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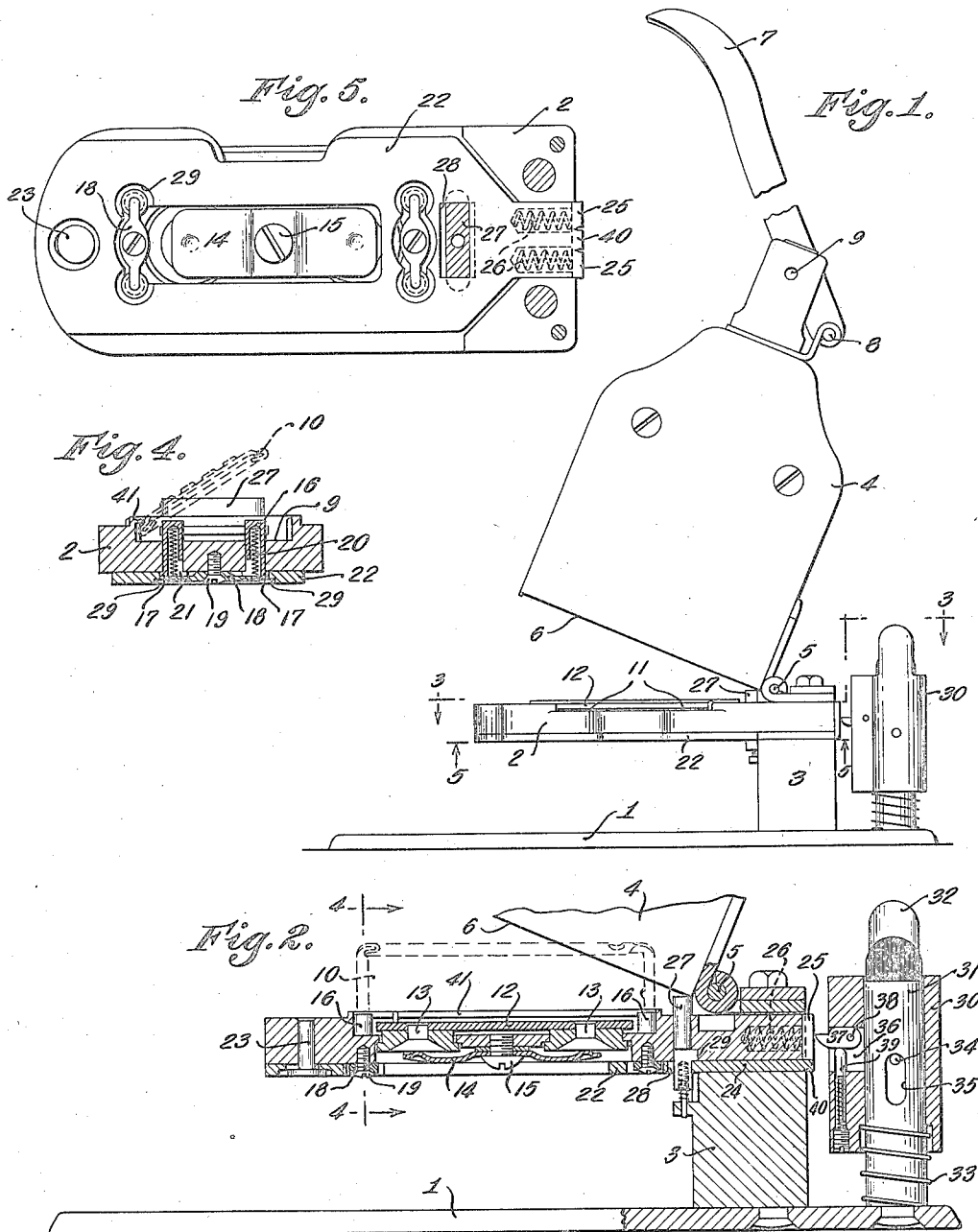
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2,039,072

PRINTING DEVICE

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PRINTING DEVICE

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9 Claims. (Cl. 101—287)

This invention relates to printing devices using separable printing plates, such as disclosed for example in my prior Patent No. 1,801,593, and particularly to devices of the type disclosed in my prior Patents Nos. 1,801,592 and 1,801,594 for use in department stores and other establishments for printing names and addresses or other indicia on sales slips or other sheets. Whether the printing plates are carried by customers as identification tokens or are stored in trays, visible filing panels or other filing devices, it is highly desirable that they be light and thin; consequently they are easily distorted by abuse. Inasmuch as all operators are not careful in placing the plates in proper position in the printing devices before compressing together the plates and the articles to be printed, frequently the plates are compressed when not properly seated in the plate holder, thereby resulting not only in failure to print properly but also in damage to the plates.

