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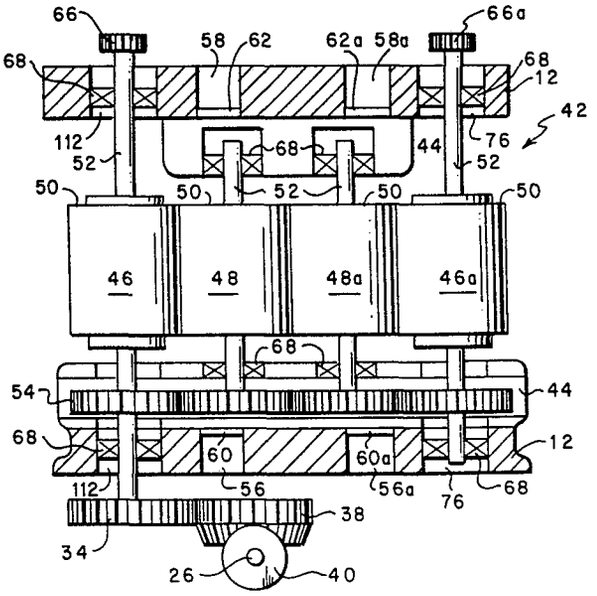
(54) Offset printing press unit and method for converting a letter press unit into same.

(57) A method and apparatus for conversion of a web fed letterpress unit (10) into a web fed offset printing press unit (42) having a main frame (12) an auxiliary frame (44) inside the main frame for receiving cylinders, a pair of offset plate cylinders (46 and 46a) for mounting printing plates thereon, an inking arrangement (16, 18 and 20) vor applying films of ink to the plates, and a pair of blanket cylinders (48 and 48a) in close proximity to a position for respective rolling contact with the plate cylinder and the other blanket cylinder. An offset press gear train (114) is installed outside the frames if the shafts for the cylinders can be extended through the bores (56, 56a, 58, 58a, 76 and 112) in the main frame left from the removed letterpress unit cylinders. Otherwise the gear train (54) is placed inside the main frame. Pilots (60, 60a, 62 and 62a) for insertion into bores in the main frame guide the installation of the auxiliary frame. Eccentric bearings (68) are installed for bodily swinging cylinders between alternative positions.



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Description

Conversion of Letterpress to Offset Printing

Technical Field

The present invention relates generally to printing presses, and in one of its aspects, to a method and apparatus for converting a web fed letterpress unit into a web fed offset printing press unit.

The news publishing industry has billions of dollars worth of letterpress equipment in the United States. The newspaper industry has, however, been switching from letterpress to offset printing for numerous reasons including improved quality of the print and lowered operating cost. At present, publishers have had little option other than to purchase new offset equipment to replace their letterpress equipment.

The frames for the letterpress units are massive and reboring the frames in place for insertion of offset cylinders is impractical. Often reboring is impossible because the new bores would overlap the old bores. Moreover, completely replacing the equipment or completely reworking it is very time consuming.

Background Art

As far as the inventor knows, there is no background art for conversion of letterpress units to offset printing units. A conversion known as direct lithographic or "di-litho" simply replaces the letterpress plate and impression cylinders with offset plate and blanket cylinders. In the di-litho process, the web is fed between the di-litho plate and blanket cylinders so that the process is not a true offset printing process.

Disclosure of Invention

In accordance with the present invention, a method for converting a web fed letterpress unit having a main frame, a pair of plate cylinders laterally spaced in the frame for mounting printing plates thereon, means for applying films of ink to the plates, and a pair of impression cylinders in respective rolling contact with the plates on the plate cylinder, into a web fed offset printing press unit includes removing the pair of letterpress plate cylinders and the pair of letterpress impression cylinders. A lower portion of an auxiliary frame for receiving offset cylinders in an offset printing press configuration is put inside the main frame. A pair of offset plate cylinders is then installed. The offset plate cylinders might fit into the bores and bearings for the letterpress plate cylinders in which case they can be installed directly, otherwise one or both of the offset plate cylinders is installed in the auxiliary frame. The lower portion of the auxiliary frame is then installed, using pilots to guide the installation of the auxiliary frame. The pilots, in one embodiment, are affixed to the auxiliary frame and are designed to be inserted into the unused cylinder bores of the main frame. After the auxiliary frame is installed, a pair of blanket cylinders is installed in close proximity to a position for respective rolling contact with the plates on the plate cylinder and the other blanket cylinder. In some circumstances the auxiliary frame is completely installed prior to the installation of the plate cylinders.

It is common for letterpress units to also have a pair of laterally spaced form rollers in respective rolling contact with the plates on the plate cylinder. A preferred conversion according to the present method includes removing the at least one pair of form rollers, and mounting micrometric adjusting sockets for receiving the form rollers for respective rolling

contact between the at least one pair of form rollers with the plates of the plate cylinder after the pair of offset plate cylinders is installed. It is also preferred to plate the ink drums with copper, and add dampener motions which can be added on one of the form rollers.

The gear train used to drive the letterpress unit cylinders is not suitable for driving the offset cylinders. A new offset gear train must, therefore, be installed for imparting motion from one of the offset press unit cylinders to other offset press unit cylinders. Some of the gears for the letterpress unit can be removed, but many will still be used for driving at least one of the cylinders and for driving the inking drums. In converting some letterpress units, it will be possible to extend the shaft of the offset cylinders through the bores for the letterpress unit cylinders in the main frame by removing the bearings for the letterpress cylinders. In such a case, the offset gear train can normally be installed on the outside of the main frame to allow more room inside the frames for wider web widths. Otherwise, the offset gear train can be installed inside of the main frame.

Considering the cylinders to include both the drum body and the shaft, it is frequently necessary to make the drum bodies for the offset press shorter than the drum bodies were for the letterpress in order to allow additional room for the auxiliary frame and the offset gear train when it is inside the main frame. This shortening of the drum bodies narrows the allowable web width, but this normally does not present a problem since the industry has fairly well settled on a 58 inch web width which is sufficiently narrower than the typical 68 inch web width for which most letterpress units were designed. The total length of the cylinders is also shorter when the shafts cannot extend through the main frame bores for the letterpress cylinders.

