Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 10 January 2013

Case Number: T 0247/09 - 3.5.05

Application Number: 02743563.5

Publication Number: 1451671

IPC: G06F3/033

Language of the proceedings: EN

Title of invention:
Image processing method for interacting with a 3-D surface represented in a 3-D image

Applicant:
Qualcomm Incorporated

Headword:
Image processing of 3-D objects/QUALCOMM

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
Novelty - second and fifth auxiliary requests (no)
Inventive step - all requests (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0247/09 - 3.5.05

D E C I S I O N
of the Technical Board of Appeal 3.5.05
of 10 January 2013

Appellant: (Applicant)	Qualcomm Incorporated 5775 Morehouse Drive San Diego, CA 92121 (US)
Representative:	Carstens, Dirk Wilhelm Wagner & Geyer Gewürzmühlstrasse 5 80538 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted 12 September 2008 refusing European patent application No. 02743563.5 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair: A. Ritzka
Members: K. Bengi-Akyuerek
F. Blumer

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division, posted on 12 September 2008, refusing European patent application No. 02743563.5 on the grounds of lack of novelty (Article 54 EPC) with respect to a main and a first auxiliary request, and lack of inventive step (Article 56 EPC) with respect to a second and third auxiliary request, having regard to the disclosure of

D1: US-A-6 097 393.

II. Notice of appeal was received on 6 October 2008. The appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 26 November 2008. The appellant requested that the decision of the examining division be set aside and that a patent be granted on the basis of redrafted claims (claims 1 to 15) according to a main request or one of three auxiliary requests submitted with the statement setting out the grounds of appeal. In addition, oral proceedings were requested as an auxiliary measure.

III. A summons to oral proceedings scheduled for 10 January 2013 was issued on 8 October 2012. In an annex to this summons, the board gave its preliminary opinion on the appeal pursuant to Article 15(1) RPBA. In particular, objections were raised under Article 52(1) EPC in conjunction with Articles 54 and/or 56 EPC, mainly in view of D1.

IV. With a letter of reply dated 7 December 2012, the appellant submitted amended claims according to a

fourth auxiliary request (claims 1 to 13).

V. Oral proceedings were held as scheduled on 10 January 2013, during which the pending main request, the first auxiliary request, the second auxiliary request, and the third auxiliary request were renamed as the second auxiliary request, third auxiliary request, fourth auxiliary request, and fifth auxiliary request, respectively, while the pending fourth auxiliary request was renamed as the main request. Furthermore, a new set of claims was filed as a first auxiliary request. All the pending requests were admitted into the proceedings and the main and first auxiliary requests were discussed. Concerning the remaining auxiliary requests, the appellant did not provide any further comments as to the substance during the oral proceedings, but only referred to the respective written submissions.

The appellant finally requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request, filed as the fourth auxiliary request with the letter dated 7 December 2012, or on the basis of the first auxiliary request as filed during the oral proceedings before the board, or on the basis of any of the second, third, fourth and fifth auxiliary requests, filed as the main request, first, second and third auxiliary requests, respectively, with the statement setting out the grounds of appeal. At the end of the oral proceedings, the decision of the board was announced.

VI. Independent claim 1 of the main request reads as follows:

"Image processing method for displaying a

processed image of a three dimensional (3-D) object using a two-dimensional display means and for interacting with the surface of the displayed 3-D object comprising steps of constructing and displaying of at least two coupled views of the surface of the 3-D object, including a global 3-D view (32A) and a connected local 2-D view (32B) of the surface of said object on which local interactions are made, further comprising steps of interactively navigating on the object surface in the 2-D view (32B) and processing data in said view with automatic updating of corresponding data in the other coupled view (32A);
for a static representation of said two coupled views (32A, 32B), the method further comprising steps of choosing a starting point (P0), denoted by focus point, in the 3-D view (32A), defining a region (12A) around the focus point and automatically projecting said region into the 2-D view (32B); and
for a further dynamic representation of said coupled views (32A, 32B), the method further the [sic] comprising steps of interactive navigation on the object surface, with sub-steps of continuously sliding the focus point to a new location (P1) in the 2-D view (32B), which automatically updates the new focus point in the 3-D view (32A),
defining a new region around the new focus point and automatically projecting said region into the 2-D view (32B), and sub-steps of processing data in said new region of the 2-D view (32B), which automatically and simultaneously updates corresponding data in the coupled 3-D view (32A)."

