Dec. 6, 1966 O. V. DUTRO 3,289,580

ROLLER SUPPORT ADJUSTING DEVICE

Filed Aug. 4, 1964

FIG. 1

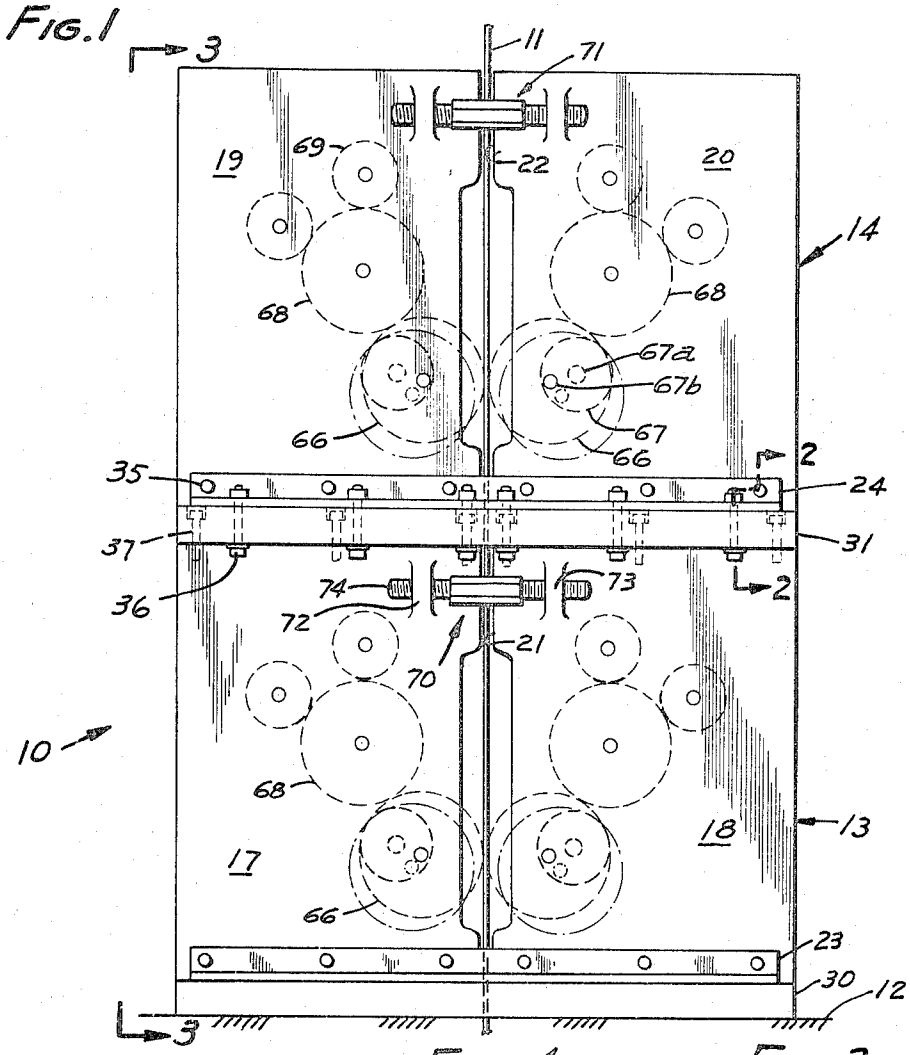


FIG. 2

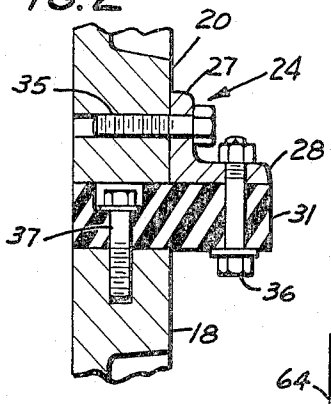


FIG. 4

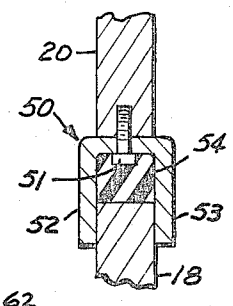
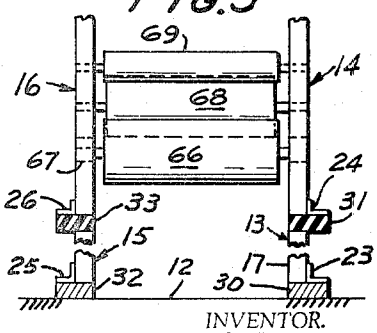


