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(71) Applicant: **SEIKO EPSON CORPORATION**
Shinjuku-ku, Tokyo (JP)

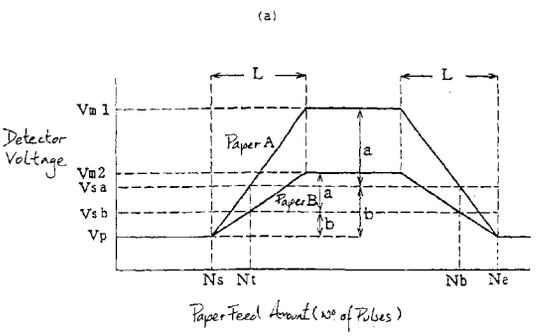
(72) Inventors:
- **Yamaguchi, Naoto**
  Suwa-shi, Nagano-ken (JP)
- **Ishida, Hiroshi**
  Suwa-shi, Nagano-ken (JP)
- **Kumazaki, Masayuki**
  Suwa-shi, Nagano-ken (JP)
- **Yamaguchi, Kazuhiko**
  Suwa-shi, Nagano-ken (JP)
- **Uchiyama, Yukihiro**
  Suwa-shi, Nagano-ken (JP)

(74) Representative: **Sturt, Clifford Mark et al**
J. MILLER & CO.
34 Bedford Row,
Holborn
London WC1R 4JH (GB)

(54) Method for detecting an end portion of a recording paper in a recording apparatus and end portion detection apparatus

(57) A sheet end detector 10, made from a light-emitting element 11 and a light-receiving element 12, detecting changes in the amount of light associated with movement of a recording paper; a standard value calculation means 24, detecting an amount of difference (Vm - Vp) between said sheet end detector 10 platen voltage Vp resulting from light reflected from a sheet guide and said sheet end detector 10 paper saturation voltage Vm resulting from light reflected from a recording paper, and calculating a standard value Vs= [(Vm - Vp) x C] + Vm by multiplying by a constant coefficient C greater than 0 and less than 1; and a comparing means 25, comparing said standard value and a signal from said sheet end detector 10 and recognizing a point in time when said signal corresponds to said standard level as being indicative of the presence of a leading edge or trailing edge of a recording paper, are provided. The amount of paper feeding necessary for platen voltage Vp to reach standard value Vsa, Vsb is a constant value Nt - Ns irrespective of paper characteristics. As standard value Vs is a constant value, the point in time when this amount of light is reached is the point in time when the end portion of a recording paper has reached a constant sheet end detector relative position Nt, Nb.

FIG. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 6667

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB 2 220 742 A (BROTHER IND LTD) 17 January 1990 * the whole document *	1,4	G03G15/00 B41J29/42
A	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 30, no. 4, September 1987, NEW YORK, US, pages 1894-1895, XP002028638 ANONYMOUS: "Form Detection Mechanism on a Serial Printer" * the whole document *	1,4	
A	EP 0 031 137 A (SIEMENS AG) 1 July 1981 * claims; figure 1 *	1,4	
A	EP 0 015 553 A (VYDEC, INC.) 17 September 1980 * claims; figure 1 *	1,4	
A	US 4 540 299 A (YAMADA YASUAKI) 10 September 1985 * the whole document *	1,4	
A	EP 0 266 209 A (BROTHER IND LTD) 4 May 1988 * the whole document *	1,4	
A	EP 0 539 857 A (OKI ELECTRIC IND CO LTD) 5 May 1993 * the whole document *	1,4	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

G03G
B41J
G03B
H04N
B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	3 April 1997	Hoppe, H

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