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Datasheet for the decision of 20 May 2021

Case Number: T 2594/17 - 3.4.03

Application Number: 12721596.0

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Language of the proceedings: EN

Title of invention:
VIRTUAL TESTING AND INSPECTION OF A VIRTUAL WELDMENT

Applicant:
Lincoln Global, Inc.

Headword:

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 13(1), 13(2)

Keyword:
Inventive step - main request and auxiliary requests 1 - 4 (no) - obvious implementation of non-technical features
auxiliary request 3a - exceptional circumstances (yes)
auxiliary request 3a - admitted (no) - raises new issues - detrimental to procedural economy

Decisions cited:
G 0001/19, T 0625/11

Catchword:

Europäisches Patentamt
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Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 2594/17 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 20 May 2021

Appellant: (Applicant)	Lincoln Global, Inc. 9160 Norwalk Boulevard Santa Fe Springs, CA 90670 (US)
Representative:	Grosse Schumacher Knauer von Hirschhausen Patent- und Rechtsanwälte Frühlingstrasse 43A 45133 Essen (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 12 June 2017 refusing European patent application No. 12721596.0 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	M. Stenger
Members:	M. Papastefanou
	W. Van der Eijk

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division refusing the European patent application No. 12 721 596.0 (published as WO 2012/137060 A1) on the grounds that neither the Main Request nor any of the Auxiliary Requests 1 to 4 before it involved an inventive step within the meaning of Article 56 EPC.

II. At the end of the oral proceedings before the board, the appellant's (applicant's) requests were that the decision under appeal be set aside and that a patent be granted on the basis of the Main Request or any one of the Auxiliary Requests 1, 2, 3, 3a and 4. The Main Request and the Auxiliary Requests 1, 2, 3 and 4 were filed with the statement of the grounds of appeal and correspond to the respective requests underlying the impugned decision. The Auxiliary Request 3a was filed during the oral proceedings before the board.

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

A system (100) for the virtual testing and inspecting of a virtual weldment, said system (100) comprising:
a programmable processor-based subsystem (110) operable to execute coded instructions, said coded instructions including:
a rendering engine configured to render at least one of a three-dimensional (3D) virtual weldment (2200) before simulated testing, a 3D animation of a virtual weldment (2200) under simulated testing, and a 3D virtual weldment (2200) after simulated testing, and
an analysis engine configured to perform simulated testing of a 3D virtual weldment (2200), and

further configured to perform inspection of at least one of a 3D virtual weldment (2200) before simulated testing, a 3D animation of a virtual weldment (2200) under simulated testing, and a 3D virtual weldment (2200) after simulated testing for at least one of pass/fail conditions and defect/ discontinuity characteristics;

at least one display device (140, 150) operatively connected to said programmable processor-based subsystem (110) for displaying at least one of a 3D virtual weldment (2200) before simulated testing, a 3D animation of a virtual weldment (2200) under simulated testing, and a 3D virtual weldment (2200) after simulated testing; and

a user interface (130) operatively connected to said programmable processor-based subsystem (110) and configured for at least manipulating an orientation of at least one of a 3D virtual weldment (2200) before simulated testing, a 3D animation of a virtual weldment (2200) under simulated testing, and a 3D virtual weldment (2200) after simulated testing on said at least one display device (140, 150),

wherein said simulated testing includes at least one of simulated destructive testing and simulated non-destructive testing of the virtual weldment.

IV. Claim 1 of the **Auxiliary Request 1** has the same wording as claim 1 of the Main Request with the exception of the last feature which is amended as follows (added features underlined by the board):

wherein said simulated testing includes at least one of simulated destructive testing, <u>namely a bend test</u>, and simulated non-destructive testing, <u>namely X-ray or ultrasound testing</u>, of the virtual weldment.

V. Claim 1 of the **Auxiliary Request 2** has the same wording as claim 1 of Auxiliary Request 1 with the following additional feature at the end:

wherein said analysis uses welding code data or welding standards data to analyze at least one of a 3D virtual weldment (2200) before simulated testing, a 3D animation of a virtual weldment (2200) under simulated testing, and a 3D virtual weldment (2200) after simulated testing.

VI. Claim 1 of the **Auxiliary Request 3** has the same wording as claim of Auxiliary Request 2 with the following additional features at the end:

said coded instructions further including:
re-rendering said baseline virtual weldment in virtual reality space;
subjecting said baseline virtual weldment to a second computer-simulated test configured to test at least one other characteristic of said baseline virtual weldment;

rendering a second tested virtual weldment and generating second test data in response to said second test; and
subjecting said second tested virtual weldment and said second test data to a computer-simulated analysis configured to determine at least one other pass/fail condition of said second tested virtual weldment with respect to said at least one other characteristic.

