

[54] **AUTOMATIC PLATE CLAMPING AND DISCHARGING DEVICE FOR USE IN OFFSET PRINTING PRESS**

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Related U.S. Application Data

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[52] U.S. Cl. 101/216, 101/415.1

[51] Int. Cl. B41f 27/06

[58] Field of Search 101/415.1, DIG. 12, 132, 136, 101/137, 140, 141, 142, 232, 216, 217; 271/57

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Primary Examiner—J. Reed Fisher

Attorney—Burgess, Ryan & Wayne

[57] **ABSTRACT**

In an offset printing plate having an automatic plate clamping and discharging device, light reflected from or transmitted through both side edges of a plate feed passageway and/or plate cylinder is intercepted by a pair of photoelectric effect elements whereby misalignment of the plate edges provides a detectable different electrical output in each photoelectric element. When the printing plate is fed under normal conditions and/or when the printing plate is correctly clamped around the plate cylinder, only a clamp means for clamping the plate around the plate cylinder is actuated. When the plate is fed under abnormal conditions and/or is not correctly clamped, a plate discharge means is also actuated in addition to the clamp means so that the plate which is once clamped, is removed from the plate cylinder and discharged out of the printing press. The plate clamp means as well as discharge means are controlled by electronic circuit means.

7 Claims, 19 Drawing Figures

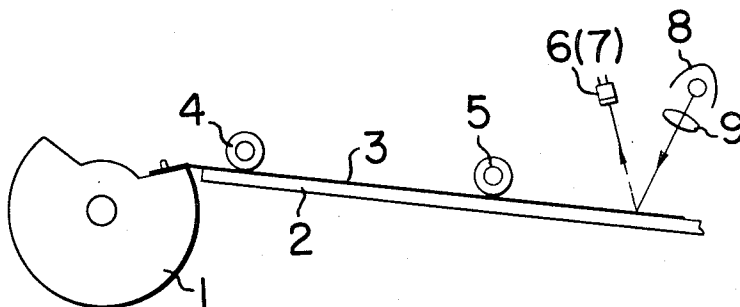


FIG. 1

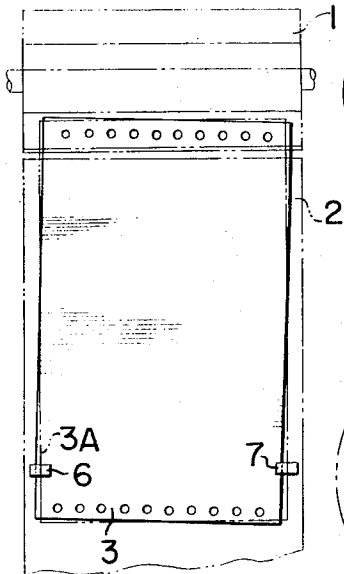


FIG. 2

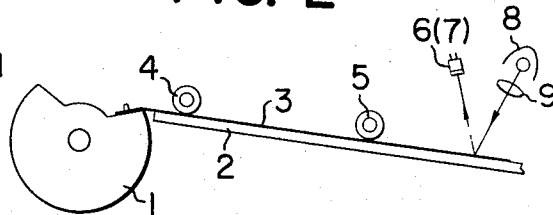


FIG. 3

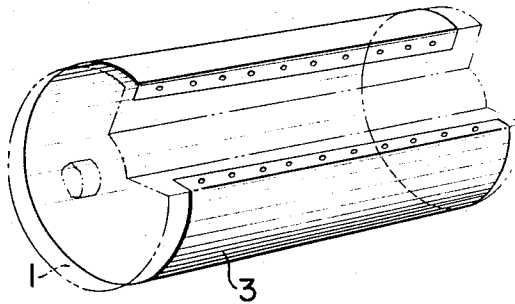


FIG. 4A

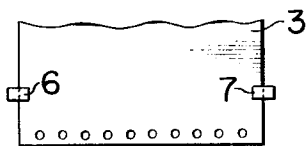


FIG. 5

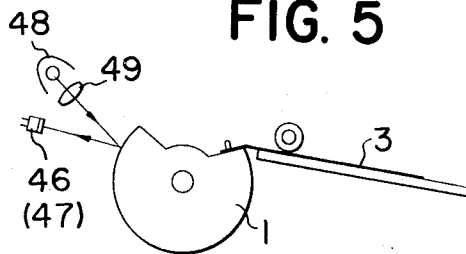


FIG. 4B

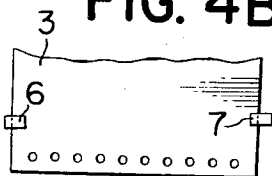


FIG. 6

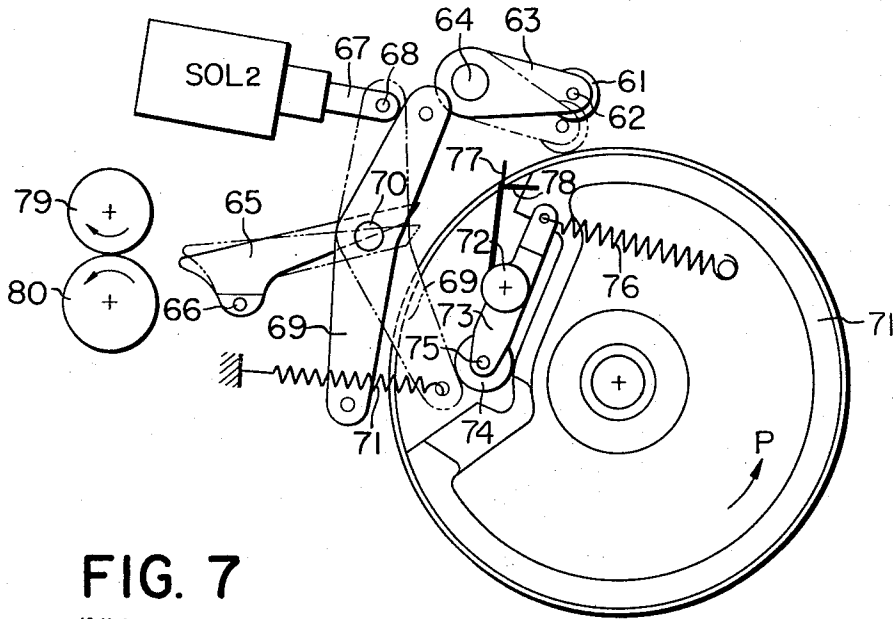


FIG. 7

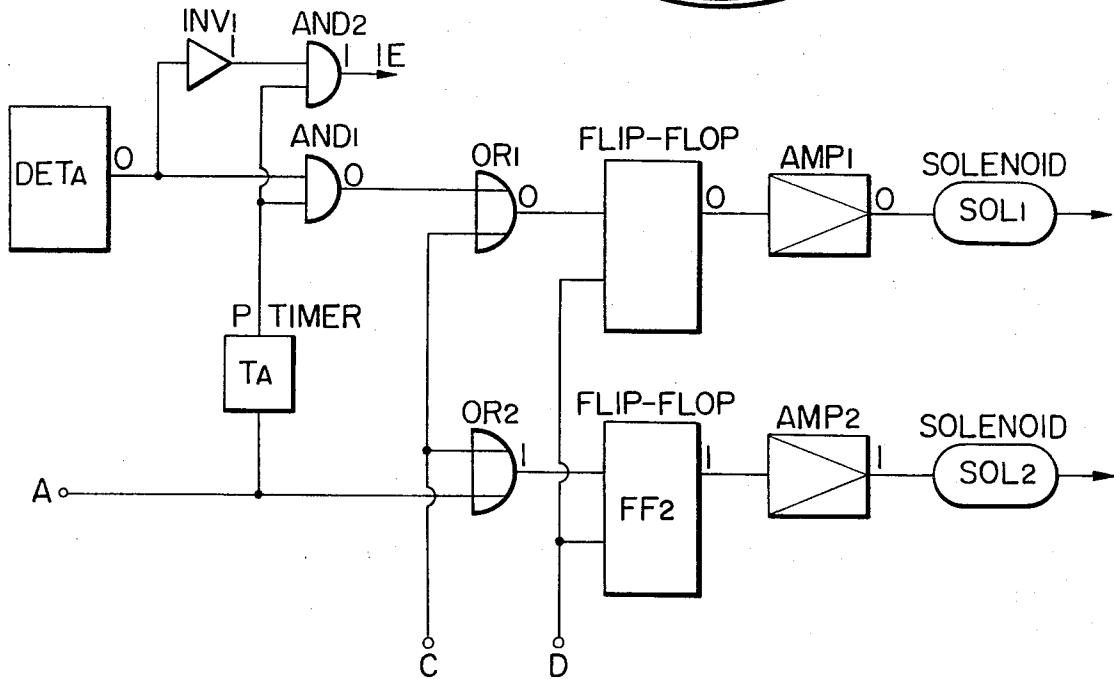


FIG. 8

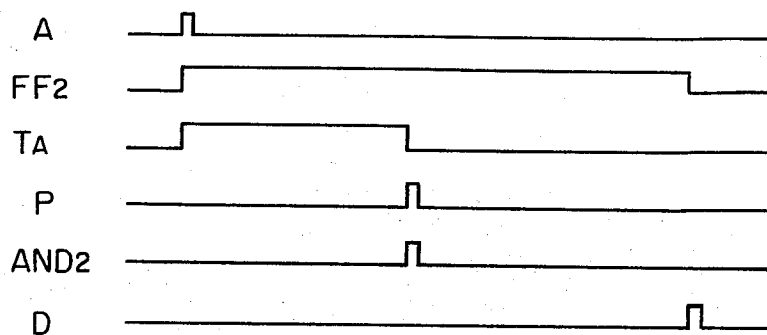


FIG. 9

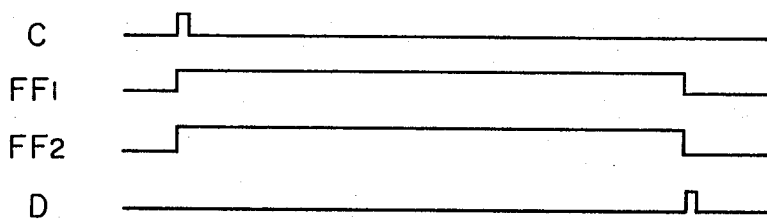
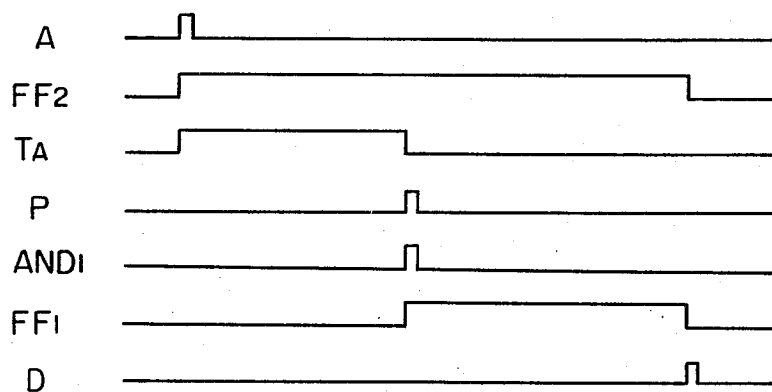


