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Datasheet for the decision of 21 July 2006

Case Number: T 0006/04 - 3.4.01

Application Number: 93105339.1

Publication Number: 0567794

IPC: G01R 33/54

Language of the proceedings: EN

Title of invention:
Nuclear magnetic resonance imaging with high speed and interactive pulse sequence control

Applicant:
KABUSHIKI KAISHA TOSHIBA

Opponent:
-

Headword:
NMR imaging with simulation of the pulse sequence

Relevant legal provisions:
EPC Art. 56, 84, 123(2)

Keyword:
"Inventive step (no; main request and second auxiliary request)"
"Clarity (no; first auxiliary request)"

Decisions cited:
-

Catchword:
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Case Number: T 0006/04 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 21 July 2006

Appellant: KABUSHIKI KAISHA TOSHIBA
72, Horikawa-cho
Saiwai-ku
Kawasaki-shi,
Kanagawa-ken 210-8572 (JP)

Representative: Lehn, Werner
Hoffmann Eitle,
Patent- und Rechtsanwälte
Postfach 81 04 20
D-81904 München (DE)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 30 May 2003 refusing European application No. 93105339.1 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: B. Schachenmann
Members: H. Wolfrum
G. Assi

Summary of Facts and Submissions

I. European patent application 93 105 339.1 (publication No. EP 0 567 794) was refused by a decision of the examining division dispatched on 30 May 2003, on the ground of lack of inventive step within the meaning of Articles 52(1) and 56 EPC of the subject-matter of a main request and two auxiliary requests then on file.

II. The applicant lodged an appeal against the decision and paid the prescribed fee on 30 July 2003. On 25 September 2003 a statement of grounds of appeal was filed together with new sets of claims according to a main request and four auxiliary requests.

III. On 31 August 2005 the appellant was summoned to oral proceedings to take place on 9 May 2006. On 12 April 2006 the appellant was informed that the oral proceedings were postponed until 21 July 2006.

In a communication also dated 12 April 2006 the Board raised questions concerning matters of clarity (Article 84 EPC) and basis of disclosure (Article 123(2) EPC) and gave a preliminary view as to the issue of inventive step for the claimed subject-matter. In this context, reference was made *inter alia* to documents:

D3: W. Dreher, P. Börnert : "Pulse Sequence and Parameter Choice in NMR Imaging as a Problem of Constrained Multidimensional Nonlinear Optimization"; MAGNETIC RESONANCE IN MEDICINE, vol. 8, no. 1, September 1988, DULUTH, USA, pages 16 - 24; and

D5: US-A-4 707 797.

IV. In response, the appellant filed by letter of 21 June 2006 four additional sets of claims as fifth to eighth auxiliary requests, respectively.

V. Oral proceedings were held on 21 July 2006.

As a result of the discussion, the appellant requested that the decision under appeal be set aside and a patent be granted on the basis of one of three sets of claims filed in the oral proceedings as a main request, a first auxiliary request and a second auxiliary request, the requests being based on the former fifth, sixth and eighth auxiliary request, respectively.

VI. Claim 1 of the appellant's **main request** reads as follows :

"*1. A method for pulse sequence control in a nuclear magnetic resonance imaging, comprising the steps of :*

measuring characteristic parameters including system characteristic parameters related to an actual apparatus for the nuclear magnetic resonance imaging, and target characteristic parameters of an actual target object of the nuclear magnetic resonance imaging;

simulating a pulse sequence execution based on the simulated RF pulse waveform, the simulated gradient magnetic field waveforms, the simulated static magnetic field, and the simulated nuclear spin density distribution according to the system and patient *characteristic parameters obtained by the characteristic parameter measurement step by : calculating a spin motion according to the Bloch equation expressing a time change of magnetic moments of spins using the simulated RF pulse waveform, the simulated gradient magnetic field waveforms, the simulated static magnetic field; and calculating an echo signal as a function of time from the simulated gradient magnetic field waveforms in X- and Y-directions, the simulated static magnetic field, and the simulated nuclear spin density distribution such that slice characteristics and a signal strength at a time of application of RF pulses can be calculated; and*

automatically adjusting the pulse sequence to improve properties of RF pulses and gradient magnetic fields realizable by the pulse sequence according to the result of the simulation obtained at the simulating step."

