1. The present invention relates to improvements in a machine for making container closures, particularly metal foil closure hoods such as are used in the capping of milk bottles and the like.

The invention contemplates making the hoods from successive portions of the length of metal foil strip that is provided with multi-color printed circular label sections incorporating such indicia as product designation, dairy identification, ornamentation, etc., at regular intervals along its length, and which are to appear on the top panel and, as desired, on the skirt portion of the hoods without excessive offsetting. To obtain this result, the invention contemplates the provision of a hood forming machine having a novel and simple die controlled shuttle mechanism incorporated in the forming die structure and effective subsequent to each feed cycle to shift the foil into registry position with respect to the die just before theblanking operation occurs. The invention further contemplates the incorporation of slack take-up means also controlled by the die and interrelated with the foil feed mechanism to actuate the latter to remove the slack in the foil web that is created by the registry motion of the shuttle, so that the succeeding feed starts with a taut web and additive errors are thus avoided. It is a still further object of the invention to provide in a hood forming machine that is nominally operative on plain foil to make embossed hoods, die operated registry and slack take-up instrumentalities that are easily incorporated in the machine to enable it to produce the printed hoods or the embossed hoods with equal facility, so that the dairy may make and apply the two types of hoods to different products, as desired. The invention further consists in certain novel and advantageous features of construction and arrangement of parts hereinafter set forth and claimed.

Other objects and advantages of the invention, as well as the foregoing, will appear from the following description, appended claims and accompanying drawings illustrating a preferred embodiment of the invention and in which:

Fig. 1 is a side elevation of the hood forming machine adapted for the production of printed foil hoods, the top casing being shown in section;

Fig. 2 is a plan view on an enlarged scale partly in elevation and partly in section taken substantially on the line II—II of Fig. 1;

Fig. 3 is a front elevational view of the feed mechanism;

Fig. 4 is a side elevation thereof and showing its association with the forming die structure;

Fig. 5 is a sectional view on an enlarged scale taken on the line V—V of Fig. 4;

Fig. 6 is a sectional elevational view on an enlarged scale taken on the line VI—VI of Fig. 2 and showing the die structure;

Fig. 7 is a view taken on the line VII—VII of Fig. 6;

Fig. 8 is a fragmentary sectional plan view of the lower part of the die structure and showing part of the associated shuttle mechanism in section;

Fig. 9 is a fragmentary view on an enlarged scale taken on the line IX—IX of Fig. 8 and showing the die structure in partially closed position to show the action of the shuttle, and

Fig. 10 is a plan view of a fragment of the foil strip from which the printed hoods are to be made and illustrating diagrammatically the indexing action on this strip to effect its registry with the die.

The machine illustrated in the drawings is a self-contained unit that is adapted to be used in the bottling room of a dairy for making the hoods and delivering them for reuse onto the tops of filled bottles passing to a sealing head where they are sealed on the bottles in a well known fashion. The invention, however, is not limited to this particular mode of use of the machine.

The general organization of the machine is shown in Fig. 1 and it comprises a foil supply station 18 at the rear of the machine, a hood forming station 14, a feed station 12 and a scrap rewind station 13. All of these elements are supported on the upper portion of a transmission housing 14 which is supported on a table base 15 having adjustable legs 16 by which the machine can be located properly with respect to the path of bottles moving from a filling station to a sealing station. The transmission housing 14 contains the driving mechanism for a main shaft 17 extending across the housing and journalled in bearings carried by the side walls thereof. This shaft carries an eccentric 18 which cooperates with pitman rod 19 to vertically reciprocate slide platen 20 mounted in guide ways in a supporting bracket 21 that is rigidly bolted to the top of the housing 14. A continuously driven gear 22 is rotatably supported on shaft 17 and is operable to drive the shaft through a one revolution clutch having a control trigger element 23. Continuous rotation is imparted to gear 22 through reduction gearing, as indicated, and an adjustable speed pulley drive including pulleys 24 and 25, the latter being driven by motor 26. The clutch control trigger 23 is mounted on
shaft 27 which extends through the front and the rear walls of the housing 14 and is adapted to be tripped by a solenoid 28 that is connected by means of a lever and link connection 29 to shaft 27 and also to be tripped manually by a finger piece 30 on the front end of the shaft 27. The parts in housing 14 thus far named may be of any appropriate known construction.

