May 27, 1952 T. E. BASTIAN ET AL 2,598,656

WIRE-POINTING MECHANISM

Filed April 1, 1950 2 SHEETS—SHEET 1

Fig. 1

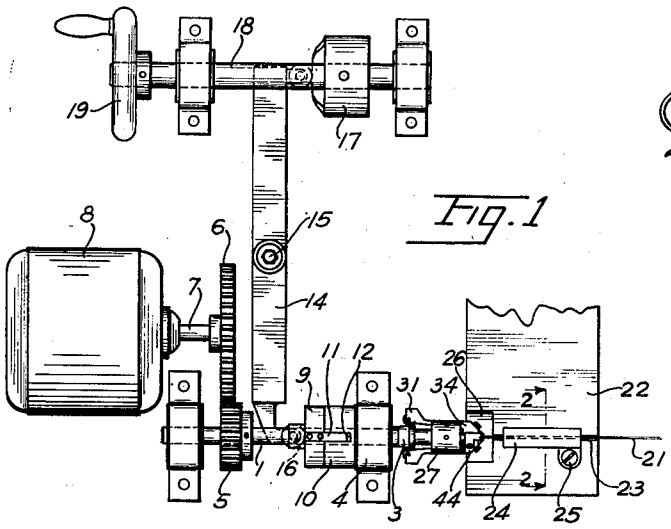


Fig. 3

Fig. 2

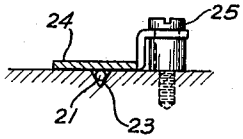


Fig. 4

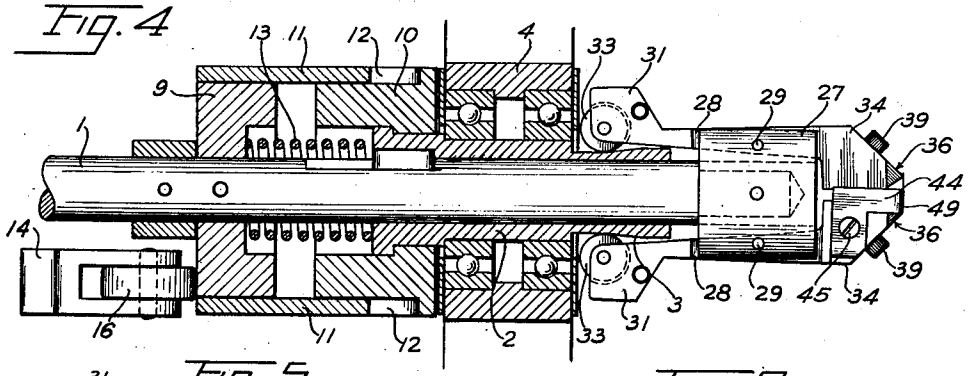


Fig. 5

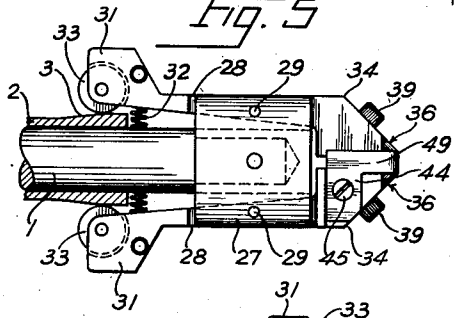


Fig. 6

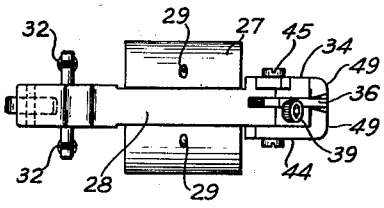


Fig. 7

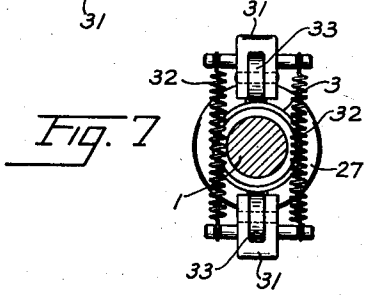
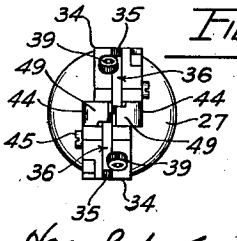


