

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Henri Daussi, LLC,
Petitioner,

v.

ECNA, LLC,
Patent Owner.

IPR2025-00807
Patent 9,398,791

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 9,398,791**

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	REQUIREMENTS FOR <i>Inter Partes</i> Review	3
A.	Grounds for Standing	3
B.	Challenge and Relief Requested	3
III.	SUMMARY OF THE '791 PATENT	4
A.	Brief Description	4
B.	Prosecution History	6
C.	Claims.....	8
D.	Level of Ordinary Skill in the Art	11
E.	Claim Construction.....	11
IV.	THE CHALLENGED CLAIMS ARE UNPATENTABLE.....	11
A.	GROUND 1: Claims 1-14 Are Obvious Over Kanner In View of Schmidt (HDL-1003/HDL-1004)	11
1.	Kanner	11
2.	Schmidt	12
3.	Kanner and Schmidt Teach Each Element of Independent Claim 1	15
4.	Motivation to Combine Kanner and Schmidt	36
5.	Schmidt Teaches Claim 2: “The precious stone of claim 1, wherein said total depth percentage is in the range of 36.00 to 57.00.”	40
6.	Schmidt Teaches Claim 3: “The precious stone of claim 1 wherein the total depth percentage is in the range of 40 to 50.”	41
7.	Schmidt Teaches Claim 4: “The precious stone of claim 1, wherein said crown angle is in the range of 31-34 degrees.”	41
8.	Schmidt Teaches Claim 5: “The precious stone of claim 1, wherein said pavilion angle is in the range of 31 to 33 degrees.”	41

9.	Schmidt Teaches Claim 6: “The precious stone of claim 1, wherein said precious stone is a diamond.”	42
10.	Schmidt and the Applicant Admitted Prior Art Teach Claims 7-12: “The precious stone of claim 1, wherein said precious stone has a . . . [cushion-cut shape, emerald-cut shape, radiant shape, oval shape, marquise shape, or princess shape].”	42
11.	Schmidt Teaches Claim 13: “The precious stone of claim 1, wherein said crown height percentage in the range of 6-15, said girdle height percentage in the range of 3-5, said table percentage in the range of 70-79, and said total depth percentage in the range of 36-57.”	43
12.	Schmidt Teaches Claim 14: “The precious stone of claim 13, wherein said crown height percentage is in the range of 8-13, said girdle height percentage is in the range of 3.5-4.5, said table percentage is in the range of 72-77, and said total depth percentage is in the range of 40-50.”..	44
B.	GROUND 2: Claims 1, 5 and 6 Are Anticipated by Grossbard (HDL-1007)	45
1.	Grossbard	45
2.	Grossbard Discloses Each Element of Independent Claim 1	46
3.	Grossbard Discloses Claim 5: “The precious stone of claim 1, wherein said pavilion angle is in the range of 31 to 33 degrees.”	54
4.	Grossbard Discloses Claim 6: “The precious stone of claim 1, wherein said precious stone is a diamond.” ..	54
C.	GROUND 3: Claims 1 and 5-12 Are Obvious Over Greeff (HDL-1008) in View of Grossbard (HDL-1007)	54
1.	Greeff	54
2.	Grossbard	55
3.	Greeff and Grossbard Render the Claims Obvious	56
4.	Greeff and Grossbard Teach Each Element of Independent Claim 1	56
5.	Motivation to Combine Greeff and Grossbard	70

6.	Grossbard Teaches Claim 5: “The precious stone of claim 1, wherein said pavilion angle is in the range of 31 to 33 degrees.”	73
7.	Grossbard Teaches Claim 6: “The precious stone of claim 1, wherein said precious stone is a diamond.”	73
8.	Greef in view of Grossbard and Admitted Prior Art Teach Claims 7-12: “The precious stone of claim 1, wherein said precious stone has a . . . [cushion-cut shape, emerald-cut shape, radiant shape, oval shape, marquise shape, or princess shape].”	73
D.	GROUND 4: Claims 1, 5-12 Are Obvious Over Sung (HDL-1009) in View of Grossbard (HDL-1007).....	73
1.	Sung.....	73
2.	Grossbard	74
3.	Sung and Grossbard Render the Claims Obvious.....	75
4.	Sung and Grossbard Teach Each Element of Independent Claim 1	75
5.	Motivation to Combine Sung and Grossbard	80
6.	Grossbard Teaches Claim 5: “The precious stone of claim 1, wherein said pavilion angle is in the range of 31 to 33 degrees.”	80
7.	Grossbard Teaches Claim 6: “The precious stone of claim 1, wherein said precious stone is a diamond.”	80
8.	Sung in view of Grossbard and Admitted Prior Art Teach Claims 7-12: “The precious stone of claim 1, wherein said precious stone has a . . . [cushion-cut shape, emerald-cut shape, radiant shape, oval shape, marquise shape, or princess shape].”	80
E.	GROUND 5: Claims 2-4, 13 and 14 Are Obvious In View of Grossbard and Schmidt	80
1.	Schmidt Teaches Claim 2: “The precious stone of claim 1, wherein said total depth percentage is in the range of 36.00 to 57.00.”	81

2.	Schmidt Teaches Claim 3: “The precious stone of claim 1 wherein the total depth percentage is in the range of 40 to 50.”	81
3.	Schmidt Teaches Claim 4: “The precious stone of claim 1, wherein said crown angle is in the range of 31-34 degrees.”	81
4.	Schmidt Teaches Claim 13: “The precious stone of claim 1, wherein said crown height percentage in the range of 6-15, said girdle height percentage in the range of 3-5, said table percentage in the range of 70-79, and said total depth percentage in the range of 36-57.”	82
5.	Schmidt Teaches Claim 14: “The precious stone of claim 13, wherein said crown height percentage is in the range of 8-13, said girdle height percentage is in the range of 3.5-4.5, said table percentage is in the range of 72-77, and said total depth percentage is in the range of 40-50.”..	82
F.	GROUND 6: Claims 2-4, 13 and 14 Are Obvious In View of Greeff, Grossbard, and Schmidt	83
G.	GROUND 7: Claims 2-4, 13 and 14 Are Obvious In View of Sung, Grossbard, and Schmidt	83
H.	GROUND 8: Claims 2-4, 13 and 14 Are Obvious In View of Grossbard, and Alburger	83
1.	Alburger	83
2.	Alburger Teaches Claim 2: “The precious stone of claim 1, wherein said total depth percentage is in the range of 36.00 to 57.00.”	85
3.	Alburger Teaches Claim 3: “The precious stone of claim 1 wherein the total depth percentage is in the range of 40 to 50.”	86
4.	Alburger Discloses Claim 4: “The precious stone of claim 1, wherein said crown angle is in the range of 31-34 degrees.”	86
5.	Alburger Discloses Claim 13: “The precious stone of claim 1, wherein said crown height percentage in the range of 6-15, said girdle height percentage in the range	

of 3-5, said table percentage in the range of 70-79, and said total depth percentage in the range of 36-57.” 87

6. Alburger Discloses Claim 14: “The precious stone of claim 13, wherein said crown height percentage is in the range of 8-13, said girdle height percentage is in the range of 3.5-4.5, said table percentage is in the range of 72-77, and said total depth percentage is in the range of 40-50.” 87

I.	GROUND 9: Claims 2-4, 13 and 14 Are Obvious In View of Greeff, Grossbard and Alburger.....	88
J.	GROUND 10: Claims 2-4, 13 and 14 Are Obvious In View of Sung, Grossbard and Alburger	88
V.	SECONDARY CONSIDERATIONS CANNOT OVERCOME THE STRONG EVIDENCE OF OBVIOUSNESS	88
VI.	PTAB DISCRETION SHOULD NOT PRECLUDE INSTITUTION...	89
A.	The <i>Fintiv</i> Factors Favor Institution—§314(a).....	89
B.	The <i>Advanced Bionics</i> Test Favors Institution—§325(d).....	91
VII.	CONCLUSION.....	91
VIII.	MANDATORY NOTICES UNDER 37 C.F.R § 42.8(a)(1).....	92
A.	Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1).....	92
B.	Related Matters Under 37 C.F.R. § 42.8(b)(2)	92
C.	Lead and Backup Counsel Under 37 C.F.R. § 42.8(b)(2).....	92
D.	Payment of Fees Under 37 C.F.R. § 42.103.....	93
E.	Power of Attorney 37 C.F.R. § 42.10	93

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Almirall, LLC v. Amneal Pharms. LLC,

28 F.4th 265 (Fed. Cir. 2022).....35

Apple Inc. v. SEVEN Networks, LLC,

IPR2020-00255, Paper 13 (PTAB Jul. 28, 2020)..... 90, 91

Eskimo Pie Corp. v. Levous,

35 F.2d 120 (3d Cir. 1929) 7

In re Baxter Travenol Labs.,

952 F.2d 388 (Fed. Cir. 1991) 39

In re Ethicon, Inc.,

844 F.3d 1344 (Fed. Cir. 2017) 38, 72

In re Freeman,

474 F.2d 1318 (CCPA 1973).....39

In re Harza,

274 F.2d 669 (CCPA 1960).....28

Leapfrog Enters., Inc. v. Fisher-Price, Inc.,

485 F.3d 1157 (Fed. Cir. 2007) 88

Optivus Tech., Inc. v. Ion Beam Applications S.A.,

No. CV03-2052 SJO(VBKX), 2005 WL 6070811 (C.D. Cal. Mar. 14, 2005)....28

Pfizer, Inc. v. Apotex, Inc.,

480 F.3d 1348 (Fed. Cir. 2007) 38, 72

Ranir, LLC v. The Procter & Gamble Co.,

IPR2017-01878, Paper 7 (PTAB Feb. 7, 2018) 89

Sand Revolution II, LLC v. Cont'l Intermodal Group – Trucking LLC,

IPR2019-01393, Paper 24 (PTAB Jun. 16, 2020).....89

Sotera Wireless Inc. v. Masimo Corp.,

IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) 89

Wellman, Inc. v. Eastman Chem. Co.,

642 F.3d 1355 (Fed. Cir. 2011) 11

EXHIBIT LIST

Exhibit No.	Description
HDL-1001	U.S. Patent No. 9,398,791
HDL-1002	File History for U.S. Patent No. 9,398,791
HDL-1003	U.S. Design Patent No. 465,431 to Kanner
HDL-1004	CH 684301 A5 to Schmidt (in German)
HDL-1005	Certified English Translation of HDL-1004 with Certificate of Translation
HDL-1006	Expert Declaration of Thomas R. Paradise, PhD
HDL-1007	U.S. Patent No. US4555916 to Grossbard
HDL-1008	U.S. Design Patent No. 463,315 to Greeff
HDL-1009	U.S. Design Patent No. 524,682 to Sung
HDL-1010	US Patent No. 4,708,001 to Alburger
HDL-1011	Docket Sheet for Parallel District Court Litigation (<i>Christopher Designs, Inc. v. Henri Daussi, LLC</i> , No. 1:24-cv-03186 (S.D.N.Y. Apr 26, 2024))
HDL-1012	Combined Civil and Criminal Federal Court Management Statistics (Dec. 31, 2024) United States Courts (uscourts.gov), available at: https://www.uscourts.gov/sites/default/files/2025-02/fcms_na_distprofile1231.2024.pdf
HDL-1013	Complaint for Parallel District Court Litigation

I. INTRODUCTION

Henri Daussi, LLC (“Petitioner”) petitions for an *Inter Parties* Review (“IPR”) of claims 1-14 (the “Challenged Claims”) of U.S. Patent No. 9,398,791 to Slowinski (the “’791 Patent”).

The original brilliant-cut for gemstones was developed by Marcel Tolkowsky in 1919. Since then, this cut has become very popular because it provides better light reflectivity. One of the primary challenges with the original brilliant-cut is that it requires a minimum depth for the gemstone, which is likely not feasible for many rough gemstones, particularly for the shallow or flat ones. If a shallow rough gem is cut according to the original brilliant-cut, a significant amount of the gemstone would be wasted, thereby the cut will have a low yield. But shallow gemstones are also valuable, and the diamond industry has developed many different cuts for shallow gemstones, particularly as they relate to non-round stones. The ’791 Patent simply claims of one of these cuts, which has been known for nearly four (4) decades. (*See generally* HDL-1006, ¶¶27-55).

The ’791 Patent purports to address the problem of how to cut shallow and non-round (or “oblong”) gemstones to increase their internal reflections and brilliance to be more like the well-known “brilliant-cut” for deeper and round diamonds. The patent purports to solve this problem by optimizing brilliance by requiring a specific range of values for standard parameters like crown angle,

pavilion angle and depth percentage, and in several of the dependent claims, requiring various specific non-round shapes. To secure allowance during the prosecution, Slowinski argued that the prior art taught only larger pavilion angles and depth percentages, and that the brilliance of his design was surprising and unexpected.

But there is nothing new in optimizing brilliance by adjusting the cutting angles of the crown (the top) and the pavilion (the base) of gemstones, including shallow gemstones with smaller pavilion angles and lower depth percentages. (See *generally* HDL-1006, ¶¶27-55). Nor is there anything in the art to suggest that the optimizing process is different for round and non-round or oblong gemstones. In fact, not only does the prior art include multiple designs nearly identical to Slowinski's preferred embodiment, but it also includes express teaching that specific cuts for round stones can be equally applied to various shapes of non-round stones, and it includes designs with specifically taught crown and pavilion angles that fall within the scope of the '791 Patent's claims.

