

Sept. 6, 1955

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2,716,940

BORDER STRIP DESIGN MACHINE

Filed Sept. 26, 1951

2 Sheets-Sheet 1

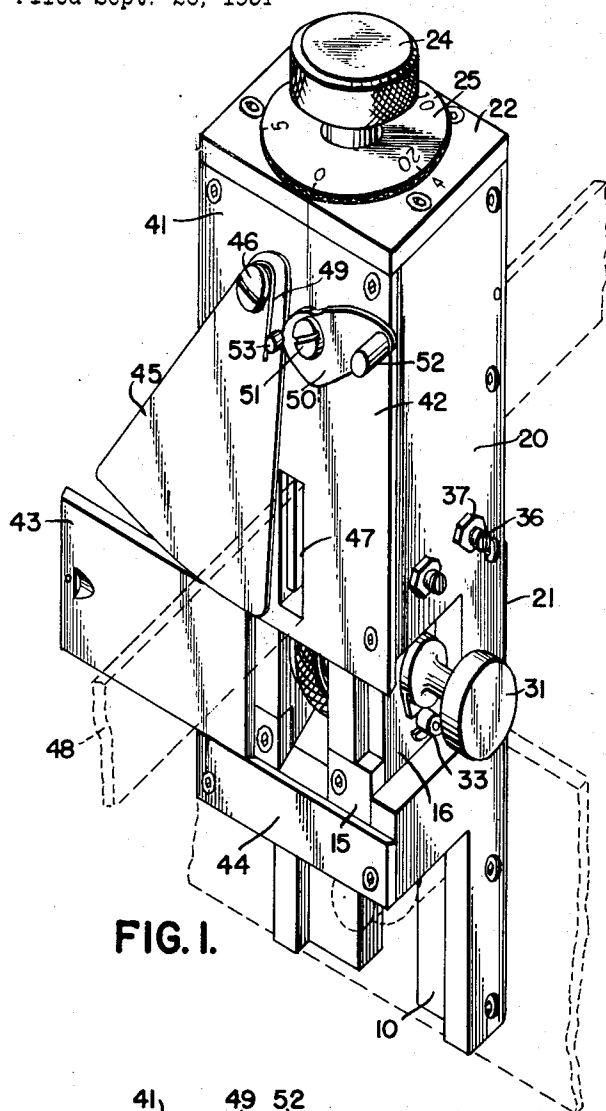


FIG. 1.

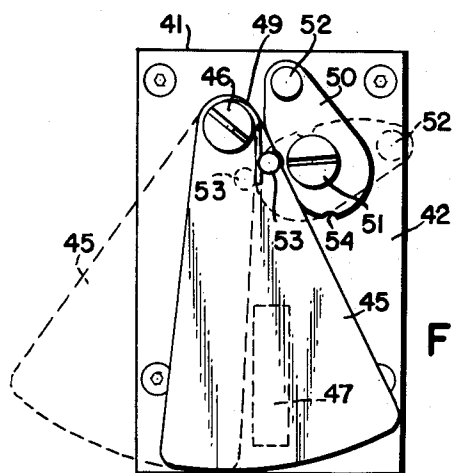


FIG. 4.

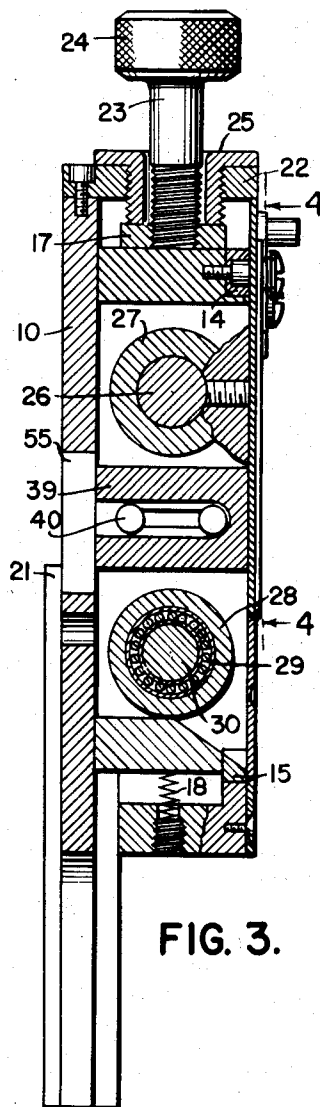


FIG. 3.

