surrounding said head portion and retaining said spring member in place.

3. A tool assembly for use in the dressing or trueing of rotary work such as grinding wheels or the like, which comprises a holder having an axial pilot bore at one end, a transverse slot through said holder in the vicinity of the bore, a radial bearing surface at said one end, a cutting tool having a pilot rotatably received in said bore and an enlarged head portion extending from said pilot for carrying a cutting member, said head portion being polygonally-shaped for receiving a wrench, said pilot having an annular groove therearound in alignment with the slot in said holder, a radial bearing surface defined between the pilot and the head portion of said cutting tool and bearingly contacting said bearing surface of said holder, a U-shaped spring member received by said slot and said groove for resiliently locking said holder and said cutting tool together, and a sleeve surrounding said head portion and retaining said spring member in place.

4. A tool assembly for use in the dressing or trueing of rotary work such as grinding wheels or the like, which comprises a holder having an axial pilot bore at one end, a transverse slot through said holder in the vicinity of the bore, a radial bearing surface at said one end, a cutting tool having a pilot rotatably received in said bore and an enlarged head portion extending from said pilot for carrying a cutting member, said pilot having an annular groove therearound in alignment with the slot in said holder, a radial bearing surface defined between the pilot and the head portion of said cutting tool and bearingly contacting said bearing surface of said holder, a U-shaped spring member laterally insertable to be received by and retained in said slot and said groove for resiliently locking said holder and said cutting tool together, and a sleeve secured to said holder over said slot for retaining said U-shaped member in position.

5. A tool assembly for use in the dressing or trueing of the rotary work such as grinding wheels or the like, which comprises a holder having an axial pilot bore at one end, a transverse slot through said holder in the vicinity of the bore, a radial bearing surface at the inlet to said bore, a plurality of radial holes leading from said bore, a cutting tool having a pilot rotatably received in said bore and an enlarged head portion carrying a cutting member, a radial bearing face on said cutting tool between the pilot and head portion bearingly engaging said holder bearing surface, a detent carried on said pilot and being biased radially outward to resiliently engage the inner radial end of a hole in said holder, and means received in said slot for maintaining the bearing surface of said holder and the bearing face of said cutting tool resiliently engaged.

6. A tool assembly for use in the dressing or trueing of rotary work such as grinding wheels or the like, which comprises a holder having an axial pilot bore at one end, a transverse slot through said holder in the vicinity of the bore, a radial bearing surface at said one end, a plurality of circumferentially spaced radial holes leading from said bore, a cutting tool having a pilot rotatably received in said bore and an enlarged head portion extending from said pilot for carrying a cutting member, a radial bearing surface defined between the pilot and the head portion of said cutting tool and bearingly contacting said bearing surface of said holder, a detent carried on said pilot and being biased radially outward to resiliently engage the inner radial end of a hole in said holder, and means received in said slot for maintaining the bearing surfaces resiliently engaged.

7. A tool assembly for use in the dressing or trueing of rotary work such as grinding wheels or the like, which comprises a holder having an axial pilot bore at one end, a transverse slot through said holder in the vicinity of the bore, a radial bearing surface at said one end, a plurality of circumferentially spaced radial holes leading from said bore, a cutting tool having a pilot rotatably received in said bore and an enlarged head portion extending from said pilot for carrying a cutting member, said pilot having a circumferential groove in alignment with said slot, a radial bearing surface defined between the pilot and the head portion of said cutting tool and bearingly contacting said bearing surface of said holder, a detent carried on said pilot and being biased radially outwardly to resiliently engage the inner radial end of a hole in said holder, and means received by said slot and said groove for resiliently locking said holder and said cutting tool together.

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