A preferred conversion according to the present method and apparatus includes the installation of means for bodily swinging various cylinders into different positions for different printing arrangements and for throw-off in case of web wrap, for changing plates, or other cylinder maintenance.

A special method according to the present invention for converting a letterpress unit that has at least a half deck with a deck plate cylinder and a deck impression cylinder is to remove the deck impression cylinder, install a deck blanket cylinder in a position for rolling contact with the plates of the deck plate cylinder, if necessary replacing the deck plate cylinder with a deck offset plate cylinder, and installing an impression cylinder in the vicinity of the cusp formed by the pair of blanket cylinders for placing in rolling contact with the deck blanket cylinder and for placing in rolling contact with all three cylinders, the deck blanket cylinder and the pair of offset blanket cylinders. This method also includes the situation where there is a full deck, the full deck being simply two half decks.

In a conversion involving at least one half deck, a means is installed for bodily swinging each of the blanket cylinders and the impression cylinder between a first position in which the blanket cylinders make contact with the plates of their respective plate cylinders and with the impression cylinder, a second position in which the pair of blanket cylinders make contact with each other and are isolated from the impression cylinder, and the deck blanket cylinder makes contact with the impression cylinder, and a third position in which the blanket cylinders and the impression cylinder are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders. Such a method can also include installing a means for bodily swinging the remaining offset cylinders wherein all offset cylinders

are displaced in the third position.

These and other objects, advantages and features of this invention will be apparent from the following description taken with reference to the accompanying drawings, wherein is shown the preferred embodiments of the invention.

Brief Description of Drawings

Figure 1 is a diagramatic cross-sectional view taken from one end of a web fed letterpress unit;

Figure 2 is a diagramatic end view of the letterpress unit of Figure 1;

Figure 3 is a diagramatic sectional view similar to that of Figure 1 of the press of Figure 1 after it has been converted to a web fed offset printing press unit;

Figure 4 is a top view of the offset printing press unit of Figure 3 partly in section to show the bores in the press main frame;

Figure 5 is a top view similar to that of Figure 4 for an offset press unit converted from a different letterpress unit;

Figure 6 is a diagramatic view similar to that of Figure 1 for a three-color letterpress unit;

Figure 7 is a diagramatic view similar to that of Figure 3 for a three-color offset press converted from the three-color letterpress of Figure 6;

Figure 8 is a diagramatic view similar to that of Figure 3 for the offset press unit of Figure 7 shown in a "spot color" configuration;

Figure 9 is a diagramatic view similar to that of Figure 1 for a double hump four-color unit;

Figure 10 is a diagramatic view similar to that of Figure 3 for a four-color offset printing press unit converted from the double hump four-color letterpress unit of Figure 9; and

Figure 11 is a top view similar to that of Figures 4 and 5 for a different offset press unit.

Best Mode for Carrying Out the Invention

Referring now to the drawing, and in particular to Figure 1, a typical web fed letterpress unit, referred to generally by reference numeral 10 prints on both sides of a web 11. Letterpress unit 10 includes a main frame 12, a pair of plate cylinders 14 and 14a laterally spaced in frame 12 for mounting printing plates thereon, means including ink transfer rollers and cylinders or drums 16 and 16a and form rollers 18, 18a, 20 and 20a for applying films of ink to the plates. Letterpress unit 10 also includes a pair of impression cylinders 22 and 22a in respective rolling contact with the plates on the plate cylinder 14 and 14a, respectively.

Referring also to Figure 2, the letterpress unit is driven by a horizontal shaft 24 which drives a vertical drive shaft 26 through bevel gears 28 and 30. Vertical drive shaft 26 in turn drives the letterpress cylinders through gear train 32 which includes a spur drive gear 34 for cylinder 14, a spur drive gear 36 for compression cylinder 22a and a spur gear-bevel gear combination 38 driven by vertical shaft 26 through bevel gear 40. On the far end of frame 12 are mounted spur gears corresponding to each of the plate cylinders 14 and 14a and each of the impression cylinders 22 and 22a so that the gear for plate cylinder 14 drives the gear for impression cylinder 22, and the gear for impression cylinder 22a drives the gear for plate cylinder 14a.

Referring now to Figures 3 and 4, a web fed offset printing press unit converted from web fed letterpress unit 10 of Figures 1 and 2 is referred to generally by reference numeral 42. It includes main frame 12, ink transfer rollers and drums 16 and 16a, and form rollers 18, 18a, 20 and 20a. It also includes the same driving mechanism through vertical shaft 26, bevel gear 40, combination spur gear-bevel gear 38 and spur gear 34. Offset press unit 42, however, also has an auxiliary

frame 44 inside main frame 12 for receiving cylinders. A pair of offset plate cylinders 46 and 46a are laterally spaced inside the frames for mounting printing plates thereon, and a pair of blanket cylinders 48 and 48a are inside the frames in close proximity to a position for respective rolling contact with the plates on the plate cylinder, cylinder 46 or 46a, and the other blanket cylinder. Considering cylinder 46 to include a drum 50 and a shaft 52, it can be seen that the shaft for some cylinders extends beyond auxiliary frame 44 and even beyond main frame 12. The cylinders are thus "inside the frames" in the sense that they are primarily inside the frames.

Web fed offset printing press unit 42 also includes a gear train 54 inside main frame 12 for imparting motion from one of the cylinders, cylinder 46 in this case, to other cylinders, in this case cylinders 48, 48a and 46a. It was necessary to shorten drums 50 of the cylinders in order to allow more room within main frame 12 for both auxiliary frame 44 and gear train 54. Gear train 54 could not be moved outside of main frame 12 since the shafts 52 of cylinders 48 and 48a do not align with bores 56, 56a, 58 and 58a for the letterpress unit cylinders even with the bearings removed from those bores.