FIG. 3



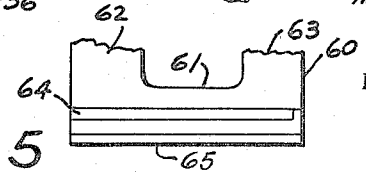


FIG. 5

INVENTOR.
ORVILLE V. DUTRO

BY Angus & Mow

ATTORNEYS.

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3,289,580

ROLLER SUPPORT ADJUSTING DEVICE

Orville V. Dutro, 5068 N. Commonwealth, La Canada, Calif.

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12 Claims. (Cl. 101—221)

This invention relates to blanket-to-blanket rotary presses.

In web offset printing presses, there is a requirement to adjust the spacing between the centers of a pair of cylinders which contact opposite sides of a web in order to compensate for different thicknesses of paper, and blankets, thereby to control the impression. Customarily this adjustment has been accomplished by the use of eccentric mountings for both plate and blanket cylinders. However, these mountings create problems of their own, because when the cylinders are swung in eccentric mountings they move in an arc which does not coincide with the loci of the members of a long train of cylinders and rollers which must make mutual contact. It is therefore necessary to go back up the train and adjust the other cylinders and rollers. This adjustment becomes so complex that it is frequently beyond the ability of a press operator to accomplish successfully. Errors in such adjustment inevitably lead to reduction in quality of the printed material.

It is an object of this invention to provide a means for adjusting the spacing between a pair of blanket cylinders which are opposed to each other across a web of material wherein the adjustment of the spacing between these cylinders can be accomplished without varying the spacing between the other rollers and cylinders in the train, thereby making the adjustment of the spacing of these cylinders one of great simplicity. Furthermore, the adjustment can be reduced to a simple turnbuckle, the operation of which is clearly within the scope of the abilities of the most inexperienced press operator. Furthermore, this is attainable in multiple-deck presses.

This device permits the necessary eccentric motion of the rollers which abut the web to break away from the web and from the plate cylinder, while still permitting the system on each side to be maintained in a definite, invariable relationship from operation to operation. This is accomplished while still allowing the space between the opposed rollers to be adjusted independently of the remainder of the cylinders and rollers in the system. All of this is accomplished in an economically-built frame construction, with the additional benefit of reducing pressman training costs.

A device according to this invention is adapted to be utilized in connection with a press that is supported vertically from a foundation. In the preferred embodiment of the invention, two opposed and mutually-facing side plates are provided. Each of the side plates comprises two spaced-apart rigid cylinder support members. A tie member joins the support members and thereby forms a bight between them. A resilient, incompressible separator member is disposed contiguous to, and beneath, the support members of each of these side plates. The separator members support the side plates. Adjustable spacer members interconnect the support members of each pair at a location vertically spaced from the tie member. Opposed cylinder support means is carried by each of the support members between which the cylinder can be supported. Adjusting the spacer members will vary the spacing-apart of the two support members and thereby adjust the spacing-apart of the cylinders which they are to support.

According to a preferred but optional feature of the invention, there are two pairs of side plates, one disposed above the other. Separator members are placed beneath each of the support members.

According to another feature of the invention, the side members may be continuous across their bottom regions, deleting the tie member. A split may be formed in an upper region to form a bight and provide for the necessary movement between edges of the split member.

The above and other features of this invention will be fully understood from the following detailed description and the accompanying drawings in which:

FIG. 1 is a side elevation of the presently preferred embodiment of the invention;

FIG. 2 is a cross-section taken at line 2—2 of FIG. 1;

FIG. 3 is a side view taken at line 3—3 of FIG. 1;

FIG. 4 is a fragmentary cross-section showing an alternate embodiment of the invention; and

FIG. 5 is a fragmentary side elevation showing still another embodiment of the invention.