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2 Sheets-Sheet 2

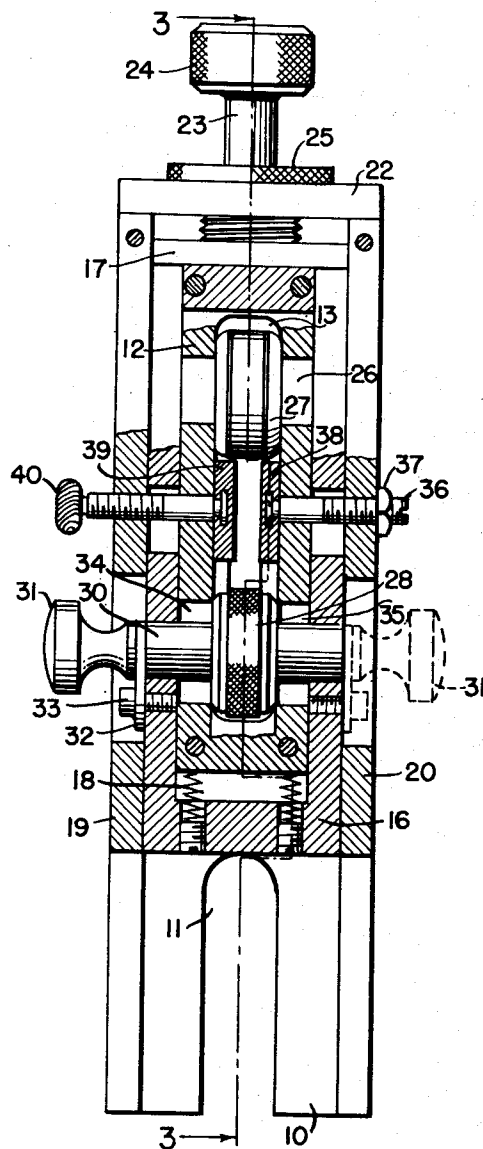


FIG. 2.

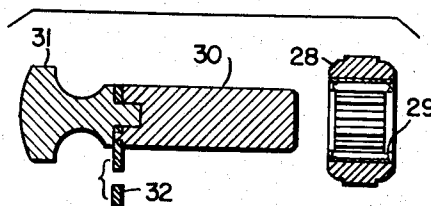


FIG. 5.

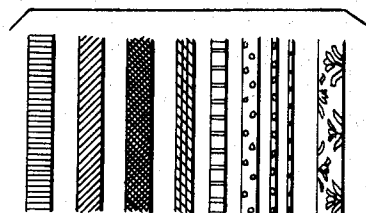


FIG. 6.

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BORDER STRIP DESIGN MACHINE

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6 Claims. (Cl. 101-6)

The present invention pertains to a border strip design machine used in the printing industry, and more particularly to a machine for impressing a design upon a border strip which may be subsequently used in printing.

In the printing of newspapers, advertising circulars and the like, it is frequently desired to call attention to some portion of the reading matter by enclosing the same with a unique border design. It is well known that a border design which is in keeping with the thought of the announcement or advertisement will attract the eye of the reader more quickly and will be retained in the mind for a longer period of time. While the artistic variations of these designs are unlimited, the matter of actually incorporating them into a usable border strip for printing has been extremely difficult and expensive.

There are two commonly known and used prior art methods of making border strips, each of which have certain disadvantages that are believed to be overcome in the present invention. One of these prior art methods includes a molding machine for type metal having a piston for forcing the metal, while still in a hot, plastic state, into a container which gives size and shape to the border strip. The container consists of a box-like structure having an inlet hole for the molten type metal in one of its side walls. At the top of the container, and forming one of the side walls, is a movable die having the desired design upon its surface which is pointed downwardly into the box. As the molten metal is forced into the container, it not only assumes a proper shape and size, but is also made to flow around the impression of the die. As the metal solidifies, the die is raised, and the solid strip is pulled horizontally through an open end of the container for the length of the die. The die is again lowered and another charge of metal is forced into the container which not only forms another length of border strip carrying the border design, but also automatically welds it to the rear end of that portion of the strip which has been partially pulled from the container.

From the above brief description of one of the prior art machines, it is apparent that several difficulties arise in an attempt to form a perfect border strip. One of the difficulties is to move the strip for an exact length so that a succeeding impression will overlap a former impression for perfect continuity. Frequently this continuation of impressions by lifting the die is broken and a marred and imperfect "joint" appears when the border is finally printed. When the border consists of an intricate design it is readily apparent that to match the border for continuation at its ends is extremely difficult. When the die is being raised or lowered, any movement, whether laterally or longitudinally, will amount to an offset in the final printing sufficient to distort continuity.