Accordingly, the claims of the '791 Patent lack novelty, and for that reason, are invalid.

II. REQUIREMENTS FOR *Inter Partes* Review

A. Grounds for Standing

Petitioner certifies that the '791 Patent is available for IPR. Petitioner is not barred from requesting this review.

B. Challenge and Relief Requested

Petitioner requests IPR of the claims on the below grounds.

Ground	Claims	Basis for Rejection
1	1-14	35 U.S.C. § 103 as obvious over Kanner (HDL-1003) in view of Schmidt (HDL-1004 (original language); HDL-1005 (translation)) and/or the applicant admitted prior art
2	1, 5, and 6	35 U.S.C. § 102 as anticipated by Grossbard (HDL-1007)
3	1, and 5-12	35 U.S.C. § 103 as obvious over Greeff (HDL-1008), in view of Grossbard (HDL-1007) and/or the applicant admitted prior art
4	1, and 5-12	35 U.S.C. § 103 as obvious over Sung (HDL-1009), in view of Grossbard (HDL-1007) and/or the applicant admitted prior art
5	2-4, 13, and 14	35 U.S.C. § 103 as obvious over Grossbard (HDL-1007), in view of Schmidt (HDL-1004)
6	2-4, 13, and 14	35 U.S.C. § 103 as obvious over Greeff (HDL-1008) and Grossbard (HDL-1007), in view of Schmidt (HDL-1004)
7	2-4, 13, and 14	35 U.S.C. § 103 as obvious over Sung (HDL-1009) and Grossbard (HDL-1007), in view of Schmidt (HDL-1004)
8	2-4, 13, and 14	35 U.S.C. § 103 as obvious over Grossbard (HDL-1007), in view of Alburger (HDL-1010)
9	2-4, 13, and 14	35 U.S.C. § 103 as obvious over Greeff (HDL-1008) and Grossbard (HDL-1007), in view of Alburger (HDL-1010)

Ground	Claims	Basis for Rejection
10	2-4, 13, and 14	35 U.S.C. § 103 as obvious over Sung (HDL-1009) and Grossbard (HDL-1007), in view of Alburger (HDL-1010)

Each applied reference predates January 26, 2015, the critical date of the '791 Patent, as described below.

III. SUMMARY OF THE '791 PATENT

A. Brief Description

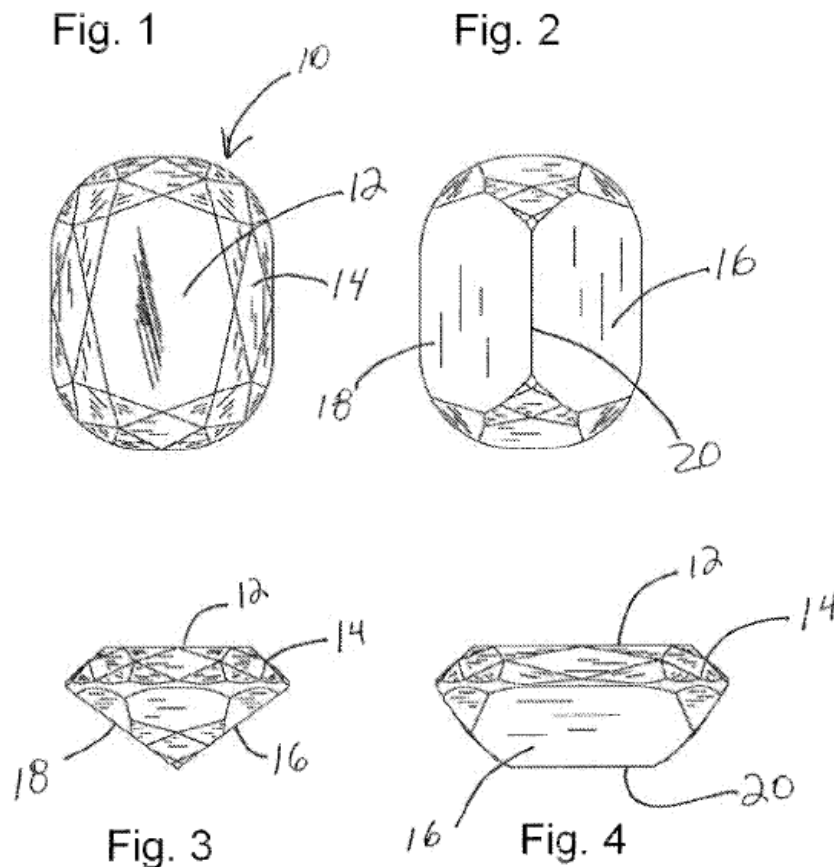
The '791 Patent was filed on January 26, 2015, and issued on July 26, 2016. Thus, the earliest effective priority date, or critical date, for the patent is January 26, 2015.

The '791 Patent purports to offer a cut for flat or shallow diamonds which enhances the brilliance of the stone. (HDL-1001,2:48-55 (“In marked departure from the prior art, the instant inventor has discovered that a brilliant-like reflection pattern can be obtained by providing an emerald cut stone with a very *shallow* underside” (emphasis added))). The '791 Patent discloses:

A sparkling, oblong-shaped precious stone, such as an emerald or cushion cut diamond is formed by providing these diamonds with two long crown surfaces extending at a crown angle and two long pavilion surfaces extending at a pavilion angle, where the crown angle is in the range of 30-36 and the pavilion angle is in the range of 30-34. The crown angle and the pavilion angle are so formed that the crown angle

is either equal to or larger than the pavilion angle by an angle that does not exceed 6 degrees.

(HDL-1001,Abstract). Figures 1-4, which appear to depict the claimed invention, are reproduced below.



(HDL-1001,Figs. 1-4). These figures are described in the specification of the '791 Patent, as follows:

Referring to FIGS. 1-4, one can note the cushion-cut diamond 10 in FIG. 1, its table 12, crown 14 extending adjacently to the table and left and right side oblong pavilions 16, 18 extending adjacently to the

oblong pavilion, the pavilion meeting at a culet-like line 20. FIG. 3 shows that the oblong pavilions 16, 18 extending at a distinct pavilion angle relative to the table surface (or to a line passing through the girdle) of the precious stone. Similarly, the crown angle is also indicated, although it is noted that the crown angle is more definitively provided in an emerald cut diamond.

(HDL-1001,2:38-48).

B. Prosecution History

The application resulting in the '791 Patent was filed with 15 total claims.¹ (HDL-1002,p.32). During the prosecution, the application received two office actions. (HDL-1002,pp.45-58;85-98). In the first office action, all the claims were rejected on various § 112 indefiniteness grounds and under 35 U.S.C. §§ 102 and 103 as anticipated and/or obvious in view of the prior art. In particular, with respect to dependent claims 7-12 requiring that the stone have various specific non-round shapes, *e.g.*, cushion, emerald, radiant, oval and princess, the office action took official notice that these shapes are “extremely well-known in the gemstone art.” (HDL-1002,pp.52-53;56). Thus, in addition to finding that the art taught the basic

¹ Claim 13 was cancelled in response to the second office action. (HDL-1002,p.227).

parameters of claims 1-6, the office action concluded that it was obvious to one of ordinary skill in the art to shape the stone into one of these non-round shapes: cushion, emerald, radiant, oval, marquise, or princess. (HDL-1002,pp.52-53;56). The office action further stated that “there is no invention in merely changing the shape or form of an article without changing its function” (HDL-1002, pp.52-53;56 (citing *Eskimo Pie Corp. v. Levous*, 35 F.2d 120, 122 (3d Cir. 1929))). In response to this statement from the examiner, applicant never traversed the official notice. (HDL-1002,pp.63-73).²

In the second office action, all the claims were rejected under 35 U.S.C. § 103 as obvious in view of new references. (HDL-1002,pp.85-98). In rejecting claims 7-12, the office action again took official notice that these shapes are “extremely well-known in the gemstone art.” (HDL-1002,pp.94-95). The office action further noted that “the applicant did not traverse the . . . official notice in the previous office action,

² It is notable that in response to the first office action, Patent Owner amended claim 1 to require that the first crown surface and second crown surface be “elongated . . . adjacently to the table.” (HDL-1002,p.67). Patent Owner also required that the second pavilion surface to be “located proximately to the first crown surface.” (HDL-1002,p.67). Patent Owner, however, deleted these limitations in response to the second office action. (HDL-1002,p.225).

[and thus] the above common knowledge statement is taken to be admitted prior art.” (HDL-1002,pp.94-95 (citing MPEP 2144.03(C)). In response to this statement from the examiner, applicant again did not traverse this official notice. (HDL-1002,pp.228-233).

With respect to the main rejection of independent claim 1 and the other dependent claims specifying a range of values for crown and pavilion angles and other parameters, Slowinski submitted a declaration arguing that the art had always taught values for crown and pavilion angles that fell outside the scope of the ranges in his claims, and that the internal reflections and brilliance of gemstones cut with angles within the scope of his claims was surprising and unexpected.

The prior references relied upon in this petition that expressly teach values for crown and pavilion angles that do fall within the scope of the '791 Patent claims were not before the examiner. As will be discussed below, the claimed values for crown and pavilion angles were well-known before the critical date.

C. Claims

The '791 Patent contains 14 total claims, with claim 1 being the sole independent claim. Claim 1 is reproduced below:

[1a] An oblong precious stone elongated in one direction and defining a length of the precious stone in said one direction and a width in a direction perpendicular to said one direction, the precious stone

having a left side and a right side both of which extend along the length of the stone, the precious stone comprising:

[1b] a table having a table plane, elongated in the one direction, a girdle, and said precious stone having a shape and configuration that results in a specific total depth percentage, a specific crown height percentage, a specific girdle height percentage and a specific table percentage;

[1c] a first crown surface, elongated in the one direction and extending at the left side of the stone and located between the table and the girdle and extending at a crown angle to the table plane;

[1d] a second crown surface, elongated in the one direction and extending at the right side of the stone and located between the table and the girdle and opposed to the first crown surface and extending at said crown angle relative to the table plane;

[1e] a first pavilion surface, elongated in the one direction and extending at the left side of the stone and at a pavilion angle relative to the table plane;

[1f] a second pavilion surface, elongated in the one direction and extending at the right side of the stone and extending oppositely

to the first pavilion surface and extending at said pavilion angle relative to the table plane;

[1g] wherein said crown angle is in the range of 30-36 degrees and wherein said pavilion angle is in the range of 30-34 degrees; and

[1h] wherein said crown angle and said pavilion angle are so formed that the crown angle is either equal to or larger than said pavilion angle by an angle that does not exceed 6 degrees, to attain increased light amplification.

(HDL-1001,Claims).

For ease of reference, Fig. 8 (which “replicates Fig. 3”) is annotated by Petitioner to visually represent the limitations of claim 1:

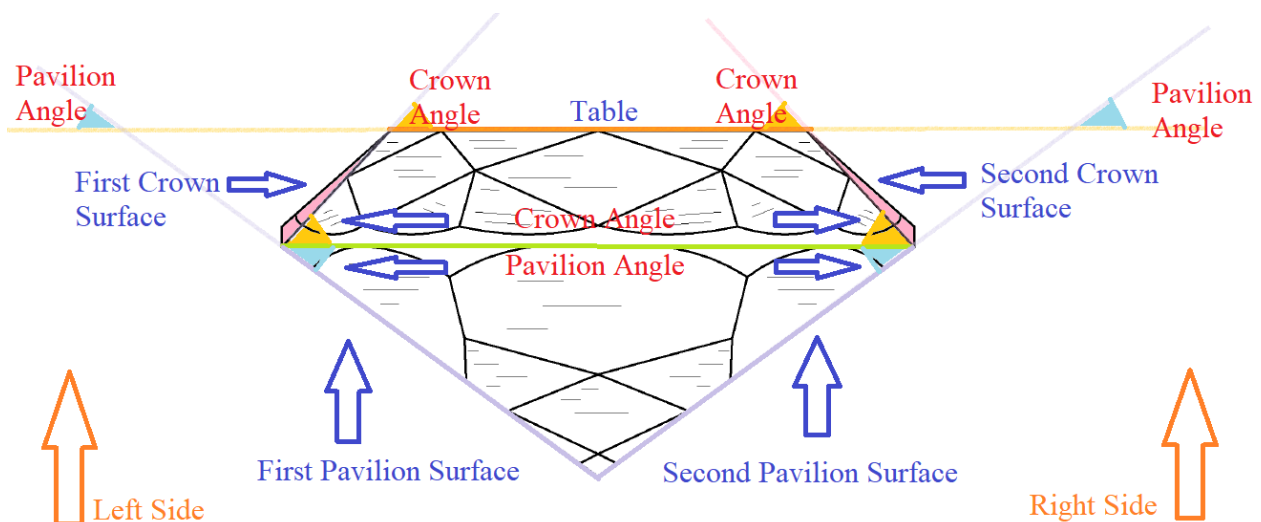


FIG. 8

(HDL-1001, Fig. 8; 2:31-32) (annotations added); (HDL-1006, ¶61).

