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Datasheet for the decision of 23 March 2021

Case Number: T 2520/16 - 3.4.03

Application Number: 10775498.8

Publication Number: 2438584

IPC: G09B23/30, G09B23/28

Language of the proceedings: EN

Title of invention:
SYSTEM, METHOD, APPARATUS, AND COMPUTER PROGRAM FOR INTERACTIVE PRE-OPERATIVE ASSESSMENT

Applicant:
Edda Technology, Inc.

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - all requests (no)

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Catchword:

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Case Number: T 2520/16 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 23 March 2021

Appellant: (Applicant)	Edda Technology, Inc. 5 Independence Way Princeton, NJ 08540 (US)
Representative:	Latham, Stuart Alexander Withers & Rogers LLP 4 More London Riverside London SE1 2AU (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 30 June 2016 refusing European patent application No. 10775498.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	T. Häusser
Members:	M. Papastefanou
	C. Heath

Summary of Facts and Submissions

I. The appeal lies against the decision of the examining division refusing the European patent application No. 10 775 498.8 (published as WO 2010/132606 A1) on the grounds that none of the requests before it involved an inventive step.

II. At the end of the oral proceedings before the board, which were held via video conference at the request of the appellant, the appellant (applicant) requested that the decision under appeal be set aside and that a patent be granted on the basis of the Main Request or one of Auxiliary Request 1 and Auxiliary Request 2, all filed with the statement of the grounds of appeal and corresponding to the respective requests underlying the impugned decision.

Auxiliary Requests 3 to 5, which were filed with appellant's letter of 23 February 2021, were withdrawn during the oral proceedings.

III. Reference is made to the following document, cited during the first instance examination procedure:

D1: US 2005/0251038 A1.

IV. Claim 1 of the Main Request is worded as follows:

A procedure for pre-operating assessment of one or more anatomical structures generated from medical images and provided in a rendered 3D space, comprising:

providing one or more safety margin indicators in the rendered 3D space on a user-perceptible output interface, each safety margin indicator defining a 3D

closed volume shape and having a shape and size that are deformable and adjustable in order to conform to shape and size of anatomical structures within an organ;

receiving, from a user, an input for deforming one of the one or more safety margin indicators with respect to the anatomical structures;

converting the input from the user to parameters to be used for deforming the safety margin indicator;

generating a deformed version of the safety margin indicator based on the parameters; and

immediately rendering, on the user-perceptible output interface, the deformed version of the safety margin indicator.

V. Claim 1 of Auxiliary Request 1 has the same wording with claim 1 of the Main Request except that the expression "defining a 3D closed volume shape and" is deleted in the second feature and the following feature is added at the end:

"*and displaying one or more quantified measurements of the parts of structures inside the safety margin indicator on the output interface*"

VI. Claim 1 of Auxiliary Request 2 has the same wording with claim 1 of the Main Request except that the expression "defining a 3D closed volume shape and" is deleted in the second feature and the following feature is added at the end:

", wherein the safety margin indicator deformation is achieved by setting a zoom factor in a rendering transformation of a 3D computer graphics library"

VII. The appellant argued essentially that the features distinguishing the claimed invention from the prior art were not related to presentation of information as such, but were technical features providing a technical effect, rendering thus the claimed subject-matter inventive. The appellant's arguments are discussed in detail in the reasons.

Reasons for the Decision

1. The appeal is admissible.

2. The claimed invention

The claimed invention relates to a procedure and a system for performing pre-operating assessment of one or more anatomical structures.

Anatomical structures (e. g. a tumour) within organs (e. g. a liver) are rendered as 3D images in a 3D space and displayed at an output interface (e. g. a screen). One or more closed 3D volumes having a size and shape that are deformable represent(s) (a) safety margin indicator(s). These volumes are adjustable in order to conform to the shape and size of anatomical structures.

The user manipulates on the screen a safety margin indicator deforming it with respect to the anatomical structure it surrounds/encloses. The system provides immediate feedback to the user by re-rendering and displaying the deformed safety margin indicator immediately after the user's manipulation.

For example, the user (a surgeon) deforms the safety margin indicator displayed around a tumour within an

organ so that they can visualise the part of the organ that has to be removed in the operation. The pre-operating assessment is carried out by visualising several possible deformations of the safety margin indicator and assessing which approach would be best for the subsequent operation.

3. Main Request

3.1 It is common ground that document D1 represents the closest prior art. D1 discloses a method (procedure) and a system for rendering, displaying and manipulating images comprising multiple volumes.

As can be seen in Figure 10 and paragraphs [0051] to [0054] of D1, the described system is similar to the one of the present application (compare with Figure 8 and paragraphs [0029] to [0034] of the application as published).

