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Datasheet for the decision of 24 February 2016

Case Number: T 1948/13 - 3.5.04

Application Number: 10181052.1

Publication Number: 2290613

IPC: G06T11/20

Language of the proceedings: EN

Title of invention:
System and method for presentation of data streams

Applicant:
Given Imaging Ltd.

Headword:

Relevant legal provisions:
EPC Art. 54(2), 54(3), 56

Keyword:
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

Catchword:

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Case Number: T 1948/13 - 3.5.04

D E C I S I O N
of Technical Board of Appeal 3.5.04
of 24 February 2016

Appellant: (Applicant)	Given Imaging Ltd. 2 HaCarmel Street New Industrial Park Yoqneam 20692 (IL)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 8 May 2013 refusing European patent application No. 10181052.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	C. Kunzelmann
Members:	M. Paci
	B. Müller

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division refusing European patent application No. 10181052.1 published as EP 2 290 613 A1.

II. In the decision under appeal the following prior-art documents were cited:

D1: EP 1 618 832 A1,
D2: US 5 519 828 A, and
D3: Lewis, B.:"The Utility of Capsule Endoscopy in Obscure Gastrointestinal Bleeding", Techniques in Gastrointestinal Endoscopy, Vol. 5, No. 3 (July), 2003, pp 115-120.

III. The application was refused on the following grounds:

Main request:

- the subject-matter of claims 1 to 15 lacked novelty in view of D1 (prior art under Article 54(3) EPC);
- the subject-matter of claims 1 to 8 and 10 to 15 lacked novelty in view of D3; and
- the subject-matter of claim 9 did not involve an inventive step in view of D3 and D2.

First auxiliary request:

- claims 1 to 8 and 10 to 15 did not meet the requirements of Article 123(2) EPC.

Second auxiliary request:

- the subject-matter of claims 1 to 14 did not involve an inventive step in view of D3 and D2.

IV. With the statement of grounds of appeal the appellant filed amended claims according to a main and first to

fourth auxiliary requests, which replaced all previous claims on file.

V. In a letter dated 22 July 2015 the appellant requested accelerated processing of the appeal essentially because at least one competitor was advertising a product believed to fall within the scope of the claims of the present application. The appellant also filed supporting evidence.

VI. In a communication under Article 15(1) RPBA (Rules of Procedure of the Boards of Appeal, OJ EPO 2007, 536), annexed to the summons to oral proceedings dated 2 December 2015, the board explained why it was of the provisional view that each of the then valid requests failed to meet the requirements of one or more of Articles 54, 56 and 84 EPC.

VII. With a letter dated 22 January 2016, the appellant filed amended claims according to a main and nine auxiliary requests replacing all previous claims on file.

VIII. The board held oral proceedings on 24 February 2016, during which the appellant submitted a set of amended claims 1 to 13 according to a sole request replacing all previous claims on file.

The appellant's requests at the end of the oral proceedings were that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 13 of the sole request filed during the oral proceedings before the board.

At the end of the oral proceedings, the chairman announced the board's decision.

IX. Independent claims 1 and 9 according to the appellant's sole request read as follows:

"1. A method for presentation of a data stream (210), said method comprising:

receiving a data stream from an in-vivo imaging device, the data stream comprising in-vivo images;

generating a summarized presentation (220) of the data stream (210), wherein said presentation (220) includes at least a spatially varying visual representation, said visual representation varying in color in accordance with color varying along the data stream (210), said visual representation comprising a series of pixel groups of color, each pixel group summarizing color data of one or more image frames from the data stream (210), such that changes in color may be used to identify passage through a specific anatomical site, wherein for each image frame, the summarized color data is an average color value calculated from a defined area that is smaller than the area of the frame; and

displaying the summarized presentation."

