

Feb. 17, 1953

H. E. DICKERMAN  
FEEDING APPARATUS

2,628,835

Filed May 12, 1950

2 SHEETS—SHEET 1

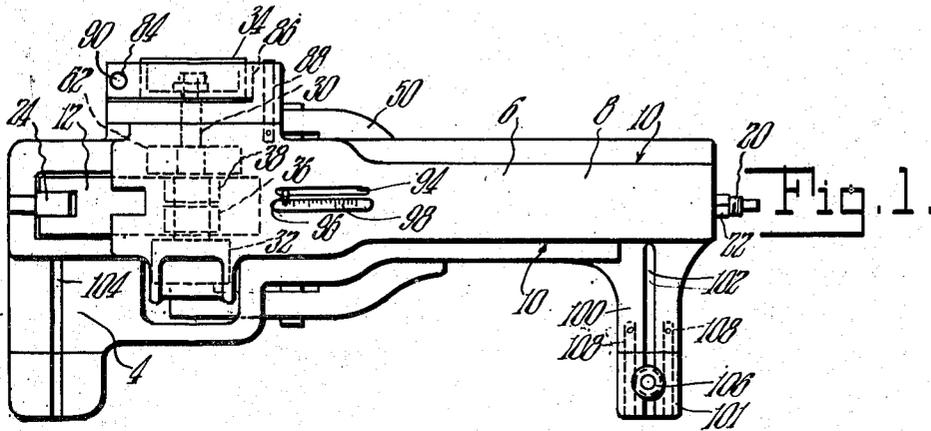


Fig. 1.

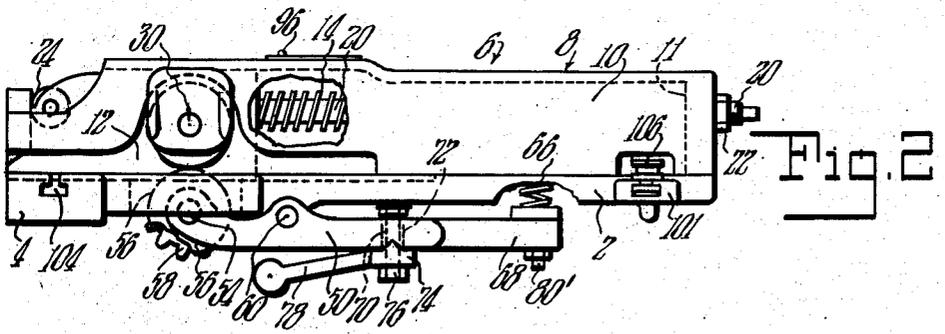


Fig. 2.

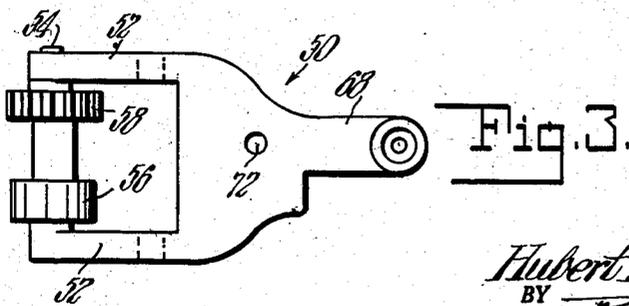


Fig. 3.

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2 SHEETS—SHEET 2

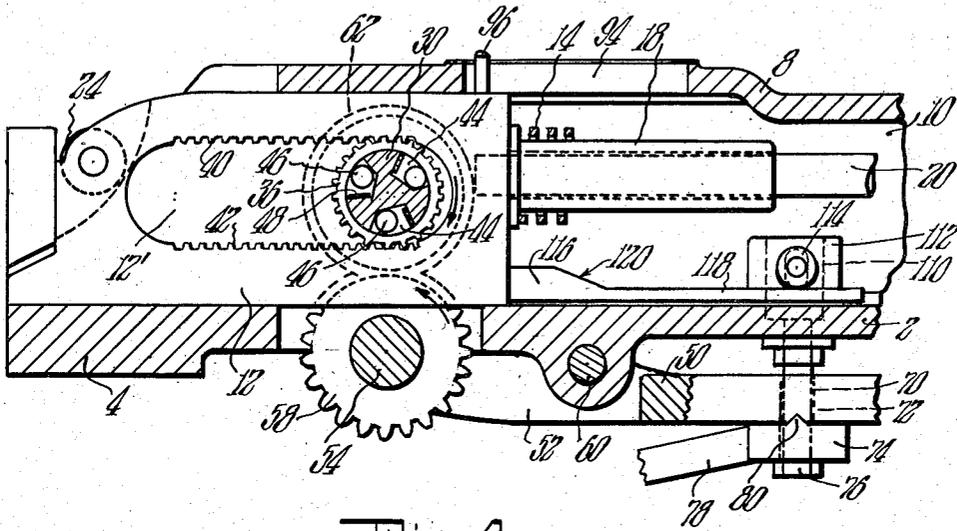


Fig. 4.

