June 10, 1952 J. WATSON 2,600,349

DIE HOLDER CAP

Filed March 4, 1950

FIG. 1

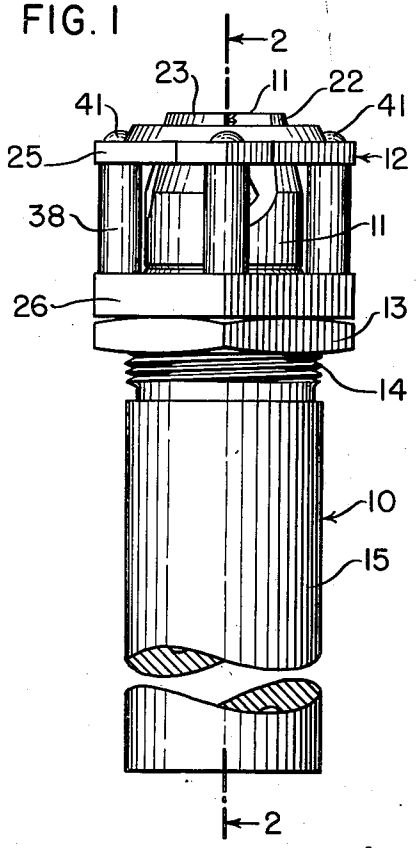


FIG. 2

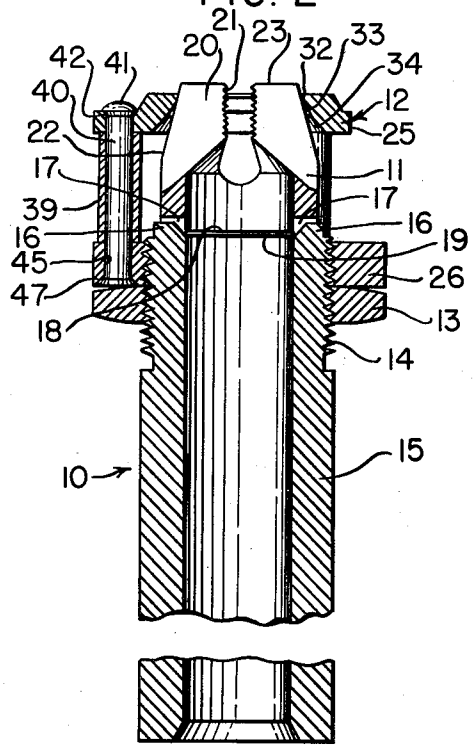


FIG. 3

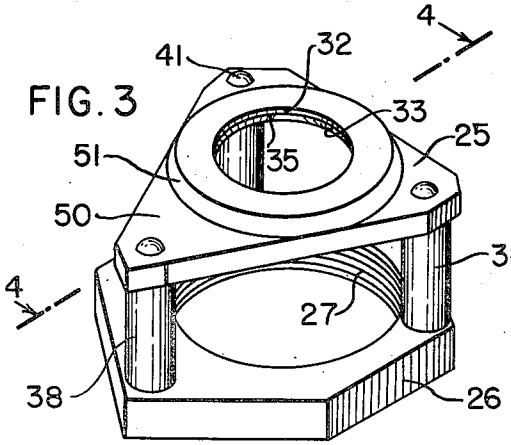
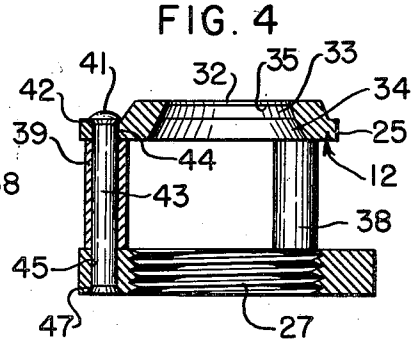


FIG. 4



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DIE HOLDER CAP

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Application March 4, 1950, Serial No. 147,611

1 Claim. (Cl. 10—119)

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This invention relates to thread-cutting dies and more particularly to the die mounting for threading at high rotative speeds.

An object of the invention is to provide a die mounting which will be simple in form, inexpensive in manufacture and light and efficient in operation.

A further object of the invention is to provide a special form of die holder cap for a die having a tapered slotted end.