Fig. 8



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WIRE-POINTING MECHANISM

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Fig. 9

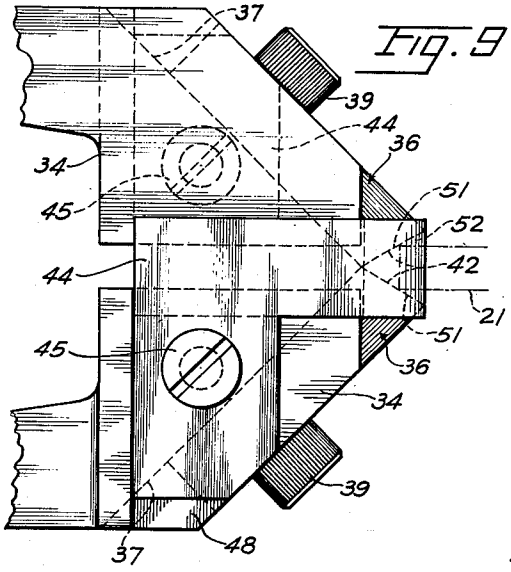


Fig. 11

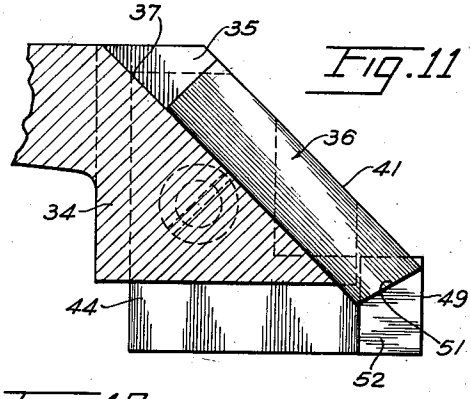


Fig. 12

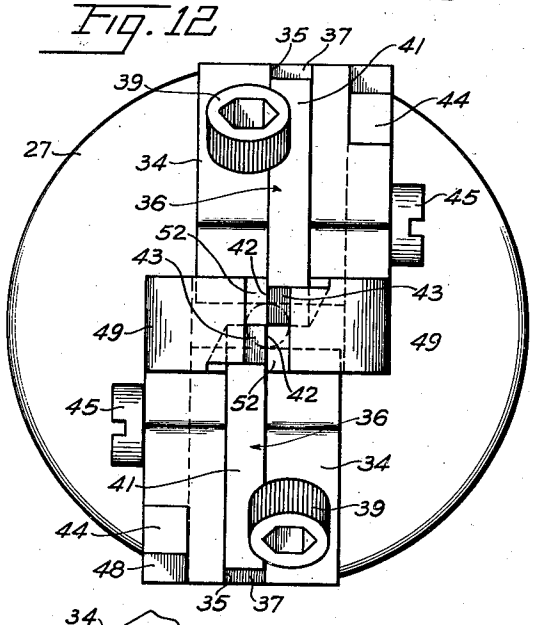


Fig. 10

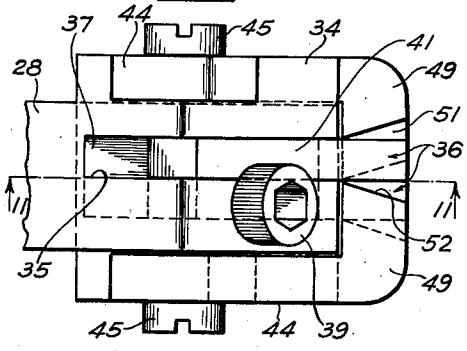


Fig. 13

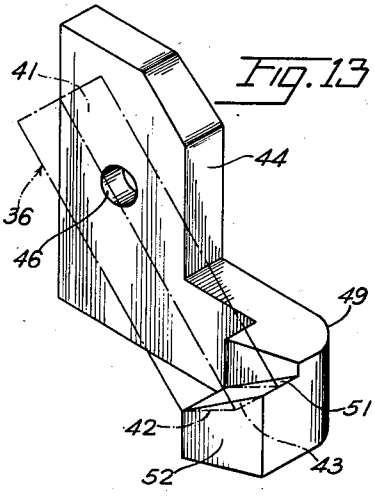
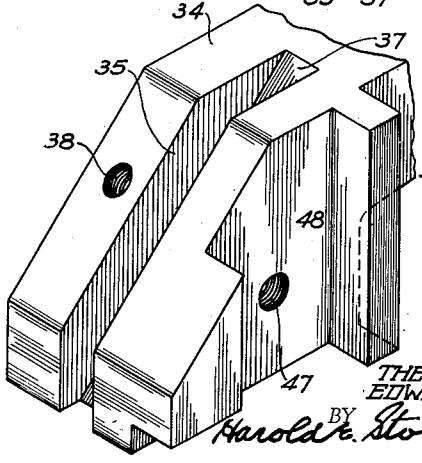


