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D E C I S I O N
of 6 December 2005

Case Number: T 1177/01 - 3.5.03

Application Number: 95923781.9

Publication Number: 0714526

IPC: G05D 1/00

Language of the proceedings: EN

Title of invention:

Assured-integrity monitored-extrapolation navigation apparatus

Applicant:

Litton Systems, Inc.

Opponent:

-

Headword:

Navigation apparatus/LITTON

Relevant legal provisions:

EPC Art. 84, 52(1), 56

Keyword:

"Clarity and support (no) "

"Inventive step (no) "

Decisions cited:

G 0010/93

Catchword:

-



Case Number: T 1177/01 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 6 December 2005

Appellant: Litton Systems, Inc.
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 8 May 2001
refusing European application No. 95923781.9
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. S. Clelland
Members: D. H. Rees
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division announced in oral proceedings held on 25 April 2001, with written reasons dispatched on 8 May 2001, to refuse European patent application No. 95 923 781.9. The reason given for the refusal was that the claimed subject-matter of none of the requests involved an inventive step with respect to the combined disclosures of

D4: J. Diesel et al., "New integrated INS/GPS mechanisation flight test results" (Abstract), IEEE Position Location and Navigation Symposium (PLANS '92) Record, Monterey CA, US, 23-27 March 1992, page 433, IEEE, 1992; and

D5: J.W. Diesel, "GPS/INS integration for civil aviation", National Telesystems Conf. (NTC '91) Proc., Atlanta GA, US, 26-27 March 1991, Vol. 1, pages 223 to 228, IEEE, 1991.

Further objections were also mentioned; there was said to be a lack of clarity and support in respect of the claims of all requests, whilst the subject-matter of the independent claims of the main and first auxiliary requests was said to lack novelty with respect to a further document.

II. Notice of appeal was filed and the appeal fee paid on 18 July 2001. A statement of grounds of appeal was filed on 18 September 2001. Oral proceedings were requested in the notice of appeal.

III. In response to a first communication from the board, the appellant made clear on what text grant of a patent was requested, filing new copies of the claim set originally filed on 22 May 1997, as well as resubmitting amendments to the description originally filed during the oral proceedings before the examining division.

In preparation for the oral proceedings subsequently appointed by the board the appellant further filed new amended independent claims 1 and 35 to form the basis of an auxiliary request. During the oral proceedings the appellant withdrew the main request, making the auxiliary request the only request, and then, in response to comments by the board, filed a further amended claim 1 to be the basis of the only request.

IV. Claim 1 as filed during the oral proceedings reads as follows:

"A navigation apparatus comprising a digital processor and a memory that utilizes a first subset and a second subset of a set of measured quantities provided at periodic time intervals by at least two sources, mounted on the platform, one source comprising an inertial system, the other source comprising a satellite [sic] navigation system, for repeatedly determining the state of a platform on which the apparatus is mounted, a platform being a dynamic system which exists in a state that can be characterized by a state vector consisting of a set of state variables that define in whole or in part the platform's position and orientation in space, the set of measured quantities being presumptively useful in determining platform

state, the number of members of the first subset being less than the total number of members of the set of measured quantities, the members of the set of measured quantities provided at periodic time intervals not included in the first subset being subject to selection for the second subset by the apparatus in accordance with a predetermined set of selection rules, said selection rules comprising: identifying the measured quantities [sic] provided by the satellites [sic] whose clock drifts are within specification."

- V. In the oral proceedings the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the new claim 1 of the main request as filed during the oral proceedings or alternatively that the case be remitted to the department of first instance for further prosecution on the basis of this claim.
- VI. At the end of the oral proceedings the chairman announced the decision.

Reasons for the Decision

1. *Preliminary remark on procedure*
- 1.1 In the course of the oral proceedings the appellant submitted a new claim 1 to be the basis of its main request. The board exercised its discretion to admit this request despite its late filing. Also during the oral proceedings the appellant indicated a willingness to make further amendments if necessary, without making any specific corresponding requests.

