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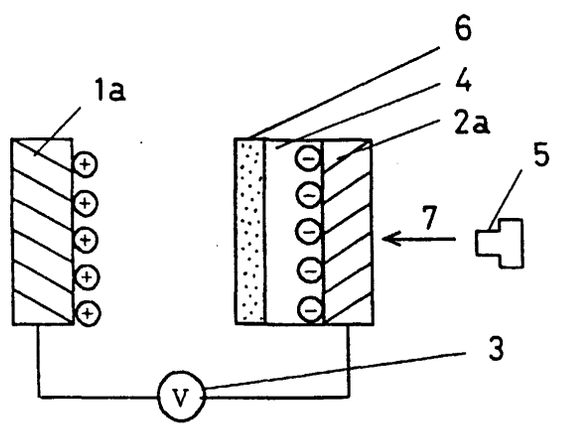
(54) Recording apparatus as well as recording unit and recording head for using same apparatus

(57) In ink jet recording methods, the continuous type is high in recording speed but difficult to simplify the device due to restoration of unnecessary ink or the like, while the on-demand type is simplified in device structure but difficult to speed up recording rate. An recording apparatus employing a recording head structured by: having a head section formed by a transparent electrode 2a formed on a substrate, a photoconductive layer 4 formed on the transparent electrode 2a, and a means for supplying ink 6 onto the photoconductive layer 4, and an opposing electrode la, in this order; the means for supplying ink 6 and the opposing electrode la being arranged to have a gap sufficient for inserting a medium to be recorded therethrough; having a power supply 3 for applying voltage to between the transparent electrode 2a and the opposing electrode la, and a light irradiating means 5 for supplying light corresponding to a desired image pixel to the potoconductive layer, enabling high-precision and high-quality output printing of characters.

FIG. 1



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EUROPEAN SEARCH REPORT

Application Number
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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	PATENT ABSTRACTS OF JAPAN vol. 17, no. 623 (M-1511), 17 November 1993 & JP 05 193135 A (OLYMPUS OPTICAL CO LTD), 3 August 1993 * abstract *	1,6,8, 10,14	B41J2/06 B41J2/015
A	PATENT ABSTRACTS OF JAPAN vol. 8, no. 58 (P-261), 16 March 1984 & JP 58 207058 A (YOKOGAWA DENKI SEISAKUSHO KK), 2 December 1983 * abstract *	1,6,14	
A	PATENT ABSTRACTS OF JAPAN vol. 11, no. 391 (P-649), 22 December 1987 & JP 62 156674 A (SEIKOSHA CO LTD), 11 July 1987 * abstract *	1,2,6,8, 14	
A	PATENT ABSTRACTS OF JAPAN vol. 11, no. 391 (P-649), 22 December 1987 & JP 62 156673 A (SEIKOSHA CO LTD), 11 July 1987 * abstract *	1,6,14	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B41J G03G
A	US 3 484 162 A (H. E. CLARK) 16 December 1969 * column 2, line 71 - column 3, line 35; figure 2 *	1,4,14	
A	PATENT ABSTRACTS OF JAPAN vol. 96, no. 8, 30 August 1996 & JP 08 095356 A (NEC CORP), 12 April 1996 * abstract *	1,6,14	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	8 January 1999	Ducreau, F

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EP 97 30 2780

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)
A	US 4 794 463 A (S. TAMURA ET AL.) 27 December 1988 * claim 1; figures 1,2 * ---	1,10,14	
A	PATENT ABSTRACTS OF JAPAN vol. 17, no. 652 (M-1520), 3 December 1993 & JP 05 212869 A (SEIKOSHA CO LTD), 24 August 1993 * abstract * -----	1,14	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)

The present search report has been drawn up for all claims

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08-01-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3484162 A	16-12-1969	CH 472710 A	15-05-1969
		DE 1497109 A	29-05-1969
		GB 1086197 A	
		NL 6411249 A,B	05-04-1965
		SE 331032 B	07-12-1970
US 4794463 A	27-12-1988	JP 1008050 A	12-01-1989
		JP 2602817 B	23-04-1997
		JP 63120658 A	25-05-1988
		EP 0267782 A	18-05-1988
		JP 1077550 A	23-03-1989

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