Independent claim 7 is directed to an apparatus for pulse sequence control in a nuclear magnetic resonance imaging comprising measuring means, simulator means and pulse sequence adjustment means for executing the respective steps as specified in claim 1.

Claims 2 to 6 and 8 to 12 are dependent claims.

Claim 1 of the appellant's **first auxiliary request** reads as follows:

"1. A method for pulse sequence control in a nuclear magnetic resonance imaging, comprising the steps of :

measuring characteristic parameters including system characteristic parameters related to an actual apparatus for the nuclear magnetic resonance imaging, and target characteristic parameters related to an actual target object of the nuclear magnetic resonance imaging;

simulating an execution of the pulse sequence by using a simulated RF pulse waveform, simulated gradient magnetic field waveforms, a simulated static magnetic field, and a simulated nuclear spin density distribution according to the characteristic parameters measured at the measuring step, to obtain a result of a simulation in terms of a spin motion according to the Bloch equation expressing a time change of magnetic moments of spins and calculating an echo signal as a function of time;

automatically adjusting the pulse sequence to improve properties of RF pulses and gradient magnetic fields realizable by the pulse sequence according to the result of the simulation obtained at the simulating step;

storing event codes indicating events for realizing the execution of the pulse sequence;

decoding a plurality of the event codes stored at the storing step in parallel by a plurality of series connected decoder means; and *controlling an apparatus for the nuclear magnetic resonance imaging by a sequence controller to carry out the events indicated by the decoded event codes.*"

Independent claim 4 is directed to an apparatus having the respective means for carrying out the steps defined in claim 1.

Claims 2, 3, 5 and 6 are dependent claims.

Claim 1 of the **second auxiliary request** is based on the wording of claim 1 of the main request and further defines the steps of :

"*storing event codes indicating events for realizing the execution of the pulse sequence in an event memory, each entry of the event memory having a time slot, an event code slot, and an argument slot;*

providing a rewriting table storing rewriting table entries specifying a manner of rewriting each one of the time slot, the event code slot, and the argument slot of each entry in the event memory;

indicating an appropriate one of the rewriting table entries in the rewriting table for each one of the time slots, the event code slot, and the argument slot, in conjunction with the event memory; and

rewriting any of the time slots, the event code slot, and the argument slot of each entry in the event memory according to the corresponding rewriting table entry indicated at the indicating step."

Independent claim 3 is directed to an apparatus having the respective means for carrying out the steps defined in claim 1.

Claims 2 and 4 are dependent claims.

VII. In support of inventive step, the appellant argued in essence that the available prior art did not teach the skilled person any one of the steps of measuring, simulating and adjusting as claimed in independent claims 1 and 7 of the main request. D3, being the only document which disclosed a kind of simulation to be performed before an actual nuclear magnetic resonance (NMR) imaging experiment, did not measure characteristic parameters related to an actual apparatus and of an actual target object. According to D3, a simulation of signal intensities was made from statistical data or previous measurements of the objects to be imaged and the simulation was restricted to the calculation of the contrast or a contrast-to-noise-ratio between two (adjacent) regions of the object. In distinction thereto, the invention concerned a simulation on the basis of the measured parameters using as inputs a simulated RF pulse waveform, a simulated gradient magnetic field, a simulated static magnetic field, and a simulated nuclear spin density distribution. Moreover, the simulation comprised two calculations, *ie* that of calculating a spin motion according to the Bloch equation expressing a time change of magnetic moments of spins and that of calculating an echo signal as a function of time, as was supported in particular by the disclosure at page 18, line 13 to page 20, line 7, of the originally-filed description. The adjustment, being based on two independently calculated physical entities, accordingly allowed for adjustment of different variables, such as for instance shown in Figure 10 for the variables magnetic field strength and waveform of the gradient magnetic field. Finally, D3 did not mention an automatic adjustment of the pulse sequence to improve properties of RF pulses and gradient magnetic fields.

According to the independent claims of the first auxiliary request, events for realizing the execution of the NMR imaging pulse sequence were stored as event codes and decoded when needed. Nothing in the available prior art suggested to decode a plurality of the event codes in parallel by a plurality of series connected decoder means, thus increasing event decoding speed, as was explained on page 24, line 12 to page 25, line 20, of the originally-filed description. Document D5 in particular decoded a plurality of event codes by means of a plurality of synthesizers which generated analogue waveforms and were arranged in parallel.

