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(56) Documents Cited

EP 0533305 A US 5163012 A US 4872024 A

US 4685139 A US 4567506 A US 4371265 A

**WPI Abstract Accession No 92-232128/28(VAN DAM)
and NL 9002576 (see abstract)**

(58) Field of Search

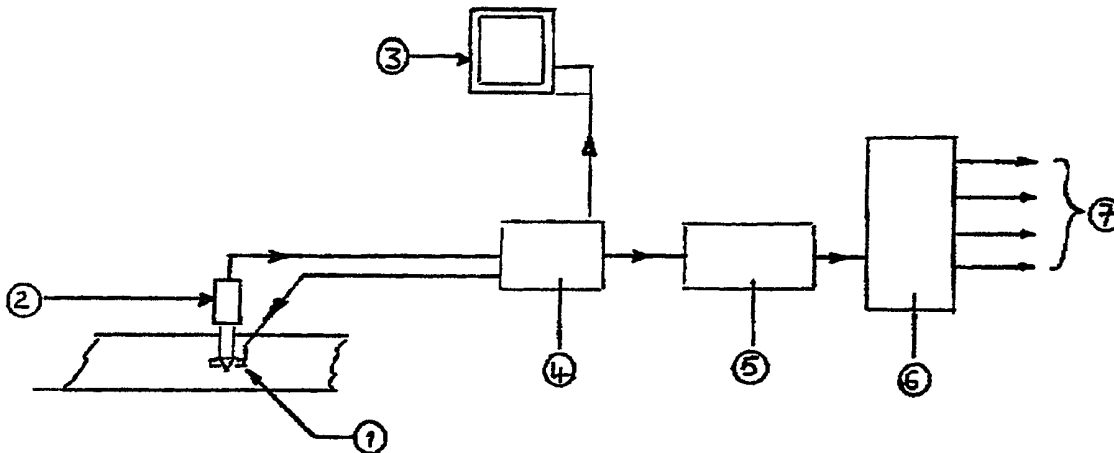
UK CL (Edition L) B6C CVT CVU CWG CWK CWR

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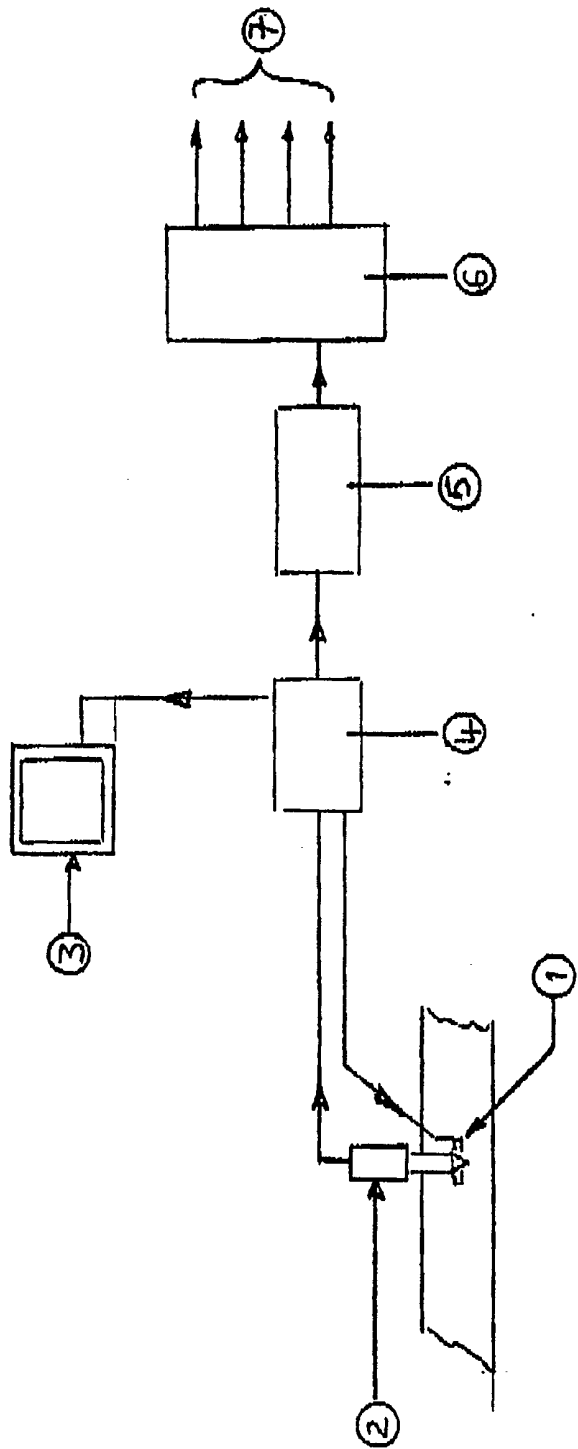
ON-LINE DATABASE : WPI

(54) **Print monitor.**

(57) An apparatus for monitoring printed matter in a printing press comprises a video camera 2 directed at a pattern of dots printed on successive copies to form an enlarged image of the dot pattern in a frame store 5. An analyser 6 analyses the successive video images to measure or determine various parameters of the dot pattern, such as dot gain, spread, shape, skip, slur, ink density and registration of the component colours. The measurements determined can be interpreted by the analyser 6 to control or adjust the printing press, in a closed-loop control system.



