Dec. 17, 1963 E. DI MARZIO 3,114,200

APPARATUS FOR INSERTING AND SECURING LABELS IN PRINTING PLATES

Original Filed July 1, 1959

3 Sheets-Sheet 1

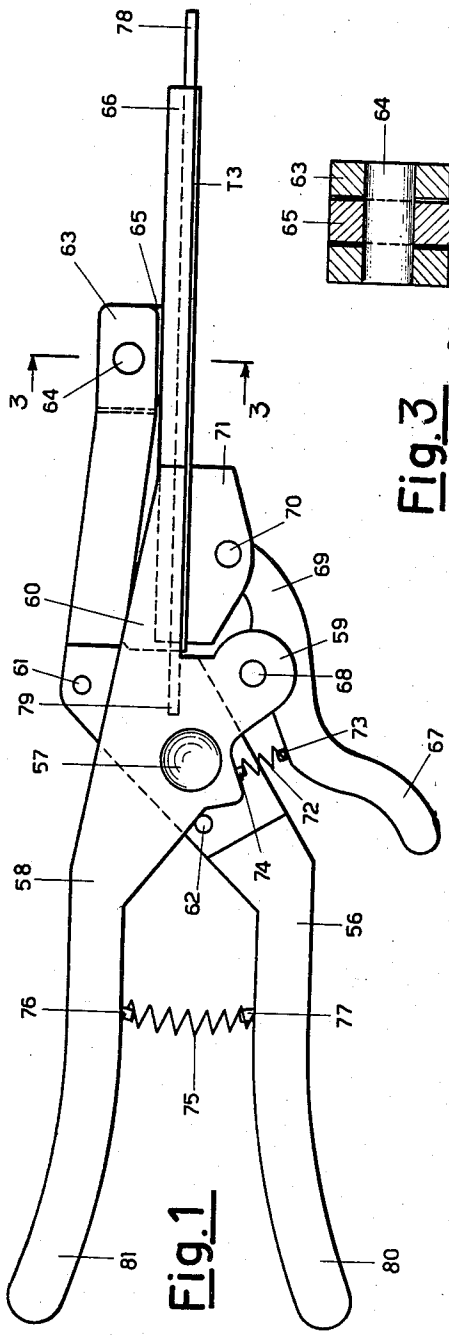


Fig. 1

Fig. 3

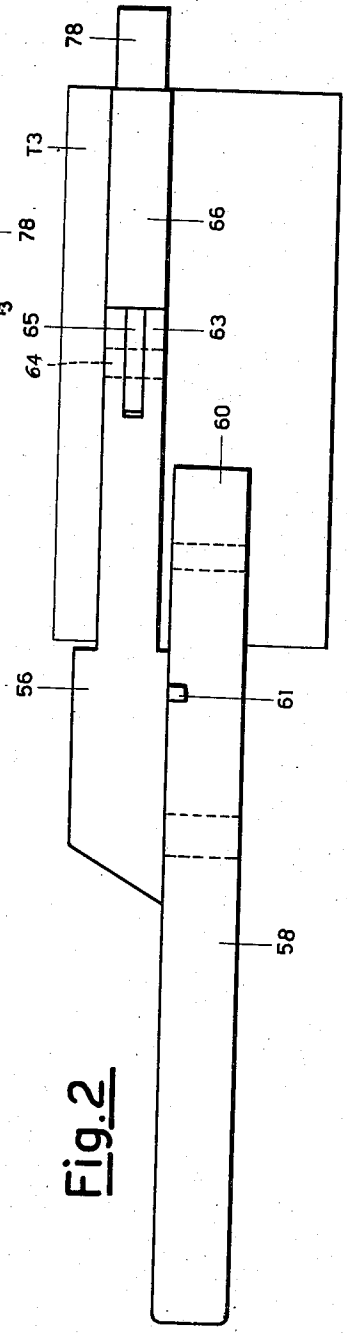


Fig. 2

INVENTOR
EMILIO DIMARZIO
BY
ATTORNEY

Dec. 17, 1963 E. DI MARZIO 3,114,200

APPARATUS FOR INSERTING AND SECURING LABELS IN PRINTING PLATES

Original Filed July 1, 1959

3 Sheets-Sheet 2

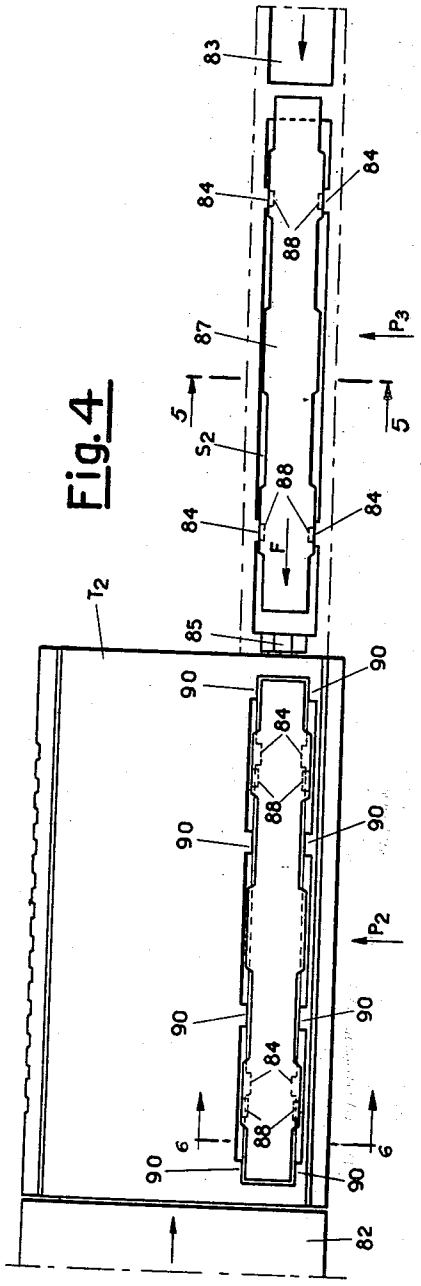


Fig.4

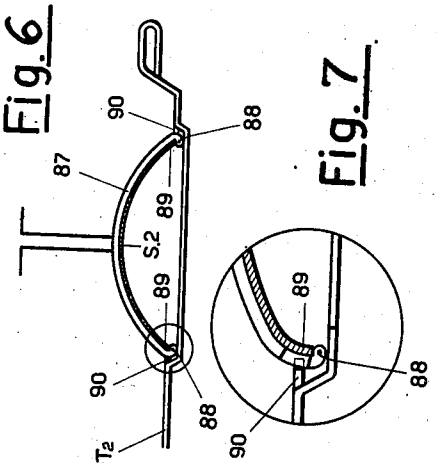


Fig.6

Fig.7

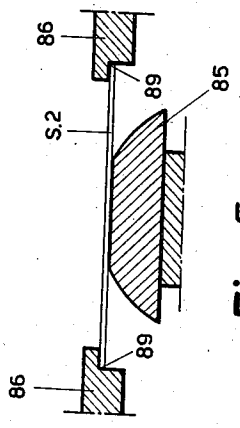


Fig.5

INVENTOR
EMILIO DI MARZIO
BY B. Schlesinger
ATTORNEY

Dec. 17, 1963 E. DI MARZIO 3,114,200

APPARATUS FOR INSERTING AND SECURING LABELS IN PRINTING PLATES

Original Filed July 1, 1959 3 Sheets-Sheet 3

Fig. 8

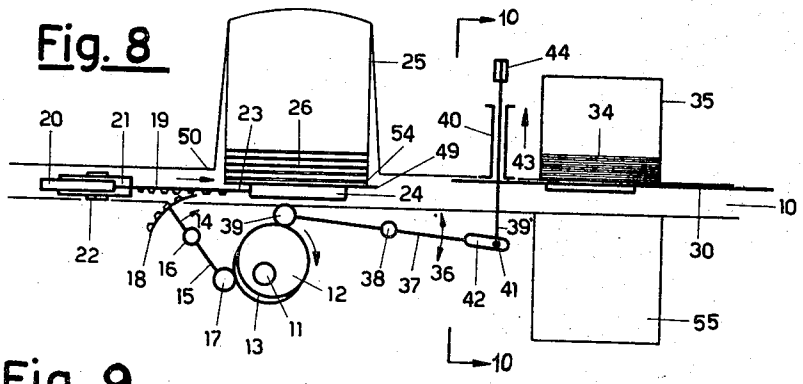


Fig. 9

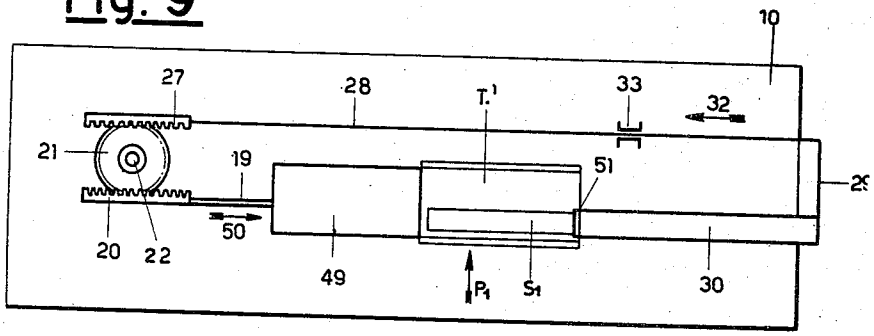


Fig. 10