A method for converting web fed letterpress unit 10 of Figures 1 and 2 into web fed offset printing press unit 42 of Figures 3 and 4 comprises in combination the steps of removing the pair of letterpress plate cylinders 14 and 14a and the pair of letterpress impression cylinders 22 and 22a, putting inside main frame 12 a lower portion of an auxiliary frame 44 for receiving offset cylinders in an offset printing press configuration, installing a pair of offset plate cylinders 46 and 46a, installing the lower portion of auxiliary frame 44, and installing a pair of blanket cylinders 48 and 48a in close proximity to a position for respective rolling contact with the plates

on plate cylinder 46 and 46a respectively and the other blanket cylinder.

A method according to the present invention where auxiliary frame 44 also includes a pilot, in this case four pilots 60, 60a, 62, and 62a, for insertion into a bore, bores 56, 56a, 58 and 58a respectively, for one of the letterpress cylinders can also include positioning auxiliary frame 44 on the inside of main frame 12 after the pair of letterpress plate cylinders 46 and 46a and pair of letterpress impression cylinders 48 and 48a have been removed to make the pilot align with the associated bore, and then moving auxiliary frame 44 to insert the pilot into the bore.

A preferred method includes removing at least one pair of form rollers, either 18 and 18a or 20 and 20a or both pairs, mounting micrometric adjusting sockets for receiving the form rollers for respective rolling contact by the form rollers with the plates of plate cylinders 46 and 46a after the pair of offset plate cylinders is installed, and then installing the at least one pair of form rollers. It is also preferred that the ink drums of 16 and 16a be plated with copper, and that dampener motions 64 and 64a be added to one of the form rollers. Gear train 54 is also added. Gears 66 and 66a are added to plate cylinders 46 and 46a respectively for driving the inking rollers and drums. Means 68 for bodily swinging each of blanket cylinders 48 and 48a is installed. Means 68 is for bodily swinging the cylinders between a first position in which the blanket cylinders make contact with their respective plate cylinders and with each other for applying an inked image on opposite sides of a web fed between them, and a second position in which the blanket cylinders are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders. Means 68 can be manually or hydraulically turned eccentric bearings. Such mechanisms are common in printing presses and are

described in detail in United States Patent No. 3,329,086, issued to Pullen. Means 68 are also installed for bodily swinging each of the plate cylinders, and the positions mentioned can be accomplished by bodily swinging both plate cylinders and blanket cylinders.

Referring now to Figure 5, an offset press unit converted from a different letterpress unit is referred to generally by reference numeral 70, but elements similar to those in offset press unit 42 are numbered the same as in Figures 3 and 4. An extension 71 of shaft 52 is added for cylinder 46 by means of coupler 72. An additional means 68 for bodily swinging plate cylinder 46 is added along with an additional bearing 74 in order to support both ends of shaft 52 and extension 71, thus structurally relieving coupler 72. Since the shaft of plate cylinder 46a no longer aligns with the letterpress plate cylinder bore 76, a gear train 78 is used to impart motion from blanket cylinder 48a to shaft 80 which extends through bore 76 and is supported by bearings 82 and 84. Extra means 68 for bodily swinging plate cylinder 46a are installed in auxiliary frame 44 since the journal for the shaft of plate cylinder 46a must now be in the auxiliary frame rather than in main frame 12.

Referring now to Figure 6, a three-color letterpress unit for printing three colors on one side of web 11 is referred to generally by reference numeral 86. Three-color letterpress unit 86 includes a half deck 88 which includes deck plate cylinder 90 and deck impression cylinder 92. Referring also to Figures 7 and 8, a method according to the present invention for converting to an offset press unit 94 includes removing the letterpress cylinders and adding offset press cylinders as before, including replacing impression cylinder 92 with deck blanket cylinder 96 and replacing deck letterpress plate cylinder 90 with deck offset plate cylinder 98. The method further includes

installing an offset impression cylinder 100 along with the necessary auxiliary frame to support it, impression cylinder 100 being chosen of the proper size to be in rolling contact with blanket cylinders 48, 48a, and 96. If it is desired to dedicate three-color offset press unit 94 as a three-color unit, then no further changes are necessary, but a preferred method according to the present invention includes conversion of letterpress unit 86 into an offset press 94 which can be used for three color or spot color, where "spot color" refers to adding a single color to one side of a web that is printed on both sides. Referring in particular to Figure 8, blanket cylinders 48 and 48a print on both sides of web 11 in what is known as "blanket-to-blanket" printing while blanket cylinder 96 is used to add an additional color to one side of web 11 in "blanket-to-impression" printing. By installing the cylinders in the auxiliary frame as already described and installing a means for bodily swinging each of the blanket cylinders and the impression cylinder, which can include a means for bodily swinging the remaining offset cylinders, between a first position in which blanket cylinders 48, 48a and 96 make contact with the plates of their respective plate cylinders, 46, 46a and 98, and with impression cylinder 100, a second position in which the pair of blanket cylinders 48 and 48a make contact with each other and are isolated from impression cylinder 100, and deck blanket cylinder 96 makes contact with impression cylinder 100, and a third position in which blanket cylinders 48, 48a and 96, and impression cylinder 100 are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders. All offset cylinders could be displaced into the third positon. One simple means for carrying out such an arrangement between the first two positions is to include means for bodily swinging blanket cylinders 48 and 48a and lifting the entire half deck 88 along with impression cylinder 100.

Referring now to Figure 9, a four-color letterpress unit is referred to generally by reference numeral 102. Four-color letterpress unit 102 prints four colors on one side of web 11, one color being added by each plate cylinder 14, 14a, 104 and 104a. Plate cylinders 104 and 104a are referred to as "humps". Hump plate cylinders 104 and 104a are on half decks. A method according to the present invention includes removing plate cylinders 104 and 104a from their respective half decks and replacing them by offset plate cylinders 106 and 106a respectively in conjunction with blanket cylinders 108 and 108a respectively. In addition, offset impression cylinder 110 is added between the four blanket cylinders for placing in rolling contact with the blanket cylinders.

