

April 24, 1951

E. T. KNITTER
FEED MECHANISM

2,549,975

Filed June 12, 1948

4 Sheets-Sheet 1

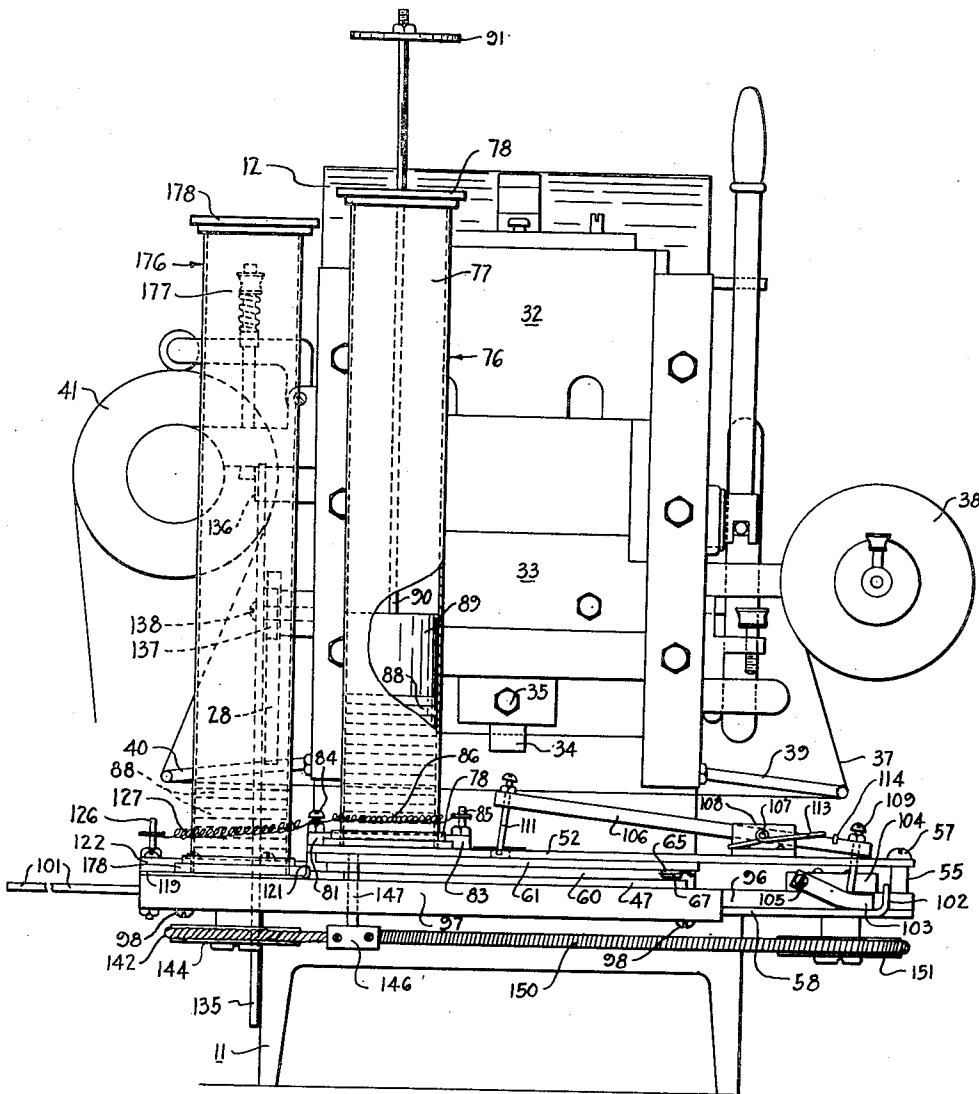


FIG. 1

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April 24, 1951

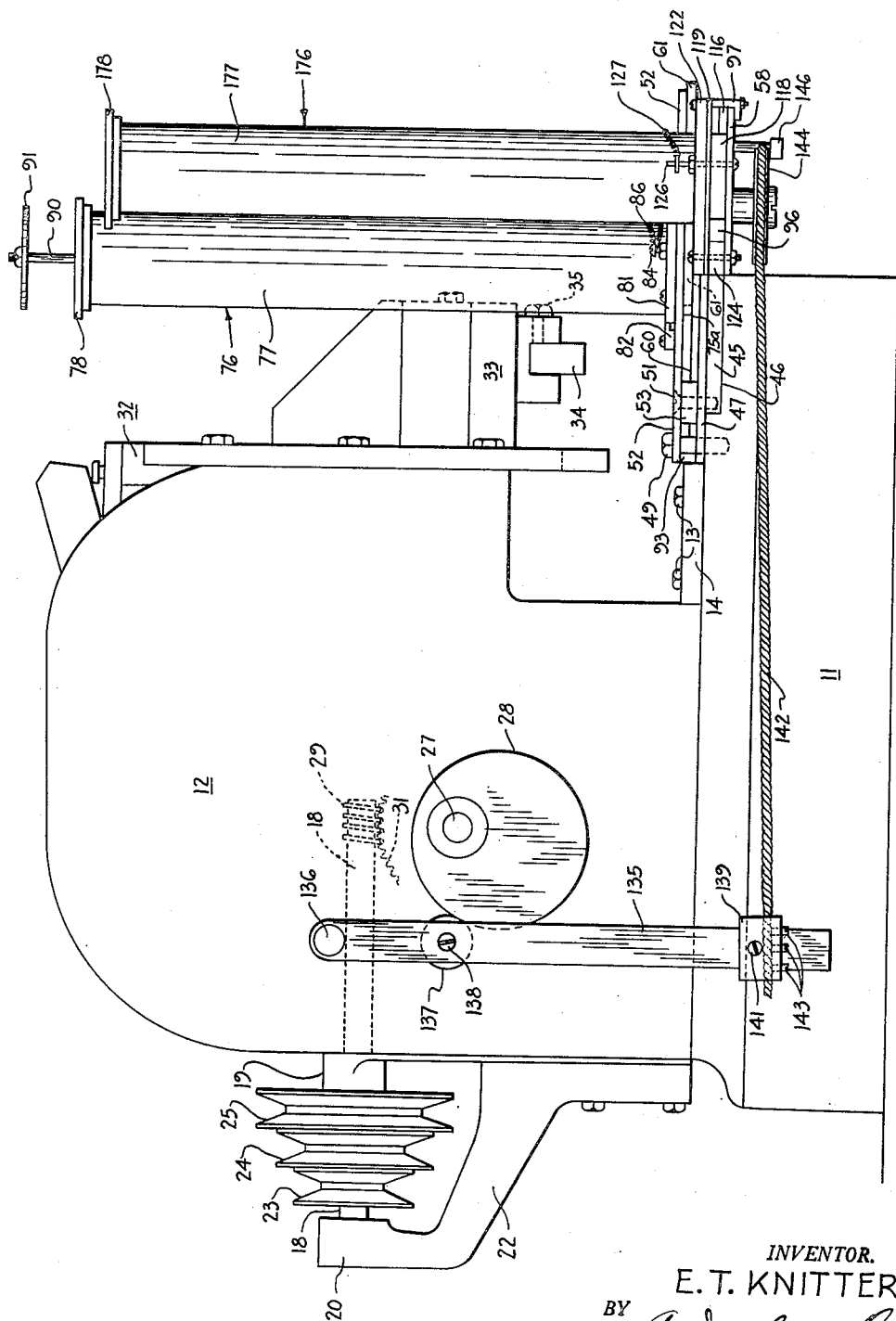
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4 Sheets-Sheet 3