Independent claim 1 of the first auxiliary request comprises all the features of claim 1 of the main request and further adds the following feature:

"wherein the updating comprises automatically and simultaneously sliding on the 3-D view (32A)".

Independent claim 1 of the second auxiliary request reads as follows:

"Image processing method for displaying a processed image of a three dimensional (3-D) object using a two-dimensional display means and for interacting with the surface of the displayed 3-D object comprising steps of constructing and displaying of at least two coupled views of the surface of the 3-D object, including a global 3-D view (32A) and a connected local 2-D view (32B) of the surface of said object on which local interactions are made, further comprising steps of interactively navigating on the object surface in the 2-D view (32B) and processing data in said view with automatic updating of corresponding data in the other coupled view (32A)."

Independent claim 1 of the third auxiliary request comprises all the features of claim 1 of the second auxiliary request and further adds the following feature:

"wherein the local 2-D view (32B) is obtained by a projection technique resulting in local surface flattening".

Independent claim 1 of the fourth auxiliary request comprises all the features of claim 1 of the second auxiliary request and further adds the following feature:

"wherein a region around a focus point is defined and automatically projected into the 2-D view and wherein

an amplitude of the region is automatically delimited in order to avoid that the distortion of elements exceed [sic] a predetermined threshold".

Independent claim 1 of the fifth auxiliary request comprises all the features of claim 1 of the second auxiliary request and further adds the following feature:

"wherein a focus point is constantly set in a center of both views thereby allowing during a navigation step, performing a continuous interaction with the 3-D surface view by sliding on the 2-D surface view, called Virtual Mouse Pad".

Reasons for the Decision

1. Admissibility of the appeal

The appeal complies with the provisions of Articles 106 to 108 EPC (cf. point II above) and is therefore admissible.

2. MAIN REQUEST

This request was filed in response to the objections raised in the board's communication under Article 15(1) RPBA and further limits the underlying subject-matter. Therefore, it was admitted into the proceedings under Article 13(1) RPBA.

The claim set of this request differs from that of the main request underlying the appealed decision mainly in that claim 1 as amended further comprises the features of claims 2 and 5 (corresponding to originally filed

claims 3 and 6, respectively) while the word "continuously" has been incorporated before the term "sliding" (supported by page 8, lines 19-21 of the application as filed).

Hence, the above amendments comply with the provision of Article 123(2) EPC.

2.1 Article 52(1) EPC: Novelty and inventive step

In the board's judgment, claim 1 of this request does not meet the requirements of Articles 52(1) and 56 EPC, for the following reasons:

2.1.1 Although the board expressed its reservations as to novelty with regard to claim 1 (Article 54 EPC), for procedural efficiency reasons, the board decided only upon the question of inventive step regarding claim 1 of this request at the oral proceedings.

2.1.2 Since claim 1 of the first auxiliary request is more limited in scope and since it was decided that claim 1 of the first auxiliary request lacks an inventive step (cf. point 3.2 below), the board holds that claim 1 of the main request *a fortiori* lacks an inventive step (Article 56 EPC) based on the reasoning in view of the first auxiliary request set out in point 3.1 below.

2.2 In conclusion, this request is not allowable (at least) under Article 56 EPC.

3. FIRST AUXILIARY REQUEST

Although this new request was submitted during the oral proceedings before the board, i.e. at a relatively late stage of the procedure, it was admitted into the

proceedings under Article 13(1) RPBA, since it was considered as a serious attempt to overcome the objections raised by the board during the oral proceedings.

This request differs from the main request basically in that claim 1 as amended further specifies that

(a) the updating of the focus point comprises automatically and simultaneously sliding on the 3-D view.

This amendment is based on the disclosure of page 8, lines 19-21 of the description as filed.

3.1 Article 52(1) EPC: Novelty and inventive step

The board judges that claim 1 of this request does not meet the requirements of Article 52(1) EPC in conjunction with Article 56 EPC, for the following reasons:

3.1.1 The board agrees with the examining division that D1 represents the closest prior art since this document is, like the present invention, related to the interaction between coupled 2-D and 3-D display views of an original 3-D object for a user-friendly navigation through those views.