The independent claims of the second auxiliary request referred to a specific organization of the event memory which had no precedent in the art and which allowed together with a correspondingly structured rewriting table to efficiently change pulse sequences without the need for any wasteful rewriting of data remaining unchanged.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

A. Main request

2. Amendments

The subject-matter of amended claims 1 and 7 may be considered to be formally disclosed by originally filed claims 3 to 5 and 13 to 15, respectively, together with the description on page 18, line 13 to page 20, line 7, as originally filed.

Thus, for the purpose of this decision the Board considers the amendments made to comply with the requirements of Article 123(2) EPC.

3. Inventive step (Articles 52(1) and 56 EPC)

3.1 Document D3 relates to a study of pulse sequence control in a nuclear magnetic resonance (NMR) experiment, in which, in order to optimize the imaging experiment, a computer simulation of the pulse sequence is performed "*if the NMR parameters are known a priori*". On the other hand, "*for a given imaging task the NMR parameters can be determined from statistics or previous measurements of the objects to be imaged*" (cf. page 17, first paragraph). The computer simulation comprises the calculation of signal intensities of two adjacent regions for a given pulse sequence and different NMR parameter sets and uses a contrast-to-noise-ratio (CNR) between these regions for optimizing the parameters of the pulse sequence (cf. the chapter "contrast criteria" on pages 17 to 19). In a specific example, the signal intensity of a spin echo is calculated (see for instance equation [5] on page 19) according to characteristic parameters of a target object (cf. page 20, example 1) and optimum parameter values (such as repetition time TR, spin echo time TE or flip angle α) are determined for adjustment of the pulse sequence (cf. Table 1 and the corresponding description on page 20). In particular from the pulse sequences shown in Figure 1 and the repeated references to "*NMR imaging*", "*single-slice*", "*multislice*" or "*three-dimensional measurements*" it is evident for the skilled reader of D3 that the known simulation method is based on a simulated RF pulse waveform, a simulated gradient waveform, a simulated static magnetic field and a simulated nuclear spin density distribution.

As a result of the study, it is found that "*the use of optimized pulse sequences can improve the image quality in the sense of the CNR or shorten the necessary total measuring time*" (cf. page 24). In this context, it is considered "*a straightforward demand also to optimize the applied imaging scheme within the given experimental constraints*" and stated that "*for practical application the proposed optimization approach should be extended in several directions*", including "*the influence of the real excitation profile across the excited slice on the signal intensity*" and "*the specific experimental limitations of the NMR imaging system used*".

3.2 Hence, in the terms of claim 1 under consideration, D3 teaches a method for pulse sequence control in a nuclear magnetic resonance imaging, comprising the steps of:

- measuring characteristic parameters related to an apparatus for the NMR imaging and to a target object of the NMR imaging;

- simulating a pulse sequence execution based on a simulated RF pulse waveform, a simulated gradient waveform, a simulated static magnetic field and a simulated nuclear spin density distribution according to the system and object (patient) characteristic parameters by calculating for instance an echo signal as a function of time; and

- adjusting the pulse sequence to improve properties of RF pulses realizable by the pulse sequence according to the result of the simulation obtained at the simulating step.

3.3 The appellant sees in essence three aspects by which the subject-matter of claims 1 and 7 was distinguished from the teaching of document D3:

(a) According to the claimed invention, parameters related to an actual apparatus and to an actual target object were measured and used for the simulation, whereas D3 taught a simulation of signal intensities from statistics or previous measurements of the objects to be imaged.

(b) The claimed step of simulation comprised two calculations based on the simulated RF pulse waveform, the simulated gradient magnetic field, the simulated static magnetic field, and the simulated nuclear spin density distribution, namely:

- the calculation of the spin motion according to the Bloch equation expressing a time change of magnetic moments using, and

- the calculation of an echo signal as a function of time,

such that slice characteristics and a signal strength at the time of application of the RF pulses could be calculated from the spin motion.

(c) Finally, D3 did not mention an automatic adjustment of the pulse sequence to improve properties of RF pulses and gradient magnetic fields.