FIG. 10



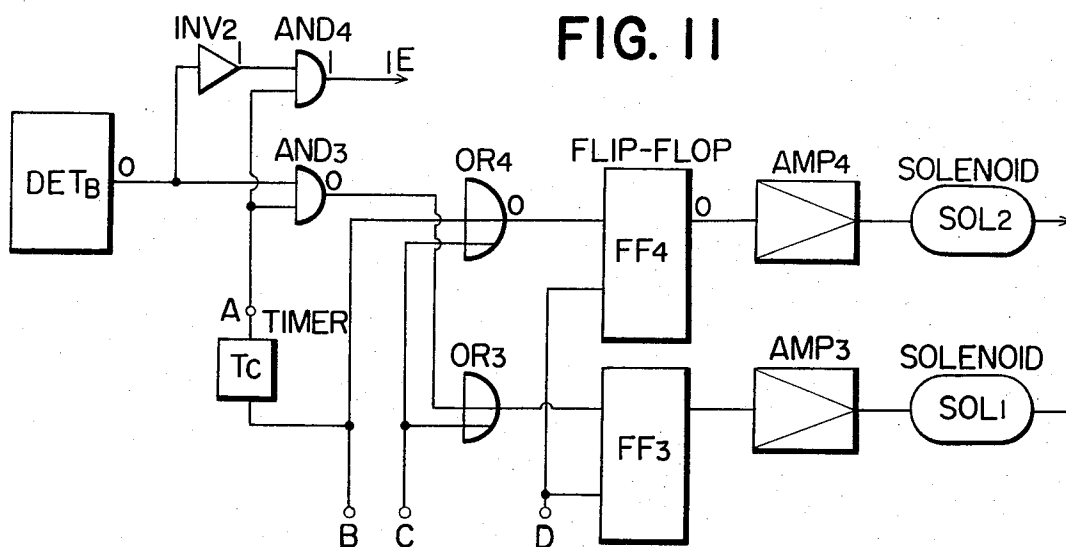


FIG. 12

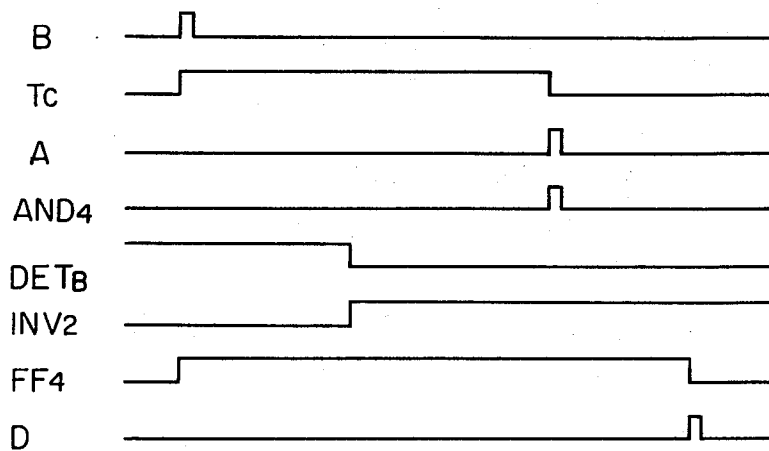


FIG. 13

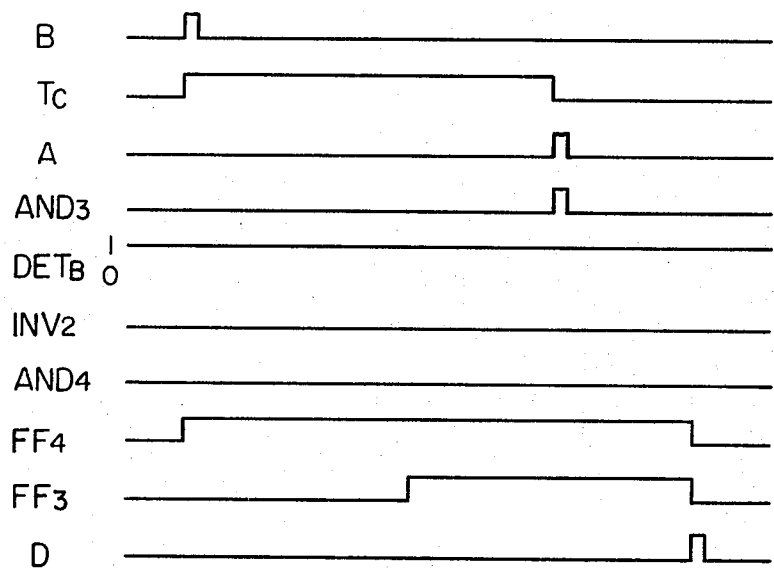


FIG. 14

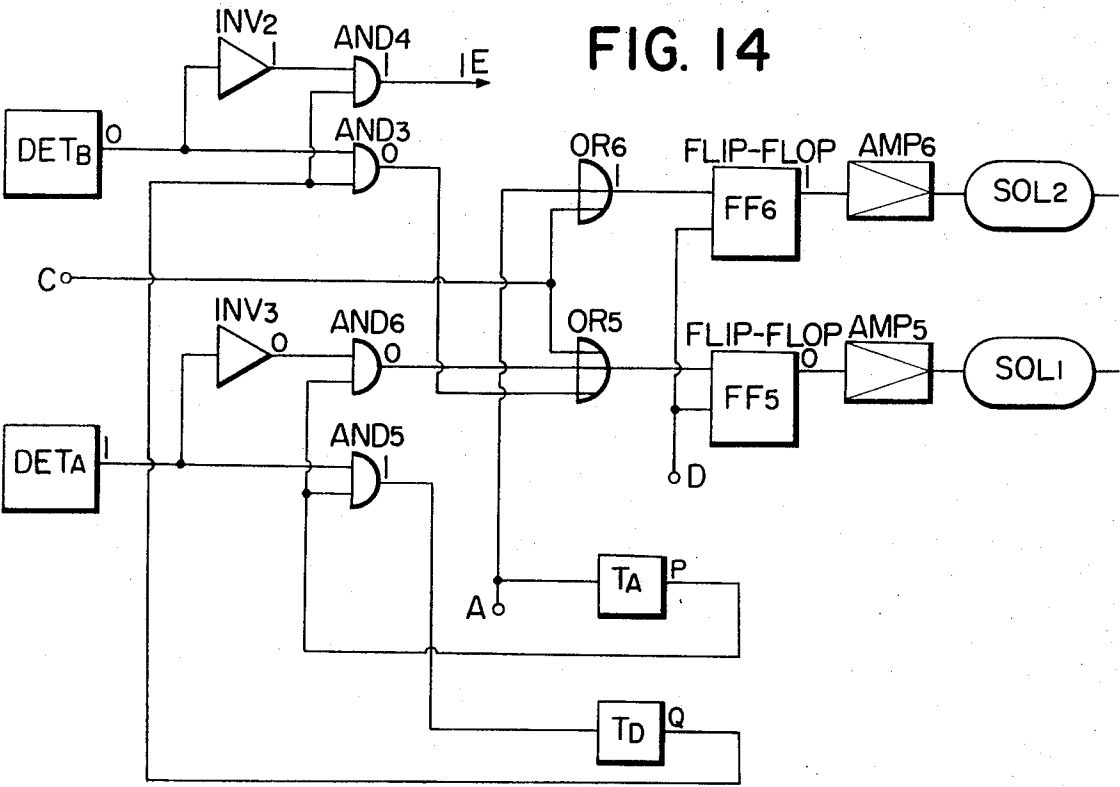


