Feb. 9, 1937. C. A. RICH 2,069,775

FEED COLLET

Filed May 15, 1935

Fig. 1

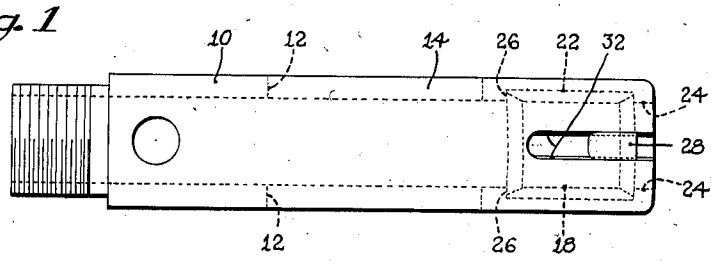


Fig. 2

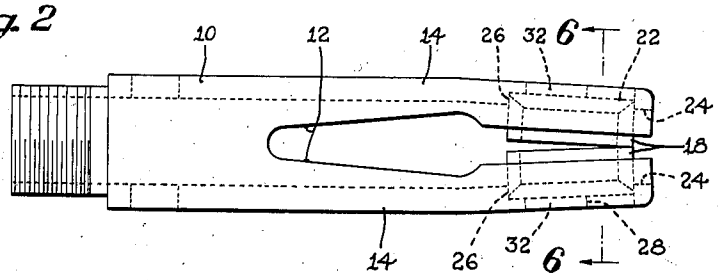


Fig. 3

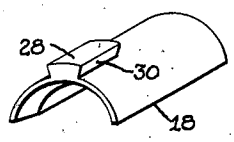


Fig. 4

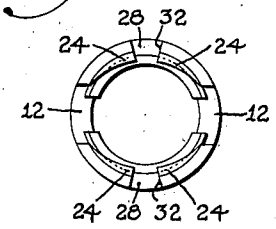


Fig. 5

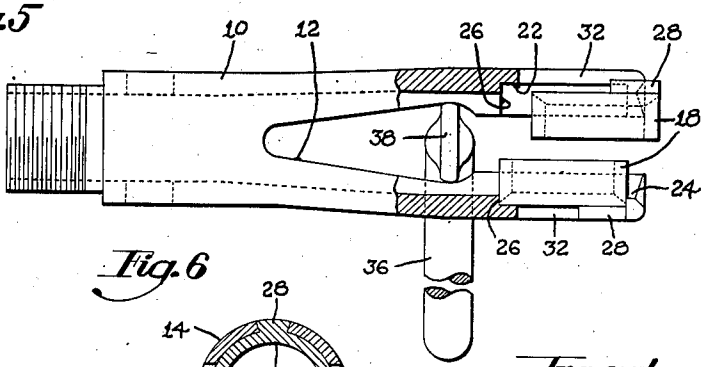
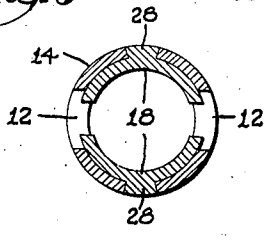


Fig. 6



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UNITED STATES PATENT OFFICE

2,069,775

FEED COLLET

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Application May 15, 1935, Serial No. 21,571

9 Claims. (Cl. 29—62)

The present invention relates to a feed collet for use with automatic screw and similar machines for feeding bar stock.

More specifically, the invention relates to a feed collet of the general type which includes a tubular member through which the bar stock is passed, feed fingers formed thereon, and gripper pads or jaws which are removably supported on the fingers to engage with and feed the bar.

It is a principal object of the invention to provide a simplified and improved assembly of the feed fingers and gripper pads including a novel and more efficient locking means for maintaining the pads in their correct operating position which operates automatically as the pad is moved into place to lock the pad securely in position, and yet permits an equal facility of removal when it becomes necessary to replace the same.

With these and other objects in view as may hereinafter appear, a principal feature of the present invention consists in the provision of a feed finger and pad associated therewith, together with means for yieldingly gripping the pad to hold it snugly in locking position against the inner face of the finger.

Another feature of the invention more specifically consists in the provision of a feed finger having formed in the end thereof a longitudinal slot, the walls of which are arranged for yielding engagement with a lug formed on the cooperating pad or jaw to maintain the pad yieldingly in locking position with respect to the feed finger.

The several features of the present invention consist also in the devices, combinations and arrangement of parts hereinafter described and claimed, which together with the advantages to be obtained thereby will be readily understood by one skilled in the art from the following description taken in connection with the accompanying drawing, in which Fig. 1 is a plan view of a feed collet illustrating the feed fingers and the pads supported therein; Fig. 2 is a side elevation of the feed collet shown in Fig. 1, showing the parts in the positions taken when there is no bar feeding therethrough; Fig. 3 is a perspective view of one of the gripper jaws or pads; Fig. 4 is an end view of the feed collet with the gripper pads in position and the fingers spread in the position they would normally assume with the bar feeding in the machine; Fig. 5 is a view in side elevation partly in section illustrating a spreading tool in position to spread the fingers and showing one of the pads in an intermediate position assumed during the insertion of the same; and Fig. 6 is a sectional view of the assembled feed collet taken substantially along the line 6—6 of Fig. 2, but with the feed fingers spread in the position shown for instance in Figs. 4 and 5.

