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**D E C I S I O N**  
**of 19 June 1998**

**Case Number:** T 0413/97 - 3.4.2

**Application Number:** 93920176.0

**Publication Number:** 0656108

**IPC:** G01C 19/66

**Language of the proceedings:** EN

**Title of invention:**

Laser gyro microprocessor start up control method and apparatus

**Applicant:**

HONEYWELL INC.

**Opponent:**

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**Headword:**

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**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step (no)"

**Decisions cited:**

-

**Catchword:**



Case Number: T 0413/97 - 3.4.2

**D E C I S I O N**  
of the Technical Board of Appeal 3.4.2  
of 19 June 1998

**Appellant:** HONEYWELL INC.  
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Minnesota 55408 (US)

**Representative:** Herzbach, Dieter, Dipl.-Ing.  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 29 October 1996  
refusing European patent application  
No. 93 920 176.0 pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** E. Turrini  
**Members:** A. G. Klein  
B. J. Schachenmann

## Summary of Facts and Submissions

- I. European patent application No. 93 920 176.0 (international publication No. WO 94/04 889) was refused by decision of the Examining Division.

The reason for the refusal was that the subject-matter of claim 1 then on file lacked an inventive step in the sense of Article 56 EPC, in view in particular of the content of the article:

GG1308 Ring Laser Gyro Inertial Measurement Systems - Honeywell's Low Cost Solution for Tactical Applications by J. M. Oelschlaeger and al., IEEE PLANS 1990, Position Location and Navigation Symposium, 20 to 23 March 1990, pages 528 to 536 (hereinafter D1).

In the Examining Division's opinion, the claimed invention resided in storing start-up parameters corresponding to the last known operating points of the laser gyro of document D1 in a non-volatile memory, so that the systems of the gyro, when started with the stored parameters, become operational in a minimum of time. However, one evident characteristic of any micro-controller or computer was its ability to store parameters for later use. Using such characteristic would not therefore imply an inventive step for the skilled person (see points 2 and 3 of the Reasons of the Examining Division's decision).

- II. The appellant (applicant) lodged an appeal against the decision, requesting in effect that it be set aside and

that a patent be granted on the basis of a single amended claim, which reads as follows:

"A method for start-up of a laser gyro (200), said laser gyro comprising:  
a microcontroller (100), including a microprocessor (120) and a non-volatile memory (102, 107) with said microprocessor (120) connected to control the laser gyro;  
an active current control means (300) connected to the laser gyro and said microprocessor;  
a dither pickoff means (244A) connected to the laser gyro and said microprocessor;  
a dither drive means (244B) connected to the laser gyro and said microprocessor;  
a path length control means (600) connected to the laser gyro and said microprocessor;  
characterized by memorizing within said non-volatile memory (102, 107) laser gyro start-up parameters including initializing constants and run parameters corresponding to the last known parameters of the laser gyro;  
wherein the microprocessor (120) starts-up the active current control means (300), the dither pick-off means (244A), the dither drive means (244B) and the path length control means (600) in a sequence under use of said start-up parameters."

III. In support of his request the appellant explained that ring laser gyros together with accelerometers formed the material parts of inertial navigation units as used to a large extent on land vehicle and aircrafts, but also on tactical missiles, torpedoes, etc. Whereas a mechanical gyro had a spinning mass which had to be run up on speed for its appropriate operation, a ring laser gyro had no moveable parts, but included an electronics which had to control different functions, such as balancing the discharge currents in the gyro legs, controlling the difference between the two path length transducers to minimise bias variations or holding the laser at an operating frequency, where the optical gain was maximum.

In case such an inertial navigation unit was used for inertial guidance on a practical missile or torpedo where the decision for its launching was made on the spot, a reaction time as short as possible was required and lengthy pre-flight calibrations were not possible.

A ring laser gyro was a very complicated and sophisticated device having its own personality. However, the claimed start-up method, and in particular the holding by a programmable memory of individual parameters used to compensate for differences among gyros or to tailor a gyro for a particular application, avoided the need of setting or trimming any component.

This was illustrated for instance in the article:

The Digital Laser Gyro by J. Killpatrick, Scientific

Honeyweller, 1996, pages 80 to 87 (hereinafter D0),

which was published later than the priority date of the present application and stemmed from one of his inventors.