"9. A system for presentation of a data stream (210) received from an in-vivo imaging device, the data stream comprising in-vivo images, said system comprising:

a controller to generate a summarized graphical presentation (220) of the data stream (210) wherein said presentation (220) includes at least a spatially varying visual representation, said visual representation varying in color in accordance with color varying along the data stream (210), said visual representation comprising a series of pixel groups of color, each pixel group summarizing color data of one or more image frames from the data stream (210), such that changes in color may be used to identify passage through a specific anatomical site, wherein for each image frame, the

summarized color data is an average color value calculated from a defined area that is smaller than the area of the frame; and

a display unit to display the summarized graphical presentation (220) of the data stream (210)."

X. In the decision under appeal, the examining division's reasoning (in section 4 of the Reasons for the decision) regarding the then second auxiliary request (the independent claims of which were the most similar to the present independent claims) may be summarised as follows:

D3 was regarded as the closest prior art.

The subject-matter of claim 1 differed from the disclosure of D3 only by the features that

(1) the summarised colour data was calculated from a defined area that was smaller than the area of the frame and

(2) the summarised colour was an average colour value.

Since the application did not specify what technical effect was associated with these features, the objective technical problem was regarded as being to provide a particular summarised colour of a frame of the video.

The skilled person would have consulted D2, which dealt with the problem of how to summarise a video in a graphical user interface (GUI). D2 taught the skilled person to summarise a video frame by computing a frame sample representing the average colour values within eight different regions distributed vertically along the centre of the video frame. Such a representation was an average colour value calculated "from a defined area

that is smaller than the area of the frame" as stated in claim 1.

By applying the teaching of D2 to D3, the skilled person would have arrived without an inventive step at the subject-matter of claim 1 of the second auxiliary request underlying the decision under appeal. The same conclusion applied to claim 9.

XI. The appellant's arguments regarding the issues relevant to the present decision may be summarised as follows:

D3 was in no way concerned with questions of average colours of video frames. Nor was there any suggestion that this average colour could be useful for identifying passage through a specific anatomical site.

D2 related to video editing, not to video reviewing of the images of the gastrointestinal tract taken by an endoscopic capsule. Only with hindsight would the skilled person have combined D2 with D3. Moreover, neither D3 nor D2 mentioned the use of average colours for the identification of passage through a specific anatomical site.

Hence the claimed subject-matter involved an inventive step in view D3, D2 or the combination thereof.

Reasons for the Decision

1. The appeal is admissible.

The invention

2. The present invention relates to the presentation on a display of a data stream of in-vivo images obtained, for example, from a swallowed endoscopic capsule capturing images from the gastrointestinal tract. The invention relates in particular to the display of additional information for the purpose of helping a physician reviewing the in-vivo images to determine the location (inside the gastrointestinal tract) at which a given image was taken.

Amendments

3. Claim 1 of the present sole request differs from claim 1 of the second auxiliary request underlying the appealed decision by the additional text "such that changes in color may be used to identify passage through a specific anatomical site". Corresponding amendments have been made in independent claim 9.

4. The board is satisfied that the amended claims comply with the requirements of Articles 76(1) EPC and 123(2) EPC.

5. The expression "such that changes in color may be used to identify passage through a specific anatomical site" introduced a functional limitation defined as a result to be achieved. However, in the present case, the board considers that this limitation meets the requirements of clarity and support of Article 84 EPC because it is

sufficiently clear for the skilled person when this limitation is met (i.e. when the colour variation in the displayed "visual representation" makes it possible for a normally skilled physician to identify passage through a specific anatomical site) and because the claimed subject-matter could not be defined more precisely without unduly restricting the scope of the invention. It is established jurisprudence of the boards of appeal that when these conditions are met such functional features are permissible (see point II.A.3.4, first paragraph, of Case Law of the Boards of Appeal of the European Patent Office, 7th Edition 2013).

For the above reasons, the board is satisfied that the claims meet the requirements of Article 84 EPC.

Novelty over D1 - Articles 54(1) and (3) EPC

6. It has not been disputed that document D1 is prior art under Article 54(3) EPC and that it is therefore only relevant for novelty.

