



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**07.01.2004 Bulletin 2004/02**

(51) Int Cl.7: **H01Q 1/24**, H01Q 1/42,  
H01Q 21/06

(43) Date of publication A2:  
**06.09.2000 Bulletin 2000/36**

(21) Application number: **00301243.2**

(22) Date of filing: **17.02.2000**

(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) Inventors:  
• Ikeda, Tomoki, c/o Alps Electric Co., Ltd.  
Ota-ku, Tokyo 145 (JP)  
• Yuanzhu, Dou, c/o Alps Electric Co., Ltd.  
Ota-ku, Tokyo 145 (JP)

(30) Priority: **04.03.1999 JP 5715099**

(74) Representative: **Kensett, John Hinton**  
**Saunders & Dolleymore,**  
**9 Rickmansworth Road**  
**Watford, Hertfordshire WD18 0JU (GB)**

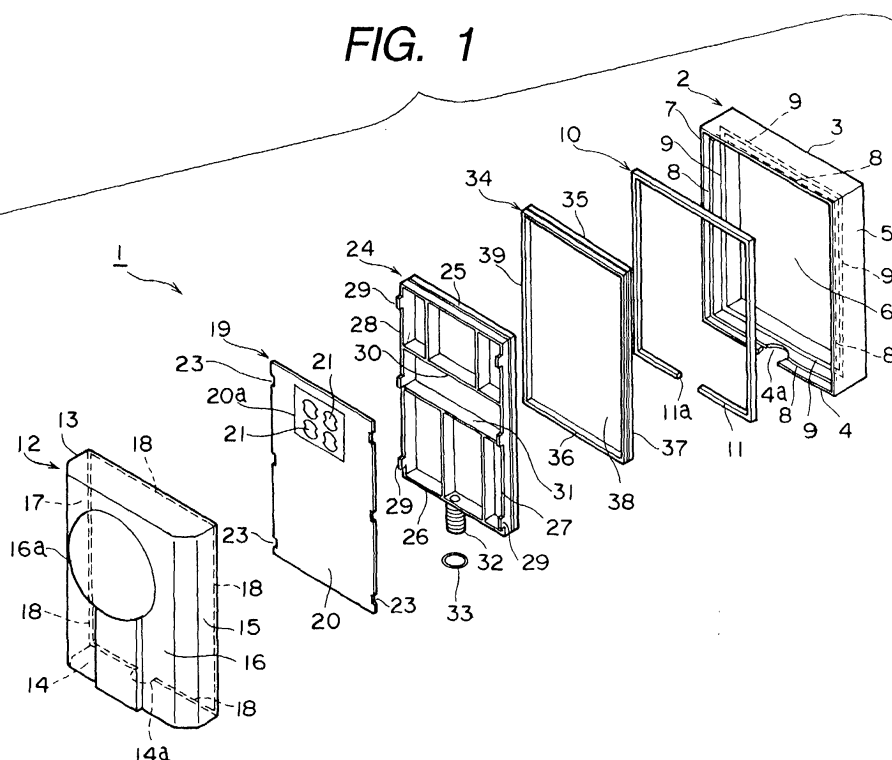
(71) Applicant: **ALPS ELECTRIC CO., LTD.**  
**Ota-ku Tokyo 145 (JP)**

(54) **Converter provided with built-in patch antennas for receiving direct broadcasting by satellite**

(57) The object of the present invention is to provide a converter (1) for receiving satellite broadcasting wherein a radio wave from a satellite can be received without using a die-cast frame and the cost can be reduced. A printed circuit board (19) and an antenna mem-

ber provided to the printed circuit board for receiving a radio wave from a satellite via a parabolic reflector are provided, the antenna member is composed of patch antennae (21) made of conductive foil and is formed on one surface of the printed circuit board (19).

**FIG. 1**





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 00 30 1243

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	GB 2 242 316 A (FUNAI ELECTRIC ENGINEERING COM) 25 September 1991 (1991-09-25)	1	H01Q1/24
Y	* the whole document *	2,3	H01Q1/42
	---		H01Q21/06
Y	US 5 625 365 A (DENNINGER VALENTINE L ET AL) 29 April 1997 (1997-04-29)	2,3	
	* the whole document *		
	---		
X	EP 0 346 125 A (NIPPON ELECTRIC CO) 13 December 1989 (1989-12-13)	1-3	
	* column 1, line 7 - line 12 *		
	* column 2, line 54 - column 4, line 36 *		
	* claims 1,12 *		
	* figures 1-3 *		
	---		
X	EP 0 516 981 A (SUMITOMO ELECTRIC INDUSTRIES) 9 December 1992 (1992-12-09)	1-3	
	* column 1, line 5 - line 8 *		
	* claims 1-5,17 *		
	* figures 1,9 *		
	---		
A	GB 2 296 385 A (NORTHERN TELECOM LTD) 26 June 1996 (1996-06-26)	2,3	
	* claims 1,2,8 *		
	* figures 1-4 *		
	-----		
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
MUNICH		18 November 2003	van Norel, J
<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</p> <p>&amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (P04C01)

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

EP 00 30 1243

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.

18-11-2003

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
GB 2242316	A	25-09-1991	NONE		
-----					
US 5625365	A	29-04-1997	NONE		
-----					
EP 0346125	A	13-12-1989	JP	1310572 A	14-12-1989
			JP	1311605 A	15-12-1989
			JP	2066774 C	10-07-1996
			JP	7101812 B	01-11-1995
			DE	68924001 D1	05-10-1995
			DE	68924001 T2	04-04-1996
			EP	0346125 A2	13-12-1989
			US	5142698 A	25-08-1992
-----					
EP 0516981	A	09-12-1992	JP	4330807 A	18-11-1992
			JP	4354404 A	08-12-1992
			CA	2067510 A1	03-11-1992
			EP	0516981 A1	09-12-1992
			US	5381157 A	10-01-1995
-----					
GB 2296385	A	26-06-1996	EP	0745278 A1	04-12-1996
			WO	9619844 A2	27-06-1996
			JP	9509554 T	22-09-1997
-----					

EPO FORM P0459

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