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**Datasheet for the decision
of 28 September 2023**

Case Number: T 0544/20 - 3.2.02

Application Number: 16700933.1

Publication Number: 3206575

IPC: A61B5/04, A61B5/044, A61B5/00,
G06T19/20, A61B5/042

Language of the proceedings: EN

Title of invention:

SYSTEM, METHOD, AND APPARATUS FOR VISUALIZING CARDIAC TIMING
INFORMATION USING ANIMATIONS

Applicant:

St. Jude Medical, Cardiology Division, Inc.

Relevant legal provisions:

EPC Art. 84, 123(2)
RPBA 2020 Art. 13(1), 13(2)

Keyword:

Clarity of the claims (no)
Added subject-matter (yes)
Amendment to appeal case after summons - taken into account
(no)



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Case Number: T 0544/20 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 28 September 2023

Appellant: St. Jude Medical, Cardiology Division, Inc.
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St. Paul, MN 55117 (US)

Representative: Kramer Barske Schmidtchen
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 4 October 2019
refusing European patent application No.
16700933.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman M. Alvazzi Delfrate
Members: S. Dennler
C. Schmidt

Summary of Facts and Submissions

- I. The applicant ("the appellant") filed an appeal against the decision of the Examining Division to refuse its patent application no. 16700933.1.
- II. In its statement setting out the grounds of appeal, the appellant requested that the decision be set aside and that a patent be granted on the basis of the claims of one of the main request, first auxiliary request and second auxiliary request enclosed with the statement.
- III. The Board issued a summons to oral proceedings dated 22 February 2023 and gave a preliminary opinion on these requests in its communication under Article 15(1) RPBA 2020 dated 14 March 2023. The Board expressed the view that none of these requests was allowable, *inter alia* due to objections as to lack of clarity and added subject-matter.
- IV. With its submission of 12 May 2023, the appellant filed a new main request, a new first auxiliary request and a new second auxiliary request, based on and replacing the corresponding requests filed with the statement of grounds of appeal. The appellant also maintained the latter requests, unamended, as lower-ranking requests, re-filing them as new third to fifth auxiliary requests.
- V. By letter of 19 June 2023, the appellant announced that it would neither attend nor be represented at the oral proceedings before the Board.

The Board therefore cancelled the oral proceedings.

VI. Claim 14 of the **new main request** reads as follows (the amendments to claim 14 of the main request filed with the statement of grounds of appeal have been highlighted by the Board):

"A system for generating an animated electrophysiological map by superimposing an animated timing sequence onto an electrophysiological map, the system comprising:

a computer configured to:

receive a plurality of three-dimensional data points each including timing activation information;

generate an electrophysiological map on a display screen based on the plurality of three-dimensional data points;

initiate a playback animation to generate a sequence of cardiac timing activation frames over time, each frame including an active timing marker which is a graphical representation;

superimpose, for each frame, an ~~the~~ active timing marker onto the electrophysiological map;
and

generate the animated electrophysiology map by adjusting an opacity of the active timing marker on the display screen based on a current time of the playback animation."

VII. Claim 13 of the **new first auxiliary request** reads as follows (the amendments to claim 13 of the first auxiliary request filed with the statement of grounds of appeal have been highlighted by the Board):

"A system for generating an animated electrophysiology map by superimposing an animated timing sequence onto an electrophysiological map, the system comprising:

a computer configured to:

receive a plurality of three-dimensional data points each including timing activation information;

generate an electrophysiological map on a display screen based on the plurality of three-dimensional data points;

initiate a playback animation to generate a sequence of cardiac timing activation frames over time, each frame including an active timing marker; and

superimpose, for each frame, an ~~the~~ active timing marker onto the electrophysiological map;

wherein superimposing an animation of a plurality of timing markers (108) upon the electrophysiology map comprises:

generating a series of frames, each frame of the series of frames comprising:

a static image of the electrophysiology map at a point in time; and

one or more timing markers superimposed upon the static image of the electrophysiology map, positions of the one or more timing markers (108) corresponding to a position of an activation wavefront at the point in time and wherein visibility of the one or more timing markers (108) on the static image of the electrophysiology map is related to a distance between the position of the activation wavefront on electrophysiology map at the point of time and the position of the timing marker on the electrophysiology map such that the time markers (108) appear to move across the surface of the electrophysiology map when displaying the series of frames in chronological sequence,

wherein the computer is configured to adjust an opacity of the active timing marker on the display screen based on a current time of the playback animation."

