Oct. 31, 1950 R. KRYESKE 2,528,374

STRIP FEEDING DEVICE

Filed May 29, 1948 2 Sheets-Sheet 1

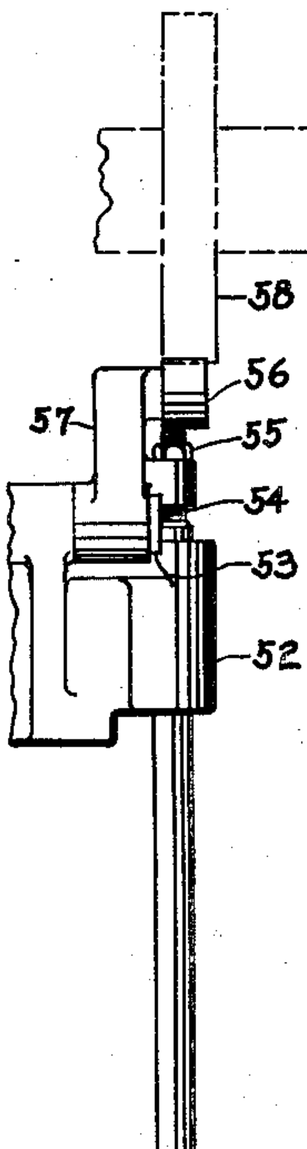
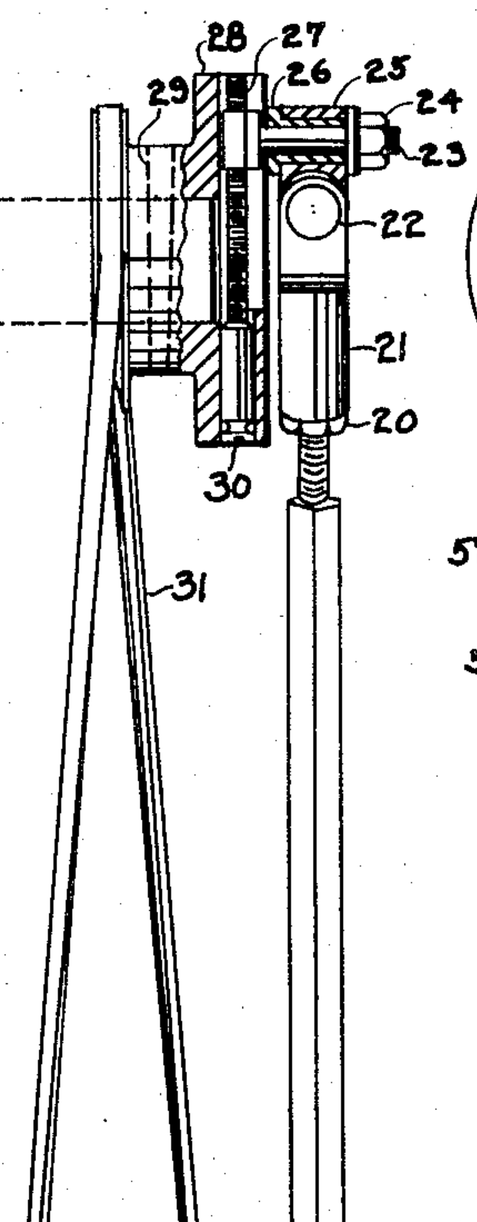


FIG. 1.