3.4.1 As regards the alleged difference under (a), the phrase "For a given imaging task the NMR parameters can be determined from statistics or previous measurements of the objects to be imaged" on page 17 of D3 does not provide specific instructions how to proceed in case the characteristic parameters required for the simulation are not a priori available. However, a clear hint at a suitable approach in such a case is given by the proposal on page 24 of D3, according to which, "for practical application", "the influence of the real excitation profile across the excited slice on the signal intensity" and "the specific experimental limitations of the NMR imaging system used" are to be taken into consideration.

3.4.2 As regards the alleged differences under (b), the appellant's argumentation does not properly acknowledge the nature and extent of the technical teaching provided by D3 and misinterprets the technical information provided by the application documents.

According to D3, the simulation is based on a selected pulse sequence for NMR imaging, and as such inevitably implies the use of a simulated RF pulse waveform, a simulated gradient magnetic field, a simulated static magnetic field and a simulated nuclear spin density distribution, taking account of characteristic parameters of the imaging system and the target object. Moreover, in the Board's view, it may be safely assumed that according to the teaching of D3 a calculated signal strength of a spin echo signal is used (Figure 1). Furthermore, since D3 explicitly envisages single- or multi-slice imaging, execution of the simulation necessarily involves the calculation of slice characteristics. It is true that D3 is specifically concerned with an optimization of the contrast-to-noise ratio (CNR). However, in the method according to D3 the CNR is but the specific criterion chosen for evaluating the simulation and for adjusting the pulse sequence, this criterion being nevertheless related to the simulated difference of calculated signal intensities. At any rate, no distinction with respect to the claimed subject-matter can be derived from the circumstance that the latter is silent as to the criterion to be used for the step of adjusting.

Furthermore, appellant's allegation that the simulation according to the invention involved calculating two separate variables, *ie* the spin motion and an echo signal, is not based on a proper perception of the technical information provided by the present application documents.

Information as to how the simulation is performed is indeed given in the passage from page 18, line 13 to page 20, line 7, of the originally-filed description, as cited by the appellant. In this context, it is indicated that "*First, the spin motion due to the application of the RF pulses can be calculated from the following Bloch equation (1)*", that "*Thus, the magnetic moment M' of the spin at each time t can be calculated by using the simulated RF pulse waveform, the simulated gradient magnetic field waveforms, and the simulated static magnetic field*", and that "*Consequently, the slice characteristics and the signal strength at the time of the application of the RF pulses can be calculated.*" The description continues with the statement that "*On the other hand, the echo signal S(t) can be expressed by the following equation (4)*" and that "*Thus, the echo signal S(t) can be calculated from the simulated gradient magnetic field waveforms g_x and g_y, the simulated static magnetic field, and the simulated nuclear spin density distribution*".

It is textbook knowledge in the field of NMR that the observed signal S(t) in an NMR experiment arises from the motion of the nuclear spins and, thus, directly corresponds to dM/dt, *ie* the change of the magnetic moment M of the spins with time t, as described by the

Bloch equation. The signal S(t) may take the form of a free induction decay (FID) immediately subsequent to the application of exciting RF pulses, or a spin-echo that is evoked after spin refocusing. As a matter of fact, in NMR any calculation of signal intensities is directly or indirectly based on the Bloch equation. Spin motion according to the Bloch equation and a spin echo signal, therefore, do not constitute independent physical variables, but the latter is an expression of the former, evoked under certain experimental conditions.

In view of these facts, the description by referring "*first*" to the calculation of the magnetic moment and the resulting spin motion and then "*on the other hand*" to the calculation of an echo signal does not distract a skilled person from understanding the reference to equation (1) as presenting the universally valid relationship for the nuclear spin motion, and thus for any NMR signal, and the reference to equation (4) as presenting a specific embodiment thereof in case of a simulated spin echo signal. This finding is further corroborated by the circumstance that the subsequent explanation in the description of the step of adjusting exclusively refers to an adjustment solely on the basis of a calculated spin echo signal S(t) according to equation (4) (cf. page 20, line 8 to page 22, line 1).

Consequently, to the extent that the claimed subject-matter is in accordance with the physical principles governing an NMR imaging experiment, no difference can be identified between the claimed manner of simulation and the respective teaching of D3.

3.4.3 As regards difference (c), the known method, by using the CNR as a criterion for optimization of parameters pertinent to the RF pulse excitation, apparently improves properties of RF pulses and gradient magnetic fields realizable by the pulse sequence within the meaning of claim 1 under consideration.