The feed collet disclosed in the drawing as embodying in a preferred form the several features of the present invention, is of the general type usually employed in automatic screw machines in which bar stock is mounted within a rapidly rotating feed assembly including a chuck which is arranged to grip and rotate the bar during the operation of the forming tools, and a feed collet which is intermittently actuated to engage with and advance the bar to present another section thereof to the operating tools. The feed collet as shown in the drawing, comprises a tubular member 10 through which the bar stock passes, having two longitudinal slots 12 cut one in each side of the tube to form two identical cooperating feed fingers 14. Separate gripping jaws or pads 18 are removably supported within the feed fingers which are bent inwardly to provide a frictional engagement of the pads with the bar stock.

In accordance with a principal feature of the present invention, a novel and improved construction and arrangement of the feed finger and gripping jaw or pad assembly is provided which serves to secure a rigid locking engagement of the pads with their respective feed fingers, and is at the same time well adapted to permit the ready insertion and removal of these pads as desired. As illustrated in the drawing, two identical gripping pads or jaws 18 are provided which are fitted respectively into the two feed fingers 14. Each of these pads, as best shown in Fig. 3, comprises a substantially semi-circular member having its inner periphery bevelled at each end and arranged to fit snugly within a recess or groove 22 in the feed finger between an abutting shoulder 24 formed at the outer end of the feed finger, and a shoulder 26 forming the other end of the recess. The construction as thus far described follows substantially the usual construction employed in commercial machines. In carrying out the invention, novel and improved means are employed for maintaining each of the pads 18 rigidly in position in its recess 22, constructed and arranged to permit the ready insertion or removal of the pad from the operating position shown in Figs. 2, 4, and 6. To this end a lug 28 is formed on the external periphery of the pad 18 adjacent its forward end, with the longitudinally extending side portions undercut at 30, and with the rear corners of said side portions slightly bevelled to provide a tapered nose portion for a purpose hereinafter to be explained. There is also provided in

the end of each of the feed fingers, a longitudinally extending dovetail slot 32 which is open at its forward end and extends rearwardly a substantial distance to permit the two end portions of the feed finger separated by the slot 32 to be forced yieldingly apart to provide a yielding gripping engagement between the sloping walls of the slot and the correspondingly under cut sides of the lug 28. With the pad 18 in operating position in the recess 22 of the feed finger 14, the lug 28 is firmly engaged within the dovetail slot 32 so that the gripper pad or jaw 18 is securely held in its recess, and is also prevented from possible rotational movements with relation thereto.

This construction and arrangement of the gripping pad 18 and the feed finger 14 is particularly well adapted to permit the insertion or removal of the pad from the feed finger. The manner in which this operation is carried out will be readily evident from an inspection of Fig. 5. In accordance with the usual practice, a tool such as that designated at 36 having a flat key portion 38 is inserted in a longitudinal position through the slots 12 separating the feed fingers, and is turned through a right angle to the position illustrated in Fig. 5, to spread the feed fingers in the usual manner. The pad 18 is then inserted longitudinally into the feed finger, the lug 28 being partially engaged within the dovetail slot 32, and the bevelled end of the lug acting to slightly separate the walls of the slot 32 to permit the engagement of the lug therein. The pad or jaw 18 is now pushed rearwardly to register the lug with the recess 22. As the forward end of the jaw passes beyond the shoulder 24, the pad will be snapped upwardly and held in locking position by the spring pressure exerted on the undercut side walls of the lug 28 by the correspondingly sloping side portions of the dovetail slot 32. In removing the pad 18 from the feed finger, the feed collet is again opened as above described, and the lug 28 is forced downwardly, causing the wall portions of the dovetail slot to be sprung apart until the lug is wholly disengaged from the slot. The pad is now entirely free from the finger, and may be readily removed from the feed collet.

It will be noted from an inspection particularly of Fig. 4 of the drawing, that the inner face or edge of the shoulder 24 for each feed finger, is tapered outwardly away from the edges of the dovetail slot 32. This shape of the shoulder 24 is provided in order to enable the lug 28 to project radially into the dovetail slot 32 as far as possible as it is moved axially into the slot.