VIII. Claim 13 of the **new second auxiliary request** reads as follows (the amendments to claim 13 of the second auxiliary request filed with the statement of grounds of appeal have been highlighted by the Board):

"A system for generating an animated electrophysiology map by superimposing an animated timing sequence onto an electrophysiological map, the system comprising:

a computer configured to:

receive a plurality of three-dimensional data points each including timing activation information;

generate an electrophysiological map on a display screen based on the plurality of three-dimensional data points;

initiate a playback animation to generate a sequence of cardiac timing activation frames over time, each frame including an active timing marker; and

superimpose, for each frame, an ~~the~~ active timing marker onto the electrophysiological map;

wherein superimposing an animation of a plurality of timing markers (108) upon the electrophysiology map comprises:

generating a series of frames, each frame of the series of frames comprising:

a static image of the electrophysiology map at a point in time; and

one or more timing markers superimposed upon the static image of the electrophysiology map,

positions of the one or more timing markers (108) corresponding to a position of an activation wavefront at the point in time and wherein visibility of the one or more timing markers (108) on the static image of the electrophysiology map is related to a distance between the position of the activation wavefront on electrophysiology map at the point of time and the position of the timing marker on the electrophysiology map such that the time markers (108) appear to move across the surface of the electrophysiology map when displaying the series of frames in chronological sequence, wherein and the closer the timing marker (108) is to the position of the activation wavefront on the electrophysiology map, the more visible the timing marker (108) is, and

wherein the computer is configured to adjust an opacity of the active timing marker on the display screen based on a current time of the playback animation."

- IX. Claim 14 of the **new third auxiliary request**, identical to claim 14 of the main request filed with the statement of grounds of appeal, reads as follows:

"A system for generating an animated electrophysiological map by superimposing an animated timing sequence onto an electrophysiological map, the system comprising:

a computer configured to:

receive a plurality of three-dimensional data points each including timing activation information;

generate an electrophysiological map on a display screen based on the plurality of three-dimensional data points;

initiate a playback animation to generate a sequence of cardiac timing activation frames over time, each frame including an active timing marker which is a graphical representation; superimpose, for each frame, the active timing marker onto the electrophysiological map; and generate the animated electrophysiology map by adjusting an opacity of the active timing marker on the display screen based on a current time of the playback animation."

- X. Claim 13 of the **new fourth auxiliary request**, identical to claim 13 of the first auxiliary request filed with the statement of grounds of appeal, reads as follows (the amendments to claim 19 as originally filed have been highlighted by the Board):

"A system for generating an animated electrophysiology map by superimposing an animated timing sequence onto an electrophysiological map, the system comprising:

a computer configured to:

receive a plurality of three-dimensional data points each including timing activation information;

generate an electrophysiological map on a display screen based on the plurality of three-dimensional data points;

initiate a playback animation to generate a sequence of cardiac timing activation frames over time, each frame including an active timing marker; and

superimpose, for each frame, the active timing marker onto the electrophysiological map;

wherein superimposing an animation of a plurality of timing markers (108) upon the electrophysiology map comprises:

generating a series of frames, each frame of the series of frames comprising:

a static image of the electrophysiology map at a point in time; and

one or more timing markers superimposed upon the static image of the electrophysiology map, positions of the one or more timing markers (108) corresponding to the position of an activation wavefront at the point in time and wherein visibility of the one or more timing markers (108) on the static image of the electrophysiology map is related to a distance between the position of the activation wavefront on electrophysiology map at the point of time and the position of the timing marker on the electrophysiology map,

wherein the computer is configured to adjust an opacity of the active timing marker on the display screen based on a current time of the playback animation."

- XI. Claim 13 of the **new fifth auxiliary request**, identical to claim 13 of the second auxiliary request filed with the statement of grounds of appeal, reads as follows (the amendments to claim 13 of the new fourth auxiliary request have been highlighted by the Board):