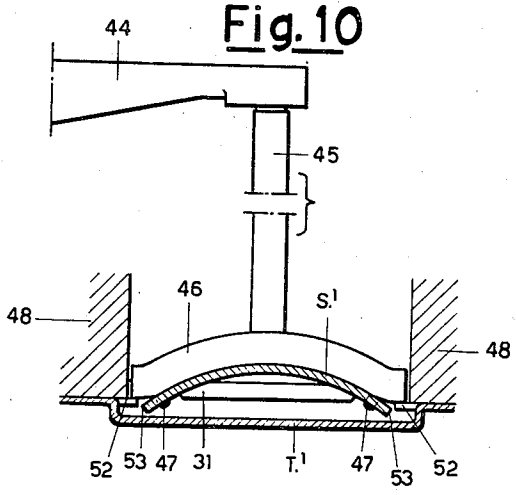
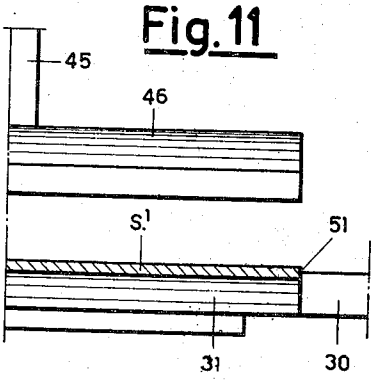


Fig. 11



INVENTOR
EMILIO DI MARZIO
BY B. G. Schlesinger
ATTORNEY

United States Patent Office 3,114,200 Patented Dec. 17, 1963

3,114,200

APPARATUS FOR INSERTING AND SECURING LABELS IN PRINTING PLATES

Emilio Di Marzio, Milan, Italy, assignor to Fabbrica Italiana Macchine Aziendali, Milan, Italy, a corporation of Italy

Original application July 1, 1959, Ser. No. 824,313. Divided and this application Nov. 21, 1961, Ser. No. 155,884

Claims priority, application Italy July 2, 1958

5 Claims. (Cl. 29—211)

The present invention relates to printing plates, and it covers more particularly the means for inserting substantially rectangular labels made of cardboard, plastic material or any suitable material into the plates. This application is a division of my pending application Serial No. 824,313, filed July 1, 1959, now abandoned.

It is a well-known fact that address-carrying plates or frames carrying such plates require the introduction into the plate of a label on which are recorded complete or partial indications forming part of the letter-press to be punched by the plate, or in which are provided perforations or the like controlling other mechanisms of the address-printing machine or the like machine associated therewith.

The known means for retaining the label inside the plate are formed in the actual plate or in the support carrying the latter, and they consist generally of two guiding members, either continuous or intermittent; said guiding members being parallel with each other and alined with the characters punched in the plate to extend over the longer sides of the label, with a view to preventing any relative movement between the plate and the label in a transverse direction, and to allow introduction of the label longitudinally into the plate.