At the supply station 10, a coil 31 of printed foil is adapted to be supported on an arbor 32. Aluminum foil strip .0035" in thickness or similar impervious foil strip material may be used. The printed foil 14 is perforated by a series of holes 34 that are formed around a tension roller 35 and extends in substantially a straight line through an elongated guide 36 past the die station 11 to pull-through feed rolls at the feed station 12. The tension roller 35 is carried on a swinging arm that is normally tensioned to swing to the right as viewed in Fig. 1 by means of a spring 37. A hold-down roller and cooperating wiper felt, as indicated at 38, are provided at the entrance end of the guide 36. The foil is intermittently fed in timed relation to the operation of the die structure. The swinging of the arm and its roller 35 provides a cushioned feed of the strip from the supply coil, the arm and roller swinging forwardly at each feed stroke and therefrom retracting so as to impart practically constant rotation to the supply coil, even though the amount of feed varies. A spring pressed friction disc bearing on the end of the foil spool on arbor 32 is adjusted to prevent overrunning of the spool as is customary.

As is seen more clearly in Figs. 3 and 4, the feed mechanism includes a feed roll 40 which is keyed to shaft 41 journalled in suitable bearings in a supporting bracket 42 which in turn is secured by bracket 43 to the front side of the housing 14. Laterally spaced portions of the feed roll 40 are knurled, as indicated, to prevent foil slippage and the foil is pressed down firmly in contact therewith by a rubber hold-down roll 44 that is carried by shaft 45 journalled in arm portions 46 of a hold-down weight 47 that is pivotally connected to a back shaft 48 rigidly supported in upstanding arm portions 49 of the bracket 42. Feed roll shaft 41 is of reduced diameter at one end (Fig. 3) and has mounted thereon a one-way or overrunning clutch 50, the rotor element of which is pinned to the shaft while the casing portion thereof is keyed to the bracket against rotation by means of set screw 51. This clutch is of well known construction, and serves to permit rotation of the feed roll in a counter-clockwise direction but to prevent its rotation in the clockwise direction, as viewed in Fig. 4. Thereby, any retrograde movement of the foil once it has been advanced by the feed mechanism is prevented. A spring pressed friction disc 52 is slidable on one end of shaft 45 but bears against adjacent arm portion 46 and the drag pressure is adjusted to prevent overrunning of the hold-down roll 44 with respect to the feed roll 40.

Feed roll 40 is adapted to be driven by means of gear 53 secured to the outer end of shaft 41 which gear meshes with a drive gear 54 whose hub is secured to the rotor element 55 of a one-way or overrunning clutch 56, the rotor 55 being journalled on the outer end of the fixed shaft 47. Rotation with respect to the one-way clutch 56 is adapted to be oscillated to actuate the gear 54 and thus intermittently drive feed roll 40 in the feed direction by crank arm 57 having a crank pin 58 that is connected by a connecting rod 59 to a crank pin 60 of a crank 61 fixed on a stub shaft 62 that is suitably journalled in the side wall of housing 14. The inner end of the shaft 62 carries a sprocket 63 (Fig. 1) that is connected by chain 64 to a sprocket 65 secured on main shaft 11. Timing of the feed with respect to the position of eccentric 18 is controlled by adjusting the crank 61 on its shaft 62 while the amount of feed imparted at each stroke is adjustable by radially shifting crank pin 58 with respect to crank arm 57. Pin 55 is carried by an adjusting screw 66 rotatably mounted in the outer banded end of arm 57 whereby to permit accurate adjustment of the amount of feed.