Referring now to Figure 11, an alternative embodiment of an offset press converted from a letterpress is referred to generally by reference numeral 110. Shaft 52 of plate cylinder 46 aligns with bore 112, but means 68 for bodily swinging plate cylinder 46 is moved into auxiliary frame 44 although it could have remained in bore 112. To allow for a longer drum 50, and hence a wider web width, a gear train 114 is placed outside main frame 12 for imparting motion from one of the cylinders, plate cylinder 46, to other cylinders, in this case blanket cylinders 48 and 48a and plate cylinder 46a. The shafts of the cylinders extend through bores 56, 56a, 76 and 112 for the letterpress unit cylinders in main frame 12 and through the associated bearings, in this case means 68, to the outside of main frame 12. The gears of gear train 114 are fixed to shafts 52 of the cylinders. This arrangement was possible because for this particular conversion, the shafts of the offset press cylinders aligned with the bores of the letterpress cylinder. The bearings from the main frame bores were removed for the offset press configuration cylinder shafts which do not align with the bearings. In this

case, the bearings for cylinder 46 were removed from the main frame even though they aligned. This method includes the situation in which some gears can be put outside main frame 12 but others must be put inside main frame 12 in order to get different print configurations.

Only a lower portion of auxiliary frame 44 has been discussed, and in some situations this may be the entire auxiliary frame. Referring again to Figure 3, another embodiment of a lower portion of auxiliary frame 44 will leave the bores for the cylinders exposed so that the offset cylinders can simply be dropped into place. The location of the top of such a lower portion is illustrated by line 116. A cap is then attached to hold the cylinders and their respective bearings in place. This is similar to the common practice of capping main frames.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advantages which are obvious and which are inherent to the apparatus. It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Claims

1. A method for converting a web fed letterpress unit having a main frame, a pair of plate cylinders laterally spaced in the frame for mounting printing plates thereon, means for applying films of ink to the plates, and a pair of impression cylinders in respective rolling contact with the plates on the plate cylinder, into a web fed offset printing press unit, comprising in combination the steps of:

removing the pair of letterpress plate cylinders and the pair of letterpress impression cylinders;

putting inside the main frame a lower portion of an auxiliary frame for receiving offset cylinders in an offset printing press configuation;

installing a pair of offset plate cylinders;

installing the lower portion of the auxiliary frame; and

installing a pair of blanket cylinders in close proximity to a position for respective rolling contact with the plates on the plate cylinder and the other blanket cylinder.

2. A method according to Claim 1 wherein the auxiliary frame includes a pilot for insertion into a bore for one of the letterpress cylinders, further comprising:

positioning the auxiliary frame on the inside of the main frame after the pair of letterpress plate cylinders and pair of letterpress impression cylinders have been removed wherein the pilot aligns with the associated bore; and

moving the auxiliary frame wherein the pilot is inserted into the bore.

3. A method according to Claim 2 wherein the letterpress unit also has at least one pair of laterally spaced form rollers in respective rolling contact with the plates on the plate cylinder, further comprising:

removing the at least one pair of form rollers;

mounting micrometric adjusting sockets for receiving the at least one pair of form rollers for respective rolling contact by the at least one pair of form rollers with the plates of the plate cylinder after the pair of offset plate cylinders is installed; and

installing the at least one pair of form rollers.

4. A method according to Claim 2 wherein the letterpress unit also has at least one pair of laterally spaced form rollers in respective rolling contact with the plates of the plate cylinder and at least one pair of ink drums in respective rolling contact with the form roller, further comprising:

plating the ink drums with copper; and

adding dampener motions on one of the form rollers.

5. A method according to Claim 4 wherein the cylinders of the letterpress unit are driven through a gear train, further comprising installing an offset gear train for imparting motion from one of the offset press unit cylinders to other offset press unit cylinders.

6. A method according to Claim 5 further comprising installing a means for bodily swinging each of the blanket cylinders between a first position in which the blanket cylinders make contact with their respective plate cylinders and with each other for applying an inked image on opposite sides of a web fed between them and a second position in which the blanket cylinders are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders.

7. A method according to Claim 1 further comprising installing a means for bodily swinging each of the blanket cylinders between a first position in which the blanket cylinders make contact with their respective plate cylinders and with each other for applying an inked image on opposite sides of a web fed between them and a second position in which the blanket cylinders are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders.

8. A method according to Claim 1 further comprising installing a means for bodily swinging each of the blanket cylinders and the plate cylinders between a first position in which the blanket cylinders make contact with their respective plate cylinders and with each other for applying an inked image on opposite sides of a web fed between them and a second position in which the blanket cylinders and the plate cylinders are displaced into a throw-off position in which the blanket cylinders and the plate cylinders are isolated from their associated cylinders.

9. A method according to Claim 1 wherein the letterpress unit also has at least a half deck with a deck plate cylinder and a deck impression cylinder, further comprising:

removing the deck impression cylinder;

installing a deck blanket cylinder in a position for rolling contact with the plates of the deck plate cylinder; and

installing an impression cylinder in the vicinity of the cusp formed by the pair of blanket cylinders for placing in rolling contact with the deck blanket cylinder and for placing in rolling contact with all three blanket cylinders.

10. A method according to Claim 9 further comprising installing a means for bodily swinging each of the blanket cylinders and the impression cylinder between a first position in which the blanket cylinders make contact with the plates of their respective plate cylinders and with the impression cylinder, a second position in which the pair of blanket cylinders make contact with each other and are isolated from the impression cylinder, and the deck blanket cylinder makes contact with impression cylinder, and a third position in which the blanket cylinders and the impression cylinder are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders.

11. A method according to Claim 10 further including installing a means for bodily swinging the remaining offset cylinders wherein all offset cylinders are displaced in the third position.

12. A method according to Claim 9 further comprising a means for bodily swinging each of the blanket cylinders, each of the plate cylinders and the impression cylinder between a first position in which the blanket cylinders make contact with the plates of their respective plate cylinders and with the impression cylinder, a second position in which the pair of blanket cylinders make contact with each other and are isolated from the impression cylinder and the deck blanket cylinder makes contact with impression cylinder, and a third position in which the blanket cylinders and the impression cylinder are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders.

