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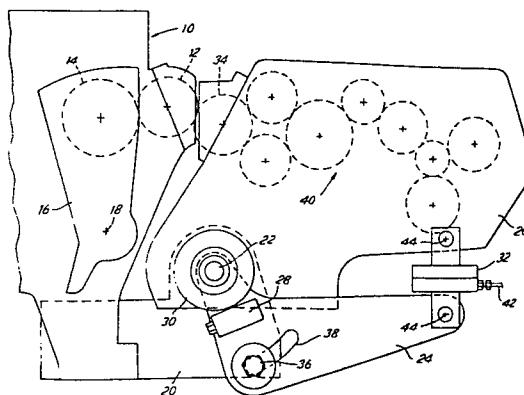
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(54) Variable size printing machines.

(57) In a printing machine, an interchangeable printing cylinder (34) is mounted in a first part (26) of a two-part frame, and an adjacent cylinder (12) is mounted in another frame (10). The first frame part (26) is pivoted (22) to the second frame part (24) which is in turn pivoted (22) to the other frame (10). The second frame part (24) can be locked (36) relative to the frame (10) near the co-operating printing position for the cylinders (12,34), and a pneumatic cylinder (32) between the two frame parts (24,26) then biases the printing cylinder into the co-operating printing position.



VARIABLE SIZE PRINTING MACHINES

This invention relates to variable size printing machines, i.e. machines which are capable of producing 5 copies of different sizes by having provision for replacing the printing cylinder with one of a different size.

In web offset printing, the printing or plate cylinder is in contact with a blanket cylinder, which 10 carries ink from the printing cylinder to a web to be printed. The web runs between the blanket cylinder and an impression cylinder. Both printing cylinder and blanket cylinder must have circumferences which correspond to the length of the copies being printed onto the web, and 15 consequently if it is desired to print copies with a different length the printing and blanket cylinders must be exchanged for cylinders with a different diameter. This gives rise to a problem, in that printing and blanket cylinders of different diameters will not be in the 20 correct contacting relationship with each other and with the impression cylinder if they are fitted on the same axes. In the past, this has been overcome by replacing the plate and blanket cylinders as a unit, the axes of 25 those cylinders being correctly positioned within the unit, but this has necessitated the use of eccentrics to provide the drive to the cylinders and to allow for any desired loading of the cylinders against each other. This is relatively complicated.

In direct printing (i.e. where there is no blanket 30 cylinder) it is still necessary to adjust the axis about which the printing cylinder rotates with respect to the impression cylinder if the size of the printing cylinder is to be changed, and similar problems arise.

According to the invention there is provided a 35 printing machine having a printing cylinder and at an

adjacent cylinder co-operating with the printing cylinder during printing, the printing cylinder being removable and replaceable by a printing cylinder of different diameter, the two cylinders being mounted in respective frames which

5 are movable relative to each other to accommodate the different diameters of printing cylinders, one of the frames is in two parts, means being provided for locking a first said part relative to the other frame at a desired position close to the co-operating printing position of

10 the cylinders, and means acting between said two frame parts for moving the second part relative to the first part when locked so as to bias the cylinder carried by said one frame into co-operating printing relationship with the other cylinder.

15 Preferably said two frames are pivotally interconnected about a pivot axis, and the two parts of the two-part frame are pivotally interconnected about the same pivot axis.

For direct printing, said adjacent cylinder may be

20 an impression cylinder, with a web or other matter to be printed running between the impression cylinder and the printing cylinder. Alternatively, for offset printing, said adjacent cylinder may be a blanket cylinder for transferring ink from the printing cylinder to a web or other matter to be printed. In this case, there would

25 generally be an impression cylinder against which the blanket cylinder presses, with the web between the blanket and impression cylinders. The impression cylinder may also be movable so that a different sized blanket cylinder

30 can be introduced and operative printing engagement can still be maintained (through the web) between the blanket and impression cylinders.

35 Preferably it is the printing cylinder which is mounted in the two-part frame, and suitably an inking system for the printing cylinder is also mounted in the

two-part frame.

The biasing means may for example be a pneumatic cylinder.

In order that the invention may be more clearly understood, an example of it will now be described with reference to the accompanying drawing, which is a simplified side view of part of a printing machine.