D. Level of Ordinary Skill in the Art

A person of ordinary skill in the art relating to the subject matter of the '791 Patent as of the critical date (a "POSITA") would have had at least (1) a Bachelor's Degree in gemology or geology, or (2) 6 months of experience in faceting or cutting gemstones. (HDL-1006, ¶¶21-26).

E. Claim Construction

Based on the prior art's description of the claimed elements being similar to that of the '791 Patent's specification, no formal claim construction is necessary in this proceeding because "claim terms need only be construed to the extent necessary to resolve the controversy." *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011).

IV. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. GROUND 1: Claims 1-14 Are Obvious Over Kanner In View of Schmidt (HDL-1003/HDL-1004)

Kanner and Schmidt render claims 1-14 obvious either explicitly or combined with the knowledge of a POSITA. The motivation for combining the references is provided below. (*See generally* HDL-1006, ¶¶64-112).

1. Kanner

The first prior art reference applied in this Ground is U.S. Design Patent No. D465,431 to Kanner ("Kanner"). (HDL-1003). It has a patent grant date of

November 12, 2002 and was filed on December 19, 2001. It therefore qualifies as prior art to the '791 Patent under 35 U.S.C. § 102(a)(1).

Similar to the '791 Patent, Kanner offers an emerald cut for a diamond (HDL-1003; see HDL-1001(claim 8)). Figs. 1-6 of Kanner show various views of the diamond. Figs. 1 and 2 of the reference are included below. (HDL-1006, ¶65).

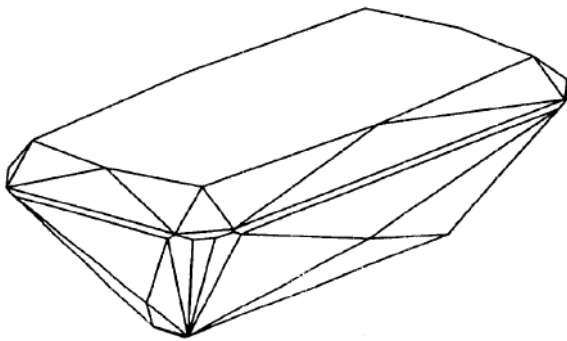


FIG.1

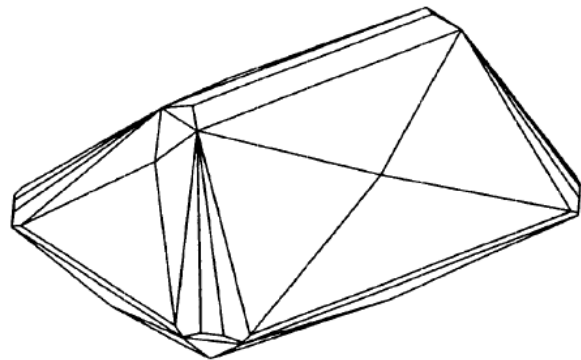


FIG.2

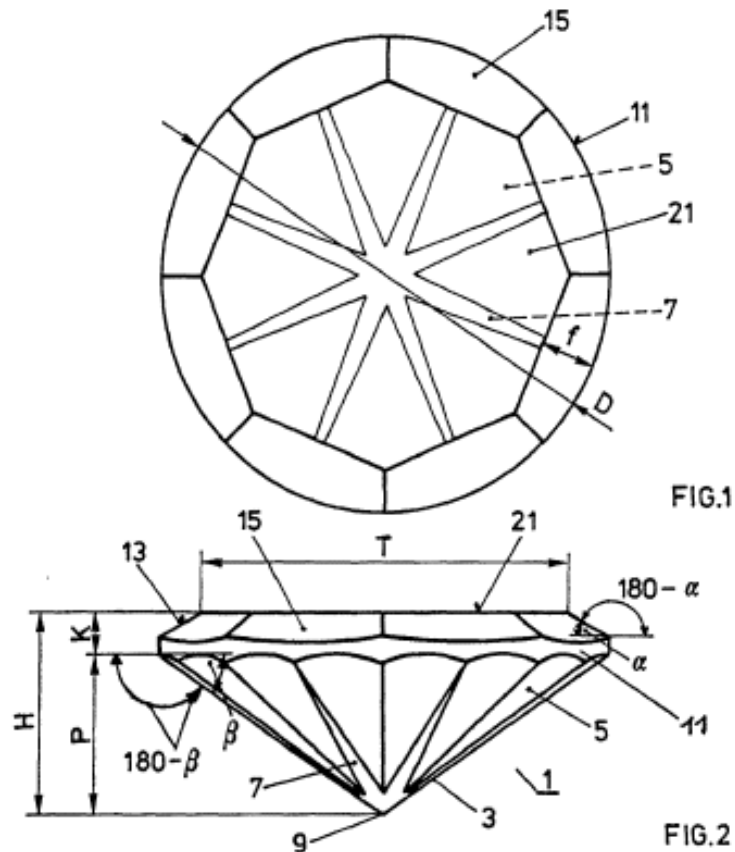
2. Schmidt

The second prior art applied in this Ground is Patent No. CH 684301 to Schmidt ("Schmidt"). (HDL-1004). This is a Swiss Patent Publication and the certified translation thereof is included as HDL-1005. It has a patent grant date of August 31, 1994 and was filed on March 19, 1991. It therefore qualifies as prior art to the '791 Patent under 35 U.S.C. § 102(a)(1).

Similar to the '791 Patent, Schmidt offers a cut for "a precious stone or diamond which is relatively *flat*" (HDL-1005,2:25-28(emphasis added)). Schmidt's cut offers "good brilliance" and a "large appearance" for the stone. (HDL-

1005,2:25-28). Schmidt explains that “it has been shown that despite the choice of a relatively small angle between the surface of the pavilion and the girdle plane, excellent brilliance can be produced in a cut precious stone if the table plane of the crown is kept large at the same time.” (HDL-1005,2:38-46).

In this regard, Schmidt discloses “diamond 1” which has “a downwardly oriented pavilion 3 and an upwardly formed crown 13. The girdle plane, which is formed peripherally by the circular girdle line 11, is positioned centrally between the crown and the pavilion.” (HDL-1005,3:52-57). The two figures of Schmidt are included below:



According to Schmidt, the angle α between “the facets 15 of the crown 13 and the girdle plane is preferably 28–32°” and the angle β between “the pavilion surface or lower girdle facets 5 and the girdle plane is preferably less than 38°” (HDL-1005,4:14-17;4:23-26). Schmidt further discloses that the angle β can be 32–37°. (HDL-1005,3:15-17).

Schmidt further explains the broad applicability of its invention to a variety of stones and shapes:

The examples of diamonds cut according to the invention, as shown in Figures 1–2, can be varied or modified in any way. It is irrelevant whether an eight-, sixteen-, or thirty-two-side cut (8/8; 16/16; 32/24) is used, whether it is a diamond, a sapphire, a ruby, or an emerald, or whether it is a semi-precious, a colored stone, or a gemstone. It goes without saying that the cuts proposed in accordance with the invention can be used on any precious, semi-precious, or gemstones in order to solve the problem posed in accordance with the invention. Ultimately, it is also a question of optimizing the selected stone and the design of the girdle line, whether circular, square, rectangular, trapezoidal, etc., how the various angular dimensions of α and β are selected, as well as the size ratios of the table diameter to the diameter of the girdle line and the depth of the pavilion, etc.

(HDL-1005,5:15-40).

Accordingly, Schmidt discloses a diamond with crown angle α of 32° and a pavilion angle β of 32° . (HDL-1005,3:15-17,4:14-17,4:23-26). Schmidt also explains that its disclosure can be broadly applied to “any” precious gemstone, inducing oblong shapes such as circular, square, rectangular, trapezoidal shapes to solve the problem addressed in the reference, which is enhancing the brilliance of flat or shallow stones. (HDL-1005,5:15-40,2:25-28,2:38-46); (HDL-1006,¶¶66-71).

3. Kanner and Schmidt Teach Each Element of Independent Claim 1

Claim element [1a]:

Fig. 1 of Kanner discloses these limitations of claim 1. (HDL-1003, Fig. 1(annotated)). Kanner discloses an emerald diamond, which is an oblong precious stone. (HDL-1006, ¶72); (HDL-1003, Fig. 1(annotated)). The diamond of Kanner is elongated in one direction, which defines the length of the diamond. (HDL-1003, Fig. 1(annotated)). The diamond also has a width in a perpendicular direction to the one direction, and a left side and a right side, both extending along the length of the stone. (HDL-1006, ¶72); (HDL-1003, Fig. 1(annotated)).

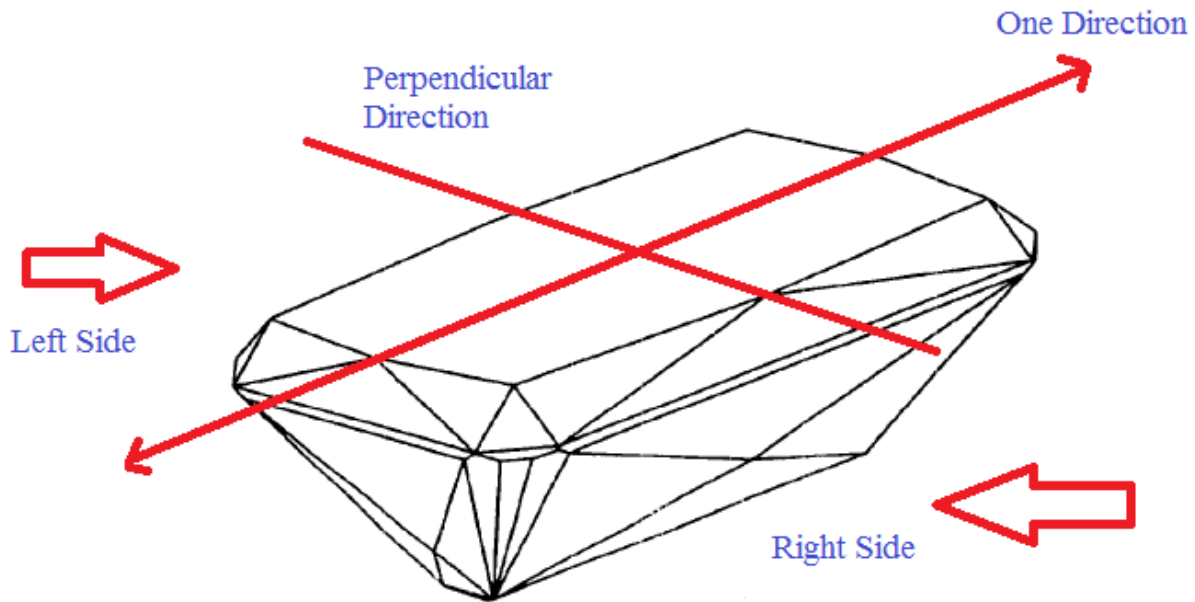
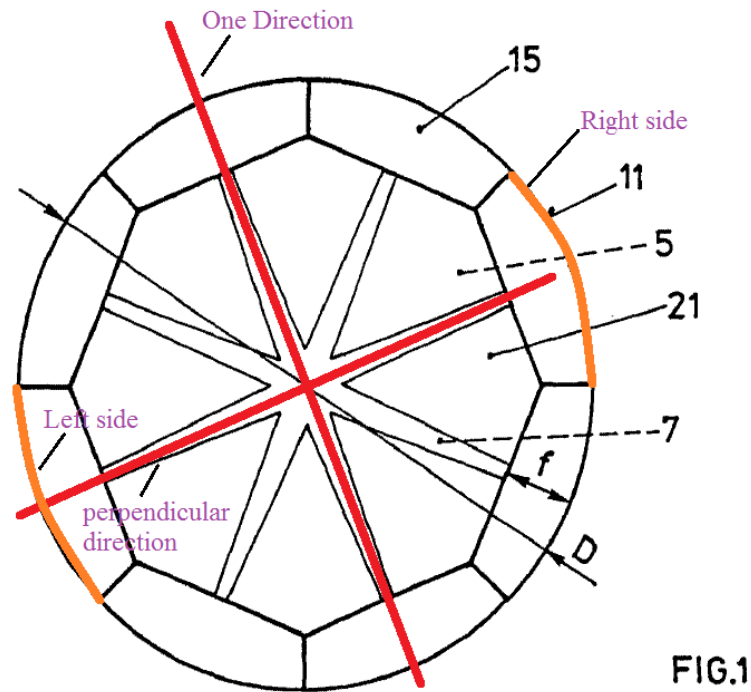


FIG.1

Fig. 1 as well as the specification of Schmidt also disclose these limitations of claim 1. (HDL-1005, Fig. 1). In particular, Fig. 1 of Schmidt teaches a precious stone that has a length in one direction and a width in a direction perpendicular to the one direction. (HDL-1005, Fig. 1). Fig. 1 (reproduced and annotated below) also shows a left side and a right side, both of which are extended along the one direction. (HDL-1005, Fig. 1(annotated)); (HDL-1006, ¶73). The left side and the right side are also annotated in Fig. 1.