13. A method according to Claim 1 further comprising installing an impression cylinder in the vicinity of the cusp formed by the pair of blanket cylinders for placing in rolling contact with the pair of blanket cylinders.

14. A method according to Claim 13 further comprising installing a means for bodily swinging each of the blanket cylinders and the impression cylinder between a first position in which the blanket cylinders make contact with the plates of their respective plate cylinders and with the impression cylinder, a second position in which the pair of blanket cylinders make contact with each other and are isolated from the impression cylinder, and a third position in which the blanket cylinders and the impression cylinder are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders.

15. A method according to Claim 13 further comprising a means for bodily swinging each of the blanket cylinders, each of the plate cylinders and the impression cylinder between a first position in which the blanket cylinders make contact with the plates of their respective plate cylinders and with the impression cylinder, a second position in which the pair of blanket cylinders make contact with each other and are isolated from the impression cylinder, and a third position in which the blanket cylinders and the impression cylinder are displaced into a throw-off position in which the blanket cylinders are isolated from their associated cylinders.

16. A method according to Claim 1 further comprising installing a gear train inside the main frame between the main frame and the offset press unit cylinders for driving at least two offset press unit cylinders.

17. A method according to Claim 1 wherein the bores in the main frame for the pair of plate cylinders and the pair of impression cylinders of the letterpress configuration can receive the shafts of the pair of plate cylinders and the pair of blanket cylinders of the offset printing press configuration, further comprising:

removing the bearings from the main frame bores for the offset press configuration cylinder shafts which do not align with the bearings; and

installing a gear train outside the main frame for driving at least two offset press unit cylinders wherein the at least two offset press unit cylinders are installed with their shafts extending through the main frame bores to the outside of the main frame whereby gears of the gear train can be affixed to the shafts of the cylinders.

18. In a web fed offset printing press unit converted from a web fed letterpress unit having a main frame for supporting a pair of laterally spaced letterpress plate cylinders for mounting printing plates thereon and a pair of letterpress impression cylinders in respective rolling contact with the plates on the plate cylinder, the letterpress cylinders having been removed, the combination of:

the main frame;

an auxiliary frame inside the main frame for receiving cylinders;

a pair of plate cylinders laterally spaced inside the frames for mounting printing plates thereon;

means for applying films of ink to the plates; and

a pair of blanket cylinders inside the frames in close proximity to a position for respective rolling contact with the plates on the plate cylinder and each other.

19. A combination according to Claim 18 further comprising a gear train inside the main frame for imparting motion from one of the cylinders to other cylinders.

20. A combination according to Claim 18 further comprising a gear train outside the main frame for imparting motion from one of the cylinders to other cylinders, wherein the shafts of the cylinders extend through the bores for the letterpress unit cylinders in the main frame and through the associated bearings to the outside of the main frame, and gears of the gear train are affixed to the shafts of the cylinders.

21. A combination according to Claim 18 further comprising at least one pilot for insertion into a main frame bore for a letterpress cylinder, for aligning the auxiliary frame with the main frame.

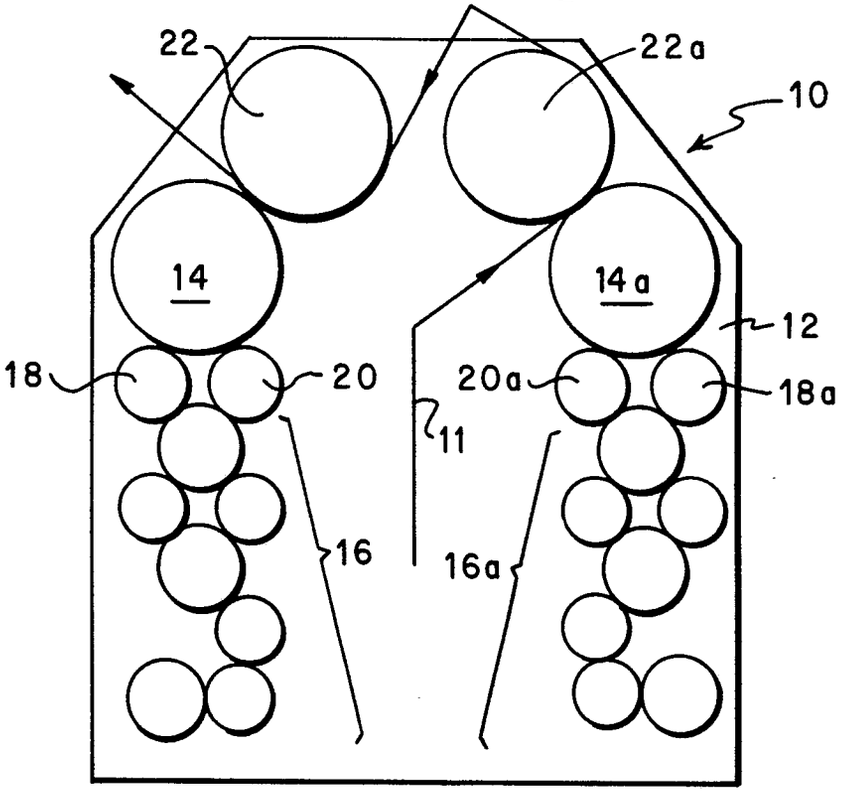
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FIG. 1