FIG. 15

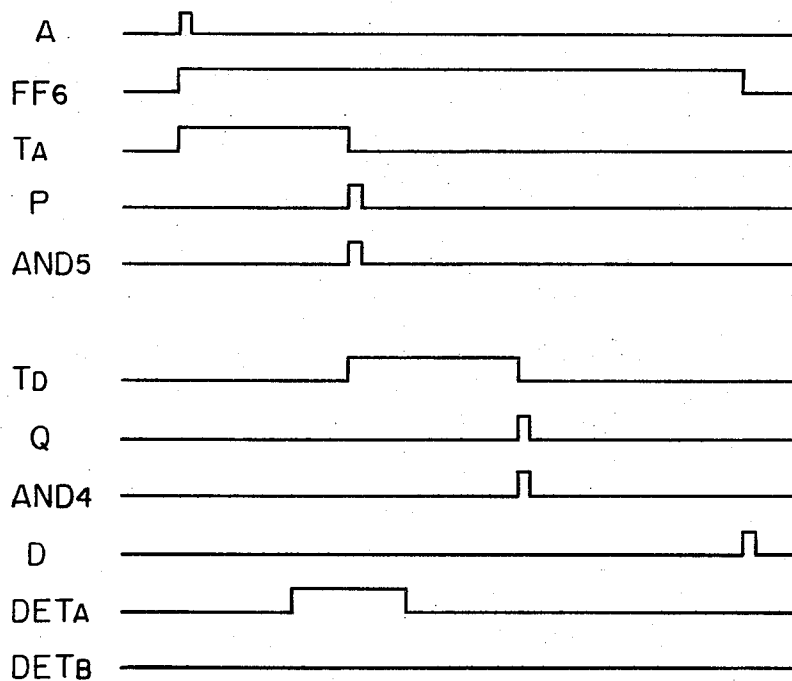


FIG. 16

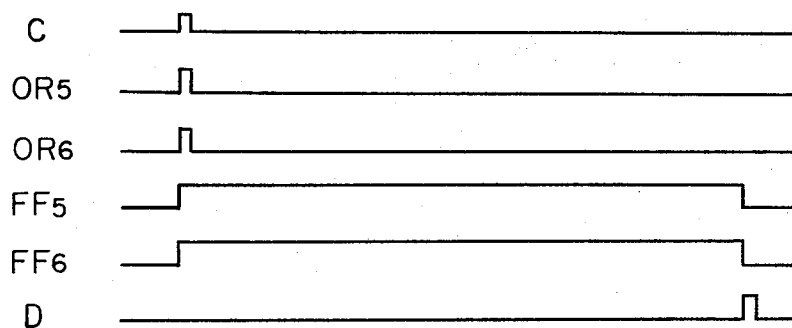


FIG. 17

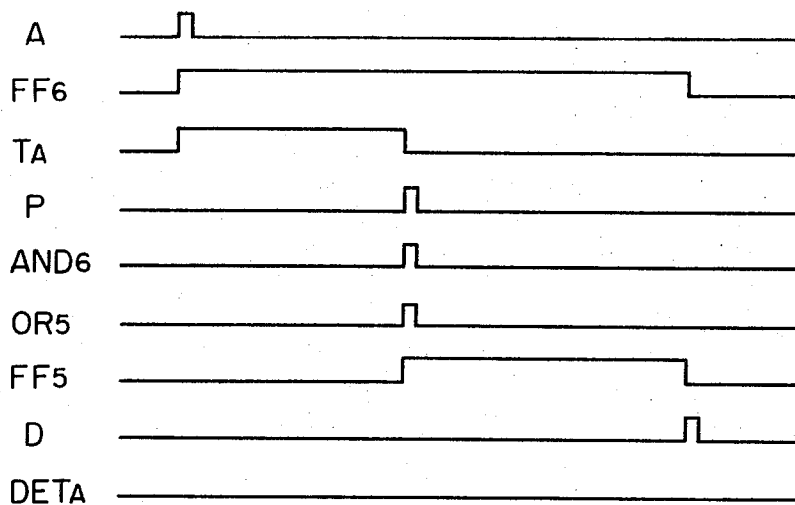
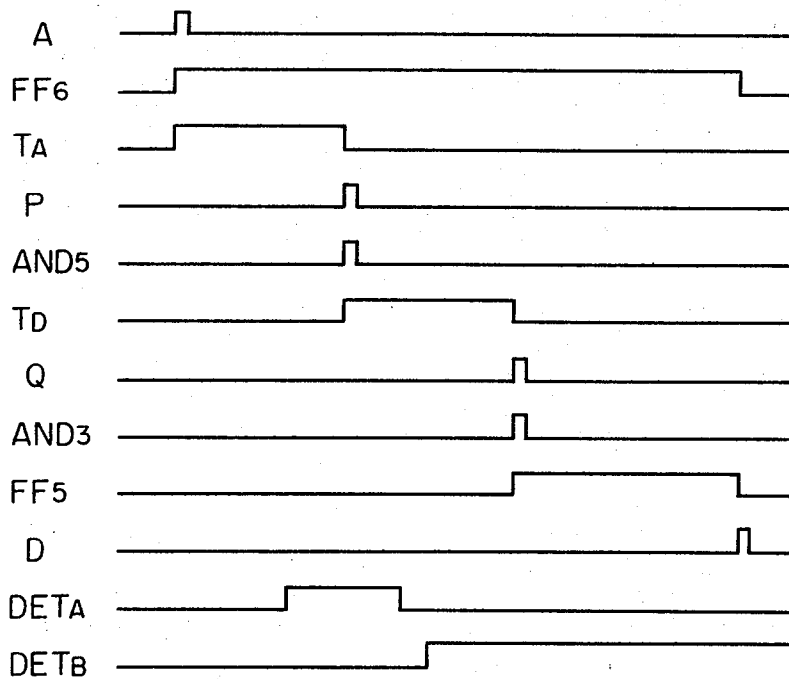


