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Datasheet for the decision of 23 October 2013

Case Number: T 1642/10 - 3.2.02

Application Number: 00955472.6

Publication Number: 1143852

IPC: A61B 5/00

Language of the proceedings: EN

Title of invention:
Apparatus for performing intra-operative angiography

Patent Proprietor:
NATIONAL RESEARCH COUNCIL OF CANADA

Opponents:
HAMAMATSU PHOTONICS K.K.
Pulsion Medical Systems AG

Headword:
-

Relevant legal provisions:
EPC Art. 56, 111(1)
EPC R. 80
RPBA Art. 12(2), 13(1)

Keyword:
"Remittal (no); substantiation (yes)"
"Admissibility of auxiliary requests 1 to 3 (yes)"
"Admissibility of auxiliary requests 4 to 6 (no)"
"Inventive step (no - main and auxiliary requests 1 and 3"
"Compliance with Rule 80 EPC (no - auxiliary request 2)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1642/10 - 3.2.02

D E C I S I O N
of the Technical Board of Appeal 3.2.02
of 23 October 2013

Appellant: (Patent Proprietor)	NATIONAL RESEARCH COUNCIL OF CANADA 1200 Montreal Road Ottawa, ON K1A 0R6 (CA)
Representative:	Jansen, Cornelis Marinus V.O. Johan de Wittlaan 7 2517 JR Dan Haag (NL)
Respondent: (Opponent 1)	HAMAMATSU PHOTONICS K.K. 1126-1, Ichino-cho Higashi-ku Hamamatsu-shi Shizuoka 435-8558 (JP)
Representative:	HOFFMANN EITLE Patent- und Rechtsanwälte Arabellastrasse 4 D-81925 München (DE)
Respondent: (Opponent 2)	Pulsion Medical Systems AG Joseph-Wild-Strasse 20 D-81829 München (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 10 June 2010 revoking European patent No. 1143852 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman: E. Dufrasne
Members: M. Stern
P. L. P. Weber

Summary of Facts and Submissions

I. The proprietor lodged an appeal against the decision of the Opposition Division dispatched on 10 June 2010 revoking European patent No. 1 143 852.

II. The Opposition Division revoked the patent on the basis that the subject-matter of claim 1 of the granted patent lacked novelty over document D32, and that the subject-matter of the then pending auxiliary requests did not comply with the requirements of Articles 123(2), 84, 54 and/or 56 EPC. The ground of lack of inventive step was based on D32 as closest prior art.

III. Notice of appeal was filed by the proprietor on 30 July 2010 and the fee for appeal was paid on 2 August 2010. A statement setting out the grounds of appeal was received on 11 October 2010.

IV. In a communication under Article 15(1) and 17(2) RPBA dated 24 May 2013 annexed to a summons to oral proceedings, the Board gave its provisional opinion regarding novelty over document D32 and indicated that all further objections raised and substantiated by respondent-opponent 1 would also be discussed if considered necessary.

Respondent-opponent 2 remained silent throughout the appeal proceedings.

Hence, in what follows, references to "the respondent" are to be understood as referring to "respondent-opponent 1".

V. With its letter dated 9 September 2013, the appellant filed auxiliary requests 1 to 6.

VI. In its response dated 23 September 2013, the respondent objected to the admissibility of auxiliary requests 1 to 6 since they had been filed only about six weeks before the oral proceedings and contained features taken from the description which related to unsearched subject-matter.

VII. Oral proceedings took place on 23 October 2013.

The appellant requested that the decision under appeal be set aside and that the patent be maintained as granted or, in the alternative, on the basis of one of auxiliary requests 1 and 2 filed with letter dated 9 September 2013, auxiliary request 3 filed during oral proceedings, and auxiliary requests 4 to 6 filed with letter dated 9 September 2013.

At the beginning of the oral proceedings the appellant requested that only novelty over document D32 be discussed and decided upon, particularly since novelty over document D1 and inventive step starting from D1 had not been substantiated by the respondents in reply to the statement of grounds of appeal. Moreover, for the discussion of any grounds other than novelty over D32, the appellant requested remittal of the case to the Opposition Division.

