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**Datasheet for the decision  
of 27 July 2021**

**Case Number:** T 2011/20 - 3.5.05

**Application Number:** 06766123.1

**Publication Number:** 1955226

**IPC:** G06F19/00, A61C5/04

**Language of the proceedings:** EN

**Title of invention:**

METHOD FOR MANIPULATING A DENTAL VIRTUAL MODEL

**Applicant:**

Align Technology, Inc.

**Headword:**

Obscured finish line/ALIGN

**Relevant legal provisions:**

RPBA Art. 12(4)  
EPC Art. 83, 54(3)  
RPBA 2020 Art. 11  
EPC R. 103(4)(c)

**Keyword:**

Late-filed request - request could have been filed in first instance proceedings (yes)

Sufficiency of disclosure - (yes)

Remittal - (yes) - special reasons for remittal



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Case Number: T 2011/20 - 3.5.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.05**  
**of 27 July 2021**

**Appellant:** Align Technology, Inc.  
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**Representative:** Leach, Sean Adam  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 27 July 2020  
refusing European patent application No.  
06766123.1 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chair** A. Ritzka  
**Members:** E. Konak  
D. Prietzel-Funk

## **Summary of Facts and Submissions**

- I. The appeal is against the decision of the examining division to refuse the application for lack of sufficiency of disclosure (Article 83 EPC) of the invention according to claim 1 of the main request and the auxiliary request then on file.
- II. With its statement setting out the grounds of appeal, the appellant filed a new main request and nine auxiliary requests to replace the requests on file. It requested that the decision be set aside and that a patent be granted on the basis of one of these requests. It requested oral proceedings as an auxiliary measure.
- III. With its preliminary opinion issued in preparation for the oral proceedings, the board informed the appellant of its intention not to admit the main request and the first to fourth auxiliary requests but to remit the case to the examining division for further examination.
- IV. In reply, the appellant withdrew its request for oral proceedings. The oral proceedings were thus cancelled.
- V. The following document was referred to as the closest prior art during the examination proceedings:  
  
D1: EP 1 607 041 A2
- VI. Claim 1 of the main request reads as follows:  
  
"A computer-implemented method of creating an auxiliary 3D virtual model corresponding to an obscured portion

(S2) of a finish line in a 3D virtual model of at least a portion of an intraoral cavity comprising a preparation (P) having said finish line (S), the computer-implemented method comprising:

(A) providing a 3D virtual model (500) of at least a portion of the intraoral cavity comprising the preparation having the finish line (S), wherein at least a portion (S2) of the finish line (S) is obscured by obscuring matter (550), wherein the 3D virtual model comprises 3D digitized data of the intraoral cavity provided by scanning a patient's teeth;

(B) identifying in said 3D virtual model (500) a first virtual model part (510) representing a dental site (250) comprising said preparation (P) and a second virtual model part (520) representing at least soft tissues in abutting virtual contact with said first virtual model part;

(C) manipulating said 3D virtual model (500) such as to separate said first virtual model part (510) from said second virtual model part (520);

(D) manipulating said 3D virtual model (500) in an area comprising said obscured portion of said finish line (S) in a virtual manner such as to create an auxiliary 3D virtual model corresponding to said obscured portion of said finish line, wherein the manipulating comprises manipulating said first virtual model part such as to create said auxiliary virtual model; and

(E) providing topographical data of the finish line from the 3D virtual model and the said 3D auxiliary virtual model, wherein manipulating said first virtual model part (510) such as to create said auxiliary virtual model corresponding to said obscured part of said finish line comprises:

(F) providing at least one cross section (CN) of said 3D virtual model (500) along a working plane (XN) inclined to the occlusion plane, at least within said

obscured finish line portion, said cross-section comprising a first cross-section profile representing said preparation and a second cross-section profile representing said obscuring matter in abutting virtual contact with said first cross-section profile at a contact region;

(G) extrapolating said first cross-section profile from said contact region to provide a third cross-section profile representing an approximation of a corresponding cross-section of said dental site obscured by said obscuring matter and identifying therein a corresponding element of said obscured finish line portion (S2N)."

VII. Claim 1 of the first auxiliary request differs from claim 1 of the main request in that it has the following additional text at the end:

"wherein the extrapolating is based on one of:

(a) spatial data of the first cross section profile and an expected profile of the finish line's cross section; and

(b) input data provided by a user and indicating locations at which the user considers that the missing finish line data may be in relation to the first cross-section."