In order to secure the label longitudinally of the plate, there are formed in the plate projections or the like acting on the transverse sides of the label, so as to prevent any dropping of said label out of the plate once said label has been introduced therein; said projections allowing, however, the introduction of the label through one of its sides.

To introduce the label into the plate, the label is bent elastically around an axis parallel with its longer sides, in a manner such that the convexity obtained may face the plate. The label is shifted in its elastically deformed condition, so that its longer sides may lie in contact with the seat provided in the plate. Then, when the label is released, the label returns elastically into its original flat condition and is automatically held fast inside the plate under the action of the above-mentioned guiding means and projections formed in the plate.

More specifically, the invention provides for the use of mechanical means including essentially an arrangement comprising a first convex member in the shape of a cylindrical segment and a second concave member, the concavity of which matches the convexity of the first member, whereby the label may be bent by being pressed between said convex and concave members prior to its introduction into the plate.

Further, the invention has for its object various apparatus for the actual introduction of the labels into the plates in the manner mentioned hereinabove, for instance, a hand-controlled implement for inserting labels into the plates. The invention has also for its object a machine for the automatic feeding of the labels and plates. There will also be disclosed hereinafter an embodiment provided with automatic feeding means, in which embodiment it is not necessary to provide for the simultaneous presence of the concave and convex members for the introduction of the labels.

Now, whereas in known plates the labels are introduced by hand; and furthermore, the labels are not held fast with reference to the plates, the present invention has the advantage that the labels may be introduced mechanically under satisfactory speed and accuracy conditions, and the further advantage of obtaining plates in which the labels are held fast reliably with reference to the plates. This is of a considerable importance because it is often necessary to make the perforations and the like registrations in the label register with similar perforations formed in the plate and underlying the perforations in the label. For a proper operation to be controlled by such perforations, it is necessary that the latter register as perfectly as possible.

There will be described hereinafter, by way of example and by no means in a limiting sense, various embodiments of mechanisms for inserting labels into plates made according to the invention. These embodiments are illustrated in the accompanying drawings, wherein:

FIG. 1 is an elevational view of a manually operable mechanism for insertion of labels inside plates;

FIG. 2 is a plan view of FIG. 1;

FIG. 3 is a cross-sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is a partial diagrammatic plan view of a further embodiment of the invention and showing a mechanically controlled arrangement for inserting a label into a plate;

FIG. 5 is a sectional view through line 5—5 of FIG. 4;

FIG. 6 is a cross-sectional view of FIG. 4 along the line 6—6 of FIG. 4;

FIG. 7 is an enlarged fragmentary view of the parts shown in FIG. 6;

FIG. 8 is a diagrammatic side view of an automatically fed apparatus;

FIG. 9 is a diagrammatic plan view of the apparatus shown in FIG. 8;

FIG. 10 is an enlarged sectional view of FIG. 8 along the line 10—10, as seen in the direction of the arrows; and

FIG. 11 is a view of a detail of FIG. 10.

Turning to FIGS. 1 and 2 which illustrate an arrangement for manually introducing the label, as described hereinafter, the lever 56 carries a pivot pin 57 on which is pivotally mounted the cooperating lever 58 which carries a projecting flange 59 and an extension 60. On the lever 56 are provided two stops 61 and 62 which project from the side of the lever in the same direction as pin 57.

The end 63 of the lever 56 is forked, and it carries, through the agency of the pivot 64 extending between the forked ends of the lever, the tail-piece of a concave member 66 which may thus rock round said pivot 64. The lever 67, in the shape of a trigger, carries intermediate its ends a small pivot pin 68 which is rotatably mounted in a corresponding port formed in the projecting flange 59 of the lever 58.

The forward end 69 of the trigger 67 is bored to accommodate the pivot pin 70 on which is pivotally mounted a small block 71. The trigger 67 and the lever 58 are held in the position illustrated in FIG. 1 by the action of the compression spring 72 held in position on the cooperating parts by the stubs 73 and 74.

