Nov. 3, 1953 A. STUEBNER 2,657,933

STOCK PUSHER

Filed March 29, 1951

FIG. 1.

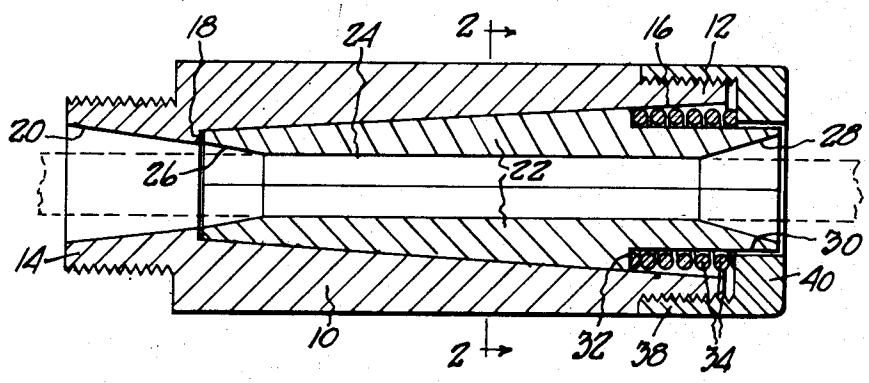


FIG. 2.

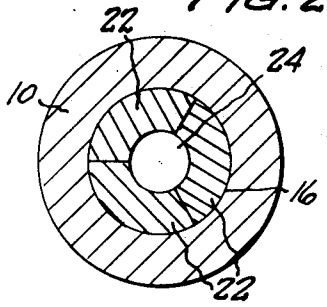


FIG. 4.

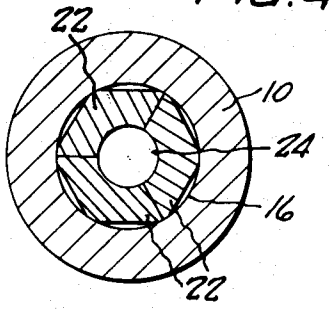
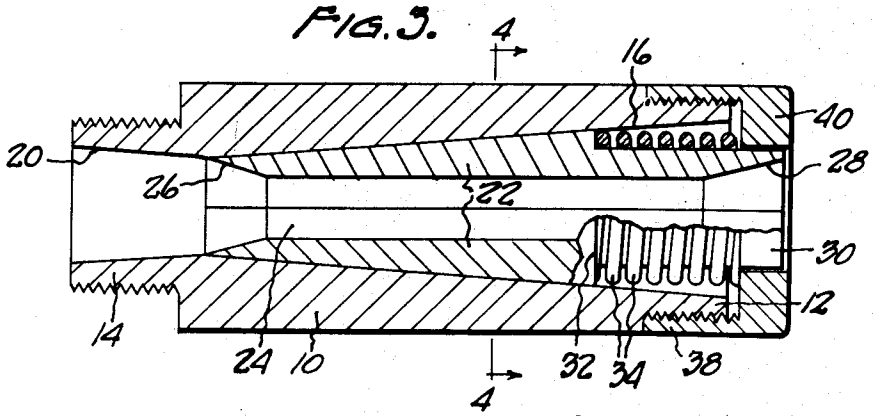


FIG. 3.



ARTHUR STUEBNER.
INVENTOR.

BY Altsch & Knoblock

ATTORNEYS.

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STOCK PUSHER

Arthur Stuebner, La Porte, Ind.

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2 Claims. (Cl. 279—28)

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This invention relates to improvements in stock pushers, and more particularly to a stock pusher for automatic screw machines, forming or cutting-off machines, or the like.

A primary object of this invention is to provide a novel, simple and inexpensive stock pusher which possesses long wearing properties, which avoids excessive slipping, which is easily repaired or reconditioned, which can be disassembled quickly for cleaning, which accommodates itself to variations in cross-sectional dimension and shape of the work piece along its length, and which can be adjusted quickly to accommodate work pieces of different cross-sectional sizes.

Other objects will be apparent from the following specification.

In the drawing:

Fig. 1 is an axial sectional view illustrating one embodiment of the invention.

Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a longitudinal axial sectional view of a modified embodiment of the invention.

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 3.

Referring to the drawing, and particularly to Figs. 1 and 2, the numeral 10 designates a shell or body which is preferably formed of tempered steel and has a substantially cylindrical external surface throughout the major portion of its length. At one end the shell 10 has a reduced diameter externally screw-threaded portion 12. At its opposite end the shell 10 has a reduced externally screw-threaded portion 14 adapted for connection to a feed reel (not shown) in the manner well understood in the art. The shell 10 has a bore 16 extending therethrough for the major portion of its length. The bore 16 is substantially uniformly tapered with a taper preferably of between seven and ten degrees. The tapered portion 16 of the bore extends continuously from the right-hand portion of the shell to a reduced shoulder portion 18 which is located adjacent to the reduced end portion 14. The taper of the bore portion 16 is such that its outer end is of largest diameter and the end thereof at the shoulder 18 is of smallest diameter. The reduced end portion 14 of the shell has a tapered bore 20 whose angle of taper is preferably greater than the taper of the bore portion 16 and whose direction of taper is opposite that of the bore 16 so that its large diameter portion is outermost or at the left and its small diameter portion is provided at the shoulder 18.