FIG. 18



AUTOMATIC PLATE CLAMPING AND DISCHARGING DEVICE FOR USE IN OFFSET PRINTING PRESS

CROSS-REFERENCE TO RELATED APPLICATION

The present invention is a continuation-in-part of patent application Ser. No. 855,452, filed Aug. 19, 1969, now abandoned, entitled "Detecting Means for Printing Plate about a Plate Cylinder of a Printing Press," by Takeshi Abe.

BACKGROUND OF THE INVENTION

The present invention relates generally a printing press, and more particularly an offset printing press capable of automatically clamping a printing plate around a printing plate cylinder and removing it therefrom.

It is very tedious and inefficient in offset printing press operation to manually clamp around and detach from a plate cylinder each printing plate when a plurality of printing plates are successively used for printing. To eliminate these defects, there has been proposed a method of the type in which a plurality of printing plates are stacked upon a predetermined position and are fed one by one by means of a suitable feed mechanism through a printing plate passageway toward the plate cylinder so that the printing plate may be automatically clamped around the plate cylinder. In this case, each of the printing plates must be clamped around the plate cylinder in correct position for correct printing in an automatic offset printing press. In the conventional automatic offset printing press, a printing plate is transported toward a plate cylinder in such a manner that the printing plate may be correctly clamped around the plate cylinder. However, it is extremely difficult to clamp the printing plate around the plate cylinder with a high degree of accuracy. The printing plate often tends to be inclined upon the printing plate passageway relative to the correct feeding direction so that the printing plate clamped around the plate cylinder is misaligned relative to the correct direction. In some case, because of the misalignment of the printing plate during its transportation toward the plate cylinder, the printing plate will not be clamped around the cylinder at all.

One of the objects of the present invention is to detect mis-alignment of a printing plate being fed in a plate passageway to a plate cylinder and/or being clamped on a plate cylinder so that the plate may be correctly clamped around the plate cylinder.

SUMMARY OF THE INVENTION

Briefly stated, according to the present invention, means is provided in an offset printing press capable of automatically clamping a printing plate around a plate cylinder to detect the conditions and position of a printing plate being fed toward the plate cylinder in a plate feed passageway and/or being clamped on a plate cylinder, and to generate the signals representative of said conditions and position of the plate. When the printing plate is fed under normal conditions, the plate is clamped around the plate cylinder, but when the plate is fed under abnormal conditions it is discharged out of the offset printing press without being clamped around the plate cylinder. Electronic circuit means are

provided to control a plate clamp means and a plate discharge means in response to the signals from said detecting means.

According to one aspect of the present invention, the plate clamping means and the plate discharge means are controlled by independent electronic circuit means in such a manner that only the plate clamp means is actuated to clamp the plate around the plate cylinder, whereas both of clamp means and plate discharge means are actuated to discharge the printing plate. Thus the control becomes reliable in operation.

According to another aspect of the present invention, the plate is automatically removed from the plate cylinder and discharged out of the offset printing press when a predetermined number of sheets has been printed.

The above and other objects, features and advantages of the present invention will become more apparent from the following description of the preferred embodiments thereof taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic plan view of one embodiment of the present invention;

FIG. 2 is a side view thereof;

FIG. 3 is a perspective view illustrating a printing plate clamped around a plate cylinder in mis-alignment relation therewith;

FIGS. 4A and 4B are explanatory views illustrating the relative positions of a pair of photoelectric effect elements and both side edges of the aligned and mis-aligned printing plates, respectively.

FIG. 5 is a side view of another embodiment of the present invention;

FIG. 6 is a schematic side view of a printing plate clamp means and discharge means of the present invention;

FIG. 7 is a diagram of an electronic control circuit of a first embodiment of the present invention;

FIGS. 8, 9 and 10 are time charts used to explain the mode of operation of the electronic circuit shown in FIG. 7, FIG. 8 illustrating the normal condition, FIG. 9 the operation of discharging the printing plate, and FIG. 10, the abnormal condition;

FIG. 11 is a diagram of an electronic control circuit of a second embodiment of the present invention;

FIGS. 12 and 13 are time charts used to explain the mode of operation of the electronic control circuit shown in FIG. 11, FIG. 12 illustrating the normal condition, and FIG. 13, the abnormal condition;

FIG. 14 is a diagram of an electronic control circuit of a third embodiment of the present invention; and