3.1.2 Document D1 discloses, with regard to the terminology of claim 1, an image processing method for displaying a processed image of a 3-D object ("three-dimensional view of a first room 114"; see Fig. 1) using a 2-D display means ("display device 102"; see Fig. 7) and for interacting with the surface of the displayed 3-D object (see e.g. Figs. 1-4). The method of D1 further involves the construction and display of two coupled

views, namely a local 2-D view ("view box window 108") and a global 3-D view ("main view window 104") of the surface (i.e. "top plan view") of the 3-D object (see e.g. column 7, lines 33-38 and Fig. 1). Also, local interactions are made on the object in question (see e.g. column 19, lines 20-24). In addition, D1 teaches a "first mode of navigating" and a "second mode of navigating". The "first mode" implies 3D-to-2D updates and corresponds to the "static representation" of the coupled views according to claim 1 whereas the "second mode" implies 2D-to-3D updates and corresponds to the "dynamic representation" in the sense of claim 1 (see e.g. column 9, line 24 to column 10, line 50).

In the "first mode", a region ("three-dimensional space") defined by a chosen focus point ("user's position") in the 3-D view is automatically projected into the 2-D view (see e.g. column 9, lines 24-28; column 9, lines 34-40: "... As the main view camera moves through the three-dimensional space displayed in the main view window 104, a two-dimensional top view of the environment moves by or rotates around the pointer 162 so that the pointer continuously indicates the user's position ...").

According to the "second mode" of D1, the user may interactively navigate on the object surface in the 2-D view (see column 7, lines 38-42: "... A cursor 110 is preferably used for ... navigating within the view box window 108 and accessing resource icons within the main view window 104 ...") by way of continuously sliding the focus point (i.e. "cursor 110") to a new location in the 2-D view (see e.g. the sequence depicted by Figs. 2 to 4 where the cursor is continuously slid over the 2-D views) followed by an automatic update of the new focus point ("pointer 162") in the 3-D view (see

e.g. Fig. 5). Thereafter, a new region around the new focus point may be defined along with automatically projecting this region into the 2-D view according to the "first mode" (see e.g. column 9, lines 24-40).

Finally, processing data in the new region of the 2-D view is followed by an automatic and simultaneous update of the processed data in the coupled 3-D view (see e.g. column 17, line 36 to column 18, line 17 in combination with Fig. 11, steps 268 to 274).

3.1.3 As regards feature (a), even though the "second mode" in D1 involves an update of the focus point on the 3-D view *after* having been moved on the 2-D view (see e.g. Figs. 1 to 5 exemplifying the situation before and after a pointer update), the board agrees with the appellant that D1 does not directly and unambiguously disclose an automatic and simultaneous sliding on the 3-D view *while* continuously sliding the focus point on the 2-D view.

3.1.4 Hence, the difference between the subject-matter of claim 1 and the disclosure of D1 is seen to reside in feature (a). Consequently, the subject-matter of claim 1 of this request is found to be novel over D1 (Article 54 EPC).

3.1.5 The board accepts the view of the appellant that the objective problem to be solved by claim 1 may be regarded as being how to ensure that a user does not get lost when considering a more complex surface to be viewed with the image processing method under consideration.

3.1.6 From the relevant embodiments of D1, the skilled person would understand that the 3-D objects being viewed are

relatively simple graphical images such as furnished rooms of a modelled house with regular geometric object surfaces related to furniture (see e.g. Fig. 1). Hence, the skilled person would know that for this scenario the danger of a user becoming disoriented when sliding on the 2-D view is negligible. Moreover, concerning the 2D-to-3D updates according to the "second mode", the skilled person would deduce therefrom that the focus point on the 3-D view appears to be actually updated only at the conclusion of the leap of the focus point on the 2-D view (see e.g. column 12, lines 13-22 and, in particular, column 19, lines 5-7) instead of updating the focus point on the 3-D view simultaneously with the continuous sliding operation performed on the 2-D view.