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# UNITED STATES PATENT OFFICE

2,628,835

## FEEDING APPARATUS

Hubert E. Dickerman, Springfield, Mass.

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3 Claims. (Cl. 271-2.4)

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This invention relates to improvements in feeding mechanism for feeding successive portions of stock to mechanism for forming, punching and other operations and is directed in a general way to feeding mechanism of the general type shown and described in U. S. Letters Patent #2,348,456 issued to me on May 9, 1944.

The principal objects of the invention are directed to the provision of feeding mechanism wherein cooperating feed rolls are open ended whereby stock may be located therebetween axially thereof in combination with means to facilitate the manual release of the stock by the feed rolls.

As one special feature of the invention means is provided to obviate overtravel of the feed rolls, and stock of various widths may be fed by the mechanism.

As with the mechanism of the patent referred to, the mechanism hereof may be associated with the relatively movable members of a punch press or similar machine or with a die set, the apparatus being operable by a movable part to feed successive portions of a strip or the like to be acted upon by cooperating tools.

All of the above objects I accomplish by means of such structure and relative arrangement of parts thereof, as will fully appear by a perusal of the description below and by various specific features which will be hereinafter set forth.

To the above cited and other ends and with the foregoing and various other novel features and advantages and other objects of my invention, as will become more readily apparent as the description proceeds, my invention consists in certain novel features of construction in the combination and arrangement of parts as will be hereinafter more particularly pointed in the claims hereunto annexed and more fully described and referred to in connection with the accompanying drawings wherein:

Figs. 1 and 2 are plan and side elevational views of feeding mechanism embodying the novel features of the invention;

Fig. 3 is a plan view of the pressure release lever of the mechanism shown in Figs. 1 and 2; and

Fig. 4 is a partial longitudinal sectional view through the mechanism shown in Figs. 1 and 2.

Referring now to the drawings more in detail, the invention will be fully described.

A base or support is shown at 2 which at its forward end 4 is adapted for securement to the bed of a press, die set or the like.

An upper elongated housing 6 is disposed over

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and secured to the base in any suitable manner and has upper and side walls 8 and 10 and an end wall 11.

A slide 12 is reciprocable back and forth relative to the base and housing and is urged forwardly in feeding direction by means of a spring 14 disposed between the rear side of said slide 12 and rear wall 11 of the housing 6. The slide is moved rearwardly as is common with apparatus of this type.

A spring guide 18 is provided adjacent the slide 12 and a rod 20 has its inner end connected to said slide, see Fig. 4. The outer end of said rod 20 extends through wall 11 and is threaded. A nut 22 on the threaded end of the rod abuts said wall and limits forward feeding movements of said slide and may be adjusted to limit feeding movements.

A roll 24 is journaled in the forward end of the slide. With the feeding mechanism secured to a stationary part such as the bed of a press, a cam on a movable part of the press may engage said roll as the movable part moves towards the stationary part. The cam will move the slide rearwardly against action of spring 14. As the movable part moves away from the stationary part the cam allows the slide to be moved forwardly by the spring. The forward movement of the slide is the feeding movement thereof.

A transverse shaft 30 is rotatable at its opposite ends in the housing and has an upper feed roll 32 fixed thereto adjacent its forward end, a brake drum 34 is fixed thereto at its rear end and clutch gears 36 and 38 are disposed thereon intermediate its ends.

The slide 12 is provided with an elongated opening 12' and has upper and lower racks 40 and 42, as shown in Fig. 4, along edges of the opening.

The upper rack 40 is in mesh with gear 36 and the lower rack 42 is in mesh with gear 38.

The shaft 30 and gears 36 and 38 are provided with means whereby as the slide 12 is moved back and forth the said gears are alternately clutched to the shaft so that the said shaft is rotated clockwise in feeding direction, shown by the arrows in Fig. 4.

That is, the parts are arranged whereby as the slide moves rearwardly from the position of Fig. 4, the gear 36 is rotated clockwise so as to clutch shaft 30 and rotate it and roll 32 clockwise while gear 38 is rotated freely on said shaft. As the slide moves forwardly gear 38 is clutched to the shaft to rotate it and the roll 32 clockwise while gear 36 is rotated freely on the shaft.