Further objects of the invention, particularly in the formation of a three point support for a holder cap plate, will appear from the following specification taken in connection with the accompanying drawings in which

Fig. 1 is a plan view of the die and holder;

Fig. 2 is a sectional view of the die and holder along line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the cap; and

Fig. 4 is a sectional view of the cap along line 4—4 of Fig. 3.

Referring to the drawings, there is shown a threading device comprising a die holder 10, a die 11, a die holder cap 12, and a lock nut 13. The die holder 10 has a threaded portion 14 and a shank portion 15. Diametrically opposed lugs 16 are provided on the holder 10 to engage the grooves 17 in the inner face 18 of the die 11.

The die 11 is provided with prongs or lands 20, threads 21, and outer conical surfaces 22 terminated by the outer face 23. The inner face 18 seats against the end surface 19 of the holder 10. The cap 12 comprises a cap holder plate 25 and cap holder base 26. The base 26 is hexagonal in shape and has threads 27 adapted to engage the threads 28 to hold the cap 12 on the holder 10. The holder plate 25 is of a triangular shape with a circular opening centered in the middle. The opening has a cylindrical wall portion 32 and conical walls 33 and 34. The conical wall portion 33 is at a lesser angle with the axis of the tool than the conical wall 34. The conical wall 33 engages the conical surfaces 22 holding the die on the holder. The angle of taper of the conical walls 22 is less than the angle of the wall 34. Therefore the wall 33 contacts the surfaces 22 along the surface adjacent the edge 35 and the inner portions of the surfaces are slightly separated. The holder plate is rigidly secured to the holder base 26 by the equally-spaced posts 38 in each corner of the triangular shape forming a three element connection between the inner and outer members. The posts 38 comprise a spacer 39 and rivet 40. The spacer 39 is tubular in shape preferably cylindrical. The rivet 40

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has a head 41 positioned in a seat 42 in the outer portion 12 and a shaft 43 extending through openings 44 in the rim of the portion 12, the tubular portion 39, through the opening 45 in the inner portion. The end of the rivet is peened over and forced into the seat 47 tightly holding the inner and outer members against the spacers 39. The surface 50 of the rim is below the surface of the opening with a bevel 51 between them. The posts 38 are widely spaced with large spaces between them for the discharge of the chips and cooling medium, keeping the cutting threads clean of the cuttings. The lock nut 13 is tightened against the inner portion of the cap to lock the cap in place and preventing it from loosening.

At high speed operation, the torque of the shank 15 is transmitted to the lug 17 at the die end and directly to the sides of the slot of the die itself so that the holder parts are carried around with the shank substantially torque-free. The sole or main function of the cap parts is to accurately center the die jaws in adjusted position, the exerted force of the holder being an inward pressure on the outer tapered surfaces of the die. This pressure is converted substantially entirely to tension between the holder plate 25 and the holder base 26 and in the construction of this invention is transmitted through the three posts 38 which are assembled and headed over tightly to subject them to an initial tension snugly holding the holder plate 25 against the ends of the spacers 39 and so placing these spacers under initial compression. In this way the entire cap structure is made a unitary piece with no play or looseness between the parts which are relatively light and the complete assembly provides wide-open spaces discharging the chips outward from the die freely and with no tendency to obstruct or pack the material within the holder parts.

A three point support is provided for the head plate and this automatically accurately supports the end plate by three points which necessarily fall within a predetermined plane giving a precise and dependable positioning and permanent sustaining of the head plate tightly against the die surfaces in all positions of adjustment and use.

The supporting posts are symmetrically and equidistantly spaced around the center of rotation and provide a light structure adapted for high speeds of rotation and offering very little obstruction to the discharge of material from the die under such speeds.

I claim:

In combination with a threading device having an externally threaded holder and a conical surfaced die keyed to the end thereof to turn therewith and comprising separated lands with spaces between them for the discharge of material from the die threads, a rigid cap structure consisting of a flat externally threaded annular base member on the threaded end of said holder, an outer plate member of generally triangular shape with a central opening surrounded by an inner conical wall diverging from the conical surface of the die and having its edge at said opening engaging the conical surfaces of the die along a line near the outer end thereof, sleeve spacers held between said base and plate members at the three corners of said plate member, and

rivets passing through said plate and sleeve members and normally under tension to hold said base plate and plate members against the ends of said sleeve spacers and in assembled position of the parts to draw said edge of said opening tightly onto the outer end of the conical die surface to center the die on the holder and press the die lands onto the work.

JOHN WATSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,945,906	Koehler	Feb. 6, 1934