Feb. 16, 1926. 1,573,048

C. J. FANCHER ET AL

FEED COLLET

Filed Nov. 1, 1923

Fig. 1.

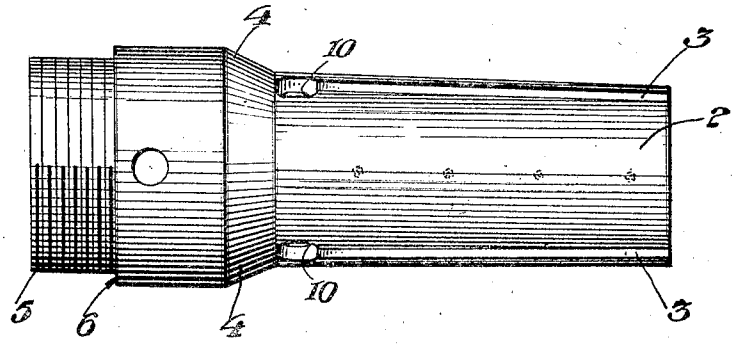


Fig. 2.

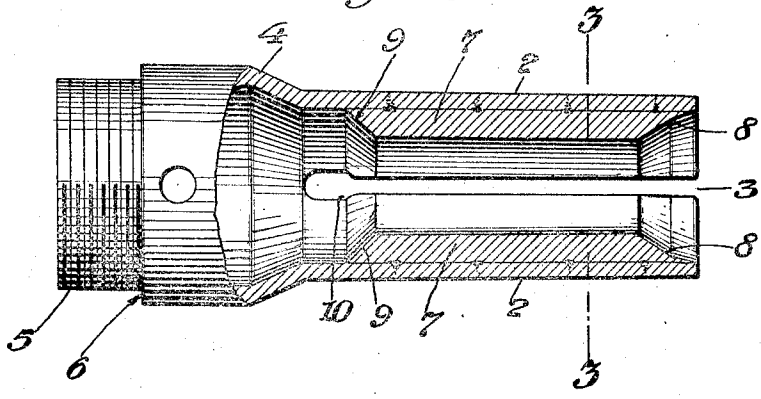
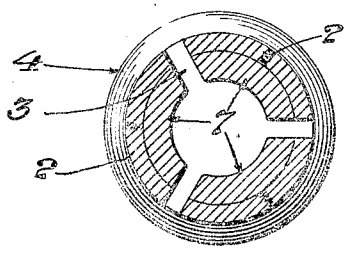


Fig. 3.



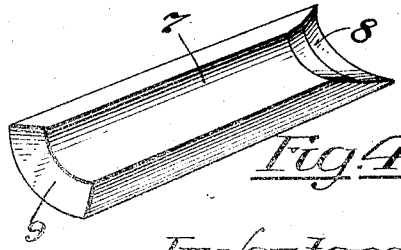


Fig. 4.

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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 November 1, 1923. Serial No. 672,057.

To all whom it may concern:

Be it known that we, CHARLES J. FANCHER and ROBERT A. JOHNSON, both 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 to the method of making the same, an object thereof being to provide an improved article of this class and more particularly a collet made of sheet metal such as sheet steel, having improved gripping surfaces whereby a more durable and longer lived feed collet is obtained, in which there is less likelihood of the marring or scratching of the stock and in which less tension is required to secure a sufficient friction or grip on the stock, and by means of which also the heat treatment of the collet is simplified, with the result that breakage of the collect is largely avoided and in which the tension of the collet may be adjusted by the operator at will so that there is no delay in production and no idle machines.

These improved feed collets or pushers are adapted for use in various types of machines such as metal working machines, including automatic or hand operated screw machines, bar forming machines or the like, and are constructed especially for the purpose of feeding the stock or work.

In the drawings accompanying and forming a part of this specification, Fig. 1 is a side view of this improved collet; Fig. 2 is a longitudinal sectional view of Fig. 1;

Fig. 3 is a cross sectional view taken on line 3—3 Fig. 2; and Fig. 4 is a perspective view of one of the sectional filler members.

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

Before explaining in detail the present improvement and mode of operation thereof, we desire 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 we employ is for the purpose of description and not of limitation.