Fig. 14



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UNITED STATES PATENT OFFICE

2,598,656

WIRE-POINTING MECHANISM

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Application April 1, 1950, Serial No. 153,448

8 Claims. (Cl. 82—11)

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This invention relates to a wire-pointing mechanism, and has for its purpose to afford a practical and efficient mechanism that will automatically point or sharpen the end of a piece of brass or other wire such as employed in the manufacture of pin-attached buttons, badges, and the like.

More particularly the invention has for its object to provide a machine that employes oppositely arranged cutters with cutting edges that converge to a point, which are rotated and advanced in relation to the wire to be pointed while maintaining the end of the wire in fixed position with reference to the cutters.

An additional purpose of the invention is to afford a construction in which cutters are carried by jaws movably mounted on a rotating and endwise movable tool-head, and adapted to be moved toward each other and into cutting engagement with a piece of wire and automatically withdrawn therefrom.

The invention has for a particular object to afford a structure of this general character in which each jaw is provided with a removable positioning plate that includes a surface which serves as a stop for and determines the location of the cutter when it is inserted into the jaw and a wire-positioning surface that maintains the wire in proper position while being operated on by the cutters, thus making it possible to grind the stop and positioning surfaces on the positioning plate accurately to the proper angles.

To these and other ends, the invention consists in the construction and arrangement of parts that will appear clearly from the following description when read in conjunction with the accompanying drawings, the novel features being pointed out in the claims following the specification.

In the drawings:

Fig. 1 is a plan view of a pointing mechanism constructed according to one embodiment of the invention, showing the cutters in the position which they occupy when pointing the wire;

Fig. 2 is an enlarged sectional view on line 2—2 of Fig. 1;

Fig. 3 is a detail perspective view of a pin that was initially pointed on the mechanism shown in Fig. 1 and adapted to be applied to a lapel button;

Fig. 4 is an enlarged longitudinal sectional view taken centrally of the pointing mechanism and showing the cutters in open position;

Fig. 5 is a sectional view similar to Fig. 4 partially broken away and showing the cutters in cutting position;

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Fig. 6 is a plan view of the parts illustrated in Fig. 5;

Fig. 7 is a transverse sectional view on line 7—7 of Fig. 5;

Fig. 8 is a view in end elevation of the jaws and cutters in cutting position;

Fig. 9 is a view in side elevation of the outer ends of the jaws, and the cutters, when in cutting position, approximately four times actual size;

Fig. 10 is an enlarged plan view of the structure illustrated in Fig. 9;

Fig. 11 is a sectional view on line 11—11 of Fig. 10;

Fig. 12 is an end elevation of the structure illustrated in Fig. 9 showing the jaws and cutters in cutting position;

Fig. 13 is an enlarged detail perspective view of one of the cutter-positioning plates, with a cutter appearing in dotted lines in the position it occupies in relation to the positioning plate, and

Fig. 14 is an enlarged detail perspective view of one of the jaws, partially broken away, with the cutter and positioning plate removed.

Referring more particularly to the drawings in which like reference numerals refer to the same parts throughout the several views, 1 designates a continuously rotating shaft on which the cutter mechanism is mounted, as will be described more fully hereinafter, the shaft 1 being movable endwise within a sleeve 2 keyed to the shaft 1, the sleeve 2 being held against endwise movement and having a cam surface 3. The sleeve 2 is mounted and rotatable with the shaft 1 in a suitable fixed bearing 4. The shaft 1 has fixed thereon a pinion 5 that is driven by a gear 6 on a motor shaft 7 operated by the electric motor 8 which furnishes the power for continuous rotation of shaft 1, the necessary endwise movement of the latter for effecting operation of the cutting mechanism being accomplished in the following manner.