- 1.2 Until the submission of an auxiliary request in response to the summons to oral proceedings before the board, the appellant had shown no apparent willingness to make substantive amendments to the claimed subject-matter despite reiteration of a number of major objections by both the examining division and the board. In the course of the oral proceedings before the board the appellant submitted for the first time a request which proposed substantive amendments to the claims, and also indicated that it would submit further amendments if necessary. However, the effect of this latter indication was that the board was being asked to carry out the complete task of examination of the application in the oral proceedings, or to continue the proceedings in writing, or to remit an only superficially examined case to the department of first instance for further prosecution.
- 1.3 With regard to the question whether to remit the case, the Enlarged Board of Appeal has stated that the board must decide after due assessment of the particular circumstances whether it will rule on the case itself or whether it will remit the matter for further prosecution to the examining division (Article 111(1), second sentence, EPC) (see G 10/93, OJ 95, 172, point 5).
- 1.4 In the case in hand remittal was not an acceptable option to the board in view of the age of the application and the possibility that the appellant might return to an uncooperative approach. For the same reasons it was not appropriate to continue the procedure in writing. As to completing examination in

the oral proceedings, in G 10/93 point 4 the Enlarged Board of Appeal also stated that proceedings before the boards of appeal in ex parte cases are primarily concerned with examining the contested decision, and that boards of appeal do not carry out a full examination of the application. This is the task of the examining division. It is therefore not the task of a board to substitute for the examining division; nor did it seem at all likely that the board would be in a position to come to a considered conclusion in favour of allowing claims submitted during oral proceedings within the time constraints imposed by the oral proceedings, given the apparently significant amendments which would be necessary (see below) and the technical complexity of the subject-matter of the application. Moreover, the communication accompanying the summons to oral proceedings had as usual warned the appellant that amendments submitted later than four weeks before the oral proceedings might be disregarded.

1.5 As a result of all these considerations the board decided when it had come to a conclusion regarding the sole request that it would not further break the proceedings to give the appellant the opportunity to formulate further requests.

2. *Clarity, support in the description (Article 84 EPC) and added subject-matter (Article 123(2) EPC)*

2.1 The claim specifies "at least two sources", but then "one source ..., the other source ...", implying that there are exactly two sources. This leads to a lack of clarity in the matter for which protection is sought. Moreover, the sources merely "comprise" an inertial

system and a satellite navigation system respectively, leaving open what else they might include.

2.2 The second source is specified as comprising "a satellite navigation system". However, the passages in the description cited by the appellant in support of this feature (page 3, line 5, and lines 17 and 18, and page 5, lines 6 to 8) refer only to "GPS" (Global Positioning System) and a "global positioning system receiver". While it is indisputable that a global positioning system receiver is a component of a satellite navigation system, the matter for which protection is sought is rendered unclear by this change in terminology. Further, since a satellite navigation system evidently consists of more than just a GPS receiver, the feature as claimed would appear to introduce added subject-matter to the application. Still further the fact that the claim is directed to a "navigation apparatus" which in turn is specified as comprising a "satellite navigation system", i.e. another navigation apparatus, is also at least *prima facie* unclear.

2.3 The claim specifies first and second subsets of measured quantities, and at least two sources of these quantities. In the main embodiment described the first subset is the set of measurements from the first source, i.e. the inertial reference system, and the second subset is a selection from the measurements provided by the second source, the GPS receiver. However, in the claim there is no restriction of the first subset to measurements provided by the first source, leading to a lack of support by the description for the subject-matter in the breadth claimed.

- 2.4 The claim specifies a set of selection rules comprising "identifying the measured quantities provided by the satellites whose clock drifts are within specification." However, "identifying" something is not a rule but an action, and is also *per se* inappropriate for defining a feature of an apparatus. This objection, while minor, nonetheless adds to the overall lack of clarity of the subject-matter for which protection is sought.
- 2.5 Hence the claim does not satisfy the requirements of Article 84 EPC for clarity and support by the description, and is not allowable.
3. Despite these objections the board considered whether the claimed subject-matter, insofar as it could be understood, was novel and inventive, in order to assess the value of inviting the appellant to make further requests (see point 1 above).
- 3.1 Documents D4 and D5 both discuss the integration of GPS measurements into an INS (Inertial Navigation System). It goes without saying that at the priority date of the present application, this would involve at least one digital processor and memory. Moreover the part of an INS which measures the values from the sensors and the part which derives the navigation information from the measurements can clearly be considered to be separate elements. Thus the configuration in D4 and D5 is equivalent to that described in the main embodiment in the present application, where measurements from a GPS receiver and an "inertial reference system" are provided to a "navigation apparatus" (e.g. Fig. 1).