While the precious stone in Fig. 1 appears to be round, Schmidt further disclosed that the precious stone can have any shape, including **rectangular**. (HDL-1005,5:15-40 (“Ultimately, it is also a question of optimizing the selected stone and the design of the girdle line, whether circular, square, rectangular, trapezoidal, etc., how the various angular dimensions of α and β are selected, as well as the size ratios of the table diameter to the diameter of the girdle line and the depth of the pavilion, etc.”)). A rectangular shape is oblong and elongated in one direction, defining a length and width as described in the claim element. (HDL-1006,¶74). Further, the mention of “rectangular” implies a shape with left and right sides extending along the length of the stone. (HDL-1006,¶74). Schmidt also discloses that the stone can be substantially circular. (HDL-1005,3:23-25 (“the girdle of the precious stone is

substantially circular.)). While in a circular stone the length of the stone in any direction is the same (by definition), in a substantially circular stone, the length of the stone is not the same at least in one direction. (HDL-1006,¶74). Therefore, a substantially circular stone must be elongated in at least one direction, and thus, Schmidt discloses an oblong precious stone. (HDL-1006,¶74).

Moreover, during prosecution of the '791 Patent, the examiner took official notice, and the Patent Owner did not traverse, that oblong shapes such as cushion, emerald, radiant, oval, marquise, or princess are “extremely well-known in the gemstone art.” (HDL-1002, pp.52-53;56;63-73;94-95 (“common knowledge statement is taken to be admitted prior art”)). Thus, one of ordinary skill in the art would have shaped the stone into one of these shapes because “there is no invention in merely changing the shape or form of an article without changing its function” (HDL-1002, pp.52-53;56;94-95). The reason for this implementation would have been to provide the “good brilliance” and “large appearance” of the design in Schmidt to other designs. (HDL-1006,¶75). Such a change would have been obvious for one of ordinary skill in the art. (HDL-1006,¶75).

Claim element [1b]:

Kanner discloses a table having a table plane, which is elongated in the one direction and a girdle. (HDL-1003, Fig.1(annotated)); (HDL-1006,¶76).

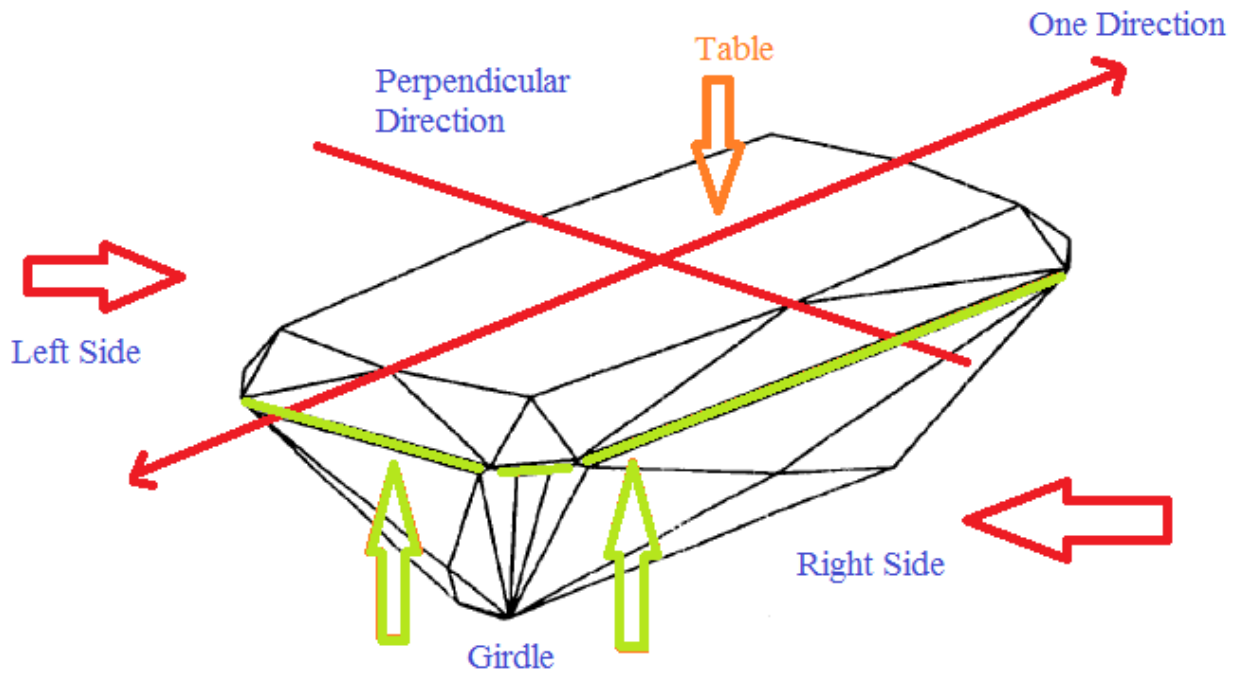


FIG.1

Schmidt also discloses a table and a girdle. Specifically, Schmidt discloses a table plane 21 and a girdle line 11. Schmidt discloses that “[t]he diamond 1 according to the invention has a downwardly oriented pavilion 3 and an upwardly formed crown 13. The girdle plane, which is formed peripherally by the circular girdle line 11, is positioned centrally between the crown and the pavilion.” (HDL-1005,3:53-57). Schmidt further discloses that “[o]n the upper side, the crown 13 has the so-called table plane 21.” (HDL-1005,4:12-13). As explained in [1a] and shown in the annotated Fig. 1, the stone disclosed in Schmidt can be elongated in the “one direction,” and thus, the table 21 is elongated in the “one direction.” Accordingly, Schmidt discloses a girdle line or girdle between the crown and pavilion and an

elongated table on the top of the crown. (HDL-1006,¶77). These descriptions are consistent with the claim element's description of a precious stone with a table and girdle. (HDL-1006,¶77).

Claim 1 further requires a specific total depth percentage, a specific crown height percentage, a specific girdle height percentage and a specific table percentage, but does not define any value for these parameters. These parameters are merely characteristics that a POSITA would understand all stones to have and are well known and conventional, as admitted by the '791 Patent. (HDL-1006,¶78).

Indeed, in the background section of the '791 Patent, the Patent Owner admitted that it is “**well known**” that “emerald and cushion cut diamonds have associated therewith certain parameters.” (HDL-1001,1:29-33 (emphasis added)). The '791 Patent further admitted that “[t]hese parameters include the crown angle, the crown height percentage, the girdle height percentage, the pavilion angle, the table percentage and the total depth percentage.” (HDL-1001,1:29-33). The '791 Patent continues to define the “conventional[]” values for these parameters. (HDL-1001,1:33-36). Similarly, during prosecution of the '791 Patent, Patent Owner further admitted that “parameters such as the various angles associated with a diamond, for example, the crown angle, and the parameters such as ‘total depth percentage’ ‘crown height percentage’; ‘girdle height percentage’; and ‘table

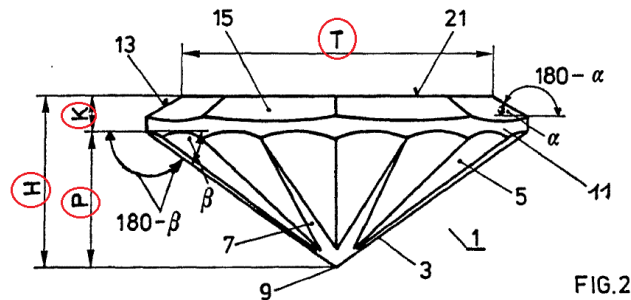
percentage' are ***well known, basic*** parameters in the art of diamonds.” (HDL-1002,p.70(emphasis added)).

In any event, for a diamond, the total depth percentage, the crown height percentage, the girdle height percentage, and the table percentage are calculated by dividing the total depth, crown height, girdle height, and table diameter by width of the diamond. (HDL-1006,¶80). Schmidt further discloses that:

Various parameters are essential for the sizing of a precious stone or diamond, which are also shown in Figs. 1 and 2. The initial measurement is the diameter D of the girdle line 11, which is usually given as 100%. The diameter of the table plane 21 is designated as T, wherein this size refers to the distance between two opposite corner points of the table plane 21. The height of the crown 13 is designated K and refers to the distance of the table plane 21 from the girdle surface formed by the girdle line 11. Similarly, P denotes the depth of the pavilion 3, *i.e.*, the distance of the tip 9 from the girdle surface. The height H of the precious stone or diamond is made up of K and P.

(HDL-1005,4:38-51). This excerpt directly addresses the specific percentages mentioned in the claim element. (HDL-1006,¶81). It describes how the dimensions of the gemstone are measured, including the crown height (K), pavilion depth (P),

and total height (H), which correspond to the crown height percentage, pavilion depth percentage, and total depth percentage mentioned in the claim element. (HDL-1006,¶81). The table diameter (T) is also specifically mentioned, which relates to the table percentage. (HDL-1006,¶81).



(HDL-1005, Fig. 2(annotated)).

One of ordinary skill in the art would have also been able to measure the girdle height (G) for the stone in Schmidt, and thus, could have calculated the total depth percentage, the crown height percentage, the girdle height percentage, and the table percentage for the diamond in Schmidt using K, P, H, T and G. (HDL-1006,¶82). Similarly, one of ordinary skill in the art would have also been able to measure K, P, H, T and G for the stone in Kanner, and thus, could have calculated the total depth percentage, the crown height percentage, the girdle height percentage, and the table percentage for the diamond in Kanner using K, P, H, T and G. (HDL-1006,¶82). One of ordinary skill in the art is motivated to make these calculations because these parameters identify the physical attributes of the diamond. (HDL-1006,¶82). Therefore, Kanner and Schmidt disclose element [1b] of the '791 Patent.

Claim element [1c]:

Kanner discloses a first crown surface in Fig. 3 (reproduced below and annotated in pink), which is elongated in the one direction. (HDL-1003,Figs.3;6 (annotated)). The crown surface of Kanner extends at the left side of the stone and is located between the table and the girdle. (HDL-1003,Figs.3;6(annotated)). As shown in Fig. 6, the first crown surface of Kanner extends at a crown angle relative to the table. (HDL-1003,Figs.3;6(annotated)); (HDL-1006,¶83).

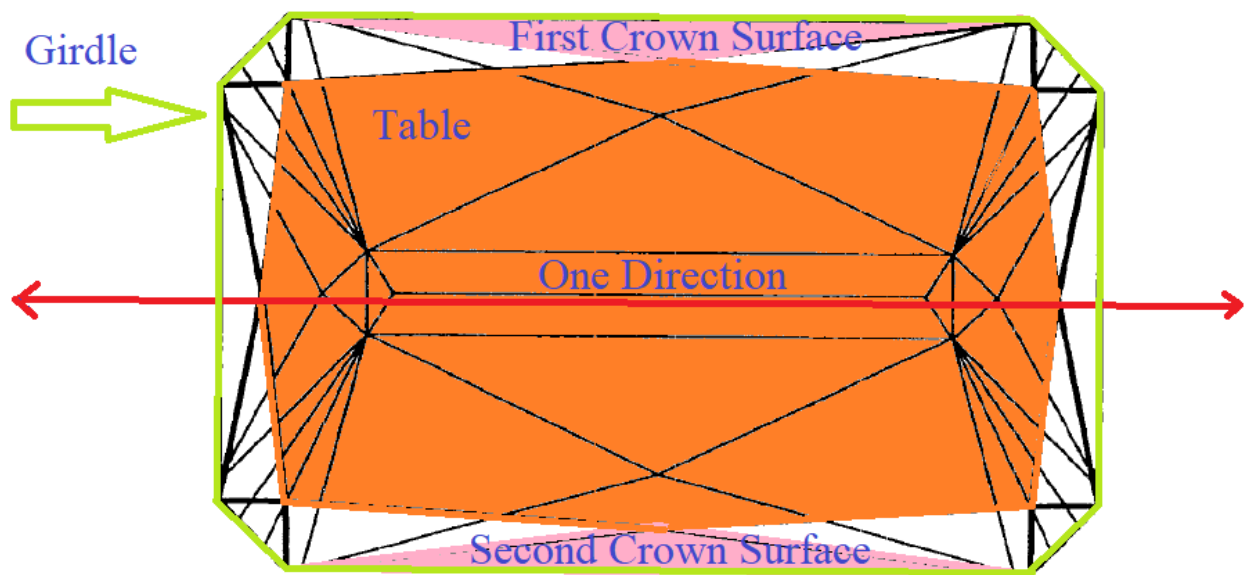


FIG.3

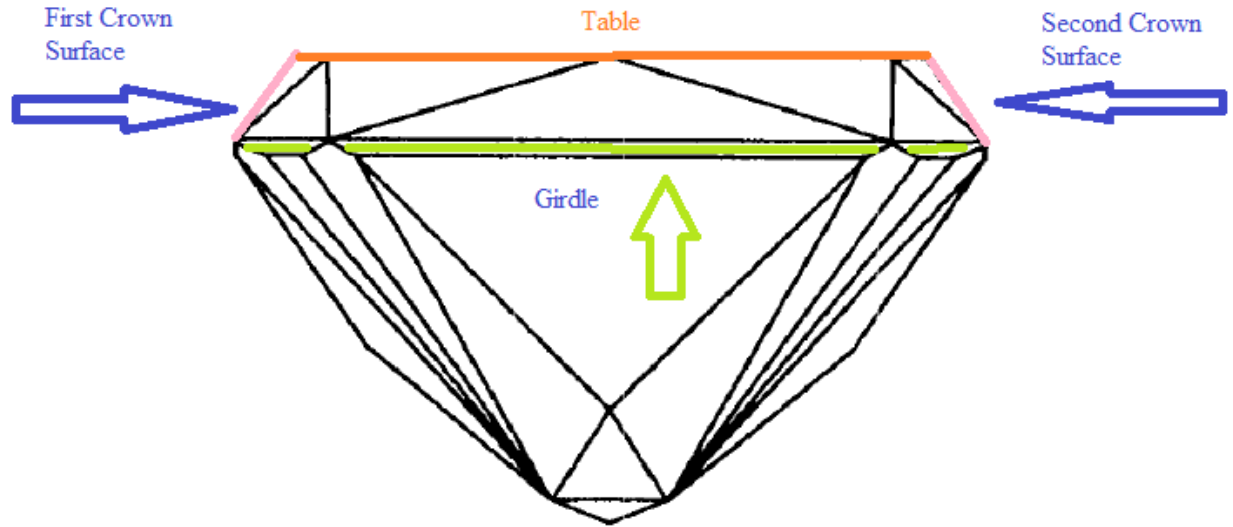


FIG. 6

Also, Schmidt discloses eight side facets for crown 13:

The crown 13 has eight side facets, which have been formed using a so-called octagonal cut according to a known technique. It is of course possible to increase the number of facets accordingly by doubling or quadrupling the cut. On the upper side, the crown 13 has the so-called table plane 21, which is uniformly octagonal in the example shown. According to the invention, the angle α included between the facets 15 of the crown 13 and the girdle plane is preferably 28–32° and is 30° in the example shown in Figs. 1 and 2.