The object of this invention is to provide safeguards against such abuse of the plates and particularly to prevent the devices from printing when the plates are in improper position.

In one aspect the present invention involves a plate holder, which is preferably in the form of a base having a plate seat in its upper surface, a presser, which is preferably in the form of a head mounted on the base to move between plate pressing position and a retracted idle position, and means for producing relative movement between the holder and presser to effect compression of the printing plate and the article to be printed, together with means for protecting the plate from distortion by the compression means due to improper placement in the holder, the protecting means comprising a device associated with the holder which is actuated by the plate when the latter is placed in proper position in the holder. The protecting means preferably controls the relative movement between the holder and presser, as for example by means of a detent movable into and out of the path of the printing head under the control of the plate in the holder. Said device is preferably in the form of a plunger projecting beyond the base of the holder and adapted to be retracted by placement of a plate in the holder. By providing a spring behind the plunger it may be caused to advance automatically into projecting position upon removal of the plate and indeed it may be used as an ejector for ejecting the plate from the holder after a printing operation.

In a more limited aspect of the invention the aforesaid detent means comprises two detents,

one of which acts directly upon the printing head and which is moved to obstructing position by means of a spring, and the other of which is interposed between the first detent and the plunger in the plate holder and which is moved from obstructing to non-obstructing position by means of a spring when the plate is placed in proper position in the holder. When the second detent is in obstructing position it physically blocks movement of the first detent from obstructing position but when the second detent is moved to non-obstructing position the first detent is free to be retracted against the action of its spring by movement of the presser head toward the plate holder.

In another aspect the invention involves means responsive to separation of the plate holder and presser head for again rendering the detent means effective to block the closing movement of the head until a plate has again been placed in proper position in the plate holder.

For the purpose of illustration a typical embodiment of the invention is shown in the accompanying drawings, in which

Fig. 1 is a side elevation of a printing device;

Fig. 2 is a vertical longitudinal section on the base of the device;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a section on line 4—4 of Fig. 2;

Fig. 5 is a section on line 5—5 of Fig. 1;

Fig. 6 is a view similar to Fig. 2 showing the presser head in retracted idle position; and

Fig. 7 is a section on line 7—7 of Fig. 6.

The particular embodiment of the invention chosen for the purpose of illustration comprises a base plate 1, a platform 2 mounted on a stud 3 and a presser head 4 hinged to the platform at 5. The presser head swings about the pivot 5 between two limiting positions, a printing position in which the lower end 6 of the head is substantially horizontal and the retracted idle position shown in broken lines in Fig. 6. The handle 7 pivoted at 8 to the upper end of the head actuates a roller inside the head as disclosed in the aforesaid patents. To operate the device the head is swung from the retracted idle position to printing position by means of the handle and further movement of the handle causes the pressure roller inside the head to roll over the article to be printed, thereby compressing the article and the printing plate together.

The printing plate holder comprises a seat for the plate in the upper side of the platform 2. The seat comprises a recess 9 having substantially the same outline as the plate 10 except in that

it is open on the front as indicated at 11 in Figs. 1 and 3. In the center of this recess is a plate 12 carrying two studs 13 which extend through the platform into engagement with the ends of a spring 14 secured to the bottom of the platform by means of a screw 15. Thus the plate holder comprises a raised central portion 12 surrounded by a narrow depression 9 and the printing plate is shaped to fit over the platform 12 with its margins extending into the surrounding recess 9, the central portion of the printing plate being recessed to receive the plate 12. The spring 14 holds the plate 12 in slightly raised position so that pressure applied by the pressure head may cause the printing plate to be somewhat depressed against the action of the spring 14, also permitting the plate 12 which supports the printing plate to tilt slightly both transversely and longitudinally.

In the recess 9 surrounding the plate 12 four spring pressed plungers 16 extend through the platform. The lower ends of these plungers have enlarged heads 17 which prevent the plungers from projecting upwardly beyond the position shown in Fig. 4. Beneath the pair of plungers 16 at each end of the platform is a cross-arm 18 (Figs. 4 and 5) which is fast to the under side of the platform by means of a screw 19. The springs 20 which urge the plungers 16 upwardly seat at their lower ends on the ends of these arms 18, the sides of the plungers 16 being cut out at 21 to receive the ends of the arms when the plungers are depressed from their normal position shown in Fig. 4 to their retracted position shown in Fig. 7.