The respondent requested that the appeal be dismissed. It also requested that the Board make a final decision on all outstanding matters instead of remitting the

case to the Opposition Division, and that auxiliary requests 1 to 6 should not be admitted.

VIII. The following documents are of importance for the present decision:

D1: JP-A-9 309 845 (with English translation)
D9: Brochure "ARGUS-20 with C2400-75i"; printed May 1997
D32: M. Sato et al.: "Development of Deep Organ Microcirculation Visualization Techniques Using an Infrared Biomicroscope System; Research Report 1990 from the Suzuken Memorial Foundation; Vol. 9, pages 63-73 and 228; 20 December, 1991
D32a: English translation of D32.

IX. Claim 1 of the different requests reads as follows (amendments with respect to claim 1 of the main request, i.e. claim 1 of the patent as granted, are highlighted by the Board):

Main request:

"A device for visualizing movement of a fluorescent dye carried in the bloodstream of a cardiovascular bypass graft during a surgical procedure, the device comprising
a means capable of providing radiation suitable to excite the fluorescent dye;
a camera capable of capturing the radiation emitted from the fluorescent dye within the blood vessel as an angiographic image; and
wherein the camera captures images at the rate of at least 15 images per second;

wherein the fluorescent dye is ICG and/or has a peak absorption and emission in the range 800 to 850 nm; wherein the camera is capable of obtaining multiple images of the cardiovascular bypass graft while the heart is beating; and wherein the device is suitable to convert the images into a viewable image."

Auxiliary request 1:

"A device for visualizing movement of a fluorescent dye carried in the bloodstream of a cardiovascular bypass graft during a surgical procedure, the device comprising:
a means capable of providing radiation suitable to excite the fluorescent dye;
a camera capable of capturing the radiation emitted from the fluorescent dye within the blood vessel as an angiographic image; ~~and~~
wherein the camera captures images at the rate of at least 15 images per second;
wherein the fluorescent dye is ICG and/or has a peak absorption and emission in the range 800 to 850 nm;
wherein the camera is capable of obtaining multiple images of the cardiovascular bypass graft while the heart is beating; and
wherein the device is suitable to convert the images into a viewable image <u>to assess graft patency</u>."

Auxiliary request 2:

"A device for visualizing ~~movement of~~ a fluorescent dye carried in the bloodstream ~~of a cardiovascular bypass graft~~ during a surgical procedure, the device comprising:

a means arranged for ~~capable of~~ providing radiation suitable to excite the fluorescent dye;
a camera arranged for ~~capable of~~ capturing the radiation emitted from the fluorescent dye within the blood vessel as an angiographic image; ~~and~~
wherein the camera captures images at the rate of at least 15 images per second;
wherein the fluorescent dye is ICG and/or has a peak absorption and emission in the range 800 to 850 nm;
wherein the camera is arranged for ~~capable of~~ obtaining multiple images of a human coronary artery ~~the cardiovascular~~ bypass graft while the heart is beating; and
wherein the device is arranged for visualizing movement of the fluorescent dye carried in the bloodstream of the bypass graft during the surgical procedure, and is suitable to convert the images into a viewable image."

Auxiliary request 3:

"A device for visualizing ~~movement of~~ a fluorescent dye carried in the bloodstream ~~of a cardiovascular bypass graft~~ during a surgical procedure, the device comprising:
a laser ~~means~~ capable of providing radiation suitable to excite the fluorescent dye and optics positioned to diverge the radiant energy beam to cover the area of interest wherein the optics provide for even radiation of a 7.5 cm x 7.5 cm area, thereby inducing fluorescence in the region being imaged;
a camera capable of capturing the radiation emitted from the fluorescent dye within the blood vessel as an angiographic image; ~~and~~

wherein the camera captures images at the rate of at least 15 images per second;
wherein the fluorescent dye is ICG and/or has a peak absorption and emission in the range 800 to 850 nm;
wherein the camera is capable of obtaining multiple images of a human coronary artery ~~the cardiovascular~~ bypass graft while the heart is beating; and
wherein the device is capable of visualizing movement of the fluorescent dye carried in the bloodstream of the bypass graft during the surgical procedure, and is suitable to convert the images into a viewable image."