(HDL-1005,4:1-10). This excerpt describes a crown that extends between the table and the girdle line at a specific angle. (HDL-1006,¶84). The crown is described as

having facets, which would be elongated in one direction when applied to an oblong stone.³ (See [1a] (annotated Fig. 1); (HDL-1006,¶84). The angle between the crown facets and the girdle plane is specified as preferably 28-32°, which corresponds to the “crown angle” mentioned in the claim element because the girdle plane and the table are parallel. (HDL-1006,¶84).

Claim element [1d]:

Kanner discloses a second crown surface in Figs. 1, 3, and 6 (reproduced below and annotated in pink). (HDL-1003,Figs.1;3;6(annotated)). The second crown surface is elongated in the one direction and extends at the right side of the stone. (HDL-1003,Figs.1;3;6(annotated)). The second crown surface is on the opposite side of the first crown surface. (HDL-1003,Figs.1;3;6(annotated)). The second crown surface is located between the table and the girdle and extends at the crown

³ Schmidt further confirms that “[t]he diamond shown in Figs. 1 and 2 is a circular diamond with a so-called octagonal cut, wherein the diamond in the example shown has eight side facets on its crown. However, it can of course also have more than eight side facets.” (HDL-1004,3:38-42). This excerpt further supports the presence of multiple crown surfaces elongated in the one direction. (HDL-1006,¶84).

angle relative to the table plane. (HDL-1003,Figs.1;3;6(annotated)); (HDL-1006,¶85).

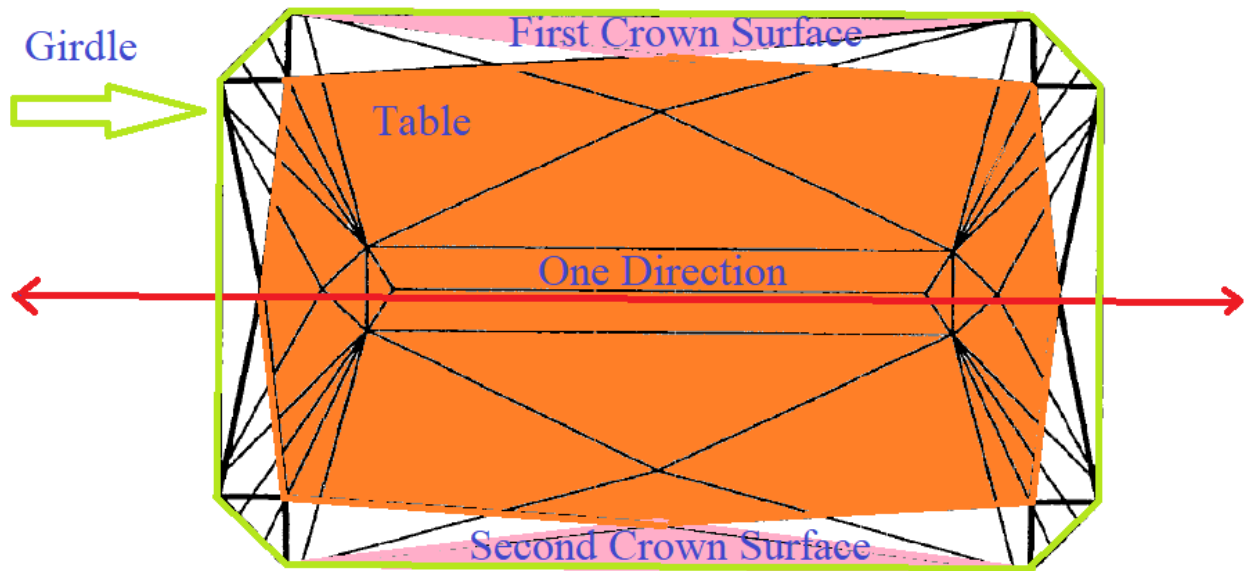


FIG. 3

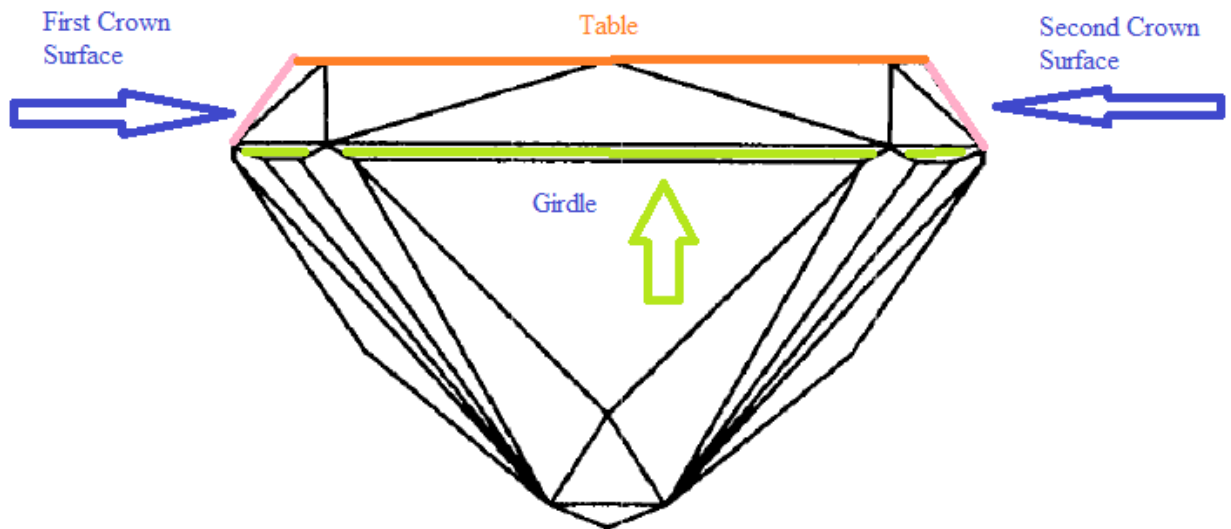


FIG. 6

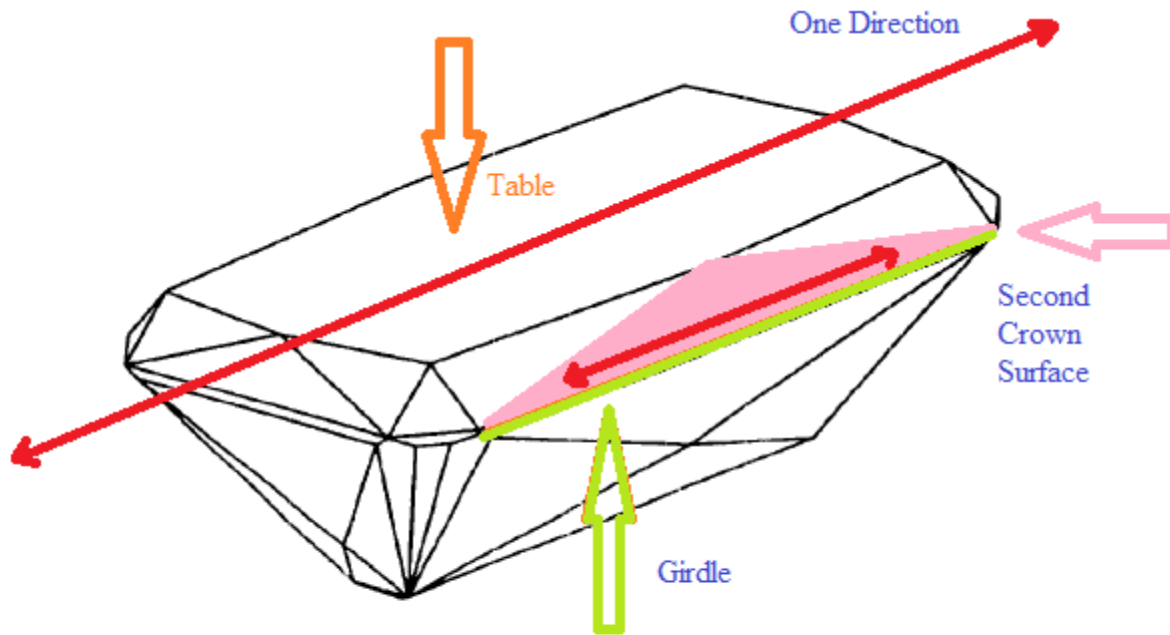


FIG.1

Also, Schmidt discloses:

The crown 13 has eight side facets, which have been formed using a so-called octagonal cut according to a known technique. It is of course possible to increase the number of facets accordingly by doubling or quadrupling the cut. On the upper side, the crown 13 has the so-called table plane 21, which is uniformly octagonal in the example shown. According to the invention, the angle α included between the facets 15 of the crown 13 and the girdle plane is preferably 28–32° and is 30° in the example shown in Figs. 1 and 2.

(HDL-1005,4:1-10). This excerpt describes a crown surface of a gemstone. (HDL-1006,¶86). The crown 13 has side facets that extend between the table (table level 21) and the girdle (belt plane). The angle between these facets and the belt plane is specified as preferably 28-32°, which corresponds to the “crown angle” mentioned in the claim element because the table and girdle plane are parallel. (HDL-1006,¶86). One of these facets extends in the “one direction. (See [1a], above, (annotated Fig.1); (HDL-1006,¶86). While the excerpt does not explicitly mention a “second” crown surface, it discloses that the diamond has multiple side facets on its crown, which would include surfaces on both the left and right sides of the stone. (HDL-1006,¶86). It also describes the general structure of the crown surface that matches the claim element with respect to one facet. (HDL-1006,¶86). One of ordinary skill in the art recognizes that the crown angle described with respect to one facet can be applied to any crown facet. Indeed, the ’791 Patent only describes the crown angle and pavilion angle with respect to one of the facets. (See, e.g., HDL-1001, Fig.5 (showing the angle only with respect to the left side of the stone); 2:48-60 (providing a description that is agnostic as to the side on which the facet appears)); see also *In re Harza*, 274 F.2d 669, 671 (CCPA 1960) (holding mere duplication of parts has no patentable significance unless a new and unexpected result is produced); *Optivus Tech., Inc. v. Ion Beam Applications S.A.*, No. CV03-2052 SJO(VBKX), 2005 WL 6070811, at *7 (C.D. Cal. Mar. 14, 2005), *aff’d*, 469

F.3d 978 (Fed. Cir. 2006) (holding mere duplication of gantry is obvious when no new or unexpected result shown and citing *Harza*). Accordingly, Kanner and Schmidt describe this element of claim 1. (*See also* [1c]).

Claim element [1e]:

Kanner in Fig. 4 displays a first pavilion surface (reproduced below and annotated in purple), which is elongated in the one direction. (HDL-1003,Figs. 4;6(annotated)). The first pavilion surface of Kanner extends on the left side of the stone. (HDL-1003,Figs. 4;6(annotated)). As shown in Fig. 6, the first pavilion surface extends at a pavilion angle relative to the table plane. (HDL-1003,Figs. 4;6(annotated)); (HDL-1006,¶88).

