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Bezeichnung der Erfindung: Presence sensing system
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : G08 B13/22

ENTSCHEIDUNG / DECISION
vom / of / du 21 October 1987

Anmelder / Applicant / Demandeur : TAG Radionics Ltd

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence : Presence sensing system/TAG

EPÜ / EPC / CBE Article 56

Kennwort / Keyword / Mot clé : Inventive step

Leitsatz / Headnote / Sommaire

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Case Number : T 146/82

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 21 October 1987

Appellant : TAG RADIONICS LIMITED
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Decision under appeal : Decision of Examining Division 055 of the European Patent Office dated 20 April 1982 refusing European patent application No. 79 300 047.2 pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : P.K.J. Van den Berg

Members : J.A. Van Voorthuizen

P. Ford

Summary of Facts and Submissions

I. European patent application No. 79 300 047.2, filed on 11.01.79 (publication No. 0 003 178) claiming a priority of 11.01.78 (GB), was refused by a decision of the Examining Division 055 dated 20.04.82. That decision was based on Claims 1-13 filed on 07.09.81.

II. The reason given for the refusal was that the subject-matter of the Claim 1 lacked inventive step with regard to GB-A-1 212 504 and to the fact that phase-locked-loops and their inherent properties are well known. Reference was made in particular to "Signetics Linear Phase Locked Loops Applications Book", 1972, pages 5, 7, 11 and 12.

III. The Appellant lodged an appeal against this decision on 18.06.1982. The appeal fee was paid on 21.06.1982. On 16.08.1982 the Statement of Grounds was filed.

IV. In communications of 20.11.1984, 27.06.86 and 18.03.87, the Rapporteur set out objections against the then valid claims and drew the Appellant's attention to some further documents viz.: Turner, Electronics Engineer's Reference Book, 4th Edition, 1976, pages 18-25, 24-122, 24-123 and 25-60 and US-A-3 745 569.

V. In the Statement of Grounds and in the replies to the aforementioned communications the Appellant argued essentially as follows: The invention as now claimed could not be derived in an obvious way from the prior art, if alone in view of the number of independent pieces of prior art which it is necessary to combine. None of the first two characteristic features of Claim 1 had even been proposed in connection with a presence indicating system in spite of clear advantages resulting from their application in such a

system. With regard to GB-A-1 212 504 it was to be noted that synthesizing a frequency by multiplication or division is a different process from energising a passive resonant circuit comprising a non-linear component. Finally, the provision of a PLL in combination with the use of digitally coded pulses produced by the bug had the advantage of providing a reasonably accurate clock timing.

VI. The Appellant requested the grant of a European patent on the basis of Claims 1-7 filed on 11.07.87, the independent Claim 1 of which reads as follows:

1. A local presence sensing system, comprising a detector having a transmitter (34, 35) for transmitting an interrogation signal and a receiver (36) for receiving a local presence indicating signal, both said signals being in the inductive communication frequency band, and a receiver/transmitter device (61 to 69) the presence of which is to be detected adapted to receive the interrogation frequency and to transmit said presence indicating signal in response thereto, characterised in that the detector further comprises a phase lock loop circuit (38) having a first input coupled with the output of the receiver (36), a second input for the output of a variable frequency oscillator (40) and an output for providing a phase locked signal indicative of phase or frequency coherence between the signals on said first and second inputs and an alarm circuit (49) coupled with the output of the phase lock loop circuit (38) actuable in response to said phase locked signal and in that the receiver/transmitter device comprises means (62) for synthesizing the presence indicating signal from the received interrogation signal by multiplication or division of the interrogation frequency by an integral number (including 1), said synthesizing means being connected between the output of the receiver (61) and a first input

of a logic means (63), the output of which is connected to the input of the transmitter (64), and coding means (65 to 68) comprising dividing means (65, 66) having an input arranged to receive a signal derived from the output of the receiver (61) and an output connected to a second input of the logic means (63) for providing as the presence indicating signal digitally coded pulses at a coding rate derived from the received frequency by division.

Reasons for the Decision

1. The appeal complies with Articles 106-108 and Rule 64 EPC and is, therefore, admissible.

2. Local presence sensing systems in accordance with the preamble of Claim 1 are known from GB-A-1 212 504. The frequency transmitted by the detector (the interrogation frequency) and the local presence indicating frequency retransmitted by the receiver-transmitter device (the "bug") are different and may or may not be harmonically related. In the case of a harmonic relationship a non-linear device (a diode) is used to obtain the frequency to be retransmitted.

3. The problem which the application sets out to solve with respect to this prior art is to provide a system of such kind which is less sensitive to spurious signals. Briefly summarising this aim is attained according to the characterising part of Claim 1 by:

(a) providing a Phase Locked Loop in the receiver part of the detector;

(b) synthesizing the presence indicating signal from the interrogation signal by multiplication or division; and

(c) providing coding means for generating as the presence indicating signal digitally coded pulses derived from the interrogation frequency by division.

4. The use of a PLL to provide a receiver circuit which remains sharply tuned to a frequency varying within a narrow range (pulling range) is well known as shown in the literature (e.g. "Signetics linear PLL applications book", 1972, page 5). Its application to a presence sensing system based on the reception of a predetermined frequency transmitted by a bug must in itself be considered as obvious to a person skilled in the art.

5. Frequency synthesizing by means of division or multiplication is shown in the literature to be a conventional technique. Its application for obtaining a presence indicating frequency in a system of the kind referred to in the preamble of Claim 1 must be considered obvious in itself, since it represents no more than a routine application of a known technical expedient to give its known advantages.

6. Finally, US-A-3 745 659 discloses a bug with digital coding means consisting of dividing means (a counter), a decoder and selecting means interconnected in a similar manner as the coding means according to the present application. However, the presence indicating frequency is unrelated to the interrogation frequency and the counter is driven by a pulse train received from the interrogating transmitter.

7. It is clear that in the system according to the present application some means in the detector must be provided in order to obtain a clock function for decoding the pulsed signal received from the bug. Although nothing is said about this explicitly in the description it must be regarded as also clear to the person skilled in the art that this clock function could advantageously be derived from the continuously running VCO of the PLL, which follows the actually received frequency, rather than from the intermittently received presence indicating signal.

8. Also, the use of multiplication or division as a means of synthesizing the carrier frequency of the presence indicating signal is especially useful when dividing means are used to derive the pulse repetition frequency of the coded pulses.

9. It is, therefore, considered that features (a), (b) and (c) of Claim 1 are so technically related that they can be regarded together in assessing inventive step.

10. The Board is of the opinion that the claimed combination of features cannot be considered as obvious having regard to the state of the art as discussed hereinbefore. In particular, nothing in this prior art or in the other, less relevant, documents cited in the course of the proceedings suggests to the person skilled in the art to derive the coding rate from the interrogation frequency although this apparently simple solution provides the practical advantage that the same bug can be used for widely differing interrogation frequencies.

11. The dependent Claims 2-7 describe particular embodiments of the invention and are not open to objections.

12. The amended description and drawings filed on 11.07.87 take account of the prior art and of the scope of the claims in their present form. They are not open to objection.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a European patent on the basis of the following documents

   (a) Claims 1-7 as filed on 11.07.87
   (b) Description as filed on 11.07.87
   (c) Drawings, as filed on 11.07.87.

The Registrar

The Chairman

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