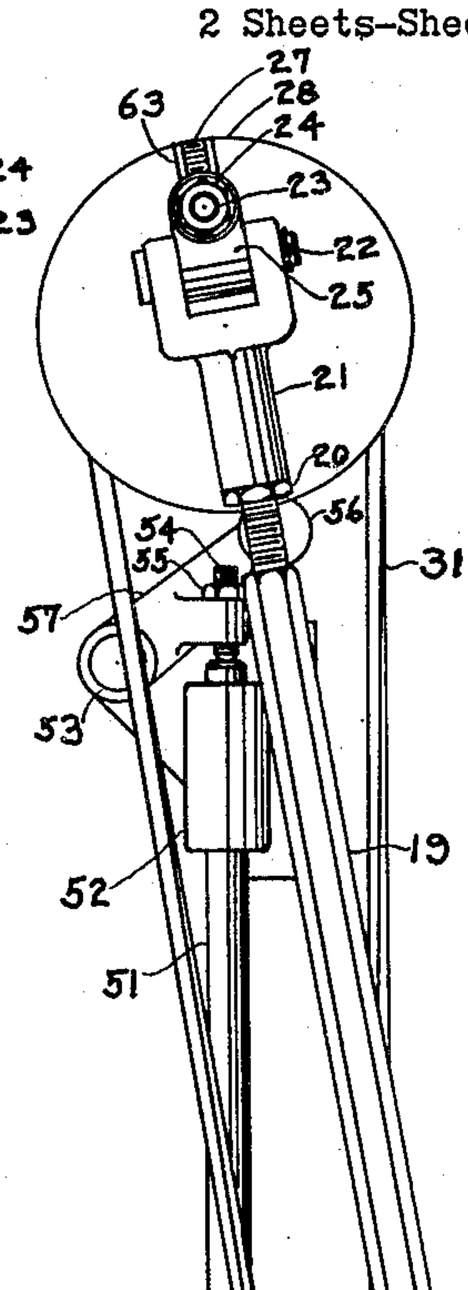
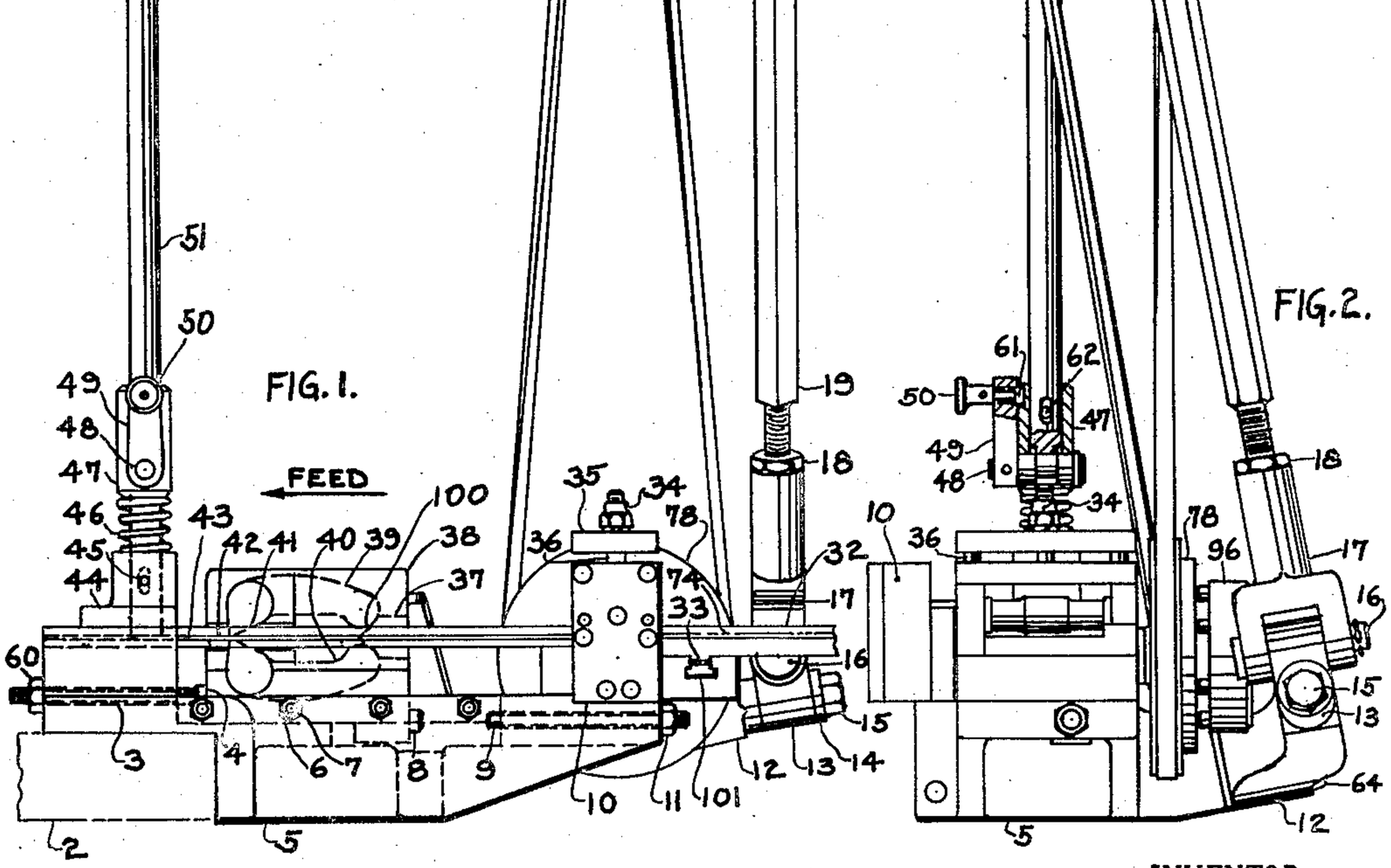