A spring 75 held fast by two studs 76 and 77 urges apart the projecting flange 60 on the lever 58, on the one hand, and the end 63 of the lever 56, on the other hand.

The printing plate T3 is adapted to be held between the projecting flange 60 of the lever 58 and the small block 71 on the trigger 67, by means of the spring 72.

The convex member 78 is independent of the arrangement, and is adapted to be introduced between the concave member 66 and the plate T3 and inserted into a slot or channel 79 formed in the lever 58. The label S4 is adapted to be introduced between the convex member 78 and the cooperating concave member 66.

The operation of the arrangement described is as follows: While overcoming manually the resistance of the spring 72, the operator acts on the trigger 67 to make it rock round the pivot 68. Thus, the projecting flange 60 is shifted away from the small block 71 which frees a space into which may be introduced the plate T3. This being done, the trigger 67 is released, so that the spring 72 holds the plate T3 securely in the position illustrated in FIG. 3. At this moment, the convex member 78 is inserted into the channel 79 in the lever 58. The label S4 is then engaged between the convex member 78 and the concave member 66.

This being done, the operator urges the arms 80 and 81 of the levers 56 and 58 together against the action of the spring 75. Thus, the label S4 is held fast between the concave and convex members and assumes a curved shape.

Lastly, while the lever arms 80 and 81 are held against each other, the convex member 78 is removed and the label S4 returns under the action of its own elasticity into its normal flat shape, and engages the undersides of the projections 80 on the plate T3.

The trigger 67 is then urged against the action of the spring 72 round the pivot 68, so as to shift the small block 71 away from the projecting flange 60 on the lever 58; and the plate T3 is removed with the label S4 properly fitted inside it.

Turning now to FIGS. 8 to 11, the machine illustrated therein includes a frame 10 on which is revolubly mounted a driving shaft 11 to which are keyed two cams 12 and 13. The cam 13, during its rotation, produces a rotary reciprocation, first in the direction of the arrow 14 and then in the opposite direction, of the rocking lever 15 round its pivot 16 through the agency of the cam follower 17 revolvably carried at one of the ends of said lever 15. At its outer end, the lever 15 carries a toothed sector 18 meshing with the gear teeth of rack 19. The rack 19 is rigid with a further rack 20 alined therewith, the teeth of rack 20 extending in a plane perpendicular to the teeth of rack 19 and meshing with the toothed wheel 21 revolvably mounted on the pivot 22 rigid with the machine frame. To the end 23 of the rack 19 is secured the carriage 24 which, in the position illustrated in FIG. 8, lies underneath a container 25 for the superposed plates.

The toothed wheel 21 meshes with a second rack 27 which is connected through a system of rods 28 and 29 with a carriage 30 carrying at its end the convex member 31.

The rigid system of rods 28 and 29 may reciprocate with the rack 27, the carriage 30 and the convex member 31 first in the direction of the arrow 32 and then in the opposite direction, while the rod 28 is guided in the sleeve 33. In the position of the parts illustrated in FIGS. 10 and 11, the convex member 31 lies above the plate T1 and underneath the label S1 which is to be introduced into the said plate T1. The labels S4 are stacked as at 34 in a label-feeding container 35.

Turning to FIG. 8, it will be observed that the cam 12, when it turns, provides for reciprocation, alternately in the direction of the arrow 36 and in the opposite direction, of the rocking lever 37 round the pivot 38 through the agency of the roller or cam follower 39 adapted to revolve round a pivot at one end of said lever 37.

The outer end of the rocking lever 37 is connected with a vertical rod 39' which is guided vertically inside a sleeve 40, and which at its lower end carries a stud 41 which is engaged in a longitudinal slot formed in the rocking lever 37.

Thus, the rod 39' may reciprocate in the direction of the arrow 43 and in the opposite direction. At its upper end, the rod 39' is rigidly connected with an arm 44 which, through the agency of a further rod 45 (FIGS. 10 and 11), is rigidly secured to the concave member 46. Said concave member 46 carries at the ends of its outer edge facing the container 35 the abutments illustrated at 47.