VIII. Claim 1 of the second auxiliary request differs from claim 1 of the first auxiliary request in that step (A) of the claimed method reads as follows (with the additions underlined and the deletions ~~struck through~~):

"(A) providing a 3D virtual model (500) of at least a portion of the intraoral cavity comprising the preparation having the finish line, wherein ~~at least a portion (S2) of the~~ finish line (S) is partially

obscured by obscuring matter and partially not obscured, (550), wherein the 3D virtual model comprises 3D digitized data of the intraoral cavity provided by scanning a patient's teeth;"

- IX. Claim 1 of the third auxiliary request differs from claim 1 of the second request in that step (G) of the claimed method reads as follows (with the deletions ~~struck through~~):

"(G) extrapolating said first cross-section profile from said contact region to provide a third cross-section profile representing an approximation of a corresponding cross-section of said dental site obscured by said obscuring matter and identifying therein a corresponding element of said obscured finish line portion (S2N) wherein the extrapolating is based on ~~one of~~:

~~(a) spatial data of the first cross section profile and an expected profile of the finish line's cross section; and~~

~~(b) input data provided by a user and indicating locations at which the user considers that the missing finish line data may be in relation to the first cross-section."~~

- X. Claim 1 of the fourth auxiliary request differs from claim 1 of the second request in that step (G) of the claimed method reads as follows (with the deletions ~~struck through~~):

"(G) extrapolating said first cross-section profile from said contact region to provide a third cross-section profile representing an approximation of a corresponding cross-section of said dental site obscured by said obscuring matter and identifying

therein a corresponding element of said obscured finish line portion (S2N) wherein the extrapolating is based on ~~one of:~~

~~(a) spatial data of the first cross section profile and an expected profile of the finish line's cross section; and~~

~~(b) input data provided by a user and indicating locations at which the user considers that the missing finish line data may be in relation to the first cross-section."~~

XI. Claim 1 of the fifth auxiliary request reads as follows:

"A method comprising a computer-implemented method for manipulating a virtual dental model and a step of using the virtual dental model in manufacturing a coping and/or a prosthesis, the computer-implemented method for manipulating a virtual dental model comprising:

(A) providing a 3D virtual model (500) of at least a portion of the intraoral cavity comprising the preparation having the finish line (S), wherein at least a portion (S2) of the finish line (S) is obscured by obscuring matter;

(B) identifying in said 3D virtual model (500) a first virtual model part (510) representing a dental site (250) comprising said preparation (P) and a second virtual model part (520) representing at least soft tissues in abutting virtual contact with said first virtual model part;

(C) manipulating said 3D virtual model (500) such as to separate said first virtual model part (510) from said second virtual model part (520);

(D) manipulating said 3D virtual model (500) in an area comprising said obscured portion of said finish line (S) in a virtual manner such as to create an auxiliary



3D virtual model corresponding to said obscured portion of said finish line, wherein the manipulating comprises manipulating said first virtual model part such as to create said auxiliary virtual model; and

(E) providing topographical data of the finish line from the 3D virtual model and the said 3D auxiliary virtual model, wherein manipulating said first virtual model part (510) such as to create said auxiliary virtual model corresponding to said obscured part of said finish line comprises:

(F) providing at least one cross section (CN) of said 3D virtual model (500) along a working plane (XN) inclined to the occlusion plane, at least within said obscured finish line portion, said cross-section comprising a first cross-section profile representing said preparation and a second cross-section profile representing said obscuring matter in abutting virtual contact with said first cross-section profile at a contact region;

(G) extrapolating said first cross-section profile from said contact region to provide a third cross-section profile representing an approximation of a corresponding cross-section of said dental site obscured by said obscuring matter and identifying therein a corresponding element of said obscured finish line portion (S2N)."

XII. Claims of lower ranking auxiliary requests are not relevant for this decision.

### **Reasons for the Decision**

1. Admissibility of the main request and the first to fourth auxiliary requests (Article 12(4) RPBA 2007)

- 1.1 The fifth auxiliary request filed with the statement setting out the grounds of appeal corresponds to the main request on which the contested decision is based, except for the addition of reference signs to the claims. With its statement setting out the grounds of appeal, the appellant filed a new main request and new first to fourth auxiliary requests as its higher-ranking requests.
- 1.2 The appellant explains the reasons for this behaviour as follows (see the statement setting out the grounds of appeal, page 1, last paragraph): "*The undersigned representative has newly taken responsibility for the file, and whilst it is understood that this does not justify the late filing of new requests, our review of the file has brought to light issues which the Applicant had not previously fully appreciated*".
- 1.3 In accordance with the case law of the Boards of Appeal (see Case Law of the Boards of Appeal of the European Patent Office, Ninth Edition, July 2019, V.A.4.8.2), the fact that newly-filed requests are filed by a new representative bears no weight on their admissibility.
- 1.4 The "*issues which the Applicant had not previously fully appreciated*" concern, in particular, the objection raised by the examining division in its communication of 14 August 2019 that the method of claim 1 had to be amended to include a manufacturing step. In the examination proceedings, the appellant chose to address this objection by adding the required step to claim 1 (see the appellant's letter of 20 December 2019, page 1, last paragraph and the sole main request filed on that date, preamble of claim 1). However, in its statement setting out the grounds of

appeal (page 2, penultimate paragraph), the appellant states that this objection is believed to have been incorrect. Therefore, it deleted this step in claim 1 of the main request and the first to fourth auxiliary requests.