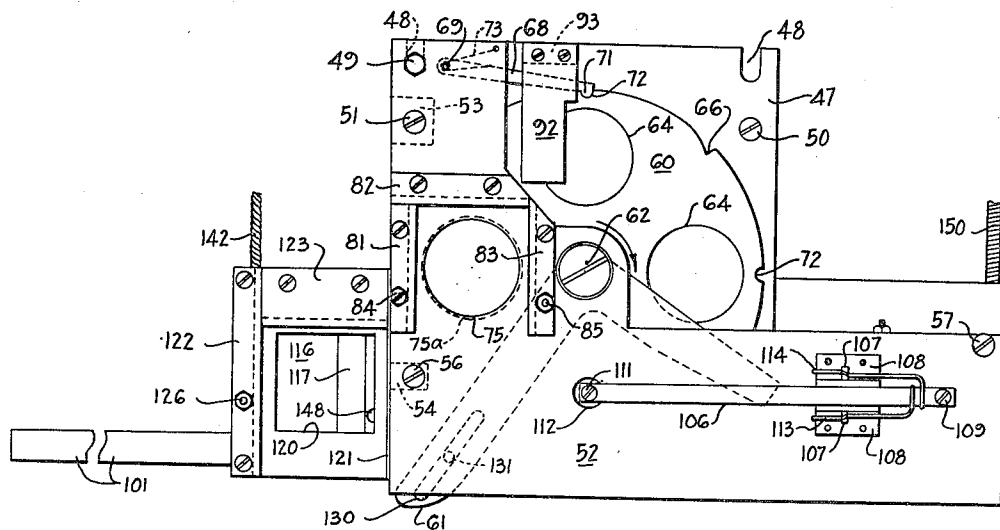


FIG. 3

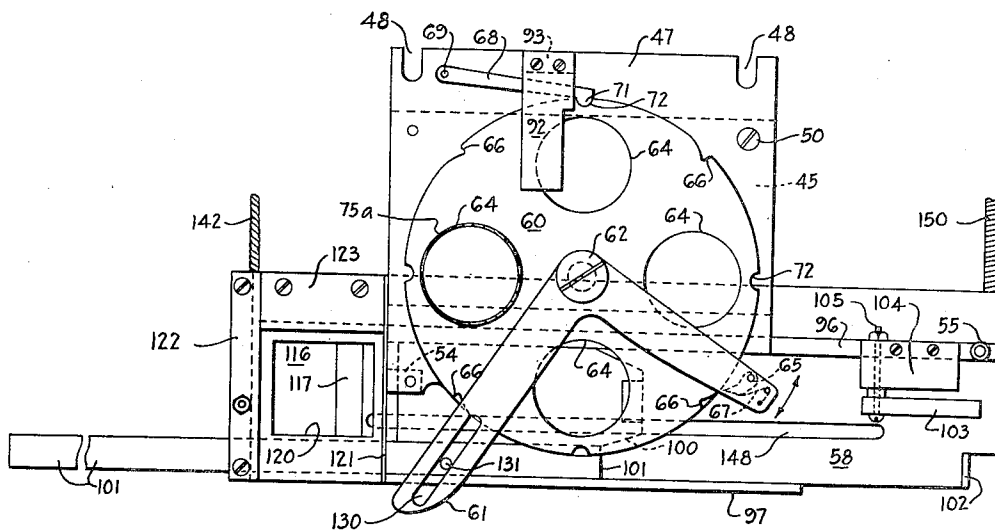


FIG. 4

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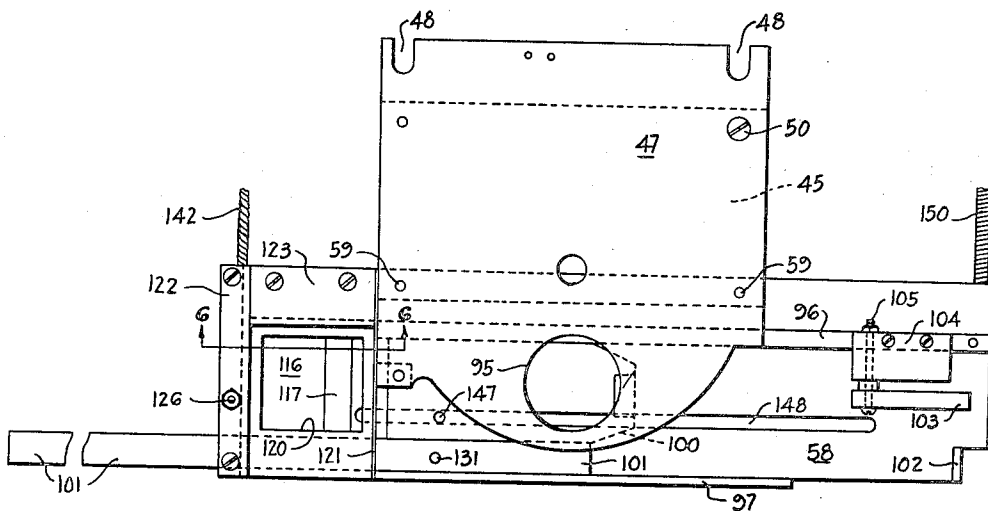


FIG. 5

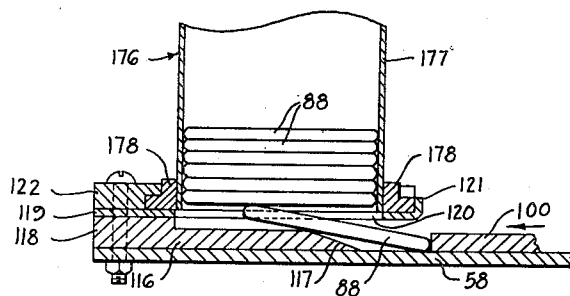


FIG. 6

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UNITED STATES PATENT OFFICE

2,549,975

FEED MECHANISM

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Application June 12, 1948, Serial No. 32,689

2 Claims. (Cl. 214-6)

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This invention relates to machines for performing any of various operations upon uniformly shaped articles such, for example, as the stamping, engraving or printing of the same design, monogram, or the like on each of a large number of poker chips, dominoes, or any other articles of uniform size and shape. The invention relates particularly to fully automatic feed mechanisms for such machines, and, more specifically, to feed mechanisms that will feed the articles to be operated upon to the machine and collect them thereafter in an orderly manner such that only a simple hand operation is required to cause the same articles to be fed through the machine a second time in positions relatively inverted with respect to their positions during the first pass through the machine, whereby the same operation will be performed on both sides of each article.

One of the principal objects of the invention is to provide a feed mechanism of the general character mentioned which is relatively simple and inexpensive to make and which is adaptable for feeding a series of uniformly shaped objects to any of a variety of kinds of machines.

Another object of the invention is to provide such a feed mechanism that will collect the articles, after they have been operated upon, in an orderly fashion with the articles uniformly oriented for packing or any other subsequent handling that may be required.

Another object of the invention is to provide such a feed mechanism that will collect the articles, after they have been operated upon, in a receiving magazine that can also serve as a feeding magazine, and that will collect the articles in uniformly oriented positions within that magazine, so that the magazine may be easily and quickly removed from its collecting position and placed in a feeding position for feeding the same articles to the machine a second time, but in relatively inverted positions with respect to their first pass through the machine.