Underneath the platform a detent plate 22 is arranged to slide longitudinally of the platform. The left-hand end of this plate is guided by means of a stud 23 extending through a slot in the plate and the right-hand end of the plate is reduced in width to form a neck 24 which extends through a slideway between the post 3 and the platform. At the right-hand end of the platform the plate 22 is provided with an upwardly extending bifurcated abutment 25 fast to the detent plate itself. A spring 26 in the platform engages each leg of the abutment 25 yielding to urge the detent plate to the right.

Extending vertically through aligned openings in the platform 2 and the detent plate 22 is a plunger 27 which is pressed upwardly by spring 28 into the position shown in Fig. 2 where it obstructs closing movement of the head 4 beyond the position shown in Figs. 1 and 2. This detent plunger is provided with a shoulder 29 which overhangs the detent plate 22 when the latter is in the left-hand normal position shown in Figs. 2 and 5. However when the detent plate 22 is pushed by spring 26 to its right-hand position it does not obstruct the downward movement of the detent plunger 27 so that the latter can be depressed by the presser head 4.

When the detent plate 22 snaps to the right under the action of spring 26 it not only unblocks the detent plunger 27 but it interlocks with the heads of the plungers 16 so that these plungers can not be advanced upwardly to projecting position until the detent plate 22 is again moved to the left. This interlocking between the plate 22 and the heads 17 of the plungers 16 is effected by recesses 29 formed in the under side of the plate 22 concentric with the openings in the plate for the plunger heads 17 but somewhat larger in diameter. When the plungers 16 are depressed the heads 17 are depressed from the

openings of small diameter in plate 22 to the enlarged recesses, thereby permitting the plate 22 to move to the right to a position wherein the heads 17 seat in the enlarged recesses 29.

For the purpose of restoring the detent mechanism to obstructing position, mechanism is provided for moving the detent plate 22 to the left to the position shown in Fig. 2 when the presser head 4 is swung about the pivot 5 to the idle position shown in Fig. 6 by broken lines. This mechanism comprises a sleeve 30 sliding vertically on a post 31 fast to the base plate 1, the sleeve having two upstanding projections 32 at the top on opposite sides of the post 31 to be engaged by the head 4. The sleeve 30 is pressed upwardly by a spring 33 and a pin 34 extending through the sleeve and through a slot 35 in the post 31 limits the upward and downward movement of the sleeve. In a recess 36 in the left-hand side of the sleeve is a dog 37 pivoted to the sleeve at 38 and normally held in the position shown in Fig. 2 by spring-pressed plunger 39. In this position the upper side of the dog engages the upper surface of the recess in the sleeve, thereby limiting further upward movement of the dog about the pivot 38. The nose of the dog projects from the sleeve far enough to engage the detent plate 22 when the plate is in the right-hand position. As the dog moves upward into engagement with the plate it is free to swing downwardly against the action of the spring-pressed plunger 39 but when the dog moves downwardly it forces the plate to the left-hand position shown in Fig. 2. As shown in Figs. 2 and 5 the abutment 25 is bifurcated at 40 so that the dog engages only the end of the plate 22 at the bottom of the bifurcation.

With the head 4 swung to the idle retracted position the sleeve 30 is pressed downwardly until the pin 34 engages the bottom of the slot 35 and the detent mechanism is automatically restored to the position shown in Fig. 2. In this position it is impossible to swing the head 4 toward the plate holder farther than the position shown in Figs. 1 and 2 because further movement is obstructed by the detent plunger 27 which has its abutment 29 bearing against the upper surface of the detent plate 22. When the printing plate is moved to its seat in the plate holder, where it occupies the position shown in Figs. 6 and 7, the four plungers 16 are depressed sufficiently to permit the detent plate 22 to snap to the right in response to spring 26. This movement of the detent plate to the right not only frees the detent plunger 27 but by virtue of the interengagement between the heads 17 of the plungers 16 and the recesses 29 in the detent plate the plungers 16 are held in retracted position so that the springs 20 do not tend to eject the printing plate from the plate holder. With the detent plunger 27 unobstructed by the detent plate 22 the presser head 4 may be swung to the full-line position shown in Fig. 6 to compress the article to be printed against the printing plate, it being understood that the sheet to be printed is laid over the platform before the presser head is swung down.