On the other hand, it is true that D3 does not mention an automatic adjustment. This adaptation, however, constitutes a straightforward design option for an expert in the field of NMR methods and apparatuses.

3.5 For the above reasons, no exercise of inventive skill would have been required for the skilled person to devise a method for pulse sequence control in an NMR imaging experiment as defined by claim 1 of the main request.

For the sake of completeness it is noted that this conclusion applies with equal force to the subject-matter of corresponding apparatus claim 7.

Therefore, the main request does not comply with the requirements of Articles 52(1) and 56 EPC and, consequently, is not allowable.

B. First auxiliary request

4. Clarity (Article 84 EPC)

4.1 Independent claims 1 and 4 comprise the amendment that a plurality of stored event codes for realizing the execution of the pulse sequence are decoded "in parallel" by a plurality of "series connected decoder means".

The amended feature is intended to define an inventive distinction over the teaching of document D5, according to which, in the appellant's opinion, the decoding of a plurality of stored event codes in parallel was performed by a plurality of synthesizers arranged in parallel.

4.2 From the claim wording itself it is not apparent how event codes could be decoded in parallel by decoders which are connected in series, nor which purpose would be served at all by the series-connected decoder means.

4.3 Even by consulting the application description this obscurity cannot be dispelled.

"Decoders" that are "connected in series" are indeed mentioned in the application documents as filed, where it is stated in the context of the description of Figure 12 that "*the event decoding operation is divided into a plurality of steps by using the decoders 37 connected in series, and each step of decoding is carried out at each clock CLK, in order to speed up the event decoding speed. Here, …, the decoded data are sequentially handed from one of the decoders 37 to the next one of the decoders 37, such that the pre-reading of a plurality of the event codes can be realized in a manner similar to the pre-reading control used in a computer technology. Here, however, there is nothing corresponding to the jump instruction appearing in the computer technology, so that the continuity of the decoding steps is automatically guaranteed. The*

decoders 37 effectively decodes a plurality of the event codes in parallel, and the event control unit 25 is capable of carrying out a plurality of the mutually consistent events simultaneously.
Thus, it becomes possible in this event control unit 25 to improve the time resolution of the event controlling, because of the pre-reading realized by the decoders 37 and a plurality of the event memories 31 which can be selectively connected to the decoders 37 " (cf. page 24, line 34 to page 25, line 20, of the application as filed).

What becomes evident from this piece of disclosure is the fact that decoding of event codes will be sped up by operating a plurality of decoders in parallel for pre-reading event codes. However, no explanation is given in the description as to which purpose the decoders would serve by being connected in series and as to why the decoded data are sequentially handed along the series of decoders. Figure 12 itself is not helpful in this respect either. Though showing decoders fed by event codes in parallel, the arrangement of the decoders connected in series apparently has only a single output for all decoded data. In the absence of any further information as to the nature, internal structure and function of the decoders, it remains completely obscure how series connected decoders can make available a plurality of decoded event codes in parallel.

4.4 Moreover, the lack of any information as to the exact functioning of the claimed decoder means and the technical significance of their claimed series connection, renders a meaningful comparison with prior art technology of decoding event codes for the purpose of assessing inventive step virtually impossible.

An example of relevant art in this respect is given by document D5 (cf. Figures 1 to 3 and 7 with the corresponding description), which refers to a function generator for an NMR imaging apparatus the circuitry of which is also capable of effectively decoding in parallel a plurality of stored data specifying the pulse sequence (ie of "event codes" in the terminology of the present application) and thus of simultaneously carrying out a plurality of events.

4.5 For the above reasons, amended independent claims 1 and 4 according to the first auxiliary request do not meet the requirement of Article 84 EPC having regard to clarity.

Therefore, the first auxiliary request is not allowable, either.

C. Second auxiliary request

5. Amendments

Independent claims 1 and 3 are based on the wording of claims 1 and 7 of the main request, respectively, and further specify the additional features disclosed in original claims 9 and 19, respectively.

Thus, the Board considers the amendments to comply with the requirements of Article 123(2) EPC.

6. Inventive step (Articles 52(1) and 56 EPC)

6.1 The further features added to the independent claims of the main request concern the organization of the memory used for storing the pieces of information comprised in event codes and basic aspects of rewriting such pieces of information.