In FIG. 1 there is shown a press 10 of the offset type with a web 11 to be processed which moves either upwardly or downwardly between cylinders which bear against it. The direction of motion of the web is vertical, and the word vertical as used herein means upwardly or downwardly relative to a foundation 12 upon which the press rests. FIG. 1 shows one side of the press, it being understood that the other side is a mirror image thereof. Therefore, only the side shown in FIG. 1 will be described in detail.

Two side plates 13, 14 are shown in FIG. 1, side plate 13 resting on foundation 12 and side plate 14 being above and supported by side plate 13. As can be seen in FIG. 3, side plates 13 and 14 are opposed by side plates 15 and 16, respectively, with their vertical relationship as aforesaid.

Side plate 13 comprises a pair of spaced-apart rigid cylinder support members 17, 18. Side plate 14 includes a pair of cylinder support members 19, 20. Members 17–20 are identical, and are used in pairs as mirror images for each side plate. The same is true of side plates 15 and 16. Therefore, all of the side plates may be formed simultaneously in a jig boring operation, which results in an accurately and expediently manufactured structure. The cylinder support members are spaced-apart by splits 21, 22. The cylinder support members are joined together adjacent to their respective lower margins by tie members 23, 24, 25, 26. The tie members are preferably L-shaped angles which extend along the plates. Each has flanges 27, 28. As best shown in connection with tie member 24 the flanges are drilled appropriately to receive fastening means yet to be described. In this embodiment, the tie members act as a bight which connects the respective pair of cylinder support members. For this reason, the tie member is sometimes called a "bight."

Beneath each side plate there is located a separator member 30, 31, 32, 33. Each separator member comprises a layer of an elastic, incompressible material such as rubber of Shore Hardness about 50. Such rubber is able to yield elastically under substantial forces, and still exert significant springback and physical support. Furthermore, it is able to yield somewhat in shear so as to make up for sidewise as well as vertical movements between adjacent support members. For side plates which have an elevation of approximately three feet and a width of about 16 inches, a separator member about 1¼ inches thick is suitable. The thickness of these side plates immediately contiguous to the separator members is ordinarily the order of about 1¼ inches.

Bolt sets 35 join the upper flanges of the tie members to the cylinder support members. Bolt sets 36 join the other flange to a cantilevered portion of the separator members. Bolt sets 37 join the separator members either

to the lower side plates or to the foundation, respectively.

It will be seen from FIG. 2 that the side plates are vertically in line in the preferred embodiment of the invention and are held from sidewise motion by bolt sets 35 and 37. It will also be seen that the flanges of the tie members permit the side plates to move toward and away from each other across the gap between them and that these are also principally supported in line with each other through the separator members. Additional strength is provided as shown in FIG. 2 by making the separator members somewhat wider than the side plates so that a portion thereof extends beyond the side plates in a cantilever manner to as to support one of the flanges of the tie member.

FIG. 4 shows an alternate embodiment for the separator member. In this embodiment, tie member 50 comprises a U-channel which is joined by bolts 51 to a lower margin of an upper side plate. The tie member includes a pair of arms 52, 53 which embrace a separator member 54 beneath them and also extends downwardly over the next lower side plate. This downward projection of the arms of the tie member gives additional lateral support.

FIG. 5 shows a side plate 60 which is unitary and includes its own bight 61 and cylinder supporting members 62, 63 thereby flexing inherently at the bight rather than at the tie member itself. A tie member 64 is provided of the same construction as that shown in FIG. 1 so as to join the side plates to a separator member 65. In this embodiment, the functions of tie plate and of bight are performed by two different elements, while in the device of FIG. 1, the tie plates are both bight and hold-down means.

Cylinders 66 are shown on opposite sides of the web and are journaled in eccentric bearings 67. Each eccentric bearing has a center 67*a* around which center 67*b* of cylinder 66 moves. This motion enables the cylinder to be withdrawn from contact with the web and with the adjoining plate cylinder 68 when the press is stopped. Cylinders 69 are shown which schematically illustrate the rest of a train of gears or rollers intended to interact with each other in the operation of the press. Element 68 is immovably journaled in the plates in the sense that the center of rotation cannot be laterally moved.