The shell mounts therein a plurality of elongated pad members 22. The pad members 22 are

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preferably formed of cast iron not tempered. The pad members 22 are similar in shape, and three or more are provided of such size that they normally fit loosely in the shell, but when they are positioned as illustrated in Fig. 1 at the left-hand end of the shell, they will engage one another and define a substantially circumferentially continuous bar gripping unit as illustrated in Fig. 2. The pads 22, when assembled or arranged as illustrated in Fig. 2, define a unit of frusto-conical external shape, the taper of which corresponds to the taper of the bore 16. Thus each individual pad for the major portion of its length preferably has a transversely arcuate external surface and tapers lengthwise thereof so that each pad becomes progressively narrow in its dimension from its right-hand end toward its left-hand end. Each of the pads has a smooth or polished transversely arcuate concave inner surface, which surfaces cooperate to provide a bore 24. The left-hand end portion 26 of the bore is tapered to provide a flaring mouth. The right-hand end portion of the inner surface of each pad is tapered and cooperates with similar tapered portions of the remaining pads to provide a flaring mouth 28.

The external surface of each of the pad members 22 is reduced in cross-sectional size at 30 for a portion of its length, thus defining a shoulder 32. The pads 22 are preferably of a length greater than the spacing between the shoulder 18 and the right-hand end of the shell 10 so as to project from the shell. A coil spring 34 encircles the reduced portion 30 of the pad assembly or unit and bears against the shoulder 32 at its inner end. A cap has an internally screw-threaded skirt portion 38 which is threaded upon the shell portion 12 and is provided with an end wall 40 centrally apertured to a diameter slightly greater than the external diameter of the parts 30 of the pad unit. The outer end of the coil spring bears against the end wall 40 and is normally compressed so as to tend to urge the pad units toward the left as illustrated in Fig. 1 to abut against the shoulder 18 of the shell.

In the use of this mechanism, assuming that the stock pusher is properly connected to a feed reel (not shown) so that it may be moved in a reciprocating path in properly timed and correlated relation to the working parts of an automatic screw machine, a cutting-off device or the like, the device will be caused to function in the manner and sequence well understood in the art. Specifically, the pusher will push stock to a stop position at which the cutters of the screw machine will come into play to shape or form the work piece and to cut the projecting portion of

the stock so shaped from the remainder of the work piece. Thereupon the pusher will be withdrawn to take a new grip upon the work and then will be projected forwardly to push or feed another length of the work piece into the cutter mechanism of the machine.

As viewed in Fig. 1, the feeding movement of the cutter will occur in a direction in which the device moves bodily to the right, and the retracting operation will occur when the device is moved bodily to the left. It will be evident that with the springs **34** tending to push the pads **22** toward the left, the insertion of the feed stock through the mouth openings **20**, **26**, and the passage of the stock through the central bore **24** of the device, will entail a normal firm grip by the pads of the device upon the stock as the device is moved bodily toward the right as viewed in Fig. 1. The springs resist the movement of the pads **22** with the shell **10** and consequently cause the pads **22** to seat themselves at the small end of the bore portion **16** of the device, thus effecting a firm clamping grip upon the work piece. Upon reverse movement of the device, that is, movement toward the left, the frictional engagement of the inner surfaces **24** of the pads with the work piece will resist the spring and will tend to cause the pads to move out of wedged position in the tapered bore **16** of the shell and thereby will loosen the grip of the pads upon the work piece. The result of the two operations above described incident to movement of the device alternately in opposite directions will provide an effective feed action by the device. A minimum of friction and a minimum of wear of the parts will occur, and likewise the device will have little or no tendency to scratch or mar the work piece.

In the event pads **24** do become worn to a point which requires replacement, such replacement is accommodated very quickly and simply by unscrewing the end cap **38**, **40**, whereupon the pads may be withdrawn bodily from the right-hand end of the device and new pads may be inserted. Thereupon, by simply replacing the spring **34** and re-applying the cap **38**, **40**, the device with the new pads is ready for operation. It will also be apparent that the same replacement of the pads may be practiced where the size of the work being fed changes, in which event the pads must be replaced by pads of selected size so that the central bore in the device will be of a size or dimension to grip the work.