"A system for generating an animated electrophysiology map by superimposing an animated timing sequence onto an electrophysiological map, the system comprising:

a computer configured to:

receive a plurality of three-dimensional data points each including timing activation information;

generate an electrophysiological map on a display screen based on the plurality of three-dimensional data points;

initiate a playback animation to generate a sequence of cardiac timing activation frames over time, each frame including an active timing marker; and

superimpose, for each frame, the active timing marker onto the electrophysiological map;

wherein superimposing an animation of a plurality of timing markers (108) upon the electrophysiology map comprises:

generating a series of frames, each frame of the series of frames comprising:

a static image of the electrophysiology map at a point in time; and

one or more timing markers superimposed upon the static image of the electrophysiology map, positions of the one or more timing markers (108) corresponding to the position of an activation wavefront at the point in time and wherein visibility of the one or more timing markers (108) on the static image of the electrophysiology map is related to a distance between the position of the activation wavefront on electrophysiology map at the point of time and the position of the timing marker on the electrophysiology map and the closer the timing marker (108) is to the position of the activation wavefront on the electrophysiology map, the more visible the timing marker (108) is, and

wherein the computer is configured to adjust an opacity of the active timing marker on the display screen based on a current time of the playback animation."

Reasons for the Decision

1. Subject-matter of the patent application

The present patent application concerns a method and a system for generating an animated electrophysiological map, for example for visualising cardiac timing information on the surface of a three-dimensional heart model (paragraph [0002] of the description as originally filed).

Electrophysiological mapping, such as cardiac mapping, is used in many diagnostic and therapeutic procedures to detect and analyse pathologies, such as arrhythmia, and to guide appropriate medical treatment, for example to locate suitable target sites for catheter ablation. In certain procedures, for example, various components associated with a depolarisation wave are detected from electrogram signals obtained from a diagnostic catheter, and are used to generate a map, such as a local activation time map ("LAT map"). Typically, such maps are static maps that use colours and/or shading to represent parameters of interest, such as activation time or voltage (paragraph [0003]).

The patent application proposes generating an animated map to facilitate the detection of complex rhythms that might otherwise be difficult to discern from traditional, static maps (paragraph [0004]). To this end, the patent application contemplates, in essence, the generation of an animated map by superimposing on a (static) electrophysiology map an animation of a plurality of what are described as "timing markers" (paragraph [0005]).

An example of such an animated electrophysiology map is shown in the screenshots of a graphical user interface 100 presented in figures 3A (reproduced below) to 3F, wherein a static LAT map 104 is displayed over the surface of a heart 10 with a plurality of timing markers 108, 108a superimposed thereon (paragraphs [0041] to [0050]).

