April 8, 1969 KIYOSHI HAJIKANO 3,436,953

DIE CASE

Filed Sept. 2, 1966

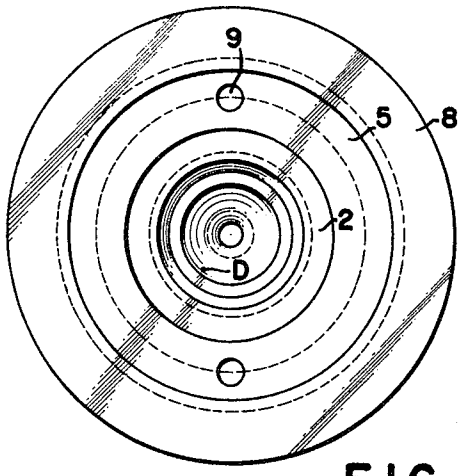


FIG. 1.

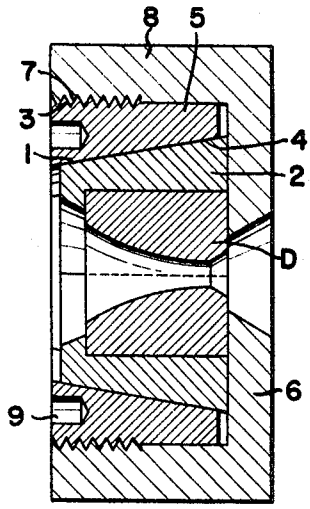


FIG. 2.

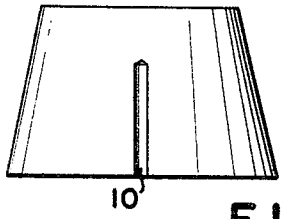


FIG. 4.

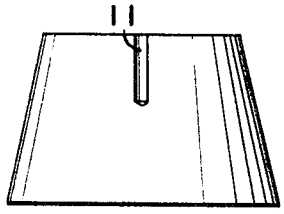


FIG. 5.

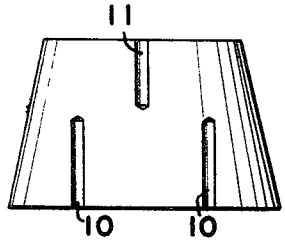


FIG. 6.

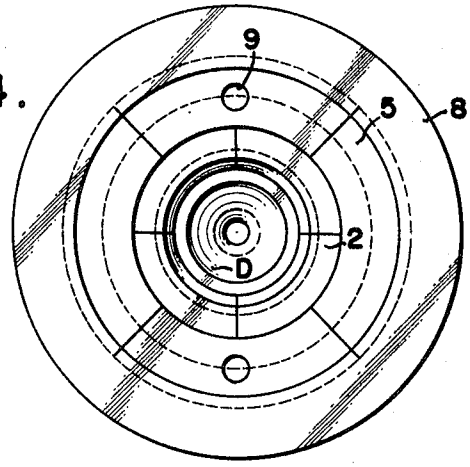


FIG. 3.

United States Patent Office

3,436,953
Patented Apr. 8, 1969

3,436,953

DIE CASE

Kiyoshi Hajikano, No. 8, 3-chome, Sendagaya, Shibuya-ku, Tokyo, Japan

Filed Sept. 2, 1966, Ser. No. 577,071
Claims priority, application Japan, Sept. 7, 1965, 40/73,002
Int. Cl. B21c 3/00
U.S. Cl. 72—467 5 Claims

ABSTRACT OF THE DISCLOSURE

A die case for holding a drawing die in which the latter is secured between the flanges of an outer case and an inner sleeve, the latter having a tapered surface which is slidable on the inner surface of an outer sleeve which in turn is threadably engaged in the outer case and can be advanced therein to cause the die and sleeves to be concentrically locked in the outer case.

This invention relates to an improved die case for holding a die nib of very hard metal.

A die is composed of a part of abrasion-resistant hard metal (hereinafter referred to as a "die nib" or "nib") and a case for holding and securing the nib. In a hitherto known way, a die nib is secured in a steel case of any size by the method of shrinkage fit or by the method of brazing. However, in the case of the shrinkage of a small sized die, it frequently happens that the nib escapes from the case during the process of drawing or pressing, due to insufficient shrinkage. In the case of brazing, the brazing material frequently penetrates into a hole of die nib, therefore requiring labor and time to remove the penetrated material. Moreover it is very difficult to obtain satisfactory brazing over the entire surfaces of the die nib and the case. Small bubbles may exist between the case and the nib. Furthermore, in the known arrangements, it is not possible to replace the die nib in the case.

