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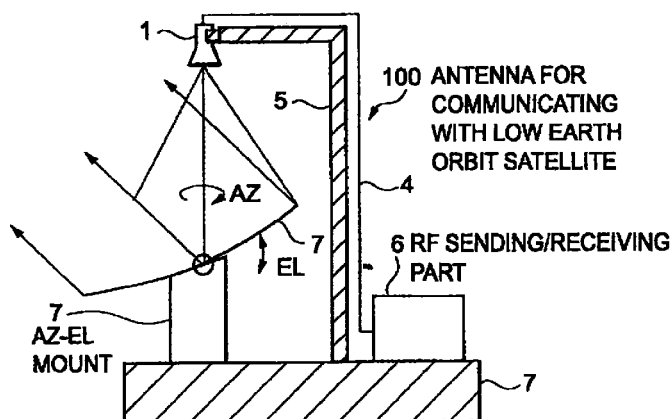
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(54) **Antenna for communicating with low earth orbit satellite**

(57) To provide an antenna for communicating with a low earth orbit (LEO) satellite which is small-sized and light and can track a LEO satellite at high speed at a small-sized earth station using a LEO satellite, the above antenna uses an offset parabolic antenna-type reflector and a primary feed is installed in the focal position of the paraboloid of revolution forming the reflector. The quantity of an offset of the offset parabolic antenna

is selected so that antenna gain is maximum at the minimum operational elevation. The primary feed is mechanically independent of the mobile reflector and is attached and fixed to a radiator supporting part. The reflector is turned based upon an azimuth axis and an elevation axis according to AZ-EL mount.



**Fig.1**

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# EUROPEAN SEARCH REPORT

Application Number  
EP 98 30 9924

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	US 4 862 185 A (ANDREWS GEORGE S ET AL) 29 August 1989 (1989-08-29) * column 1, line 21 - line 36 * * column 3, line 15 - line 25 * * column 5, line 12 - line 68 * ---	1-4,6,9, 11-13	H01Q3/20 H01Q19/13
X	GB 2 226 186 A (KOKUSAI DENSHIN DENWA CO LTD) 20 June 1990 (1990-06-20) * page 1, line 5 - line 16 * * page 6, line 18 - page 7, line 6 * ---	1 2-13	
A			
X	WO 90 06004 A (CROOKS MICHELL PEACOCK STEWART) 31 May 1990 (1990-05-31) * page 2, line 2 - line 8 * * page 3, line 4 - line 15 * * page 7, line 19 - page 8, line 3 * ---	1 2-13	
A			
A	US 4 312 002 A (STEWART DOUGLAS E) 19 January 1982 (1982-01-19) * column 1, line 36 - line 53 * -----	1-13	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6) H01Q
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 23 July 1999	Examiner Wattiaux, V
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			

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

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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  
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23-07-1999

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 4862185	A	29-08-1989	NONE		
GB 2226186	A	20-06-1990	JP	2134001 A	23-05-1990
WO 9006004	A	31-05-1990	NONE		
US 4312002	A	19-01-1982	GB	1603657 A	25-11-1981
			NL	7809306 A	15-03-1979