Auxiliary request 4:

"A device for visualizing movement of a fluorescent dye carried in the bloodstream of a cardiovascular bypass graft during a surgical procedure, the device comprising:
a means capable of providing radiation suitable to excite the fluorescent dye;
a camera capable of capturing the radiation emitted from the fluorescent dye within the blood vessel as an angiographic image; and
a computer running image capture and processing software,
wherein the camera captures images at the rate of at least 15 images per second;
wherein the fluorescent dye is ICG and/or has a peak absorption and emission in the range 800 to 850 nm;
wherein the camera is capable of obtaining multiple images of the cardiovascular bypass graft while the heart is beating; ~~and~~ wherein the device is suitable to convert the images into a viewable image; and wherein the software is arranged for selecting from the

multiple images the optimal images for analysis, and for determining from the selected images the diameter of the blood vessel as well as a rate and volume of blood flow through the vessel."

Auxiliary request 5:

"A device for visualizing movement of a fluorescent dye carried in the bloodstream of a cardiovascular bypass graft during a surgical procedure, the device comprising:
a means capable of providing radiation suitable to excite the fluorescent dye;
a camera capable of capturing the radiation emitted from the fluorescent dye within the blood vessel as an angiographic image; and
a computer running image capture and processing software,
wherein the camera captures images at the rate of at least 15 images per second;
wherein the fluorescent dye is ICG and/or has a peak absorption and emission in the range 800 to 850 nm;
wherein the camera is capable of obtaining multiple images of the cardiovascular bypass graft while the heart is beating; ~~and~~ wherein the device is suitable to convert the images into a viewable image; and wherein the software is arranged for selecting from the multiple images the images with greatest contrast for analysis, and for determining from the selected images the diameter of the blood vessel as well as a rate and volume of blood flow through the vessel."

Auxiliary request 6:

"A device for visualizing movement of a fluorescent dye carried in the bloodstream of a cardiovascular bypass graft during a surgical procedure, the device comprising:
a means capable of providing radiation suitable to excite the fluorescent dye;
a camera capable of capturing the radiation emitted from the fluorescent dye within the blood vessel as an angiographic image; ~~and~~
wherein the camera captures images at the rate of at least 15 images per second;
wherein the fluorescent dye is ICG and/or has a peak absorption and emission in the range 800 to 850 nm;
wherein the camera is capable of obtaining multiple images of the cardiovascular bypass graft while the heart is beating; and wherein the device is suitable to convert the images into a viewable image,
wherein the means capable of providing radiation is a laser and the device further comprises optics positioned to diverge the radiant energy beam to cover the area of interest, wherein the optics are adjustable, permitting variation in a field of illumination, and wherein the camera comprises a lens system for a [sic] magnifying a field of view, wherein the lens system is capable of being switched to the laser to correspondingly adjust a field of illumination provided by the laser to match the field of view of the camera."

X. The arguments of the appellant relevant for the present decision are summarised as follows.

(i) *Procedural matters*:

- Since the Opposition Division had only decided questions of patentability on the basis of D32 it was justified to remit the case to the Opposition Division for examination of any other grounds, in particular the grounds of novelty over D1 and of inventive step starting from D1. The appellant should not be deprived of its right to have its case considered by two degrees of jurisdiction. Furthermore, the objection of lack of novelty over D1 had not been adequately substantiated by the respondent since its reply to the statement of grounds of appeal merely referred to submissions made during the first-instance proceedings (point 1.3 of the respondent's reply to the statement of grounds of appeal).