The system of D1 compiles and displays 2D and 3D images comprising multiple volumes (see Figure 1 and paragraph [0019]). The user can manipulate the displayed volumes and the system updates their rendering accordingly, providing the user with immediate visible feedback of their actions (see for example paragraphs [0018], [0050] and Figure 9). Various types of manipulations are possible (see paragraphs [0020] to [0023]).

3.1.1 D1 mentions using the system in a medical context for rendering and displaying medical images. Images of liver lesions are specifically mentioned in the description of the related art (see paragraphs [0005] and [0006]). In the detailed description of the various embodiments, however, there is no mention of medical

images or specific manipulations of medical images.

3.1.2 Summarising, D1 discloses a method and a system for rendering 3D and 2D images containing multiple volumes. The system allows a user to manipulate the volumes in the displayed images and provides real-time updating of the modified images (see for example paragraphs [0032] and [0038]). The description of the related art can be considered a hint that the system may be used in medical applications without any further details.

3.2 The claimed invention differs from D1 only in that the displayed volumes represent anatomical structures, organs and safety margin indicators. In other words, in the information the images convey to the user, i. e. their cognitive content ("what" is displayed).

3.3 The appellant argued that the invention in claim 1 of the Main Request differed from D1 *not only in what is presented to the user, but in how a representation is shown to the user and also how the user interacts with that representation* (appellant's letter of 23 February 2021, page 5, first paragraph).

3.3.1 According to the appellant, the claimed invention comprised the displaying of 3D volumes representing anatomical structures. Making reference to paragraphs [0038] and [0039] as well as Figures 2a to 2c of the application, the appellant explained that the safety margin indicator was a closed 3D volume having shape and size that were adjustable to conform to the shape and size of anatomical structures. Based on input from the user, the safety margin indicator was deformed in its shape and/or size with respect to the anatomical structure (see also appellant's letter of

23 February 2021, pages 2 and 3).

3.3.2 In contrast thereto, the system of D1 displayed 3D volumes as stacks of cross sectional 2D images. The user's manipulation of those volumes consisted in moving section planes through the 3D volumes and displaying the corresponding cross sections (see appellant's letter of 23 February 2021, page 4).

3.3.3 These differences provided a technical effect in that they enabled the user to perform pre-operating assessment more efficiently and intuitively.

The safety margin indicator represented an operating safety margin of an organ, i. e. how "close" to an organ was it possible to operate, so that e. g. a tumor could be removed without leaving any residue but also without damaging the organ by removing too much healthy tissue therefrom. When deforming the safety margin indicator, the user would be warned when the shape and/or the size of the safety margin indicator was set too close to the healthy part of the organ or if it left out too much of the tumour. The user could, thus, test various approaches by deforming the safety margin indicator to conform to the shape and size of the anatomical structure to be operated and select, before the operation starts, the most suitable one, i. e. the one with the most chances of success.

3.3.4 Hence, the features distinguishing the claimed invention from D1 allowed the user to draw conclusions and take decisions about the subsequent surgical operation in an intuitive and effective manner. This was a technical effect which should be taken into account in the assessment of inventive step.

3.4 The board is not persuaded by these arguments.

3.4.1 First of all, the board does not consider the pre-operating assessment in the context of the present application to be a technical activity, but rather a cognitive process that takes place in the mind of the user (a surgeon in this case). The user receives information from the displayed images and takes decisions regarding the surgical operation that they are supposed to perform subsequently. It is thus a mental activity, based on subjective perception and appreciation of the displayed information in combination with the user's personal medical knowledge. Any effect the interaction of the user with the displayed images (e. g. deforming a safety margin indicator) may produce relates to the subjective appreciation of the displayed information and conclusions/decisions that may be reached based on that information. The surgical operation itself is not intimately linked to the claimed procedure, i. e. the displayed information does not have any direct effect on the surgical operation at all. In the board's view, therefore, the pre-operating assessment is a purely mental activity devoid of any technical character.

3.4.2 Second, according to established case law and practice, features aimed exclusively at improvements regarding the way information is perceived or processed by the human mind are generally regarded as non-technical.

Such features defining presentation of information may be considered to produce a technical effect if they credibly assist the user in performing a technical task by means of a continued and/or guided human-machine interaction process. Such a technical effect is considered credibly achieved if the assistance to the

user in performing the technical task is objectively, reliably and causally linked to the features (see *Case Law of the Boards of Appeal of the EPO,* 9th Edition, July 2019, I.D.9.1.6 a)).

In the present case, the task performed by the user (pre-operating assessment) is not technical. Moreover, there is no indication of a continued and/or guided human-machine interaction process that might guide the user in performing this task. The user (surgeon) is provided with information to which they may react by, for example, changing their mind about the subsequent operation. In this context, the board notes that the information in the displayed images is comprehensive only to specific users (medical doctors/surgeons), i. e. users with specific medical knowledge. To any other user without such specialised knowledge, the displayed images do not convey any useful information. This is another indication that the interaction of the user with the displayed images is limited to mental acts.