A further object of the invention is to provide a fully automatic feed mechanism that incorporates the foregoing features in a rugged structure requiring a minimum amount of adjustment and maintenance and possessing a high degree of reliability in service.

Still other objects and advantages of the invention, and the various features by means of which they are accomplished, will be apparent from the following detailed description of a specific embodiment of the invention. The particular embodiment of the invention to be de-

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scribed has been specifically designed for feeding disk-shaped articles, such as poker chips, to a stamping machine of the general character disclosed in my copending applications Serial No. 617,026, filed September 18, 1945 and now Patent No. 2,505,900 granted May 2, 1950, and Serial No. 704,000, filed October 18, 1946 and now abandoned. For clarity of illustration, the present invention is shown in the accompanying drawings in association with the form of stamping machine disclosed in Figs. 1 to 3 of the latter of said copending applications, modified only in minor particulars to accommodate my new, fully automatic feed mechanism in place of the work supporting table disclosed therein. Only such parts of that stamping machine are shown and described herein in detail as appear conducive to a full and clear understanding of the present invention.

Referring now to the accompanying drawings:

Fig. 1 is a front elevation of a stamping machine having my new feed mechanism mounted thereon;

Fig. 2 is a side elevation of the stamping machine and feed mechanism shown in Fig. 1;

Fig. 3 is a plan view of the feed mechanism of Figs. 1 and 2, but with certain parts of the feed mechanism removed;

Fig. 4 is a plan view similar to Fig. 3, but shown partly in section and with additional parts of the feed mechanism removed;

Fig. 5 is another plan view similar to Figs. 3 and 4, but with still more parts removed; and

Fig. 6 is a sectional elevation of a portion of the fully assembled feed mechanism, the plane of the section being indicated by the line 6-6 in Fig. 5.