- Auxiliary requests 1, 2, and 4 to 6 had been filed about six weeks before the oral proceedings in response to the Board's communication dealing with the novelty objections regarding D32, and should certainly be seen as an appropriate attempt to counter the objections of lack of inventive step departing from D1 as discussed during the oral proceedings. The further limitations added to claim 1 of each of these requests did not involve technically complex issues preventing the respondent or the Board from dealing with them effectively. Current auxiliary request 3 had been filed at oral proceedings as a slightly amended version of the previously filed auxiliary request 3 in response to

the objection under Rule 80 EPC discussed for the first time during the oral proceedings.

(ii) *Novelty and inventive step*:

- The ICG complex of the examples of D1 had apparently been specifically designed for migration in the nervous system. It was administered by direct injection into the brain for gradual diffusion and migration throughout the body, rather than as a tight bolus directly into the bloodstream, whereby D1 taught away from the use of ICG as a means to measure the rapid blood flow in vessels.

- The particular visualisation feature of visualising movement of a fluorescent dye carried in the bloodstream of a cardiovascular bypass graft during a surgical procedure while the heart was beating had not been disclosed previously. Moreover, the experiments described in D1 were performed in real time using exposure times of 1 second (paragraphs [0037], [0040]), as low light conditions would prompt the user to use an increased integration time. Hence, the camera of D1 was set to capture images at a much slower rate than the maximal capture rate of about 30 images per second disclosed in D9. Such a long exposure time would not allow visualisation of movement of a fluorescent dye carried in the blood stream of a cardiovascular bypass graft while the heart was beating. In contrast, the device of the invention provided the camera with the capability of capturing angiographic images at an image capture rate of at least 15 images per second. In particular, a high image capture rate was necessary to determine the movement of the dye to assess graft

patency, as further defined in claim 1 of auxiliary request 1. There was no hint in D1 to use the camera of D1 in low light conditions with the higher capture rate disclosed in D9.

- There was no reason to replace the halogen lamp disclosed in D1 by a laser, as defined in claim 1 of auxiliary request 3. Moreover, the area of interest was defined to be large enough to visualise the whole length of a human coronary artery bypass graft.

(iii) *Rule 80 EPC*:

The expression "arranged for" in claim 1 of auxiliary request 2 was intended to define more clearly that the device was intended to expressly carry out the specified functions. There was however no structural difference between a feature recited to be "arranged for" performing a certain function and the same feature recited to be "capable of" performing that function.

XI. The arguments of the respondent relevant for the present decision are summarised as follows.

(i) *Procedural matters*:

- For the sake of procedural efficiency and in the interest of the respondent's and the public's legal certainty, the Board was requested to make a final decision on all outstanding matters, rather than remit the case to the Opposition Division after consideration of D32. The respondent's reply to the statement of grounds of appeal contained several passages (sections 1.2.1, 2.1.1 and 2.1.2) in which the objections of

novelty and inventive step based on D1, even in combination with D9, were discussed. These objections were thus substantiated and formed part of the respondent's case in the present appeal. Moreover, the appellant had presented detailed counterarguments to the objections based on D1 in its letter in preparation of the oral proceedings.

- Auxiliary requests 1, 2 and 4 to 6 had been filed about six weeks before the oral proceedings, and auxiliary request 3 had been filed during the oral proceedings. These late-filed requests could have been presented earlier, particularly during the first-instance proceedings when D32 was discussed. In particular, claims 1 of auxiliary requests 4 to 6 had been amended with features extracted from the description (page 13, lines 13 to 16; page 11, lines 5 to 8) which had not yet been searched, had not been examined by the Opposition Division, and involved considerable complexity which prevented a thorough assessment of their patentability. Therefore, the Board was requested to exercise its discretion under Article 13(1) RPBA not to admit these late requests.