- IV. In a communication under Article 110(2) EPC dated 9 March 1998, the Board informed the appellant, without prejudice to its final decision, that the preliminary view of the Board was that the claimed method did not involve an inventive step and no specific features could be identified in the description which would allow to define patentable subject-matter.

#### **Reasons for the Decision**

1. The appeal is admissible.
2. *Novelty*

The claim is directed to a method for start-up of a laser gyro comprising a series of system elements as set out in the preamble of the claim, i.e. a microcontroller, an active current control means, a dither pickoff means, a dither drive means and a path length control means. Such laser gyros are undisputedly known in the art and described for instance in document D1 (see in particular page 534, left hand column, second paragraph and right hand column, third to fifth paragraphs).

Document D1 does not comprise specific information as

to the way start up of the laser gyro it describes is achieved, nor do the other prior art citations on the file.

Accordingly, the subject-matter of the claim - which in this respect essentially specifies that start-up parameters corresponding to the last known parameters of the laser gyro are memorized in the non-volatile memory and are used by the microprocessor to start-up the various system elements of the laser gyro in a sequence - is novel in the sense of Article 54 EPC.

3. *Inventive step*

The technical problem solved by the claimed start-up method, in particular the use for start-up of memorised parameters corresponding to the last known parameters of the gyros, is to reduce the time delay necessary for the gyro to be operational after the start command (see description page 4, lines 16 to 18 and appellant's statement of the grounds of appeal).

The formulation of this technical problem as such does not in the Board's opinion contribute to inventive step, since the importance of short "warm-up" time and instant reaction of ring laser gyros is well-known in the art, in particular in military, tactical applications, as is evidenced e.g. by document D1 (see page 528: table 1, first line and last paragraph, first sentence).

A number of electronic appliances of everyday use, like

TV or radio sets, video-recorders or personal computers, embody start-up procedures which aim at quickly restoring the conditions which prevailed before an interruption (e.g. the last set TV channel or broadcasting frequency, the specific setting of the controls for the luminosity, colour balance, sound volume, or the set-up of the computer screen). To this effect, as is immediately apparent to any person of elemental technical sense, those last known parameters which defined the previous operation conditions are memorized in a non-volatile memory means upon termination of operation, and used again in the subsequent start-up procedure.

Applying this obvious principle, for the same purpose, to the start-up or re-start of a laser gyro immediately leads to memorizing in a non-volatile memory start-up parameters corresponding to the last known parameters of the laser gyro, and using them for the next start-up procedure, as is set out in claim 1.

The additional feature contained in claim 1 that the start up parameters corresponding to the last known parameters of the laser gyro include "initializing constants and run parameters" defines an obvious way of setting the starting conditions of the various algorithms which control the operation of the microprocessor. The Board cannot therefore recognize any inventive merit in the particular definition of the start-up parameters as "including initializing constants and run parameters". The appellant's argumentation did not rely upon this particular definition either.

Finally, the Board was unable find in document D0 published later than the filing date of the present patent application, and which the appellant stated to be a description of a laser gyro embodying the alleged invention, any evidence in support of the non-obviousness of the claimed method. In particular, the passages in the last paragraph of the section "Gyro Electronics" and at the end of the caption under Figure 4 (both on page 83) as expressly by referred to by the appellant only specify that all necessary adjustments are made digitally, so as to avoid the need of setting or trimming any components to compensate for differences between individual gyros or tailor a gyro for a particular application, and that the programmable memory holds parameters to provide for such digital adjustments. The document thus certainly emphasizes the digital character of the adjustment or setting of the gyro laser, but it does not however in any way refer to the storing of parameters "corresponding to the last known parameters of the laser gyro", which is an essential feature of claim 1. The fact that this aspect is not even evoked in the detailed description published by one of the inventors a few years after the filing of the present patent application, can hardly be considered to provide evidence supporting the inventive character of the claimed method.

For these reasons, the subject-matter of claim 1 does not in the Board's view involve an inventive step in the sense of Article 56 EPC.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar: The Chairman:

P. Martorana E. Turrini