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(54) Ink cartridge and recording device

(57) An ink cartridge (200) is used mounted in a recording device with a hollow needle (82), a lever, a protruding wall, and an optical sensor (170). The lever and the optical sensor are located on either side of the hollow needle, but closer to the opening through which the ink cartridge is mounted. The ink cartridge is formed with two grooves open (236,240) to the front and lower surfaces of the ink cartridge at positions that correspond to the protruding wall and the optical sensor. A light blocking member is disposed in the groove that corresponds to the optical sensor. When the ink cartridge is mounted into the recording device, one groove accommodates and is guided by the protruding wall. The other groove accommodates the sensor so that the light blocking member protrudes into the optical sensor. Also, the front surface of the ink cartridge abuts the lever, which uncovers the hollow needle so that ink supply hole in the front surface of the ink cartridge is inserted with the hollow needle.

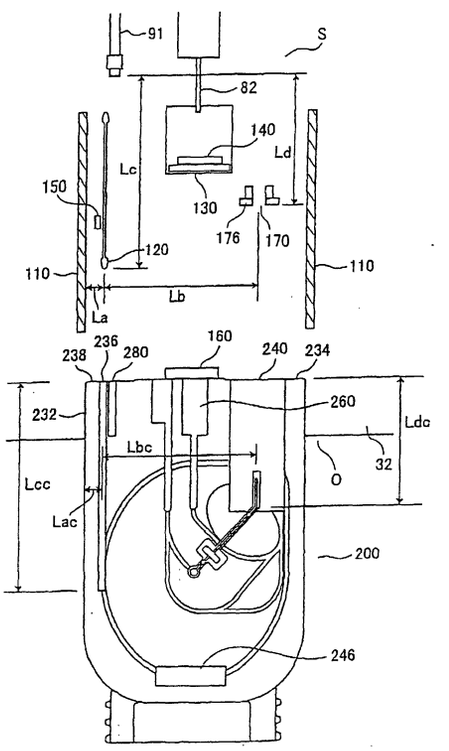


FIG. 30

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EUROPEAN SEARCH REPORT

Application Number
EP 04 01 6566

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.7)
X	US 4 074 284 A (DEXTER JOHN L ET AL) 14 February 1978 (1978-02-14) * column 4, line 17 - column 5, line 20; figures 1a,1b *	1-5	B41J2/175
X	US 6 170 937 B1 (BULLOCK MICHAEL L ET AL) 9 January 2001 (2001-01-09) * column 7, line 6 - line 47 *	1-5	
X	US 4 604 633 A (KIMURA YOSHIAKI ET AL) 5 August 1986 (1986-08-05) * column 23, line 28 - line 45; figure 44 *	1-5	
X	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 13, 30 November 1998 (1998-11-30) & JP 10 202896 A (MATSUSHITA ELECTRIC IND CO LTD), 4 August 1998 (1998-08-04) * abstract *	1-5	
X	US 6 338 552 B1 (HIROSAWA TOSHIAKI ET AL) 15 January 2002 (2002-01-15) * column 17, line 45 - column 18, line 24; figure 9 *	1-5	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B41J
P,X	US 2002/047882 A1 (GOLDMAN YOSSI ET AL) 25 April 2002 (2002-04-25) * paragraph [0016] - paragraph [0026]; figure 1 * * paragraph [0049] - paragraph [0050]; figure 7 * * paragraph [0073] - paragraph [0077]; figure 8 *	1-5	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 December 2004	Adam, E

