



(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
22.08.2001 Bulletin 2001/34

(51) Int Cl.7: B41J 29/393

(43) Date of publication A2:
06.12.2000 Bulletin 2000/49

(21) Application number: 00304308.0

(22) Date of filing: 22.05.2000

(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

(72) Inventor: Otsuka, Syuji
Suwa-shi, Nagano-ken (JP)

(74) Representative: Sturt, Clifford Mark et al
Miller Sturt Kenyon
9 John Street
London WC1N 2ES (GB)

(30) Priority: 26.05.1999 JP 14723399

(71) Applicant: SEIKO EPSON CORPORATION
Shinjuku-ku Tokyo (JP)

(54) Printer and charging device

(57) The object of the present invention is to realize a charging device of a backup power supply for supplying power to perform backup operation to a printer by simplified circuit configuration. The other object of the present invention is to provide a printer which can decrease use of components such as a primary battery undesirable for environment and can realize low cost and low power consumption.

The main power supply unit (6B) of the present invention transits to sleep mode from ON state when a panel switch (5) is turned off. A RTC (34) has a timer (34B) and a comparator (34C), checks output voltage of the rechargeable battery (36a) by the comparator (34C). When the comparator (34C) detected that the output voltage became lower than a reference voltage RefV, the RTC (34) outputs a power ON signal (34d) until the timer (34B) counts up 3 minutes. A second switch (38) is turned on by the power ON signal (34d), and the main power supply unit (6B) returns to ON state only for 3 minutes in order to charge the rechargeable battery (30a) by using power supplied from the main power supply unit (6B).

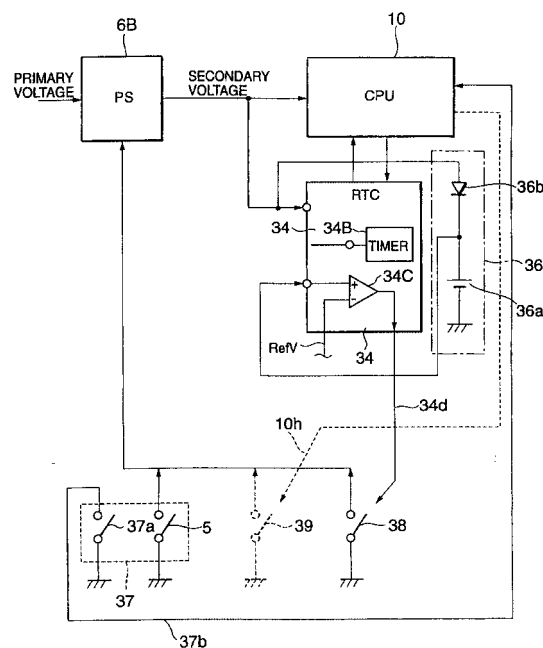


FIG.4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 30 4308

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 5 449 238 A (PHAM NGOC Q ET AL) 12 September 1995 (1995-09-12) * column 3, line 37 - line 68; figure 1 * * abstract *	1-13, 18	B41J29/393
A	FR 2 719 947 A (MOULAGES PLASTIQUES ROCHELAIS) 17 November 1995 (1995-11-17) * page 4, line 3 - line 33; figure 1 * * abstract *	1, 2, 8, 13, 18	
A	EP 0 709 943 A (CANON KK) 1 May 1996 (1996-05-01)		
A	US 5 218 286 A (VANDUNK GUY J) 8 June 1993 (1993-06-08)		
X	PATENT ABSTRACTS OF JAPAN vol. 018, no. 602 (M-1705), 16 November 1994 (1994-11-16) & JP 06 227099 A (BROTHER IND LTD), 16 August 1994 (1994-08-16) * abstract *	13-16, 18, 19	
A		17	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B41J
A	US 4 743 831 A (YOUNG JAMES E) 10 May 1988 (1988-05-10) * column 3, line 4 - line 11 * * column 4, line 1 - line 14; claim 1 *	13-20	
A	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 05, 30 May 1997 (1997-05-30) & JP 09 022741 A (HITACHI LTD), 21 January 1997 (1997-01-21) * abstract *	13-20	
		-/--	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18 June 2001	Examiner Adam, 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 (P04001)



European Patent
Office

Application Number
EP 00 30 4308

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:



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 30 4308

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)
A	PATENT ABSTRACTS OF JAPAN vol. 013, no. 176 (E-749), 25 April 1989 (1989-04-25) & JP 01 005334 A (MATSUSHITA ELECTRIC WORKS LTD), 10 January 1989 (1989-01-10) * abstract *	13-20	
A	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 12, 25 December 1997 (1997-12-25) & JP 09 205736 A (CASIO COMPUT CO LTD), 5 August 1997 (1997-08-05) * abstract *	13-19	
A	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 06, 30 April 1998 (1998-04-30) & JP 10 038985 A (NIPPON SOKEN INC; DENSO CORP), 13 February 1998 (1998-02-13) * abstract *		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Place of search THE HAGUE		Date of completion of the search 18 June 2001	Examiner Adam, E
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

EPO FORM 1503 03 82 (P04C01)



European Patent
Office

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 00 30 4308

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: 1-12

Printer comprising a backup power and a charging controller for allowing the main supply unit to turn on by period necessary to charge the backup power.

2. Claims: 13-20

Printer comprising a backup power supply unit and a hysteretic management means for managing past hysteretic information to charge the backup power supply.

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

EP 00 30 4308

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 (EPO) file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-06-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5449238 A	12-09-1995	WO 9106430 A DE 58906957 D EP 0500520 A JP 5501992 T	16-05-1991 24-03-1994 02-09-1992 15-04-1993
FR 2719947 A	17-11-1995	NONE	
EP 0709943 A	01-05-1996	JP 8123587 A US 5811890 A	17-05-1996 22-09-1998
US 5218286 A	08-06-1993	CA 2076258 A DE 4231000 A GB 2259615 A JP 6189464 A	17-03-1993 29-04-1993 17-03-1993 08-07-1994
JP 06227099 A	16-08-1994	NONE	
US 4743831 A	10-05-1988	NONE	
JP 09022741 A	21-01-1997	NONE	
JP 01005334 A	10-01-1989	NONE	
JP 09205736 A	05-08-1997	NONE	
JP 10038985 A	13-02-1998	NONE	