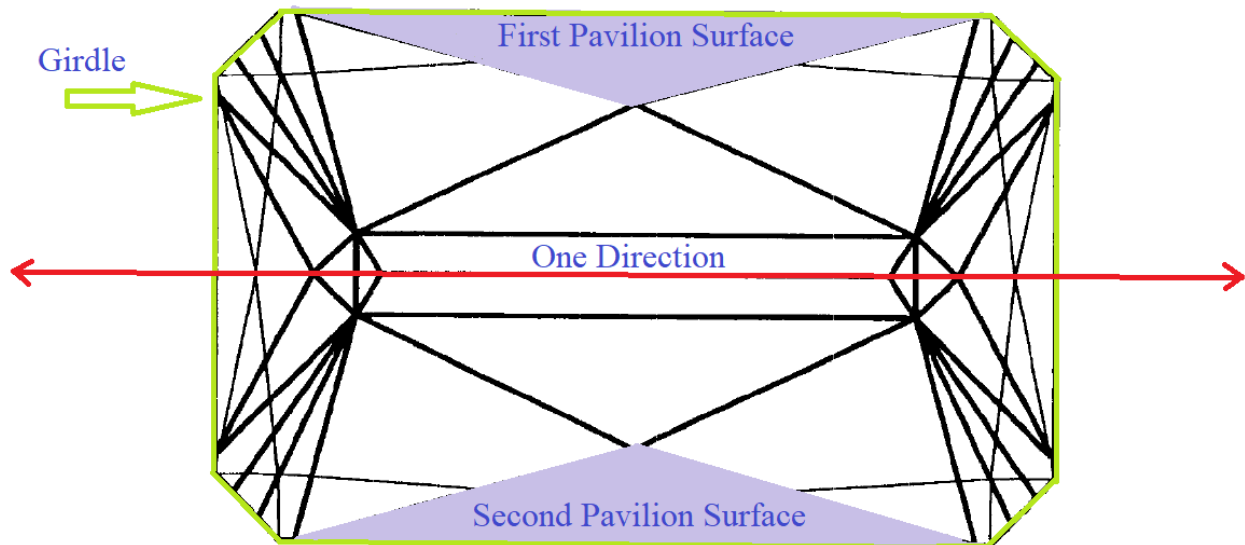


FIG.4

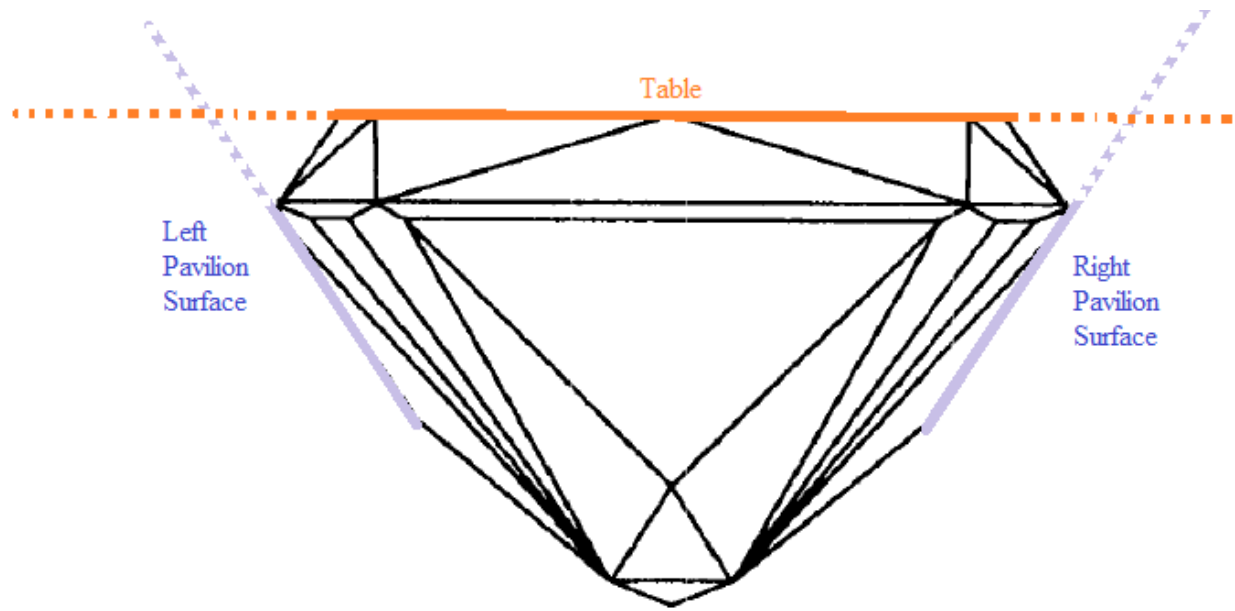


FIG. 6

Also, Schmidt discloses:

The pavilion 3 has lower girdle facets 5 on its surface, as well as main facets 7, which, as can be seen in Fig. 2, are visible shimmering through the table plane 21. The pavilion 3 preferably has a tip (culet) 9 at its lower end, but this can be very finely ground depending on requirements and the appearance to be created. According to the invention, the angle β between the pavilion surface or lower girdle facets 5 and the girdle plane is preferably less than 38° and is 35° in the example shown in Figs. 1 and 2.

(HDL-1005,4:11-19). This excerpt describes a pavilion surface of a gemstone. (HDL-1006,¶89). The pavilion surface extends at an angle β relative to the belt plane (which is analogous to the table plane in the claim element because the belt plane and table plane are parallel). The angle β is described as being less than 38° , which corresponds to the “pavilion angle” mentioned in the claim element. While the excerpt does not explicitly state that the pavilion surface is elongated in one direction or extends at the left side of the stone, these characteristics can be inferred from the overall description of the gemstone’s structure. (HDL-1006,¶89); *see also* [1a] (explaining that the stone is oblong).

Claim Element [1f]:

Kanner in Figs. 1, 4 and 6 displays a second pavilion surface. (HDL-1003,Figs.1;4;6(annotated)). The second pavilion surface is elongated in the one direction and extends at the right side of the stone. ((HDL-1003,Figs.1;4;6(annotated)). The second pavilion surface extends opposite to the first pavilion surface and extends at the pavilion angle relative to the table plane. ((HDL-1003,Figs.1;4;6(annotated)); (HDL-1006,¶90).

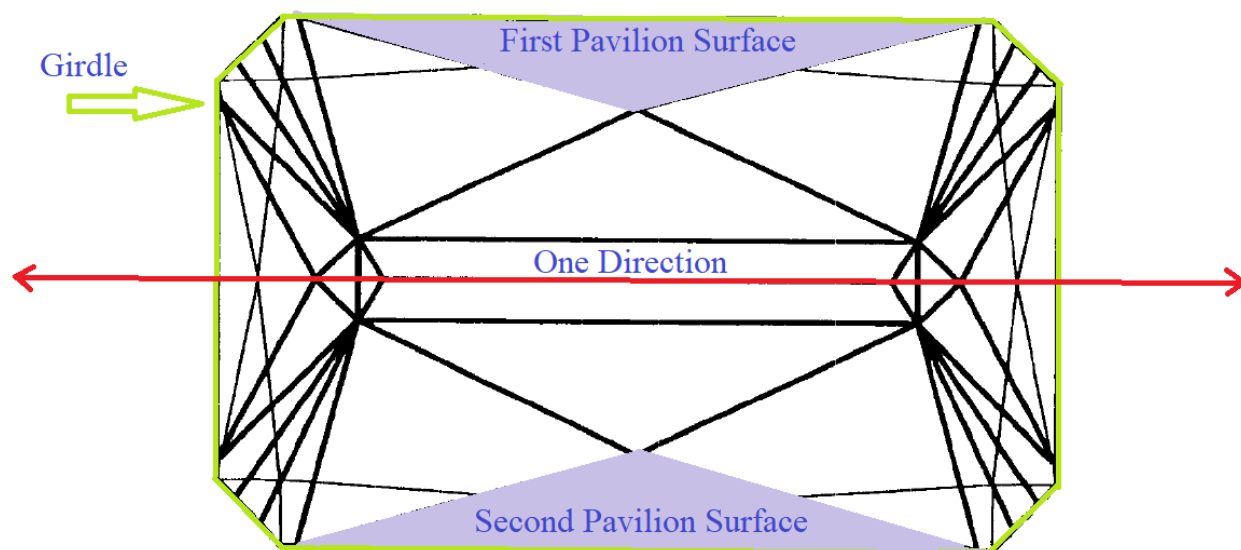


FIG. 4

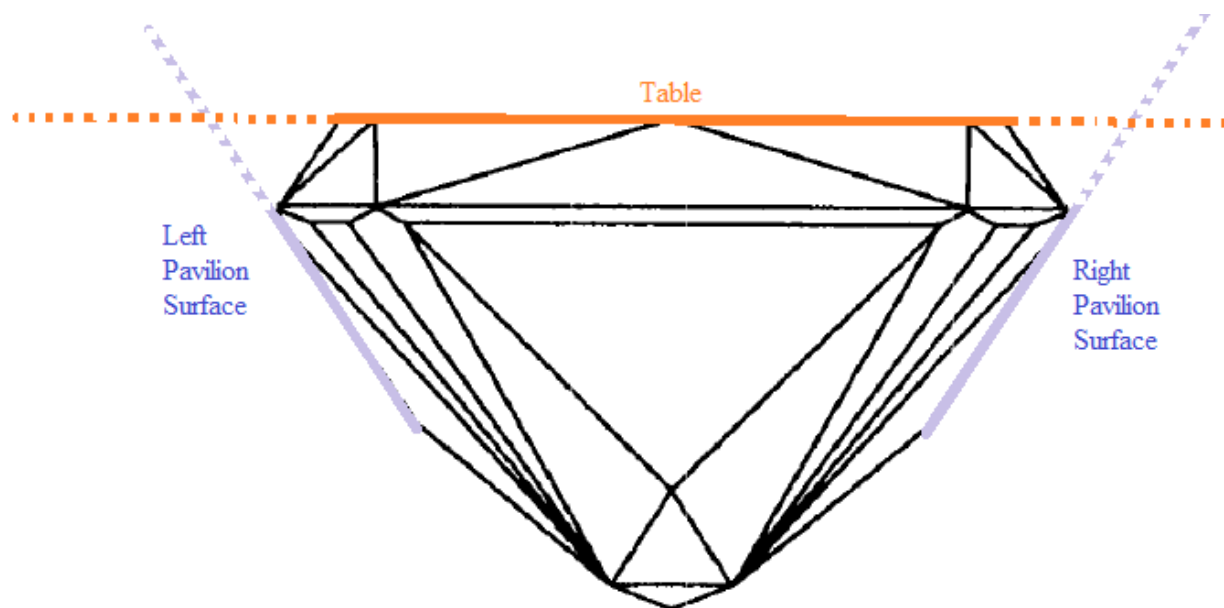


FIG. 6

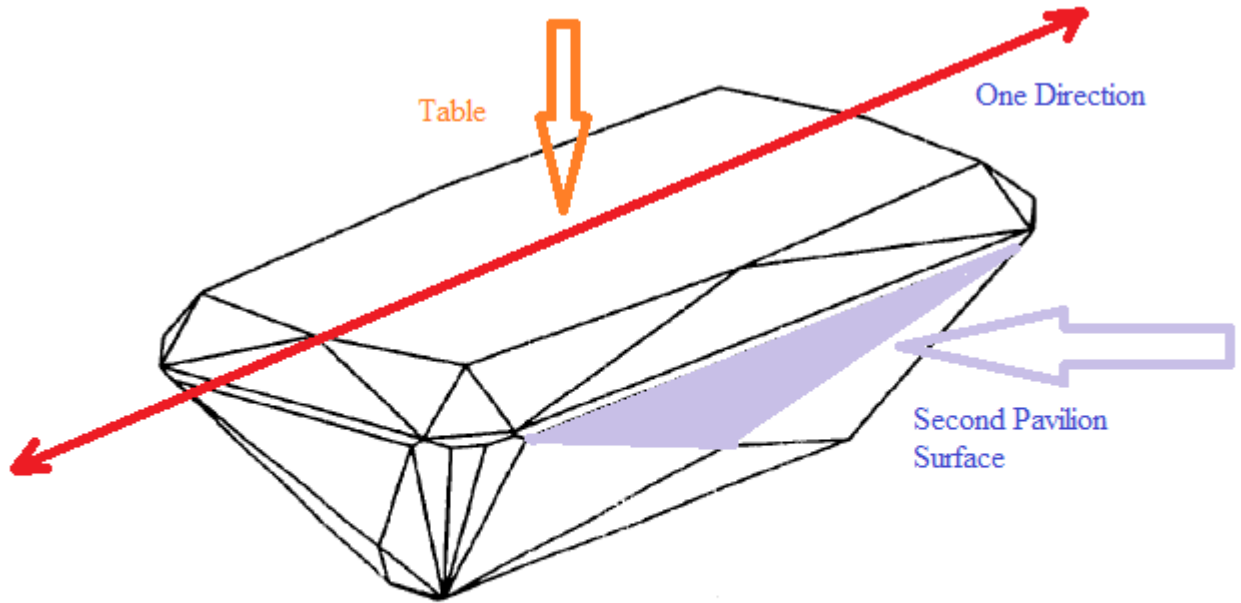


FIG.1

Also, Schmidt discloses

The pavilion 3 has lower girdle facets 5 on its surface, as well as main facets 7, which, as can be seen in Fig. 2, are visible shimmering through the table plane 21. The pavilion 3 preferably has a tip (culet) 9 at its lower end, but this can be very finely ground depending on requirements and the appearance to be created. According to the invention, the angle β between the pavilion surface or lower girdle facets 5 and the girdle plane is preferably less than 38° and is 35° in the example shown in Figs. 1 and 2.

