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# Datasheet for the decision of 27 October 2010

**Case Number:** T 0891/07 - 3.4.01

**Application Number:** 04012383.8

**Publication Number:** 1571584

**IPC:** G06K 9/00

**Language of the proceedings:** EN

**Title of invention:**
Integrating visual and object information in a pervasive computing environment

**Applicant:**
Honda Research Institute Europe GmbH

**Opponent:**
-

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 123(2)

**Relevant legal provisions (EPC 1973):**
EPC Art. 83, 84

**Keyword:**
-

**Decisions cited:**
T 0409/91

**Catchword:**
-

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**Case Number:** T 0891/07 - 3.4.01

# D E C I S I O N
**of the Technical Board of Appeal 3.4.01**
**of 27 October 2010**

**Appellant**: Honda research Institute Europe GmbH
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**Representative**: Rupp, Christian
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted 4 December 2006 refusing European patent application No. 04012383.8 pursuant to Article 97(1) EPC 1973.**

**Composition of the Board:**

**Chairman:** B. Schachenmann
**Members:** F. Neumann
G. Assi

## Summary of Facts and Submissions

I. The appeal lies from the decision of the examining division to refuse the European patent application number 04012383.8.

II. The appellant has requested that the decision be set aside and a patent be granted on the basis of claims 1 and 2 filed at the oral proceedings on 27 October 2010.

III. Independent claim 1 reads as follows:

"A system for gathering information from an environment, the system comprising :
- RFID tags to be provided on objects and transmitting information on the associated objects, and
- a humanoid robot provided with a computing device, the computing device comprising:
visual sensing means for gathering visual information on objects in the environment, the environment being an area surrounding the computing device, wherein the computing device gathers said visual information and receives said information transmitted from said RFID tags of said objects located within said area,
antenna means for wirelessly receiving said information from said RFID tags of said objects,
means for combining the visual information as well as the wirelessly received RFID information for making a decision on objects identified by the visual information and the RFID information and for generating output signals based on said decision in order to drive a manipulator of the humanoid robot."

Claim 2 reads as follows:

"A method for gathering information from an environment using the system of claim 1, the method comprising the following steps:
- gathering visual information on objects in the environment, the environment being the area surrounding a computing device of the robot, wherein the computing device gathers said visual information and receives information transmitted from RFID tags of said objects located within said area,
the RFID tags transmitting information on the associated objects, and
- combining the visual information as well as the wirelessly received RFID information, making a decision on objects identified by the visual information and the RFID information, and generating output signals based on said decision in order to drive a manipulator of said humanoid robot."

IV. The arguments of the appellant, insofar as they are pertinent to the present decision, are set out below in the reasons for the decision.

## Reasons for the Decision

1. Reference is made to the transitional provisions for the amended and new provisions of the EPC, from which it may be derived which Articles of the EPC 1973 are still applicable to the present application and which Articles of the EPC 2000 shall apply.

2. The appeal is admissible.

3. *The invention*

The invention concerns a system and method for gathering information from the area around the system. The application explains that scene analysis in the prior art had been performed with purely sensory systems (see page 4, lines 24-28). Visual information was supplemented by information from additional sensors, e.g. radar or infrared sensors. Against this background, the application presents the invention as a system and method for gathering information whereby visual information is supplemented not by information from additional sensors but by information transmitted directly from the objects which are located in the area of interest. In particular, RFID tags are employed for transmitting the additional "object-centred" information, i.e. information concerning the object itself. The combination of the visual information with the RFID information improves the whole data-gathering process and enables the number of sensors to be dramatically reduced, the transmitted information relating to specific properties of the object to which the RFID tag is associated.

4. *The contested decision*

4.1 The application was refused on the ground that the invention was not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC 1973). Additional comments were provided in the contested decision indicating that the examining division was also of the

view that the claims were not supported by the description (Article 84 EPC 1973).

4.2 In the framework of the present appeal, it must therefore be ascertained whether the requirements of Article 83 EPC 1973 have been fulfilled. In view of the comments provided in the contested decision concerning Article 84 EPC 1973 with regard to support by the description, the Board has also considered whether this requirement has been fulfilled.

5. *Amendments - Article 123(2) EPC*

5.1 It must first be ascertained whether the amendments made during the appeal proceedings satisfy the requirements of Article 123(2) EPC.

5.2 Claim 1 is based broadly on claim 1 as originally filed but a number of features have been set out in greater detail. The basis for the amendments is outlined below.

The "*RFID tags to be provided on objects and transmitting information on the associated objects*" is derived from page 3, lines 34 to 35 of the original disclosure; the plural comes from original claim 1 and page 3, lines 14 and 19.

The "*humanoid robot provided with a computing device*" is derived from page 4, lines 32-33 and page 6, lines 3-4 and 21-24 and Figure 1. The "integrator" mentioned at these passages is part of a computing device 9.

The "*visual sensing means*" is derived from page 3, line 22 and the definition of the environment comes from page 3, lines 15-19.

The "*antenna means for wirelessly receiving said information from said RFID tags of said objects*" is derived from original claim 1 in combination with page 3, lines 23-25. The fact that the antenna is provided as part of the robot may be seen from Figure 1.