The present improved feed collet as shown herein in its preferred form is formed or rolled up from a metal blank struck from or stamped out from a piece of sheet metal such as a pressed sheet steel plate. The blank usually comprises a body portion and a plurality of finger pieces extending or projecting from one of the sides of the body, which finger pieces are usually of tapered formation. This 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. The finger pieces 2 are then bent, pressed or otherwise forced inwardly a suitable distance or shaped in any suitable manner and are shown spaced apart by lengthwise extending slots 3 which extend back to 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. This shoulder may be formed by offsetting the blank, thus leaving more metal under the threads to strengthen the body of the collet than would otherwise be the case by turning down the body on the outside prior to threading. Secured to the inside of each finger is a filler member, section block or pad 7, each of segmental form, the outer surface of which conforms to the inner surface of a finger, while the inner surface of each pad is shaped to conform to the shape of the work, and these pads or sections are suitably secured, preferably by spot welding, to the fingers thus becoming a part thereof. From this it will be obvious that by forming the collet of a predetermined size various shapes and sizes of pads may be interchangeably secured to the collet fingers according to the shape, size or form of the stock or work. In other words when a collet of small size is desired small filler blocks may be inserted and secured to the collet and when a collet of large size is desired, filler members of larger size may be used. The outer end of each filler section is tapered as at 8, so as to form a tapered opening for guiding and centralizing the end of the stock bar and thus preventing the waste end of the stock from jamming the collet after the bar is fed completely through the collet, and the inner end of each filler section is

similarly tapered as at 9 to facilitate the feeding of each new stock bar into the collet.

In the present improved collet the filler members or sections 7 correspond substantially with the length of the fingers, that is to say, each filler member extends back from the forward end of the collet almost to the relieved portions 10 of the slots so that practically the whole length of the fingers corresponds to and fits the stock instead of as in our prior Patent No. 1,449,505 of March 27, 1923, in which a very short filler block only at the front end of the collet fits the stock. By having these filler blocks of a length not substantially less than the length of the fingers some very important practical advantages are obtained.

In the first place it will be observed that the fingers fit the stock for nearly the full length of the resilient fingers, thus giving a longer gripping surface on the stock which reduces the scratching or marring of the stock, and requires 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 fingers 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 fingers fit the stock throughout practically their 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.

The sections may be welded to the fingers in any desired way and not necessarily by spot welding, for instance a single member or bushing may be inserted and welded to the collet fingers, the slots of which originally may be made somewhat wider than usual. Thereupon the welding material may be inserted or located through the slots of the fingers thus welding the cylindrical bushing to the fingers, especially along the edges of the slots. When the fingers are finished off on the outside to conform to the outside diameter of the fingers, slots of the desired width may be formed through the welded material by a suitable milling cutter and through the bushing, these slots being preferably somewhat narrower than the original slots. By this method of procedure it will be observed that the sections are welded their whole length to the edges of the fingers.

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 constructing 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 having a slotted portion extending therefrom, and filler means for gripping the work and having a length substantially as long as said slotted portion and secured to said slotted portion substantially along its entire length.

2. A feed collet comprising a hollow body portion having a resilient gripping portion, insertable filler means therein for lessening the interior diameter of the gripping portion according to the size of the filler means and comprising a plurality of sectional members, each of a length substantially as

long as the resilient gripping portion and each secured to a slotted portion along substantially the entire length thereof.

3. A feed collet comprising a body portion, and resilient projecting gripping portions having a relatively low degree of tension and long stock gripping portions.

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

5. The method of making a feed collet which consists in forming a tubular member having a body portion and slotted gripping portions, providing the gripping portions with sectional filler members thereby to decrease the interior diameter of the collet, and then heat treating said collet to impart to the gripping portions a low degree of tension.

6. The method of making a feed collet which consists in forming a tubular member having a body portion and slotted gripping portions, providing the gripping portions with sectional filler members thereby to decrease the interior diameter of the collet, each of a length not substantially less than the length of its gripping portion, and then heat treating said collet to impart to the gripping portions a low degree of tension.

7. The method of making a feed collet which consists in forming a tubular member comprising a body portion and a slotted portion, then inserting a filler member therein, then welding the filler member to the slotted portion along the slots thereof, and then forming resilient gripping portions by cutting through the weld and the filler member.

8. The method of making a feed collet which consists in forming a tubular member having a body portion and a slotted portion, then inserting a filler member thereby to decrease the interior diameter of the collet, said filler member having a length substantially not less than the length of the slotted portion, then welding the filler member to the slotted portion along the slots thereof, and then cutting through the weld and the filler member to form resilient gripping portions, and then heat treating the collet.

9. The method of making a feed collet which consists in forming a tubular member having a body portion and a slotted portion, then inserting a filler member thereby to decrease the interior diameter of the collet, said filler member having a length substantially not less than the length of the slotted portion, then welding the filler member to the slotted portion along the slots thereof, and then cutting through the weld and the filler member to form resilient gripping members, and then so heat treating the collet as to impart to the gripping portions a low degree of tension.

Signed at Windsor, Vermont, this 25th day of October, 1923.

CHARLES J. FANCHER.
ROBERT A. JOHNSON.