In the frame 10 of the machine are provided guiding shoulders 48 (FIG. 10) which are not shown in FIGS. 8 and 9 and which serve as guides for the labels 34. Such guides 48 extend between the label-feeding container 35 and the station, designated by the arrow P_1 in FIG. 9, at which each label is introduced into the corresponding plate.

The operation of the arrangement described is as follows: During its rotation round the axis of the shaft 11, the eccentric member or cam 13 produces a periodical angular movement of the toothed sector 18 in the direction of the arrow 14 and reversely. The rack 19 meshing with the toothed sector 18 executes a reciprocation in the direction of the arrow 50 and in the opposite direction. The carriage 24 and the support 49 execute the same movement.

When advancing in the direction of the arrow 50, the flat support 49 on carriage 24 engages, through its leading edge, the lowermost plate in the stack 26 of plates and urges it into the station P_1 where the label is to be introduced into the plate.

The movement of the rack 20 produces a rotation of the toothed wheel 21 which, in its turn, shifts the rack 27 in a direction opposite to that of the rack 19. The carriage 30 and the convex member 31 are thereby reciprocated in the direction of the arrow 32 and in a direction opposed to the latter. During the movement of said parts in the direction of the arrow 32, the carriage 30 engages, by means of its leading edge 51, the transverse edge of the lowest label in the stack of labels 34 and urges it towards the station P_1 for introduction above the plate T' which has been fed previously into the station P_1.

During the operative stage just described, the concave member 46, which is adapted to reciprocate in the direction of the arrow 43, and reversely, under the action of the eccentric member or cam 12, the rocking lever 37, the rod 39, the arm 34 and the rod 45, remains in its raised position illustrated in FIG. 11.

During the next operative stage, the concave member 46 is lowered towards the bed 10 of the machine, so as to constrain the label S1, held fast between the convex member 31 and said concave member 46, to assume the bent shape illustrated in FIG. 10.

This being done, and while the flat support 49 returns to its original position underneath the container 25, the convex member 31, following the movement of the rack 27 opposite to the direction of the arrow 32, is removed from underneath the label S1 and returns into its original position underneath the container 35.

The label S1 does not follow the movement of the convex member 31 because it is held fast beneath the concave member 46 by the abutments 47 on the latter.

As soon as the convex member 31 has been completely removed from underneath the label S1, the latter returns, through the elastic reaction of the material of which it is formed, into its normal flat shape and engages the undersides of the projections 52 of the plate T'.

This occurs because the confronting curved surfaces of the convex member 31 and of the concave member 46 set the edges 53 of the label S1 on a plane surface which is slightly lower than the plane containing the lower surfaces of the projections 52 on the plate T'.

This being done, the concave member 46 rises again and the cycle of operations begins over again with a shifting of a further plate into the station P_1.

This further plate, as it progresses in the direction of the arrow 50, urges by means of its leading edge 54, the plate loaded during the preceding cycle, towards the open top of the container 55 into which the filled label-carrying plates are intended to drop in succession over one another.

In the arrangements previously described relating to the introduction of a label inside a plate, it is necessary to resort simultaneously to a convex and a concave member. However, a different embodiment will now be disclosed which makes such a simultaneous use unnecessary, as illustrated in the arrangement according to FIGS.

4 to 7. The plate T2 is shown in FIG. 4 at the station P_2 in which it is to be engaged by a label, while the carriage 82 is provided for conveying the plate T2 towards said station P_2. The carriage 83 is provided for conveying the label S2 to the station P_3 which is adjacent the station P_2. The label S2 has a rectangular shape, and has two longitudinally spaced recesses 84 in each side thereof.

Turning to FIG. 5, the latter shows a stationary support 85 which in cross section is substantially in the shape of an arcuate segment; and which lies in the gap between the two parallel guiding shoulders 86 for the label S2.

Turning now to FIG. 6, the latter shows the concave member 87 provided with two pairs of projections 88. The operation is as follows: The label S2, guided by the shoulders 86, is first urged by the carriage 83 into the station P_3 preceding the station P_2. At the station P_3, the label S2 is placed on the upper surface of the support 85 extending between the guiding shoulders 86.