VII. Claim 1 of the **Auxiliary Request 3a** has the same wording as claim 1 of Auxiliary Request 3 with the exception of the first feature which is amended as follows:

A virtual reality arc welding system (100) capable of allowing a user to create a virtual weldment in real time by simulating a welding scenario as if the user is actually welding, and capturing all of the resultant data which defines the virtual weldment, including defects and discontinuities, and capable of performing virtual testing and inspecting of a virtual weldment, said system (100) comprising...

and with the additional feature at the end:

wherein travel speed and other welding process parameters are tracked in the welding scenario and used to determine heat input to the weldment and cracks near the surface of the weldment which may be detected using the virtual non-destructive testing.

VIII. Claim 1 of the **Auxiliary Request 4** has the same wording as claim 1 of the Main Request with the additional feature at the end:

wherein the simulated destructive testing is selected from the group consisting of a simulated root bend test, a simulated face bend test, a simulated side bends test, a simulated tensile or pull test, a simulated break test, a simulated impact test, and a simulated hardness test.

IX. The appellant essentially argued that the claimed system should not be considered as an isolated general purpose computer but as an extension of the virtual reality arc welding (VRAW) system described in the application. It provided feedback concerning the use of the VRAW system and enhanced its functionality. The

appellant's arguments are dealt in detail in the reasons for the decision.

Reasons for the Decision

1. The appeal is admissible.

2. The claimed invention

The claimed invention relates to a system and a method for carrying out virtual (computer-simulated) testing and inspection of virtual (computer-simulated) weldments.

The claimed system renders 3D images of virtual weldments. The virtual weldments are generated using a virtual reality arc welding system, which is described in detail in the application.

The system carries out a series of computer-simulated tests on the rendered virtual weldments. These computer simulated tests correspond to tests carried out in "real-life" weldments in order to assess their quality and identify possible defects. The system renders animations of such tests and displays the virtual weldment after the test. The user can then inspect the tested virtual weldment by moving the image around in a display.

The system is conceived for a training context in which trainees generate virtual weldments, which are then tested and the result of the test can be used as criterion for passing or failing an examination.

3. Main Request

3.1 Closest prior art

3.1.1 The claimed system is presented in Figure 20 of the application (see also paragraph [0029] in the brief description of the drawings of the application as published). The system is described as a stand alone virtual weldment inspection (VWI) system. It imports virtual weldments which can be generated by a virtual reality arc welding system (VRAW) (paragraphs [0125] to [0127]). The VRAW system is described in the application but is not claimed, so that the claimed system does not comprise any features relating to tools/parts that are used to simulate a welding action.

3.1.2 According to the application, the claimed system comprises a processor unit ("programmable processor based subsystem" - PPS - 2010), a display ("observer display device" - ODD - 2050) and a user interface consisting of a keyboard (2020) and a mouse (2030) operatively connected to the PPS 2010 (see Figure 20 and paragraph [00126]).

The PPS 2010 is similar to the PPS 110 (see Figure 10), which includes a central processing unit (CPU 111) and graphic processing units (GPU 115) (see paragraph [0079]). During the virtual testing and inspection, the GPUs act as a rendering engine to provide 3D (animated) renderings of a virtual weldment and the CPU acts as an analysis engine to provide testing analysis of the virtual weldment (see last sentences of paragraph [0080]).

3.1.3 The board concludes from the above that the claimed system is a general purpose personal computer

configured to execute virtual testing and inspection of virtual weldments.

3.1.4 The board considers thus a notoriously well-known, general purpose, personal computer to be a suitable starting point for the skilled person.

3.2 Differences and technical problem

3.2.1 Compared to such a notoriously well-known personal computer, the claimed system differs in that it can ("is operable to") execute coded instructions including a rendering engine configured to render a 3D virtual weldment and an analysis engine configured to perform simulated testing and inspection of the 3D virtual weldment for pass/fail conditions and/or defect/ discontinuity characteristics. In addition, the display device can display the 3D images of the weldment and the user interface allows the user to move the displayed images around ("manipulating an orientation").

In essence, the claimed system renders a 3D image, which can also be an animated 3D image (of a virtual weldment) and processes this image by simulating testing and inspection of the virtual 3D weldment. It then displays the processed image and allows the user to move it around.

