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Datasheet for the decision of 9 November 2023

Case Number: T 1179/20 - 3.2.02

Application Number: 16176419.6

Publication Number: 3117772

IPC: A61B6/03, A61B6/14

Language of the proceedings: EN

Title of invention:
X-RAY CT IMAGING APPARATUS

Patent Proprietor:
J. Morita Manufacturing Corporation

Opponent:
Sirona Dental Systems GmbH

Headword:

Relevant legal provisions:
EPC Art. 100(a), 56
RPBA 2020 Art. 12(2), 12(3), 12(4), 12(5)

Keyword:
Inventive step - (yes)
Late-filed objection - should have been submitted in first-instance proceedings (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1179/20 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 9 November 2023

Appellant: (Opponent)	Sirona Dental Systems GmbH Fabrikstrasse 31 64625 Bensheim (DE)
Representative:	Özer, Alpdeniz Sirona Dental Systems GmbH Corporate Legal Fabrikstraße 31 64625 Bensheim (DE)
Respondent: (Patent Proprietor)	J. Morita Manufacturing Corporation 680, Higashihama Minami-Cho, Fushimi-Ku Kyoto-Shi, Kyoto 612-8533 (JP)
Representative:	Müller Hoffmann & Partner Patentanwälte mbB St.-Martin-Strasse 58 81541 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 March 2020 rejecting the opposition filed against European patent No. 3117772 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chair	M. Alvazzi Delfrate
Members:	A. Martinez Möller
	C. Schmidt

Summary of Facts and Submissions

I. The appeal is directed against the decision of the Opposition Division rejecting the opposition against European patent No. 3117772.

II. Oral proceedings before the Board took place on 9 November 2023.

The appellant/opponent requested that the decision under appeal be set aside and that the patent be revoked.

The respondent/proprietor requested that the decision under appeal be upheld and that the patent be maintained as granted. In the alternative, the appellant requested that the patent be maintained on the basis of one of auxiliary requests 1 to 3, filed on 19 March 2019, or auxiliary requests 4 to 6, filed on 21 November 2019.

III. Claim 1 of the **main request**, with feature numbering added in bold, reads as follows:

"**M1.0** An X-ray CT imaging apparatus, comprising:
M1.1 a frame (61);
M1.2 a rotary shaft (32), supported by the frame (61);
M1.3 a first movement mechanism (65) provided between the frame (61) and the rotary shaft (32) to move the rotary shaft (32) with respect to the frame (61) in a plane perpendicular to the rotary shaft (32);
M1.4 a supporter (30) supported at a lower side of the rotary shaft (32),

M1.5 said supporter (30) having an X-ray generator (11) for generating an X-ray cone beam and an X-ray detector (21) for receiving the X-ray cone beam from the X-ray generator (11),
M1.6 the X-ray generator (11) and the X-ray detector (21) being spaced apart to oppose each other so that the X-ray cone beam from the X-ray generator (11) is detected by the X-ray detector (21);
M1.7 a second movement mechanism (36, 38, 60r) provided in the frame (61) or in the supporter (30) to rotate the supporter (30) around the rotary shaft (32) about a longitudinal axis thereof; and
M 1.8 a controller (70') configured to simultaneously drive the first movement mechanism (65) and the second movement mechanism (36, 38, 60r) to move the rotary shaft (32) and rotate the supporter (30) around the rotary shaft (32) so that a two dimensional movement of the rotary shaft (32) by the first movement mechanism (65) and a rotational movement of the supporter (30) around the rotary shaft (32) by the second movement mechanism (36, 38, 60r) are combined with each other,
M 1.9 which results in that the rotary shaft (32) travels along a circular orbit around a center of a CT imaging region of an object positioned stationary between the X-ray generator (11) and the X-ray detector (21) in accordance with a rotational angle of the supporter (30)
M 1.10 while the X-ray cone beam is projected to a part of the CT imaging region (51) with a symmetrical axis (34) of the X-ray cone beam displaced from a central position of the CT imaging region (51) to perform an offset scan X-ray CT imaging of the object."

IV. The following documents are relevant to this decision:

O1 DE 197 54 670 A1

O2 WO 2007/020318 A2
O3 Figure 11 of JP 2005 006772 A
O3' US 2004 258195 A1, Figure 11 corresponding to JP 2005 006772 A
O4 US 2004 258195 A1, Figure 10 corresponding to JP 2005 006772 A
O5 JPS58116342 with English translation
O6 JP 2000298105A with English translation

V. The appellant's arguments relevant to the present decision can be summarised as follows.

Main request - inventive step starting from O1

The subject-matter of claim 1 was not inventive when starting from O1.

O1 used a single controller, not two separate controllers, for acquiring CT and panoramic images. Moreover, in view of documents O3 to O6 and paragraph [0065] of the patent specification, it was clear that features M1.8, M1.9 and M1.10 were independent from each other. Hence, O1 disclosed features M1.0 to M1.9, meaning that feature M1.10 defined the only distinguishing feature.