(ii) *Novelty and inventive step*:

- D1 disclosed a device for imaging a fluorescent dye in a rat, wherein the camera captured the radiation emitted from the dye in the range of 800 to 850 nm (paragraphs [0014], [0021], [0035]; Figure 2). D1 disclosed the imaging processing device to be a Hamamatsu ARGUS-20 processor with a C2400-75i camera, which was explained in D9 to have an image capture rate of about 30 or 25 images per second, for NTSC and PAL

respectively. Hence, D1 disclosed, or at least rendered obvious, all the structural features of the device of claim 1 of the main request.

- The device resulting from the combination of D1 with D9 was moreover suitable for the claimed application to visualise movement of a fluorescent dye carried in the bloodstream of a cardiovascular bypass graft during a surgical procedure while the heart was beating. D1 disclosed the imaging of the fluorescence emitted from within the body of a rat through its body tissues. The imaging of a fluorescent dye carried by the blood stream of a cardiovascular bypass graft required a field of view which was comparable to, if not smaller than, the field of view necessary for visualising the whole body of a rat. Also the fluorescence light intensities emitted from an exposed blood vessel were comparable to, if not larger than, those emitted by a fluorescent dye from inside the body of a rat. The appropriate image capture rate was set according to the particular application, and was not necessarily restricted to be equal to the maximal capture rate of about 30 images per second disclosed in D9. Consequently, there were no considerations of dimensions or light intensities which made the imaging of a cardiovascular bypass graft unfeasible, let alone impossible. Images revealing the dye would make it possible to determine the movement of the injected fluorescent dye through the cardiovascular graft while the heart was beating, and thus to assess graft patency.

- From D32 it was known that a halogen lamp and a laser were alternative light sources for fluorescence imaging devices. Moreover, the skilled person would readily

adjust the size of the area of interest to the size of the object to be imaged, whereby optics providing an area of interest size of 7.5 cm x 7.5 cm as recited in claim 1 of auxiliary request 3 would be readily considered.

(iii) *Rule 80 EPC*:

No structural difference was apparent between a feature recited to be "capable of" (or "suitable for") performing a certain function and the same feature "arranged for" performing that function. Hence, claim 1 of auxiliary request 2 was not allowable under Rule 80 EPC.

Reasons for the Decision

1. The appeal is admissible.

2. *Procedural matters*

2.1 Whilst the appellant requested (during the oral proceedings) that the case be remitted to the Opposition Division particularly for the examination of novelty over D1 and inventive step starting from D1, the respondent opposed this request in order not to further delay a final decision on the fate of the contested patent.

2.2 Article 111(1) EPC leaves it to the discretion of the Board whether to exercise any power within the competence of the department of first instance or to remit the case to that department. Hence, a party has

no absolute right to have each individual issue considered by two instances (Case Law of the Boards of Appeal of the EPO, 7th edition 2013, IV.E.7.6.1). In the present case, the Board observes that the patent was granted in 2007, i.e. six years ago, and that remittal would prolong the already lengthy opposition proceedings. Moreover, the considerations of novelty and inventive step regarding D1, as already addressed by both parties in the written appeal proceedings, appeared to be very similar to those regarding D32 on which the impugned decision was based.

2.3 Contrary to the appellant's view, the Board considers that the objections of lack of novelty regarding D1 and of inventive step starting from D1 are part of the respondent's case since they were presented in the respondent's reply to the statement of grounds of appeal (Article 12(2) RPBA). Whilst the appellant considered that the lack of novelty over D1 had only been addressed in the respondent's reply (point 1.3) by referring to submissions made during the first-instance proceedings, the Board finds that the reply does in fact contain explicit discussions about several technical details disclosed in D1 (sections 1.2.1, 2.1.1 and 2.1.2). It was therefore clear to the appellant and the Board which were the main factual reasons relied upon by the respondent for its objections of lack of novelty and inventive step in view of D1. Moreover, the appellant had in fact already presented detailed arguments concerning the objections based on D1 in its letter dated 9 September 2013 in preparation of the oral proceedings (even the statement of grounds of appeal included, on pages 17 to 20, a detailed discussion of the disclosure of D1).