- 3.2 Both documents D4 and D5 disclose that the GPS measurements and the inertial system measurements are supplied to a Kalman filter to produce navigational information, so that it would also be clear to the skilled person that the measurements are provided repetitively to the navigation apparatus part of the INS, and that the navigation information is calculated repetitively in the Kalman filter. A Kalman filter, by its nature, produces a state vector, which in D4 and D5 clearly defines in whole or in part the position and orientation of the platform to which the navigation system is attached.
- 3.3 D5 goes on to disclose how to integrate the IRS and GPS information (on pages 226 and 227, section, "Integrated System Error Equations"), noting that "The external measurements are assumed to be the Pseudo Range (PR) and Delta Range (DR) for each satellite in view, obtained from the GPS sensor," (page 226, column 2, lines 34 to 36). Thus, in principle, the navigation calculations are based on two subsets of the complete set of measurements, the first being the IRS measurements, and the second being the GPS measurements for all the satellites in view. All of these measurements are clearly presumptively useful in determining the platform state. D5 further however indicates that the GPS measurements are subject to an integrity check - page 223, column 2, lines 15 to 18, "The advantage of using individual satellite measurements is that the INS can delay the data until its integrity is ensured before using it to calibrate the INS error sources." Thus the set of measurements not provided by the IRS (that is the measurements not

included in the first subset, in the terms used in the present claim) are subject to selection for the second subset of measurements which is actually used in determining the navigational state of the platform according to a selection rule, namely, "Only select GPS measurements from satellites whose integrity has been ensured."

3.4 D5 does not disclose explicitly how to ensure the data integrity. D4 spells out the steps to be taken: "GPS data is pre-filtered and stored in a circular file, so that it is only used in the integrated solution after an integrity assurance delay time T , which is the maximum time required for the ground monitoring system to warn of bad satellite signals," (lines 13 to 16). The skilled person would combine the teachings of the two documents, since they share an author, and clearly relate to the same development project. Thus the skilled person would be led to a navigation apparatus which would identify which GPS signals to integrate into the process of determining the navigation state of its platform on the basis of information sent from the ground monitoring system. The claim does not exclude the use of such a ground monitoring system.

3.5 Finally, the present claim 1 specifies that the selection criterion is that the satellite's clock drift is within specification, whereas the criterion of D4 is simply that the ground monitoring system has not, after the appropriate delay, declared the satellite's signals "bad". But it would have been clear to the skilled person that satellite clock drift is one of the most important sources of error in GPS systems, so that the ground monitoring system would undoubtedly be

- configured to look for this source of error, among others. Thus the teaching given in D5 (and D4) to exclude bad signals would for the person skilled in the art in this field implicitly include the teaching to exclude signals from satellites whose clock drift was out of specification.
- 3.6 Thus the board concludes that the claimed subject-matter, interpreted in the light of the description, does not involve an inventive step with respect to the teaching of D4 applied to the disclosure of D5.
- 3.7 The appellant argued that the "identifying" in the claim meant identifying from the measurements provided by the two specified sources alone, thus excluding the use of signals from a ground monitoring system as proposed in D4. The board cannot accept this argument; there is nothing in the claimed subject-matter to exclude the navigation apparatus receiving further signals, over and above the "measured quantities", from outside and using them to identify which GPS measurements to be used in calculating the navigational state of the platform.
4. Finally, since it appeared to be the appellant's intention to distinguish the claimed subject-matter from D4 and D5 by specifying that the selection process was not dependent on external signals from e.g. a ground monitoring system, the board considered hypothetically the case of the appellant submitting a claim restricted in this way. It concluded that even in this case, the distinguishing feature would be a mere desideratum, claiming by result a feature which in itself was obviously desirable. Such a claim would not,

without further restriction, include any features determining how this result was achieved. No claim including such features had been presented at any point in the proceedings before either instance.

5. Thus the board concluded that the claimed subject-matter was not allowable, and that there was no indication that inviting the appellant to file further amendments would in the course of the oral proceedings lead to an allowable claim. In the light of the procedural framework defined in G 10/93, discussed in point 1 above, the appeal therefore had to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Magliano

A. S. Clelland