In addition to this principal oscillating drive means for actuating the feed roll, an auxiliary friction drive means is provided which comprises a pair of friction discs 67 on either side of the drive gear 54. Pressure discs 68 supported on the hub of gear 54 bear on the outer faces of friction discs 67. These discs at circumferentially spaced points are connected by cross bolts 69. Knurled compression springs 70 interposed between the face of one of the discs and the facing nuts 71 on the ends of the bolts. Under the influence of the springs, the plates 68 are urged toward each other and maintain the friction discs 67 in frictional driving contact with gear 54. The pressure spring 68 is inserted in externally through their outer ends pivoting to carry a thimble 72 having a bore through which an operating rod 73 slidably extends. This operating rod is carried by the punch holder of the die set hereinafter to be described so as to take part of the vertical reciprocation thereof. Upon downward movement of the rod, the rod slides through the thimble until stop nuts 74 adjustably positioned thereon engage the top of the thimble and further movement of the rod effects turning of the pressure plates 68. This motion through friction discs 67 is imparted to both of the upper and lower die assemblies which are to the same and drive the feed roll in the feed direction. The purpose of this auxiliary feed roll actuation will be hereinafter pointed out. Subsequently, during upward travel of operating rod 74, a head or shoulder 75 on the lower end of the rod comes into engagement with the teeth of the thimble to effect turning of the plates 68 in the opposite direction. This motion of the discs is also transmitted to the gear 54, but no movement thereof occurs because the clutch 50 prevents turning of the feed roll 40 in the counter-feeding direction and thus through gear 53 the feed gear 54 is held against turning. The tension of springs 70 is adjusted to a point where the frictional driving torque for turning the feed roll is sufficient to feed the foil but insufficient to cause rupture thereof. A spring pressed friction disc 52 is slidable on one end of shaft 45 but bears against adjacent arm portion 46 and the drag pressure is adjusted to prevent overrunning of the hold-down roll 44 with respect to the feed roll 40.

At the die station, there is provided a punch and die structure designed for blanking and forming closure holes, which structure is of the character forming the subject matter of United States patent to R. M. Wareham, No. 2,581,433 which is the subject of this application. In general, a lower die assembly 20 and an upper reciprocable punch assembly 81 that is secured to a cap plate 82 integral with and pro-
jecting forwardly from the face of the slide platen 20. The die assembly 80 is bolted on the upper side of housing 14 and includes a support or base plate 82 which carries vertical guide posts or rods 84 which slidably cooperate with the punch assembly 81 to maintain it in registration with the die assembly. A die body 85 is secured to the base plate 83 and carries a die plate 86 having a raised central portion or area 87 of a diameter greater than the strip width and formed with a central aperture therethrough which forms a cutting edge surrounding a draw ring 88 which in turn surrounds an upstanding die ram 89 internally of the die body 85. The draw ring is resiliently supported by spring pressed posts 86, one of which is shown in Fig. 6. The punch assembly 81 includes hollow punch 91 which cooperates with the cutting edge of die 86 to blank the foil strip F 20 interposed therebetween. A clamping plate 92 which also serves as a stripper supports the punch 91 and is movable therewith, but is also reciprocable with respect to punch 91 by virtue of the action of pressure springs 83, plate 92 being suspended from a punch holder 94 by bolts 95, one of which is shown in Fig. 4. The punch 91 is carried by the punch holder 94 and is secured to the cap plate 93 and is retained a reciprocable knock-out 86 and within the latter a slidable plunger 97 suspended from a removable plunger holder 98.

Heretofore, the plunger 97 constitutes or was provided with an embossing die at its lower side, as disclosed in the above-mentioned patent, but in the novel instance the plunger is to act upon printed foil so a puncher with a blank top face is utilized.