2.4 Accordingly, in view of the above circumstances and taking into consideration the imperative of procedural efficiency and the interest of the respondent and the public in a speedy and streamlined procedure, the Board considers it appropriate to decide the case itself rather than remit it to the department of first instance pursuant to Article 111(1) EPC.

2.5 Admissibility of auxiliary requests 1 to 6

2.5.1 The respondent requested the Board to exercise its discretion under Article 13(1) RPBA not to admit auxiliary requests 1, 2 and 4 to 6 which were filed about six weeks before the oral proceedings, as well as auxiliary request 3 filed during the oral proceedings. It was argued that these requests could have been presented earlier, particularly during the first-instance proceedings when D32 was discussed.

2.5.2 The Board considers, however, that auxiliary requests 1 to 3 as filed on 9 September 2013, about six weeks before the oral proceedings, constitute an appropriate attempt to counter the objections of lack of inventive step departing from D1 discussed in the written proceedings. The further limitations added to claim 1 of each of these requests do not involve any technical complexity preventing the respondent or the Board from dealing with them effectively. Current auxiliary request 3 was filed at oral proceedings as a slightly amended version of the previously filed auxiliary request 3 in order to render it compliant with Rule 80 EPC, a requirement discussed for the first time during the oral proceedings.

Hence, the Board considers that auxiliary requests 1 to 3 are admissible.

2.5.3 Auxiliary requests 4 to 6 relate to subject-matter which does not have a counterpart in the claims of the granted patent. In particular, claim 1 of auxiliary requests 4 and 5 contains the feature of computer processing software for determining from selected images the diameter of the blood vessel as well as the rate and volume of blood flow through the vessel. This subject-matter, which had not been part of the first-instance proceedings, has been extracted from the description (page 13, lines 13 to 16). This also holds for claim 1 of auxiliary request 6 which contains the feature of adjusting the field of illumination provided by the laser to match the field of view of the camera, which is disclosed in the description on page 11, lines 5 to 8.

Therefore, the Board shares the respondent's view that the subject-matter claimed in these requests has not yet been searched and involves considerable complexity, preventing the respondent from adequately preparing a thorough assessment of its patentability.

As a consequence, the Board does not admit auxiliary requests 4 to 6 pursuant to Article 13(1) RPBA.

3. Main request and auxiliary requests 1 and 3 - novelty and inventive step

3.1 Document D1 discloses a device for visualising or imaging a fluorescent dye in a living body

(paragraphs [0014], [0021], [0035]; Figure 2), the device comprising means capable of providing radiation suitable to excite the fluorescent dye and a camera capable of capturing the radiation emitted from the fluorescent dye (paragraph [0035]). The fluorescent dye has a peak emission in a wavelength range which, as seen in Figure 1, lies in the claimed range of 800 to 850 nm (cf. also paragraph [0016]). D1 specifically discloses the imaging of an experimental animal, in particular the entire body of a Wister rat, after the fluorescent dye has been injected into the brain from where it migrates to the spinal cord (paragraphs [0036] to [0038]; Figures 2 to 6). The device of D1 is therefore suitable to convert the images into a viewable image, as defined in claim 1.

3.2 D1 does not however explicitly disclose the following features of the device specified in claim 1 of the main request:

(a) the camera captures images at a rate of at least 15 images per second;
(b) the device is suitable for visualising movement of a fluorescent dye carried in the blood stream of a cardiovascular bypass graft while the heart is beating; and
(c) the camera is capable of capturing the radiation emitted from the fluorescent dye within the blood vessel as an angiographic image.

3.3 The only disclosure given in D1 regarding camera specifications is that the device comprises a C2400-75i CCD camera with an image processing device ARGUS-20, both manufactured by Hamamatsu Photonics Co. Ltd.

The respondent argued that since document D9 was a specification brochure of a Hamamatsu imaging processing device with the same product name "ARGUS-20 with a C2400-75i CCD camera", the disclosure of D9 should be considered as being incorporated into D1 by reference.