The warning of the user mentioned by the appellant (see point 3.3.3 above) is not a warning given by the system, e. g. when it recognises that the user has set the safety margin indicator too close to the healthy organ. It is the user who, looking at the displayed images, is supposed to recognize that they have set the safety margin indicator too close to the healthy organ. This again indicates that purely mental acts are concerned.

Finally, the user is free to use or reject the displayed information (see also the last sentence of paragraph [0071] of the application), something that corroborates the fact that the claimed procedure is not

intimately linked to any operation that might follow.

3.4.3 The appellant argued that according to the application, the safety margin indicator can be used as a separating or resection surface for the subsequent surgical operation (see paragraph [0046] of the description of the application) and that it can be displayed in both the 3D view and the 2D view for use as a reference when the user is defining a resection surface (see paragraph [0048]). Hence, there was a guidance/assistance to the user in performing the pre-operating assessment and even in performing the surgical operation. In line with the case law referred to by the board, this would imply the presence of a technical effect.

The board does not find this argument convincing. As previously stated, the board does not consider the pre-operating assessment to be a technical task. Moreover, the use of an image as a reference does not fulfil the requirement of *a continued and/or guided human-machine interaction process* (see point 3.4.2 above).

3.4.4 Finally, regarding the interaction between the user and the displayed images, the board notes that any deformation of the safety margin indicator to conform to the shape and/or size of the anatomical structure is done manually by the user. There is no function in the system that would recognise the shape and/or form of the anatomical structure and deform the safety margin indicator automatically, for example.

The board further remarks that there is no information at all in the application about how the system renders the displayed 2D and 3D images or how it reacts to the user's manipulation of them. There is only mention of a user interface allowing "drag & drop" actions by the

user (see paragraph [0039] of the description of the application). There is no other information about any technical aspects or functions of the system. The board considers thus that these aspects of the claimed invention are standard features of any system adapted to render and display 2D and 3D images that may be manipulated by the user, like the one in D1, for example.

Hence, regarding the appellant's argument regarding the different types of user manipulation of the displayed images in the claimed invention, the board considers that the mere mention of "deforming" the displayed volume(s) (the safety margin indicator(s)) is not sufficient to indicate a manipulation that is technically different from that in D1. In addition, the manipulation of 3D volumes in the displayed images is also mentioned in D1 (see, for example, paragraph [0041] and claim 10 of D1).

3.5 The board concludes, therefore, that the only difference between the claimed invention and D1 lies in the cognitive content of the displayed images. It is established case law that the cognitive content of an image (i. e. "what" is displayed) is not a technical feature (see *Case Law of the Boards of Appeal of the EPO,* 9th Edition, July 2019, I.A.2.6).

Since such a feature cannot provide any technical contribution over the prior art, the subject-matter of claim 1 of the Main Request does not involve any inventive step within the meaning of Article 56 EPC.

4. Auxiliary Requests

4.1 Claim 1 of **Auxiliary Request 1** defines additional aspects (quantified measurements of the parts of structures inside the safety margin indicator) of the content of the image to be displayed.

4.1.1 The appellant argued that the displayed quantified measurements related to physical dimensions of anatomical structures and organs, i. e. they represented physical data. They were, thus, technical features, that assisted the user in a better appreciation of the displayed images and a better definition of the resection surface. In other words they provided a better and more efficient pre-operating assessment.

4.1.2 The board is not convinced by this argument, either. As for the Main Request, any impact that the displayed measurements might have is related to the mental activity of the pre-operating assessment. There is no contribution to any apparent technical effect. Even if the measurements represented physical dimensions of real anatomical organs, the claimed invention is limited only in displaying them for the user to perceive. As such, they are part of the cognitive content of the displayed image.

4.1.3 The board's conclusion is thus that the subject-matter of claim 1 of Auxiliary Request 1 does not involve an inventive step, either.

4.2 Compared to claim 1 of the Main Request, claim 1 of **Auxiliary Request 2** defines additionally that the deformation of the safety margin indicator "*is achieved by setting a zoom factor in a rendering transformation of a 3D computer graphics library*".

4.2.1 According to this feature, setting a zoom factor is among the possible actions a user can perform when deforming the safety margin indicator (i. e. one of the displayed volumes).

This feature is already disclosed in document D1 (see, for example, paragraph [0041]).

The appellant did not provide any arguments regarding this request.

4.2.2 The board's conclusion is that the subject-matter of claim 1 of Auxiliary Request 2 is not inventive, either.

5. Since none of the appellant's requests on file is allowable, the appeal must fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Sánchez Chiquero T. Häusser

Decision electronically authenticated