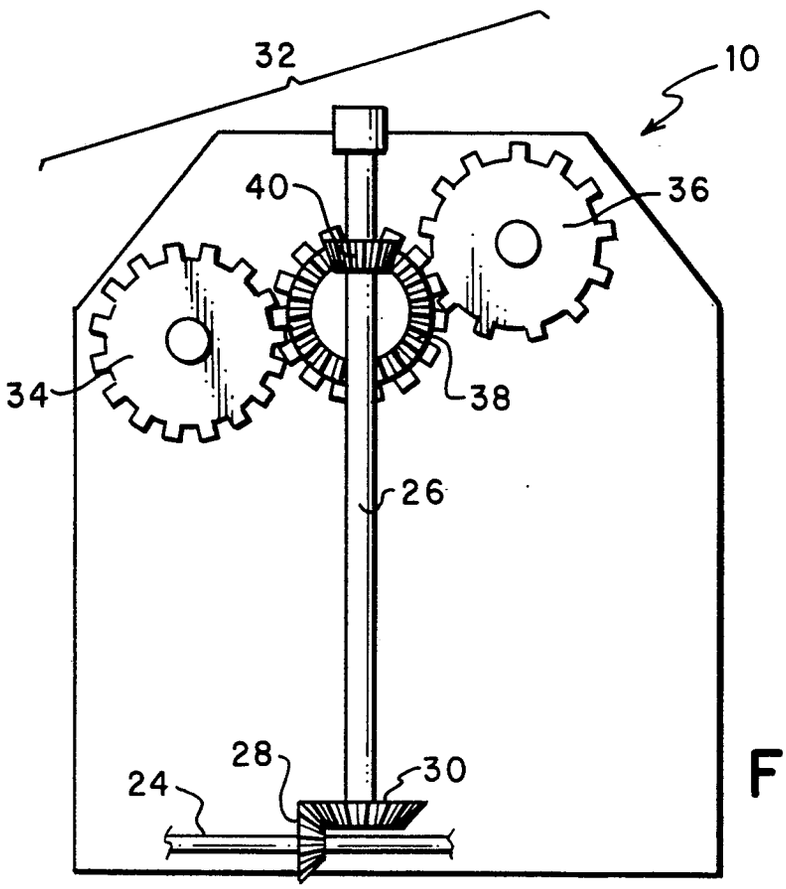
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FIG. 2

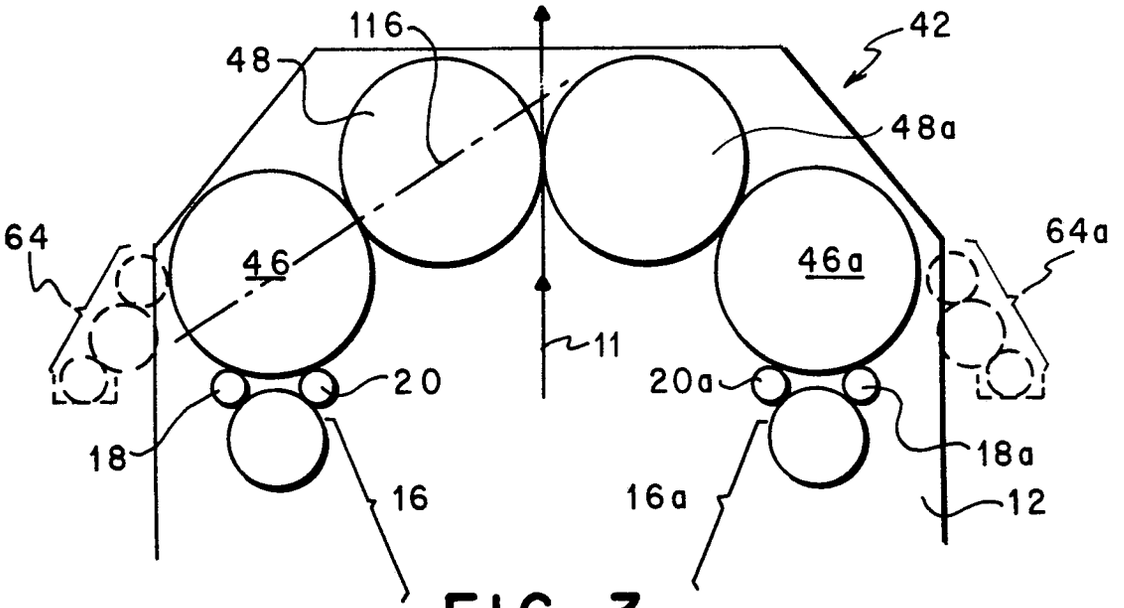
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FIG. 3

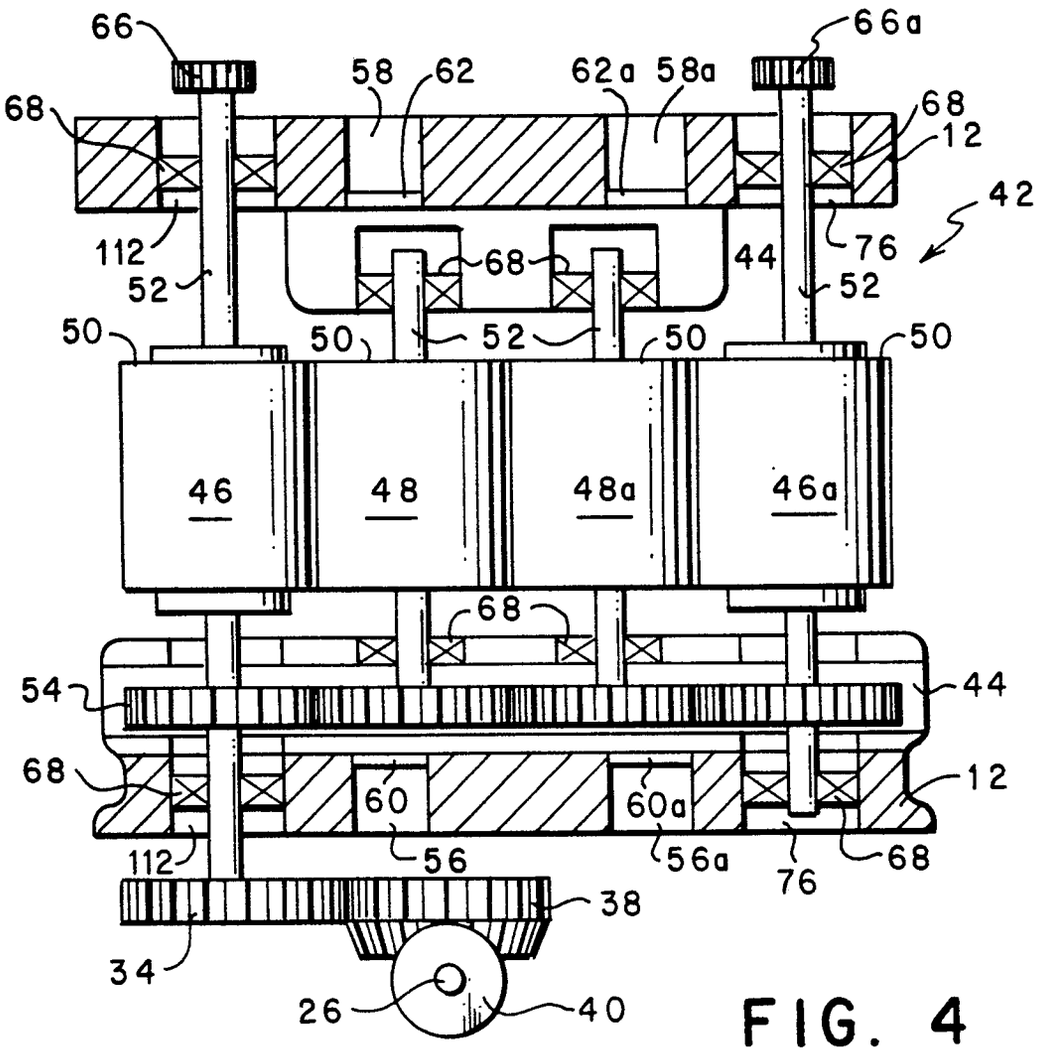
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FIG. 4