Simultaneously, the plate T2, which is to receive the label, is urged by the carriage 82 towards the station P_2 where the label is to be introduced into the plate.

During the second operative stage, the concave member 87, which had remained in its raised position above the support 85, is lowered at the station P_3 and engages through its projections 88 the corresponding recesses 84 in the label S2. As it continues its downward movement, member 87 bends the label S2, so that the latter matches the shape of the support 85 until the label adheres completely against the upper curved surface of said concave member 87.

At this moment, there is a short longitudinal translational movement between the label S2 and the concave member 87. Thus, the projections 88 on the concave member are shifted out of the recesses 84 in the label S2 and engage the longitudinal edges 89 of the label S2, so as to hold the latter adhesively against the curved surface of the concave member. During the next stage of operation, the concave member 87, which now holds the label S2 in position, shifts it in the direction of the arrow F so as to set said label S2 above the plate T2 at the station P2. The label registers then with the stamped area of the plate forming a seat for said label S2. The plate is provided with projections 90, formed along the edges of the stamped area, for holding the label in the plate.

The location of said projections 90 (FIG. 4) is staggered with reference to the location of the recesses 84 formed in the label, because the projections 90 should actually hold fast the label S2, when in its final position.

The concave member 87 is now lowered onto the flat surface of the plate until the edges 89 of the label lie in a plane slightly lower than the plane containing the lower surfaces of the projections 90 on the plate T2.

There is then produced a relative translational movement in a longitudinal direction between the concave member 87 and the label S2, until the projections 88 on the concave member register again with the recesses 84 in the label.

Under such conditions, the label is no longer held fast by the concave member and, under the action of its own elasticity, it returns into its normal flat shape and engages the lower surfaces of the projections 90 on the plate, so as to remain finally engaged by the latter.

Having thus described my invention, what I claim is:

1. Apparatus for introducing a normally flat, flexible label onto a recessed seat formed for it in a printing plate provided with projections for covering opposite sides of the label to hold the label on its seat, comprising a convex member the cross-sectional configuration of which is substantially that of a cylindrical segment and which has an upper convex surface, and over which the label is to be first elastically deformed about an axis extending parallel to its opposite sides, a concave member, the concavity of which matches the convexity of the convex member, a container for a stack of plates open at its lower end, a container for a stack of normally flat, flexible labels open at its lower end, and a mechanism adapted to feed simultaneously the lowermost plate from the first-named container and the lowermost label from the second-named container into a location beneath said concave member where said label is superposed over a recess in the plate and confronts the concavity of said concave member, and means for inserting the convex member between said label and said plate, and with the label resting on the upper convex surface of said convex member, and beneath the concave surface on said concave member, said recess in said plate being open at at least one end thereof, and said plate having thereon projections which overlie opposite sides of said recess, means for first producing a lowering of the concave member over the label on the convex member to cause the concavity of said concave member to approach the convex upper surface of said convex member to elastically deform said label about said axis and to bring its opposite sides into registry with the undersides of the projections on the plate, and means for thereafter withdrawing said convex member in a direction parallel to said axis, and out of said one end of said recess thereby allowing the label to return into its normal flat condition so that it is held fast beneath the projections on the plate.

2. Apparatus for introducing a normally flat, flexible oblong label onto a recessed seat formed for it in a printing plate provided with projections for covering the longer sides of the label to hold the label on its seat, comprising a convex member the cross-sectional configuration of which is substantially that of a cylindrical segment and which has an upper convex surface, and over which the label is to be first elastically deformed about an axis extending parallel to its longer sides, a concave member, the concavity of which matches the convexity of the convex member, a container for a stack of plates open at its lower end, a container for a stack of normally flat, flexible labels open at its lower end, and a mechanism including a camshaft, two cams rigid therewith, a rocking lever controlled by each cam, a gear and rack system controlled by one of said levers, vertically reciprocating means controlled by the other lever, horizontally reciprocating means controlled by the gear and rack system and adapted to feed simultaneously the lowermost plate from the first-named container and the lowermost label from the second-named container into a location beneath said concave member where said label is superposed over a recess in said plate and confronts the curved surface of said concave member, means whereby said horizontally reciprocating means insert, between the superposed plate and label, the convex member so that the label rests on the upper convex surface thereof, means whereby said vertical reciprocating means first produces a lowering of the concave member over the label on the convex member to cause the concavity of said concave member to approach the convex upper surface of said convex member to elastically deform said label about said axis to bring said longer sides into registry with the undersides of the projections on the plate, and said horizontally reciprocating means being operative thereafter to withdraw said convex member from between said plate and said label in a direction parallel to said axis thereby to allow the label to return into its normal flat condition so that it is held fast beneath the projections on the plate.