FIGS. 15, 16, 17 and 18 are time charts used to explain the mode of operation of the electronic control circuit shown in FIG. 14, FIG. 15 illustrating the normal condition, FIG. 16, the discharge operation, FIG. 17, the abnormal condition in which mis-alignment occurs in the feed of the printing plate toward the plate cylinder, and FIG. 18, the abnormal condition in which the printing plate is not correctly clamped around the plate cylinder.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, reference numeral 1 designates a plate cylinder having a device for automatically releasably clamping a plate around the plate cylinder; 2, a printing plate passageway connecting a printing plate holding stand, not shown, and the printing plate cylinder 1; and 3, a printing plate. The printing plate 3 is adapted to be transported toward the plate cylinder 1 upon the passageway 2 by means of a pair of feed rollers 4 and 5 (see FIG. 2), and the printing plate holding stand, the plate cylinder 1 and the printing plate feeding mechanism are so arranged that the printing plate may be transported toward the plate cylinder 1 in a predetermined correct position or state. At the positions on both sides of the passageway 2 in opposed relation to their corresponding side edges of the printing plate 3, there are disposed a pair of photoelectric elements 6 and 7 and an illumination source 8 and a condenser lens 9 for converging the light from the light source 8 (see FIG. 2). The pair of photoelectric elements 6 and 7 are so arranged that they receive the light reflected by the side edges of the printing plate 3 when the latter is illuminated by the light from the light source 8 through the condenser lens 9. When the printing plate 3 is being transported correctly along the correct passage indicated by the chain line 3A in FIG. 1, the intensity of the light reflected by both sides of the printing plate 3 and received by the pair of photoelectric elements 6 and 7 is equal (see FIG. 4A). Therefore, when the printing plate 3 is being transported with the mis-alignment relative to the longitudinal direction of the passageway 2 as shown in FIG. 1, the light received by the pair of photoelectric elements 6 and 7 is not equal in intensity (see FIG. 4B) so that their outputs are accordingly different from each other. The pair of photoelectric elements 6 and 7 are electrically connected to an alarm or control circuit, not shown, so that the mis-alignment of the printing plate 3 may be detected and corrected.

The state of the printing plate 3 transported toward the plate cylinder 1 in mis-alignment relation and clamped around the cylinder 1 is shown in FIG. 3. Even when the printing plate is clamped around the cylinder 1 in mis-alignment relation therewith this mis-alignment may be detected in a manner described hereinabove. That is, referring to FIG. 5, a pair of photoelectric elements 46 and 47 are disposed in opposed relation to the sides of the plate cylinder, and a light source 48 and a condenser lens 49 are so disposed as to illuminate both sides of the cylinder 1. The light reflected by the side edges of the plate cylinder 1 is received by the pair of photoelectric elements 46 and 47. When the printing plate is not correctly clamped around the plate cylinder 1 as described above, the outputs from the pair of elements 46 and 47 are different from each other, so that the mis-alignment of the printing plate 3 upon the plate cylinder 1 can be detected and corrected by an alarm or correction device.

Although the present invention has been described so far as employing reflected light, it will be understood that direct light from a light source may be also utilized in detection of the mis-alignment of the printing plate when a plate cylinder and a printing passageway are made of a transport material. Alternately, both or one

of the detecting elements may be disposed within the plate cylinder and the portions of the peripheral surface of the plate cylinder may be made transparent or opened so as to transmit or pass therethrough the light from the light source to the detecting element or elements. Thus, the detecting device of the present invention may be disposed in the printing plate passageway or in the vicinity or within the plate cylinder as desired. The spacing between the pair of detecting elements may be suitably adjusted according to the width of the printing plate.

Next the mode of operation for automatic clamping and discharge of a plate of a printing press incorporating only means for detecting the plate feed condition, a printing press incorporating only means for detecting the condition of a plate clamped around a printing plate cylinder, and a printing press incorporating both of said two means will be described.

i. Printing Press incorporating only Means for detecting plate feed condition: (See FIGS. 6, 7, 8, 9 and 10)

When the detecting means for detecting mis-alignment of printing plate with respect to a plate cylinder (See FIG. 2) detects any fault, a detector DET_A (See FIG. 7) is turned on, whereas when the detecting means detects no fault, the detector remains off.

a. When a plate is being transported under normal conditions: (See FIG. 8)

The signal from the detector DET_A is "0" when the plate is transported under normal conditions. "0"s and "1"s in FIG. 7 designate the outputs from various component parts when the plate is transported under normal conditions. The signal A is transmitted through an OR gate OR₂ to a flip-flop FF₂ to set it, and the output of the flip-flop FF₂ is amplified by an amplifier AMP₂ to energize a solenoid SOL₂. As a result, a lever 69 which is pivoted to a plunger 67 of the solenoid SOL₂ with a pivot pin 68, is caused to rotate about a pivot 70 in the counterclockwise direction against the force of a spring 71. A plate clamp lever 73 having a roller 74 fixed rotatably to one end thereof with a pivot 75 and made into contact with the lever 69, is caused to rotate about a pivot 72 against the force of a spring 76 in the counterclockwise direction. As a result, a plate clamp 77 is opened. The clamp 77 and a pawl 78 are formed integral with the lever 73. The plate is made into engagement with the pawl 73, and then is wrapped around the plate cylinder 71.

Since the output signal from the DET_A is "0", the "1" signal is applied to an AND gate AND₂. An inverter INV₁ is turned on, and the signal A is delayed in time by a timer T_A and is applied to an AND gate AND₂. Therefore the AND gate AND₂ outputs the signal for etching or inking. When the plate cylinder 71 rotates through a predetermined angle, the reset signal is applied to a terminal D, and flip-flops FF₁ and FF₂ are reset. As a result in response to the signals from the amplifiers AMP₁ and AMP₂, the solenoids SOL₁ and SOL₂ are de-energized, a plate-discharge-runner supporter 63, a plate discharge clamp 65, and the lever 69 are returned to their initial positions indicated by the solid lines. Thus, the printing plate is securely clamped around the plate cylinder 71.

b. When printing is finished: (See FIG. 9)

When a predetermined number of sheets are printed, a counter, not shown, outputs the signal to a terminal

C, and the OR gates OR_1 and OR_2 are turned on, whereas the flip-flops FF_1 and FF_2 are set so that the solenoids SOL_1 and SOL_2 are energized. The plate discharge clamp 65 and the lever 69 are actuated to move to the positions indicated by the chain lines in FIG. 6, and the plate clamp 77 is opened. The plate discharge runner 61 pushes the leading edge of the plate into the cavity, not shown, formed in the surface of the plate cylinder 71 so that the printing plate is bowed and disengaged from the clamp 77. Thereafter, the plate passes over the clamp 65 and is discharged by a pair of upper and lower plate discharge runners 79 and 80.

