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File Number: T 76/90 - 3.2.2  
Application No.: 86 307 935.6  
Publication No.: 0 223 405  
Title of invention: Register control apparatus

Classification: B41F 13/02

D E C I S I O N  
of 30 September 1991

Proprietor of the patent: HARLAND CROSFIELD LIMITED

Headword:

EPC Article 56 EPC

Keyword: "Inventive step - no"

Headnote



Europäisches  
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Patent Office

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Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number : T 76/90 - 3.2.2

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.2**  
**of 30 September 1991**

**Appellant :** HARLAND CROSFIELD LIMITED  
18 Cork Street  
London W1X 1HB (GB)

**Representative :** Skone James, Robert Edmund  
GILL JENNINGS & EVERY  
53-64 Chancery Lane  
London WC2A 1HN (GB)

**Decision under appeal :** Decision of Examining Division 2.3.04.086 of the  
European Patent Office dated 31 August 1989  
refusing European patent application  
No. 86 307 935.6 pursuant to Article 97(1) EPC.

**Composition of the Board :**

**Chairman :** G.S.A. Szabo  
**Members :** W.D. Weiß  
J.H. van Moer

## Summary of Facts and Submissions

I. European patent application No. 86 307 935.6, filed on 14 October 1986, published under No. 0 223 405, was refused by the decision of the Examining Division dated 31 August 1989.

II. The decision was based on Claims 1 to 3 received on 2 May 1989 with a letter dated 27 April 1989. The independent Claim 1 of this set of claims reads as follows:

"1. Printing apparatus having a web flow path extending from a printing cylinder (12a), for printing repeat images and register marks on the web (10), to a machine (20a, 20b) for performing a non-printing operation on the web in register with the printed images, the web flow path having a length such that it includes a number of printed images, and including detector means for sensing the condition of register between the non-printing operation performed on the web and the images printed on the web, a register control circuit (28) responsive to the output of the detector means and providing an output indicative of any departure from a desired condition of register, and register correcting means (18, 30) responsive to an output of the register control circuit indicative of such departure to restore the condition of register between the non-printing operation and the printed images on the web; and characterised in that the said machine (20a, 20b) operates in synchronism with the operation of the printing cylinder (12a), and in that the detector means includes a first mark detector (24) arranged in the flow path immediately after the printing cylinder and providing a signal indicative of the passage of register marks printed on the web and therefore indicative of the timing of the operation of the printing cylinder and of the said machine

synchronised with the printing cylinder; and a second mark detector (26) arranged in the flow path immediately before the machine performing the non-printing operation and providing a signal indicative of the timing of the passage of register marks and therefore of printed images on the web entering the said machine at the end of the said flow path; the register control circuit (28) receiving the said signals from the first and second mark detectors and controlling the register correcting means accordingly."

The dependent Claims 2 and 3 refer to particular embodiments of the printing apparatus according to Claim 1.

- III. In its decision, the Examining Division held that the subject-matter of the three claims did not involve an inventive step having regard to FR-A-1 312 238, referred to hereinafter as (D1) and "Automation", July 1965, pages 80 to 81, hereinafter referred to as (D2).
- IV. On 25 September 1989, an appeal was lodged against this decision. The fee for appeal was paid simultaneously. The Statement of the Grounds was submitted on 11 December 1989.
- V. The gist of the Appellant's argument is as follows:

In the field of printing there are two different types of operation which involve monitoring of images printed on a web:

- repeat length measurement, and
- print registration.

The application under appeal is concerned with print registration and not with repeat length measurement.

The apparatus described in document (D1) is designed to achieve repeat length measurement.

Document (D2) does describe a print registration method, but it does not disclose

- that the non-printing operation machine operates in synchronism with the printing cylinder;
- that a first mark detector is arranged immediately before the non-printing machine;
- that a second mark detector is arranged immediately before the non-printing operating machine; and
- the register control circuit receives signals from the first and second mark detectors to control the register correcting means.

Moreover, both the documents (D1) and (D2) require there to be monitoring of shaft rotation.

VI. By a letter of 5 June 1991 the Appellant withdrew a previous auxiliary request for oral proceedings and requested a decision on this Appeal based on the written submissions already made.

Consequently, the Appellant requests that the decision under Appeal be set aside and a patent be granted on the basis of the Claims 1 to 3 and description pages 2, 2a, and 3 filed on 2 May 1989 by letter of 27 April 1989 as well as pages 1, 4, 5 of the description and Figures 1 and 2 as originally filed.

**Reasons for the Decision**

1. The appeal is admissible.
2. The amendments made to the application do not contravene Article 123 (2) EPC.
3. The Board is in agreement with the Examining Division that the subject-matter of Claim 1 is novel.

4. Closest prior art

Document (D2), in particular Figure 1 on page 80, represents the closest prior art. This Figure displays undisputedly a printing apparatus which comprises all the features in the preamble of Claim 1, the non-printing operation being represented by a cutting operation.