The shaft 1 has fixed thereon a collar 9 that is interlockingly engaged with a collar 10 fixedly connected to sleeve 2, the interlocking relationship being established by the arms 11 carried by the collar 9 and engaging slots 12 in the collar 10, while 13 is a spring surrounding the shaft 1 between the collars 9 and 10 and operating to move the shaft 1 normally to the inoperative position illustrated in Fig. 4. Movement of the shaft 1 to cutting position is effected by an actuating lever 14 pivoted at 15 and provided at one end with an anti-friction roller 16 engaging the adjacent surface of collar 9 while the other end

of the lever 14 has an anti-friction roller engaged by a cam 17 mounted on the arbor 18 which is mounted in suitable bearings and arranged to be rotated by a hand wheel 19. The arbor 18 may be turned by hand as shown, or may be operated by any suitable motor or power source, and at each complete rotation of the arbor 18, the lever 14 is oscillated to effect endwise movement of the shaft 1 to cutting position and permit its return to inoperative position and thus complete a cutting cycle. During such endwise movement of the shaft 1, the cam surface 3 effects movement of the cutters into cutting relationship with the wire after which they are returned to initial position upon return of the shaft 1, as will now be described in more detail.

The wire to be pointed is indicated at 21, see Fig. 2, and is arranged to be positioned on a table or support 22 in a suitable recess 23, the wire being stationarily held in place during the pointing operation by a clamp 24 pivotally mounted on a post 25 and adapted to be rotated over the recess 23 when the wire is positioned therein, it being understood that the end of the wire to be pointed projects beyond the support 22 into a recess or cutaway portion 26 where it is engaged by the pointing mechanism.

Such pointed wire pieces are used for shaping into button-pins such as illustrated in Fig. 3, which may include circular portions that engage the attaching flange of lapel and advertising buttons, badges, and the like, the pin being pointed before being shaped and secured to the button, although the structure herein disclosed may be used for pointing wire or metallic pins for other purposes, either where the wire element is in a pre-cut length or part of a continuous coil of wire from which the pin portion is cut after the pointing operation.

The cutting mechanism includes in general a tool-head or cutter-head in the form of a cylindrical block 27 that is permanently attached to the end of the shaft 1, see Fig. 4, and the cutter-head 27 has pivoted thereon two jaws, each comprising a body portion 28 pivoted at 29 in slots formed in the tool-head 27 while at the rear end the jaws include tail pieces 31 connected by springs 32. 33 designate anti-friction rollers mounted in the tail pieces 31 and engaging the outer surface of the sleeve 2 and cam surface 3 so that as the shaft 1 is advanced from the position illustrated in Fig. 4 to the position illustrated in Fig. 5, the anti-friction rollers 33 engage the cam surface 3 and are moved outwardly against the tension of springs 32 to actuate the forward ends of the jaws inwardly and cause the cutters to engage and point the wire.

Referring to Figs. 9 to 14, each jaw includes at its forward end a cutter-supporting portion designated generally at 34, see Fig. 14, and including a slot 35 that receives the cutter 36. The bottom surface of the cutter engages the base 37 of the slot 35 and is held on the jaw by a suitable fastening screw that engages a threaded opening 38 in the cutter-supporting portion 34 of the jaw and has a head 39 that overlies and engages the outer surface 41 of the cutter to clamp the latter securely in position.

The operative or cutting edge of the cutter is indicated at 42, the adjacent end surface 43 of the cutter being ground to a suitable angle which determines the angle of the cutting edge and the angle of the pin formed on the wire, and in order to position the cutter accurately on the jaw, there is provided a positioning plate 44, see Fig. 13,

which is attached to the cutter-supporting end of the jaw by a set screw 45 that extends through an opening 46 in the plate 44 and engages a threaded opening 47 in the side of the jaw, the latter being preferably slotted or cut away as at 48 to receive the attaching portion 44 of the positioning plate.