The problem to be solved could be seen as using an unmodified generator-detector system to allow imaging an enlarged field of view. Alternatively, the problem could be regarded as allowing an offset CT scan.

O2 addressed this problem and taught that an enlarged field of view could be achieved by means of an offset geometry in which the centre between the X-ray source and the X-ray detector followed a circular path during the acquisition. The person skilled in the art was a

highly qualified engineer, aware of different ways of acquiring an offset CT scan as shown in O3 to O6, and would have understood the principle underlying the teaching of O2, recognising that the offset CT acquisition could be achieved in the system of O1 by using the available X-Y table to displace the rotary axis along a circular orbit during CT acquisition. Accordingly, the combination of O1 and O2 rendered the subject-matter of claim 1 obvious.

Main request - inventive step starting from O2

The subject-matter of claim 1 was not inventive when starting from O2 for the reasons indicated in the notice of opposition.

The subject-matter of claim 4 was rendered obvious by the combination of O2 and O1.

VI. The respondent's arguments relevant to the present decision can be summarised as follows.

Main request - inventive step starting from O1

The subject-matter of claim 1 was not rendered obvious by the combination of O1 and O2.

O1 did not disclose any of features M1.8 to M1.10. These features solved the problem of obtaining an enlarged field of view.

The person skilled in the art starting from O1 and consulting O2 would have used slide means as taught by O2 and would not have moved the rotary shaft during the acquisition. Hence, they would not have arrived at the solution defined by claim 1.

Main request - inventive step starting from O2

The arguments considered in the appealed decision and repeated on appeal were to be disregarded. The appellant's attack of lack of inventive step against claim 4 as granted was raised for the first time in the appeal proceedings and should not be admitted.

Reasons for the Decision

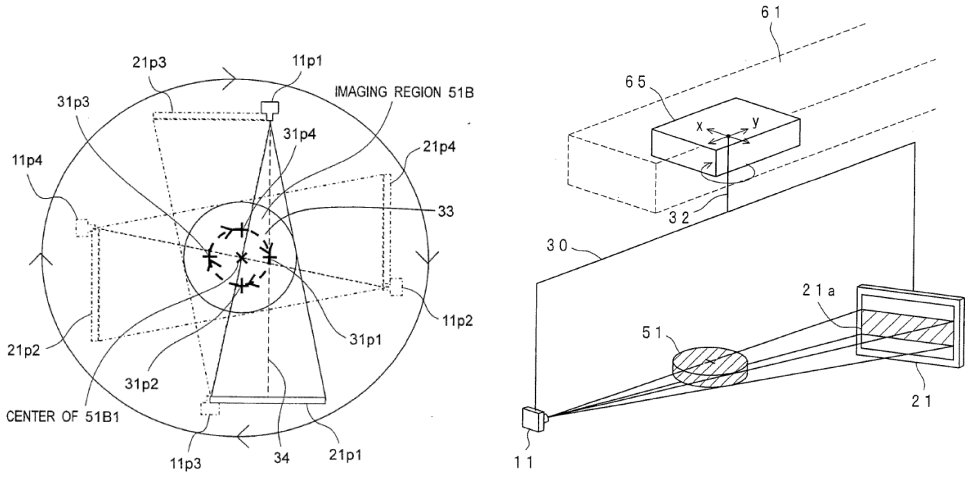
1. The patent

1.1 The patent relates to an X-ray computed tomography (CT) imaging apparatus, in particular a head X-ray CT apparatus using an X-ray cone beam.

1.2 In conventional CT imaging, acquisition relies on a synchronous rotation of the X-ray generator and the X-ray detector around the centre of the imaging region. Thus, the size of the X-ray detector limits the maximum size of the imaging area. A wider imaging area requires a larger and more expensive X-ray detector.

1.3 The patent addresses this by proposing an apparatus to image a wide area with an X-ray detector having a small detection area.

1.4 Reproduced below are Figures 2A and 3 of the patent specification. Figure 3 shows an embodiment of the invention with a frame 61, a rotary shaft 32 and a supporter 30, the supporter 30 having an X-ray generator 11 and an X-ray detector 21.



1.5 At each moment during the acquisition, the apparatus does not irradiate the entire CT imaging region 51 but only a part of it, as shown for each of the four imaging phases p1 to p4 displayed in Figure 2A. This offset acquisition geometry is achieved in the apparatus of claim 1 by simultaneously driving two movement mechanisms to move the rotary shaft 32 and rotate the supporter 30. Thus, the rotary shaft 32 travels along a circular orbit around the centre of the CT imaging region 51. In Figure 2A, the orbit of the rotary shaft throughout the acquisition is shown as a dashed circle starting and ending at point 31p1. Although the data acquired at each time point covers only part of the CT imaging region 51, the data acquired throughout the complete acquisition covers the entire CT imaging region 51 so that a three-dimensional CT image can be reconstructed based on this data.