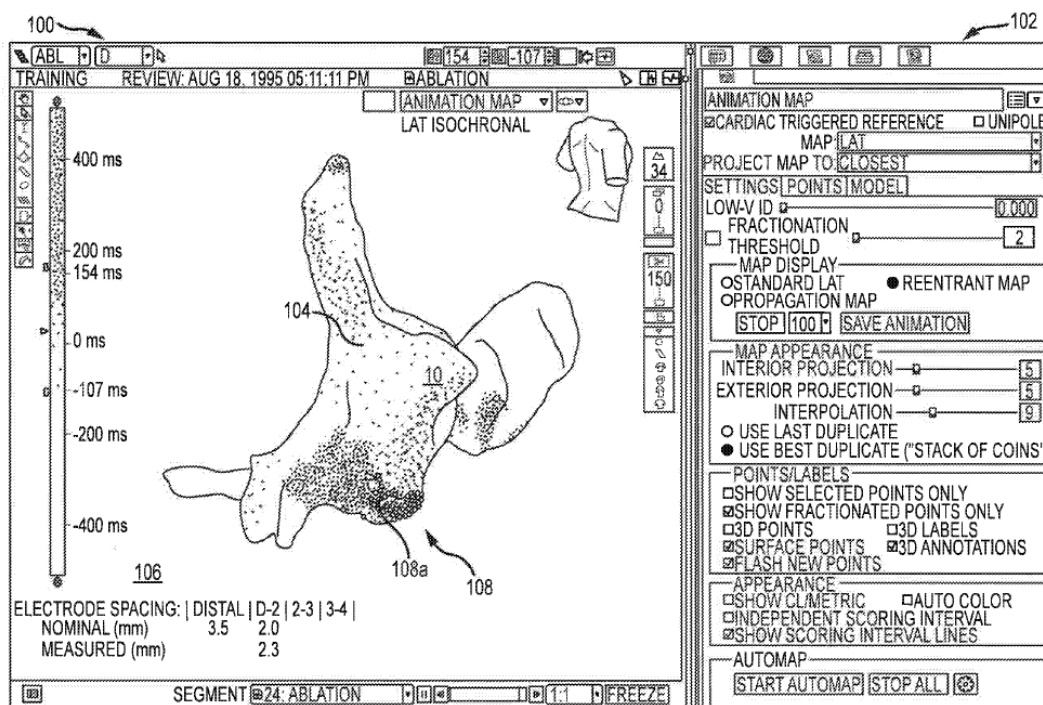


FIG.3A

2. New main request and new first and second auxiliary requests - admittance into the appeal proceedings

2.1 Each of the new main request and the new first and second auxiliary requests filed with the submission of 12 May 2023 constitutes an amendment to the appellant's appeal case made after the notification of the summons to oral proceedings. The admittance of these requests into the appeal proceedings is therefore subject to Article 13(2) RPBA 2020.

While the Board recognises that these requests were filed in response to the preliminary opinion of the Board provided in its communication under Article 15(1) RPBA 2020, the Board may also, in the exercise of its discretion, rely on the criteria set out in Article 13(1) RPBA 2020, including the suitability of the amendment to resolve the issues which were raised by the Board, and, in the present case of an amendment to a patent application, whether the appellant has demonstrated that any such amendment, *prima facie*, overcomes the issues raised by the Board. These criteria are not fulfilled by any of these new requests.

- 2.2 In the communication under Article 15(1) RPBA 2020, point 2.1, the Board stated that claim 14 of the main request filed with the statement of grounds was contradictory. The Board was of the view that part of the claim conveyed the impression that each timing marker was associated with one specific frame ("each frame including an active timing marker") and was superimposed on that frame only ("superimpose, for each frame, the active timing marker"), whereas another part of the claim suggested, on the contrary, that the timing marker was visible on more frames than just the frame on which it had been superimposed ("generate the animated electrophysiology map by adjusting an opacity of the active timing marker on the display screen based on a current time of the playback animation").

Claim 14 of the new main request differs from claim 14 of the main request filed with the statement of grounds of appeal only by an amended article in the penultimate step defined in the claim, which reads "superimpose, for each frame, an ~~the~~ active timing marker onto the

electrophysiological map" (amendments highlighted by the Board).

In its submission of 12 May 2023 (see point 1), the appellant merely stated that claim 14 of the new request had been "clarified" in reaction to the Board's preliminary opinion. The appellant also referred to paragraph [0044] of the description as originally filed, to which the Board had referred in its communication - in connection with inventive step - and essentially repeated a sentence from point 1.1.2 of the Board's communication.

However, the appellant did not explain, and the Board sees no reason, why the substitution of the definite article "the" by the indefinite article "an" would overcome the clarity objection raised by the Board in its communication. On the contrary, the indefinite article "an" *prima facie* reinforces the impression that each frame contains only its own distinct active timing marker.

- 2.3 In the communication under Article 15(1) RPBA 2020, point 4, the Board further stated that both the first and the second auxiliary requests filed with the statement of grounds comprised added subject-matter. The Board considered that the independent system claims of both these requests defined a "playback animation" together with a further "animation" and that such a combination was not originally disclosed.

Claim 13 of the new first auxiliary request differs from claim 13 of the first auxiliary request filed with the statement of grounds of appeal in that the further "animation" is "such that the time markers (108) appear to move across the surface of the electrophysiology map

when displaying the series of frames in chronological sequence". This additional wording merely specifies the further "animation" defined in the claim, leaving the other "playback animation" unaddressed. This amendment cannot overcome the Board's added-matter objection to claim 13 of the first auxiliary request filed with the statement of grounds of appeal.

In addition, the same article substitution has been made as in claim 14 of the new main request. This amendment also has no effect on the issue of added subject-matter.

In its submission of 12 May 2023 (see point 2), the appellant merely stated that claim 13 of the new first auxiliary request had been "amended in view of the disclosure in paragraph [0044] of the description as originally filed" in order to address the Board's objection regarding technical effect in point 3.1 of its communication.

However, the appellant did not comment on the added-matter objection raised by the Board in its communication. As explained above, the Board sees no reason why the amendments made in the new first auxiliary request would overcome this objection.

2.4 Claim 13 of the new second auxiliary request differs from claim 13 of the second auxiliary request filed with the statement of grounds of appeal by substantially the same amendments as those made in claim 13 of the new first auxiliary request. For the same reasons, these amendments cannot overcome the added-matter objection raised by the Board in its communication. The appellant did not comment on this issue either.