FIG. 2.



INVENTOR.
RAYMOND KRYESKE
BY Peter J. Saylor
attorney

Oct. 31, 1950

R. KRYESKE

2,528,374

STRIP FEEDING DEVICE

Filed May 29, 1948

2 Sheets-Sheet 2

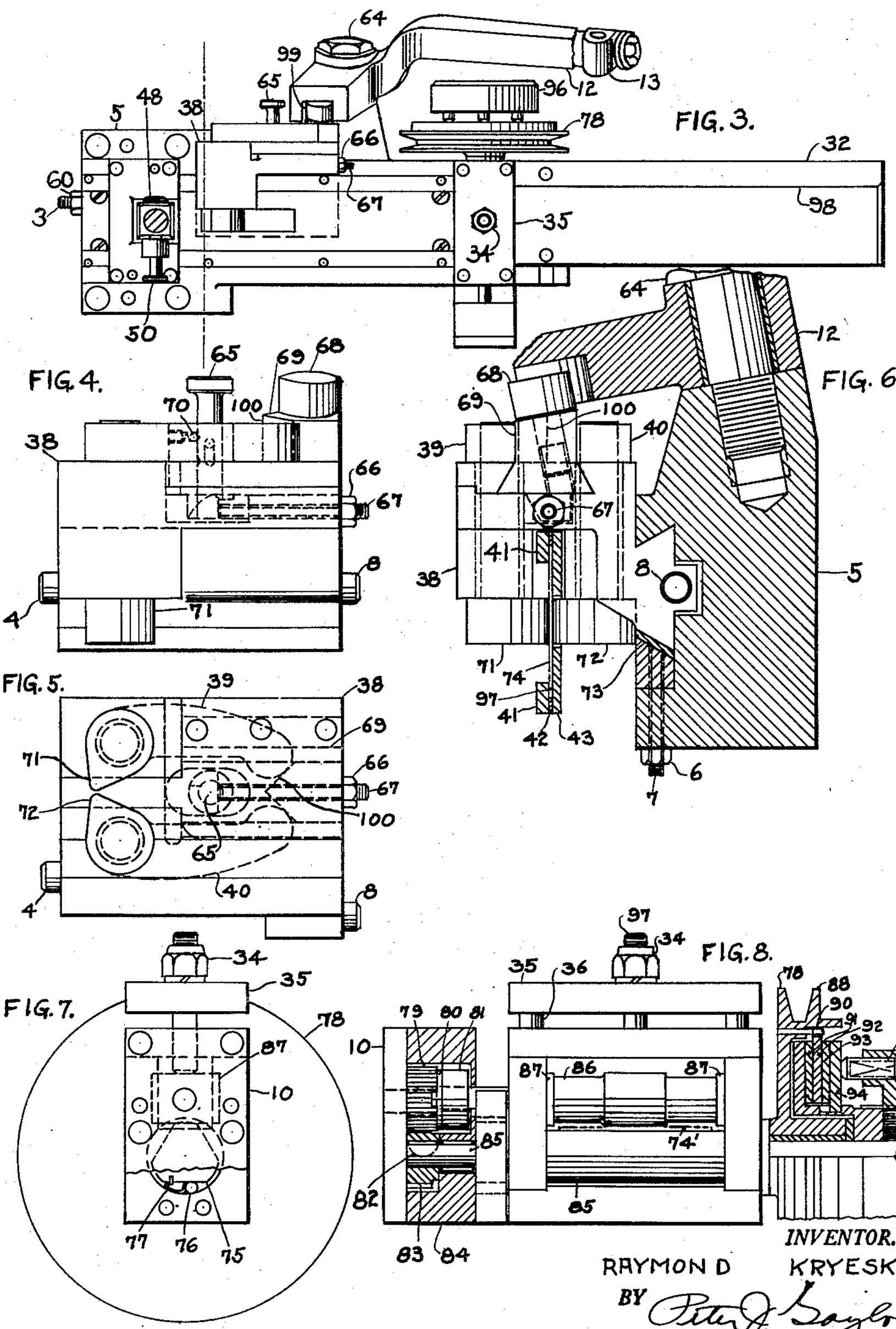


FIG. 3.