The positioning plate is preferably attached to the jaw on the same side of the longitudinal axis of the cutter-head as the cutter and at its lower end is provided with a forwardly extending portion 49 that is cut away to provide an inclined surface 51 which is ground accurately to the same angle as the adjacent end surface of the cutter. When the cutter has been properly ground and positioned in the slot 35 of the jaw, it is moved endwise until its forward surface engages and butts against the surface 51 of the positioning plate which serves as a stop for the cutter and insures its proper positioning in the jaw.

The portion 49 of the positioning plate is also provided with a positioning surface 52 which is preferably inclined and extends away from the end of the cutter, acting as a positioning means for the wire as the jaws and cutters come into operative or cutting relation therewith, see Fig. 9, and by having the positioning plate removable from the jaw, it is possible to grind the inclined surfaces 51 and 52 accurately to an exact degree and thus determine to a nicety the angle of the point formed on the wire and also to retain the wire in proper relation to the cutting tools.

When the jaws are moved inwardly to engage the wire, the cutting edges 42 of the two cutting tools are disposed oppositely as illustrated in Fig. 9 to effect a V-shaped or pointed cut as the cutter-head rotates and advances, and during such rotation the wire is held against lateral movement transversely with respect to the cutting edges by means of the oppositely disposed inclined surfaces 52 on the positioning plates. In this manner, the wire can be effectively and accurately pointed by a few rotations of the cutter-head, during the period when the tail pieces 31 of the jaws are moved outwardly by the cam 3 to the position shown in Fig. 5, and upon return movement of the lever 14 to its initial position, the shaft 1 is released and returned to the Fig. 4 position by the spring 13 whereupon the jaws and the cutting tools are moved by springs 32 to the position shown in Fig. 4 to release the wire, which can then be removed from the machine.

While the invention has been described with reference to the structure herein shown, it is not confined to the particular details illustrated, and this application is intended to cover such modifications, departures or other adaptations as may come within the purposes of the improvements and the scope of the following claims.

We claim:

1. Wire-pointing mechanism comprising a fixed bearing, a rotatable shaft movable endwise in said bearing and a tool-head mounted at one end of said shaft, oppositely arranged jaws pivotally mounted and movable transversely on said tool-head, a cam sleeve surrounding said shaft and held against longitudinal movement, said jaws having tail pieces engaging and controlled by said cam sleeve, cutters secured to said jaws having cutting edges which intersect in converging relationship when in cutting position thereby forming a point on a wire, and wire-positioning surfaces on the jaws located between said cutters adjacent to said cutting edges in con-

verging relationship and on opposite sides of the cutters and wire when the cutters are in cutting position.

2. Wire-pointing mechanism comprising a fixed bearing, a rotatable shaft movable endwise in said bearing and a tool-head mounted at one end of said shaft, oppositely arranged jaws pivotally mounted and movable transversely on said tool-head, a cam sleeve surrounding said shaft and held against longitudinal movement, said jaws having tail pieces engaging and controlled by said cam sleeve, each of said jaws having a cutter-receiving slot therein inclined to the longitudinal axis of the tool-head, a cutter fastened in said slot having a cutting edge arranged at an angle to the longitudinal axis of the tool-head, and a stop surface on each jaw engaging the forward end surface of and determining the position of the cutter on the jaw.

3. Wire-pointing mechanism comprising a fixed bearing, a rotatable shaft movable endwise in said bearing and a tool-head mounted at one end of said shaft oppositely arranged jaws pivotally mounted and movable transversely on said tool-head, a cam sleeve surrounding said shaft and held against longitudinal movement, said jaws having tail pieces engaging and controlled by said cam sleeve, each of said jaws having a cutter-receiving slot therein inclined to the longitudinal axis of the tool head, a cutter fastened in said slot having a cutting edge arranged at an angle to the longitudinal axis of the tool-head, a stop surface on each jaw engaging the forward end surface of and determining the position of the cutter on the jaw, and a wire-positioning surface disposed angularly to said stop surface to one side of the longitudinal axis of the cutter-head, said positioning surfaces on the jaws engaging the wire on opposite sides of and between said cutting edges and acting to maintain the wire in correct cutting relation to the tools.