The machine shown in the drawings is organized about a metal base and frame assembly shown only in general outline in Figs. 1 and 2. The base 11 is preferably a heavy steel casting upon which the frame 12 may be mounted by means of a plurality of suitable fastening elements, such as bolts 13 which pass through frame flanges 14 on opposite sides of the machine and are threaded into the base 11. The frame 12 houses a mechanism disclosed in detail in both of my aforementioned copending applications (but not here shown) for effecting controlled reciprocation of a carriage 32 described briefly herein-after. That mechanism is adapted to be driven by means of a constantly rotating shaft 18 that may pass through a back wall of the frame 12. The shaft 18 may be journaled intermediate its ends in one bearing 19 formed integrally with the casting 12 and at its rearward end in a second

bearing 20 formed on a bracket 22 bolted to the casting 12. A plurality of pulleys 23, 24, and 25 may be secured fast on the constantly rotating shaft 18 between the bearings 19 and 20 for selective engagement by a belt drive from any suitable source of power (not shown).

In the machine illustrated in my aforementioned application Serial No. 704,000, the mechanism for effecting reciprocation of the carriage 32 includes a shaft 27 that extends transversely of the machine and is journaled at its opposite ends in suitable bearings (not shown) in the side walls of the frame 12. To provide a power take-off arrangement for driving the feed mechanism of the present invention, the shaft 27 may protrude through one side wall of the frame 12 for carrying a cam 28. In said application Serial No. 704,000, a normally disengaged driving connection (not here shown) between the constantly rotating shaft 18 and the transverse shaft 27 is provided, the driving connection being adapted, in response to manual manipulation of a suitable control lever, to cause the transverse shaft 27 to make one full revolution about its axis and then stop until the control lever is again actuated for the same purpose. A portion of this driving connection may comprise a worm 29 on the constantly rotating shaft 18, a gear or worm wheel 31 mounted on the transverse shaft 27 so as normally to turn freely thereon, and a clutch mechanism (not here shown) that may be manually actuated by the aforementioned control lever to lock the gear 31 to the transverse shaft 27 for one revolution of that shaft and then automatically release the gear 31 so that it will again turn freely on the transverse shaft and permit the latter to come to an immediate stop. Suitable clutches for that purpose are well known in the mechanical arts, and one particularly suitable form is disclosed in detail in my aforementioned application Serial No. 617,126. Suitable mechanism for driving the reciprocating carriage 32 through one working cycle during each revolution of the transverse shaft 27 is disclosed in both of my aforementioned applications. In both of those applications, the clutch control lever may be manually moved against a spring and immediately released to engage the clutch for one revolution, or it can be held in the clutch engaging position so that the clutch will remain engaged and the carriage will reciprocate constantly without interruption. Though operation of my new feed mechanism is not dependent upon any particular manner in which reciprocation of the carriage may be controlled, it is contemplated that a suitable latch or lock will be provided for securing the clutch control lever in its clutch engaging position for effecting continuous operation of the stamping machine and my new feed mechanism associated therewith.

Referring again to Fig. 1 herein, the reciprocating carriage 32 is mounted on the front of the frame 12 for vertical reciprocation with respect thereto, and any desired form of die holder 33 is rigidly secured thereto for movement therewith. A die 34 for producing a selected impression on articles to be stamped is removably secured in the die holder 33 by any convenient securing device, such as a bolt 35. A tape feeding mechanism is preferably mounted on the frame 12 for feeding an embossing tape 37 below the die 34 so that it will be compressed between the die and any article being stamped to color the impression made by the die thereon. The tape may be fed from a tape supply reel 38 mounted

on one side of the frame 12 and over a tape advancing drum 41 that is adapted to be driven about its axis through a predetermined angle during each revolution of the transverse shaft 27, whereby an unused portion of the tape is moved directly under the die 34 during each cycle of its travel.

The foregoing general description of certain elements of the stamping machine forms no part of the present invention and have been disclosed herein only to the extent deemed necessary or helpful in fully understanding the feed mechanism now to be described in detail. The features of the stamping machine which have been briefly described above are all more completely disclosed in one form or another in both of my aforementioned copending applications.

My new and improved feed mechanism is preferably constructed around a framework of four individual plates, which are superimposed one above another in a staggered fashion. A foundation plate 45 of this frame is shown in Fig. 2 resting upon a depressed or rabbeted forward portion 46 of the stamping machine base 11 so as to position the feed mechanism longitudinally of the stamping machine.

The next higher plate 47 of this frame (hereinafter designated a "table plate" for convenience) rests directly upon the foundation plate 45 and projects further rearwardly or inwardly with respect to the stamping machine. The inward edge of the table plate 47 has a pair of U-shaped notches 48 (see Figs. 3 and 4) cut therein for receiving a pair of bolts 49, which may be screwed into the base 11 of the stamping machine for positioning the feed mechanism laterally with respect thereto and securing it rigidly in place. The foundation plate 45 and the table plate 47 may be secured firmly together by means of a pair of screws 50 and 51, the latter serving an additional function described hereinafter.

An uppermost frame plate 52 (hereinafter designated a "cover plate" for convenience) is spaced vertically from the table plate 47 by means of a first spacer block 53 (Figs. 2, 3, and 4), a second spacer block 54 (Figs. 3 and 4), and a spacer sleeve 55 (Figs. 1 and 4). The aforementioned screw 51, which serves to secure the table plate and foundation plate together, passes freely through the cover plate 52, the first spacer block 53, and the table plate 47 and is screwed into the foundation plate 45. Another screw 56 passes freely through the cover plate 52 and the second spacer block 54 and is screwed into the table plate 47. A third screw 57 passes freely through the cover plate 52 and the spacer sleeve 55 and is screwed into the table plate 47.