When confronted with the task of processing complex surfaces (such as e.g. cylindrical or tubular surfaces including circumvolutions) according to the above objective problem, the skilled person in the field of image processing would therefore consider it quite useful to enable virtually synchronised views to be displayed not only *after* but also *during* the movement of the focus point in order to avoid the viewing user becoming disoriented or stuck when continuously moving through complex or more challenging surfaces on the 2-D view.

Furthermore, based on the implementation details as to the "second mode" presented in D1 (see column 17, line 36 to column 19, line 9), the skilled person would not see any obstacles or difficulties in enforcing such a simultaneous update. To the contrary, the person skilled in the art would notice that calls to the respective "main view camera movement task 202" (see Fig. 11, step 274) were solely to be done during the

leap from one pointer position to another rather than at its termination. This modification of the "second mode" in D1 would amount merely to a minor adaptation associated with no surprising technical effect, as the functional operations of this mode (as demonstrated in Fig. 11) could remain unaltered while only the update interval depending on the focus point movements would have to be adapted accordingly for attaining essentially simultaneous updates. This is all the more so when considering that the application itself does not provide any details as to the actual implementation or expected challenges with regard to the simultaneous view updates.

As a consequence, the board can therefore see no reason why the person skilled in the art using his common general knowledge would be deterred from applying essentially simultaneous 2D-to-3D view updates in the event of complex surfaces to be viewed. Nor could the appellant provide any plausible reason in this regard during the oral proceedings.

3.1.7 In view of the above, the subject-matter of claim 1 of this request does not involve an inventive step, having regard to D1 and the skilled person's common general knowledge.

3.1.8 The appellant argued that the 2-D view used in D1 was not a representation of the surface of the displayed objects but at most showed portions of the object surface which can be seen from a specific view point and would only describe setting this view point by navigating in space rather than on a surface.

The board considers, however, that - due to the broad scope of the term "surface" - the respective 2-D view

(i.e. "view box window 108") showing a top plan view with respect to the X-Z coordinates of the 3-D object in D1 (see e.g. column 9, lines 29-45) clearly corresponds to a representation of the object surface as claimed.

3.1.9 The appellant further submitted that D1 did not provide any hint to interacting with the displayed objects.

In this regard, the board takes the view that D1 not only teaches that resource icons within the displayed object may be double clicked for displaying the corresponding resources (see e.g. column 19, lines 20-24), in accordance with the finding in the decision under appeal, but also that the user may move the respective resources by dragging the associated sub-resources to another position (see column 20, lines 1-5; Fig. 15) which can be readily read onto interactively navigating on the object surface in the corresponding 2-D view as claimed.

3.1.10 Moreover, in the appellant's view, the phrase "continuously sliding the focus point" of claim 1 implied that the mouse for placing the focus point was continuously moved from one position to another position. Based on this interpretation, D1 did not disclose the feature of continuously sliding the focus point to a new location in the 2-D view. Instead, D1 merely taught to "leap" directly between a first point and a second point on the 3-D view according to column 10, lines 28-50 of D1.

The board notes, however, that D1 in fact teaches a sequence of cursor movements within the 2-D view (see column 10, lines 63-67 and Figs. 1 to 5) which palpably evidences that the focus point ("cursor 110") is

continuously moved through the different window views according to this embodiment rather than "directly" leaping from one point to another, i.e. moving the focus point in one go.

3.2 In conclusion, this request is not allowable under Article 56 EPC.

4. SECOND AUXILIARY REQUEST

This request corresponds to the main request underlying the appealed decision and differs from the first auxiliary request substantially in that claim 1 as amended no longer contains feature (a) as quoted in point 3 above, i.e. the sole difference between claim 1 of the first auxiliary request and the disclosure of D1.

4.1 Article 52(1) EPC: Novelty and inventive step

The feature analysis and observations concerning the first auxiliary request set out in points 3.1.2, 3.1.8, and 3.1.9 apply *mutatis mutandis* to claim 1 of this request. As a result, the subject-matter of claim 1 of this request lacks novelty (Article 54 EPC).

4.2 In conclusion, this request is not allowable under Article 54 EPC.

5. THIRD AUXILIARY REQUEST

This request is based on the main request underlying the appealed decision and differs from the present second auxiliary request in that claim 1 as amended further specifies that
(b) the local 2-D view is obtained by a projection

technique resulting in local surface flattening.