By the coaction of these punch and die elements, the interposed foil strip F is blanked and drawn into a hood H (Fig. 6) of shallow cup-like form at each downward stroke of the slide 20. The hood remains in the hole in the strip from which the hood blank was cut so that upon the next feed step imparted to the foil by the feed roll 49, the hood is carried along and turns down into the mouth of the chute 99 (Fig. 2). The strip F is normally spaced above the top surface of the die a distance less than the depth of the skirt portion of the hood to assure the hood movement to the chute. The chute leads downward and laterally from the machine to supply the hoods to a release at its lower end for application to the tops of passing bottles. As hereinafore mentioned, the hoods are to be made from printed foil strip which printing is to denote desired labeling and is necessarily required to be in registry or concentric with the top panel of the hoods. At the time of printing the foil strip, it is also formed with a pair of transversely aligned arcuate cuts or small diameters, for example 45, one of which is shown at 105 in Fig. 10, defining tab-closed perforations along the margin of the strip at points between adjacent circular label print sections indicated diagrammatically by the dotted circles 101, broken line 102 indicating the blanking circle at the die. These cuts define tabs 103 which remain connected with the foil by block portions delineated by the edge of the die plate cuts. The tabs are thus easily displaced from the plane of the foil strip to leave perforations 104 there-through. While full circle perforations may be provided in the strip at printing and is contemplated, leaving the tabs 103 attached to the strip avoids the problem of disposal of scrap punchings and the possibility of their falling into and injuring parts of the printing press and also becoming adhered to the foil and later on accidentally contaminating the packaged milk products.

Registry mechanism is provided to effect an exact registry of each imprint 101 with the die subsequent to normal feed of the strip. This mechanism comprises a shuttle plate 105 provided with a pair of shuttle pins 106 that are cooperative with the perforations 104. The shuttle plate is slidably supported on the die plate 86 in flanking relation to the raised central die portion 87, a central aperture 107 of plate 105 encompassing the raised die area 87 and being of slightly larger diameter so as to allow the shuttle to reciprocate in the direction of foil travel. The under face of the shuttle plate is also counter-bored on a diameter greater than that of the die plate 86 to receive the latter and allow shuttle movement. The upper face of the shuttle plate fore and aft of the raised die area 87 is co-planar therewith for clamping of the strip thereon by the stripper 92, this co-planar relationship being made preferably by forming a longitudinal strip receiving channel 108 in the top of the shuttle plate. The underside of stripper 92 is provided with a dependent portion 109 rimming the punch 91, which rim portion is formed to enter and move down through channel 108 so as to depress and clamp the foil strip against the co-planar face of the die and the shuttle. The top surface of the shuttle plate in front of aperture 107 and also the exposed top surface of the die 86 and die body 85 for a width equal to that of channel 108 is downwardly inclined as indicated at 110 (Fig. 7) to facilitate turning of the formed hoods down into the chute 99.

The shuttle plate is provided with straight lateral or side portions 112 and the adjacent bushings on the upstanding posts 84 are cut away to receive these straight portions. These portions are drilled through to provide a longitudinal bore or passageway 113 the lower wall of which is cut away to provide a bottom opening 114 through which an upstanding tongue or central member 115 of an F-shaped heel-erancker rocker lever 116 extends upwardly into the bore 113. These lever 117 engages the front and rear sides of the member 115 and each ball is held thereagainst by a cone-pointed back-up screw 118 threaded into the side portion 112 and locked in adjusted position by lock nut 119. By adjustment of the screw 118, lost motion between the rocker 116 and the shuttle plate may be removed without causing binding.

The rocker levers 116 are pivoted on pins 120 supported in the die body 85. Each lever has an upstanding arm 121 on its front end, each end of which is adapted to be engaged by a pin 122 secured to and projecting laterally from the clamping plate 92. Thereby, during descent of the punch assembly, the levers 116 are rocked about their pivot pins and cause forward motion of the shuttle plate. Spring-return plungers 123 slidably mounted in the base block 83 engage the underside of the levers 116 and through them yieldingly hold the shuttle and its pins in retracted position with respect to the die. A fail piece 124 of each lever bears against an adjustable stop screw 125 to limit the lever motion in the shuttle return direction. By adjustment of the stops 125, the tops of arms 121 are disposed in a position such that the stripper contacts them and the strip substantially simultaneously, whereby the carriage is advanced and the strip is depressed in unison. The forward position of the shuttle is reached concurrently
with clamping of the foil since the shuttle's motion is dependent upon the downward motion of the stripper into foil clamping position.