3. Apparatus for introducing a normally flat, flexible label, provided with recesses along opposite sides thereof, onto a recessed seat formed for it in a printing plate provided with projections for covering the sides of the label to hold the label on its seat, comprising a convex member having a cross-sectional configuration substantially in the shape of a cylindrical segment and having a convex upper surface, a concave member which has a concave under surface, the concavity of which matches the convexity of the upper surface of the convex member and which includes projections adjacent both ends

of its side edges, means for lowering the concave member onto a normally flat, flexible label disposed on said convex member, to deform said label elastically on the upper surface of said convex member, and to engage said projections on said concave member with the undersides of the side edges of the label adjacent the recesses therein to hold the label in its deformed state, means for shifting the concave member and the label engaged thereby longitudinally over and off the convex member and into a position registering with a recessed seat formed in a plate, to set the deformed label in said seat with its sides in registry with projections formed on the plate at opposite sides of said seat to overlie the latter, and means for shifting longitudinally the label with reference to the concave member to make the label recesses register with the projections on said concave member thereby to release said label relative to said concave member, whereby upon raising the concave member the label returns into its flat condition to be held fast under said plate projections.

4. Apparatus for introducing a normally flat, flexible label into a recessed seat formed in a printing plate that is provided with projections adapted to extend over opposite sides of a label to hold the label in said seat, comprising a first member having a concave under surface, a second member having a convex upper surface complementary to the concave surface of said first member, and over which convex surface a label is adapted to be positioned, means for moving at least one of said members into operative relation to the other to cause said surfaces to converge and elastically deform therebetween a normally flat, flexible label about an axis parallel to opposite sides of said label, means supporting a printing plate of the type described with its recessed seat in position to receive a label deformed between said members, when said members are placed in inoperative relation to one another, and means for shifting one of said members in a direction parallel to said axis to place said members in inoperative relation to one another, thereby to release the deformed label so that it may return to its normal shape, said concave surface being operative upon the release of said label to guide opposite sides thereof beneath the projections on said plate.

5. A manually operable tool for introducing a normally flat, flexible label onto a recessed seat formed for it in a printing plate that is provided with projections adapted to extend over opposite sides of the label to hold the label on its seat, said tool comprising a first and a second lever pivotally connected to one another intermediate their ends, each lever being formed with a handle at one end, spring means interposed between said handles and urging the opposite ends of the levers apart, a first member having a concave under surface mounted on the said opposite end of the first lever, a third lever pivotally mounted on the second lever at a point offset from the point of pivotal connection of the first and second levers, said third lever having a handle at one end and having at its opposite end a gripping portion, said second lever having at its said opposite end a confronting gripping portion, said two gripping portions cooperating to clamp a printing plate between them, spring means interposed between said second and third levers constantly urging said gripping portions toward gripping positions, and a second member having a convex upper surface removably mountable on a printing plate clamped between said gripping portions in position to cooperate with said concave under surface of said first member to grip and elastically deform a normally flat flexible label, which is inserted between said concave and convex surfaces, about an axis parallel to opposite sides thereof, whereby upon removal of said second member the label returns through its own elasticity to its normal flat shape to seat said opposite sides thereof under the projections of said plate.

References Cited in the file of this patent

UNITED STATES PATENTS

1,746,016	Shiffman et al.	Feb. 4, 1930
2,049,438	Gollwitzer	Aug. 4, 1936
2,621,539	Eustis et al.	Dec. 16, 1952
2,641,051	Vick	June 9, 1953