One of the important factors in this device is the fact that the pads are elongated and have a uniform gripping action upon the work piece at their inner surfaces **24** and have a uniform gripping or clamping action within the shell at the tapered bore **16** of that shell. This uniformity and large area of contact of each pad with the shell and with the work piece, respectively, minimizes wear experienced in usage and renders the device particularly well adapted and suited for its intended purpose.

Other advantages of this device include accessibility of the parts for repair and for cleaning. Thus, if the pads become scratched, they can easily be removed and handled individually, as by lapping the same, to recondition them. Where cleaning is necessary, it can be accomplished easily because the parts are separated by simply disassembling the unit.

Another advantage of the device is that the normal loose fit of the pads within the shell body and their longitudinal play to seat themselves in a clamping position permits them to accommodate themselves to variations in the cross-sectional dimension and shape of the work piece along different parts of the length thereof. Thus it is well known that the shape and cross-sectional dimensions of a long rod will vary at point to point along its length but such alterations are automatically compensated for by this device and an effective grip can be secured. This is true whether the shape of the work piece changes as where a part of the work piece may alter to an out-of-round condition. Also, if the work piece varies in dimension to be slightly oversize or undersize, the device will accommodate the variations nonetheless.

Still another advantage of the device is its economic character, it being apparent that the pads may be replaced to recondition or repair the device without requiring complete replacement of all of the parts of the device.

The embodiment of the device illustrated in Figs. 3 and 4 is somewhat altered from that illustrated in Figs. 1 and 2, the parts in Figs. 3 and 4 which are similar to parts in Figs. 1 and 2 bearing the same numerals. In the embodiment shown in Figs. 3 and 4, the interior bore **16** of the shell **10** is tapered and extends continuously from the outer end of the end portion **12** thereof to the junction between the main body part and the left-hand reduced end portion of the shell **10**. The left-hand mouth portion **20** of the bore of the shell **10** is tapered oppositely to the taper of the bore portion **16**, and the inner ends of the two bore portions are of the same dimension, thus eliminating the shoulder between the parts **16** and **18** which characterizes the Fig. 1 embodiment. The taper of the bore **16** in this embodiment preferably is somewhat greater than the taper in the previous embodiment. The pads **22** are generally tapered to conform with the taper of the bore portion **16** and have an inset portion **30** around which a coil spring **34** fits. In this embodiment the spring encircled reduced portion of the pads is preferably of greater length than in the embodiment illustrated in Fig. 1, thus accommodating the use of a spring **34** of greater length than in the Fig. 1 embodiment.

Another characteristic of the device is illustrated in Fig. 4, in which it will be seen that the exterior surface of the various pad members, instead of being arcuate in cross-section, is somewhat interrupted by the formation of flat or inset faces **50** extending lengthwise of each pad and out of contact with the interior wall of the shell defined by the bore **15**. By this construction longitudinal ribs **52** are provided and, as here shown, there may be three such ribs located respectively at the two longitudinal margins and at the center of each of the pads. This construction reduces the frictional engagement between the pads and the shell with the advantage of reducing the surface area of the parts which is in frictional contact, and consequently reducing the tendency of the parts to stick or bind.

This embodiment of the invention possesses the same advantages and functions in the same manner described above with reference to the embodiment illustrated in Fig. 1. The shell is somewhat simpler in construction, the elongation of the spring is advantageous in providing additional play as compared to the device in Fig. 1, but in all other particulars the parts function the same and the same advantages of simplicity, low cost and ease of repair and replacement exist in the Fig. 3 embodiment as in the Fig. 1 embodiment.

While the preferred embodiments of the in-

vention have been illustrated herein, it will be understood that changes in the construction may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A stock pusher comprising a sleeve having a bore substantially uniformly tapered for the major portion of its length to a large diameter portion at its discharge end, a centrally apertured cap mounted on the discharge end of said sleeve, a frusto-conical unit having an axial bore substantially uniform for its major portion, said unit being formed from a plurality of substantially similar longitudinal parts, the exterior surface of said unit for a part of its length being defined by longitudinal tapered ribs adapted to engage said tapered sleeve bore and being reduced at its remaining part, the portions of said unit between said ribs being spaced from said bore, and a spring encircling said reduced part for normally urging said unit to the small diameter end of said bore.

2. A stock pusher comprising a sleeve having a bore substantially uniformly tapered for the major portion of its length to a large diameter portion at its discharge end, a centrally apertured

cap mounted on the discharge end of said sleeve, a frusto-conical unit having an axial bore substantially uniform for its major part, said unit being formed from a plurality of substantially similar longitudinal parts, the exterior surface of a part of said unit being tapered similarly to said bore, and a spring normally urging said unit toward the small diameter end of said bore, the intake end portions of both of said sleeve bore and said unit bore being flared with their large diameter portions outermost said frusto-conical unit having a reduced end portion encircled by a spring and defining a shoulder intermediate the length of said uniform bore.

ARTHUR STUEBNER.

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