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(54) **Apparatus for producing stamped sections in continuously advanced strip blank.**

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**Description****Background of the Invention**

The present invention concerns an apparatus for producing stamped sections in a strip blank which is advanced continuously lengthwise past a stamping tool positioned to one side of the strip and arranged to cooperate with a support roll. The support roll is mounted on a shaft positioned on the side of the strip opposite the stamping tool in parallel with the plane of the strip and perpendicularly to the direction of advancement of the strip.

Stamping operations of the kind defined above are used for instance to produce threads in the strip of hose clamps of the type wherein the strip passes through a screw-worm sleeve in engagement with a screw-worm positioned therein.

One prior-art machine construction of the kind referred to above is disclosed in DE-C- 176 939. However, this construction suffers from several drawbacks. The stamping press nip is created by the contact between two tool parts, one of which is shaped as a sector of a circle and the other one as an elongate member. Exact adjustment and positioning of the parts is required prior to the stamping operation in order to ensure that the stamping tool parts mesh correctly and exactly and at the exact moment in order to effect the desired stamping. Another drawback of the prior-art construction is its lack of adaptability. When new articles of a different nature are to be stamped the stamping tools need to be dismantled and be replaced by other tools which are adequate for that operation. In addition, stamping tools shaped as a circular sector are comparatively difficult to manufacture. If they are damaged they must be replaced by new ones, in order to allow the stamping operation to be effected with the required accuracy.

The threads in the strip of hose clamps, therefore, are usually produced through stamping in a large eccentric-shaft press which in a single operation forms all the thread grooves in a section of the strip. The stamped section is subsequently severed off the strip blank and shaped into the strip of the hose clamp. During the stamping operation in the eccentric press, however, some flow of material occurs transversely relative to the lengthwise extension of the strip. This material flow increases the width of the strip by approximately 5%, with the result that the screw-worm sleeve tolerances need to be comparatively large. The difference in width between stamped and unstamped sections of the continuously advanced strip blank also is disadvantageous in that it makes it complicated to guide the strip, causes increased wear on the tools as well as operational disturbances.

The purpose of the present invention is to effect the stamping of the strip blank without causing noticeable differences in width between the stamped and unstamped sections of the strip

blank while at the same time making it possible to effect the stamping at a high rate of production.

The apparatus in accordance with the invention is characterised in that the shaft is arranged to be turned back and forth between two end positions and in that the support roll is freely and eccentrically mounted on the shaft and arranged by turning said shaft to one of the end positions, to urge the strip against the stamping tool, which is moved during stamping and, by turning the shaft to the opposite end position thereof, to allow the strip to pass past the stamping tool out of contact with the latter.

**Brief description of the drawings**

The invention will be described in closer detail in the following with reference to one embodiment thereof illustrated in the accompanying drawings, wherein

Fig. 1 is a perspective view of a stamping apparatus in accordance with the invention, and

Figs. 2 and 3 are lateral views of the apparatus, illustrating the latter in two different operational positions.

**Detailed description of a preferred embodiment**

A strip blank 1 which is to be stamped along its length with thread-groove sections and which in a subsequent operation is to be severed and shaped into a hose clamp strip, is continuously advanced by a pair of rollers 2 past a support roll 3. The support roll 3 is mounted on an eccentric shaft 4 which is positioned in parallel with the plane of the strip and perpendicularly to the direction of advancement of the latter.

A stamping tool 5 the stamping face of which is formed to give the desired thread profiles is positioned on the opposite side of the strip 1 and is attached to a slide member 6 which is mounted for displacement in a plane which is essentially parallel to the plane advancement of the strip. A bracket 7 mounted on the slide member 6 supports the piston rod of a piston-and-cylinder unit 8 arranged to displace the slide member to and fro. A second piston-and-cylinder unit 9 is secured to the eccentric shaft 4 via a lever 10. When the shaft 4 is turned with the aid of the lever 10 and the piston-and-cylinder unit 9 the support roll 3 may be displaced transversely relative to the direction of advancement of the strip 1 towards or away from the stamping tool 5 between two end positions.

In the inner end position of the tool illustrated in Fig. 2 the support roll 3 presses the strip 1 hard against the stamping tool 5. At the same time the slide member 6 is displaced by the piston-and-cylinder unit 8 in synchrony with the

advancement of the strip by the pair of rollers 2, the stamping action being effected in the press nip between the support roll 3 and the stamping tool 5.