When the plate cylinder 71 rotates through the predetermined angle, the signal is applied to the terminal D to reset the flip-flops FF_1 and FF_2 . As a result, the solenoids SOL_1 and SOL_2 are de-energized, and the plate-discharge-runner supporter 63 and the lever 69 are returned to their initial positions as described above. Thereafter the next printing plate is fed.

c. When the printing plate is fed under abnormal conditions: (See FIG. 10)

When the signal is applied to the terminal A, the flip-flop FF_2 outputs the signal to the amplifier AMP_2 so that the solenoid SOL_2 is energized as described above. The clamp 77 is opened, and the pawl 78 engages with the leading edge of the plate. Since the detector DET_A is turned on, when the output appears at the output terminal of the delay circuit T_A , the AND gate AND_1 and the OR gate OR_1 are turned on so that the flip-flop FF_1 is set. The output from the flip-flop FF_1 is amplified by the amplifier AMP_1 and is applied to the solenoid SOL_1 which is not shown in FIG. 6. When the solenoid SOL_1 is energized, the supporter 63 carrying the discharge runner 61 pivoted at 62 is caused to rotate about a pivot 64 in the clockwise direction, and the plate discharge clamp 65 is caused to rotate about a pivot 66 also in the clockwise direction to the position indicated by the chain lines. As the plate clamp 77 has been opened as described above, the leading edge of the plate is pushed into the cavity of the plate cylinder 71 by the plate discharge runner 61 and is disengaged from the pawl 78 to be discharged past over the discharge clamp 65 by the pair of plate discharge runners 79 and 80.

ii. Printing Press incorporating Means for detecting clamped Condition of Plate: (See FIGS. 11, 12 and 13)

A detector DET_B (See FIG. 11) is turned off when the plate is clamped around the plate cylinder correctly.

a. When the clamped plate is normal: (See FIG. 12)

When the signal is applied to an input terminal B after the plate feed signal has been generated, the signal is transmitted to an OR gate OR_4 , and the latter outputs the signal to set a flip-flop FF_4 . The output of the flip-flop FF_4 is amplified by an amplifier AMP_4 to be applied to a solenoid SOL_2 . Thus the solenoid SOL_2 is energized so that the lever 69 is actuated to open the plate clamp 77 in the manner described above. The printing plate is made into engagement with the pawl 78 of the plate clamp 77 and is wrapped around the plate cylinder 71. The output "1" of an inverter INV_2 is applied to an AND gate AND_4 , and when the signal A appears at the output terminal A of a timer T_C , and is applied to the AND gate AND_4 , the etching or inking

signal is generated. When the plate cylinder 71 rotates through a predetermined angle, the reset signal is applied to the terminal D, and the flip-flop FF_4 is reset to de-energize the solenoid SOL_2 . As a result, the plate clamp 77 is closed to clamp the plate around the plate cylinder 71.

After a predetermined number of sheets has been printed, a counter, not shown, generates a signal, which is applied to the terminal C. Therefore the OR gates OR_3 and OR_4 output the signals to be applied to the flip-flops FF_3 and FF_4 respectively to set them. As a consequence, both of solenoids SOL_1 and SOL_2 are energized so that the plate clamp 77 is opened, and the supporter 63, and the plate discharge clamp 65 are displaced to the positions indicated by the chain lines. Thus, the printing plate is discharged.

b. The clamped plate is abnormal: (See FIG. 13)

The printing plate is engaged with the plate clamp 77, and is wrapped around the plate cylinder in the manner described in (ii - a). The detector DET_b is turned on when the plate clamped around the plate cylinder is abnormal. Therefore when the signal A is applied to the AND gate AND_3 , the latter outputs the signal to the OR gate OR_3 , which in turn outputs the signal to the flip-flop FF_3 to set it. Thus the solenoid SOL_1 is energized so that the supporter 63 and the plate discharge clamp 65 are displaced to the position indicated by the chain lines in the manner described hereinbefore. Therefore the plate is discharged. When the reset signal is applied to the terminal D, the flip-flops FF_3 and FF_4 are reset, and the solenoids SOL_1 and SOL_2 are de-energized.

iii. Printing press incorporating both of said means: (See FIGS. 14-18)

Referring to FIG. 14, a detector DET_A is turned on when the plate is fed under normal conditions, whereas a detector DET_B is turned off when the clamped plate is normal.

a. When the printing plate is fed under normal conditions and is clamped correctly around the plate cylinder: (See FIG. 15)

The signal is applied to the terminal A after a short period of time the plate feed signal generated, so that the OR gate OR_6 outputs the signal to a flip-flop FF_6 to set it. The output of the flip-flop FF_6 is amplified by an amplifier AMP_6 , and applied to the solenoid SOL_2 to energize it. The plate clamp is opened, and the printing plate engages with the pawl 78 and is wrapped around the plate cylinder 71 in the manner described hereinbefore. When the signal P, which is the signal applied to the terminal A and delayed by a timer T_A , is applied to an AND gate AND_5 , the latter outputs the signal which is further delayed by a timer T_D and applied to the AND gate AND_4 . Since the output "1" of the inverter INV_2 is also applied to the AND gate AND_4 , the etching or inking signal is generated as described hereinbefore. When the plate cylinder rotates through a predetermined angle, the reset signal is applied to the terminal D to reset the flip-flop FF_6 so that the solenoid SOL_2 is de-energized in a manner similar to that described above with reference to FIGS. 7 and 11. Therefore, the plate clamp 57 is closed to clamp the plate around the plate cylinder 71. Thus, printing is started.