The wording "for making a decision on objects identified by the visual information and the RFID information and for generating output signals based on said decision" is derived from page 3, lines 27-30. That these output signals are used to drive a manipulator of the humanoid robot may be derived from page 3, line 31 and page 5, lines 31-32 in combination with page 4, lines 32-33.

Correspondingly, the above passages in combination with original claim 6 provide the basis for claim 2.

5.3 The amendments are therefore considered to satisfy the requirements of Article 123(2) EPC.

6. Articles 83 and 84 EPC 1973 - general remarks

6.1 Both the requirement that the claims be supported by the description (Article 84 EPC 1973) and the requirement that the invention be sufficiently disclosed (Article 83 EPC 1973) are designed to reflect the principle that the terms of the claim should be commensurate with, or be justified by, the actual

contribution to the art (T 409/91, Reasons, point 3.5). It is the actual contribution to the art which defines the invention and for which protection may be sought. In view of the background outlined in paragraph 3 above, the independent claims have been directed to the general concept of combining visual and RFID information. It is this concept which is currently considered to represent the contribution to the art.

6.2 The Board supports the idea that an invention which opens up a whole new field is entitled to more generality in the claims than one which is concerned with advances in a known technology (Guidelines for Examination in the EPO, C-III, 6.2). In view of the fact that multimodal integration was known at the priority date of the application (as can be seen from US-A1-2003/0149803, cited in the application), whether the present invention really opens up a whole new field may perhaps be questioned. Nevertheless, if the assessment of novelty and inventive step shows that the combination of visual and RFID information in a humanoid robotic context is new and inventive, then the Board considers that the appellant would be entitled to protection at this level of generality. This illustrates the interrelation that exists between Articles 84, 83 and 52(1) EPC and highlights the risk that a broad claim will be more vulnerable to a novelty or inventive step objection.

7. Article 83 EPC 1973

7.1 Article 83 EPC requires that the invention be disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. For an

application to be refused on this ground, the skilled person, equipped only with the description, claims and drawings of the application, and his general knowledge, would have to be unable to produce a working version of the claimed system. It cannot be expected that the skilled person will have to resort to inventive ingenuity in order to fill any gaps in the teaching of the application.

7.2 Before it can be considered whether the skilled person would be able to carry out the invention, it is first necessary to establish what qualifications and level of knowledge the skilled person holds.

The Board accepts the position of the appellant that the skilled person in this particular field will be very highly qualified. In particular in the field of humanoid robotics, the skilled person will typically come from a background of computer science, but will require expertise in the fields of mechanics, electronics, biomechanics, computer programming and humanoid signal processing. Consequently, the "skilled person" in this field will comprise a team of experts, this team being technically very highly skilled and having a vast range of technical literature at its disposal.

7.3 The invention, as it is set out in the independent claims, concerns the use of two signals, one emanating from the visual sensing means and one emanating from the RFID transmitter. These two signals are combined for making a decision on objects identified by the two information sources. The invention does not lie in the

details of the manner in which the signals are combined, but instead in the mere fact that they **are** combined.

7.4 The examining division considered that Article 83 EPC 1973 was not satisfied since the application did not provide sufficient information to enable the skilled person to perform the combination of visual and RFID information without undue burden. No information was provided as to how the combination was performed, how the decision was taken, nor indeed as to the nature of the decision. No explanation of the specific processing required for multimodal integration was contained in the application, so the skilled person would not know how to perform the necessary data fusion. Even when referring to the specific example provided on page 5 of the application, no details were provided as to how the information integration should be performed.

Clearly, processing the visual and the RFID signals to make a decision will involve a certain degree of programming skill and signal processing knowledge: this task is certainly not trivial. It is noted however that data fusion in a multi-sensory environment is presented in the description as being the starting point of the invention (see page 1, paragraph 1 and page 4, paragraph 3 of the originally filed application documents). The skilled person must therefore be considered to be conversant with such data fusion techniques. Moreover, the description refers to US-A1-2003/0149803 which concerns multimodal integration. The skilled person may therefore also be considered to be conversant with multimodal integration techniques. Thus it must be assumed that the skilled person having the level of knowledge set out above will know how to

process the data received from the two different sources and be in a position to draw a conclusion based on the combined data. The Board observes that, at a very basic level, this data could, for example, simply be a change in contrast boundaries sensed by the visual sensing means and information sent by the RFID tag establishing the identity of the object. As pointed out by the appellant, the decision which is taken need not even be correct. The Board is therefore convinced that the skilled person in this field will have sufficient knowledge to provide a "means for combining the visual information as well as the wirelessly received information for making a decision on objects identified by the visual information and the RFID information" and for generating a corresponding output signal.

7.5 Moreover, the examining division noted that the application contained no guidance on how the vision system formulated the hypotheses mentioned on page 5 of the description, nor did it instruct on a general framework of formulating hypotheses which could be applied in the context of heterogeneous data fusion. The examining division therefore concluded that the "essential components of the invention, in particular those concerning object recognition during the process of data fusion are missing from the application as filed" (point 4 of the contested decision) and that the skilled person would have to resort to inventive activity in order to integrate the visual and the RFID data.

