

[54] **CUTTER AND CREASER**

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[30] **Foreign Application Priority Data**

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[51] Int. Cl.**B65h 5/10, B65h 5/12, B65h 29/04**

[58] Field of Search.....**83/284, 509, 510, 277, 94; 93/58.2**

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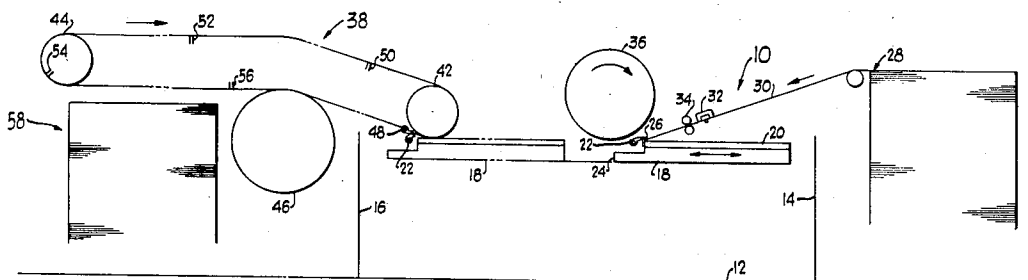
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[57] **ABSTRACT**

A cutter and creaser is fabricated from the components of a flat bed letter press. A carriage is mounted on the press frame member for horizontal longitudinal reciprocal movement between the feed end of the press and the delivery end of the press. A die plate suitable for cutting or creasing paperboard or the like is positioned on the upper surface of the carriage, or in some cases, wrapped around the cylinder. A cylinder is positioned above the carriage and is arranged to press a sheet into the die plate as the carriage moves reciprocally thereunder. A sheet delivery device includes an inclined feedboard that feeds the front edge of the sheet to the front edge of the carriage where the front edge of the sheet is engaged by gripper means. The carriage is advanced forwardly beneath the cylinder while the sheet is engaged by the gripper device on the carriage to press the sheet against the die plate. A sheet delivery device includes gripper means to engage the front edge of the sheet on the carriage and transfer the sheet from the carriage to a stacking device. Another embodiment includes gripper means on the cylinder to engage the front edge of the sheet and transfer the sheet to the gripper device on the front of the carriage.

5 Claims, 2 Drawing Figures



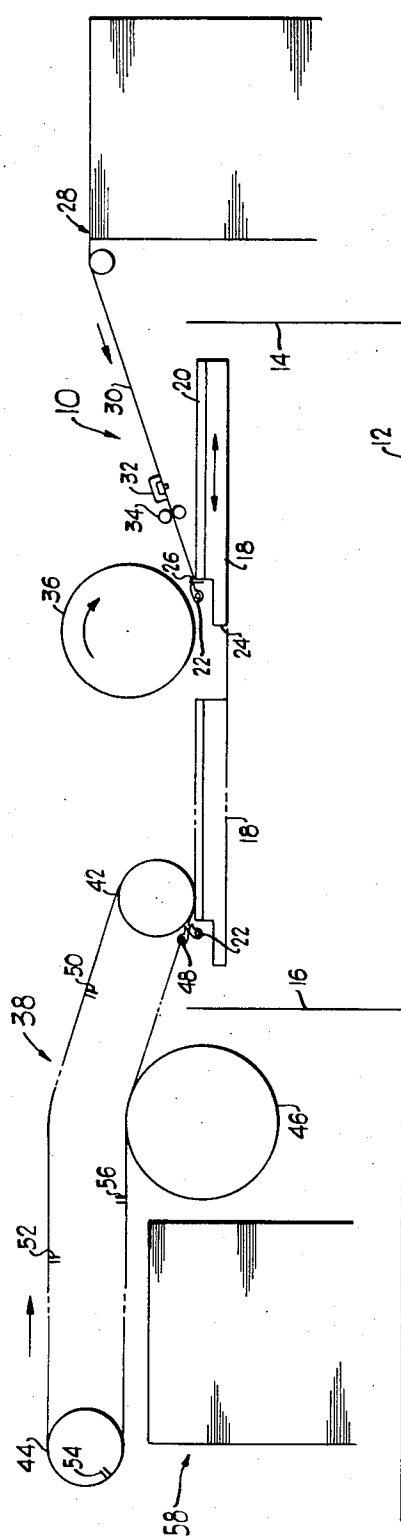


Fig. 1.