3.2.2 As a first point the board notes that the claimed system carries out computer-simulated testing and inspection of a virtual weldment, i.e. of a computer-simulated weldment and not of a physical, i.e. "real life", weldment.

The application describes various types of destructive

and non-destructive tests that can be carried out on a "real life" weldment (paragraphs [0039] to [0042]), but it is evident that none of these tests can be carried out without any adaptation on a virtual (computer-simulated) weldment.

The application does not provide any information as to how the "real life" tests are to be adapted for carrying them out on a virtual weldment.

3.2.3 Moreover, the claimed system does not simulate such tests carried out on a "real life" weldment. In other words, there is no particular "real life" weldment that needs to be tested (and inspected) and instead of carrying out "real life" tests on it, computer-simulated tests are carried out on a computer-simulated virtual representation of that particular "real life" weldment. As the application describes, only a virtual weldment is generated, mainly for training purposes, and without any link to a particular "real life" weldment.

Hence, considerations such as that the claimed system may allow a computer-simulated destructive test to be carried out several times (on a virtual weldment) whereas a "real life" test can be carried out only once on a "real life" weldment or that multiple tests can be applied to the same virtual weldment without any damage to the weldment etc., do not apply in this case, since there is only a virtual weldment to be tested, anyway.

3.2.4 The board notes also that technical aspects relating to how weldment testing is performed, either in real life or in a virtual manner are not relevant to the claimed invention. Indeed, the role of weldment testing in the claimed invention is limited to constituting the

content of the displayed images, i.e. to the information that is displayed.

3.2.5 In the board's opinion, therefore, the claimed system carries out image processing. Images of weldments are rendered, manipulated and displayed. That the images represent weldments or that the manipulations represent testing and/or inspection of those weldments is, in the general manner claimed and described in the application, the result of the cognitive content (information) of the displayed images. It is the user who perceives the images as weldments and the manipulation of those images as testing and/or inspection. Such cognitive information ("what" is displayed) is not related to any technical problem or technical constraints. This applies also to the type of tests (e.g. destructive or non-destructive) the system is able to simulate.

It is established case law that the cognitive content of a displayed image ("what" is displayed) is in principle not a technical feature (*Case Law of the Boards of Appeal of the EPO*, 9th Edition, July 2019, I.A.2.6).

The board adheres to this case law and considers, therefore, that the display of 3D virtual weldments and the fact that the image processing carried out represents weldment testing and/or inspection cannot be seen as technical features of the claimed system which provide any technical effect.

3.2.6 The appellant argued that the board's interpretation was too narrow. The claimed system provided a computer-implemented simulation and it was not related to mere image processing. Moreover, features that appeared to

be non-technical should still be taken into account for the assessment of inventive step, if they interacted with technical features and contributed to a technical effect. And this was the case with the features of claim 1.

3.2.7 According to the appellant, the invention had to be assessed as a whole. The claimed system was rather specific and not a general purpose computer. The system processed *virtual* weldments and this indicated that it was part of a virtual reality system. This virtual reality system was used for generating the virtual weldments (VRAW system) and was described in detail in the application. The claimed system was to be understood as part of this VRAW system and aimed at improving it.

The claimed system provided analysis, inspection, and testing of the virtual weldments in order to identify defects in the way the VRAW system was used in generating these virtual weldments. The claimed system should thus be considered as a feedback component of the VRAW system, which contributed to the generation of virtual weldments of a better quality.

3.2.8 Moreover, the application described an embodiment where the claimed system was part of the VRAW system (see paragraph [0037]). It was undisputed that the VRAW system was a technical system with specific technical features used in generating a virtual weldment, and so going beyond a general purpose computer.

Making reference to paragraph [0043] of the application, the appellant pointed out that simulated weldments generated using the VRAW system could be used beyond training. Such a simulated weldment could be

integrated in a simulated bridge and the testing could involve simulations of the bridge over time in order to estimate whether the quality of the weldment would influence the life time of the bridge. In analogy to the reasoning of the decision T 625/11, where the deciding board had concluded that a simulation of a nuclear reactor was technical, the features relating to the simulation of the testing of the weldment were also to be seen as technical.

3.2.9 The board does not find these arguments convincing.

Firstly, the claims do not define or suggest any connection or relation of the claimed system with the VRAW system described in the application beyond importing virtual weldments that may have been generated by it. Despite the mention in paragraph [00037] that the inspection and testing system can be part of the VRAW system, the application describes in detail only an embodiment of such a system as a stand alone system (starting in paragraph [00125]).