FIG. 4.

FIG. 6.

FIG. 5.

FIG. 7.

FIG. 8.

INVENTOR.

RAYMOND KRYESKE

BY Peter J. Taylor

attorney

Patented Oct. 31, 1950

2,528,374

UNITED STATES PATENT OFFICE

2,528,374

STRIP FEEDING DEVICE

Raymond Kryeske, Union, N. J.

Application May 29, 1948, Serial No. 30,105

5 Claims. (Cl. 271—2.5)

1

This invention relates to a feeding device for feeding strip material into punch presses and other strip and coil stock fabricating machines. More specifically, it deals with a feeder synchronously driven by the press and capable of gripping the strip on both sides.

As far as is known, punch presses employing strip stock are fed by hand. This not only requires experienced and skilled operators, but it also involves laborious manipulation which often causes serious accidents, such as loss of fingers or hands caught in the press tools.

One purpose of the present invention is to provide an automatically controlled feeding device which will enable a press to employ strip stock with the same ease and results as would be obtained when handling coil stock. Another purpose is to eliminate the need of experienced operators and to minimize greatly the hazards incurred by use of conventional methods and devices, as well as increase greatly the production due to more efficient utilization of time.

The invention may be more readily understood by reference to the drawings in which Figure 1 is a side elevation of the slide feed or carriage mechanism as adapted to a punch press. Figure 2 shows an end view of the carriage mechanism shown in Figure 1, while Figure 3 is a plan view of the same carriage mechanism. An enlarged plan view of the carriage is depicted in Figure 4, while Figure 5 presents an elevation view of the carriage. An end view of the carriage (with base, lever and stock guides appearing in section) is shown in Figure 6. Figure 7 illustrates an enlarged side elevation of the slip clutch, while an end view thereof, partly in cross-section, is shown in Figure 8. Similar numerals refer to similar parts in the various figures.

Referring again to the drawings, and particularly to Figures 1, 2 and 3, numeral 5 represents a base mounted on bolster plate 2 of the power press (not shown). On base 5 are mounted positive hold-down bracket 44, carriage 38, slip clutch mechanism 10, stock guides 41, 42 and 43, and adjustable stock guide plate 32. Power for operating the carriage is taken from crankshaft 59 of the power punch press by way of a slide-actuating crank disk 28.

For varying the active stroke of carriage 38, crank pin 23 (a threaded T-bolt) has a fine adjustable mounting (T-slot) 63 in crank disk 28. Connected with this adjustable crank pin (through universal joint 25) is adjustable link assembly 17, 18, 19, 20 and 21. Connected, in pivot relation at 16 through universal joint 13,

2

is rocker lever 12 which is pivoted at its lower end on base 5 at 64. The other end of the lever is slotted at 99, and closely fitted in the slot is a cam follower 68 held in slide 69 which has a wedge double taper 100.

Carriage 38 moves in the forward or active direction as shown by the arrow in Figure 1. Wedge 100 of slide 69 spreads apart levers 39 and 40, thereby causing stock grippers 71 and 72 to grip stock 74. Any further forward motion of carriage 38 carries the stock 74 until button 4 of carriage 38 engages adjustable screw 3 locked in place by nut 60. As button 4 of carriage 38 comes in contact with adjustable screw 3, positive holddown 47 grips stocks 74 by means of lever 57 pivoted by shouldered screw 53 held in bracket 52. Lever 57 is provided with cam follower 56 at one end. Cam 58, through follower 56, causes adjustable set screw 54, locked by nut 55, to force rod 51 through quick release eccentric pin 48, forcing positive hold-down plunger 47 against stock 74, which continues to function until button 8 of carriage 38 contacts adjustable screw 9 held in place by nut 11, at which instant cam 58 allows hold-down plunger 47 to release stock 74 by relieving compression of spring 46.