A lowermost frame plate 58 (hereinafter designated a "track plate" for convenience) is disposed adjacent the forward edge of the foundation plate 45 and is rigidly secured thereto by a pair of screws that pass upwardly through the track plate and are threaded into a pair of apertures 59 (Fig. 5) in the foundation plate. As is clearly shown in Figs. 5 and 6 taken together, the track plate 58 extends laterally in both directions beyond the foundation plate 45.

A disk-shaped feeder plate 60 (Figs. 2, 3, and 4) rests upon the table plate 47, and an L-shaped actuating lever 61 rests flat upon the feeder plate. Both the feeder plate 60 and the actuating lever 61 are rotatably secured to the table plate 47 by means of a bolt 62. The bolt 62 passes freely through the lever at the juncture of two angularly disposed legs thereof and through the

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axis of the disk 60. It is threaded through the table plate 47 into abutment with the upper surface of the foundation plate 45 for insuring that it may be tightened without unduly building up a frictional pressure between the two rotatable elements and the table plate.

The feeder plate 60 has four circular holes 64 drilled therethrough and centered at points located at equal distances from the axis of the feeder plate and equal angular distances apart with respect to that axis. The holes 64 are all the same size and are adapted to receive the poker chips which this particular embodiment of the feed mechanism was designed to handle. Rotation of the feeder plate 60 causes chips dropped into any one of the holes 64 therein to slide along the same circular path on the table plate 47 in a manner described hereinafter. The feeder plate 60 is rotated about its axis for this purpose by the actuating lever 61 through the medium of a pawl 65 that is adapted sequentially to engage four uniformly spaced-apart notches 66 cut into the periphery of the feeder plate. The pawl 65 is pivotally mounted adjacent one end of a leg of the lever 61, and one end of the pawl is held yieldably against the periphery of the feeder plate 60 by means of a small wire spring 67 secured on the lever adjacent the pawl.

The rotation of the feeder plate 60 is intermittent from one to another of four predetermined positions during each complete revolution. While the feeder plate is stationary in any one of these positions, it is yieldably held in that position by a small lever 68 pivotally mounted adjacent one of its ends between the cover plate 52 and the table plate 47 by means of a pin 69 secured at its opposite ends in the adjacent plates. The opposite end of the small lever 68 is provided with a rounded dog 71 that is adapted sequentially to seat in four uniformly spaced apart notches 72 of complementary contour in the periphery of the feeder plate 60. These notches 72 are so located on the periphery of the feeder plate 60 that one of the notches will be engaged by the dog 71 each time the feeder plate reaches any of its four predetermined stationary positions. The dog 71 is held yieldably against the periphery of the feeder plate to effect such engagement by means of a small wire spring 73 that is looped around the pin 69 with one end anchored to the cover plate 52 and the other end bearing against the small lever 68. The force exerted by the wire spring 73 is selected so that the feeder plate 60 will be held by the small lever 68 against counter-clockwise rotation resulting from friction between the feeder plate and the actuating lever 61, but is not held against clockwise rotation when driven in that direction by the positive force applied through the actuating lever 61.

A circular aperture 75 is cut through the cover plate 52, this aperture being of the same diameter as the apertures 64 in the feeder plate 60, and a short ring 75a, also of the same diameter, is attached to the bottom side of the cover plate, or is formed integrally therewith, in alignment with the aperture 75. The aperture 75 through the cover plate and the ring 75a are located so that they are in vertical alignment with a hole 64 in the feeder plate whenever the feeder plate is in one of its four stationary positions. A poker chip dropping into the aperture 75 of the cover plate may continue down through the ring 75a and rest upon the feeder plate 60 until it can drop further into an aligned chip receiving hole

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64 in the feeder plate when the latter comes to a stop. The succeeding 90° movement of the feeder plate 60 carries that chip to a stamping position under the die 34 and moves another chip receiving aperture 64 into alignment with the aperture 75 in the cover plate 52 for receiving a chip therefrom.

A supply of poker chips is fed through the aperture 75 in the cover plate 52, as fast as they are carried away by the feeder plate 60, from a magazine 76 mounted directly above the aperture in the cover plate. The magazine 76 comprises a tubular element 77 that is open at both ends, and identical mounting plates 78 are respectively secured to the two ends thereof. Each mounting plate 78 is centrally apertured to receive the adjacent end of the tubular element 77 to which it is rigidly secured in any desired manner, as by screw threads or welding. The mounting plates 78 are square in outline with all four edges rabbeted as shown in Figs. 1 and 2. The magazine 76 is thus adapted to be selectively mounted in position on the cover plate 52 with either end of the magazine uppermost.

Three bars 81, 82, and 83 having identical undercut transverse sections (as shown in Fig. 1 for the bars 81 and 83) are secured to the cover plate 52 by suitable fastening elements to form a three sided slot or pocket into which either mounting plate 78 of the magazine 76 may be slid. The bars 81, 82, and 83 are located so as to position the internal bore of the magazine 76 in precise vertical alignment with the aperture 75 in the cover plate 52. Two fastening elements 84 and 85, that may respectively be employed also for securing the oppositely disposed bars 81 and 83 in place, are so formed that they project upwardly a short distance to form anchor posts for the ends of a helical spring 86. The helical spring 86 is stretched partially around the tubular portion 77 of the magazine 76 with its opposite ends hooked onto the two fastening elements 84 and 85, thereby holding the magazine 76 firmly in its mounted position.