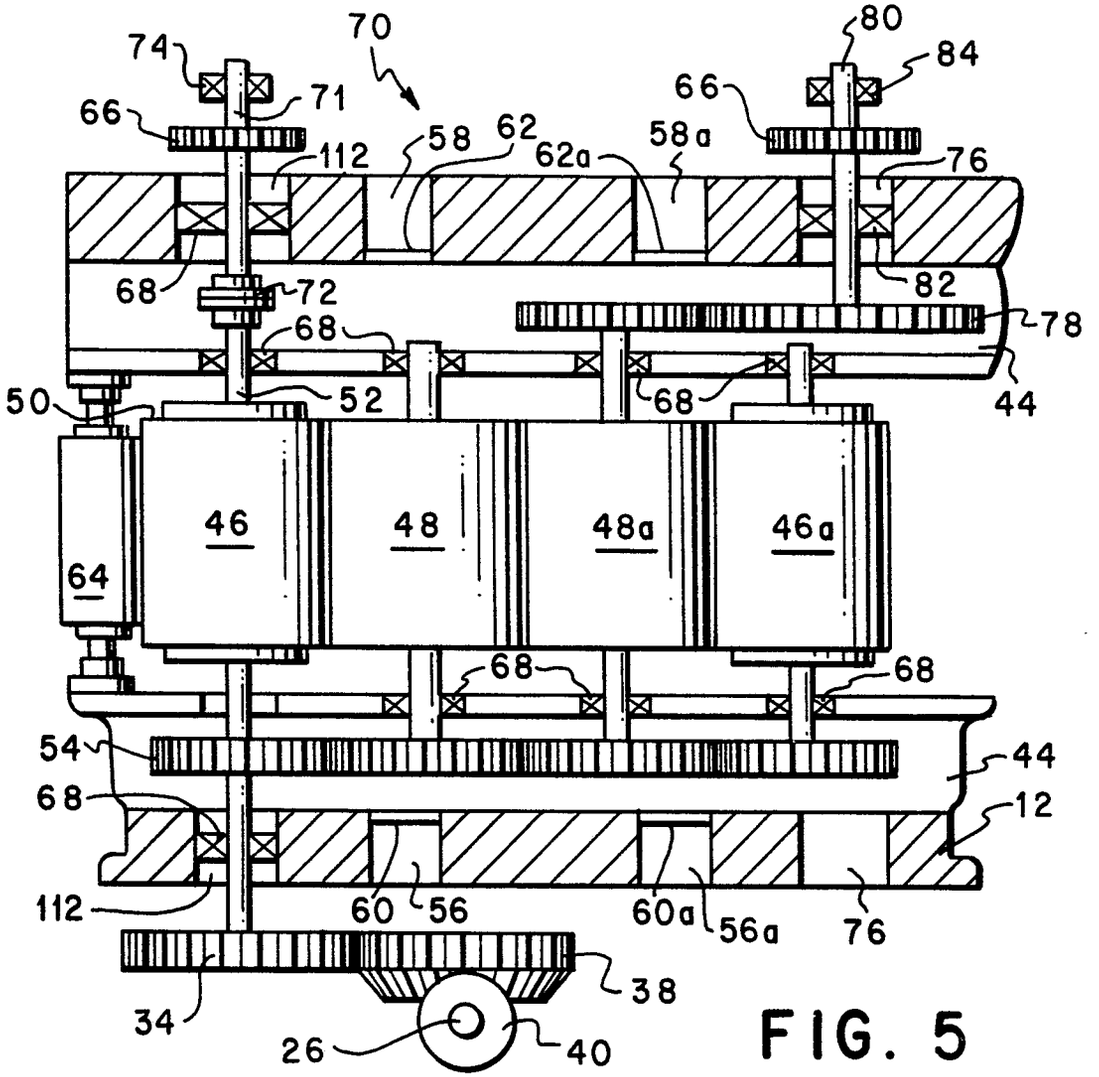

FIG. 5

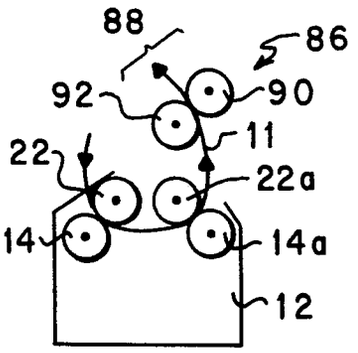

FIG. 6

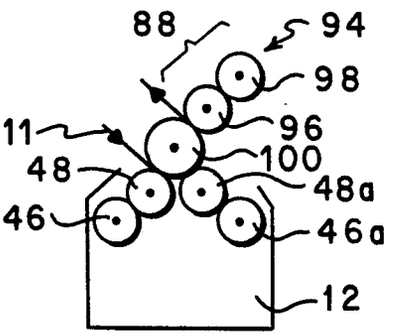

FIG. 7

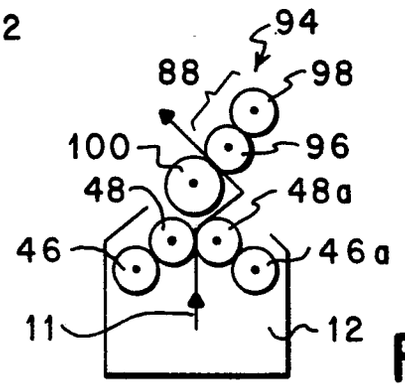

FIG. 8

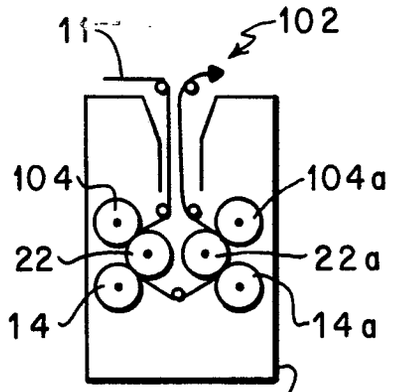

FIG. 9

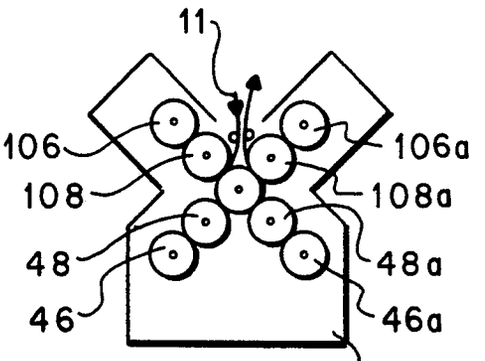

FIG. 10

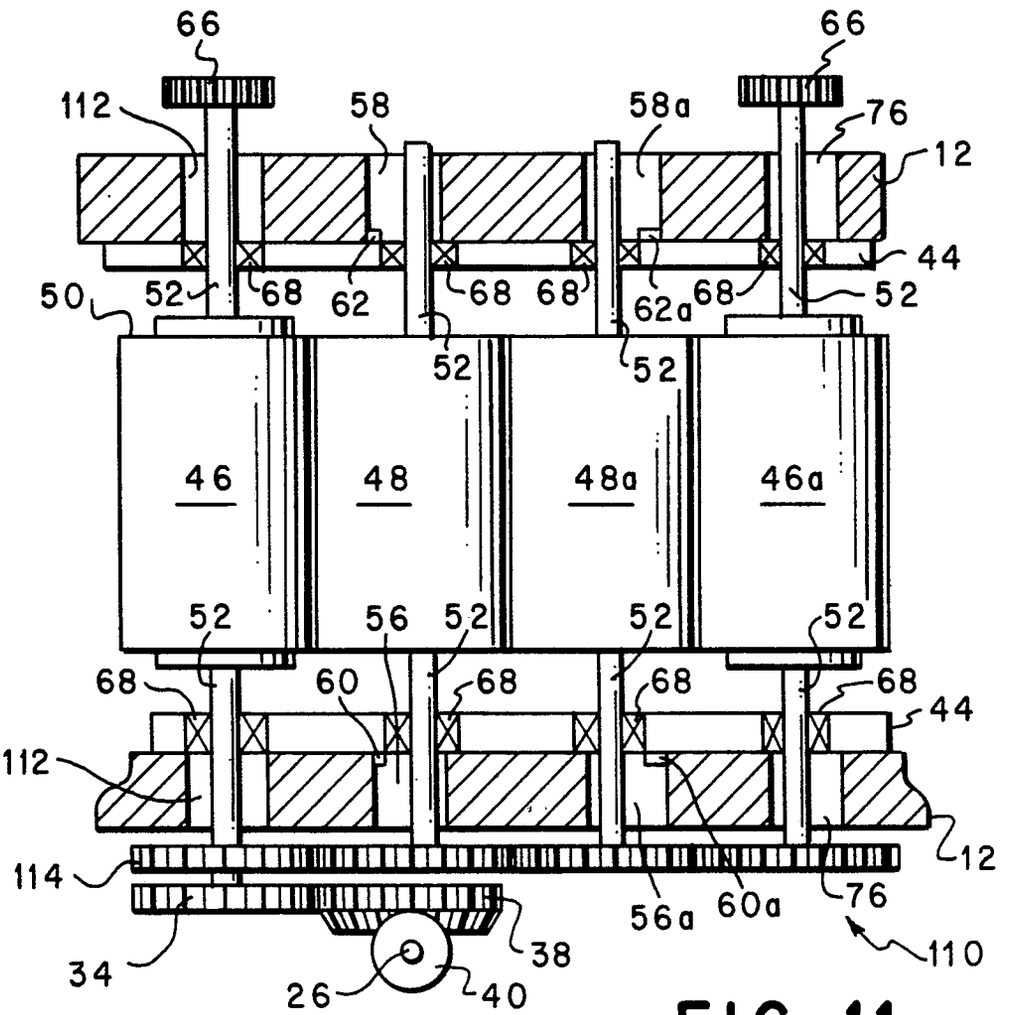

FIG. 11

0017720

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Application number
EP 80 10 0727

EUROPEAN SEARCH REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
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CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)

B 41 F 11/00

TECHNICAL FIELDS SEARCHED (Int.Cl. 3)

B 41 F

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&: member of the same patent family, corresponding document

[X] The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29-04-1980	MEULEMANS

European Patent Office

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
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A	DE - C - 544 298 (GOEBEL) * Whole document * --	1
A	FR - A - 789 782 (BRENOT) * Whole document * ----	1

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TECHNICAL FIELDS SEARCHED (Int. Cl. 3)