The shuttle pins 106, as seen in Figs. 7 and 8, are located behind the raised die area 87 and laterally match the transverse spacing of the tab-closed perforations 104 in the strip. They extend up to the plane of the strip F and are bevelled from front to rear at their upper ends to provide point contact with the strip. With the shuttle in its forward position, the back-up screws 118 are adjusted to locate the front face of the pins in exact registered relation with respect to the die. In other words, the distance between the front face of the pins and the center line of the die is made equal to the distance between the center line of the imprints 101 and the rounded side of the perforations 104. It is necessary to have the rounded side of the perforations leading with respect to the direction of feed.

The strip feed, by radial adjustment of crank pin 59, is initially set to normally feed the strip to a short of registry position by an amount which disposes the rounded side of the perforations in front of the high side of the shuttle pins. In this position the perforations directly behind the foremost imprint are in forwardly overlapping relation to the shuttle pins.

Thus, as the foil is depressed it is pegged by the pins 106, the pointed ends of the pins pushing out the tabs 103, as shown in Fig. 9. Pockets 127 are provided in the rim portion 103 of the stripper to receive the pins and the up-struck tabs and also to cooperate with the pins for cleanly punching plain foil whenever such foil is used. The forward motion of the shuttle with the foil thus pegged on the shuttle pins will index the foil into registry position, the pins freely advancing until they contact the front rounded walls of the perforations, whereupon they positively move the strip during the remainder of their forward travel.

Preferably, the pins 106 have the same diameter as the round front walls of the perforations so as to provide maximum bearing contact between the pins and such walls and thereby prevent the possibility of the foil being torn by the pins as they drive the strip foil into registry position.

With reference to Fig. 10, broken lines A and C indicate the position of the front face of the shuttle pins, indicated by dotted line circle, in retracted and advanced positions, respectively. Broken line B indicates the position reached by the perforations in the strip at the end of the normal feed. It will be seen that the shuttle pins have clearance or free travel with respect to the strip from A to B and a registry correcting travel from B to C in which they move the strip. By way of example, the total shuttle travel between A and C may be 1\(\frac{1}{2}''\) and the foil feed may be set to 1300" underfeed, whereby the perforations in the strip will forwardly overlap the shuttle pins. Thus, during depression of the foil, the tips of the pins immediately punch up the tabs 103 while moving forwardly to engage the rounded front wall of the holes thus exposed in the foil. This engagement comes about as a result of the shuttle's forward motion concurrently with the depression of the foil. In this way the pins take-up the clearance between A and B afforded by the underfeed, plus or minus any difference which may be caused by variation from normal in the spacing between perforations, or otherwise, and then they move the foil into registry with the die for blanking and drawing. Within the total length of its stroke, the shuttle thus compensates for any unavoidable variant imprint spacing throughout the length of the strip due to printing tolerance and foil stretch incurred in the several tension collapsing operations to which the strip is subjected after printing to produce the suitably sized tight coils for storage in the machine. As a result, the imprint on each successive length of foil to be converted into a hood is quite accurately brought into registration despite printing or stretching variations which may be present in the strip.

During the blanking and hood forming operation, the slack in the length of scrap or skeleton strip extending from the die to the feed roll which the shuttle's forward motion creates is removed by operation of the aforedescribed friction feed operating device by depression of thimble 72 by the nute 74 on operating rod 73.

At the front of the shuttle, a pair of hold down pins 130 project inwardly and forwards from the side walls of the channel 103 and the foil strip passes under them. They are in cooperation with the hold down fingers 128 at the front end of guide 35 (see Figs. 2 and 6) to hold the foil declined with respect to its normal straight pass line to an extent that the foil normally presses against the tips of the shuttle pins 106 during feeding, so that it snaps down upon the shuttle pins as soon as the rounded edge of the abrasive cuts 109 defining the perforations 104 there-through clear the tips of the pins. In addition, the beveling of the ends of the pins from front to rear provides flaring edges from the tips to the sides of the pins which serve in cooperation with the walls of the perforations to shift the foil sideways, if it is offside, as the foil is depressed onto the pins. This has been found effective to cause sheared strip where the shearing at some points is off laterally with respect to the perforations as much as 0.075", to be shifted sideways by the pins into alignment with the die without difficulty.

The scrap foil strip leaving the feed rolls is wound into a coil on an arbor 131 that, through a friction coupling 132, is intermittently driven from the main shaft 71 through suitable sprocket and chain connections indicated at 133, the wind-up of the scrap foil occurring only as the operation of the feed rolls 40—41 permits.