Another disadvantage of the above described machine is its inability to fuse a succeeding charge of metal to the end of the previously formed strip. While the strip will eventually be cut to length, it is apparent that the joining of the lengths as above described must be positive so that the strip will assume the characteristics of an

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integrally molded piece. Up to the present time no actual reason has been given for the difficult fusing problem on the border strip nor has any solution been given.

In the other of the two commonly used methods, a similar molding machine is used, also provided with a piston which forces a charge of molten type metal into a container giving size and shape to the border strip. One of the side walls of this container is provided with the design upon its inner surface which, of course, is embedded into the charge of metal as it enters the mold. When the metal has solidified, it is pulled from an open end of the container or mold and later cut to the desired lengths. From the brief description of this type machine, it should be apparent that the design upon the die would be limited either to a single line or a group of parallel lines. Since the die in this case is not movable, the metal must be pulled lengthwise across the die and hence the variations in design are extremely limited.

In order to use either type of the above described machines with the present invention, it is only necessary to remove the prior art die portion of the die or mold by which the border design is impressed upon the border strip and allow the strip to be pulled from the machine without any impression made upon it whatsoever.

It is an object of the present invention to provide a mechanism for impressing a design upon a blank border strip as formed by a prior art border strip molding machine.

It is another object of the invention to provide a die for such a mechanism in the form of a wheel whereby a continuous design of any shape may be impressed upon the border strip.

Another object of the invention is to provide a back-up wheel for the circular rotating die, the two being adjustable toward and away from each other to permit any depth impression of the design into the border strip.

A further object of the invention is to provide a means whereby a circular die may be exchanged for one of another design by an easy removal of the shaft upon which the die rotates.

Still another object of the invention is to provide adjustable guide strips which may be readily adjusted to center the moving border strip upon the circular die, even while the strip is in motion.

A still further object of the invention is to provide a novel "door" covering the entrance of the border strip into the machine, the door being made to press against the side of the strip so that in the event the strip breaks, the door will automatically close the entrance to prevent chips or molten metal from falling into the mechanisms thereof.

Another object of the invention is to provide a mechanism for continuously forming a border design upon a border strip, which mechanism is readily adaptable to receive the border strip from any molding machine of the prior art. Should the strip be fed from a machine with the flat side down, the present mechanism may also be turned on its side to receive the strip; should the molding machine be of the type which feeds its border strip with the edge side up, the present invention may also be adapted to receive the strip in this position.

Other objects and advantages of the invention will become apparent in the course of the following detailed description of operation when viewed together with the accompanying drawing in which:

Fig. 1 is an isometric view of an embodiment of my invention in a continuous border forming machine, the same being shown as receiving a length of border strip as fed from a prior art molding machine.

Fig. 2 is a front view of the device shown in Fig. 1 with the front cover removed and with certain of the parts broken away for clarity.

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Fig. 3 is a sectional view taken along line 3—3 of Fig. 2. Fig. 4 is a detail front view of the cover.

Fig. 5 is an exploded cross-sectional view of a detail illustrating the manner of changing from one die to another.

Fig. 6 is an illustration of a few of the border designs which may be formed in a continuous process by use of the present invention.

In the drawing, numeral 10 designates a back plate which is provided with an elongated slot 11 formed at the lower end thereof to permit the mechanism to be mounted upon part of a prior art structure. Mounted on this plate 10 from the back side by screws is a box-like inner housing 12 having an elongated slot 13 cut through the same to form two ends and two sides. In Fig. 3 it will be noted that the upper surface of the two ends are slightly lower than the upper surface of the sides to permit two guide strips 14 and 15 to be mounted as shown. The bottom end wall of the box-like structure 12 is beveled downwardly in the manner shown in Figs. 1 and 3 to permit easy removal of the die which will be described later in the specification.

Encircling the rigidly mounted box-like structure 12 is a yoke 16, the upper end of the yoke being closed by a flat stop plate 17. It will be noted that the opening in the yoke is made slightly longer than the length of the stationary box 12 it encloses, the upper plate 17 being normally urged against the upper end of the box by means of compression springs 18 set into the lower wall end of the yoke and having the upper ends thereof abutting the lower end of the box 12. Thus, the yoke is permitted to slide up and down with respect to the stationary box 12, but is normally held in the down position by the force of the compression springs 18.