When a predetermined number of sheets has been printed, a counter, not shown, generates the signal to be applied to the terminal C. Therefore, the flip-flops FF₅ and FF₆ are set through the OR gates OR₅ and OR₆ respectively, so that both of solenoids SOL₁ and SOL₂ are energized through the amplifiers AMP₅ and AMP₆ respectively. As a result, the plate discharge-runner supporter 63, the plate discharge clamp 65 and the lever 69 are displaced to the positions indicated by the chain lines in FIG. 6 in the manner described before. Thus the plate is discharged in the manner similar to that described in (i - c). When the reset signal is applied to the terminal D, the solenoids SOL₁ and SOL₂ are de-energized, and the plate cylinder is now ready to receive the next printing plate.

b. When the plate is fed under abnormal conditions: (See FIG. 17)

When the signal is applied to the terminal A, the solenoid SOL₂ is energized, the plate clamp 77 is opened and the pawl 78 engages with the leading edge of the plate in the manner described above. However, the inverter INV₃ does not output the signal "1" to the AND gate AND₆ so that when the time-delayed signal P is applied to the AND gate AND₆, the latter outputs the signal to the OR gate OR₅ which in turn outputs the signal to set the flip-flop FF₅. As a result, the solenoid SOL₁ is energized so that the printing plate is discharged in the manner described in (i - c).

c. When the clamped printing plate is abnormal: (See FIG. 18)

The signal applied to the terminal A sets the flip-flop FF₆ so that the solenoid SOL₂ is energized. Therefore the plate is wrapped around the plate cylinder and clamped in position in the manner described above. The signal transmitted through the timer T_D, the AND gate AND₃ and the OR gate OR₃ sets the flip-flop FF₅ to energize the solenoid SOL₁. As a result, the plate is discharged in the manner described in (ii - b). When the reset signal is applied to the terminal D, the flip-flops FF₅ and FF₆ are reset to de-energize the solenoids SOL₁ and SOL₂. Thus the plate cylinder 71 is now ready to receive the next plate in the manner described above.

What is claimed is:

1. An automatic plate clamping and discharging device for use in an offset printing press comprising
 - a. means for detecting the deviation in condition and position of a printing plate being fed,
 - b. means for clamping the plate around a plate cylinder,
 - c. means for removing the plate from said plate cylinder and discharging said plate,
 - d. electronic circuit means for opening said clamp means in response to the plate feed signal,
 - e. electronic circuit means for generating the printing-ready-operation signal in response to the signal from said detecting means representing that the plate is fed under normal conditions,
 - f. electronic circuit means for actuating said plate discharge means to discharge the plate in response to the signal from said detecting means representing that the plate is fed under abnormal conditions,
 - g. electronic circuit means for resetting said clamp means and said discharge means, and

h. electronic circuit means for opening said clamp means and actuating said plate discharge means to discharge the plate in response to the signal representing that a predetermined number of sheets is printed.

2. An automatic plate clamping and discharging device as set forth in claim 1 wherein said detecting means detects the conditions and position of the plate by the difference in quantity of reflected light from the plate received in two photoelectric elements disposed on both sides of the plate.

3. An automatic plate clamping and discharging device as set forth in claim 1 wherein said clamp means comprises

- a plate clamp lever integral with a plate clamp and a clamping pawl,
- a spring for biasing said plate clamp lever in the direction in which said plate clamp is closed, a lever for rotating said plate clamp lever in the direction in which said clamp is opened, and a spring for returning said lever; and

said plate discharge means comprises a plate discharge roller adapted to push a part adjacent to the leading edge of the plate, when the latter is discharged, to cause said leading edge of said plate to bow,

supporter means for rotatably carrying said plate discharge roller,

a rotatable plate discharge clamp

a pair of plate discharge runners disposed adjacent to the trailing end of said plate discharge clamp.

4. An automatic plate clamping and discharging device for use in an offset printing press comprising

- a. means for detecting the deviation in condition and position of the plate which is being wrapped around a plate cylinder,
- b. means for clamping the plate around a plate cylinder,
- c. means for removing the plate from said plate cylinder and discharging said plate,
- d. electronic circuit means for opening said clamp means in response to the plate feed signal,
- e. electronic circuit means for generating the printing-ready-operation signal in response to the signal from said detecting means representing that the plate is fed under normal conditions,
- f. electronic circuit means for actuating said plate discharge means to discharge the plate in response to the signal from said detecting means representing that the plate is fed under abnormal conditions,
- g. electronic circuit means for resetting said clamp means and said discharge means, and
- h. electronic circuit means for opening said clamp means and actuating said plate discharge means to discharge the plate in response to the signal representing that a predetermined number of sheets is printed.

5. An automatic plate clamping and discharging device as set forth in claim 4 wherein said detecting means detects the conditions and position of the plate by the difference in quantity of reflected light from the plate received in two photoelectric elements disposed on both sides of the plate.

6. An automatic plate clamping and discharging device as set forth in claim 4 wherein said clamp means comprises

- a plate clamp lever integral with a plate clamp and a clamping pawl, 5
- a spring for biasing said plate clamp lever in the direction in which said plate clamp is closed,
- a lever for rotating said plate clamp lever in the direction in which said clamp is opened, and
- a spring for returning said lever; and 10
- said plate discharge means comprises
- a plate discharge roller adapted to push a part adjacent to the leading edge of the plate, when the latter is discharged, to cause said leading edge of said plate to bow, 15
- supporter means for rotatably carrying said plate discharge roller,
- a rotatable plate discharge clamp
- a pair of plate discharge runners disposed adjacent to the trailing end of said plate discharge clamp. 20

7. An automatic plate clamping and discharging device for use in an offset printing press comprising

- a. means for detecting the deviation in condition and position of a plate being fed,
- b. means for detecting the deviation in condition and 25

position of the plate which is being wrapped around a plate cylinder,

- c. means for clamping the plate around a plate cylinder,
- d. means for removing the plate from said plate cylinder and discharging said plate,
- e. electronic circuit means for opening said clamp means in response to the plate feed signal,
- f. electronic circuit means for generating the printing-ready-operation signal in response to the signal from said detecting means representing that the plate is fed under normal conditions,
- g. electronic circuit means for actuating said plate discharge means to discharge the plate in response to the signal from said detecting means representing that the plate is fed under abnormal conditions,
- h. electronic circuit means for resetting said clamp means and said discharge means, and
- i. electronic circuit means for opening said clamp means and actuating said plate discharge means to discharge the plate in response to the signal representing that a predetermined number of sheets is printed.

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