Adjustable spacer members 70, 71 are provided between the cylinder support members of each side plate and the same will be provided in the embodiment of FIG. 5. These conveniently comprise turnbuckle assemblies which may be as simple as those shown in FIG. 1 wherein a pair of bearing pads 72, 73 receive the end of a threaded turnbuckle bolt 74 which can be turned so as to adjust the spacing between the cylinder support means, and thereby of the cylinders 66. The pitches of the threads at each end of the bolt are different, though of the same hand, so that there is a differential effect between them. A relatively small adjustment can therefore be made with a fairly large turn of the bolt. Other types of spacer members such as cams, jacks, and the like, could be used instead of turnbuckles.

It will be appreciated from an examination of FIGS. 1 and 5 that this arrangement is readily suitable for a press which is one or more units high. Were there not to be the separator member between two stacked units, it would be impossible to make an independent adjustment of the lower sets of cylinders 66 and of the next upper set, because change in the adjustments of spacer member 70 would cause a change in a spacing-apart of the upper set of cylinders. However, the interposition of the elastic separator member permits this sideward motion to be taken up by shear reaction in the separator member and thereby isolates the two press units from each other so that each is adjustable independently of the other.

There is thereby provided in a simple straightforward and easily manufactured press assembly means for readily adjusting the spacing-apart of two individual primary cylinders in a vertical press construction and also of accomplishing this in a multiple vertically stacked press construction.

This invention is not to be limited by the embodiments shown in the drawings and described in the description which are given by way of example and not of limitation but only in accordance with the scope of the appended claims.

What is claimed is:

1. In a press adapted to be supported vertically from a foundation, said press being of the class wherein a pair of cylinders is rotatably mounted so as to contact the opposite sides of a web, the improvement comprising: two opposed and mutually facing side plates, each of said side plates comprising two spaced-apart rigid cylinder support members, a bight joining the support members of each pair adjacent to a lower margin thereof; a resilient, incompressible separator member contiguous to and disposed beneath and supporting the support members of each side plate; and adjustable spacer member interconnecting the support members of each pair at a location vertically spaced from the bight member; and opposed cylinder support means carried by each of said support members and adapted to journal a cylinder to the cylinder support means, whereby adjusting the spacer members varies the spacing-apart of the two support members and thereby adjusts the spacing-apart of the cylinders which they support.

2. Apparatus according to claim 1 in which the separator members are made of rubber.

3. Apparatus according to claim 1 in which the separator members are made of rubber, and in which the bights are joined to both respective support members and separator member.

4. Apparatus according to claim 1 in which the spacer members comprise turnbuckle assemblies.

5. Apparatus according to claim 1 in which there are provided two pairs of side plates, the side plates of each pair being vertically stacked, there being a bight and a separator member adjacent to the lower margin of each side plate.

6. Apparatus according to claim 5 in which the separator members are made of rubber.

7. Apparatus according to claim 5 in which the separator members are made of rubber, and in which the bights are joined to both respective support members and separator member.

8. Apparatus according to claim 5 in which the spacer members comprise turnbuckle assemblies.

9. In a press adapted to be supported vertically from a foundation, said press being of the class wherein pairs of cylinders are rotatably mounted so as to contact the opposite sides of a web, the improvement comprising: two pairs of opposed and mutually facing side plates, each of said side plates having a split and a bight, there being a spacing between the edges of the split, and the bight providing limited flexibility in order that the edges may be moved toward and away from each other; a resilient, incompressible separator member contiguous to and disposed beneath and supporting each side plate; adjustable spacer members bridging the split and joining the respective opposite sides thereof at a location vertically spaced from the separator member; cylinder support means carried by each of said side plates and adapted to journal a cylinder to the cylinder support means, whereby adjusting the spacer members varies the width of the split and thereby adjusts the spacing-apart of the cylinders which they support.

10. Apparatus according to claim 9 in which the separator members are made of rubber.

11. Apparatus according to claim 9 in which the separator members are made of rubber, and in which the bights are joined to both respective support members and separator member.

12. Apparatus according to claim 9 in which the spacer members comprise turnbuckle assemblies.

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WILLIAM B. PENN, *Primary Examiner.*

ROBERT E. PULFREY, *Examiner.*

P. R. WOODS, *Assistant Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,289,580 December 6, 1966

Orville V. Dutro

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 20, for "and" read -- an --; line 62, strike out "respective"; line 63, after "the" insert -- respective --.

Signed and sealed this 19th day of September 1967.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNEI
Commissioner of Patents