3.4 However, the Board does not accept this argument at least for the reason that the brochure D9 carries a printing date of May 1997 which is later than the filing date of D1, 21 May 1996. Therefore, the specifications of the C2400-75i camera and ARGUS-20 image processing device given in D9 may well be different from those at the filing date of D1. Whilst the respondent stated at oral proceedings that this possibility had not in fact occurred, the Board did not see this statement as evidence for the respondent's argument that D1 specifically referred to precisely the same device as was later disclosed in D9.

3.5 Hence, the absence of the aforementioned structural feature (a) from D1 renders the device of claim 1 novel over this document.

3.6 However, when solving the objective technical problem of reducing the device of D1 to practice, the skilled person would readily search for specifications of the C2400-75i camera and ARGUS-20 image processing device mentioned in D1. Since D9 offers these specifications, it would be straightforward for the skilled person to devise the camera of D1 according to the D9 specifications. In particular, D9 specifies in the C2400-75i parameter table that the camera uses a sync

system at 59.94 Hz (NTSC) or 50 Hz (PAL) which, with the specified interlace ratio of 2:1, is equivalent to an image capture rate of 29.97 or 25 images per second (for NTSC and PAL respectively). Both of these image capture rates fall within the range of "at least 15 images per second" defined in claim 1.

3.7 The Board furthermore considers that the device resulting from the combination of documents D1 and D9 has the imaging capabilities expressed by aforementioned functional features (b) and (c). The reasons are the following.

3.7.1 The appellant is correct in observing that the particular application of visualising movement of a fluorescent dye carried in the bloodstream of a cardiovascular bypass graft during a surgical procedure while the heart is beating has not been disclosed in D1. However, claim 1 merely defines a device which is suitable for such an application. Thus, the only question to be answered is whether the device resulting from the combination of D1 with D9 is deemed to be suitable for this application.

3.7.2 Contrary to the view held by the appellant, the nature of the fluorescent dye used is relevant for specifying the device according to claim 1 only to the extent that it requires the camera to be capable of effectively capturing images at the fluorescence wavelength emitting range of 800 to 850 nm defined in claim 1. As indicated under point 3.1 above, the camera of D1 has the capability of imaging fluorescence emissions in that range.

Moreover, D1 discloses the imaging of the fluorescence emitted from within the body of a rat through its body tissues. The imaging of a fluorescent dye carried in the blood stream of a cardiovascular bypass graft requires a field of view which is comparable to, if not smaller than, the field of view necessary for visualising the whole body of a rat. Also the fluorescence light intensities emitted from an exposed blood vessel is comparable to, if not larger than, those emitted from a dye emitting fluorescence from inside the body of a rat through body tissue. Consequently, there are no considerations of dimensions or light intensities which would make the imaging of a cardiovascular bypass graft unfeasible, let alone impossible.

3.7.3 D1 discloses that imaging of the rat body was performed in real time with an exposure time of one second (paragraphs [0037] and [0040]). The imaging capabilities of the device of D1 is however not restricted to the particular use described in D1. Consequently, when the device of D1 is used for a different purpose, such as the presently claimed imaging of a fluorescent dye carried in the bloodstream of a cardiovascular graft, the skilled person would naturally adapt the imaging parameters of the known device. The image exposure time would be set in accordance with the fluorescence intensities to obtain adequate angiographic images. The appellant's observation may certainly be correct that low light conditions may prompt the user to use somewhat longer integration times than those corresponding to the maximal capture rate of about 30 images per second disclosed in D9. Nevertheless, once the appropriate

capture rate has been set, the camera will be able to obtain an image revealing the passage, i.e. the "movement", of the fluorescent dye through the cardiovascular graft "during a surgical procedure" and "while the heart is beating".

3.7.4 The Board therefore considers that the device resulting from the combination of D1 with D9 would allow the visualisation of the movement of the fluorescent dye carried in the bloodstream of the cardiovascular bypass graft while the heart is beating.

