(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 396 344 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
28.07.2004 Bulletin 2004/31

(43) Date of publication A2:
10.03.2004 Bulletin 2004/11

(21) Application number: **03026325.5**

(22) Date of filing: **07.08.1992**

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

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE

(30) Priority: **28.01.1992 JP 1283492**
19.02.1992 JP 3222692
16.03.1992 JP 5815192
26.06.1992 JP 19340292

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
02076904.8 / 1 241 012
00200827.4 / 1 013 444

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(54) Ink tank cartridge and container therefor

(57) An ink tank cartridge (5) is disclosed including a housing (11,50) removeably mounted onto an ink supply needle (14,90) of the ink-jet type recording apparatus body. The housing being provided with an ink supply port (15,53,71) projecting from a bottom surface of the housing both inwardly and outwardly. A porous member (21,64) for impregnating ink is positioned inside the housing abutting against the ink supply port through a filter (17,55). The ink tank cartridge being further provided with a packing member (19,57,73) resiliently abutting against an outer periphery of the ink supply needle at the end of the ink supply port. An end opening is sealed with a sealing member (20,60,77) through which the ink supply needle penetrates.

Accordingly, the ink tank cartridge of the invention is advantageous in that the ink supply needle does not require a sharp tip, air is prevented from entering the ink supply path of the recording apparatus, and a tight air-seal between the ink supply needle and the ink tank can be maintained.

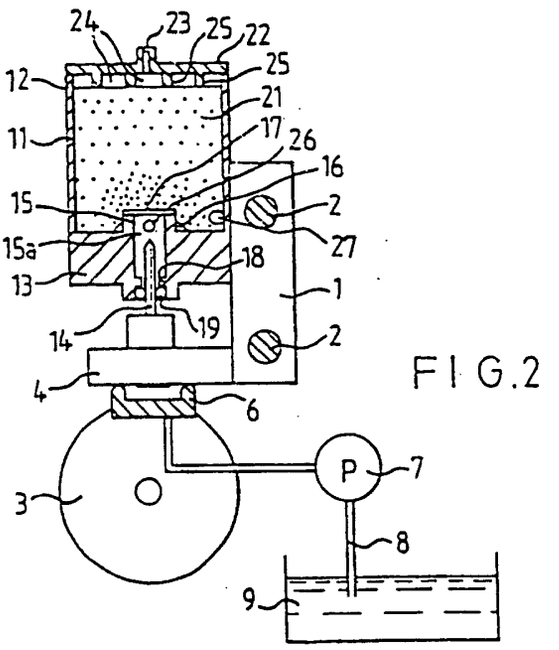

FIG.2

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EUROPEAN SEARCH REPORT

Application Number
EP 03 02 6325

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.5)
Y	PATENT ABSTRACTS OF JAPAN vol. 016, no. 122 (M-1226), 27 March 1992 (1992-03-27) & JP 03 288653 A (SEIKO EPSON CORP), 18 December 1991 (1991-12-18) * abstract *	1	B41J2/175
D,Y	JP 50 074341 A (NN) 19 June 1975 (1975-06-19) * figures *	1	
A	PATENT ABSTRACTS OF JAPAN vol. 012, no. 197 (M-706), 8 June 1988 (1988-06-08) & JP 63 003961 A (CANON INC), 8 January 1988 (1988-01-08) * abstract *	1,2	
D,A	EP 0 378 240 A (CANON KK) 18 July 1990 (1990-07-18) * column 4, line 20 - column 5, line 25; figures 3A,3B *	3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5) B41J

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
The Hague	15 January 2004	De Groot, R

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)

European Patent Office

Application Number
EP 03 02 6325

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1, 2, 3

European Patent Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 03 02 6325

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1,2,3

1.1. claim: 1

STF:
combination of a seal and an O-ring
Problem/solution:
no longer need of a sharp needle and thus no longer risk of injuries

1.2. claim: 2

STF:
means for stopping broken pieces
Problem/Solution:
preventing blockage or damaging ink supply system

1.3. claim: 3

STF:
compression of porous member at a region in the vicinity of the ink supply port
Problem/Solution:
Preventing forming spaces for air and therewith blockage of ink transport

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2. claims: 4,10

STF:
Shape of the ink supply port
Problem/Solution:
Improvement of the connection between printhead part and ink tank

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3. claims: 5-9

STF:
Filter connection, filter material and pore size
Problem/Solution:
Improved function and reliability of the filter

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4. claims: 11,12

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

STF:
place of the ink level detection electrodes
Problem/Solution
improved reliability of the detection signal that the ink tank is empty
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5. claims: 13,14

STF:
Ribs for abutting of porous member and air communication holes
Problem/Solution
Preventing ink transport blockage by air/gas presence
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6. claims: 15-17

STF:
absorbing means in the supply port channel and supports therefor
Problem/Solution:
better ink transport from tank to printhead needle
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7. claims: 18-20

STF:
film seal material
Problem/Solution:
Better tightness
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8. claims: 21-23

STF:
position of holes in the needle
Problem/Solution:
Better ink transport in case of presence of air bubbles

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 02 6325

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.

15-01-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 03288653 A	18-12-1991	NONE	
JP 50074341 A	19-06-1975	NONE	
JP 63003961 A	08-01-1988	NONE	
EP 0378240 A	18-07-1990	JP 2187364 A	23-07-1990
		JP 2575205 B2	22-01-1997
		DE 9007787 U1	14-03-1996
		DE 69028858 D1	21-11-1996
		EP 0378240 A2	18-07-1990
		HK 1007716 A1	23-04-1999
		SG 44689 A1	19-12-1997
		SG 82015 A1	24-07-2001
		US 5515091 A	07-05-1996
		US 5155502 A	13-10-1992
		US 5917524 A	29-06-1999

EPO FORM P0459

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