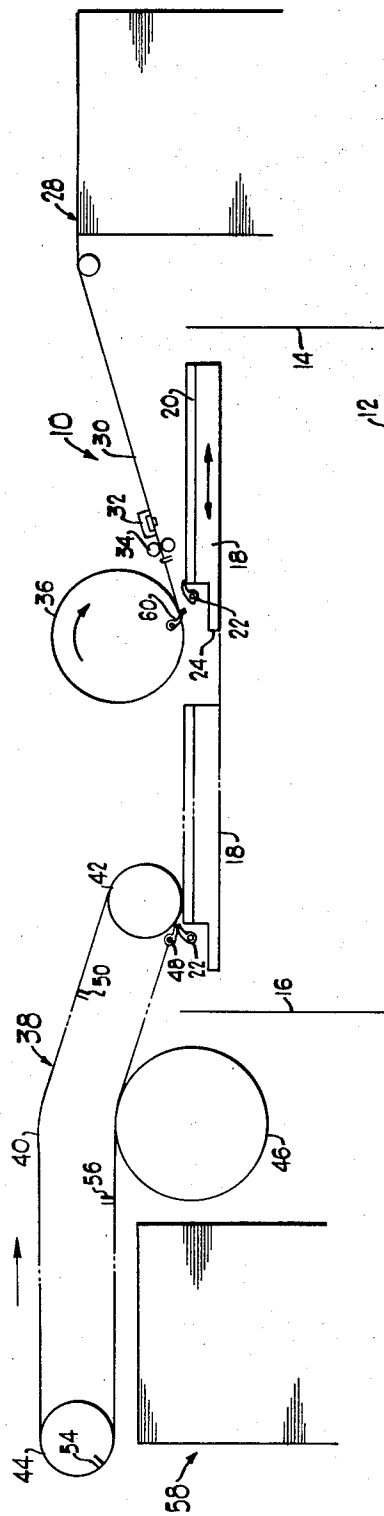


Fig. 2.

CUTTER AND CREASER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a flat bed cutter or creaser and, more particularly, to a cutter and creaser fabricated from a flat bed offset printing press.

2. Description of the Prior Art

Letter presses include a cylinder mounted above a reciprocating bed. The cylinder has gripper devices thereon and is arranged to engage the front edge of a sheet adjacent the top periphery of the cylinder from a sheet feeder device. Rotation of the cylinder in a direction away from the sheet feeder device wraps the sheet around the cylinder and, as the cylinder rotates, contacts the sheet with the flat printing plate positioned on the reciprocating bed. The printed sheet is transferred from the cylinder to a sheet delivery device at a location adjacent the upper portion of the cylinder.

The conversion of a flat bed press to a cutter and creaser is known. A die plate is substituted for the printing plate and the sheet wrapped around the cylinder is subjected to a cutting or creasing operation as the sheet wrapped around the cylinder passes between the cylinder and the die plate on the reciprocating bed.

The cutting and creasing operation takes place while the reciprocating bed or carriage is moving toward the sheet feed end of the press. The sheet subjected to the cutting and creasing operation is removed from the cylinder at a location adjacent the upper portion of the cylinder in a manner similar to the sheet removal on a conventional flat bed press.

Problems are encountered with the flat bed presses converted to cutters and creasers in that it has been found, in the past, that it is necessary to wrap the sheet around the cylinder. Where relatively thick sheets of cardboard, pasteboard or the like are employed, difficulty is encountered in smoothly wrapping the sheet around the printing cylinder. The relatively stiff cardboard, pasteboard or the like must be subjected to substantial forces to smoothly wrap the sheet around the printing cylinder.

SUMMARY OF THE INVENTION

The herein described invention relates to an apparatus for cutting and creasing sheets that is fabricated from a modified flat bed printing press. The apparatus includes a press frame member having a feed end portion and a delivery end portion. A carriage or bed is mounted on the frame member for horizontal reciprocating movement. A cylinder is rotatably mounted above the carriage and is arranged to press a sheet between the upper surface of the carriage and the outer surface of the cylinder as the carriage moves under the cylinder. A die plate is mounted on either the upper surface of the carriage or wrapped around the cylinder surface so that the die portions of the die are pressed into the sheet as the carriage moves under the cylinder. A sheet feeder device feeds the sheet onto the upper surface of the die plate where the sheet front edge portion is engaged by gripper devices on the carriage. A sheet delivery device includes gripper devices operable to engage the front edge of the sheet on the carriage and transfer the sheet from the carriage to stacking apparatus.

In another embodiment of the invention, the front edge of the sheet is fed by the sheet feeder device to the gripper devices on the cylinder and the sheet is transferred from the gripper devices on the cylinder to the gripper devices on the front end of the reciprocating carriage before the carriage moves beneath the cylinder.