Even if a relation to a VRAW system as described by the appellant were to be acknowledged, the board does not see the claimed system as a feedback component of the VRAW system. The result of the virtual inspection and testing carried out by the claimed system is presented to one or more users (i.e. persons). It is the user(s), who are supposed to understand the results of these tests and inspections and draw conclusions as to how the tested and inspected virtual weldment was generated and if and how it could be possible to improve it. There is no direct link between the results of the testing and inspection and the operation of the VRAW system; it all depends on the users' understanding, knowledge and capabilities.

Moreover, the claimed system does not provide any specific information related to any defects in the virtual weldment that are identified by the testing. For example, there is no indication about an angle of the virtual welding rod that could be adjusted better or a wrong setting of (virtual) temperature that could be corrected. The user has to recognise what mistakes were possibly made and how they can be corrected.

Hence, the board cannot accept that the claimed system provides any feedback to the VRAW system or that it is related to it in any other way and adheres to its initial opinion that the claimed system is a suitably configured general purpose computer.

3.2.10 Secondly, regarding the technical character of the simulation, the board notes that the decision referred to by the appellant was cited in decision G 1/19 of the Enlarged Board of Appeal (EBoA)(see point 109 of the reasons), which relates to computer-implemented simulations. In G1/19 the EBoA concluded that, for the purposes of assessing inventive step of a computer-implemented simulation, *it is not a sufficient condition that the simulation is based, in whole or in part, on technical principles underlying the simulated system or process* (see e.g. points 1 and 2 of the Headnote).

Hence, even if the computer-simulated testing of the virtual weldment were to be carried out within a computer-simulated simulation of a bridge (the bridge having incontestably sufficient technical character), this would not have any influence on the board's assessment of inventive step of the features of the claimed invention. Moreover, the board points out that

in the system of claim 1 of the Main Request there is no mention of nor any suggestion to such a type of testing at all but only of testing used for training purposes, as the reference to the determination of a pass/fail condition indicates.

3.2.11 Summarising, the claimed system differs from a notoriously well-known general purpose computer in that it is configured to display images of virtual weldments, of virtual testing of those virtual weldments, and of the results of the virtual testing on those virtual weldments. It can also determine a pass/fail condition based on those results.

These differences relate only to the cognitive content of the images and the board does not consider them to be technical features (see point 3.2.5 above).

3.2.12 Following the established case law and practice in the formulation of the technical problem, these non-technical features will be given to the skilled person (a computer programmer expert in image processing) for implementation. The objective technical problem can thus be formulated as how the skilled person would implement these non-technical features in the notoriously well-known general purpose computer. In other words, how the skilled person would configure the notoriously well-known general purpose computer to render, process, and display 3D images of the virtual weldment, before, during and after the virtual testing and determine a pass/fail condition based on them.

3.3 Solution and obviousness

3.3.1 The claimed system solves this problem by using a "rendering engine" and an "analysis engine". According

to claim 1 of the Main Request both the rendering engine and the analysis engine of the claimed system are "coded instructions", i.e. computer programs, or parts of a computer program.

3.3.2 The application describes what the rendering and the analysis engines do but does not provide any information as to how they do it (see paragraphs [0127] to [0135]).

The rendering engine performs what its name suggests: it renders an image, in this case a 3D image or a 3D animated image. There is no information in the application about any particular technical constraints or considerations regarding the implementation (programming) of the rendering engine, so the board's conclusion is that a skilled person would be able to program such a rendering engine only with their common general knowledge.

3.3.3 Similar considerations apply to the analysis engine. The analysis engine processes the displayed 3D image/ animation of the virtual weldment. What this processing constitutes, e.g. a simulation of destructive or non-destructive testing, is a decision that is taken by the designer of the system. The designer of the system decides which tests will be implemented in the claimed system and this decision seems to be arbitrary from a technical point of view, i.e. it does not solve any particular technical problem or involve any technical considerations. In the board's view the type(s) of tests that will be implemented is not a technical feature and will be given as a constraint to the skilled person for implementation (programming).

3.3.4 Regarding the implementation of this image processing, the application mentions that parameters for the processing of the images and animation may be provided by expert systems with rules, vector machines, a neural network and/or intelligent agents (see paragraph [00134]). The application, however, merely lists these possibilities without any further details that might indicate a particular technical problem that has to be solved or any technical constraints that have to be met. The board considers thus that the implementation of the analysis engine also lies within the common general knowledge of the skilled person.

