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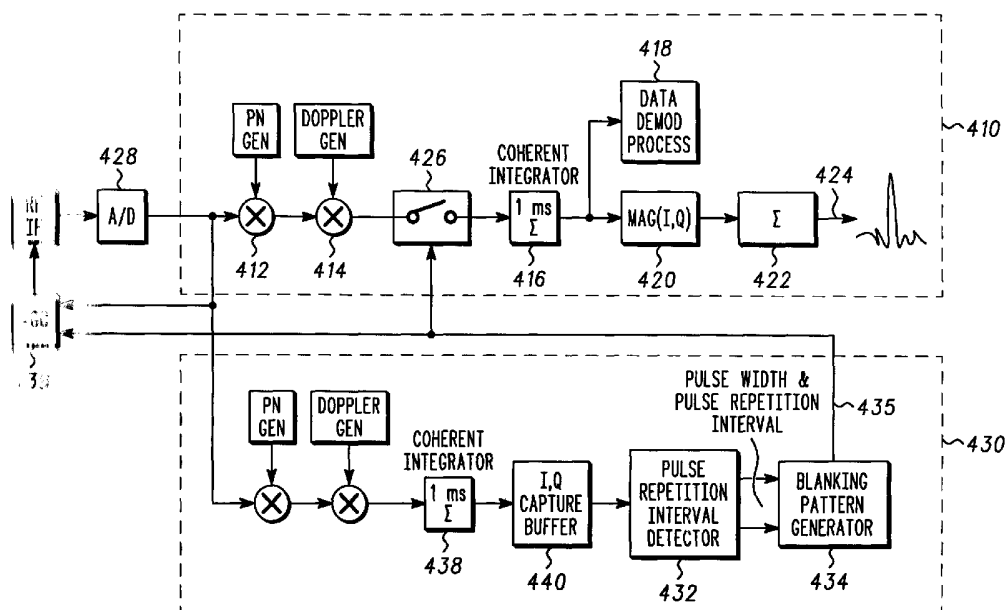
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(54) Title: DETECTION AND REDUCTION OF PERIODIC JAMMING SIGNALS IN GPS RECEIVERS AND METHODS THEREFOR



(57) Abstract: A method for eliminating or reducing interference in a receiver, for example, interference in a satellite positioning system receiver caused by a co-located TDMA transmitter, including detecting (210) the presence of a jamming signal, generating a synchronous blanking signal (220), and reducing the jamming signal by blanking (230) the receiver with a blanking signal. In one embodiment, the jamming signal is detected in the receiver, for example, at a correlator output of a satellite positioning system receiver.



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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/13892

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(7) : G01S 5/14; H04B 1/10 US CL : 342/357.02, 357.12; 455/223 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) U.S. : 342/357.02, 357.12; 455/223 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1, 122,554 A1 (NARUSE et al) 08 August 2001 (08.08.2001) see entire document, especially Figure 1.	20-22
X	US 20020107033 A1 (KIM) 08 August 2002 (08.08.2002) see entire document, especially Figures 2 and 3a/3b.	20-22
X	US 6,442,375 B1 (PARMETIER) 27 August 2002 (27.08.2002) see entire document,	20-22
X	US 6,107,960 A (KRASNER) 22 August 2000 (22.08.2000), see Figures 2 and 4	20-22
Y	JP 2000-249754 A (SHRIDHARA) 14 September 2000 (14.09.2000) see entire document (US equivalent on which the priority of the Japanese Patent is based is US 6,448,925).	1-7, 10-17, 23-26
Y	GB 2,113,047 A (BEESLEY) 27 July 1983 (27.07.1983) see Figures 1 and 2 and col. 1, line 47 through col. 2, line 97.	1-7, 10-17, 23-26
Y	US 5,212,827 A (MESZKO et al) 18 May 1993 (18.05.1993) see Figure 1 and col. 4, line 44 through col. 5, line 28.	1-7, 10-17, 23-26
X,P	US 6,681,181 B2 (FIELDER) 20 January 2004 (20.01.2004) see Figure 2.	1-7, 10-17, 23-26
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	
Date of the actual completion of the international search 05 October 2004 (05.10.2004)		Date of mailing of the international search report <b>19 JAN 2005</b>
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer Gregory C. Issing  Telephone No. 703-306-4171

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/13892

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US04/13892

### BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-19 and 23-26, drawn to a method for detecting and blanking a jamming signal in a satellite positioning receiver.

Group II, claim(s) 20-22, drawn to a method for operating a communications device on an assigned cycle and blanking the operation of a satellite positioning receiver with a signal synchronized to the assigned cycle.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I does not require the special technical feature for blanking the satellite positioning receiver according to an assigned slot cycle of a communications device as set forth in the Group II invention. Likewise, Group II does not require the special technical feature for blanking the satellite positioning receiver based on detection of a jamming signal in the satellite positioning receiver.