In Fig. 1, a supply of poker chips 88 is shown in the magazine 76. When the magazine is full of chips, the weight thereof is amply sufficient to force the lowermost chip in the stack to drop quickly into an aperture 64 in the feeder plate 60 at the proper time. As the stack of chips approaches exhaustion, however, an additional weight on top of the stack is needed. For this purpose, a cylindrical weight 89 is placed on top of the stack of chips. A rod 90 is screwed into the top of the weight 89 and projects upwardly therefrom, terminating in an axially mounted disk 91 that is too large in diameter to enter the magazine. The length of the rod 90 is selected so that the disk 91 will contact and rest upon the top of the magazine as the weight 89 forces the last chip out of the magazine and into an aperture 64 in the feeder plate 60.

When a chip has been carried by the feeder plate 60 from under the magazine 76 to a position under the die 34 and the die 34 has descended into forcible contact therewith, there is a tendency at times for the chip to stick to the die and be carried up with it on its return stroke. This tendency may be encountered even when an embossing tape is disposed between the die and chips being stamped thereby. To prevent this tendency, a thin, spring steel, retainer plate 92 is screwed to the table plate 47 with a spacer block 93 disposed therebetween. (Figs. 3 and 4.) The thickness of the spacer block 93 is prefer-

ably selected so that the retainer plate 92 lightly engages the top of each chip passing thereunder, and the retainer plate is positioned laterally with respect to the stamping machine so that it will remain over one edge of chips stopped in the stamping position. Thus the retainer plate 92 will prevent chips from being lifted by reason of any tendency for them to stick to the stamping die 34.

With two 90° movements from the stamping position, a chip is carried by the feeder plate 60 to a discharge position. As shown in Fig. 5, the table plate 47 is shaped to support the chips throughout their travel from their initial position thereon until they reach the discharge position. At the discharge position, however, the table plate 47 is cut away to form a circular aperture 95 through which the chips may successively drop from the feeder plate 60 on reaching this position.

Upon dropping from the feeder plate 60, the chips fall onto the track plate 58 of the feeder mechanism frame and between two parallel guide bars 96 and 97, which are both secured rigidly to the track plate 58. One of the guide bars 96 is approximately square in transverse section and is secured on top of the track plate 58 by suitable fastening elements. The other guide bar 97 is preferably L-shaped in transverse section and is disposed with one vertically disposed flange against the forward edge of the track plate 58 and a horizontal flange extending under the track plate and secured thereto by suitable fastening elements 98 (Fig. 1).

Each time a chip drops through the discharge aperture 95 and onto the track plate 58, it is moved to the left along the track plate (viewing Figs. 1, 3, 4, and 5) to a second magazine 176, to be described hereinafter, in which the chips are finally collected. Movement of the chips along the track plate 58 is effected by a sliding block 100 having a long guide strip 101 suitably secured to one side thereof, as by welding, or initially formed integrally therewith if desired. The sliding block 100 and its guide strip 101 are adapted to fit between the two guide bars 96 and 97 and to slide along the track formed thereby on the track plate 58.

A cut-out and turned-up tab 102 at one corner of the track plate 58 forms a stop for limiting the travel of the sliding block 100 toward the right, at which limit of its travel, the sliding block is entirely to the right of the discharge aperture 95. As the sliding block 100 approaches this position, it slides under a trip lever 103, forcing the trip lever upwardly. The trip lever 103 is pivotally secured to one side of a block 104, by means of a pin 105, and the block 104 is rigidly secured by suitable fastening elements to the upper side of the innermost guide bar 96. Associated with the trip lever 103 is an ejecting lever 106 which is pivotally mounted on a horizontally disposed pin 107. This pin 107 is mounted at its opposite ends in two supporting brackets 108, which are in turn rigidly secured to the cover plate 52 by suitable fastening elements or by welding. A first adjustable pin 109 is secured at one end of the ejecting lever 106 and projects downwardly into contact with the trip lever 103. At the opposite end of the ejecting lever 106, a second, similarly adjustable pin 111 is secured and projects downwardly through a small aperture 112 in the cover plate 52. A pair of wire springs 113 and 114 are looped intermediate their ends around oppositely projecting ends of the

lever pin 107. One end of both springs bears downwardly against the base of its associated supporting bracket 108, and the other ends of the springs are turned inwardly toward each other and bear downwardly on the ejecting lever 106 to the right of the pin 107 on which it is pivotally mounted. Thereby, the two wire springs 113 and 114 yieldingly urge the right hand end of the ejecting lever downwardly for keeping the first adjustable pin 109 constantly in contact with the trip lever 103. Thus, when the sliding block 100 moves to the right into contact with the limiting stop 102, thereby swinging the trip lever 103 upwardly, the ejecting lever 106 is actuated to plunge the eject-pin 111 downwardly through the aperture 112 of the cover plate 52, through an aligned aperture 64 of the feeder plate 60, and through the aligned discharge aperture 95 in the table plate 47. This positively forces any chip that may be jammed in the feeder plate aperture 64 when it reaches the discharge position, to drop downwardly onto the track plate 58.

At the left hand end of the track formed by the track plate 58 and the two guide bars 96 and 97, a lifting plate 116, having a beveled right hand edge 117 and a raised left hand portion 118, is mounted on the track plate 58 directly in the path of chips pushed along the track by the sliding block 100. The forward edge of the lifting plate 116 is spaced from the forward or outer guide bar 97 by an amount just sufficient to permit the guide strip 101 of the sliding block 100 to slide freely therebetween, thereby providing additional means for accurately guiding the travel of the sliding block. The rearward edge of the lifting plate 116 is tight against the rearward or inner guide bar 96. The heights of the two guide bars 96 and 97 and of the raised portion 118 of the lifting plate 116 are the same, whereby they cooperate to form a level support for a positioning plate 119 having a generally rectangular aperture 120 cut therethrough. The right hand edge of the positioning plate 120 is bent upwardly to form a positioning flange 121 adapted to assist in positioning the second magazine 176, in cooperation with two additional positioning elements 122 and 123. The two additional positioning elements 122 and 123 are generally similar in transverse section to the three bars 81, 82, and 83 which serve to position the first magazine 76, each having one edge undercut (as shown for one of the positioning elements 122 in Fig. 5). The rearward positioning element 123 and the forward end of the left hand positioning element 122 rest upon a spacer block 124. A number of suitably disposed screws are employed in convenient locations for securing rigidly together the entire assembly comprising the track plate 58, the lifting plate 116, the spacer block 124, the positioning plate 119, and the two undercut positioning elements 122 and 123.

