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Datasheet for the decision of 19 November 2015

Case Number: T 0423/11 - 3.5.06

Application Number: 96921304.0

Publication Number: 0834121

IPC: G06F9/45

Language of the proceedings: EN

Title of invention:
RECONFIGURABLE ALGORITHMIC NETWORKS FOR AIRCRAFT DATA MANAGEMENT

Patent Proprietor:
Honeywell International Inc.

Opponent:
SAGEM DEFENSE SECURITE

Headword:
Reconfigurable algorithmic networks/HONEYWELL

Relevant legal provisions:
EPC 1973 Art. 56

Keyword:
Inventive step - (no)

Decisions cited:

Headnote:

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Case Number: T 0423/11 - 3.5.06

D E C I S I O N
of Technical Board of Appeal 3.5.06
of 19 November 2015

Appellant: (Opponent)	SAGEM DEFENSE SECURITE 18/20 Quai du Point du Jour 92100 BOULOGNE-BILLANCOURT (FR)
Representative:	Regimbeau 20, rue de Chazelles 75847 Paris Cedex 17 (FR)
Respondent: (Patent Proprietor)	Honeywell International Inc. 115 Tabor Road Morris Plains, NJ 07950 (US)
Representative:	WP Thompson 55 Drury Lane London WC2B 5SQ (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 17 December 2010 concerning maintenance of the European Patent No. 0834121 in amended form.**

Composition of the Board:

Chairman	W. Sekretaruk
Members:	S. Krischer
	A. Teale

Summary of Facts and Submissions

I. The appeal by the opponent is directed against the interlocutory decision of the opposition division, dated 17 December 2010, that, account being taken of the amendments made by the patent proprietor during opposition proceedings, patent 0 834 121 and the invention to which it relates met the requirements of the EPC.

II. Notices of appeal by the opponent were received on 16 and 17 February 2011. The appeal fee was received on 16 February 2011. A statement of grounds of appeal was received on 26 April 2011.

III. Oral proceedings restricted to the issues of the admissibility of the appeal and the validity of the transfer of opponent status were held on 11 March 2015. The board decided that the appeal was admissible, the transfer of opponent status was valid, and that the appeal proceedings would be continued.

IV. In its summons to the second oral proceedings, the board explained its preliminary opinion that inter alia the claims of the amended patent seemed not to be inventive (Articles 100(a) and 56 EPC).

V. In a letter dated 19 October 2015, the proprietor (respondent) disagreed with the board's assessment.

VI. Oral proceedings were held on 19 November 2015, at the end of which the board announced its decision.

VII. The opponent (appellant) requests that the decision be set aside and that the patent be revoked. A previous

request for reimbursement of the appeal fee was withdrawn during the oral proceedings.

VIII. The proprietor (respondent) requests that the appeal be dismissed (main request), or that the patent be maintained in amended form based on a claim combining claims 1, 2, 13 and 16 of the amended patent as decided upon in the appealed decision (auxiliary request).

IX. Claim 1 of the main request (i.e. of the amended patent) reads as follows:

"1. A data management system for use with aircraft comprising:

a plurality of flight data sources for generating a plurality of flight data;
a computer;
transmittal means for transmitting at least a portion of said flight data from said flight data sources to said computer;
a reconfigurable algorithmic network, resident on said computer, that defines a set of predetermined operations on a predetermined set of said flight data[,] said reconfigurable algorithmic network including a plurality of functional elements wherein each said functional element defines at least one of said predetermined operations, a series of codes representing functional elements to be executed, and connection means for defining the operational relationships between said functional elements; and
interpreter means, resident on said computer, for processing said set of flight data in accordance with said reconfigurable algorithmic network in that said functional element codes of the recon-

figurable algorithmic network are received and the corresponding computer routine is selected for execution; and
an input/output device for transferring information to and from the aircraft and for receiving a data transfer medium."

X. Claim 1 of the auxiliary request is a combination of claim 1 with the following claims of the main request:

"2. The system of Claim 1 additionally including development means, having a display, for developing said reconfigurable algorithmic network wherein said algorithmic network is visually represented on said display with a plurality of element symbols representing said functional elements and a plurality of connection lines representing said connection means."

"13. The system of Claim 2 wherein said system includes a data management unit located in the aircraft includes said interpreter and said reconfigurable algorithmic network, said transmittal means additionally transmits at least a portion of said flight data to said data management unit and said interpreter interprets said reconfigurable algorithmic network."

"16. The system of Claim 13 wherein said transmittal means includes a first communications transceiver in the aircraft a second communications transceiver connected to said development means for transmitting said reconfigurable algorithmic

network via said first communications means to said data management unit."

