

(19)



(11)

**EP 1 872 957 A3**

(12)

**EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**05.11.2008 Bulletin 2008/45**

(51) Int Cl.:  
**B41J 2/50 (2006.01) B41J 2/505 (2006.01)**  
**B41J 3/54 (2006.01) B41J 3/60 (2006.01)**

(43) Date of publication A2:  
**02.01.2008 Bulletin 2008/01**

(21) Application number: **07109059.1**

(22) Date of filing: **29.05.2007**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR**  
Designated Extension States:  
**AL BA HR MK RS**

(72) Inventors:  
• **Sekino, Toshiharu**  
**Tokyo 141-8664 (JP)**  
• **Eoka, Kenji**  
**Tokyo 141-8664 (JP)**  
• **Takahashi, Kousuke**  
**Tokyo 141-8664 (JP)**  
• **Hiyoshi, Takeshi**  
**Tokyo 141-8664 (JP)**  
• **Sanada, Tsuyoshi**  
**Tokyo 141-8664 (JP)**  
• **Suzuki, Akira**  
**Tokyo 141-8664 (JP)**

(30) Priority: **29.06.2006 JP 2006178945**  
**29.06.2006 JP 2006178946**  
**29.06.2006 JP 2006178951**  
**29.06.2006 JP 2006178956**  
**26.01.2007 JP 2007016592**  
**26.01.2007 JP 2007016593**

(71) Applicant: **Toshiba TEC Kabushiki Kaisha**  
**Tokyo 141-8664 (JP)**

(74) Representative: **Fuchs**  
**Patentanwälte**  
**Söhnleinstrasse 8**  
**65201 Wiesbaden (DE)**

(54) **Printer**

(57) A printer comprising a main unit (103), a cover (105), a first print head (104) provided in the cover (105), a second print head (102) provided in the main unit (103), and a hinge mechanism (106). The cover (105) can rotate

around the hinge mechanism (106), between a first state (P1) and a second state (P2) in which the cover (105) is opened and closed, respectively, with respect to the main unit (103). The first print head (104) and the second print head (102) can rotate along the locus of the cover (105).

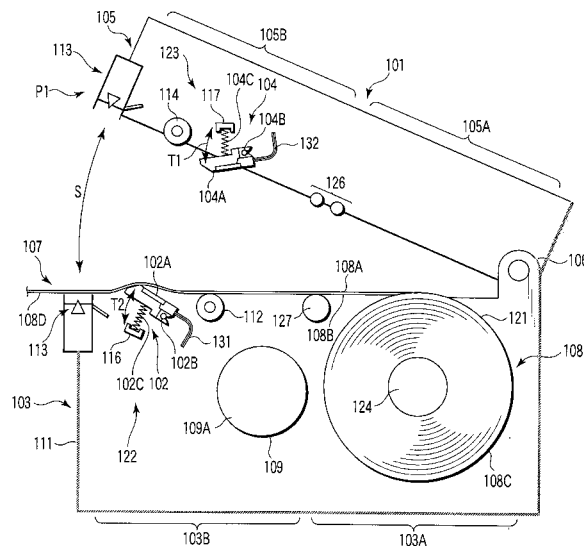


FIG. 2

**EP 1 872 957 A3**



DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
X,E	EP 1 862 322 A (TOSHIBA TEC KK [JP]) 5 December 2007 (2007-12-05) * figures 3,9-11 *	1-9	INV. B41J2/50 B41J2/505 B41J3/54 B41J3/60	
X	US 2002/067386 A1 (ASAI NAOKI [JP] ET AL) 6 June 2002 (2002-06-06) * figures 1-3 *	1-9		
X,D	JP 11 286147 A (NEC YONEZAWA LTD) 19 October 1999 (1999-10-19) * the whole document *	1-9		
X,D	US 2003/112318 A1 (LONG JOHN [US] ET AL) 19 June 2003 (2003-06-19) * figure 5 *	1-9		
X	EP 0 947 340 A (NIPPON ELECTRIC CO [JP]) 6 October 1999 (1999-10-06) * abstract; figure 3 *	10-13		
X	US 5 868 069 A (KHALID NAJEEB [CA] ET AL) 9 February 1999 (1999-02-09) * column 4, lines 51-54; figure 1 *	10-13		TECHNICAL FIELDS SEARCHED (IPC)
A	US 4 750 006 A (HASHIMOTO KENICHIRO [JP]) 7 June 1988 (1988-06-07) * figure 6 *	14-18		B41J
A	EP 1 120 265 A (OKI DATA KK [JP]; OKI DATA SYSTEMS CO LTD [JP]) 1 August 2001 (2001-08-01) * the whole document *	14-18		
A	EP 0 376 404 A (OCE GRAPHICS FRANCE [FR]) 4 July 1990 (1990-07-04) * figure 3 *	14-18		
The present search report has been drawn up for all claims				
Place of search Munich		Date of completion of the search 26 September 2008	Examiner Christen, Jérôme	
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		

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due 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 those claims for which no payment was due.