When one thread section has been stamped, which is sensed by means provided to sense the movements of the slide member 6, by a time relay or by means arranged to sense the advancement of the strip, the second piston-and-cylinder unit 9 is activated, which by turning the shaft 4 in the opposite direction effects displacement of the support roll 3 away from the stamping tool 5. As a result the strip 1 is no longer pressed against the stamping tool and the tool is allowed to complete its movement forwards out of contact with the strip 1. The stamping tool is then brought back to its original position by the piston-and-cylinder unit 8 to effect another stamping operation. The strip 1 is advanced continuously at a constant rate and when one strip section having a length corresponding to the desired gap between two threaded sections has moved past by the support roll 3 the piston-and-cylinder unit 9 is again activated and serves to press the support roll against the stamping tool 5 to effect another stamping operation.

The length of the stamped sections and the length of the unstamped sections separating them are easily varied by controlling the operation of the piston-and-cylinder 9 in such a manner that the support roll 3 when abutting against the stamping tool at one end position of the stamping tool provides the desired length of the stamped section whereas the desired interruption between the stamped sections is effected in the other end position.

Because the stamping operations are effected successively over a short section of the length of the strip 1 most of the flow of the material will take place in the lengthwise direction of the strip whereas the difference in width will be minimal.

The invention is not limited to the embodiment described in the foregoing but modifications thereof are possible within the scope of the appended claims. The means for advancement of the stamping tool 5, for example, are not essential, it being possible to shape the tool as a round stamping cylinder mounted on a shaft which is driven in synchrony with the speed of advancement of the strip. Other means than piston-and-cylinder units may be used to effect the movements of the slide member 6 and to operate the shaft 4.

### Claims

1. An apparatus for producing stamped sections in a strip blank (1) which is advanced continuously lengthwise past a stamping tool (5) positioned to one side of the strip and arranged to cooperate with a support roll (3), said roll being mounted on a shaft (4) positioned on the

side of the strip (1) opposite the stamping tool (5) and in parallel with the plane of the strip perpendicularly to the direction of advancement of the latter, characterised in that the shaft (4) is arranged to be turned back and forth between two end positions and in that the support roll (3) is freely and eccentrically mounted on said shaft and arranged, by turning said shaft to one of the end positions thereof, to urge the strip (1) against the stamping tool (5) which is moved during stamping and, by turning the shaft (4) to the opposite end position thereof, to allow said strip to pass past the stamping tool out of contact with the latter.

2. An apparatus as claimed in claim 1, characterised in that the stamping tool (5) is elongate and straight and is provided with means (6,7,8) to advance said tool in synchrony with the advancement of the strip (1) during the stamping of a section of said strip and to return said tool to the original position thereof after completion of the stamping of the section.

### Patentansprüche

1. Vorrichtung zur Herstellung von ausgestanzten Abschnitten in einem bandförmigen Rohling (1), der in seiner Längsrichtung entlang einem Stanzwerkzeug (5) kontinuierlich vorgetrieben wird, welches Stanzwerkzeug auf der einen Seite des Bandes so angeordnet ist, dass es mit einer Tragrolle (3) zusammenwirkt, wobei diese Rolle auf einer Welle (4) montiert ist, die auf derjenigen Seite des Bandes (1), welche dem Stanzwerkzeug (5) gegenüber liegt, und parallel zur Ebene des Bandes sowie senkrecht zur Vortriebsrichtung desselben angeordnet ist, dadurch gekennzeichnet, dass die Welle (4) dazu ausgebildet ist, zwischen zwei Endstellungen hin und her gedreht zu werden, und dass die Tragrolle (3) auf dieser Welle freilaufend und exzentrisch montiert ist und dazu ausgebildet ist, bei Drehung der Welle bis zu einer ihrer Endstellungen das Band (1) gegen das während des Stanzen bewegte Stanzwerkzeug (5) zu drücken und bei Drehung der Welle (4) bis zur entgegengesetzten Endstellung dem Band zu erlauben, am Stanzwerkzeug vorbeizulaufen, ohne mit diesem in Berührung zu stehen.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass das Stanzwerkzeug (5) länglich und gerade ist und mit Mitteln (6,7,8) zum Vorrücken des Stanzwerkzeugs synchron zum Vortrieb des Bandes (1) während des Stanzen eines Abschnittes dieses Bandes und zum Zurückbringen des Stanzwerkzeugs zu seiner Ausgangsstellung nach vollständigem Stanzen des Abschnittes versehen ist.