Accordingly, the principal object of this invention is to convert a flat bed press to a cutter and creaser that does not require wrapping a sheet around the cylinder.

Another object of this invention is to provide a flat bed type cutter and creaser where the front edge of the sheet is engaged to the flat bed as the sheet is subjected to a cutting or creasing operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view in elevation of my improved cutter and creaser apparatus that may be fabricated from a flat bed press.

FIG. 2 is a schematic view in elevation similar to that illustrated in FIG. 1, illustrating another embodiment of my cutter and creaser apparatus, wherein the sheet is first engaged by grippers on the rotating cylinder.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings and more particularly to FIG. 1, there is illustrated a cutter or creaser generally designated by the numeral 10 that has a frame member schematically indicated as 12 with a feed end portion 14 and a delivery end portion 16. A carriage or bed 18 is slidably mounted on the frame member 12 for horizontal reciprocal movement, as indicated by the direction of the arrows in both FIGS. 1 and 2. The carriage 18 is arranged to move in a forward direction toward the delivery end portion 16 and in a rearward direction toward the feed end portion 14. The carriage 18 has a die plate 20 mounted thereon for cutting or creasing a sheet, as will be later explained. It should be understood that the die plate 20 could also be wrapped around the cylinder 36 positioned above the carriage 18. The carriage 18 has a plurality of grippers 22 mounted transversely thereon adjacent the front edge 24 of carriage 18. The grippers 22 are arranged to engage the front edge of a sheet to the upper surface of the die plate 20 so that upon forward movement of the carriage 18 toward the delivery end portion 16 the sheet is positioned on the upper surface of the die plate 20. A register bar 26 is provided against which the front edge of the sheet abuts as the grippers 22 engage the sheet to the top surface of the die plate 20.

A sheet feeder device generally designated by the numeral 28 includes an inclined feedboard 30 with side register apparatus 32 and front register apparatus 34 mounted thereon. The feedboard 30 is inclined to feed the sheet downwardly to an elevation adjacent the upper surface of the die plate on the carriage 18 where, as previously stated, the sheet in register is engaged by the grippers 22 on the carriage 18.

A cylinder 36 having an outer cylindrical surface is rotatably mounted in the frame member 12 at a location above the upper surface of the die plate 20 between the frame feed and delivery end portions 14 and 16. The cylinder 36 is positioned at an elevation so that upon rotation in the direction indicated by the arrow the cylinder will press a sheet onto the die plate

20 as the carriage 18 passes therebeneath. The elevation of the cylinder 36 is such that the lower portion of the cylinder periphery will abut the upper surface of the die plate 20. The front edge of the inclined feedboard 30 is at a location below the axis of the cylinder 36 and adjacent the lower periphery of the cylinder 36. The cylinder 36 is suitably driven to rotate continuously in the direction indicated by the arrow as the carriage 18 reciprocates thereunder. Suitable cam devices are also provided along the side of the frame to lift the cylinder 36 above the surface of the die plate 20 as the carriage 18 reciprocates thereunder in a reverse direction toward the frame feed portion 14.

A sheet delivery device generally designated by the numeral 38 has an endless chain conveyor 40 with a pair of spaced parallel chains reeved about sprockets 42 and 44. The outer surface of the chains abut a drum 46 positioned therebeneath. The endless conveyor chains have spaced transverse members therebetween with gripper devices 48, 50, 52, 54 and 56. The gripper devices 48, 50, 52, 54 and 56 are spaced longitudinally on the endless chain conveyor 40 and gripper devices 50, 52, 54 and 56 are illustrated diagrammatically in the drawings. The gripper devices, as for example grippers 48, are arranged to engage the front edge of the sheet on the upper surface of the die plate 20 when the carriage has advanced to the location illustrated in phantom lines in the drawings. The grippers 22 on the carriage 18 are disengaged from the sheet when the carriage reaches the position illustrated in phantom lines, so that the sheet can be removed from the die plate 20 as the carriage 18 moves in a reverse direction toward the frame feed end portion 14. The treated sheet is conveyed by the endless chain conveyor 40 to a suitable stacking device generally designated by the numeral 58.

