



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 947 328 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
10.05.2000 Bulletin 2000/19

(51) Int Cl.7: **B41J 2/175**

(43) Date of publication A2:
06.10.1999 Bulletin 1999/40

(21) Application number: **99302481.9**

(22) Date of filing: **30.03.1999**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(71) Applicant: **BROTHER KOGYO KABUSHIKI
KAISHA**
Nagoya-shi, Aichi-ken 467-8561 (JP)

(72) Inventor: **Sasaki, Toyonori**
Anjou-shi, Aichi-ken (JP)

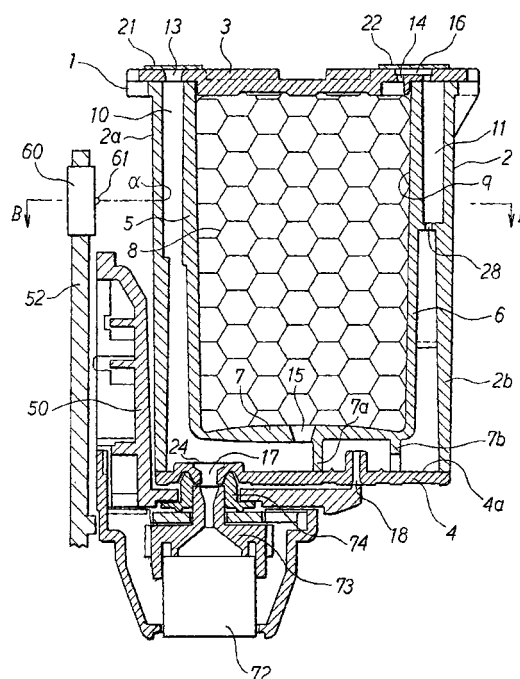
(30) Priority: **30.03.1998 JP 8403798**
07.04.1998 JP 9477298
07.04.1998 JP 9477398
07.04.1998 JP 9477498
07.04.1998 JP 9477598
07.04.1998 JP 9477698
07.04.1998 JP 9477798
07.04.1998 JP 9477898
28.05.1998 JP 14699398
15.06.1998 JP 16692098
05.02.1999 JP 2832099

(74) Representative: **Senior, Alan Murray**
J.A. KEMP & CO.,
14 South Square,
Gray's Inn
London WC1R 5LX (GB)

(54) **Ink cartridge and remaining ink volume detection method**

(57) An ink cartridge has a first partitioning wall (5) and a third partitioning wall (7) for dividing the inside of a case (2) into a first ink chamber (9) and a second ink chamber (10), and a second partitioning wall (6) for demarcating an atmosphere connection chamber (11). In an upper case cover (3) are formed an ink filling hole (13) communicating with the second ink chamber (10) and a pressure reduction hole (14) communicating with the atmosphere connection chamber (11). Therefore, when ink filling is being done, the filling apparatus and the pressure reduction apparatus need only be brought to bear from one side of the upper case cover, resulting in improved work efficiency. Ink filling can be performed efficiently because the ink successively passes to the second ink chamber (10) and the first ink chamber (9). After ink filling, the ink filling hole (13) and the pressure reduction hole (14) can easily be sealed off with sealing material. An ink cartridge is thus provided that can be easily assembled at low cost.

Fig. 1



EP 0 947 328 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 2481

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	EP 0 573 274 A (CANON KK) 8 December 1993 (1993-12-08) * column 4, line 15 - column 6, line 14 * * figures 1,2,4,6 *	40-42,44	B41J2/175
A	—	18, 21-25, 43,45	
A	US 5 703 633 A (GEHRER UDO ET AL) 30 December 1997 (1997-12-30) * column 6, line 11 - column 8, line 37 * * figures 1,3,5,7 *	1,2,12, 14,17,30	
A	EP 0 791 464 A (FUJII XEROX CO LTD) 27 August 1997 (1997-08-27) * column 4, line 33 - column 6, line 33 * * column 7, line 3 - line 31 * * column 14, line 4 - line 55 * * figures 1A,1B,14,15 *	1,2,9, 10,12, 16,18, 29,30	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	EP 0 765 756 A (CANON KK) 2 April 1997 (1997-04-02) * page 9, line 19 - line 57 * * figure 2 *	1,2,5, 18,26,29	B41J
A	EP 0 685 340 A (CANON KK) 6 December 1995 (1995-12-06) * column 10, line 44 - column 12, line 13 * * figures 3A-3C,5A,5B,14A-14C,21,22 * — -/-	1,5,6	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 March 2000	Examiner Papastefanou, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.92 (P4001)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 2481

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Clg)
A	EP 0 631 874 A (CANON KK) 4 January 1995 (1995-01-04) * column 10, line 8 - column 11, line 52 * * column 13, line 4 - line 28 * * column 28, line 38 - column 29, line 41 * * figures 1B,2A,2B,4B,22,23A-23D *	1	
			TECHNICAL FIELDS SEARCHED (Int.Clg)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 March 2000	Examiner Papastefanou, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 30 2481

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.

16-03-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0573274 A	08-12-1993	JP 5332812 A	17-12-1993
		EP 0881080 A	02-12-1998
		US 6012795 A	11-01-2000
US 5703633 A	30-12-1997	DE 4328001 A	23-02-1995
		GB 2281253 A,B	01-03-1995
EP 0791464 A	27-08-1997	JP 9226139 A	02-09-1997
		US 5856838 A	05-01-1999
EP 0765756 A	02-04-1997	JP 9094972 A	08-04-1997
		JP 9094973 A	08-04-1997
		JP 9094975 A	08-04-1997
		JP 9094976 A	08-04-1997
		JP 9094982 A	08-04-1997
		AU 6795196 A	10-04-1997
		CN 1157218 A	20-08-1997
EP 0685340 A	06-12-1995	JP 7323565 A	12-12-1995
		JP 8025640 A	30-01-1996
		DE 69511461 D	23-09-1999
EP 0631874 A	04-01-1995	JP 7040544 A	10-02-1995
		JP 2931511 B	09-08-1999
		JP 7068778 A	14-03-1995
		JP 7125239 A	16-05-1995
		AT 184544 T	15-10-1999
		DE 69420624 D	21-10-1999
		EP 0805032 A	05-11-1997
		EP 0802056 A	22-10-1997
		EP 0802057 A	22-10-1997
		EP 0805033 A	05-11-1995
		JP 11342627 A	14-12-1999
		JP 11342628 A	14-12-1999
		SG 67330 A	21-09-1999

EPO FORM P0469

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