(HDL-1005,4:11-19). This excerpt describes the pavilion surface of the gemstone, which corresponds to the second pavilion surface in the claim element. (HDL-1006,¶91). The excerpt mentions that the angle β between the pavilion surface and the belt plane is preferably less than 38° . This angle corresponds to the pavilion angle in the claim element, which is measured relative to the table plane (since the belt plane is parallel to the table plane). (HDL-1006,¶91). While the excerpt does not explicitly state that the pavilion surface is elongated in one direction or extends at the right side of the stone, these characteristics can be inferred from the overall description of the gemstone's structure. (HDL-1006,¶91); *see also* [1a] (explaining that the stone is oblong).

While Schmidt does not explicitly mention a “second” pavilion surface extending oppositely to a “first” pavilion surface, it is clear, as shown in the figures and description of Schmidt, that a circular or oblong cut gemstone has opposing pavilion surfaces. (HDL-1006,¶92).

Claim element [1g]:

Kanner does not disclose the crown and pavilion angles for its emerald cut diamond. Schmidt, however, discloses that the angle α between “the facets 15 of the crown 13 and the girdle plane is preferably $28-32^\circ$ ” and that the angle β between the pavilion surface or lower girdle facets 5 and the girdle plane is $32-37^\circ$. (HDL-1005,3:15-17;4:14-17;4:23-26); (HDL-1006,¶93). Accordingly, Schmidt discloses a

diamond with crown angle α of 28–32° and a pavilion angle β of 32–37°. (HDL-1005,3:15-17;4:14-17;4:23-26); (HDL-1006,¶93). These ranges overlap with the crown angle range of 30-36 degrees and the pavilion angle range of 30-34 degrees, as required by claim 1. Therefore, Schmidt discloses this limitation of claim 1. (See HDL-1006,¶93); *Almirall, LLC v. Amneal Pharms. LLC*, 28 F.4th 265, 272 (Fed. Cir. 2022) (affirming that the Board did not err in applying a presumption of obviousness of overlapping ranges).

One of ordinary skill in the art would have been motivated to cut the diamond of Kanner with the parameters of Schmidt to enhance its brilliance, provide it with a large appearance and preserve the raw material as much as possible. (HDL-1006,¶94).

Claim element [1h]:

Referring back to [1g], Schmidt discloses a crown angle of 28-32° and a pavilion angle of 32-37°. (HDL-1005,3:15-17;4:14-17;4:23-26). More specifically, Schmidt discloses a diamond with a crown angle α of 32 and a pavilion angle β of 32°. (HDL-1005,3:15-17;4:14-17;4:23-26). Trying this angle would have been a matter of routine optimization for one of ordinary skill in the art. Accordingly, this disclosure by Schmidt meets the claim limitation that the crown angle and the pavilion angle are equal. (HDL-1006,¶95)

Finally, the claim requires the angle relationship that is recited is “*to attain increased light amplification.*” Schmidt discloses a goal of its invention is “[i]t is therefore a further task of the present invention to create a precious stone or diamond which is relatively flat, has good brilliance and, analogous to the above-mentioned task, has a large appearance relative to the stone.” (HDL-1005,2:25-29). Schmidt further discloses that “the diamond proposed according to the invention, are suitable for any application where flat, relatively large-looking precious stones with excellent brilliance are used.” (HDL-1005,3:25-29). Thus, Schmidt provides a design that enhances the brilliance of the stone. (HDL-1006,¶96). A POSITA would understand that this brilliance would be achieved through “increased light amplification” as recited. (HDL-1006,¶96).

4. Motivation to Combine Kanner and Schmidt

As explained above, Kanner discloses a relatively flat emerald diamond with first and second crown surfaces extending in the elongated direction of the diamond. Kanner also discloses first and second pavilion surfaces extending in the elongated direction of the diamond. Kanner, however, does not disclose any crown or pavilion angles for the crown surface or the pavilion surfaces. One of ordinary skill in the art would have been motivated to look at Schmidt to cut the diamond in Kanner in accordance with the angle parameters provided in Schmidt. (HDL-1006,¶97).

A POSITA would have had several reasons to make this combination. For example, a POSITA would have utilized Schmidt to achieve “good brilliance” and a “large appearance” for a relatively flat the stone. (HDL-1005,2:25-28); (HDL-1006,¶98). Indeed, Schmidt offers a cut for “a precious stone or diamond which is relatively *flat*” (HDL-1005,2:25-28 (emphasis added)); (HDL-1006,¶98). Schmidt explains that “it has been shown that despite the choice of a relatively small angle between the surface of the pavilion and the girdle plane, excellent brilliance can be produced in a cut precious stone if the table plane of the crown is kept large at the same time.” (HDL-1005,2:38-46); (HDL-1006,¶98). Schmidt also explains that its disclosure can be broadly applied to “any” precious gemstone, inducing oblong shapes such as circular, square, rectangular, trapezoidal shapes to solve the problem addressed in the reference, which is enhancing the brilliance of flat or shallow stones. (HDL-1005,5:15-40;2:25-28;2:38-46); (HDL-1006,¶98). Therefore, a POSITA would have utilized the teachings in Schmidt to cut a brilliant diamond with a large appearance for a relatively flat cut diamond described in Kanner. (HDL-1006,¶98).

Schmidt discloses that the crown angle can be in the range of 28-32° and the pavilion angle can be in the range of 32-37°. (HDL-1005, 3:15-17;4:14-17;4:23-26). More specifically, Schmidt discloses a diamond with a crown angle α of 32° and a pavilion angle β of 32°. These ranges overlap with the ranges provided in claim

1, and the crown angle of 32° and pavilion angle of 32° falls squarely within the claimed limitations of claim 1. (HDL-1006,¶99).

It would have been a matter of routine optimization to try this angle. Indeed, Schmidt explains that “it is also a question of optimizing the selected stone and the design of the girdle line, whether circular, square, rectangular, trapezoidal, etc., how the various angular dimensions of α and β are selected, as well as the size ratios of the table diameter to the diameter of the girdle line and the depth of the pavilion, etc.” (HDL-1005,5:26-32); (HDL-1006,¶100). “The normal desire of artisans to improve upon what is already generally known can provide the motivation to optimize variables such as the percentage of a known [ingredient] for use in a known product.” *In re Ethicon, Inc.*, 844 F.3d 1344, 1351 (Fed. Cir. 2017); *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1368 (Fed. Cir. 2007) (emphasizing that “the discovery of an optimum value of a variable in a known process is usually obvious”).

A POSITA would have been particularly motivated to try the 32° because it is the upper limit for the crown angle and the lower limit for the pavilion angle taught by Schmidt. For a rough gem with a relatively large crown and a relatively small pavilion, a POSITA would have tried the upper limit of the crown angle to maximize the yield of the rough gem. (HDL-1006,¶101). A POSITA would also have tried the lower limit for the pavilion angle to ensure that the contemplate design fits within the rough gem. (HDL-1006,¶101). Therefore, cutting the rough gem at 32° would

have been a routine optimization by one of ordinary skill in the art. (HDL-1006,¶101).

During prosecution of the '791 Patent, Patent Owner submitted a Section 1.132 declaration which alleges that the ranges specified in claim 1 provide an unexpected result. (HDL-1002, pp.234-236). The declaration, however, is deficient for several reasons.

First, the declaration does not provide “a comparison of the claimed invention with the closest prior art.” *Ex Parte Eidschun*, Appeal 2023-003437, 2024 WL 4511908, at *3 (PTAB Oct. 16, 2024) (citing *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991)). Here, Schmidt was not considered during prosecution of the '791 Patent. More specifically, the declaration does not address the ranges presented in Schmidt, *i.e.*, the crown angle in the range of 28-32° and the pavilion angle in the range of 32-37°.

Second, it is not enough for the declaration to show that the results for claimed “invention and the comparative examples differ.” *Ex Parte Eidschun*, 2024 WL 4511908, at *3. “The difference must be shown to be an unexpected difference.” *Id.* (citing *In re Freeman*, 474 F.2d 1318, 1324 (CCPA 1973)). Here, the declaration merely states that a stone cut according to claim 1 has better than “excellent” result. (HDL-1002,pp.234-236). Accordingly, the declaration does not establish that one of

ordinary skill in the art would have considered the reported difference in results to be unexpected.

Accordingly, Patent Owner's declaration does not show unexpected results, and therefore, is not relevant.

5. Schmidt Teaches Claim 2: "The precious stone of claim 1, wherein said total depth percentage is in the range of 36.00 to 57.00."

Schmidt discloses the following parameters for the exemplary stone cut according to its disclosure:

$$D = 1.70 (\pm 0.05) \text{ mm}$$

$$T = 1.45 (\pm 0.05) \text{ mm}$$

$$H = 0.7 (\pm 0.05) \text{ mm}$$

$$K = 0.11 (\pm 0.01) \text{ mm}$$

$$P = 0.59 (\pm 0.01) \text{ mm}.$$

(HDL-1005,5:1-15). Of particular interest is the total height (H) of 0.7 mm and the diameter (D) of 1.70 mm. (HDL-1005,4:31-44;5:1-15). These measurements can be used to calculate the total depth percentage, which is calculated by dividing the total depth by width of the diamond. (HDL-1006,¶103); *see also* (HDL-1002,p.76). Accordingly, to calculate the total depth percentage, we need to divide the total height H by the diameter D: $(0.7 \text{ mm} / 1.70 \text{ mm}) * 100 \approx 0.4118$ or 41.18%. (HDL-

1006,¶103). Thus, the calculated total depth percentage of approximately 41.18% falls within the claimed range of 36 to 57. (HDL-1006,¶103).

6. Schmidt Teaches Claim 3: “The precious stone of claim 1 wherein the total depth percentage is in the range of 40 to 50.”

As explained above under (IV.A.5) in connection with claim 2, Schmidt discloses the total depth percentage of 41.18%, which falls within the claimed range of 40 to 50. (HDL-1006,¶104).

7. Schmidt Teaches Claim 4: “The precious stone of claim 1, wherein said crown angle is in the range of 31-34 degrees.”

Schmidt discloses “the angle α included between the facets 15 of the crown 13 and the girdle plane is preferably 28–32°” (HDL-1005,4:5-10). Thus, Schmidt disclose a crown angle in the range of 28-32° which overlaps with the claimed range of 31-34 degrees. (HDL-1006,¶105). As explained above under (IV.A.4) in connection with motivation to combine the references, there is a presumption of obviousness, and Patent Owner has not shown any unexpected results to rebut this presumption.

8. Schmidt Teaches Claim 5: “The precious stone of claim 1, wherein said pavilion angle is in the range of 31 to 33 degrees.”

Schmidt discloses that “[i]t is further proposed that the angle between the surface of the pavilion and the girdle plane is 32–37°” (HDL-1005,3:9-11). Thus, Schmidt discloses a pavilion angle with a range between 32-37°, which

overlaps with the claimed range of 31-34 degrees. (HDL-1006,¶106). As explained above under (IV.A.4) in connection with motivation to combine the references, there is a presumption of obviousness, and Patent Owner has not shown any unexpected results to rebut this presumption. (HDL-1006,¶106).

9. Schmidt Teaches Claim 6: “The precious stone of claim 1, wherein said precious stone is a diamond.”

Schmidt discloses “[t]he precious stone can be a diamond” (HDL-1005,3:19-24); (HDL-1006,¶107).

10. Schmidt and the Applicant Admitted Prior Art Teach Claims 7-12: “The precious stone of claim 1, wherein said precious stone has a . . . [cushion-cut shape, emerald-cut shape, radiant shape, oval shape, marquis shape, or princess shape].”

Both admitted prior art and Schmidt disclose the features of these claims. During prosecution of the '791 Patent, the examiner took official notice, and the Patent Owner did not traverse, that shapes such as cushion, emerald, radiant, oval, marquis, or princess are “extremely well-known in the gemstone art.” (HDL-1002,pp.52-53;56;63-73;94-95). This official notice is now admitted prior art. (HDL-1002,pp. 94-95 (“common knowledge statement is taken to be **admitted prior art**”)). Thus, one of ordinary skill in the art would have shaped the stone into one of these shapes because “there is no invention in merely changing the shape or form of an article without changing its function” (HDL-1002, pp.52-53;56;94-95). The reason for this implementation would have been to provide the “good brilliance” and

a “large appearance” of the design in Schmidt to cushion-cut shape, emerald-cut shape, radiant shape, oval shape, marquis shape, or princess shape designs. Such a change would have been obvious to one of ordinary skill in the art.

Schmidt also discloses “[u]ltimately, it is also a question of optimizing the selected stone and the design of the girdle line, whether circular, square, rectangular, trapezoidal, etc., how the various angular dimensions of α and β are selected, as well as the size ratios of the table diameter to the diameter of the girdle line and the depth of the pavilion, etc.” (HDL-1005,5:16-39); (HDL-1006,¶109). This excerpt broadly provides that the girdle line of the gemstone can have various shapes, including square and rectangular. Accordingly, Schmidt’s design can be applied to non-circular shapes. (HDL-1006,¶109).

11. Schmidt Teaches Claim 13: “The precious stone of claim 1, wherein said crown height percentage in the range of 6-15, said girdle height percentage in the range of 3-5, said table percentage in the range of 70-79, and said total depth percentage in the range of 36-57.”