The motion of carriage 38 can be adjusted by adjustable eccentric 28, by means of screw 27. Screws 3 and 9 are adjusted at the same time for the corresponding eccentric setting. The forward motion of carriage 38 is obtained through a 180° arc movement of shaft 59. The opposite 180° arc of cam 58 is employed as the positive hold-down. On the opposite (hold-down) side of cam 58 there is a raised arc portion of uniform radius (not shown) which actuates lever 57 through roll 56 to perform the hold down function.

Movement of slide 69 (Figures 4–6) in relation to carriage 38 is controlled by adjustable screw 67 held in adjustment by nut 66 and the strip stock 74. Adjustable screw 67 butts against pin 65. When a quick release is desired of the stock gripped by gripper jaws 71 and 72, pin 65 is pulled out laterally all the way, thereby allowing carriage 38 to be moved forward, resulting in release of stock 74 by gripper jaws 71 and 72, making the stock free for further movement.

Should removal of stock 74 be desirable at the time positive hold-down 47 (Figures 1–2) is gripping stock 74, quick release lever 49 which is attached to eccentric pin 48 and carries detent 61 attached to knob 50, is released by pulling knob 50. This releases detent 61 from positive hold-down 47 and by rotating lever 49 approximately 180°, allows spring 46 to bring positive

hold-down 47 away from stock 74, facilitating removal of stock 74. To insure complete release of the stock at the end of the forward movement of carriage 38, the carriage may be and preferably is provided with a friction brake such as that shown in Figure 6.

This brake comprises a gib 73 and set screws 7 which are adjusted tightly against gib 73, providing the braking action. Lock nuts 6 assure adjustment settings of screws 7. The braking action causes carriage 38 to rest momentarily at the end of its forward stroke so that slide 69 may start back, thereby allowing levers 39 and 40 to loosen and release gripping jaws 71 and 72 from stock 74. The braking effect is obtained at the end of the back stroke of carriage 38, causing the carriage to be held momentarily to allow moving forward of slide 69, causing grippers 71 and 72 to grip stock 74 at the proper instant at the commencement of the feed stroke. As a result, the stock is immediately released at the end of the forward stroke and is positively and firmly gripped at the proper moment (in synchronism with the press) on the commencement of the feed stroke, thus insuring consistent, accurate feeding of stock 74.

Stock guides 41, 42 and 43 guide stock 74 through the feeding mechanism. Stock guide strips 41 and 42 are adjustable for different widths of stock. Span 97 (Figure 6) for the thickness of the stock is preferably less than 1.5 times the thickness of stock 74.

Stock guide plate 32 (Figure 1) is keyed to ride in T-slot 101 and has T-nuts 33 so that shoulder 98 may be easily positioned and act as a guide when pieces of stock are fed into the feed mechanism.

The slip clutch roll feed stop check (shown in Figures 7–8) is actuated by drawing power from crankshaft 59 of the power press, using a V-belt 31 making a 90° V-belt drive. Sheave 88 rotates on lower roll 85 and drives roll 85 through friction discs 91 and 93. Plate 94 has a lateral movement on hub 98 and adjustable pressure is applied to friction discs 91 and 93 through spring cap 95 and nut 96. Roll 85 is keyed to gear 83 by key 82, said gear driving gear 79 which through Oldham coupling 80 and 81 drives shaft 86 mounted in bearings carried in blocks 87. The shaft 86 and bearings may be raised or lowered to allow for different thickness of stock 74′ and are easily adjustable by means of stop nut 34 and screw 97.

The slip clutch mechanism shown at the right of Figure 8 is able to allow picking up a piece of stock and moving it quickly up against the previous piece of stock 74 as it is being fed by carriage 38. When the second piece 74′ butts against the first piece, sheave 88 continues to rotate but rolls 85 and 86, which are driven by friction plates 91 and 93, remain stationary.

A one-way clutch is made from a triangular hub 75 (Figure 7) and three rolls 76, each backed up by springs 77. The clutch is mounted on roll 85 (Figure 8), enabling the roll to rotate easily in one direction, but wedges it tight when pressure is brought to bear tending to rotate it in the opposite direction. Hence, when two pieces of stock are in the feed mechanism at the same time, one behind the other, and carriage 38 is moving in the backward stroke, the first piece of stock 74 is held down by the positive hold-down 47 while the second piece 74′, which butts up against the end of the first piece, is held from moving back with carriage 38 by the one-way clutch 75, 76 and 77.