Extending forwardly from the back plate 10 to which they are mounted are two side plates 19 and 20, the lower ends of both plates being cut away in the manner illustrated in Fig. 1. Extending along the back side edge of each of the side plates 19 and 20, respectively, is a key 21 made integral with each of the plates and being somewhat triangular in cross section. These keys are made parallel to each other and are used in positioning the device upon a prior art structure.

The top of the device is provided with a cover plate 22 which is fashioned by means of screws to the top end of the back plate 10 and to the ends of both the side plates 19 and 20. Through this top plate 22 I have placed a gauging stud 23 having a conveniently formed knurled head 24. The lower end of the stud is threadedly engaged with the top cross bar 17 of the yoke 16, with the lower end of the stud in abutment with the top end of the stationary box 12. Thus, by turning the stud clockwise, the entire yoke is raised against the action of the lower compression springs 18; and when the stud is turned counterclockwise the yoke is lowered by force of the springs. To lock the movement of the stud, and consequently the yoke into various raised positions, I have provided a flanged nut 25 threadedly inserted through the top cover plate 22, the lower face thereof serving as a stop for the traveling yoke in its upward position. Calibrations on the upper face of the flanged nut 25 correspond to the pitch of the thread so that the yoke may be set for raised positions in thousandths of an inch.

Mounted for rotation upon a shaft 26 anchored in the upper side walls of the stationary box 12 is a back-up wheel 27, the thickness thereof being only slightly less than the width of the slot 13 so as to permit free rotation with a minimum of lateral movement upon the shaft 26.

Positioned in the same slot, but spaced below the back-up wheel is a circular die 28. The die 28 is fitted with an internal roller bearing 29 of a diameter suitable for slidably receiving a removable shaft 30. The outer end of this shaft 30 is provided with a removable head 31 and also an arm 32. The arm 32 is provided with a hook at its outer end so that the same may be positioned beneath

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the head of a set screw 33. The shaft 30 itself is slidably mounted in the two side walls of the movable yoke member 16 while slots 34 and 35, respectively, are cut into the walls of the inner stationary box 12 and the two side plates 19 and 20 to permit the shaft and die to move upwardly and downwardly with the movement of the yoke member 16. The design on the die 28 is formed around the periphery thereof and may be cut into the face of the wheel in any desired form, several of which are illustrated in Fig. 6.

To exchange one die for another carrying a different design, it is only necessary to loosen the set screw 33, turn the shaft slightly to remove the arm 32 from beneath the head of the screw, then slide the shaft completely out of its bearings in the yoke. The die 28 will then roll down the inclined surface at the lower end of the box 12 and into the hand. The other die is held in the slot and the shaft re-inserted and locked by the set screw 33. Since different type molding machines eject the molded border strips differently, I have cut away a portion of both of the side members 19 and 20 in the manner shown in Fig. 1 so that the die may be exchanged with its mounting shaft 30 being insertable from either side as shown by the dotted lines in Fig. 2.

As shown in Figs. 1 and 2, I have provided a pair of set screws 36 threadedly engaged through the right side plate 20 and provided with locknuts 37. These set screws extend through an opening provided in the arms of the yoke 16 and through a hole in the side wall of the inner stationary box 12. The ends of these set screws are flared and adapted to ride in slots provided in a guide strip 38. It will be noted that the outer ends of these set screws are slotted so that they may be screwed into and out of the side plate 20 and locked into such position by means of the locknuts 37. Thus the guide strip 38 is moved away from or drawn toward the axial center of the device with the flat, inner surface serving as a guide to the border strip as it passes through the machine. The opposing guide strip 39 is mounted upon screws 40 which are also arranged to move their guide strip 39 toward and away from the axial center of the machine. These two guides are used to center the border strip upon the die 28 and to guide it without lateral movement through the machine.

The front cover for the above described mechanisms is designated generally by the numeral 41 in the drawing and consists simply of a thin metal upper plate 42 fastened to the front edges of the two side members 19 and 20 by means of screws. In Fig. 1 it will be noted that the upper plate 42 is made short enough in length to permit the die 28 to be removed upon opening the sliding door 43. It will also be noted that the lower end of the upper plate 42, as well as the upper end of the bottom strip 44 is beveled to match the side edges of the sliding door 43 so that the same may be slid longitudinally, yet held firmly enough in position to prevent foreign bodies from entering the sliding mechanisms inside the device.