The second magazine 176 is identical in all respects with the first magazine 76 and is adapted to be disposed with its longitudinal axis vertical and centered with respect to the generally rectangular aperture 120 in the positioning plate 119. The lower mounting plate 118 of the second magazine 176 is adapted to be slid rearwardly into the receiving pocket formed by the positioning flange 121 and the two undercut positioning elements 122 and 123, these three positioning members being accurately located so as properly to position the second magazine 176. A fastening element 126 is secured to the left hand positioning element 122, and a helical spring 127

is detachably stretched partially around the tubular portion 177 of the second magazine 176, one end of the spring being hooked onto this fastening element 126 and the opposite end of the spring being hooked onto the same fastening element 84 to which the similar spring 86 for the first magazine is secured. The second magazine 176 is thereby held firmly in its mounted position.

As a poker chip 83 is pushed to the left along the track formed on the track plate 52, the beveled edge 117 of the lifting plate 116 acts as a ramp and tilts the chip as shown in Fig. 6. As the leading edge of this chip is raised upwardly against the bottom chip of any that may previously have been received in stacked relation within the second magazine 176, such stack of chips as is already disposed therein is forced upwardly to the extent required to permit the tilted chip to slide thereunder and into alignment with the other chips in the stack. Thus, one chip after another can be fed upwardly into the second magazine 176 until all of the chips originally placed in the first magazine 76 have been operated upon by the stamping die 34 and have been moved into the second magazine 176.

All of the moving parts of the entire feed mechanism are synchronized in a similar manner by a pin and slot connection between the actuating lever 61 and the sliding block 100. This connection comprises an elongated slot 130 cut through one leg of the actuating lever 61 and a pin 131 that is mounted in the guide strip 101 of the sliding block 100 and that projects upwardly into the slot 130. Thus, referring particularly to Fig. 4, it will be readily observed that the following sequence of movements will result from movement of the sliding block 100: As the sliding block 100 is moved from its extreme left hand position toward the right, the feeder plate 60 is held stationary against any frictional forces acting thereon by means of the dogs 71 on the small lever 58; and the pin 131 attached to the sliding block drives the actuating lever 61 in a counterclockwise direction through an angle of 90°. As the sliding block 100 reaches the stop 102 at the end of its travel toward the right, the pawl 65 falls into a new notch 66 in the feeder plate 60. During the last part of its travel toward the right, the sliding block 100 actuates the trip lever 103 and ejecting lever 106, thereby insuring that the last chip moved to the discharge position by the feeder plate 60 will have dropped therefrom onto the track therebelow and into the return path of the sliding block. Then, as the sliding block 100 is moved back along the track toward the left, it pushes the chip in its path along the path ahead of it and into the second magazine 176. During movement of the sliding block 100 toward the left, the pin 131 attached thereto drives the actuating lever 61 in a clockwise direction, and the pawl 65, engaged with a notch 66 in the feeder plate 60, drives the feeder plate in a clockwise direction until both the feeder plate and actuating lever have turned about their common axis 62 through an angle of 90°. The positive driving force thus applied to the feeder plate 60 is sufficient to force the dog 71 on the small lever 58 to ride out of one rounded notch in the feeder plate and along the outer edge thereof until it snaps into the next such notch 90° further around the perimeter of the feeder plate. At this point, a chip in the feeder plate aperture 64 which has just reached the discharge position will normally drop downwardly until it rests on top of the sliding block 100, but still within the discharge aperture 75 of

the table plate 47. As the sliding block 100 moves toward the right again in the course of a second cycle like the one just described, it slides out from under the chip in the discharge aperture 75 and permits that chip finally to drop therefrom onto the surface of the track plate 52.

The power to be received from the power take-off mechanism, driven by the rotating cam 28 on the crankshaft 27 of the stamping machine, is applied directly to the sliding block 100 for driving all the moving parts of the feed mechanism in the manner just described. This power take-off mechanism comprises an oscillating arm 135 that is pivotally hung adjacent its upper end from a fixed pin 136 mounted in the adjacent sidewall of the machine frame 12. A short distance from its upper end, the arm 135 carries a roller 137 that is rotatably mounted on the arm by a suitable bolt 138, and the roller rides against the edge of the cam 28. Adjacent its lower end, the arm 135 carries a clamping block 139 that is pivotally secured thereto by a suitable bolt 141. The clamping block 139 is drilled from end to end to provide an aperture through which one end of a cable 142 may be threaded, and a plurality of set screws 143 are screwed into the clamping block transversely with respect to that aperture and against the cable therein for anchoring the cable securely in the clamping block.

The cable 142 extends forwardly along one side of the stamping machine, passes 90° around a fixed pulley 144, and is clamped in a second clamping block 146. The pulley 144 may be conveniently pivotally mounted on a suitable bearing bolt screwed upwardly into the bottom of the track plate 52 of the feed mechanism. The second clamping block 146 is similar to the first described clamping block 139, and is pivotally mounted on a suitable pin or bolt 147 that is secured at its upper end to the sliding block 100. A long slot 148 is cut through the track plate 52 to accommodate the pin 147 as the sliding block moves back and forth along the track in which it is disposed.

