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Jestin

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[54] **PUNCHING UNIT**

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[52] **U.S. Cl.** **83/140,** 83/588, 83/698

[51] **Int. Cl.** **B26d 7/06,** B26d 1/00

[58] **Field of Search** 83/698, 694, 697, 83/687, 684, 699, 690, 140

[56] **References Cited**

UNITED STATES PATENTS

3,079,824	3/1963	Schott	83/698 X
3,205,742	9/1965	Williamson	83/698 X
3,114,280	12/1963	Schott	83/698 X

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[57] **ABSTRACT**

A punching unit of the type comprising a C-shaped body has the punch and die disposed coaxially at the outer ends of its arms. A stop member limiting the upward stroke of the external sleeve, having a punch slidably mounted therein is, fitted in a transverse bore formed in the outer end of the upper arm of the body of the punching unit and engages a longitudinal slot formed in said external sleeve. The stop member is retained in said bore by an expansion ring. A striker plate or punch head capping the upper portion of the external sleeve is secured to the flange constituting the upper portion of the sleeve by means of a retaining spring. Thus, the punch can be fitted and removed without resorting to any screwing or unscrewing operation.

6 Claims, 2 Drawing Figures

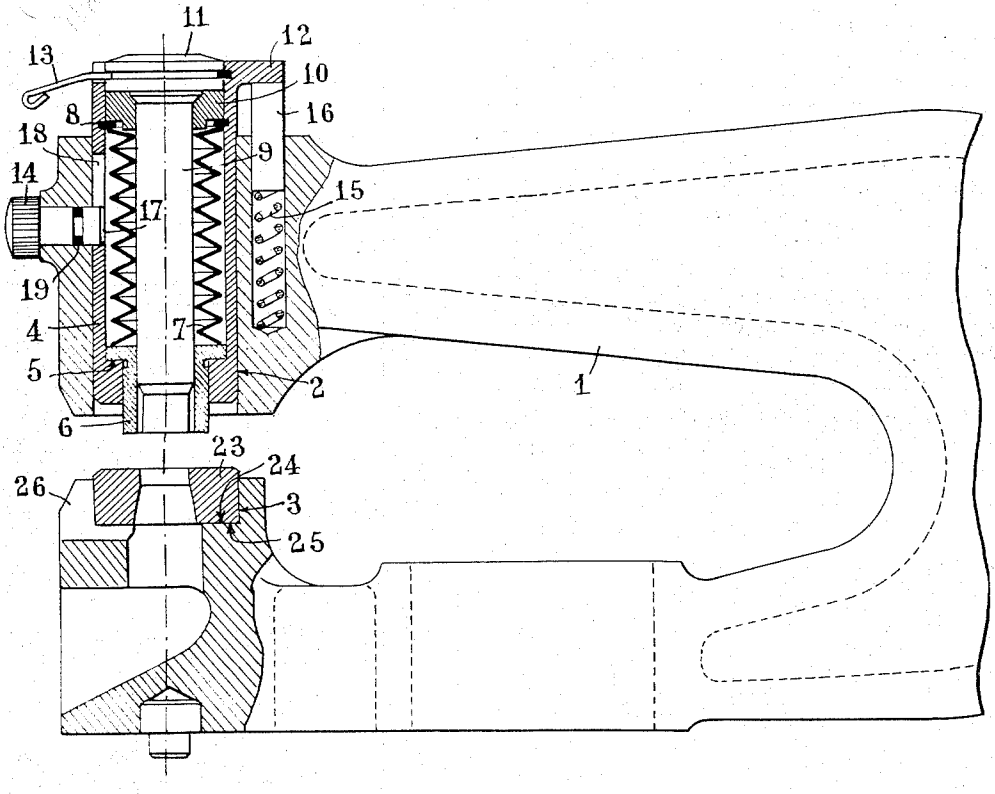


Fig. 2.