**Revendications**

1. Appareillage de production de sections estampées dans un flan en bande (1) que l'on fait avancer de façon continue dans le sens de sa longueur le long d'un outil d'estampage (5) positionné sur un côté de la bande et destiné à coopérer avec une roulette support (3), cette roulette étant montée sur un arbre (4) positionné sur le côté de la bande (1) qui est opposé à l'outil d'estampage (5), parallèlement au plan de la bande et perpendiculairement à la direction d'avancement de celle-ci, caractérisé en ce que l'arbre (4) est destiné à être mis en rotation en va et vient entre deux positions extrêmes et en ce que la roulette support (3) est montée libre et excentrée sur cet arbre et qu'elle est destinée, lors d'une rotation de l'arbre vers l'une de ses positions extrêmes, à presser la bande (1) contre l'outil d'estampage (5) que l'on déplace pendant l'estampage et, lors d'une rotation de l'arbre (4) vers sa position extrême opposée, à permettre à la bande de passer le long de l'outil d'estampage sans être en contact avec celui-ci.

2. Appareillage selon la revendication 1, caractérisé en ce que l'outil d'estampage (5) est allongé et droit et qu'il est pouvu de moyens (6, 7, 8) pour faire avancer de cet outil en synchronisme avec l'avance de la bande (1) pendant l'estampage d'une section de cette bande et pour faire revenir cet outil à sa position initiale après achèvement de l'estampage d'une section.