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This invention relates to the monitoring of printed matter in a printing press.

In accordance with this invention, there is provided a method of monitoring printed matter in a printing press, in
5 which the press prints a pattern of dots on successive copies and a video camera forms an enlarged video image of the successive dot patterns and writes the successive images into a video frame store, and an analyser is used to analyse the successive video images.

10 Also in accordance with this invention, there is provided a print monitoring apparatus, comprising a video camera for directing at a pattern of dots on successive printed copies to form an enlarged video image of the successive dot patterns, a frame store into which the successive images are
15 written, and an analyser for analysing the successive video images.

The analyser can be arranged to measure or determine various parameters of the dot pattern, for example one or more of the following: dot gain, spread, shape, skip, slur, ink
20 density, and registration of the component colours. These measurements can be interpreted by the analyser to control or make adjustments to the printing press, in a closed-loop control system.

Also, the analyser can compare each newly-read dot
25 pattern with a stored dot pattern from a previous reading, to determine any significant changes with time, which would indicate that the printing plate is suffering wear.

The pattern of dots is preferably very small, e.g. occupying an area of 1 square millimetre, and is formed on the
30 printing plate during pre-print preparation.

An embodiment of this invention will now be described by way of example only and with reference to the accompanying drawing, the single figure of which is a schematic diagram of a print monitoring system in accordance with the invention.

35 Referring to the drawing, there is shown a print monitoring system used with a moving web W in a printing press. The web W carries successive printed copies, each with a small pattern of dots (e.g. along an edge of each copy). the system

comprises a strobe flash tube 1 to give an instantaneous illumination of the web at timed intervals synchronised with the movement of the web. The system further comprises a video camera 2 with microscope directed at the illuminated area of the web, and a control unit 4 controls the arrangement such that the camera 2 is focused on the pattern of dots carried by each copy, and an enlarged image of the dot pattern is formed on a video monitor 3 and captured in a video frame store 5.

A microprocessor-based analyser 6 is arranged to analyse the image stored in the frame store 5, to measure or determine various parameters of the dot pattern, e.g. dot gain, spread, shape, skip, slur, ink density, and registration. These measurements are interpreted by the analyser 6 to control the printing press, over control lines 7. Also the analyser 6 compares each newly-read dot pattern with a stored dot pattern from a previous reading, to determine any significant changes with time, which would indicate that the printing plate is suffering wear.

It will be appreciated that the monitoring system which has been described provides considerable benefit to the operator of the printing press. The system can automatically adjust various controls of the press, and the printer will also know when the printing plate is becoming worn.

CLAIMS

- 1) A method of monitoring printed matter in a printing press, in which the press prints a pattern of dots in successive copies and a video camera forms an enlarged video image of the successive dot patterns and writes the successive images into a video frame store, and an analyser is used to analyse the successive video images.
- 2) A method of monitoring printed matter substantially as herein described with reference to the accompanying drawing.
- 10 3) A print monitoring apparatus comprising a video camera for directing at a pattern of dots on successive printed copies to form an enlarged video image of the successive dot patterns, a frame store into which the successive images are written, and are analysed for analysing the successive video images.
- 15 4) A print monitoring apparatus as claimed in claim 3 in which the analyser is arranged to measure or determine various parameters of the dot pattern.
- 5) A print monitoring apparatus as claimed in claim 4 in which the measurements determined by the analyser are interpreted to control or adjust the printing press, in a closed-loop control system.
- 20 6) A print monitoring apparatus as claimed in any of claims 3 to 5 in which the analyser compares each newly-read dot pattern with a dot pattern from a previous reading.
- 25 7) A print monitoring apparatus as claimed in any of claims 3 to 6 in which the pattern of dots is very small.
- 8) A print monitoring apparatus substantially as herein described with reference to the accompanying drawings.

Relevant Technical Fields

- (i) UK Cl (Ed.L) B6C: CVT, CVU, CWG, CWK, CWR
 (ii) Int Cl (Ed.5) B41F

Search Examiner
 A DAVEY

Date of completion of Search
 19 OCTOBER 1993

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-
 1-8

(ii) ONLINE DATABASE: WPI

Categories of documents

- X:** Document indicating lack of novelty or of inventive step. **P:** Document published on or after the declared priority date but before the filing date of the present application.
Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. **E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A: Document indicating technological background and/or state of the art. **&:** Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	EP 0533305 A (KOMORI) See Figure 1	1, 3-7
X	US 5163012 (MAN ROLAND) Whole document	1, 3-6
X	US 4872024 (SAPPORO) Whole document	1, 3-6
X	US 4685139 (TOPPAN) See Figure 7	3-5
X	US 4567506 (NIPPON) See Figure 2	3-5
X	US 4371265 (DAI NIPPON) Whole document	1, 3-6
X	WPI Abstract Accession Number 92-232128/28 (VAN DAM) and NL 9002576 (see abstract)	3-5

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).