7. The board concurs with the appellant that D1 does **not** disclose the feature of claims 1 and 9 that the average colour value is calculated "from a defined area that is smaller than the area of the frame". Indeed, D1 states that average colours are acquired "from the individual frames" and "frame by frame" (see paragraph [0066]). There is no disclosure, not even an implicit one, that the average colour could be calculated from an area smaller than the area of a frame.

8. Hence, the subject-matter of independent claims 1 and 9, and of their dependent claims 2 to 8 and 10 to 13, is novel in view of D1.

Novelty over D3 - Articles 54(1) and (2) EPC

9. D3 is a publication on the utility of capsule endoscopy in obscure gastrointestinal bleeding. D3, published in a medical journal, was written by a physician for other physicians. It explains *inter alia* how to review the recorded stream of in-vivo images received from an endoscopic capsule and displayed on a computer screen of a workstation running specialised software (see screenshots shown in figures 2 and 3).

From the text and figures of D3, it is clear to the skilled reader that *inter alia* the following steps are performed on the data stream of in-vivo images from the gastrointestinal tract:

- receiving a data stream from an in-vivo imaging device, the data stream comprising in-vivo images;
- generating a summarised presentation (see figures 2 and 3) of the data stream, wherein said presentation includes at least a spatially varying visual representation (see coloured time bar on the left side of figures 2 and 3);
- using an image recognition algorithm for identifying red pixels in the images in order to detect possible areas of bleeding or the presence of vascular lesions (see page 116, right column, first full paragraph);
- marking with a red line the position in the coloured time bar of each of the thus detected images (see red lines in coloured time bar on the left side of figures 2 and 3); and
- displaying the summarised presentation (figures 2 and 3).

The following distinguishing features/steps of the method of claim 1 are **not** disclosed in D3:

- "each pixel group summarizing color data of one or more image frames from the data stream (210), such that changes in color may be used to identify passage through a specific anatomical site, wherein for each image frame, the summarized color data is an average color value calculated from a defined area that is smaller than the area of the frame".

Indeed, the coloured time bar shown in figures 2 and 3 of D3 only contains blue, grey and red areas. There is no indication in D3 that the blue and grey colours represent average colours of the corresponding in-vivo images. As can be seen in figures 2 and 3, the red colour is used for indicating the position of images containing more red pixels (see page 116, right column, first full paragraph); however, there is no disclosure that this red colour is an average colour of the corresponding in-vivo images. The board agrees with the appellant that it can be deduced from figures 2 and 3 that a standard red is used in the coloured time bar, not the average colour of the corresponding images. There is no disclosure in D3 of calculating average colour values from images, let alone from an area smaller than a whole frame. There is also no mention in D3 that the average colour of images could be used for identifying passage through a specific anatomical site.

Hence the subject-matter of claim 1 is novel over D3.

The same conclusion applies to the system of claim 9 having means corresponding to the steps of the method of claim 1 and to dependent claims 2 to 8 and 10 to 13.

Inventive step in view of D3 - Article 56 EPC

10. Technical effect and objective technical problem

In the Reasons for the decision under appeal (under point 4.1.2), the examining division explained with respect to the then second auxiliary request that the description of the application did not indicate any particular technical effect achieved by the distinguishing feature of calculating the average colour value from a defined area smaller than the area of the whole frame. The examining division thus concluded that the objective technical problem had to be regarded as being to provide a particular summarised colour of a frame of the video.

The appellant argued that this distinguishing feature achieved the technical effect of making it possible for an observer to readily identify the colour changes and hence the passage through different anatomical sites (see last two paragraphs on page 3 of the statement of grounds of appeal).

The board concurs with the examining division that the above technical effect alleged by the appellant was not achieved by the features in **claim 1 of the second auxiliary request underlying the appealed decision** because the wording of the claim did not ensure that the "average color value" was calculated for a sufficient number of frames and over a "defined area" sufficiently large to make it possible to identify passage through different anatomical sites. For instance, the wording of claim 1 did not rule out that the average colour value could be calculated from only very sparsely distributed frames (e.g. every 1000th frame) and/or over a very small defined area (e.g. over only one pixel). In such

cases, the alleged technical effect would not have been achieved. In other words, the alleged technical effect was not achieved over the whole breadth of the claim.