The clutch means may include recesses in 44 in the shaft 30 having rollers or balls 45 therein with springs 42 urging the rollers or balls into engagement with the gears and recesses, as shown in U. S. Patent #2,348,456 of May 9, 1944.

A pressure lever 50 having spaced side arms 52, as shown in Fig. 3, is provided having a shaft 54. A lower feed roll 56 and lower driven gear 58 are fixed on said shaft so that said gear and roll are rotatable as a unit.

The pressure lever 50 is disposed below the base and is pivoted at 60 thereto so that the gear 58 is in mesh with a drive gear 62 fixed to shaft 30. The feed roll 56 is engageable with feed roll 32.

A spring 66 interposed between the base 2 and outer end 68 of lever 50 urges the said end downwardly whereby the feed rolls 32 and 56 are yieldingly engaged for feeding a strip forwardly as they rotate in direction of the arrows.

The gears 58 and 62 are provided with relatively deep or long teeth whereby the rolls 56 and 32 may be separated to the extent desired without said gears becoming disengaged.

A stud 70 depends from the base through an opening 72 in the lever 50 and a cam member 74 is oscillatable above a head 76 of said stud. A manually engageable member 78 extends from cam 74. An upwardly extending cam projection 80 is provided on the upper side of the cam for fitting in a groove of the lever 50 which is complementary thereto, see Fig. 4.

Normally with the cam projection 80 in the groove of the lever 50 the rolls 32 and 56 cooperate to grip and feed a strip of stock. When the cam 74 is oscillated to move the cam projection out of the groove said cam elevates the righthand end of lever 50 to move the opposite end downwardly and separate rolls 32 and 56.

An adjusting screw 80' in threaded engagement with the end 68 of lever 50 for adjusting the tension of spring 66 and stud 70 may be adjusted.

A brake band 84, see Fig. 1, is split as is usual and may have a lining 86 for frictionally engaging the brake drum 34. The brake band is held against rotation by a stud 88 or the like and an adjusting screw or bolt 90 is employed for drawing the brake band about the drum. The function of the brake means is to obviate back lash or lost motion of the parts.

The upper wall 8 of the housing is provided with an elongated slot 94 and a pointer 96 carried by the slide extends therethrough and is adapted for registration with indicia 98 on the said upper wall to indicate the length of feed in each cycle of operation.

A transverse projection 100 on the right-hand end of the base and the part 4 thereof are provided with T slots 102 and 104. T studs may be inserted in the said slots and carry rollers, such as 106, for engaging the outer edge of a strip so as to guide it as it is fed forwardly.

The outer portion 101 of the projection 100 may be slidable on rods 108 fixed in said projection whereby said portion 100 may be lengthened to accommodate strips of wide width.

The stud 70 previously referred to is preferably slidable in the base and has a member 110 on its upper end which is slidable in a boss 112. A roll 114 outside said boss is carried by part 110 and slidable therewith.

A cam 116 projecting from the slide has an outer part 118 underlying said roll 114 and an upwardly and forwardly inclined cam surface 120.

As the slide is moved rearwardly to the right the surface 120 engages the roll 114 to lift part 110 and stud 70 thereby to swing lever 50 counterclockwise slightly. This brings about separation of feed rolls 32 and 56 instantaneously whereby a strip therebetween is released so that it may become adjusted should kinks or strains be present therein.

With the base secured to a bed or the like and with a cam carried by the reciprocating member on the down stroke the cam engages roll 24 to move slide 12 rearwardly against spring 14. On the up stroke, the spring urges the slide forwardly. In movements of the slide rearwardly and forwardly, the feed rolls are rotated in feeding direction.

As the slide reaches its rear position the member 116 brings about instantaneous separation of the feed rolls so that the strip being fed, is released.

The pressure of the feed rolls may be relieved or released by turning cam member 74 and the pressure applied by the lower roll may be varied by adjustment of the tension of spring 66.

The brake means is important in that sufficient drag may be applied against rotation of shaft 30 thereby to obviate back lash or play and insure accuracy of feed.

It will be noted that the slide and spring are enclosed thereby protecting the same against impairment of their action by foreign matter and the like.

The invention may be embodied in other specific forms without departing from the essential characteristics thereof. Hence, the present embodiments are therefore to be considered in all respects merely as being illustrative and not as being restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all modifications and variations as fall within the meaning and purview and range of equivalency of the appended claims are therefore intended to be embraced therein.