2. **Main request - inventive step starting from O1**

2.1 O1 discloses an apparatus (see Figure 2 of O1) which can selectively operate in a panoramic mode and a CT/tomographic mode. An arm 18 carrying an X-ray generator 28 and an X-ray detector 38 is rotatable around a rotary shaft 22. The apparatus includes a movement

mechanism 20 which allows displacing the rotary shaft 22 in the X and Y directions.

2.2 According to O1, the movement mechanism to displace the rotary shaft is not used in the CT mode but only in the panoramic mode (see, for example, the characterising portion of claim 1 of O1). Although CT and panoramic imaging modes use X-ray and, in the disclosure of O1, can be acquired with the same apparatus, data acquisition and data processing/reconstruction as well as the images resulting from each mode are different for each imaging mode.

2.3 It is common ground that the subject-matter of claim 1 is novel over O1 at least in that O1 does not disclose feature M1.10. The question of whether O1 discloses features M1.8 and M1.9 can be left unanswered.

2.4 The offset CT acquisition as defined in feature M1.10 allows the acquisition of a CT image with a larger field of view with the same X-ray detector.

2.5 The appellant submitted two possible technical problems. The problem of allowing an offset CT scan cannot be accepted because it contains an unallowable pointer to the solution of claim 1. Rather, the problem to be solved is providing a CT device with an enlarged field of view (see paragraphs [0006] and [0017] of the patent specification).

2.6 O2 discloses an apparatus which can acquire an offset CT image and thus a larger field of view without requiring a larger X-ray detector. O2 thus addresses the above problem.

2.7 The apparatus of O2 consists of a frame 25 which supports a rotating part 23 with a support part 26. The X-ray source 22 and the detector 21 are at each end of the support part 26 (see Figure 2 and page 4, lines 29 to 35). The apparatus of O2 further comprises slide means which allow mutual linear sideways movement between the rotating part 23 and the support part 26. Prior to the offset CT acquisition, the support part 26 is displaced sideways so that the centreline between X-ray source 22 and detector 21 is offset with respect to the axis of rotation between the rotating part 23 and the frame 25. During the offset CT acquisition, i.e. during the rotating motion around the object, the support part 26 and the rotating part 23 remain in a mutually fixed position (see page 6, lines 7 to 16 and 25 to 28 of O2).

2.8 As pointed out by the respondent, implementing in the apparatus of O1 the solution taught by O2 would mean that slide means would be provided to displace the arm 18 sideways from the rotary shaft 22 prior to the acquisition of the CT data. The rotary shaft 22 would not be moved/translated during the offset CT acquisition, so it would not travel along a circular orbit (as required by feature M 1.9) while the X-ray cone beam is projected to perform an offset CT scan (feature M1.10, with the word "while" linking both features). Hence, the resulting apparatus and in particular its controller would not comprise features M1.9 and M1.10 in combination and thus would not fall within the scope of claim 1.

2.9 The appellant's argument that there existed ways to acquire an offset CT scan without feature M1.9, referring to documents O3 to O6, is of no bearing in view of the wording of claim 1 requiring features M1.9

and M1.10 in combination and linked by the word "while".

2.10 The appellant argues that the person skilled in the art was a highly qualified engineer who would not modify the arrangement of O1 as taught by O2. Instead, they would detect and apply the underlying principles, and they would recognise that the offset acquisition geometry could be achieved without slide means by using instead the X-Y translation mechanism available in O1 to move the rotary shaft along a circular orbit.

2.11 This argument is based on hindsight. O1 does not disclose any movement of the rotary shaft 22 during CT acquisition. O2 does not disclose any movement of the rotating part 23 during CT acquisition either. Hence, the person skilled in the art - a highly qualified engineer as submitted by the appellant - starting from O1 and in light of O2, would not have provided for such a movement during CT acquisition without applying inventive skill. Rather, they would have implemented the solution as described in O2 (see point 2.8 above) and thus would not have arrived at an apparatus falling within the scope of claim 1.

2.12 It follows that the combination of O1 and O2 does not render the subject-matter of claim 1 obvious.

3. Main request - inventive step starting from O2

3.1 The appealed decision deals with the line of reasoning for lack of inventive step starting from O2 included in the notice of opposition repeated in section III of the statement of grounds of appeal. The appellant, however, did not provide any further arguments on that line of reasoning. Hence, this part of the appellant's

submission is not substantiated within the meaning of Article 12(3) RPBA. The Board used its discretion not to admit it under Article 12(5) RPBA.

3.2 The appellant's objection of lack of inventive step of the subject-matter of claim 4 is brought forward for the first time with the statement of grounds of appeal. It thus constitutes an amendment within the meaning of Article 12(2) RPBA. The appellant has not provided any reasons for submitting this new objection in the appeal proceedings, nor are any reasons apparent to the Board. The Board thus decided under Article 12(4) RPBA not to admit this objection into the appeal proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

C. Moser M. Alvazzi Delfrate

Decision electronically authenticated