The operation of the machine will be quite apparent from the foregoing description. At a point indicated by line X in Fig. 4 in the up-stroke of the punch where the formed hood can be moved without interference with the die, crank 61 begins the normal feed of the strip. The friction on feed gear 64 imposed by the pads 67 is insufficient to interfere with this normal feed. At this time, in opposition to the clockwise drag of the feed gear on the pressure discs 68, the disc arms are dragged upwardly by the upward pull of the head 75 of the operating rod 73 on the thimble 72 until the punch assembly reaches top-most position. Then, during the down-stroke of the punch assembly, the arms move down therewith under the continued feed gear drag until normal feed stops at an intermediate point in the descent of the punch. Thereafter, the punch continues in its down-stroke while the arms remain at rest in the intermediate position, the operating rod 73 sliding freely through thimble 72. The stripper moving down with the punch engages the foil and also the shuttle operating levers 116, whereby the foil is pushed
down on the shuttle pins 106 and caused to be shifted forwardly into registry with the die by the concurrent advance of the shuttle in response to rocking of its operating levers 116 by the stripper in moving from the foil engaging position to the foil clamping position. The shuttle’s forward motion is arrested by the stripper clamping the foil against the top of the shuttle and the die, thereby preventing any overtravel of the shuttle. The punch continues to descend and blank and draw a hood from the registered strip. During these operations, the stripper of course is stationary with respect to the punch, the spring and slide bolt mounting of the stripper allowing this relative motion at this time. At this time also, nut 74 on the operating rod 73 engages thimble 72 and causes rotation of the feed gear 54 through the gear drive elements 67 and 68 so as to turn the feed roll 40 in the feed direction and remove the slack in the skeleton web of foil that was created by the shuttle’s forward motion. Overtravel of the discs 68 beyond the point where the slack is removed and the foil web made taut is permitted by slippage at the friction pads, the frictional force of the pads on the drive gear being made very light by adjustment of springs 70 so that this slipping will occur before the strength of the narrow edge portions 135 remaining in the scrap foil is exceeded. Subsequently, during retraction of the punch assembly to the point where a new cycle of operation begins, the clutch 50 holds the feed mechanism against retrograde or counter-feed movement. Thus, each successive feed step is initiated from a previously registered position and this eliminates the possibility of additive errors.

While the presently preferred embodiment of the invention has been described in detail, it will be understood that various changes and modifications may be made without departing from the spirit of the invention or from the scope of the appended claims.

What is claimed is:

1. In a hood forming machine, a die set including a die and a reciprocable punch for blanking and drawing hoods from interposed foil strip normally spaced above said die and previously provided with printed labels spaced along its length and between them with a tab-closed perforation near each edge of the strip, a pair of strip feed rolls operable on the strip leaving said die set, oscillatory means connected to one of said feed rolls to actuate the same in timed relation to reciprocations of said punch for feeding the strip past said die set and conveying the finished hoods therefrom, a shuttle plate slidably mounted on said die in flanking relation to a raised central area thereof and co-planar with the top of said central area for clamping of the foil strip thereon, means for yieldingly holding said shuttle plate in a fixed chamfered position on said die, a stripper movable with said punch for depressing and clamping the foil strip against the die and the shuttle plate, lever means arranged to be engaged and actuated by said stripper as it depresses the foil strip for advancing said shuttle plate until the stripper reaches clamping position, upstanding pins on said plate adapted to push out the tabs and enter the perforations of the foremost label concurrently with depression of the foil strip into clamped position, said feed rolls at each operation thereof advancing the strip to a short of registry position that disposen the perforations of the foremost label in forwardly overlapping relation to said pins, whereby said pins advance freely until they engage the front walls of the perforations and positively move the strip during the remainder of their forward travel, to effect registry between the label and the die set, and friction drive means interconnected between said punch and said one feed roll to actuate the latter subsequent to foil clamping to take up the slack in the foil strip between the die set and the feed rolls that is created by the forward motion of the shuttle plate.

