Feb. 16, 1926. 1,573,049

C. J. FANCHER ET AL.

FEED COLLET

Filed Feb. 23, 1924

Fig. 1.

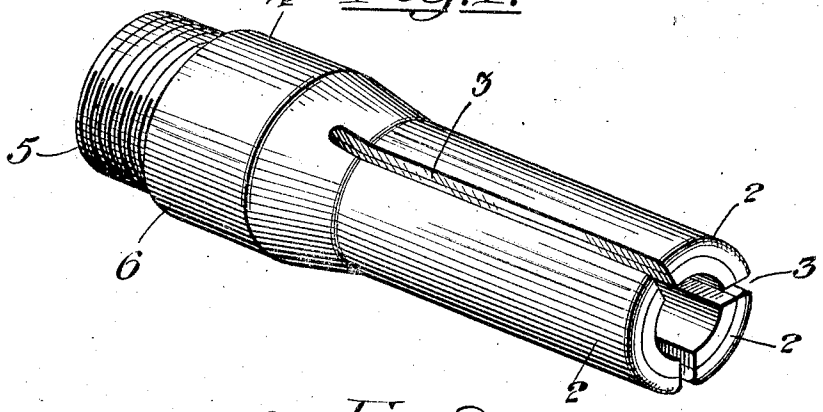


Fig. 2.

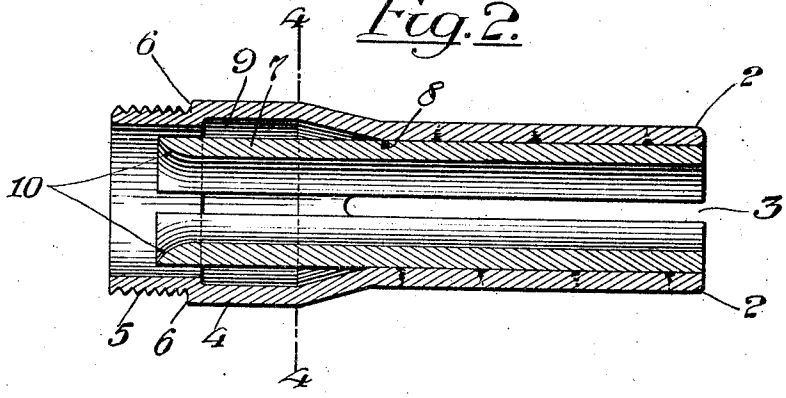


Fig. 3.

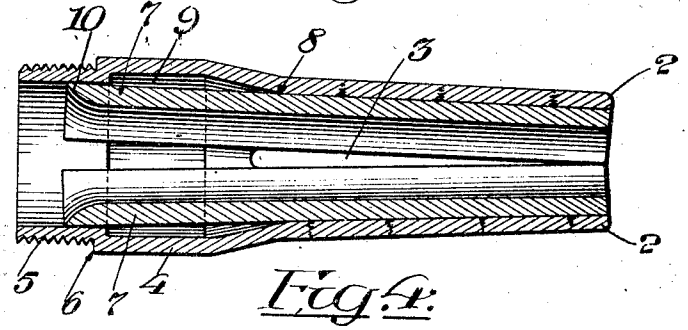
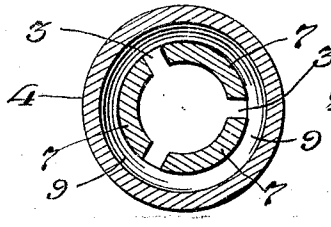


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES J. FANCHER AND ROBERT A. JOHNSON, OF WINDSOR, VERMONT, ASSIGNORS TO THE NATIONAL ACME COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

FEED COLLET.

Application filed February 23, 1924. Serial No. 694,465.

To all whom it may concern:

Be it known that we, CHARLES J. FANCHER and ROBERT A. JOHNSON, citizens of the United States, residing at Windsor, in the county of Windsor and State of Vermont, have invented certain new and useful Improvements in Feed Collets, of which the following is a specification.

This invention relates to feed collets or pushers, and the method of making the same, an object thereof being to provide an improved article of this class in which the area of the gripping or wearing surface is materially increased without increasing the over-all length of the pusher, and in which a more uniform grip on the stock is obtained throughout the whole length of the pusher.

In the drawings accompanying and forming a part of this specification Fig. 1 is a perspective view of this improved collet; Fig. 2 is a longitudinal sectional view thereof showing the fingers in that position which they assume when a bar of stock is in the collet; Fig. 3 is a similar longitudinal section illustrating the fingers of the collet in that position which they assume when the bar of stock is removed from the collet; and Fig. 4 is a transverse section taken on line 4—4 Fig. 2.