On page 81, second paragraph, of document (D2) the principle of the register control is described, which is quite the same as in the application under appeal. It consists in keeping constant the number of repeat images between two horizontally spaced positions. In Figure 1, these positions are the exit of the printing press and the position of the "scanner". It may be assumed that, initially, the "correction motor" is set in a position and that the "Register mark" in front of the fifth image counted from the exit of the printing press passes the scanner at the moment when the "Selector switch" signals that the "Register mark" after the first image has just left the printing press. Then, according to this assumed adjustment, the signals of the "Scanner" and the "Selector switch" are coincidentally registered. Whenever the length of the web between these two positions becomes shorter or longer, the scanner signal will arrive later or earlier, respectively, than the signal originating from the selector switch.

Therefore, the first step of this known - as well as of the claimed - control process is a measurement of the repeat length.

The correction motor is then actuated in a way to make the path for the web shorter or longer, respectively, until again five images fit between the two positions and the two signals coincide again. However, this register control will warrant the correct position of the cut with respect to each image only when the rotation of the "Cutoff knife" is synchronised with the rotation of the printing press. Otherwise the whole controlling effort would make no sense.

Consequently, the controlling method used in document (D2) implies that the cutoff knife operates in synchronism with the printing cylinder.

The "Selector switch" displayed in Figure 1 of document (D2) constitutes a timing element which provides a signal indicative of the timing of the operation of the printing cylinder and, consequently, of the "Cutoff knife" synchronised with the printing cylinder, see in particular page 81, left column, first paragraph.

The "Scanner" constitutes a mark detector which provides a signal indicative of the timing of the passage of register marks and therefore of printed images on the web entering the machine performing a non-printing operation.

Moreover, there is a register "Control unit" receiving the signals from the "Selector switch" (timing function) and from the "Scanner" (mark detector) and controlling the register correcting means accordingly.

5. Problem to be solved

The user of the device disclosed in document (D2), Figure 1, may have soon become aware of some sources of error inherent in the repeat length measurement of this known machine:

- a) The measurement accuracy is reduced by any backlash between the printing cylinder and the backup roll shaft, and
- b) register deviations which are due to length variations of the web occurring in the path section between the scanner and the cutoff knife are not considered by the repeat length measurement and hence in the register control which functions on the basis of this measurement.

The Board considers that there is no inventive merit in the recognition of this drawback and, hence, of the technical problem which consists in overcoming this drawback.

6. Difference to closest prior art

Following the above considerations, the subject-matter of Claim 1 differs from the device disclosed in Figure 2 of document (D2) and analysed in paragraph 4 above in that

- a first register mark detector is used instead of a selector switch to provide for the said timing function, and
- the first and the second register marks are arranged in the flow path immediately after the printing cylinder and immediately before the machine performing the non-printing operation, respectively.

These distinguishing features lead to the solution of the problem stated above.

7. Inventive step

Document (D1), see in particular Figures 1 and 2, discloses a similar device for measuring the repeat length of printed images which uses two photodetectors (56, 58) spaced apart along the path of a moving web (12, 52, 54). This measurement may also be used to automatically control a subsequent operation, be it another printing operation or for instance a cutting operation, (see in particular page 1, second paragraph, page 4, left column, third paragraph from below, and page 7, right column, first paragraph).

This known register control preferably tends to avoid working with special register marks but the photodetectors respond to features of the repeat image itself, (see page 3, left column, last paragraph, and Figures 5 and 6). Therefore, a phase indicator (44, 96, 104) has to be used to ensure that the photodetectors are only activated to respond to the selected feature of the image and not to a similar one in another region of the image. Document (D1), however, leaves no doubt that the phase indicator is not needed whenever register marks are used. On the other hand, Claim 1 of the application under appeal is silent about whether or not the device according to the application may comprise a phase indicator. Consequently, the respective argument by the Appellant is not a valid one.

What matters is that the two mark detectors (56, 58) produce signals (120, 122), respectively, which are received by the control circuit (Figure 5) and control the

register correcting means (155, 156) in a manner to reduce any temporary offset of the two signals (120, 122).

A person skilled in the art who aims at avoiding the drawback a) mentioned in Point 5 above will immediately recognise that the problem of backlash is avoided in document (D1) and will, therefore, not hesitate to replace the combination of a selector switch and a photodetector (scanner) by a combination of two photodetectors in the device disclosed in document (D2).

The device which would be created by this obvious replacement still suffers, at least to a certain extent, from the drawback b) mentioned in Point 5 above, because the mark detectors would not be positioned immediately after the printing cylinder and immediately before the cutting machine, respectively, and therefore not take account of any length variations which occur between their positions and the printing cylinder and the non-printing station, respectively. Since, however the source of error is obviously identifiable for a skilled person, the exact positioning of the detector means which provides for a remedy in this respect merely constitutes a routine and simple optimising measure.

Consequently, the Board comes to the conclusion that the subject-matter of Claim 1 is obvious having regard to the documents (D2) and (D1) and, therefore, fails to involve an inventive step.

8. Claim 1 is not allowable having regard to Article 52 (1).

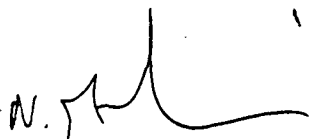
Order

For these reasons, it is decided that:

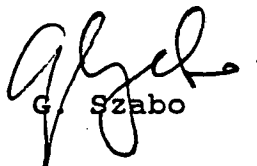
The appeal is dismissed.

The Registrar:

The Chairman:



N. Maslin



G. Szabo

*Handwritten initials*