It will be noted that the present construction in which the pads are inserted from the end of the fingers with the lug 18 partially in engagement with the dovetail slot 32, so that only a slight spreading of the feed fingers 14 by the tool 36 is necessary, thus materially decreasing the amount of effort required to spread the feed fingers, and also reducing to a minimum the amount of strain placed on the feed fingers during the spreading operation. It will also be noted in connection with the present construction, that the lug 28 is located at the extreme forward end of the pad or jaw 18, so that a maximum spreading or spring of the two portions of the finger formed by the dovetail slot 32, may be utilized for maintaining the lug 28 and jaw 18 firmly seated within the recess without at the same time materially weakening the fingers.

The invention having been described, what is claimed is:

1. In a feed collet, the combination of a feed finger extending lengthwise of and arranged for feeding engagement with bar stock, said finger having transverse shoulders and resiliently expansible spring walls comprising longitudinally extending gripper surfaces, and a bar engaging pad shaped to fit snugly against the shoulders to prevent axial movement of the pad, and having engaging surfaces formed on the outer surface thereof for engagement with said gripper surfaces to lock the pad in operating position.

2. In a feed collet, the combination of a feed finger extending lengthwise of and arranged for feeding engagement with bar stock, said finger having formed on the inner face thereof transverse shoulders and resiliently expansible spring walls comprising longitudinally extending gripper surfaces sloping inwardly toward the axis of the collet, and a bar engaging pad shaped to fit snugly against the shoulders of said inner surfaces to prevent axial movement of the pad, and having formed on the outer surfaces thereof longitudinally extending plain surfaces undercut toward the axis of the feed finger for engagement with said gripper surfaces to lock the pad in operating position.

3. In a feed collet, the combination of a feed finger extending lengthwise of and arranged for feeding engagement with bar stock, said finger having formed on the inner face thereof transverse shoulders and in the end thereof a longitudinal slot with the walls thereof formed to provide resiliently expansible gripper surfaces, a work engaging pad associated therewith arranged to fit snugly against said shoulders on the inner face of the finger, and a lug on the pad arranged for yielding gripping engagement between the walls of the slot for locking the pad in operative position.

4. In a feed collet, the combination of a feed finger extending lengthwise of and arranged for feeding engagement with bar stock, said finger having formed in the end thereof a longitudinal dovetail slot, a work engaging pad associated therewith arranged to fit snugly against the inner face of the finger, and a lug formed on the outer face of the pad having undercut side portions arranged for yielding gripping engagement between the walls of the slot to lock the pad in operating position.

5. A feed collet having, in combination, a plurality of feed fingers for feeding bar stock, each of said fingers having formed on the inner face thereof transverse shoulders, and in the end thereof a longitudinal open-ended slot, a bar engaging pad shaped to fit snugly against the shoulders to prevent axial movement of the pad, and a lug formed on the outer face of the pad having side walls arranged for yielding gripping engagement between the walls of the slot to lock the pad in operating position.

6. A feed collet having, in combination, a plurality of feed fingers for feeding bar stock, each of said fingers having formed on the inner face thereof transverse shoulders and having cut into the end thereof a longitudinal dovetail slot, a bar engaging pad shaped to fit snugly against the shoulders of said inner surface to prevent axial movement of the pad, and a lug formed on the outer face of the pad having undercut side walls arranged for yielding gripping engagement between the walls of the slot to lock the pad in operating position.

7. A feed collet having in combination, a tubular member slotted longitudinally to provide a

plurality of feed fingers, a circumferential groove formed in the inner face of each of said fingers provided at each side thereof with abutting shoulders and a dovetail slot cut longitudinally into the end of each finger, a gripper pad for each of said fingers shaped to fit snugly against said inner faces between the shoulders to prevent axial movement of the pad in either direction, and means for maintaining the pad in locking engagement with the finger comprising an undercut lug formed on the face of the lug adjacent the tip portion of the feed finger and adapted for engagement with said dovetail slot, said slot being of sufficient length to permit a spring-like action of the portions of the finger adjacent the slot to permit the insertion of the lug and pad axially into position in the recess over the shouldered portion adjacent thereto.

8. A feed collet having in combination, a tubular member slotted longitudinally to provide a plurality of feed fingers, each of said fingers having formed on its inner periphery adjacent the end thereof a recess provided at each end with an abutting shoulder and a dovetail slot cut longitudinally into the end of the finger, a work engaging pad shaped to provide a snug fit in the recess between said shoulders, an undercut lug formed on the face of the pad arranged for yielding gripping engagement between the walls of the slot, said finger having the shouldered portion adjacent the end thereof tapered away from each side of the slot to facilitate the moving of the pad and lug axially into position.

9. A feed collet having in combination, a plurality of feed fingers, each of said fingers having formed on its inner face adjacent the end thereof transversely extending shoulders and a dovetail slot cut longitudinally into the end of the finger, a work engaging pad shaped to provide a snug fit against said shoulders to prevent axial movement of the pad, an undercut lug formed on the face of the pad and having a tapered nose portion for insertion axially into yielding gripping engagement between the walls of the slot.

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