Similar characters of reference indicate corresponding parts in the several views.

Before explaining in detail the present improvement and mode of operation thereof, it is desired to have it understood that the invention is not limited to the details of construction and arrangement of parts which are illustrated in the accompanying drawings, since the invention is capable of other embodiments, and that the phraseology which is employed is for the purpose of description and not of limitation.

It has been the usual practice to make feed collets with the bar gripping surface of comparatively short length and usually located at the forward end of the fingers. By means of the improved construction herein set forth an increased area of gripping or wearing surface is obtained without increasing the over-all length of the pusher, and a more uniform grip on the stock is also obtained and the gripping pressure is more equally distributed.

This improved pusher or collet may be made of a solid bar of stock bored out and slotted to form the fingers or formed or rolled up from a metal blank stamped out of a piece of sheet metal such as a pressed sheet steel plate. When made in this way the blank usually comprises a body portion and a plurality of finger pieces extending or projecting from one of the sides or edges of the body, which are usually of tapered formation. The blank is then formed or rolled up into tubular shape, thus having a lengthwise extending non-drilled bore therethrough. The contiguous edges may be connected in any suitable manner as by welding. When formed from a bar of stock the bar is bored and the tube is then slotted to form the fingers. In both instances the finger pieces 2 are then bent, pressed or otherwise forced inwardly a suitable distance or shaped in any suitable manner and are spaced apart by the lengthwise extending slots 3 which extend back toward the body 4 of the collet.

For the purpose of attaching the collet to the feed tube the end of the collet is threaded as at 5 and a shoulder 6 is formed in a suitable manner. When the collet is of sheet metal this shoulder may be formed by compressing the blank, thus leaving more metal under the threads to strengthen the collet than would otherwise be the case by turning down the body on the outside prior to the threading.

Secured on the inside of the tubular collet as to each finger thereof by welding at suitable points as along the edges of the slots. is a bearing bushing or pad in the form of a filler member, section or block 7. In the form shown this bushing is formed in sections. Each of these sections is of segmental form, the outer surface thereof conforming to the inner surface of a finger while the inner surface conforms to the shape of the work. These sections extend back from the forward end of the fingers throughout nearly the whole length of the pusher. This materially increases the area of the wearing surface and consequently gives a good grip on the stock with less strain on the fingers and increases the wearing life of the pusher. Back of the inner ends of the fingers as for instance the joint 8, the pads are not attached to the body of the pusher in any way but are welded to the fingers forwardly of this point usually at both edges of

the fingers. Thus the rear ends of the sections or pads not being secured to the body of the pusher (see Fig. 2) are spaced therefrom as at 9 and are as it were free to float. As the theoretical fulcrum is at the point 8, and as the forward ends of the fingers move toward each other as illustrated in Fig. 3 when there is no bar of stock in the pusher, this opens the pads at their rear ends making it easy to insert a bar into the pusher from the rear end. The greatest gripping strength of the ordinary pusher is of course at the base of its fingers and therefore it will be obvious that by prolonging the bearing pads in the manner shown herein the gripping pressure of the pads is evenly distributed and an increased area of wearing surface is obtained without increasing the over-all length of the pusher and moreover a more uniform grip on the stock is obtained throughout the length of the collet. In other words by means of the present improvement the gripping efficiency of the collet is practically throughout its entire length instead of as heretofore only at the forward ends of the fingers.

At the inner or rear ends of the pads they are flared outwardly as at 10 to facilitate the feeding of the stock to the pusher.

It will be understood of course that the inner surface of each pad is shaped to conform to the shape of the work and when the pads are secured to the fingers become parts thereof. It will also be obvious that by forming the collet of a predetermined size various shapes and sizes of pads can be interchangeably secured to the fingers according to the shape, size or form of the stock or work.

It will thus be observed that in the present improvement the collet fits the stock for not only the full length of the resilient fingers but for nearly the full length of the collet, thus giving a very long gripping surface on the stock and reducing the scratching or marring thereof, and requiring very much less tension to insure a proper or sufficient friction of the fingers on the stock, and consequently the operation of the pusher under less strain. In other words with a short filler block there is of course only a short gripping surface on the stock so that this requires considerable spring tension in the fingers to insure sufficient pressure of the fingers on the stock. By reason of the long filler blocks however, and the consequently increased or lengthened gripping surface, the tension does not have to be so great and there is less liability of breakage of the fingers where they join the body. That is to say, by having the filler blocks almost the length of the body a greater gripping surface is obtained on the stock so that less resiliency or tension is required in the fingers. It has been discovered that the short filler blocks require great tension in the fingers, and therefore the long filler blocks make it possible to decrease the tension of the fingers. When the tension or spring of the fingers is high the fingers in operation are liable to break off, but when the tension is low it has been discovered that the fingers may even be bent back without breaking them off. Thus by having the collet fit the stock throughout practically its full length, it is possible to so heat treat the fingers that a low tough temper is obtained with the result that the fingers will withstand almost any amount of bending without danger of breaking while the gripping surface on the stock is materially increased, and sufficient flexibility is present to maintain a good grip on the stock.