Reasons for the Decision

1. *Overview of the invention*

The invention relates to the use of graphical (or visual) programs for processing flight data of an aircraft. The graphical programs are called "reconfigurable algorithmic networks" or RANs, (see patent description, [14], first sentence). Figure 3 shows the one and only example of a RAN program in the patent (see also [21], lines 24-41). The RAN programs are executed by an interpreter program written in the conventional manner and similar to an interpreter for the well-known BASIC programming language ([14], lines 43-49; [19], lines 13-19). One of the purposes of the RAN programs is the generation of human-readable reports (claim 12; [13], sentences 1 and 2; [14], second sentence; figure 3, (120)).

2. *Overview of the present decision*

The claims of the main request (i.e. the amended patent) and of the auxiliary request are not inventive (Articles 100(a) and 56 EPC 1973).

3. *Inventiveness of the main request*

3.1 In its letter of 19 October 2015 and during oral proceedings, the proprietor disputed the board's assessment that the invention relates to the use of

graphical programs for processing flight data of an aircraft. Rather, the invention related to an aircraft flight data management system and not to a computer program (page 2, paragraphs 3-5).

3.2 While the board agrees that claim 1 sets out a system, rather than a program, it is clear from the claim and the whole description that the claimed data management system is a computer-implemented system. It contains a conventional computer which executes a conventional interpreter program which itself executes a graphical RAN program for processing flight data of an aircraft. Without an appropriate RAN program, the system does not perform its task which is processing flight data of an aircraft. Thus, the RAN program is essential for the claimed data management system.

3.3 A RAN is a kind of a graphical program, or more precisely of a dataflow-oriented graphical program, see figure 3, [21] and [22] for the sole example of a RAN in the patent. However, since neither the claims nor the description formally defines the graphical programming language of the RANs, it is enough to know that graphical programming and in particular dataflow programming have existed since the 1960s (see https://en.wikipedia.org/wiki/Dataflow_ programming, version of 1 November 2015).

3.4 While the sole independent claim (claim 1) merely sets out the existence of a RAN and its *execution* by an interpreter program in order to process flight data on an ordinary computer having input/output devices for transferring data to and from an aircraft (e.g. over a conventional ACARS network connection or a floppy disk drive, see column 3, line 55, and column 4, line 2),

dependent claims 2-5 and 7-11 relate to *developing* RANs with the help of a graphical editor (claims 2-5, 7, 8) and a flight data simulator (claims 9-11), claims 6, 12 and 14 specify that the RAN generates a human-readable *report* (claim 12: the generating computer is on the ground), claim 13 contains a second computer in the aircraft ("data management unit") containing the interpreter and the RAN, claim 14 additionally displays flight data in the aircraft, claims 15 and 16 relate to transmitting flight data and RANs between the aircraft and other computers, and claims 17-19 relate to sub-programs (i.e. "sub-RANs").

3.5 The board considers it to be a key question whether or not a programming and execution environment for processing flight data with the help of graphical programs produces a technical effect. Or, more precisely, does the enhancement of an ordinary dataflow-oriented graphical programming language with constructs for processing flight data (e.g. icons for flight data parameters like "airspeed" or "cabin altitude warning"; see claims 7 and 8; figure 3 box 104 labeled "CAS" or figure 4, the selected line in the parameter selection window: "CAS ... COMPUTED AIRSPEED") have a technical effect, since it mainly concerns the development of a program?

3.6 As to the aspect of developing and executing graphical programs, decision T 1539/09 "Programmiersystem/ RENNER" (Reasons, 4.2) states that the activity of programming is regarded as a *mental act*, unless it serves to achieve in a causal way a technical effect in the context of a concrete application or environment. In that decision, a graphical programming and execution

environment similar to that of the appealed patent was considered not to be allowable.

3.7 Although, in the present case, the environment is more specific than that in T 1539/09 (the data is from an aircraft or an aircraft simulator), the board does not see how the origin of the data adds a technical effect to developing graphical programs (RANs).

3.8 As argued in the first communication of the examining division (dated 24 August 1998; 5.2), the only problem solved seems to relate to the nature of the programming language used to specify the required data processing. Further: "The only practical effect which can be deduced from the application resulting from choosing this set of programming constructs embodied in the RANs would appear to be exclusively related to *ease of input and editing in a visual manner.*" (emphasis added)

3.9 Thus, the effect achieved by *developing* flight data processing programs in the form of RANs appears to be to ease the work of the programmer. However, it is well-established case law of the boards of appeal that this effect lacks technical character (see for example the above mentioned decision T 1539/09, 4., second sentence: the effect of reducing the mental effort of the user when creating the program is per se in the board's view not technical ("Die Wirkung, den mentalen Aufwand des Anwenders bei der Programmerstellung zu reduzieren, ist an sich nach Ansicht der Kammer keine technische."). Therefore, this easing of the work of the programmer cannot contribute to the presence of an inventive step.

