Filed on behalf of Patent Owner 3Shape A/S

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EXOCAD GMBH and EXOCAD AMERICA, INC.
Petitioners

v.

3SHAPE A/S
Patent Owner

Case No. IPR2018-00788
Patent 9,336,336

DECLARATION OF DR. ELI SABER, PH.D.

3SHAPE EXHIBIT 2001
Exocad v. 3Shape

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A. Construction of "of at least part of an oral cavity of the patient" 13

B. Construction of "arrange the at least one 2D image relative to the 3D virtual model in a virtual 3D space such that the at least one 2D image and the 3D virtual model are aligned when viewed from a viewpoint and remain separate representations after being arranged" 15

C. Construction of "render a part of the at least one 2D image that includes teeth at least partly or wholly transparent" 16

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VII. THE CLAIMS OF THE '336 PATENT ARE NEITHER ANTICIPATED BY NOR RENDERED OBVIOUS OVER THE ART CITED BY PETITIONER....17

A. Wiedmann Does Not Anticipate Claims 1-5, 7-11, 13, 14, 16-18, 22-24, and 27-30. (Ground 1) 17

1. Petitioner inappropriately relies on the same "optimum tooth shape" disclosure of Wiedmann to allegedly satisfy two distinct elements recited in the claims. 17

2. Wiedmann does not disclose a 3D virtual model "of at least part of an oral cavity of the patient." 21

3. Wiedmann does not disclose that "the 3D virtual model and the at least one 2D image are both visualized *in the 3D space*" under Petitioner's own construction. 23

4. Wiedmann does not disclose the claimed feature "remain separate representations after being arranged." 27

5. Petitioner fails to demonstrate that claims 6-8 are anticipated by Wiedmann. 29

B. Claims 1-14, 16-20, and 22-30 Would Not Have Been Obvious Over Wiedmann in view of Sachdeva. (Ground 1)....29

1. There is no reason with rational underpinnings for why a POSITA would have replaced the optimum tooth shape of Wiedmann with a 3D virtual model which is of at least part of an original oral cavity of the patient that is provided prior to designing the recited restoration. 30

2. There is no reason with rational underpinnings for modifying Wiedmann such that the 3D virtual model and the 2D image are both visualized *in the 3D space*....31

a. Wiedmann's system already allows the user to preview the treatment before the treatment is actually done, without any need to modify the system to visualize in the 3D space. 32

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b. Petitioner's conclusory assertions are unsupported by any credible evidence. 33

3. Like Wiedmann, Sachdeva fails to disclose or suggest the claimed feature "remain separate representations after being arranged." 36

C. Sachdeva Does Not Anticipate Claims 1-14, 16-20, and 22-30. (Ground 5) 36

1. Sachdeva does not disclose that "the at least one 2D image and the 3D virtual model are aligned…and remain separate representations after being arranged." 36

a. Contrary to Petitioner's assertion, Sachdeva discloses that the morphable model 102 is 3D, not 2D.....37

b. The virtual patient model in Sachdeva is a "composite, combined digital representation"—not a 2D image and a 3D virtual model that are aligned and remain separate representations after being arranged. 42

2. Sachdeva does not disclose "either virtually cut[ting] at least a part of teeth out of the at least one 2D image or render[ing] a part of the at least one 2D image that includes teeth at least partly or wholly transparent."....50

a. Contrary to Petitioner's assertion, Sachdeva explicitly discloses that the morphable face model in Fig. 6 includes teeth.....50

b. Petitioner does not even allege that a part of the X-ray image *that includes the teeth* in Sachdeva is partly or wholly transparent.....52

c. The "virtually cut/render transparent" limitation requires an active step of causing a part of the 2D image to become partly or wholly transparent. 53

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3. Sachdeva does not anticipate the dependent claims. 54

a. Sachdeva does not anticipate dependent claims 6-8. 54

b. Sachdeva does not anticipate dependent claim 9. 55

D. Claims 1-14, 16-20, and 22-30 Would Not Have Been Obvious Over Sachdeva in View of Kopelman. (Ground 5).....55

1. A POSITA would not have combined Sachdeva with Kopelman as Petitioner alleges. 56

a. There is no reason to replace Sachdeva's 3D morphable model with a 2D image as Petitioner alleges. 56

b. Contrary to the claims which require a 2D image and 3D virtual model to be aligned and remain separate representations, Kopelman discloses *combining* 2D and 3D image data. 58

2. Petitioner makes no assertion that it would have been obvious to modify Sachdeva to arrive at "either virtually cut[ting] at least a part of teeth out of the at least one 2D image or render[ing] a part of the at least one 2D image that includes teeth at least partly or wholly transparent."..... 63

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APPENDIX 1

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