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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

3SHAPE A/S and 3SHAPE INC.,
Petitioner,

v.

ALIGN TECHNOLOGY, INC.,
Patent Owner.

Case IPR2021-01383
Patent 10,728,519

DECLARATION OF DR. DAVID SCHAAFSMA IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,728,519 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.100 *et seq.*

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A. "scanning system configured to provide depth data" 41

B. "imaging system configured to provide two-dimensional color image data" 41

C. "illumination unit configured to transmit a first array of incident light along a path towards the three-dimensional structure" / "array of incident light" 42

D. "detector configured to measure intensity of each of a plurality of returned light that returns along the path and from the three-dimensional structure" 44

E. "depth data" / "depth data corresponding to a plurality of data points defined on a plane substantially orthogonal to a depth direction" 45

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1. Independent Claim 1 68

a. Claim 1: [Preamble] "A system for determining surface topology and associated color of at least a

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portion of a three-dimensional structure, comprising:” 69

b. Claim 1: Element [1.1] “a hand-held device comprising:” 71

c. Claim 1: Element [1.2] “a scanning system configured to provide depth data of said portion, the depth data corresponding to a plurality of data points defined on a plane substantially orthogonal to a depth direction” 72

d. Claim 1: Element [1.3] “an imaging system configured to provide two-dimensional color image data of said portion associated with said plurality of data points;” 78

e. Claim 1: Element [1.4] “an illumination unit configured to transmit a first array of incident light along a path towards the three-dimensional structure;” 81

f. Claim 1: Element [1.5] “a detector configured to measure intensity of each of a plurality of returned light that returns along the path and from the three-dimensional structure; and” 84

g. Claim 1: Element [1.6] “a processor operably coupled to the hand-held device and configured to associate the depth data with the two-dimensional color image data.” 86

2. Dependent Claim 3: “The system according to claim 1, wherein the plurality of data points is associated with a two-dimensional reference array.” 91

3. Dependent Claim 4: [Preamble] “The system according to claim 1,” 92

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