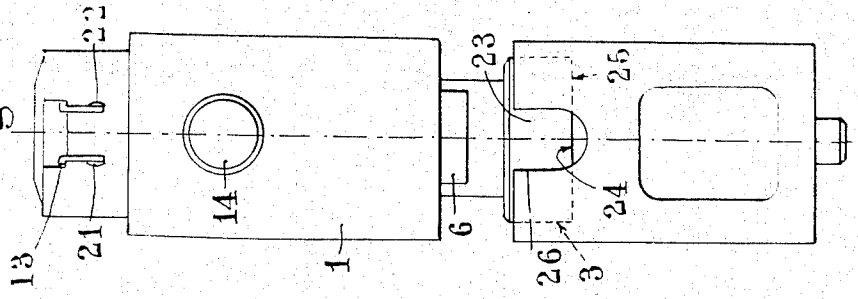
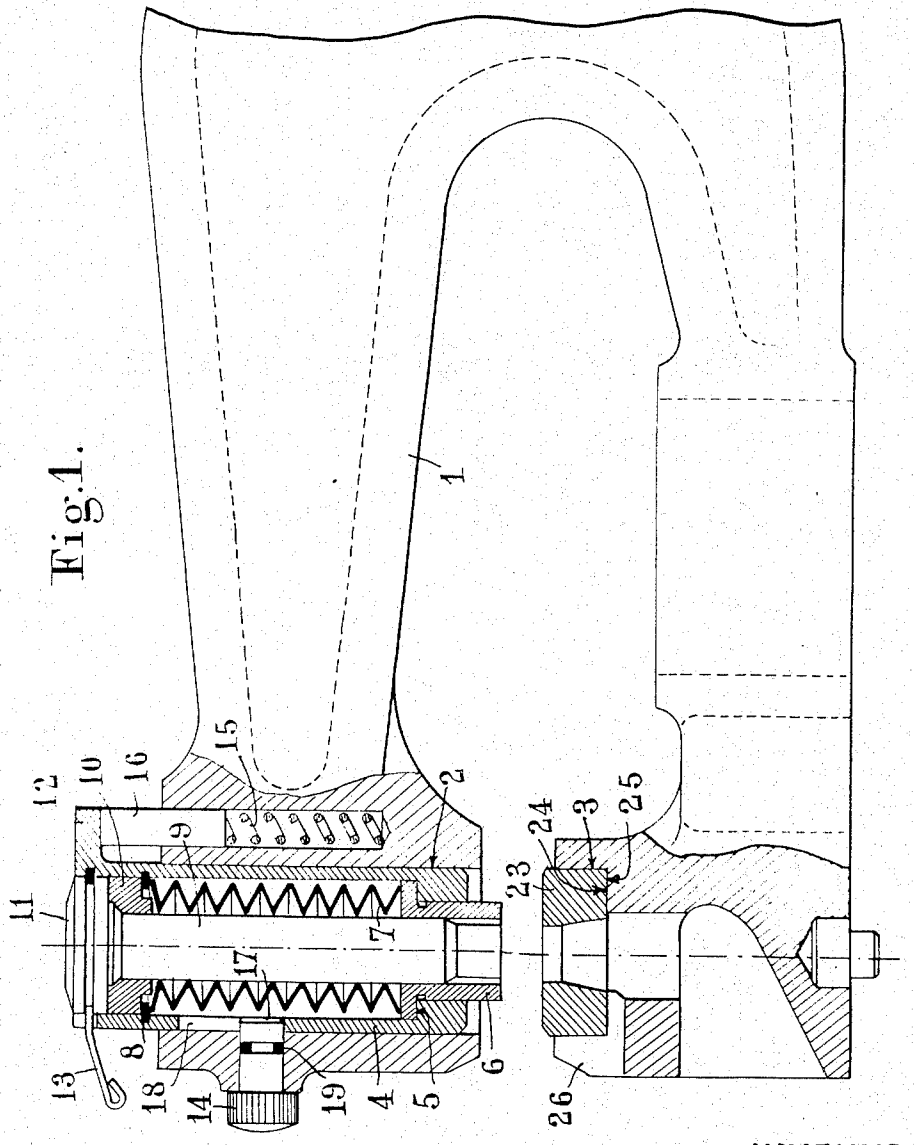


Fig. 1.