Claim 1 according to the present sole request differs from claim 1 of the second auxiliary request underlying the appealed decision by the additional text "such that changes in color may be used to identify passage through a specific anatomical site" (see also the discussion of this feature under point 5 *supra*).

In the board's view, this additional text implies that the average colour value is calculated over a sufficient number of frames and over a sufficiently large area of each of these frames for the colour variation in the displayed "visual representation" to make it possible for a normally skilled physician to identify passage through a specific anatomical site. In view of this limitation, the board considers that the technical effect alleged by the appellant is achieved over the whole breadth of present claim 1.

Hence the board considers that the objective technical problem should be formulated, without pointers to the solution, as how to make it possible for an observer to readily identify the passage through different anatomical sites.

11. Obviousness

In D3, the identification of passage through different anatomical sites is performed by the physician by looking for visual clues in the stream of in-vivo images (see the paragraph bridging the left and right columns on page 118 of D3). These visual clues may be the presence of stool indicating that the colon has been

entered or visually easily identifiable landmarks, such as the esophagogastric junction, the beginning of the duodenum or the ileocecal valve. Once these landmarks have been spotted, the physician marks them with corresponding thumbnails.

The board notes that D3 contains much advice on how to visually detect passage through different anatomical sites in the gastrointestinal tract, but that none of it is based on the average colour of the in-vivo images.

The board thus considers that D3 does not suggest using the average colour of frames to identify passage through different anatomical sites and to display it in a spatially varying visual representation. Nor is there any indication in the documents cited in the appealed decision and published before the priority date of the present application (i.e. those which are prior art under Article 54(2) EPC) that it was part of the skilled person's common general knowledge.

12. Conclusion

For the above reasons, the board is of the view that it would have required an inventive step for the skilled person to arrive at the method of claim 1 from D3 alone.

The same conclusion applies to independent claim 9 and the dependent claims.

Inventive step in view of D3 and D2 - Article 56 EPC

13. D2 discloses "an operator interface for a video editing system that provides enhanced visualization and interactive control of video sequences during the editing process" (see column 1, lines 12 to 15). The

interface "displays a graphic representation of a video sequence to give the operator a visual sense of the content of the sequence, as well as its length" (see column 2, lines 22 to 26). Specifically, each video frame is divided into eight different regions distributed vertically along the center of the frame and an eight-pixel frame sample (17) is produced with pixels having the respective average colours of these eight regions (see figure 3 and column 8, lines 53 to 65). The eight-pixel frame samples (17) of all the frames are then placed adjacent to each other to form a video pictorial timeline (10, 11) (see figures 1 and 3 and column 8, lines 5 to 9).

14. In the board's view, it is not quite clear from D2 in what situations such a video pictorial timeline provides useful information to the operator. However, the board surmises that in certain situations some video sequences might be identifiable on the video pictorial timeline. For instance, scenes with a blue sky might have distinctive blue pixels on one side of the timeline.

The board concurs with the appellant that there was no obvious reason why the skilled person would have wanted to apply this video pictorial timeline of D2 to the system of D3.

Indeed, there is no blue sky in in-vivo images. Even assuming that the skilled person had considered using D2, which relates to video editing, for improving the video reviewing of in-vivo images of the gastrointestinal tract taken by an endoscopic capsule as in D3, he or she would have soon given up the idea because there was no obvious advantage that could be achieved by doing so. Neither D2 nor D3 discloses that the average colour of in-vivo images could be useful for

identifying passage through a specific anatomical site. Without this information, there was no incentive for applying the video pictorial timeline of D2 to D3.

15. For the above reasons, the subject-matter of all the claims of the appellant's sole request is not obvious in view of D3 and D2 either.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent with the following claims and a description to be adapted thereto:

   Claims 1 to 13 of the Sole Request filed during the oral proceedings of 24 February 2016 before the Board.

The Registrar: The Chairman:

K. Boelicke C. Kunzelmann

Decision electronically authenticated