**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:
- The present supplementary 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 (Rule 164 (1) EPC).



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: 1-9

Claims 1-9 : A printer comprising:

- a main unit (103) which is configured to hold rolled paper (108);
- a cover (105) which covers the main unit (103);
- a hinge mechanism (106) which is located between the main unit (103) and the cover (105) and which supports the cover (105), allowing the cover (105) to rotate between a first state (P1) in which the cover (105) is opened with respect to the main unit (103) and the rolled paper (108) is therefore able to be set in and removed from the main unit (103), and a second state (P2) in which the cover (105) is closed with respect to the main unit (103);
- wherein a first print head (104) and a second print head (102) are able to rotate along a rotation locus of the cover (105).

Objective problem solved: to provide a printer in which the printer heads are prevented from interfering with any other components when the cover is opened or closed.

---

2. claims: 10-13

A printer designed to print data on a thermal paper (202) having a thermosensible layer (204) on at least one side, said printer comprising:

- a first platen (231) which is opposed to a first thermal head (221) across the thermal paper (202);
- a second platen (251) which is opposed to a second thermal head (242) across the thermal paper (202) ;
- a first paper sensor (271) which is arranged upstream with respect to the second thermal head (242), in the direction of feeding the thermal paper (202) and which is configured to detect the thermal paper (202); and
- a second paper sensor (273) which is arranged between the first thermal head (221) and the second thermal head (242) and which is configured to detect the thermal paper (202) and to read optically marks printed on the thermal paper (202).

Objective problem solved: to provide a thermal printer that can use not only double-sided thermal papers and single-sided thermal papers, but also thermal papers having timing marks and therefore can have a high versatility.

---

3. claims: 14-18



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:

A printer in which a first platen (311) is opposed to a second platen (321), respectively, across a paper-feeding path (304), and data is printed on both sides of a paper (302), wherein:

- the first platen (311) is a platen roller which rotates to feed the paper (302),

- and the second platen (321) is fixed in place, has an arced surface (321a) opposed to the second print head (320) and having a radius of curvature almost equal to a radius of curvature of the first platen (311), and has a width as measured in the direction of feeding the paper (302), which is smaller than a diameter of the first platen (311).

Objective problem solved: to provide a printer in which the distance between the printing-start position of the first printing unit and that of the second printing unit can be reduced, without impairing the printing performance of the second printing unit, and therefore avoid wasting paper.

---

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

EP 07 10 9059

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.

26-09-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1862322	A	05-12-2007	US 2008003038 A1	03-01-2008
US 2002067386	A1	06-06-2002	NONE	
JP 11286147	A	19-10-1999	EP 0947340 A2	06-10-1999
US 2003112318	A1	19-06-2003	DE 60215607 T2	30-08-2007
			EP 1321296 A2	25-06-2003
			ES 2272645 T3	01-05-2007
EP 0947340	A	06-10-1999	JP 11286147 A	19-10-1999
US 5868069	A	09-02-1999	US 5704282 A	06-01-1998
US 4750006	A	07-06-1988	JP 1839049 C	25-04-1994
			JP 5048188 B	20-07-1993
			JP 60115467 A	21-06-1985
EP 1120265	A	01-08-2001	CN 1306906 A	08-08-2001
			DE 60103566 D1	08-07-2004
			DE 60103566 T2	30-06-2005
			JP 3727211 B2	14-12-2005
			JP 2001205871 A	31-07-2001
			US 2001010775 A1	02-08-2001
EP 0376404	A	04-07-1990	DE 68914815 D1	26-05-1994
			DE 68914815 T2	17-11-1994
			ES 2052892 T3	16-07-1994
			FR 2642004 A1	27-07-1990
			US 5153606 A	06-10-1992

EPO FORM P0459

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