3.8 For the aforementioned reasons, the device of claim 1 of the main request lacks an inventive step in the sense of Article 56 EPC.

3.9 Under these circumstances, there is no need to consider the further objections raised by the respondent against claim 1 of the main request, such as novelty and inventive step over document D32.

3.10 Auxiliary request 1

Claim 1 of auxiliary request 1 adds that the device is suitable to convert the images into a viewable image "to assess graft patency".

As indicated above, the images obtainable with the device resulting from the combination of D1 with D9 make it possible to determine whether the fluorescent dye has passed the cardiovascular bypass graft or not. Hence, the mentioned device is capable of indicating whether patency of the graft is present or not.

As a consequence, the aforementioned objection of lack of an inventive step applies likewise to the subject-matter of claim 1 of auxiliary request 1.

3.11 Auxiliary request 3

3.11.1 Claim 1 of auxiliary request 3 adds to claim 1 of the main request substantially the further limitations that the means for providing radiation is a laser, that optics are positioned to diverge the radiant energy beam to cover an area of interest of even radiation of 7.5 cm x 7.5 cm, and that the camera is capable of obtaining images of a human coronary artery bypass graft.

3.11.2 Whilst D1 discloses a halogen lamp as an excitation light source (sentence bridging pages 13 and 14), the device of claim 1 comprises a laser.

The objective technical problem associated with this differentiating feature is to find a suitable alternative excitation light source.

Document D32 presents another fluorescence imaging device in which a halogen lamp and a laser are presented as alternative light sources (see translation D32a, page 3, last paragraph). The skilled person would therefore readily consider to alternatively provide the device of D1 with a laser.

3.11.3 As presented in D1 (sentence bridging pages 13 and 14) and shown in Figure 2, light is irradiated onto the body of the rat from an optical fibre. It is obvious to the skilled person that the divergent light beam will

be adjusted by suitable optics to provide even radiation onto the area of interest. As acknowledged by the contested patent, such optics are well known (paragraph [0049]).

It is equally obvious to the skilled person that the size of the area of interest will be adjusted to the size of the object which is to be imaged. For imaging a rat according to D1, an area of interest with side lengths of several centimetres appears necessary. No particular inventiveness is thus seen in devising the area of interest in accordance with the size of the imaged object, in particular with an area of 7.5 cm x 7.5 cm as recited in claim 1.

3.11.4 Whilst claim 1 of the main and first auxiliary requests recites that the camera should be capable of obtaining images of a "cardiovascular bypass graft", claim 1 of auxiliary request 3 specifies that the camera should be capable of obtaining images of a "human coronary artery bypass graft". The Board finds that the aforementioned objections apply likewise to a human coronary artery bypass graft as well.

3.11.5 Therefore, the device of claim 1 of auxiliary request 3 lacks an inventive step in the sense of Article 56 EPC.

3.11.6 Under these circumstances, there is no need to consider the further objections under Articles 84 and 123(2) and (3) EPC raised by the respondent against claim 1 of auxiliary request 3.

4. Auxiliary request 2 - Rule 80 EPC

4.1 In claim 1 of the second auxiliary request the definition of the capability of certain device features to perform certain functions (*"capable of"*) has been replaced by the definition that these features *"are arranged for"* performing the corresponding functions.

4.2 The Board is unable to discern the difference between the expressions "arranged for" and "capable of" in the context of the recited features, and it sees moreover no basis in the originally filed application for any such difference. The appellant moreover acknowledged at oral proceedings that the expression "arranged for" merely specified that the device had been conceived with the express intention that it should carry out the specified functions, but that otherwise there was structurally no difference between a feature "arranged for" performing a certain function and the same feature "capable of" performing that function.

4.3 As the Board finds that the amended expressions have no meaning different from the corresponding original expressions, the amendments are not considered to be occasioned by a ground for opposition under Article 100 EPC.

Thus, the amendments in claim 1 of auxiliary request 2 are not allowable under Rule 80 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Hampe E. Dufrasne