2.5 For these reasons, the Board has decided not to admit the new main request and the new first and second auxiliary requests filed by the appellant with its submission of 12 May 2023 into the appeal proceedings.

3. New third to fifth auxiliary requests

3.1 The new third to fifth auxiliary requests are identical, respectively, to the main request and the first and second auxiliary requests filed with the appellant's statement of grounds of appeal.

These requests are not allowable at least for the following reasons, which were already set out in the Board's communication under Article 15(1) RPBA 2020 (see points 2.1 and 4).

The appellant has not submitted any arguments on these issues in response to the Board's communication.

3.2 New third auxiliary request - lack of clarity

Claim 14 of the new third auxiliary request is unclear, contrary to the requirement of Article 84 EPC.

Claim 14 is directed to a system for generating an animated electrophysiological map by superimposing an animated timing sequence onto an electrophysiological map. This sequence is a "sequence of cardiac timing activation frames over time, each frame including an active timing marker which is a graphical representation".

The definition of the timing markers by the expression "each frame including an active timing marker"

(emphasis added by the Board) conveys the impression that each timing marker is associated with a particular frame and is superimposed on that frame only as further defined in the claim ("superimpose, for each frame, the active timing marker").

However, claim 14 further defines that the animated electrophysiology map is generated "by adjusting an opacity of the active timing marker on the display screen based on a current time of the playback animation". This suggests, on the contrary, that the timing marker is visible on more frames than just the frame on which it has been superimposed.

This contradiction leaves the person skilled in the art in doubt as to the scope of the protection sought by claim 14. This was not disputed by the appellant.

3.3 *New fourth auxiliary request - added subject-matter*

Claim 13 of the new fourth auxiliary request comprises subject-matter extending beyond the content of the application as originally filed, in breach of Article 123(2) EPC.

Claim 13 is based on claim 19 as originally filed and, like claim 14 of the new third auxiliary request discussed above, relates to a system for generating an animated electrophysiological map by superimposing an animated timing sequence onto an electrophysiological map, using a computer specially configured for this purpose. As also defined in original claim 19, claim 13 specifies a "playback animation" involving a "sequence of cardiac timing activation frames", each frame including "an active timing marker" superimposed on the electrophysiological map by the computer. The computer

"adjust[s] an opacity of the active timing marker on the display screen based on a current time of the playback animation". Notwithstanding the contradiction mentioned in point 3.2 above - also present in original claim 19 - this defines a first animation mechanism for generating an animated map in which the opacity, thus the visibility, of the "active timing marker" is adjusted "based on a current time of the playback animation".

Compared to claim 19 as originally filed, claim 13 further recites another "animation" involving a "series of frames" where, for each frame, a "plurality of timing markers" are superimposed on a static image of the map. Contrary to the "active timing marker" of the "playback animation", the opacity of the "one or more timing markers" on the static image in this further "animation" is not adjusted by the computer "based on a current time of the playback animation", but rather their visibility is "related to a distance between the position of the activation wavefront on the electrophysiology map at the point of time and the position of the timing marker on the electrophysiology map".

This additional animation mechanism for generating an animated map, in which visibility of the timing markers is based on the distance from the activation wavefront, was, however, disclosed in another embodiment of the original disclosure (see claims 2 and 3; paragraph [0007]). As the Board objected in its communication, there is no disclosure in the application as originally filed of an apparatus - or a method - for generating an animated electrophysiological map based on a combination of both the "playback animation" and the further "animation", i.e. using both animation

mechanisms discussed above at the same time. This objection was not commented on by the appellant.

3.4 *New fifth auxiliary request - added subject-matter*

Claim 13 of the new fifth auxiliary request differs from claim 13 of the new fourth request only in that the visibility of the "one or more timing markers" on the static image is such that "the closer the timing marker (108) is to the position of the activation wavefront on the electrophysiology map, the more visible the timing marker (108) is".

This additional wording merely further specifies the additional animation mechanism claimed based on the distance of the timing markers from the activation wavefront. Therefore, the added-matter objection set out in point 3.3 above also applies, and claim 13 of the new fifth auxiliary request does not meet the requirement of Article 123(2) EPC either.

4. Conclusion

It follows from the above that none of the appellant's requests taken into account in the appeal proceedings are allowable. Consequently, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Chavinier-Tomsic

M. Alvazzi Delfrate

Decision electronically authenticated