In Fig. 4 the upper plate 42 of the front cover 41 is illustrated as provided with a fan-shaped door 45 pivotally mounted upon a bearing screw 46. A rectangular hole 47 is cut through the plate 42 to form an entrance for the border strip 48 shown in dotted lines in Fig. 1. This door 45 is normally held closed, that is, in a position over the entrance hole 47, by means of a torsion spring 49. Positioned adjacent the door 45 is a cam plate 50 pivotally mounted upon a bearing screw 51 and provided with a handle 52. When the handle is turned to the upper position, the door 45 is urged by the force of the torsion spring acting against a pin 53 into a closed position abutting the inside edge of the cam plate 50 as shown in Fig. 4. However, by moving the handle clockwise, or downwardly, the cam forces the door 45 outwardly to the open position shown in Fig. 1. When this extreme position is reached, a notch 54 engages the

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pin 53 on the door 45 to hold the door in an outward position. It will be remembered that this is done only when inserting the border strip into the machine in the first instance. After the strip has been inserted, the handle 52 is raised to its upper position, thus revolving the cam plate 50 and allowing the door 45 to ride against the side of the border strip. Thus, if the strip is broken, or suddenly terminated, the door 45 will immediately close the opening 47 to prevent entrance of foreign bodies into the device.

In use, the device will appear as illustrated in Fig. 1 with the metal border strip 48 threaded through the hole 47 in the front cover, between the upper back-up wheel 27 and the lower die 28 and on out through an exit hole 55 provided in the back plate 10. As the strip 48 comes from the molding machine, the depth of impression of the die 28 may be adjusted to suit by means of the upper threaded stud 23 and flanged nut 25, even while the strip is in motion. The front door 45 is arranged to automatically close if the strip should break, and the device is now ready to continuously produce a border strip of any length desired.

It will be remembered that the prior art molding machine leaves a light film of oil upon the surfaces of the strip after molding which assist in sliding the strip through the present invention. Moreover, it should be noted that the strip is impressed with the desired border design from the bottom side, which permits the flakes of metal or any foreign bodies to fall away from the device and assist the die in making a clean impression. Since the present invention is positioned in close proximity with the molding machine, it is apparent that the metal border strip, while completely solidified, will still be relatively hot so that impressions of the die will be easily made. The portion of the strip extending through the device and carrying the finished design will eventually be cut to desired lengths by other special machinery used in the printing industry.

Each of the component parts of the present invention should be made of a good quality steel and suitably heat treated to a hardness sufficient to withstand normal use of related machinery.

From the above description, it will be apparent that I have provided a mechanism which is simple in its manufacture and which permits the continuous forming of a border strip. The circular die may be easily and quickly exchanged without dismantling the machine, and set for a desired depth of penetration even while the border strip is being drawn across the die. The machine has few moving parts and may operate in conjunction with any known molding machine for type metal. The dies are small enough so that many designs may be stored in only a small container.

While the mechanism as shown is adapted for mounting upon a portion of a prior art machine, it is understood that any means of mounting may be used. Other changes may also be made without departing from the spirit and scope of my invention as defined in the following claims.

I claim:

1. In a device of the class described, a stationary inner housing having upper and lower ends, a yoke encircling said inner housing and slidably mounted with respect to said inner housing and having upper and lower ends positioned respectively most nearly adjacent the upper and lower ends of said inner housing, spring means between the lower end of said yoke and said inner housing normally urging the upper end of said yoke toward the upper end of said inner housing, an outer housing surrounding said inner housing and said yoke and provided with a top cover plate and a front plate and a back plate, a back-up wheel rotatably mounted upon a shaft carried by said inner housing, a circular die rotatably mounted upon a shaft mounted in said yoke, and gauging means connected to said yoke

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for raising and lowering said yoke with respect to said inner housing, said front plate and said back plate being apertured for the passage of border strip through said device between said die and said back-up wheel.

2. In a device of the class described, a stationary inner housing having upper and lower ends, a yoke encircling said inner housing and slidably mounted with respect to said inner housing and having upper and lower ends positioned respectively most nearly adjacent the upper and lower ends of said inner housing, spring means between the lower end of said yoke and said inner housing normally urging the upper end of said yoke toward the upper end of said inner housing, an outer housing surrounding said inner housing and said yoke and provided with a top cover plate and a front plate and a back plate, a back-up wheel rotatably mounted upon a shaft carried by said inner housing, a circular die rotatably mounted upon a shaft mounted in said yoke, and gauging means threadedly engaged with said yoke and extending through said cover plate for raising and lowering said yoke with respect to said inner housing, said front plate and said back plate being apertured for the passage of border strip through said device between said die and said back-up wheel.