According to this invention, the above stated difficulties have been eliminated by an arrangement in which the die nib is secured between the flanges of an outer case and an inner sleeve, the latter having a tapered surface which is slidable on the inner surface of an outer sleeve which in turn is threadably engaged in the outer case and can be advanced therein to cause the nib and sleeves to be concentrically locked in the outer case.

Features and advantages of this invention will become apparent to those skilled in the art from the following description given in connection with the accompanying drawing, wherein:

FIG. 1 is a front view of a first embodiment of a die case according to the invention;

FIG. 2 is a sectional view taken diametrically through the die case of FIG. 1;

FIG. 3 is a front view of another embodiment of a die case; and

FIGS. 4–6 are side views of respective embodiments of inner sleeves of a die case.

In the embodiment of this invention shown in FIGS. 1 and 2, the die case comprises a cylindrical inner sleeve 2 with a tapered outer surface 1, an outer sleeve 5 of cylindrical shape which has a tapered inner surface 4 fitted on outer surface 1 of inner sleeve 2 and a thread 3 on

its outer surface, an outer case 8 of cylindrical form which has a flange 6 at one end thereof and a thread 7 on its inner surface which is engaged with thread 3 of said outer sleeve 5, and a die nib D insertable in said inner sleeve 2 which is secured by outer sleeve 5 which in turn is threaded into said outer case 8. Thus said die nib D is held and secured by fitting the tapered surfaces 1 and 4 together by screwing outer sleeve 5 into the outer case 8. A hole 9 for receiving a tool is provided in the outer sleeve 5 to screw the outer sleeve 5 into the outer case 8. It is sometimes preferable that the inner sleeve 2 be made of high heat conductive material, for example, alloys of copper and aluminum to transfer rapidly and efficiently the heat produced out of the die nib in the process of drawing or pressing. Surfaces 1 and 4 can be fitted against each other by screwing the outer sleeve 5 into the outer case 8, and thereby the die nib D can be secured in the case.

As shown by the embodiment represented in FIG. 3, it is possible, and sometimes desirable to use an inner sleeve 2 which is of radially divided cylindrical shape and an outer sleeve 5 also of radially divided cylindrical shape. In such case, inner sleeve 2 and outer sleeve 5 are respectively divided into two to six pieces, for example. It is also possible to employ, as shown by FIGS. 4, 5 and 6, inner sleeves 2 which have one or more slits 10, 11. Moreover, it is possible to use an outer sleeve 5 which has one or more slits. However, the number of the pieces which compose inner sleeve 2 and outer sleeve 5 is not limited to as above.

As understood, according to this invention, the disadvantages in the hitherto known types of dies are avoided. Moreover, as the die, nib and the die case can be disassembled, it is very easy to replace or substitute the die nib. Therefore it is possible to save material for production of the die case. And it is very convenient to transport the die, especially by air. The die case, according to this invention, is useful for drawing as well as pressing.

Although preferred embodiments of this invention have been shown and described herein, it is to be understood that this description is merely illustrative and not limiting and that the invention is to be limted only by the scope of the appended claims.

I claim:

1. A die case for holding a drawing die comprising an inner sleeve having opposite ends and including a radially inwardly extending flange at one end, said sleeve having an outer tapered surface and an inner cylindrical surface extending from said flange to the other end of the sleeve, an outer sleeve having an inner tapered surface in sliding, mating relation with the outer surface of the inner sleeve, said outer sleeve having an outer cylindrical surface which has threads therein, an outer case of cylindrical shape with an inner threaded surface engaged with the threads of said outer sleeve, said outer case including a radially inwardly extending flange disposed adjacent said other end of the inner sleeve, and a drawing die nib in engagement with the inner surface of the inner sleeve and interposed between said flange of the inner sleeve and the flange of the outer case whereby the outer sleeve can be threadably advanced into the outer case and the tapered surface of the outer sleeve advanced along the tapered surface of the inner sleeve to cause the nib and sleeves to be concentrically secured in the outer case.

2. The combination as claimed in claim 1 wherein said

other end of the inner sleeve is in abutment with the flange of said outer case.

3. The combination as claimed in claim 2 wherein said inner and outer sleeves each is constituted as a radially divided element.

4. The combination as claimed in claim 3 wherein said inner and outer sleeves each comprises a plurality of separate elements having radially facing surfaces.

5. The combination as claimed in claim 3 wherein said inner and outer sleeves each is provided with at least one axial slit to radially divide the same.

References Cited

UNITED STATES PATENTS

1,931,095	10/1933	Todt	72—467
1,986,777	1/1935	Patterson	72—467 X
2,028,652	1/1936	De Mulatier	72—467 X
2,098,675	11/1937	Procunier	279—42

FOREIGN PATENTS

565,080	10/1944	Great Britain.

MILTON S. MEHR, *Primary Examiner.*