What it is desired to claim and secure by Letters Patent of the United States is:

1. Apparatus for feeding successive lengths of strip material forwardly thereof comprising, an elongated support and an elongated housing secured thereto and cooperating therewith to provide a closed elongated guideway open at the forward end thereof, a slide reciprocable forwardly and rearwardly in said guideway having a forward end for projecting through the open end of the guideway adapted for engagement by reciprocating means to move said slide rearwardly, means to resist rearward movements of said slide and to move the same forwardly and variably limit forward movements of said slide, a shaft rotatable in said housing having an outer free end, gears on said shaft and clutching means between said gears and shaft arranged and adapted to alternately clutch said gears to said shaft as said gears are alternately rotated in a corresponding direction to rotate said shaft in feeding direction, means carried by said slide to engage and rotate said gears in movements thereof in opposite directions, said shaft having an upper drive gear fixed thereto and an upper roll fixed on the outer free end thereof, a lever provided with a rear free end and a forward end and being pivoted intermediate said ends to said support and having a driven gear and a lower roll simultaneously rotatable in the forward end thereof for engagement with the drive gear and

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upper roll of said shaft, said support and rolls and lever arranged whereby strip material may be inserted inwardly between and axially of said rolls, spring means between the rear free end of said lever and said support acting on said lever to urge said rolls into yielding engagement, manually operable cam means connecting said support and lever operable on said lever to overcome the action of said spring means, and engageable means operable in rearward position of the slide cooperating with said manually operable means to overcome said spring means.

2. Apparatus for feeding successive lengths of strip material forwardly thereof comprising, an elongated support and an elongated housing secured thereto and cooperating therewith to provide a closed elongated guideway open at the forward end thereof, a slide reciprocable forwardly and rearwardly in said guideway having a forward end for projecting through the open end of the guideway adapted for engagement by reciprocating means to move said slide rearwardly, means to resist rearward movements of said slide and to move the same forwardly and variably limit forward movements of said slide, a shaft rotatable in said housing having an outer free end, gears on said shaft and clutching means between said gears and shaft arranged and adapted to alternately clutch said gears to said shaft as said gears are alternately rotated in a corresponding direction to rotate said shaft in feeding direction, means carried by said slide to engage and rotate said gears in movements thereof in opposite directions, said shaft having an upper drive gear fixed thereto and an upper roll fixed on the outer free end thereof, a lever provided with a rear free end and a forward end and being pivoted intermediate its ends to said support and having a driven gear and a lower roll simultaneously rotatable in the forward end thereof for engagement with the drive gear and upper roll of said shaft, said support and rolls and lever arranged whereby strip material may be inserted inwardly between and axially relative to said rolls, spring means between the rear free end of said lever and said support acting on said lever to urge said rolls into yielding engagement, manually operable cam means connecting said support and lever operable on said lever to overcome the action of said spring means, and engageable means operable in rearward position of the slide cooperating with said manually operable means to overcome said spring means, said cam means including a member extending from said support and a lever pivoted thereon having a projecting cam part receivable in a recess provided in said lever.

3. Apparatus for feeding successive lengths of strip material forwardly thereof comprising, an elongated support and an elongated housing secured thereto and cooperating therewith to provide a closed elongated guideway open at the

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forward end thereof, a slide reciprocable forwardly and rearwardly in said guideway having a forward end for projecting through the open end of the guideway adapted for engagement by reciprocating means to move said slide rearwardly, means to resist rearward movements of said slide and to move the same forwardly and variably limit forward movements of said slide, a shaft rotatable in said housing having an outer free end, gears on said shaft and clutching means between said gears and shaft arranged and adapted to alternately clutch said gears to said shaft as said gears are alternately rotated in a corresponding direction to rotate said shaft in feeding direction, means carried by said slide to engage and rotate said gears in movements thereof in opposite directions, said shaft having an upper drive gear fixed thereto and an upper roll fixed on the free end thereof, a lever provided with a rear free end and a forward end and being pivoted intermediate said ends to said support and having a driven gear and a lower roll simultaneously rotatable in the forward end thereof for engagement with the drive gear and upper roll of said shaft, said support and rolls and lever arranged whereby strip material may be inserted inwardly between and axially of said rolls, spring means between the rear free end of said lever and said support acting on said lever to urge said rolls into yielding engagement, manually operable cam means connecting said support and lever operable on said lever to overcome the action of said spring means, and engageable means operable in rearward position of the slide cooperating with said manually operable means to overcome said spring means, said manually operable cam means including a member slidable up and down in said support for swinging said lever and a spring between said support and lever, and said engageable means including a cam on said slide for acting on a part on said member for moving said member upwardly.

HUBERT E. DICKERMAN.

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