Added feature (b) is supported by page 6, lines 24-27 and page 9, lines 8-9 of the application as filed.

5.1 Article 52(1) EPC: Novelty and inventive step

5.1.1 The feature analysis and observations with respect to the first auxiliary request (cf. points 3.1.2, 3.1.8, and 3.1.9) apply *mutatis mutandis* to claim 1 of this request.

5.1.2 The added feature (b), however, is not directly and unambiguously disclosed in D1. Thus, the subject-matter of claim 1 of this request is considered novel over D1 (Article 54 EPC).

5.1.3 However, the board takes the view that the type and details of the specific projection technique to be used is a common problem with which the skilled person in the field of image processing could be faced and the selection thereof typically depends on the practical circumstances. In this context, the skilled person would know from his common general knowledge that the well-established local surface flattening scheme (as corroborated by the original application itself; see page 9, lines 8-19) should be suitable for performing such a projection. Hence, he would readily select one of equally likely technological alternatives for performing 3D-to-2D projections without exercising any inventive skills (Article 56 EPC).

5.1.4 In view of the above, the subject-matter of claim 1 of this request does not involve an inventive step, having regard to D1 and the skilled person's common general

knowledge.

5.2 In conclusion, this request is not allowable under Article 56 EPC.

6. FOURTH AUXILIARY REQUEST

This request corresponds to the second auxiliary request underlying the appealed decision and differs from the present second auxiliary request in that claim 1 as amended further specifies that

(c) a region around a focus point is defined and automatically projected into the 2-D view;

(d) an amplitude of the region is automatically delimited in order to avoid that the distortion of elements exceed[s] a predetermined threshold.

6.1 Article 52(1) EPC: Novelty and inventive step

6.1.1 The feature analysis and observations with respect to the first auxiliary request (cf. points 3.1.2, 3.1.8, and 3.1.9) apply *mutatis mutandis* to claim 1 of this request.

6.1.2 Therefore, feature (c) is also found to be disclosed in D1 (see e.g. column 9, lines 34-39). The board holds, however, that the added feature (d) is not anticipated by D1. Hence, the subject-matter of claim 1 of this request is novel (Article 54 EPC).

6.1.3 The board finds that the objective problem associated with the distinguishing feature (d) may be regarded as how to limit distortions in projecting a 3-D object into a 2-D view. Yet, using thresholds for limiting distortions in any projection scheme is viewed as a straightforward implementation detail to the skilled

person according to the board.

6.1.4 For these reasons, the subject-matter of claim 1 of this request does not involve an inventive step having regard to D1 and the skilled person's common general knowledge.

6.2 In conclusion, this request is not allowable under Article 56 EPC either.

7. FIFTH AUXILIARY REQUEST

This request is based on the main request underlying the appealed decision and differs from the present second auxiliary request in that claim 1 as amended further specifies that

(e) a focus point is constantly set in a center of both views thereby allowing during a navigation step, performing a continuous interaction with the 3-D surface view by sliding on the 2-D surface view, called Virtual Mouse Pad.

The added feature (e) is supported e.g. by claims 7 and 12 of the application as filed.

7.1 Article 52(1) EPC: Novelty and inventive step

7.1.1 The feature analysis and observations with respect to the first auxiliary request (cf. points 3.1.2, 3.1.8, and 3.1.9) apply *mutatis mutandis* to claim 1 of this request.

7.1.2 Concerning the added feature (e), the phrase "thereby allowing during a navigation step, performing a continuous interaction with the 3-D surface view by sliding on the 2-D surface view" is considered to

indicate merely the purpose associated with centrally setting the focus point while the statement "called Virtual Mouse Pad" simply concerns the naming of such a setting rather than effectively limiting the scope of this claim.

7.1.3 Hence, feature (e) is also found to be anticipated by D1 (see column 9, lines 29-34: "The view box window 108 preferably shows a top plan view ... where the ... location of the main view camera ... is always located in the center of the view box window 108 and is depicted by a pointer 162 preferably shaped like a triangle ..."). As a result, the subject-matter of claim 1 of this request lacks novelty.

7.2 In conclusion, this request is not allowable under Article 54 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

K. Götz A. Ritzka

Decision electronically authenticated