4. Wire-pointing mechanism comprising a fixed bearing, a rotatable shaft movable endwise in said bearing and a tool-head mounted at one end of said shaft, oppositely arranged jaws pivotally mounted and movable transversely on said tool-head, a cam sleeve surrounding said shaft and held against longitudinal movement, said jaws having tail pieces engaging and controlled by said cam sleeve, each of said jaws having a cutter-receiving slot therein inclined to the longitudinal axis of the tool-head, a cutter fastened in said slot, a positioning plate removably secured to one side of each jaw, said positioning plate having a forwardly projecting portion provided with a stop surface which engages and determines the position of the forward end of the cutter, and a wire-positioning surface disposed angularly to said stop surface to one side of the longitudinal axis of the cutter-head, said positioning surfaces on the jaws engaging the wire on opposite sides of and between said cutting edges and acting to maintain the wire in correct cutting relation to the tools.

5. Wire-pointing mechanism comprising a fixed bearing, a rotatable shaft movable endwise in said bearing and a tool-head mounted at one end of said shaft, oppositely arranged jaws pivotally mounted and movable transversely on said tool-head, a cam sleeve surrounding said shaft and held against longitudinal movement, said jaws having tail pieces engaging and controlled by said cam sleeve, each of said jaws having a cutter-receiving slot therein disposed angularly to the longitudinal axis of the tool-head, a cutter fastened in said slot having a cutting edge that is angularly disposed to the longitudinal axis of the cutter-head when in cutting position, and a positioning plate removably attached to the jaw and having a stop surface parallel to and in contact with the forward end of the cutter, said stop surface being disposed at the same angle to the longitudinal axis of the cutter-head as said cutting edge and acting as a positioning stop for the forward end of the cutter.

6. Wire-pointing mechanism comprising a fixed bearing, a rotatable shaft movable endwise in said bearing and a tool-head mounted at one end of said shaft, oppositely arranged jaws pivotally mounted and movable transversely on said tool-head, a cam sleeve surrounding said shaft and held against longitudinal movement, said jaws having tail pieces engaging and controlled by said cam sleeve, each of said jaws having a cutter-receiving slot therein disposed angularly to the longitudinal axis of the cutter head, a cutter secured in said slot and having a cutting edge disposed angularly to the longitudinal axis of the cutter-head when in cutting position, a positioning plate removably attached to the outer surface of the jaw on the same side of the longitudinal axis of the cutter-head as said cutter, said positioning plate having a stop surface against which the forward end of the cutter abuts and arranged at the same angle as said cutting edge and a wire-positioning surface extending away from said cutting edge adjacent to one side of the wire, the wire-positioning surfaces acting to locate the wire in proper relationship to the cutting edges when the latter are in cutting position.

7. Wire-pointing mechanism comprising a fixed bearing, a rotatable shaft movable endwise in said bearing and a tool-head mounted at one end of said shaft, oppositely arranged jaws pivotally mounted on said tool-head, a cam sleeve surrounding said shaft and held against longitudinal movement, said jaws having tail pieces engaging and controlled by said cam sleeve, a cutter secured to each jaw, means for moving said shaft endwise comprising an oscillatory lever, a collar fixed on said shaft and engaged by said lever, a second collar keyed to said shaft and held against endwise movement, a spring between said collars, actuating means cooperating with said jaws and acting to move the jaws and cutters to cutting position when the shaft moves in one direction, and spring means acting to restore the jaws to initial position.

8. Wire-pointing mechanism comprising a fixed bearing, a rotatable shaft movable endwise in said bearing and a tool-head mounted at one end of said shaft, oppositely arranged jaws pivotally mounted on said tool-head, a cam sleeve surrounding said shaft and held against longitudinal movement, said jaws having tail pieces engaging and controlled by said cam sleeve, said jaws having cutters secured thereto with cutting edges which when in cutting position are in converging relationship, means for moving said shaft endwise comprising an oscillatory lever, a collar fixed on said shaft and engaged by said lever, a second collar keyed to said shaft interlocked with said first mentioned collar and held against endwise movement with the shaft, a spring between said collars acting to return the shaft to initial position, actuating portions carried by said jaws, a cam sleeve surrounding

said shaft and held against longitudinal movement, said cam sleeve engaging said actuating portions when the shaft is moved endwise in one direction to move said jaws and cutters to cutting position, and spring means for withdrawing the jaws and cutters out of cutting position when the shaft is moved in the opposite direction.

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