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PUNCHING UNIT

FIELD OF THE INVENTION

This invention relates to punching units in general and has specific reference to punching units incorporating means such that the punch and die can be fitted and removed very easily and rapidly, without resorting to any screwing or unscrewing operation.

DESCRIPTION OF THE PRIOR ART

In actual service, the tools (punch and die) of punching units must be changed rather frequently, not only for sharpening them in case of minor wear and tear but, also, and chiefly, because each punching unit is intended for punching holes of different diameters ranging between two extreme dimensions. Therefore, when it is required to change the diameter of the holes to be punched, the tools equipping the punching unit must be removed for fitting and fastening in position new tools corresponding to the desired diameter.

Under these conditions, these punching units must be designed with a view to permit a tool change as easy and rapid as possible. Now, in all hitherto known punching unit and so far as Applicant is aware, this tool replacement cannot take place unless long and tedious unscrewing and screwing operations are accomplished.

SUMMARY OF THE INVENTION

To avoid the above-mentioned drawback, the present invention provides a punching unit characterized in that the tools (punch and die) thereof are adapted to be fitted and secured in position without resorting to any screwing operation.

To this end, a stop member is provided for limiting the upward stroke of the external sleeve, which is urged upwards by a return spring, and which has the punch slidably mounted therein. The stop member is slidably mounted in a transverse bore extending through the outer end of the upper arm of the punching unit, and engages a longitudinal slot formed in said external sleeve. The stop member is retained in said bore by an expansion ring or spring ring. The striker plate or punch head capping the upper end of the external sleeve is secured to the flange constituting said upper end by means of a keeper spring preferably in the form of a spring clip.

The die proper is simply engaged with an easy fit in a shouldered bore formed to this end in the outer end of the lower arm of the punching unit body. The lower face of the die bears on said shoulder. The die-receiving bore comprises a radial notch extending axially below said lower face and shoulder in order to afford an easy access to the die proper.

BRIEF DESCRIPTION OF THE DRAWING

In the accompanying drawing:

FIG. 1 is a fragmentary elevational and sectional view of the punching unit according to this invention;

FIG. 2 is a front elevational view thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The punching unit illustrated in the drawing comprises a jaw-shaped body 1 designed with a view to ensure a perfect axial alignment of the punch and die,

the upper and lower arms of said body being formed to this end with coaxial bores 2 and 3 preferably of the same diameter and formed by the same tool.

Slidably fitted in the vertical cylindrical bore 2 of the upper arm of the punching unit body is an external sleeve or sleeve 4 having an inner lower shoulder 5 supporting a coaxial stripper or stripping member 6 constantly urged towards this shoulder by a spring or stripper spring 7 reacting against a circlip 8 with its upper end. The punch proper 9 is guided by this stripping member 6 and also by the counter-punch 10 slidably engaged in turn in said external sleeve 4. A striker plate or punch carrier 11 comprising the head of punch 9 is retained in a flange 12, constituting the upper portion of the external sleeve 4, by a retaining circlip 13 preferably in the form of a spring clip. The flange 12 bears on the sleeve shoulder, as shown.

The stop member 14, disposed in a radial bore, is provided for limiting the upward stroke of the external sleeve 4, which is urged upwards by the external or return springs 15 acting through pistons 16 against the collar or flange 12. The stop member has an inner end portion 17 engaged in an elongated or aperture slot 18 formed in the external sleeve 4. The upward stroke limiting stop member 14 is retained in the outer end of the upper arm of body 1 of this punching unit by an expansion ring 19.

Thus, removing and changing the punch 9 is a particularly simple operation, since it is only necessary to pull the stop member 14 which unlocks and releases the external sleeve 4 with all the parts associated therewith from the upper arm of the punching unit body 1. Also, by simply extracting the retaining spring 13 (which is achieved by pressing its ends 21, 22 towards each other) it is possible to remove the striker plate of the punch head 11 from the sleeve and then substitute another punch for the preceding one.