3.3.5 Finally, the board does not consider the determination of a pass/fail condition to be a technical feature, either. It is rather a non-technical feature related to administrative (i.e. non-technical considerations) that will also be given to the skilled person for implementation.

3.3.6 The rendered and processed images are displayed on a display allowing the user to move them around ("manipulating an orientation" according to claim 1) through the user interface. In the board's opinion allowing a user to move images around on a display is a standard feature of any general purpose computer (and was so at the priority date of the application).

3.3.7 Summarising, the board considers that the skilled person, starting from a notoriously well-known general purpose computer, will be tasked with the implementation of the display and processing of images representing 3D weldments, their testing and inspection. They will implement this by programming the computer to carry out these tasks using only their common general knowledge, arriving thus at the claimed

system in an obvious manner.

3.4 The board's conclusion is, hence, that the subject-matter of claim 1 of the Main Request does not involve an inventive step in the sense of Article 56 EPC.

4. Auxiliary Requests

4.1 Claim 1 of the **Auxiliary Request 1** defines additionally specific types of tests to be included in the simulated testing of the 3D weldment. As previously explained (point 3.3.3 above), the board does not consider the type of tests to be simulated a technical feature which can be a basis for an inventive step.

The appellant argued that using destructive and non-destructive testing allowed for insights in the virtual world that would not be possible in the "real world", as it was not possible to run more than one destructive test on a "real life" weldment, for example.

The board does not find this argument convincing. As stated above (point 3.2.3), such considerations do not apply in the present case, since there is no "real life" weldment at all and the system processes only virtual weldments. Moreover, as stated in point 3.2.10 above, according to G1/19 such considerations, even if they were to be taken into account, would not play any role in the assessment of inventive step of a corresponding computer-implemented simulation.

4.2 Claim 1 of the **Auxiliary Request 2** defines additionally that the analysis engine uses welding code data or welding standards data to analyze the 3D virtual weldment.

The appellant argued that the use of standard data sets allowed for the feedback of the testing and inspection to be based on "real world" standards and in this way arbitrary decisions regarding the pass/fail condition were avoided.

The board is not convinced by this argument. The determination of pass/fail conditions and whether they are based on established standards or not are not related to any technical problems or involve any technical considerations. In the board's view, therefore, the type of data used in the image processing of the virtual weldments does not provide any technical effect and, therefore, cannot contribute to an inventive step.

4.3 Claim 1 of **Auxiliary Request 3** defines additionally that the system carries out a second computer-simulated test to the rendered virtual weldment and determines a pass/fail condition based on this second test.

The appellant argued that looking at the weldment in different ways (i.e. after two tests) was not possible in the "real world", where a destructive test would definitely destroy a "real life" weldment. Carrying out a second test provided for more thorough analysis and a better assessment of the tested weldment so that the determination of the pass/fail condition was more reliable.

Similar to what is set out above for Auxiliary Requests 1 and 2, the board does not consider that aspects of how "real world" testing of "real life" weldments is carried out play any role in the present context. Moreover, the board does not regard providing a better

assessment or a more thorough analysis of the displayed virtual weldment in order to reach a more reliable pass/fail decision to be a technical problem in the present context. Hence, the decision to carry out a second test in order to better assess the displayed virtual weldment is not based on a technical problem. Instead, it is, like the decision which type(s) of tests are to be implemented (see point 3.3.3 above), a decision of the designer of the system, which will be given as a constraint to the skilled person for implementation (programming). The skilled person would implement such a decision in an obvious manner based only on common general knowledge, as explained in relation to the Main Request.

The board thus concludes that the subject-matter of claim 1 of Auxiliary Request 3 does not involve an inventive step, either.

4.4 **Auxiliary Request 3a** - Admission

4.4.1 Auxiliary Request 3a was first filed during the oral proceedings before the board.

The appellant acknowledged that it was filed late, but argued that it was a response to the board's preliminary opinion. The board had presented a "surprising" assessment of inventive step of the claimed invention, which differed substantially from the one in the decision under appeal. Moreover, the board's preliminary opinion was issued relatively late (less than 3 months before the oral proceedings) and did not allow for an earlier reaction by the appellant.