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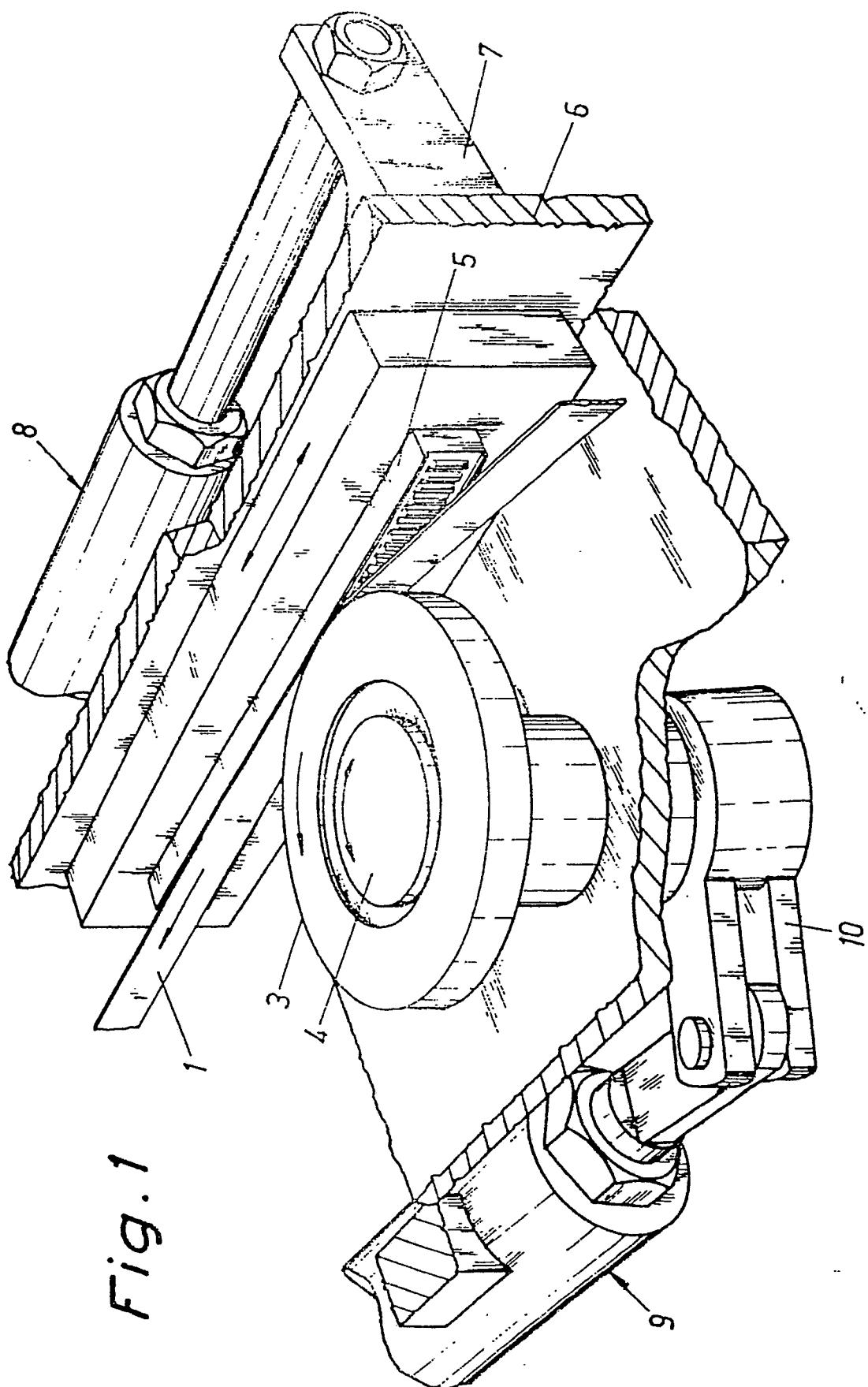
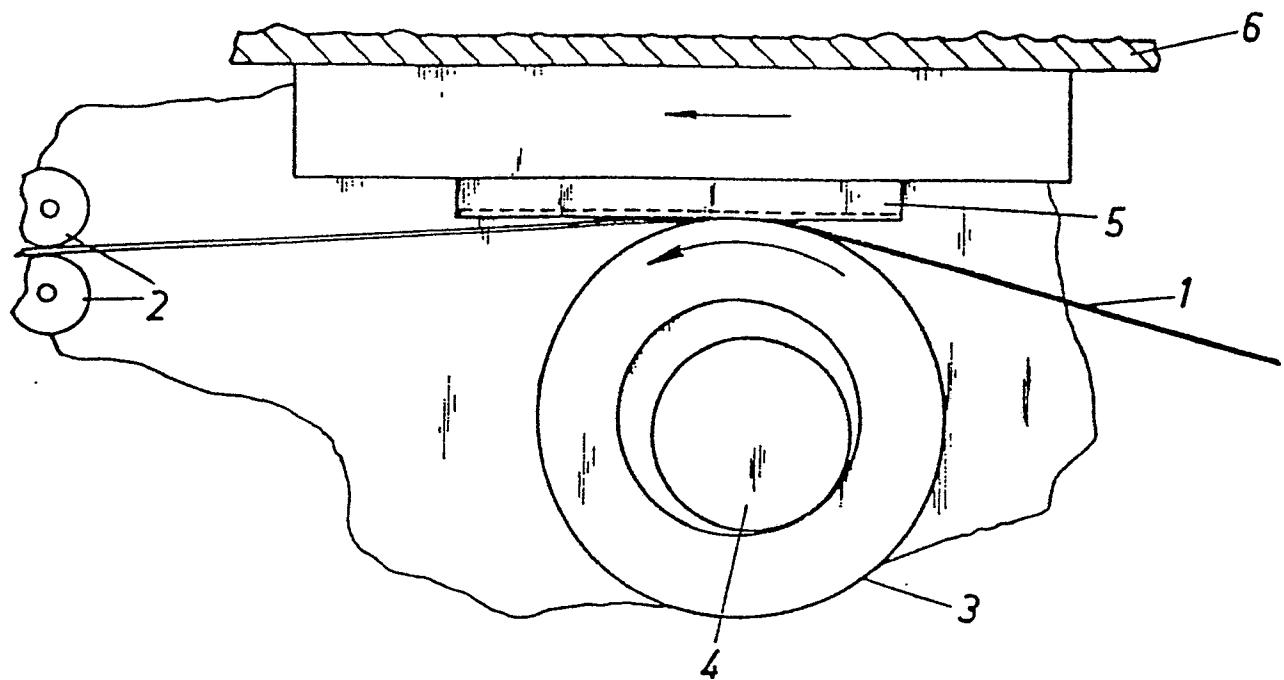


Fig. 1

*Fig.2*



*Fig.3*