On the main part 10 of the printing machine a blanket cylinder 12 is journalled in such a manner that it can be removed and replaced by a blanket cylinder of a different size when a different copy size is required. An impression cylinder 14 is journalled to a support bracket 16, which in turn is pivoted at 18 to the main part 10 of the machine. Suitable biasing (not shown) is provided so that the impression cylinder 14 bears against the blanket cylinder 12, pivoting at 18 to accommodate different sizes of blanket cylinder 12. A web to be printed will run between the impression cylinder 14 and blanket cylinder 12.

A fixed framework 20 provides a pivot point 22. A movable frame comprising two movable frame parts 24, 26 are pivoted about the pivot point 22. The first movable frame part 24 can be pivoted about pivot point 22 under the action of a worm mechanism 28 on a gear wheel 30. As it pivots, the first frame part 24 carries with it the second movable frame part 26, to which it is connected by a pneumatic cylinder 32. The second movable frame part 26 carries a printing cylinder 34, which like the blanket cylinder is removably mounted so it can be replaced by a cylinder of different size. The pivoting about the pivot point 22 brings the printing cylinder 34 towards the blanket cylinder 12, and can accommodate various different sizes of printing and blanket cylinders. During the pivoting a bolt 36 on the fixed frame 20 runs in a slot 38 on the first movable frame part 24, and once the movable frame parts have reached the desired position they can be

secured in that position by tightening the bolt 36.

The second movable frame part 26 also carries the various rollers of a conventional inking system 40 for supplying ink to the printing cylinder 34.

5 In use, the two movable frame parts are adjusted by means of the worm unit 28 until the printing cylinder 34 is nearly touching the blanket cylinder 12 (perhaps 10 to 25 thousandths of an inch - 0.25 to 0.6 mm - but this is not very critical). The bolt 36 is then tightened. Air 10 is then supplied under pressure through a line 42 to the pneumatic cylinder 32, so as to make the second frame part 26 pivot with respect to the first frame part 24, bringing the printing cylinder 34 and blanket cylinder 12 into contact and placing a desired degree of loading between 15 them. To permit this relative pivoting, the pneumatic cylinder is pivotably connected at 44 to the frame parts 24,26. The machine is now ready for printing.

When it is desired to vary the size of the copies being produced, it is a simple matter to pivot the frame 20 parts 24,26 carrying the printing cylinder 34 away from the blanket cylinder 12. The blanket cylinder 12 and printing cylinder 34 can then be removed and replaced with different sizes, and the machine set up ready for printing again as before.

25 Although the above description refers to an offset printing machine, the pivoting arrangements could clearly be provided between a fixed impression cylinder and a movable printing cylinder, with no intermediate blanket cylinder.