2. A structure as specified in claim 1, wherein a one-way clutch is connected to one end of said one feed roll to hold it against rotation to the counter-feed direction.

3. A structure as specified in claim 1 in which the said pins have their upper ends beveled downwardly from front to rear in combination with hold-down fingers behind said die set and hold-down pins on the front end of said shuttle plate both overlying the edges of the strip at a level below the tips of the beveled pins and holding the strip down to bear lightly on the tips of said bevelled pins.

4. In a hood forming machine, a die set including a die and a reciprocable punch for blanking and forming a hood from interposed foil strip normally spaced above said die and previously labeled printed at spaced intervals along its length and formed with tab-closed perforations therebetween near the edges of the strip, feed means for forwardly of the die set to feed the strip short of registry of the foremost label with the die set for subsequent shuttle feed into registry position, said feed means including a knurled feed roll and a pivotally supported hold-down roll to grip the strip therebetween, a driving gear connected to drive said feed roll in the feed direction, a one-way clutch connected to the feed roll to hold it against counter-feed rotation, a second one-way clutch connected to drive said gear, means to reciprocate said punch and to actuate said second clutch in timed relation with respect to each other, a shuttle plate slidably supported on said die and flanking a raised central area of said die and co-planar with the top thereof for depression and clamping of the foil strip thereon, a pair of interposed vertically spaced pins on said plate extended into contact with said foil strip, bell crank levers connected to opposite sides of said shuttle plate, spring pressed plungers acting on said levers to hold said plate in a fixed retracted position, with respect to which the said short of registry feed locates the perforations of the foremost label in forwardly overlapping relation to said pins, a stripper movable with said punch, means on said stripper for engaging said levers and rocking them to advance said shuttle plate concurrently with depression of the strip into clamped position, whereby said pins push out the tabs and enter the perforations and advance freely in the feed direction until they contact the front walls of said perforations whereupon they positively move the strip into said registry position, friction drive means for said gear, and means capable with said punch and operating last-motion connection with said friction drive means to actuate the same and thereby said feed roll subsequent to said clamping of the strip, to take-up the slack in the strip between the die set and the feed means that is created by the forward feed of the strip by said shuttle plate.

5. A structure as specified in claim 4, wherein
said levers are engaged between opposed balls in bores formed in the side walls of said shuttle plate, in combination with ball back-up screws threaded into the shuttle plate and adjustable to take-up lost motion between the levers and the shuttle plate and to locate said pins in registered relation with respect to said die.

6. In a machine of the class described, feed rolls arranged to pull foil-gauge strip through forming die mechanism which includes a reciprocable punch and a die above which the strip is normally spaced, a stripper movable with the punch to depress and clamp the strip on the die preliminary to a blanking and forming operation, means for actuating said feed rolls in timed relation to reciprocation of said punch, said strip having a series of closely spaced circular printed areas along its length and marginal perforations in the waste areas therebetween, said feed rolls normally feeding the strip short of registry of the foremost printed area with the die, shuttle means for further feeding the strip into registry of said area with the die, said shuttle means comprising a reciprocable shuttle carried by said die; two vertical pins therewith extended up to the plane of the strip and operating levers arranged for actuation by motion derived from movement of said stripper only as it depresses the strip, to move said shuttle and its pins from a retracted position to an advanced position of registered relation with respect to said die, the upper ends of the pins being bevelled from front to rear, means yielldingly holding said shuttle and pins in said retracted position, said normal strip feed disposing the perforations directly to the rear of said foremost printed area forwardly of the front side of said pins, whereby the strip is pegged on the pins during said strip depression and the pins freely advance until they contact the front walls of the perforations whereupon they positively move the strip into said registry position, and supplemental friction drive means for said feed rolls arranged for actuation by motion derived from movement of said punch subsequent to strip clamping, to remove the slack in the length of strip between the die mechanism and the feed rolls which is created by the registering feed of the strip by said shuttle means.

7. A structure as specified in claim 6, wherein said perforations and said pins are of round form and have equal diameters and mutually coaxial for laterally aligning the strip with respect to the die.

EDWARD M. WHEELER.

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