With the above arrangement, the sheet is fed from the sheet feeder device 28 down the feedboard 30 into side and front registers 32 and 34. The sheet front edge portion is engaged by the grippers 22 to the upper surface of the die plate 20 on the carriage 18. The carriage 18 is then advanced in a forward direction toward the frame delivery end portion 16 beneath the cylinder 36. The outer periphery of the cylinder 36 presses the sheet downwardly into the die plate as the carriage 18 moves therebeneath to cut or crease the sheet. The carriage 18 continues to advance toward the frame delivery end portion 16 until it reaches the location illustrated in phantom lines in the drawings. At that location the gripper devices 20 on the carriage 18 are disengaged from the sheet and the grippers 48 on the endless chain conveyor 40 engage the sheet front edge portion and convey the sheet to the stacking device 58 while the carriage 18 reverses direction and moves to the position indicated in full lines.

With the above arrangement it is now possible to use a substantial number of components of a flat bed press and convert a flat bed press to a cutter and creaser. Further, with the above arrangement the sheet to be treated remains flat and is positioned on the upper surface of the die plate as compared with the previous practice of wrapping the sheet around the cylinder. With the above described cutter and creaser it is now possible to convert a flat bed press to a cutter and creaser that treats relatively stiff and/or thick sheets of cardboard, paste-board or the like.

Referring to FIG. 2, where similar numerals indicate similar parts, there is illustrated a modification of the cutter and creaser illustrated in FIG. 1. In FIG. 2 the cylinder 36 has a plurality of longitudinally extending grippers 60 that are arranged to engage the front edge of the sheet as the sheet is fed down the inclined feedboard 30. The feedboard is arranged so that it is substantially tangent to the cylinder 36 at the lowermost portion of the cylinder so that the sheet front edge portion may be engaged by the grippers 60 on the cylinder 36. The rotation of the cylinder 36 and the reciprocation of the carriage 18 are so timed that the sheet engaged by the grippers 60 on the cylinder 36 is transferred to the grippers 22 on the carriage 18 as the grippers 22 on the carriage 18 are in lapped relation with the grippers 60 on the cylinder 36. With the arrangement illustrated in FIG. 2 the sheet remains substantially flat as it is subjected to the cutting and creasing operation and sheets of varying thickness and stiffness may be treated by the above described apparatus.

According to the provisions of the patent statutes, I have explained the principle, preferred construction, and mode of operation of my invention and have illustrated and described what I now consider to represent its best embodiments. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. Apparatus for cutting or creasing sheets comprising,
 - a press frame member having a feed end portion and a delivery end portion,
 - a carriage mounted on said frame member for horizontal longitudinal reciprocal movement thereon,
 - a cylinder rotatably mounted above said carriage between said frame feed end portion and said frame delivery end portion,
 - said carriage having an upper surface and said cylinder having an outer surface,
 - a die plate mounted on one of said surfaces,
 - sheet feeder means positioned adjacent to said frame feed end portion and operable to feed sheets onto the upper surface of said die plate,
 - sheet delivery means positioned adjacent said frame delivery end portion operable to remove sheets from said carriage and convey said sheets to sheet stacking apparatus,
 - gripper means positioned adjacent the front of said carriage, said gripper means operable to engage the front edge of a sheet fed from said sheet feeder means and maintain said sheet on the upper surface of said die plate while said carriage moves forwardly beneath said cylinder toward said frame delivery end portion, and
 - second gripper means on said sheet delivery means operable to engage the front edge of the sheet on the upper surface of said die plate and remove the sheet from the carriage as said carriage moves toward said frame member feed end portion,
 - said cylinder being positioned above said carriage at an elevation to press a sheet positioned on the upper surface of said carriage into said die plate to effect a cutting or creasing of the sheet.

2. Apparatus for cutting or creasing sheets as set forth in claim 1 in which,

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said sheet feeder means includes an inclined feed-
board having a front end portion positioned below
the axis of said plate cylinder so that the sheets fed
along said feedboard are engaged by said gripper
means on said carriage at a location below the axis 5
of said cylinder and adjacent the lower periphery
of said cylinder.

3. Apparatus for cutting or creasing sheets as set
forth in claim 2 in which,
said sheet delivery means includes side register 10
means and front register means to feed said sheet
to said gripper means on said carriage in a
preselected register.

4. Apparatus for cutting or creasing sheets as set
forth in claim 1 in which, 15

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said cylinder includes gripper means thereon to en-
gage the front edge of a sheet fed from said sheet
feeder means,

said cylinder arranged upon rotation to transfer the
front edge of said sheet to said gripper means posi-
tioned on said cylinder.

5. Apparatus for cutting or creasing sheets as set
forth in claim 4 in which,

said sheet feeder means includes an inclined feed-
board, said feedboard having a front end portion
tangent to said cylinder so that the front edge of a
sheet fed down said inclined feedboard moves into
position for engagement by said gripper means on
said cylinder.

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