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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14-12-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4074284 A	14-02-1978	AU 505490 B2	22-11-1979
		AU 2564977 A	07-12-1978
		AU 508993 B2	17-04-1980
		AU 2565077 A	07-12-1978
		CA 1098158 A1	24-03-1981
		CA 1092637 A1	30-12-1980
		CH 621517 A5	13-02-1981
		CH 621518 A5	13-02-1981
		DE 2725270 A1	15-12-1977
		DE 2725271 A1	15-12-1977
		ES 459529 A1	16-04-1978
		ES 459530 A1	01-05-1978
		FR 2354201 A1	06-01-1978
		GB 1578961 A	12-11-1980
		GB 1578962 A	12-11-1980
		IT 1126738 B	21-05-1986
		IT 1116657 B	10-02-1986
		JP 52150636 A	14-12-1977
		JP 52150637 A	14-12-1977
		JP 1408299 C	27-10-1987
		JP 60058860 A	05-04-1985
		JP 62016821 B	14-04-1987
		JP 1679919 C	13-07-1992
		JP 3045711 B	11-07-1991
		JP 60058861 A	05-04-1985
		JP 1733700 C	17-02-1993
		JP 3023347 B	28-03-1991
		JP 60058867 A	05-04-1985
		JP 60058868 A	05-04-1985
		JP 1432749 C	24-03-1988
		JP 60058862 A	05-04-1985
		JP 62040193 B	27-08-1987
		JP 1457076 C	09-09-1988
		JP 60058863 A	05-04-1985
		JP 63002788 B	20-01-1988
		NL 7706205 A ,B,	09-12-1977
		NL 7706206 A ,B,	09-12-1977
		SE 433474 B	28-05-1984
		SE 7706574 A	07-12-1977
		SE 420469 B	12-10-1981
		SE 7706575 A	08-12-1977
		US 4183031 A	08-01-1980
US 6170937 B1	09-01-2001	US 5812156 A	22-09-1998
		CN 1227793 A ,B	08-09-1999
		CN 1286659 T	07-03-2001

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 01 6566

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-12-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6170937 B1		DE 69808145 D1	24-10-2002
		DE 69808145 T2	17-04-2003
		EP 1201441 A1	02-05-2002
		EP 1060081 A1	20-12-2000
		EP 0940258 A1	08-09-1999
		ES 2179493 T3	16-01-2003
		HK 1029775 A1	17-01-2003
		JP 11291516 A	26-10-1999
		JP 2002505212 T	19-02-2002
		WO 9944830 A1	10-09-1999
		US 6318850 B1	20-11-2001
		US 6283586 B1	04-09-2001
		US 2003206220 A1	06-11-2003
		US 2001015742 A1	23-08-2001
		US 2002024570 A1	28-02-2002
		DE 69704477 D1	10-05-2001
		DE 69704477 T2	12-07-2001
		DE 69723737 D1	28-08-2003
		DE 69723737 T2	03-06-2004
		EP 0854043 A2	22-07-1998
		EP 0968090 A1	05-01-2000
		JP 10217509 A	18-08-1998
		JP 2001509103 T	10-07-2001
		US 6130695 A	10-10-2000
		US 6227638 B1	08-05-2001
		WO 9831548 A1	23-07-1998
		US 6322205 B1	27-11-2001
		US 2001015738 A1	23-08-2001
		US 2004027432 A1	12-02-2004
		US 5956057 A	21-09-1999
		US 6126265 A	03-10-2000
		US 2002024571 A1	28-02-2002
US 4604633 A 05-08-1986		JP 59104946 A	18-06-1984
		JP 59104947 A	18-06-1984
		JP 59115856 A	04-07-1984
		JP 59115857 A	04-07-1984
		JP 59115858 A	04-07-1984
		JP 59115859 A	04-07-1984
		JP 59115860 A	04-07-1984
		DE 3344447 A1	14-06-1984
JP 10202896 A 04-08-1998		NONE	
US 6338552 B1 15-01-2002		JP 3267488 B2	18-03-2002
		JP 9131886 A	20-05-1997

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 01 6566

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-12-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6338552 B1		JP 3267493 B2	18-03-2002
		JP 9169119 A	30-06-1997
		DE 69624063 D1	07-11-2002
		DE 69624063 T2	13-02-2003
		EP 0773109 A2	14-05-1997
		US 6024442 A	15-02-2000
US 2002047882 A1	25-04-2002	AU 1265002 A	06-05-2002
		AU 1265102 A	06-05-2002
		AU 1265202 A	06-05-2002
		EP 1244558 A2	02-10-2002
		EP 1333982 A2	13-08-2003
		WO 0234543 A2	02-05-2002
		WO 0234523 A2	02-05-2002
		WO 0234524 A2	02-05-2002
		JP 2004512201 T	22-04-2004
		US 2002044811 A1	18-04-2002
		US 2002070996 A1	13-06-2002

EPO FORM P0459

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