The term "active stroke" employed herein means the complete stroke of the rocker lever, while the term "feed stroke" means only the stroke made by carriage 38.

From the foregoing, it is apparent that the present invention provides a simple and efficient means for feeding strip stock without incurring the wastage encountered with conventional devices. Also, the gripping mechanism requires no need for jaw adjustment and has less opportunity to get out of order.

Although a one-way clutch (Fig. 7) has been described as the restraining means for shaft 85 to insure forward propulsion of the strip, other restraining means may be used, such as a ratchet device or a brake, or similar mechanism, although the one-way clutch is preferred.

I claim:

1. In a strip feeding device of high accuracy which is synchronously driven in forward and return strokes by said machine acting as the moving force, and employing a base, a carriage reciprocating on said base with adjustable braking action, which carriage intermittently feeds the strip into said machine, and a positive hold-down for holding the strip on the return stroke of the carriage, the improvement comprising a small slide to which the moving force is firmly applied, said slide fitting in parallel, limited floating relation in said carriage and moving said carriage indirectly, gripping means attached to said carriage and acting as a moving means therefor, actuating means attached to said small slide for actuating said gripping means, linearly displaceable adjusting means on said carriage for adjusting the floating travel of said small slide to accommodate for small variations in thickness of said strip, said floating relation comprising a limited travel in parallel relation to said carriage, said gripping means comprising a separately pivoted gripping member on each side of said stock oppositely disposed to each other forwardly of said pivots and a levering member attached to said gripping member, and said actuating means comprising a separately disposed lever-actuating member attached to and moved by said small slide and disposed therein to impose a leverage force upon said leverage means during the duration of the forward stroke, whereby the gripping force increases when the resistance of said stock to forward motion increases.

2. In a strip feeding device synchronously driven by the machine to which the strip is fed and employing a base, a carriage reciprocating on said base with braking action, which intermittently feeds the strip into the machine and a positive hold-down for holding the strip on the return stroke of the carriage, the improvement comprising two superimposed and reversibly disposed gripping dogs between which the strips pass and by means of which said strips are gripped on both sides as they are moved forward, a shaft projecting laterally from the center of each dog and mounted in the carriage, a lever arm attached to the end of each shaft and acting as means for opening and closing said dog, a tapered wedge disposed equidistantly between the ends of said levers and carried in a small slide mounted in the carriage, said wedge acting to close the dogs to grip the strip stock while the small slide is moving forward and release said dogs on the reverse stroke, said small slide being capable of moving to a limited ex-

tent in parallel relation to the carriage, the forward movement of said small slide being determined by the thickness of said strip stock, the backward movement thereof being determined by an adjustable means mounted on said carriage, reciprocating means for reciprocating said small slide within said carriage, and engaging means on said small slide for engaging the reciprocating means thereto.

3. A feeding device according to claim 2 in which there is mounted on the base in back of the carriage a set of gear driven, oppositely rotated, superimposed, adjustably spaced shafts, the axes of which are at right angles to the strip and which propel the new strip forward, a slip clutch mounted on the lower shaft, a pulley providing power to said slip clutch from said machine, and retaining means mounted on said lower shaft allowing rotation of said shaft only in the feeding direction of the strip.

4. A feeding device according to claim 3 in which said restraining means comprises a one-way clutch.

5. A feeding device according to claim 2 in which the carriage has mounted therein an adjustable set screw in parallel relation thereto

and a moveable pin mounted in the small slide, butting up against said set screw when the carriage is being moved on its backward stroke, the moving of which pin allows additional clearance between the set screw and the small slide, thereby causing, through further movement of the carriage, separation of the dogs to facilitate strip removal.

RAYMOND KRYESKE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
172,715	Dickinson	Jan. 25, 1876
562,222	Granger	June 16, 1896
799,321	Gardner	Sept. 12, 1905
1,291,482	Greenstreet	Jan. 14, 1919
1,447,490	Shellenberger	Mar. 6, 1923
1,826,498	Bignell	Oct. 6, 1931
2,096,073	Spencer	Oct. 19, 1937
2,115,131	Yancey	Apr. 26, 1938
2,250,530	Hafecost	July 29, 1941
2,380,320	La France	July 10, 1945