3.10 As to a possible effect being achieved by *executing* flight processing programs in the form of RANs, the board assumes that a program developed with the help of RANs is similar in size and runtime performance to a program developed in another interpreted programming language (like BASIC). At least the patent seems neither to allege nor substantiate a possible technical effect emerging from that. Furthermore, the output generated by the programs (typically a human-readable report) would be the same, regardless of whether it had been produced by a RAN or a BASIC program. Thus, the board assumes that, in order to produce the same report from the same data, the programs perform the same or similar operations. For instance, generating a report if the current airspeed is less than 200 knots or if the airspeed signal becomes invalid (see column 8, lines 33-37 and figure 3).

3.11 During oral proceedings, the proprietor argued that the "architecture" of the claimed data management system produced the technical effects of increasing the versatility, reconfigurability, manageability, modifiability, hardware independence, independence from certification requirements and reducing memory requirements.

3.12 However, as to the effects of increasing the versatility, reconfigurability, manageability and modifiability, the board is not persuaded that they have a technical character, since they are abstract and not measurable quantities. But in any case, these effects are a direct consequence of using a computer. The main characteristic of a computer is its programmability which makes a system versatile, reconfigurable (a synonym for "programmable"), manageable and modifiable. However, the idea of using a computer in order to

process data is not inventive, since that is the purpose of computers.

3.13 As to the hardware independence of the RANs, this results directly from using a (high-level) programming language, and not the machine language of the concrete processor of the concrete computer used in an implementation of the invention. That is what high-level programming languages have been designed for since their creation in the 1950s. Using high-level programming languages to write programs for computers was already so common at the patent's priority date (in 1995), that this does not establish an inventive step. The technical effect of hardware independence by using high-level programming languages is a usual one.

3.14 As to reducing the memory requirements, the proprietor argued that a RAN program was smaller than a specific program producing the same results. The board agrees that this might be the case, but it is also a direct consequence of using a high-level programming language.

3.15 The proprietor also cited paragraph [15] of the patent description which states that the RAN programs can substantially reduce certification requirements because, once the interpreter programs are certified, and because merely interpreting a RAN does not affect the database on the aircraft, it should not be necessary to obtain recertification every time the RAN was modified or a new RAN was created.

3.16 The board finds that reducing administrative certification requirements is not a technical effect. Moreover, the board is not convinced that the expectation of avoiding recertification is realistic. As

much as a non-programmed ad-hoc implementation of a flight-data management system has to be certified, a programmed version of the same functionality would have to be certified, the more since software-based solutions usually have more sources of failure than more hardware-centric approaches. Moreover, the administrative advantage of avoiding certification cannot contribute to the presence of a technical effect.

3.17 It follows that claim 1 of the patent does not produce a technical effect which goes beyond the usual technical effects which any computer produces when executing programs (e.g. changes of electric voltage or current). Without such a technical effect, claim 1 lacks inventive step.

4. *Inventiveness of the auxiliary request*

4.1 Claims 2, 13 and 16 of the amended patent add the following features to claim 1 of the auxiliary request: visual development means, a data management unit in the aircraft including an interpreter which interprets the RAN, and the transmitting means additionally transmitting flight data and the RAN to the data management unit.

4.2 According to the proprietor, this further increases the versatility, modifiability, testability and speed of implementing, makes it possible to create a new RAN anywhere and transmit it to the aircraft and decreases the bandwidth of transmission due to the programs being smaller.

4.3 Like the arguments above concerning versatility and modifiability, the board does not consider testability

in this context to be a technical effect. Testing is an integral part of programming in order to find programming errors. However, as said above, programming is per se a mental act. Thus, improving testability would accelerate the mental act of programming. The same holds for increasing the speed of implementing.

4.4 As to making "it possible to create a new RAN anywhere and to transmit it to the aircraft", this is a non-technical aim by which for example an employer specifies to his employee the system to be built. The technical solution is to provide a separate development computer and to connect it with the aircraft by a network. However, this solution is straightforward and does not need inventive skill.

4.5 As to decreasing the bandwidth of transmission due to the programs being smaller, this is again a direct consequence of using a high-level programming language, if one accepts that this technical effect is present here. The board is not convinced of the latter, since this highly depends on the specific properties of the programming language, which is not specified in the present patent.

4.6 Therefore, the system of claim 1 of the auxiliary request does not produce a technical effect which goes beyond the usual technical effects which any connected computers produce during distribution and execution of programs. Without such a technical effect, claim 1 lacks inventive step.

Order

For these reasons it is decided that:

1) The decision under appeal is set aside.

2) The patent is revoked.

The Registrar: The Chairman:

B. Atienza Vivancos W. Sekretaruk

Decision electronically authenticated