The Board notes that the invention as claimed does not require that any hypotheses be determined. Indeed, as contemplated above, depending on the decision to be

taken and on the data acquired from the two sources, the combination of the visual and RFID information may in fact be a very straightforward operation. The Board is therefore of the view that details of the hypotheses-forming procedure are not categorically required in order to carry out the invention. Notwithstanding this finding, the appellant submitted that the skilled person in this field would nonetheless know how to form hypotheses for viewed objects. The Board tends to agree with this opinion and notes that the hypothesis need not be of a complex nature. For example, motion information from the visual sensor may be sufficient for the vision system to supply a hypothesis suggesting the possible identity of the object being viewed.

7.6 The examining division maintained that "taking a decision" in claim 1 must involve a process of object recognition or identification (point 2 of the contested decision) and held that, since no information was provided as to how to perform object recognition, the invention is insufficiently disclosed. The Board sees no basis for interpreting the "decision" in this manner. As argued by the appellant, the decision is unspecified and depends entirely on what information is received from the two sources.

7.7 The examining division further objected to the fact that the application did not contain sufficient details to enable the invention to be carried out over the whole breadth claimed (point 4 of the contested decision), basing this objection on the problem of correct data association in the specific scenario in which two objects are present (but not necessarily

distinguishable as two objects) in the visual scene and two RFID signals are received. This scenario was covered by claim 1 but no explanation was provided as to how to correctly associate the two RFID signals to the respective visually-sensed objects.

Article 83 requires that the invention be disclosed in such manner as to allow it to be carried out. Article 83 does not require that details should be provided to enable each and every construction covered by the claims to be implemented; indeed, this would be an impossible undertaking when the claims are drafted in functional terms. In the view of the Board, even if hypothetical, non-implementable constructions may be conceived, this does not prevent the general principle being claimed in its full breadth if the skilled person is not put in a position where he systematically has to resort to inventive ingenuity in order to carry out the invention.

The example given on page 5 of the description is a very specific illustration of one scenario in which the invention could be employed. The invention does not hinge on whether two visually-sensed objects may be distinguished from each other, but that visual and RFID information may be used to augment each other and to permit decisions to be taken with little effort (page 5, lines 26-28). It is in this breadth that the invention has been set out in the description and it is in this breadth that it is now claimed. Whether the skilled person will know how to analyse each and every scene presented to the computing device and to derive specific information from that scene is not essential for assessing whether Article 83 is satisfied. What is

important is whether the skilled person will know how to carry out the invention, which in the present case resides merely in the combination of visual and RFID information.

In the Board's view, the examination of Article 83 EPC should not be reduced to a quest for a single construction which cannot be implemented on the basis of the information provided in the application. Article 83 EPC concerns whether the invention has been sufficiently disclosed rather than whether scenarios exist for which a full explanation has not been provided.

7.8 In the present case, the Board therefore considers Article 83 EPC 1973 to be fulfilled.

8. *Article 84 EPC 1973 - support by the description*

8.1 The examining division held that "the description fails to support to a sufficient extent" the means for combining the visual information with the RFID information, since the application contained no clear teaching on how to successfully implement the invention when two objects were viewed and information was received from two RFID tags. The Board has understood this objection to be a lack of support by the description (Article 84 EPC 1973) over the whole breadth claimed.

Indeed, the RFID information and the visual information were initially not defined in the claims as pertaining to the same object. There was no teaching in the description which suggested that information other than

object-centred information may be combined with the visual information, the implication being that the two types of information must relate to one and the same object. No other combination had been envisaged and no justification appeared to exist for generalising this concept to allow for the combination of visual information with non-related RFID information.

During the appeal proceedings claim 1 was amended and now sets out, using the wording of the original description, that the decision is taken on **objects identified by the visual information and the RFID information**. The Board considers that this serves to clarify that both information sources are used in the identification of the objects. That the objects may be identified by the visual and the RFID information means that enough information must be provided by each information source to enable the correct association of the data such that object identification is possible. Consequently, the claims have been restricted to the combination of information pertaining to the same object and so are now supported by the description in this respect.

8.2 The Board acknowledges that the claims are still very broad, relating to the general concept of combining visual information about an object with RFID information about that object. However, the Board does not consider that this generality goes beyond what is warranted by that which the appellant presents as being the contribution to the art and which is described in the application as the mere combination of the visual and the RFID signals. As will be clear from the remarks concerning Article 83 EPC 1973 above, the Board

considers that the invention may currently be seen to lie at this level of generality. In view of the fact that novelty and inventive step have not yet been considered - this being the subject of the examination still to be performed by the examining division - any limitation at this stage of the proceedings to more specific embodiments would be unduly restrictive.

8.3 Consequently the Board is of the opinion that the claims are supported by the description.

## Order

## For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division for further prosecution on the basis of claims 1 and 2 filed at the oral proceedings on 27 October 2010.

The Registrar: The Chairman:

R. Schumacher B. Schachenmann