3. In a device of the class described, a stationary inner housing having upper and lower ends, a yoke encircling said inner housing and slidably mounted with respect to said inner housing and having upper and lower ends positioned respectively most nearly adjacent the upper and lower ends of said inner housing, spring means between the lower end of said yoke and said inner housing normally urging the upper end of said yoke against the upper end of said inner housing, an outer housing surrounding said inner housing and said yoke and provided with a top cover plate and a front plate and a back plate, a back-up wheel rotatably mounted upon a shaft carried by said inner housing, a circular die rotatably mounted upon a shaft removably mounted in said yoke, and gauging means connected to said yoke and extending through said cover plate for raising and lowering said yoke with respect to said inner housing, said front plate and said back plate being apertured for the passage of border strip through said device between said die and said back-up wheel.

4. In a device of the class described, a stationary inner housing having upper and lower ends, a yoke encircling said inner housing and slidably mounted with respect to said inner housing and having upper and lower ends positioned respectively most nearly adjacent the upper and lower ends of said inner housing, spring means between the lower end of said yoke and said inner housing normally urging the upper end of said yoke against the upper end of said inner housing, an outer housing surrounding said inner housing and said yoke and provided with a top cover plate and a front plate and a back plate, a back-up wheel rotatably mounted upon a shaft carried by said inner housing, a circular die rotatably mounted upon a shaft removably mounted in said yoke, gauging means connected to said yoke and extending through said cover plate for raising and lowering said yoke with respect to said inner housing, said front plate and said back plate being apertured for the passage of border strip through said device between said die and said back-up wheel, and a door on said front plate biased against said border strip and arranged to close and block the passage into said device if said border strip should break.

5. In a device of the class described, a stationary inner housing having upper and lower ends, a yoke encircling said inner housing and slidably mounted with respect to said inner housing and having upper and lower ends positioned respectively most nearly adjacent the upper and lower ends of said inner housing, spring means between the lower end of said yoke and said inner housing normally urging the upper end of said

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yoke against the upper end of said inner housing, an outer housing surrounding said inner housing and said yoke and provided with a top cover plate and a front plate and a back plate, a back-up wheel rotatably mounted upon a shaft carried by said inner housing, a circular die rotatably mounted upon a shaft removably mounted in said yoke, gauging means connected to said yoke and extending through said cover plate for raising and lowering said yoke with respect to said inner housing, said front plate and said back plate being apertured for the passage of border strip through said device between said die and said back-up wheel, guide strips positioned to guide said border strip between said die and said back-up wheel, and a door on said front plate biased against said border strip and arranged to close and block the passage into said device if said border strip should break.

6. In a device of the class described, a stationary inner housing having upper and lower ends, a yoke encircling said inner housing and slidably mounted with respect to said inner housing and having upper and lower ends positioned respectively most nearly adjacent the upper and lower ends of said inner housing, spring means between the lower end of said yoke and said inner housing normally urging the upper end of said yoke against the upper end of said inner housing, an outer housing surrounding said inner housing and said

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yoke and provided with a top cover plate and a front plate and a back plate, a back-up wheel rotatably mounted upon a shaft carried by said inner housing, a circular die rotatably mounted upon a shaft removably mounted in said yoke, gauging means threadedly engaged with said yoke and extending through said cover plate for raising and lowering said yoke with respect to said inner housing, said front plate and said back plate being apertured for the passage of border strip through said device between said die and said back-up wheel, guide strips adjustably positioned between said die and said back-up wheel to guide said border strip, and a door on said front plate biased against said border strip and arranged to close and block the passage into said device if said border strip should break.

References Cited in the file of this patent

UNITED STATES PATENTS

1,429,720	Nisson et al. -----	Sept. 19, 1922
2,142,742	Blois -----	Jan. 3, 1939
2,202,110	Maurer -----	May 28, 1940
2,497,386	Zarobsky -----	Feb. 14, 1950
2,506,681	Norlindh -----	May 9, 1950
2,569,350	Smith -----	Sept. 28, 1951
2,598,114	Dilworth -----	May 27, 1952