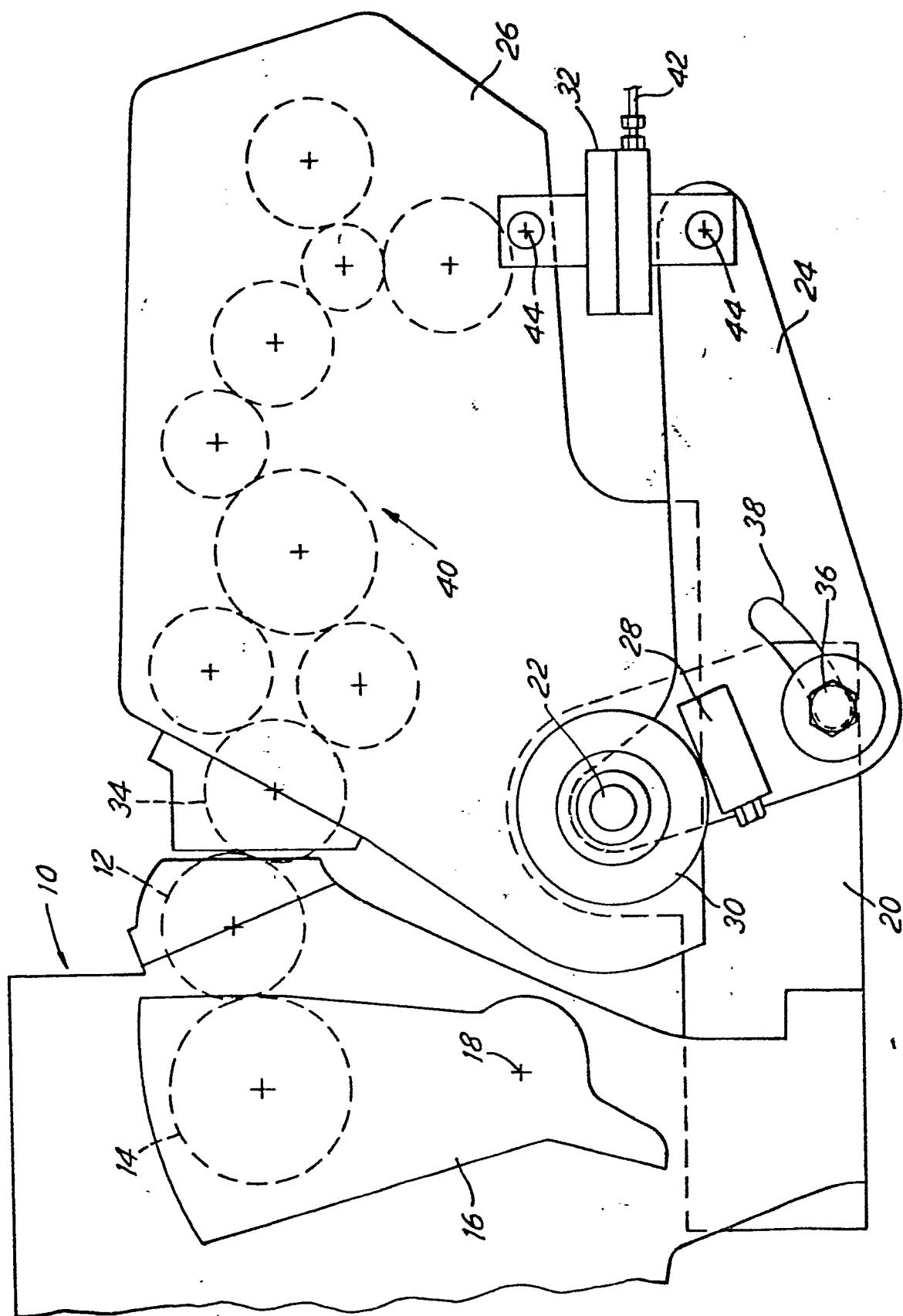
CLAIMS:

1. A printing machine having a printing cylinder (34) and at an adjacent cylinder (12) co-operating with the printing cylinder during printing, the printing cylinder being removable and replaceable by a printing cylinder of different diameter, the two cylinders being mounted in respective frames (24,26;10) which are movable relative to each other to accommodate the different diameters of printing cylinders, characterised in that one of the frames is in two parts (24,26), means (36) being provided for locking a first said part (24) relative to the other frame (10) at a desired position close to the co-operating printing position of the cylinders, and means (32) acting between said two frame parts (24,26) for moving the second part (26) relative to the first part (24) when locked so as to bias the cylinder carried by said one frame (24,26) into co-operating printing relationship with the other cylinder.
2. A printing machine according to claim 1 wherein said two frames are pivotally interconnected about a pivot axis (22), and the two parts (24,26) of the two-part frame are pivotally interconnected about the same pivot axis (22).
3. A printing machine according to claim 1 or claim 2 wherein the printing cylinder (34) is mounted in the two-part frame (24,26) and said adjacent cylinder (12) is a blanket roll for offset printing, the blanket roll being replaceable with rolls of different diameter to match the printing cylinder, an impression cylinder (14) being mounted in a further frame (16) which is movable relative to the frame (10) so that the position of the impression cylinder can be adjusted to accommodate different

diameters of blanket roll.

4. A printing machine according to any one of the preceding claims wherein said biasing means (32) is a
5 pneumatic cylinder.

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EUROPEAN SEARCH REPORT

Application number

EP 80 30 3332

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	<p><u>CH - A - 351 287</u> (FRANKENTHAL)</p> <p>* The whole description *</p> <p>---</p>	1	B 41 F 13/44
A	<p><u>US - A - 3 611 924</u> (HARRISON)</p> <p>* The whole description *</p> <p>----</p>	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.)
			B 41 F
			CATEGORY OF CITED DOCUMENTS
			<ul style="list-style-type: none"> X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			<ul style="list-style-type: none"> &: member of the same patent family, corresponding document
<p></p> <p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
The Hague	13-01-1981	LONCKE	