Upon swinging the presser head back to idle retracted position, after the printing operation is completed, the sleeve 30 is depressed by the weight of the head, the downward movement of the sleeve causes the dog 37 to move the detent plate 22 to the left, the detent plunger 27 having previously moved to upper position while the presser head is swinging from printing position to idle position. When the detent plate 22 snaps

to the right it not only locks the detent plunger 27 in upper position but it releases the plungers 16 to be snapped upwardly by their springs 20. When the plungers 16 snap upwardly they automatically eject the printing plate 10 from its seat to the position shown in Fig. 4 where it may readily be grasped by the thumb and finger for removal from the device. As shown in Fig. 4 the printing plate holder is provided with an overhanging lip 41 on its rearward side, not only to cause the printing plate to assume an inclined position after a printing operation but also to insure proper insertion of the plate in the holder when it is first applied to the device. In inserting the plate its rear edge is first placed under the lip 41 in the position shown in Fig. 4 and the plate is then swung downwardly to the position shown in Figs. 6 and 7.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A device for printing names and addresses or other indicia on sales slips or the like with separable printing plates, comprising a printing plate holder, a presser, means for producing relative movement between the holder and presser to effect compression of the printing plate and the article to be printed, a releasable detent for obstructing said relative movement, a member movable to retracted position in response to replacement of the printing plate in proper position in the holder for releasing said detent to permit said relative movement, and means for causing said detent to hold said member in said retracted position until the detent is moved back to obstructing position.
2. A device for printing names and addresses or other indicia on sales slips or the like with separable printing plates, comprising a printing plate holder, a presser, means for producing relative movement between the holder and presser to effect compression of the printing plate and the article to be printed, a releasable detent for obstructing said relative movement, a member movable to retracted position in response to placement of the printing plate in proper position in the holder for releasing said detent to permit said relative movement, means for causing said detent to hold said member in said retracted position until the detent is moved back to obstructing position, and means responsive to said relative movement for moving said detent back to obstructing position when said holder and presser are moved apart.
3. A device for printing names and addresses or other indicia on sales slips or the like with separable printing plates, comprising a base having a plate seat thereon, a presser head mounted in the base to move between plate pressing position and retracted idle position, a detent for obstructing movement of the head toward the base, means responsive to placement of the plate in proper position in said seat for rendering said detent ineffective, and means responsive to movement of the head to said idle position for again rendering the detent effective.
4. A device for printing names and addresses or other indicia on sales slips or the like with separable printing plates, comprising a printing plate holder, a presser, means for producing relative movement between the holder and presser to effect compression of the printing plate and the

article to be printed, a detent for obstructing said relative movement, means responsive to placement of the plate in proper position in the holder for rendering said detent ineffective, and means responsive to separation of the holder and presser for again rendering the detent effective.

5. A device for printing names and addresses or other indicia on sales slips or the like with separable printing plates, comprising a base having a plate seat thereon, a presser head mounted in the base to move between plate pressing position and a retracted idle position, a detent for obstructing movement of the head toward the base, means responsive to placement of the plate in proper position in said seat for rendering said detent ineffective, and means responsive to movement of the head to said idle position for ejecting the plate from said seat and again rendering the detent effective.

6. A device for printing names and addresses or other indicia on sales slips or the like with separable printing plates, comprising a printing plate holder, a presser, means for producing relative movements between said holder and presser, a movement of one away from the other to permit the insertion therebetween of the sheet to be printed and a movement of one toward the other to print the sheet, means for physically obstructing the second movement, and means responsive to the first movement for again rendering the obstructing means effective.

7. A device for printing names and addresses or other indicia on sales slips or the like with plates of the customer-token type, comprising a base portion, a head portion, means interconnecting the two portions to permit up-and-down movement of one portion toward and from the other, a recess in one of said portions to hold a plate of said type in printing position without locking the plate in the device, and means interposed between said portions for physically obstructing said movement of one portion toward the other when the plate is improperly positioned in said recess.

8. A device for printing names and addresses or other indicia on sales slips or the like with plates of the customer-token type, comprising a base portion, a head portion, means interconnecting the two portions to permit up-and-down movement of one portion toward and from the other, a recess in one of said portions to hold a plate of said type in printing position without locking the plate in the device, means interposed between said portions for physically obstructing said movement of one portion toward the other unless a plate is properly positioned in said recess, and means responsive to placement of the plate in proper position in said recess to render said obstructing means inoperative.

9. A device for printing names and addresses or other indicia on sales slips or the like with plates of the customer-token type, comprising a base, a head, means interconnecting said two parts to permit up-and-down movement of the head toward and from the base, a recess in said base to hold a plate of said type in printing position without locking the plate in the device, a detent in the path of said head for physically obstructing movement of the head toward the base when the plate is improperly positioned in said recess, and means responsive to placement of the plate in proper position in said recess to render said detent inoperative.