The cable 142 is thus adapted to pull the sliding block 100 toward the left as the oscillating arm is swung clockwise (viewing Fig. 2) by the rotating cam 28. A reversing force is conveniently applied to the sliding block 100 by a helical spring 150 that is secured at one end to the second clamping block 146 in any desired manner. In view of the length of the path of travel of the sliding block 100, it is desirable that the helical spring 150 be of substantial length in order to minimize the per cent change in the magnitude of its tension as the sliding block moves along the track. For this reason, the spring 150 is preferably extended around a second fixed pulley 151, which may be mounted in the same manner as the other fixed pulley 144, and rearwardly to any conveniently located attachment point (not shown) on the stamping machine base 11.

The above described power take-off mechanism is obviously adapted to apply a positive force to the sliding block 100, through the medium of the cable 142, for pulling the sliding block from right to left along its path of travel. This is the part of the cycle of the sliding block 100 when the greatest force is applied therethrough to the other moving parts of the feed mechanism which are actuated thereby. It is also obvious that the spring tension applied in a direction opposite to the pull of the cable 142 is adapted to move the sliding block 100 from left to right along its path of travel, which movement is not opposed by

any substantial force and is adequately effected by the resilient pull of the spring 153.

From the foregoing detailed description of the various elements of the feed mechanism and the manner in which the elements operate, it will be apparent that one poker chip will be moved from under the first magazine 76 to a stamping position under the die 34 each time the transverse shaft 27 of the stamping machine makes one revolution for driving the die through one stamping cycle, regardless of whether the rotation of the transverse shaft 27 is intermittent or continuous. Proper timing of the arrival of each poker chip under the die 34, with respect to the timing of the movement of the die, may be effected by appropriate adjustment of the angular position of the cam 28 on the transverse shaft 27.

After a chip has been stamped, it will be moved half way to the discharge position during the next revolution of the transverse shaft 27, to the discharge position during the next revolution of the transverse shaft, and into the second magazine 176 during the next revolution of the transverse shaft. Thus, four revolutions of that shaft are required to move a given chip through the entire procedure. It will also be apparent that, as one chip reaches a stamping position, a second chip will drop from the first magazine 76 into an aperture 64 in the feeder plate 60 and will in turn be moved through the same sequence of steps, and that this will be repeated until all the chips initially placed in the first magazine 76 have been stamped on one side and moved into the second magazine 176.

With articles such as poker chips, it is often desired that the same impression be stamped on both sides of each article. One of the features of my feed mechanism is the simple manner in which the chips collected in the second magazine 176 may be fed to the stamping machine a second time in relatively inverted positions so that both sides of each chip will be stamped. As pointed out above, the two magazines 76 and 176 are not only identical but are also reversible end-for-end on the feed mechanism. Thus, after the chips have been exhausted from the first magazine and collected in the second magazine in the same positions therein that they initially occupied in the first magazine, the stamping machine may be stopped, the two magazines removed, and the second magazine inverted and mounted in the chip feeding position. The first magazine may then be mounted in the chip collecting position, and the weight 89 may be transferred therefrom to the second magazine for assisting the free movement of chips therefrom. When the stamping machine is started again, the chips will be fed through the same sequence of operations a second time, but in relatively inverted positions from those which they assumed during their first pass through the feed mechanism, and will be collected in the first magazine with both sides of each chip stamped with the particular impression formed on the die 34.

While I have illustrated my new feed mechanism by showing its use with a particular type of machine and for feeding thereto a particular type of articles to be stamped, it will be appreciated by those skilled in the art that the prin-

ciples upon which the illustrated device has been constructed are equally applicable to mechanisms for feeding a variety of kinds of articles to any of a variety of kinds of operations upon the articles. It will also be appreciated that many of the details of the particular device illustrated herein may be varied widely and that many equivalent mechanical elements may be substituted for elements of the illustrated device, all without departing from the invention as defined in the appended claims.

Having thus described and illustrated my invention, I claim:

1. In a feed mechanism for stamping machines and the like, a base; a horizontally disposed feeder plate mounted on said base for rotation about a vertical axis, said feeder plate being provided at uniform distances from said axis with a plurality of uniformly spaced-apart apertures for receiving articles to be fed, whereby said apertures will travel along the same circular path during rotation of said feeder plate; a first magazine element defining a cylindrical chamber open at both ends for holding a supply of disk-shaped articles in axial alignment therein, said first magazine being mounted with its cylindrical axis vertically disposed and aligned with a first location along said circular path for dropping one of said articles into each of said apertures passing thereunder without altering the orientation of the articles; a second magazine identical with the first in the respects defined, said second magazine being mounted on said base with its cylindrical axis vertically disposed; a track extending from a point directly below a second location along said circular path to a third location directly below said second magazine; actuating means for rotating said feeder plate about its axis; and means responsive to operation of said actuating means each time a pocket reaches said second location for moving an article from that pocket onto and along said track to said third location, said track being provided with an upwardly sloping ramp disposed below said second magazine adjacent said third location for causing each article moved along the track to rise upwardly into said second magazine as the leading edge of that article moves under other articles in said second magazine.

2. The device of claim 1 in which both of said magazines are reversible end-for-end, whereby, when said second magazine has received a supply of articles from said track, the two magazines may be interchanged and the second magazine inverted for dropping articles therefrom into the apertures of said feeder plate a second time in inverted positions with respect to their original orientation in said apertures.

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

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