The die 23 is an easy fit in the bore 3. The lower face 24 of the die 23 engages a shoulder 25 formed in the bore 3. A notch 26 extending radially from said bore and down to a level lower than that of said shoulder 25 permits the use of a pointed or like tool (not shown) into the lower portion of notch 26. By exerting an upward pressure on the lower face 24 of die 23 it can be extracted from the bore 3 and replaced with another one.

Of course, it will readily occur to those conversant with the art that the present invention should not be construed as being limited by the specific form or embodiment shown and described herein, since many modifications and variations may be brought thereto without departing from the basic principle of the invention as set forth in the appended claims.

I claim:

1. A punching unit comprising a jaw-shaped body of which the upper arm has formed therethrough a vertical cylindrical bore adapted to receive the punch the corresponding die of which is aligned therewith and fitted in the lower arm of said body, a sleeve slidably mounted in said bore, an inner shoulder at the lower portion of said sleeve, a coaxial stripper comprising at its upper portion a flange bearing on said sleeve shoulder, a punch carrier mounted in the upper portion of said sleeve, a punch having its lower portion guided by said stripper and its upper portion provided with an in-

tegral head bearing on said punch carrier, a first relatively powerful spring surrounding said punch within said sleeve and bearing at one end against said stripper flange and at its other end against the lower portion of said punch carrier, at least one axially displaced external spring weaker than said first spring and constantly urging said sleeve upwards in said bore, said sleeve having formed therein an elongated longitudinal aperture, a stop member for limiting the upward stroke of said sleeve which extends through a radial bore formed in said upper arm of said punch unit body, said radial bore opening into said cylindrical bore, an external control knob for actuating said stop member and an inner end portion of said stop member engaging said elongated aperture of said sleeve, the lower edge of said elongated aperture abuting against inner said end portion to limit the upward stroke of said sleeve, and a circlip retaining said punch with respect to the upper portion of said sleeve, and wherein the punch, punch carrier and stripper are simultaneously withdrawable from the bore by the manual removal of the stop member and circlip.

2. A punching unit as set forth in claim **1,** wherein said die is an easy fit in a bore formed with a shoulder engageable by the lower face of said die, said bore being formed in the end of the lower arm of the punching unit body and comprising a radial notch extending longitudinally to a lower level than said shoulder to permit the removal of said die by lever means comprising the circlip the circlip engaging the notch formed beneath the die.

3. A punching unit comprising:

a jaw-shaped body having an upper arm and lower arm, the upper arm being provided with a vertical bore adapted to receive a punch and a radial bore in communication with the vertical bore, the lower arm adapted to receive a die,

an external sleeve slidably mounted in the vertical bore, and having a longitudinal slot formed therein,

a stripper concentrically disposed interiorly of and seatingly engaging the sleeve,

a punch disposed in the vertical bore and guided by the stripper,

means for carrying the punch mounted in the sleeve, and including means for retaining the punch in the sleeve,

biasing means interposed between the stripper and the punch-carrying means,

an axially displaced external biasing means for constantly urging the sleeve upwards in the bore, the external biasing means being weaker than the biasing means interposed between the stripper and punch-carrying means,

a stop member normally extending through the radial bore into the vertical bore and terminating at the longitudinal slot and

wherein the stripper means for carrying the punch and the punch are simultaneously removed from the sleeve by the manual removal of the stop member and the means for retaining the punch in the sleeve.

4. The unit of claim **3** wherein the stop member includes an external control knob for actuating the stop member and an inner end portion which engages the longitudinal slot, the lower edge of the slot abutting against the end portion to limit the upward stroke of the sleeve.

5. The unit of claim **3** wherein the means for carrying the punch includes a striker plate and a counter-punch, the head of the punch bearing against the counter-punch.

6. The unit of claim **3** wherein the lower arm is provided with a radial bore notch extending from the bore and a shoulder, the notch being axially lowerly displaced from the shoulder.

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