The appellant explained further that it was evident from the board's preliminary opinion that the lack of a

connection between the claimed system and the VRAW system was an important factor in the board's preliminary conclusions regarding inventive step. In the Auxiliary Request 3a, the virtual weldment testing and inspection system was claimed as part of the VRAW system, in order to clearly distinguish it from the notoriously well-known general purpose computer the board had used as closest prior art. Moreover, a feature of the VRAW system was added to claim 1 (see last feature) in order to emphasise the technical interrelation of the testing and inspection system with the VRAW system.

Regarding the basis of the amendments in the originally filed application, the appellant pointed to paragraphs [0037] and [0042] (see application as published).

4.4.2 It is uncontested that Auxiliary Request 3a constitutes an amendment to the appellant's case in the sense of Article 13 Rules of Procedure of the Boards of Appeal (RPBA 2020).

The board acknowledges that its preliminary opinion departed from the reasoning of the examining division in the decision under appeal, and accepts that it was not possible for the appellant to foresee this new approach and that it was entitled to react to this new development in the appeal case. This could thus only be done after receipt of the communication of the board. Therefore, the board considers that the late filing of Auxiliary Request 3a is justified by exceptional circumstances, as required by Article 13(2) RPBA.

4.4.3 However, the admission of a party's amendment of its appeal case is still at the discretion of the board, as stipulated in Article 13(1) RPBA 2020. In this context

it has to be considered *inter alia* whether the new request prima facie overcomes the objection to which it is a reaction and does not give rise to new objections.

As a first point, the board is not convinced that the combination of the features of claim 1 of Auxiliary Request 3a has a basis in the application as originally filed, despite the appellant's reference to paragraphs [0037] and [0042]. The features of claim 1 relating to the virtual weldment and inspection system (i.e. those in common with the other requests on file) are described in the application in the context of the embodiment of the virtual weldment testing and inspection system as a stand alone system (starting in paragraph [00125] of the published application), while the features added to the claim, which relate to the VRAW system are described as possible features in the general part of the description. A disclosure of the combination of those features is not readily apparent in the content of the application as originally filed. The board is therefore not convinced that claim 1 of Auxiliary Request 3a *prima facie* meets the requirements of Article 123(2) EPC.

Auxiliary Request 3a gives, thus, rise, at least *prima facie*, to new objections.

4.4.4 Secondly, and more importantly, the board notes that claim 1 of Auxiliary Request 3a is directed to a *virtual reality arc welding system capable of allowing a user to create a virtual weldment in real time by simulating a welding scenario as if the user is actually welding, and capturing all of the resultant data which defines* [sic] *the virtual weldment, including defects and discontinuities, and capable of performing virtual testing and inspecting of a virtual*

weldment.

This is the first request directed to a virtual reality arc welding (VRAW) system. So far all requests, including those during examination, were only directed to a system for the virtual testing and inspecting of a virtual weldment. The board regards this as a significant change.

In the board's view this change necessitates a complete review of the assessment of inventive step, a new evaluation of the prior art, and possibly the selection of a new starting point for the skilled person. Moreover, since such features have never been claimed, neither in the originally filed application nor during the first instance examination procedure, it is not even certain that they were taken into account when searching the prior art. As Auxiliary Request 3a was only filed during the oral proceedings, the board had to consider whether it was possible to deal with the prima facie allowability of the new request during the oral proceedings in a responsible way. It came to the conclusion that this was not the case.

The admission of Auxiliary Request 3a into the proceedings would thus have meant that either the oral proceedings would have had to be adjourned or that the case would have had to be remitted to the examining division for further examination, not excluding an additional prior art search. Both options would manifestly have been detrimental to procedural economy.

4.4.5 Based on these considerations the board, exercising its discretion pursuant to Article 13(1) RPBA 2020, decided not to admit the Auxiliary Request 3a into the

proceedings.

4.5 Compared to claim 1 of the Main Request, claim 1 of **Auxiliary Request 4** defines additionally a list of types of computer-simulated destructive tests that the claimed system can perform on the virtual 3D weldment.

According to the appellant, by being able to perform several types of tests, the system can better detect a poor welding technique of a trainee and can assist them in improving it.

The board does not consider these features to relate to any technical effects. The understanding of the displayed results of the tests, and any possible improvement in the welding technique of a user as a result thereof are all cognitive activities that take place in the user's mind. There is no direct connection between any test results displayed and any possible improvement in the welding technique of a user. In the board's view, these features cannot provide a basis for an inventive step.

The subject-matter of claim 1 of Auxiliary Request 4 is, therefore, not inventive.

5. Since none of the admitted requests on file is allowable, the appeal cannot succeed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Sánchez Chiquero M. Stenger

Decision electronically authenticated