By the use of this improved long filler block another advantage is obtained. Heretofore collets were heat treated by case hardening them, packing them in the usual way and carbonizing them deep or nearly through, but by the use of this long filler block it is now merely necessary to heat them in a cyanide bath and then quench them, the result being that the collet is left with a low tough temper so there is little liability of breakage, yet leaving sufficient flexibility in the fingers to afford a good grip on the stock. In other words by reason of the long filler blocks which give an increased friction engaging surface on the work, it is possible to heat treat the collet in the manner set forth, whereas heretofore they had to be so heated that the tension of the fingers was very great, and consequently while there is an increased amount of material in the filler blocks, the result is that the cost of manufacture is reduced, and a more durable, efficient and longer lived collet is produced.

It is to be understood that by describing in detail herein any particular form, structure or arrangement, it is not intended to limit the invention beyond the terms of the several claims or the requirements of the prior art.

Having thus explained the nature of our said invention and described a way of construction and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the modes of its use, we claim:

1. A feed collet comprising a body portion and a slotted portion extending therefrom, filler means secured within the collet for gripping the work and having a length greater than the slotted portion whereby it extends into the body portion, said slotted portion and filler means both being formed of heat treatable metal to permit the same to be heat treated whereby when the same is heat treated they will both have substantially the same yielding characteristics and resiliency.

2. A feed collet comprising a body por-

tion and a slotted portion extending therefrom, filler means secured within the collet to the slotted portion thereof for gripping the work and having a length greater than that of the slotted portion whereby it extends into the body portion, said slotted portion and filler means both being formed of heat treatable metal to permit the same to be heat treated whereby when the same is heat treated they will both have substantially the same yielding characteristics and resiliency.

3. A feed collet comprising a body portion and a slotted portion extending therefrom, filler means secured within the collet to the slotted portion thereof for gripping the work and having a length substantially equal to the combined length of the slotted portion and the body, said slotted portion and filler means both being formed of heat treatable metal to permit the same to be heat treated whereby when the same is heat treated they will both have substantially the same yielding characteristics and resiliency.

4. A feed collet comprising a body portion and a slotted portion extending therefrom, filler means secured within the collet to the slotted portion thereof for gripping the work and having a length greater than that of the slotted portion whereby it extends into the body portion, said body extending portion being spaced from the body of the collet and said slotted portion and filler means both being formed of heat treatable metal to permit the same to be heat treated whereby when the same is heat treated they will both have substantially the same yielding characteristics and resiliency.

5. A feed collet comprising a body portion, a slotted portion extending therefrom, and filler means having greater length than the slotted portion and having its forward portion secured to the slotted portion and its rear portion floating relatively to the body portion, said rear portion having an outward flaring end.

6. A feed collet comprising a body portion, a slotted portion extending therefrom, and means within said collet for increasing the length of the gripping surface thereof to a greater extent than the length of the slotted portion without increasing the overall length of the collet and comprising sectional filler members connected to the slotted portions and free of the body portion, whereby the rear ends of the filler members spread as the free ends of the fingers spring together.

7. A feed collet comprising an unyielding portion and a yielding portion, and means carried by the collet to fit the stock and secured to the yielding portion for movement therewith and extending rearwardly into the unyielding portion and unsecured to and spaced from said unyielding portion for floating movement relatively thereto.

8. The method of making a feed collet which consists in forming a tubular member having a body portion and slotted portions, and securing to the slotted portions gripping members having a length greater than the slotted portions, and then heat treating said collet to impart to the gripping portions a low degree of tension.

9. The method of making a feed collet which consists in forming a tubular member having a body portion and slotted portions, providing the slotted portions with sectional filler members having a length greater than the slotted portions and then heat treating said collet to impart to the gripping portions thereof a low degree of tension.

Signed at Windsor, Vermont, this 20th day of February 1924.

ROBERT A. JOHNSON.
CHARLES J. FANCHER.