The claimed measures allow to rapidly effect changes in the pulse sequence without any wasteful rewriting of event code information that need not to be changed (cf. page 27, lines 20 to 31, of the application documents as filed).

6.2 Document D3 is silent as to any technical details and specific functionalities of the components of the apparatus to be used for the imaging experiment and as such leaves it to the skilled person to search for suitable equipment in terms of hard- and software.

However, looking for existing technology which would in particular allow to execute changes of the pulse sequence according to the requirements of the imaging experiment, aforementioned document D5 offers an efficient solution.

6.3 The function generator for an NMR imaging apparatus known from D5 comprises a plurality of synthesizer modules 50 for storing and decoding a plurality of "event codes" in parallel so as to synthesize an imaging pulse sequence (cf. in particular Figures 1 to 3 and 7 and the corresponding description). Each synthesizer includes a microprogrammable controller 136 comprising *inter alia* a microprogram memory 70 (cf.

Figure 3; column 9, line 34 to column 10, line 54). The various pulses for the gradient and RF fields are composed in a modular manner from waveforms generated in different synthesizer modules, the operation of which is correspondingly synchronized (cf. column 20, line 20 to column 21, line 35). Each entry in the event memory, in which are stored data defining the shape of the waveforms and instructions which control the access to the data (ie timing and address information), is organized in the form of several fields, each field relating to a different category of data (cf. column 3, lines 9 to 21). More specifically, the 64 bits constituting an event code word are divided into an instruction field 82, a general purpose field 84 (containing address information), and a field for storing the remaining bits which define a waveform (cf. column 3, lines 22 to 36; column 9, line 61 to column 10, line 54). Hence, pulse sequence control according to document D5 involves storing event codes in an event memory, in which each entry comprises an "event code slot", a "time slot", and an "argument slot" in the general meaning of these terms.

Moreover, the organization of the data entries allows the contents of the memory to be dynamically updated or modified from an external source to provide full and dynamic control over the generation of the analogue waveform (column 3, lines 38 to 41). In this context, program means provide a unique software data and instruction organization which simplifies the generation of waveforms and reduces the amount of hardware and software necessary for implementing the waveform synthesizers (column 3, lines 42 to 46). These program means include data segments which characterize and define a set of elementary waveform segments (column 3, lines 47 to 49). A subroutine structure is used for synthesizing complete waveforms by selectively retrieving data segments and by producing, through a concatenation process, complete composite waveforms. Thus, a limited set of elementary segments in the form of, for example, a ramp, one-half of a sinusoid (180 DEG), a non-linear segment or the like, are sufficient for producing any desired waveform which may be used in an NMR imaging system (column 3, lines 49 to 57). The configuration is powerful in that a mere handful of integrated circuits is capable of generating as many as 44 independently defining timing waveforms and allows the user to define the actual waveform after the hardware has been built (column 11, lines 18 to 23). Hence, it is possible to completely alter the sequence of addresses and/or the definition of the various synthesizer outputs during different periods of times (column 11, lines 25 to 27).

The known subroutine structure, which is used to selectively retrieve data segments for dynamical updates or modifications of waveforms, thus constitutes, in view of the known organization of the event codes, a system of stored instructions specifying the manner of updating entries in the event memory and hence amounts to a "rewriting table" within the meaning of the general claim definitions under consideration. Likewise, in the Board's view, the operation of the known function generator involves the steps of providing such a rewriting table, of indicating an appropriate one of its entries for each of the event data entries in the event memory, and of rewriting, where required, any of the data fields, and therefore falls under the definitions provided by the additional features according to independent claims 1 and 3 of the second auxiliary request.

6.4 It thus ensues that the additionally claimed organization of the memory used for storing pieces of information comprised in event codes and the claimed main features of rewriting such pieces of information features concern conventional measures in the technical field at issue so that their application in a method for pulse sequence control as known from document D3 does not involve any inventive activity.

6.5 For the above reasons, no exercise of inventive skill would have been required for the skilled person to arrive at the subject-matter of independent claims 1 and 3 of the second auxiliary request. The second auxiliary request therefore does not comply with the requirements of Articles 52(1) and 56 EPC and, consequently, is also not allowable.

7. As none of the requests filed by the appellant meets the requirements of the EPC, the appeal has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar	The Chairman
R. Schumacher	B. Schachenmann