- 1.5 Regardless of whether the objection raised by the examining decision was correct or incorrect, by addressing it through the amendment required by the examining division during the examination proceedings, the appellant effectively prevented the examining division from deciding on that objection. The purpose of appeal proceedings is to review what was decided upon; not to reopen the examination of issues which the examining division was prevented from deciding upon. Such requests could and should have been filed in the examination proceedings.
- 1.6 Therefore, the board does not admit the main request and the first to fourth auxiliary requests (Article 12(4) RPBA 2007).
2. Sufficiency of disclosure of the fifth auxiliary request (Article 83 EPC)
  - 2.1 The contested decision found the invention according to claim 1 of the fifth auxiliary request (the then main request) not to be sufficiently disclosed with regard to step (G) of the method of claim 1, namely identifying an approximate obscured finish line portion in a 3D virtual dental model by extrapolating cross-section profiles along a working plane inclined to the occlusion plane. The examining division objected, in particular, that the application did not provide any suitable method for automatic extrapolation. Since the shapes of teeth, tooth preparations and obscuring

matter were highly individual and asymmetrical, this would prove to be difficult. Finish lines did not have predefined geometric shapes which could be defined by a simple set of parameters and could be highly irregular. They were defined by the actual preparation, and unless the approximation according to step (G) reasonably reflected the actual finish line, the resultant extrapolation would not be meaningful.

- 2.2 The board does not find these objections convincing. As the appellant rightly argues, preparing the tooth results in a reasonably regular and smooth shape in which the individuality of the tooth is significantly reduced. This is consistent with the aim of manufacturing a dental prosthesis at the dental lab and fitting the manufactured dental prosthesis. This also holds for the finish line. The paragraph bridging pages 15 and 16 of the description, which the contested decision also refers to, names several types of finish lines known in the relevant art, namely "knife edge, feather edge, chamfer, chamfer bevel, shoulder, shoulder bevel" and states that the finish line may be a combination of different types. While the overall finish line may thus be asymmetrical, this does not mean that the finish line is unpredictable. As the cited paragraph states, a user with experience would "have a fair idea of the profile of the finish line cross section". The examining division does not contest this but apparently objects to a fully automatic extrapolation, which would be within the scope of claim 1 and which is mentioned on page 16, lines 6 to 9 and page 17, lines 1 to 3 as an alternative embodiment. However, when read in its proper context with a mind willing to understand, it is clear that the extrapolation step would in practice be implemented as an iterative semi-automatic process in which, as page

17, lines 3 to 6 put it, the extrapolated part would "be refined over and over again until a suitable result is achieved. At each iteration, the user may inspect [the result] and perhaps finely tune control parameters [...] to arrive at a better solution". It is neither required in step (G) of the method of claim 1 that a fully automatic extrapolation provide a perfect approximation of the obscured finish line, nor would the skilled person reading claim 1 in its proper context have interpreted it so.

2.3 For these reasons, the objection under Article 83 EPC in the contested decision cannot be upheld.

3. Remittal to the examining division

3.1 Aside from lack of sufficiency of disclosure being the only reason for refusal in the contested decision, the examining division has not yet properly examined novelty and inventive step. The only document used as prior art in the examining proceedings D1 is indeed late-published (publication date 21 December 2005) and could therefore only qualify as prior art within the meaning of Article 54(3) EPC. The current application claims priority from two different US patent applications, the earlier (US 60/699,499) having a filing date of 15 July 2005. It seems that the Supplementary European Search Report, which found D1, indicated it therefore to be of category "X,P". In spite of this and although the validity of the claimed priority was never questioned, in both the European Search Opinion (see points 4 and 5) and communications issued during the examining proceedings, D1 was taken to be the state of the art within the meaning of Article 54(2) EPC. The appellant also seems not to have realised this error given that it filed arguments why

the claimed invention should be considered to be inventive with regard to D1.

3.2 Since these circumstances represent special reasons within the meaning of Article 11 RPBA 2020, the board remits the case to the examining division for further prosecution.

4. Partial reimbursement of the appeal fee

4.1 In accordance with Rule 103(4)(c) EPC, the appeal fee is to be reimbursed at 25% if any request for oral proceedings is withdrawn within one month of notification of the communication issued by the board in preparation for the oral proceedings and no oral proceedings take place. In the case at hand, the request for oral proceedings was withdrawn on 17 May 2021, i.e. within the one-month period triggered by the communication dated 22 April 2021, and the oral proceedings were cancelled. Therefore, the appeal fee is to be reimbursed at 25%.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the examining division for further prosecution.
3. The appeal fee is to be reimbursed at 25%.

The Registrar:

The Chair:



K. Götz-Wein

A. Ritzka

Decision electronically authenticated