Schmidt discloses “a cut, flat precious stone with a relatively large appearance in relation to the weight or thickness of the precious stone . . . in which the table diameter is at least 70% of the diameter of the girdle line.” (HDL-1005,2:5-12). Schmidt also discloses an exemplary embodiment in which the diameter of the girdle line is D and the height of the stone is H. (HDL-1005,4:30-45). Thus, Schmidt discloses a total depth percentage: $H/D = 0.7/1.70 \approx 41.18\%$, which falls within the

claimed range of 36-57%. (HDL-1005,4:30-45); (HDL-1006,¶110). While Schmidt does not disclose a crown height percentage in the range of 6-15, or a girdle height percentage in the range of 3-5, Schmidt discloses a combined crown height percentage and girdle height percentage of: $K/D = 0.11/1.7 \approx 6.4\%$. (HDL-1005,4:30-45); (HDL-1006,¶110). It would have been obvious to a POSITA before the filing date of the '791 Patent to shape the gemstone, as claimed, to optimize the light properties of the precious stone. (HDL-1006,¶111). Discovering an optimum value of a result effective variable involves only routine skill in the art. (HDL-1006,¶111). It is further noted that Patent Owner has not disclosed that the crown height percentage and a girdle height percentage create any unexpected result, particularly as they relate to Schmidt. (HDL-1006,¶111).

12. Schmidt Teaches Claim 14: “The precious stone of claim 13, wherein said crown height percentage is in the range of 8-13, said girdle height percentage is in the range of 3.5-4.5, said table percentage is in the range of 72-77, and said total depth percentage is in the range of 40-50.”

As explained above under (IV.A.11) in connection with claim 13, Schmidt discloses a table percentage of at least 70%, and a total depth percentage of 41.18%, which overlap and fall within the claimed ranges, respectively. Schmidt also discloses a combined crown height percentage and a girdle height percentage: $K/D = 0.11/1.7 \approx 6.4\%$. (HDL-1005,4:30-45). It would have been obvious to a POSITA before the filing date of the '791 Patent to shape the gemstone, as claimed, to

optimize the light properties of the precious stone. (HDL-1006,¶112). Discovering an optimum value of a result effective variable involves only routine skill in the art. (HDL-1006,¶112). It is further noted that Patent Owner has not disclosed that the crown height percentage and a girdle height percentage create any unexpected result. (HDL-1006,¶112).

B. GROUND 2: Claims 1, 5 and 6 Are Anticipated by Grossbard (HDL-1007)

Grossbard anticipates claims 1, 5 and 6 of the '791 Patent. *See generally* (HDL-1006,¶¶114-128).

1. Grossbard

U.S. Patent No. 4,555,916 to Grossbard was filed on July 20, 1982 and granted on December 3, 1985 (“Grossbard”). (HDL-1007). It therefore qualifies as prior art to the '791 Patent under 35 U.S.C. § 102(a)(1).

Similar to the '791 Patent, Grossbard offers a diamond cut that enhances the fire of a diamond. (HDL-1007,1:8-9). Grossbard recognizes that traditional brilliant “cut is the most wasteful of diamond raw material.” (HDL-1007,1:10-12). Grossbard also explains that “step cut stones such as square cut diamonds and emerald cut diamonds while being more conservative of diamond raw material have none of the fire of brilliant cut diamonds.” (HDL-1007,1:13-16). Thus, Grossbard provides “a diamond which is, on the one hand, more brilliant than the heretofore known conventional or hybrid square or emerald cut colored diamonds and, on the other

hand, is less wasteful of raw material than conventional brilliant cut or the aforementioned hybrid cut diamonds.” (HDL-1007,1:43-47).

The diamond 10 of Grossbard has “an octagonal girdle with straight edge long side facets 12 . . . ; a pyramidal base having . . . long side girdle breaks 18 . . . , culet breaks 20, and a culet 22 . . . ; and a crown having a girdle break 24, a table break 26 and a table 28.” (HDL 1007,2:14-21). “[T]he angle between the plane of the girdle break of the crown and the table should be in the range from 35° to 45°.” (HDL-1007,2:23-25). The angle between the plane of the culet break and the plane of the table is from 33° to 42°. (HDL-1007,2:28-29). Figs. 1 and 2 of Grossbard are provided below, which show the top and bottom view of an emerald cut diamond.

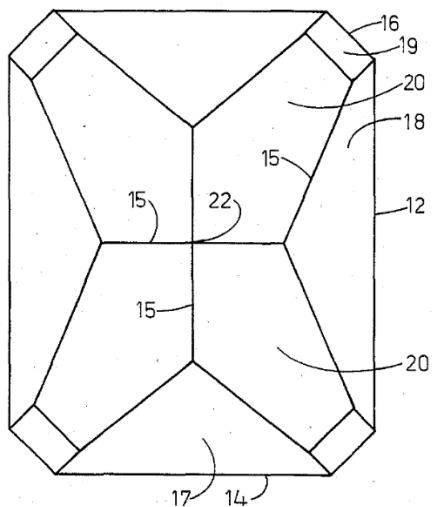


FIG. 1

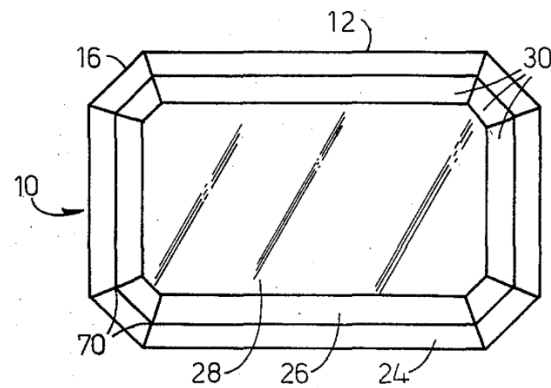
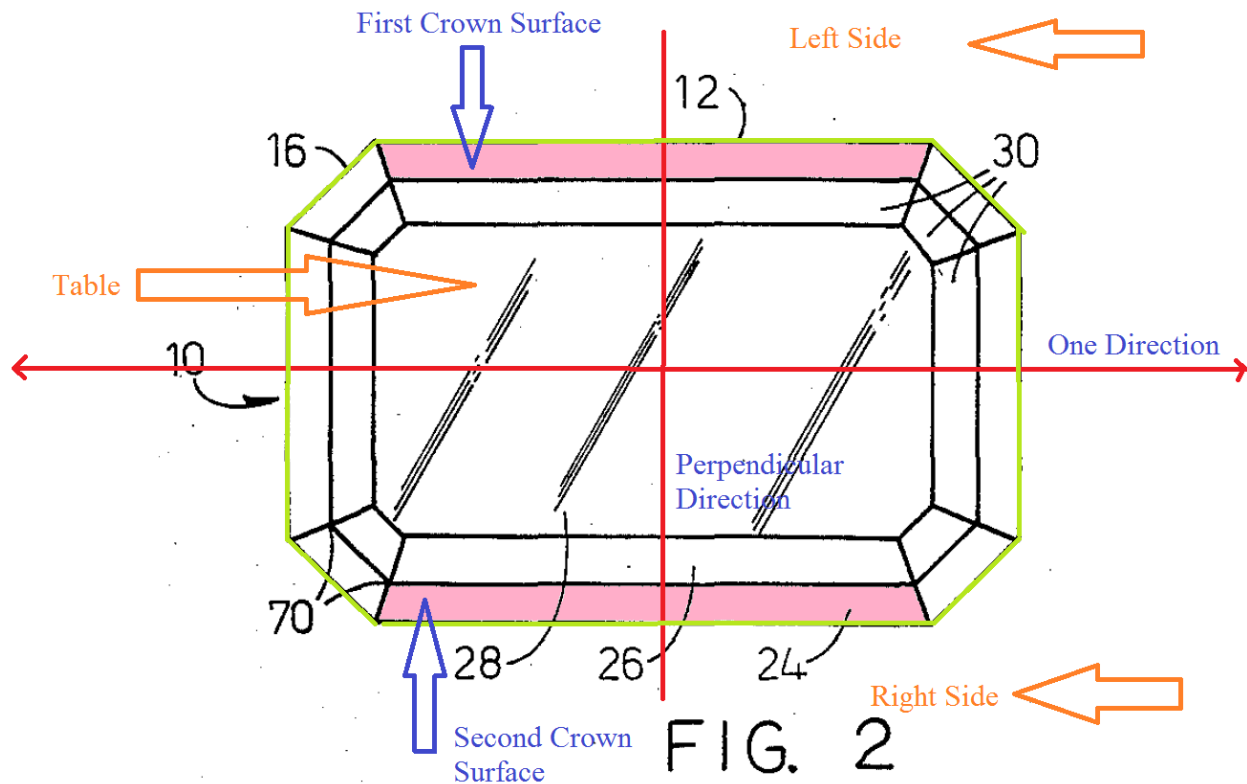


FIG. 2

2. Grossbard Discloses Each Element of Independent Claim 1

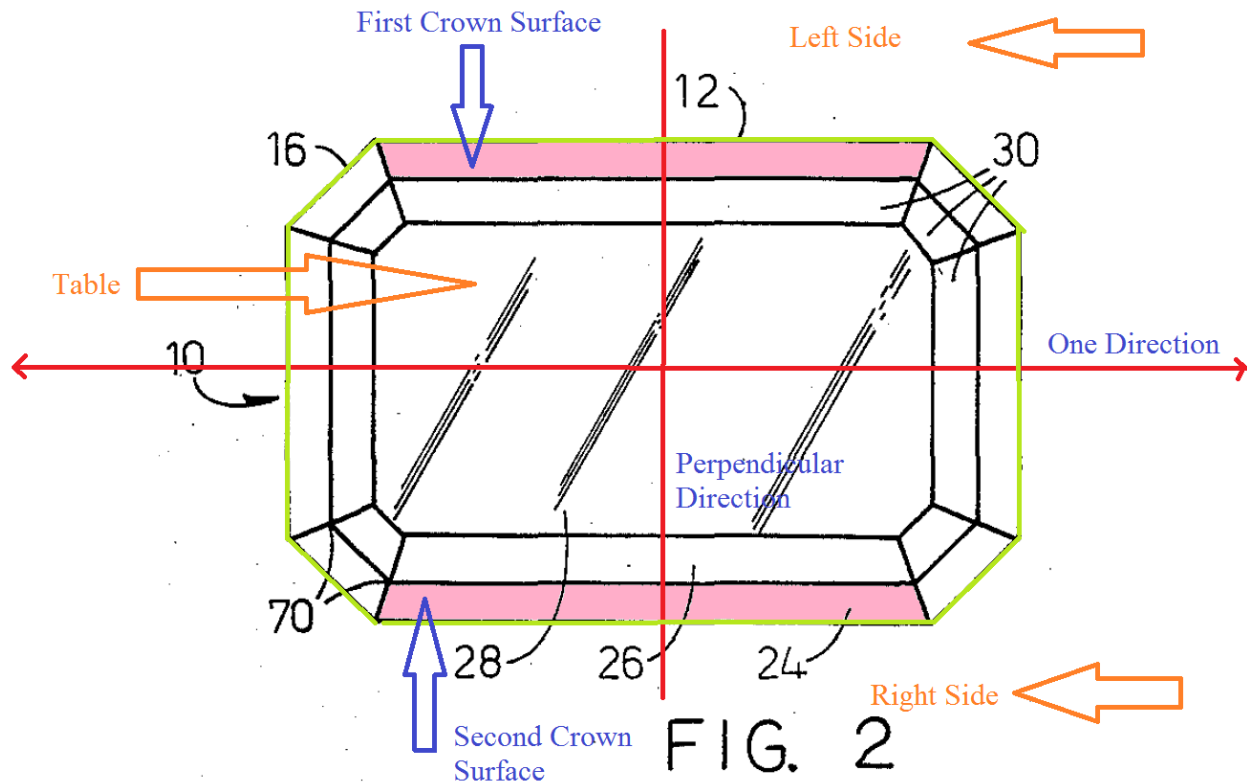
Claim element [1a]:

Grossbard discloses emerald cut diamond 10, which is elongated in one direction and defines a length of the diamond in that direction. The diamond 10 has a width in a direction perpendicular to the one direction. The diamond 10 also has a left side and a right side, both of which extend along the length of the diamond. Annotated Fig. 2 of Grossbard shows these elements of claim 1. (HDL-1006,¶117).



Claim element [1b]:

Diamond 10 of Grossbard has a table 28 with a table plane. (HDL-1007,2:14-21). The table 28 is elongated in the one direction. Diamond 10 also has an octagonal girdle. (HDL-1006,¶118).



Claim 1 further requires a specific total depth percentage, a specific crown height percentage, a specific girdle height percentage and a specific table percentage, but does not define any value for these parameters. These parameters are merely characteristics that a POSITA would understand all stones to have and are well known and conventional, as admitted by the '791 Patent. (HDL-1006, ¶119); *see also* IV.A.3 [1b] (discussing the background section of the '791 Patent as well as its prosecution history admitting that these parameters are “well known,” and explaining how these percentages are calculated).

One of ordinary skill in the art, therefore, would have measured the total depth, crown height, girdle height, table diameter, and width of the diamond 10 of

Grossbard, and calculated the total depth percentage, the crown height percentage, the girdle height percentage, and the table percentage for diamond 10. One of ordinary skill in the art is motivated to make these calculations because these parameters identify the physical attributes of the diamond. Therefore, Grossbard discloses element [1b] of the '791 Patent. (HDL-1006,¶120).

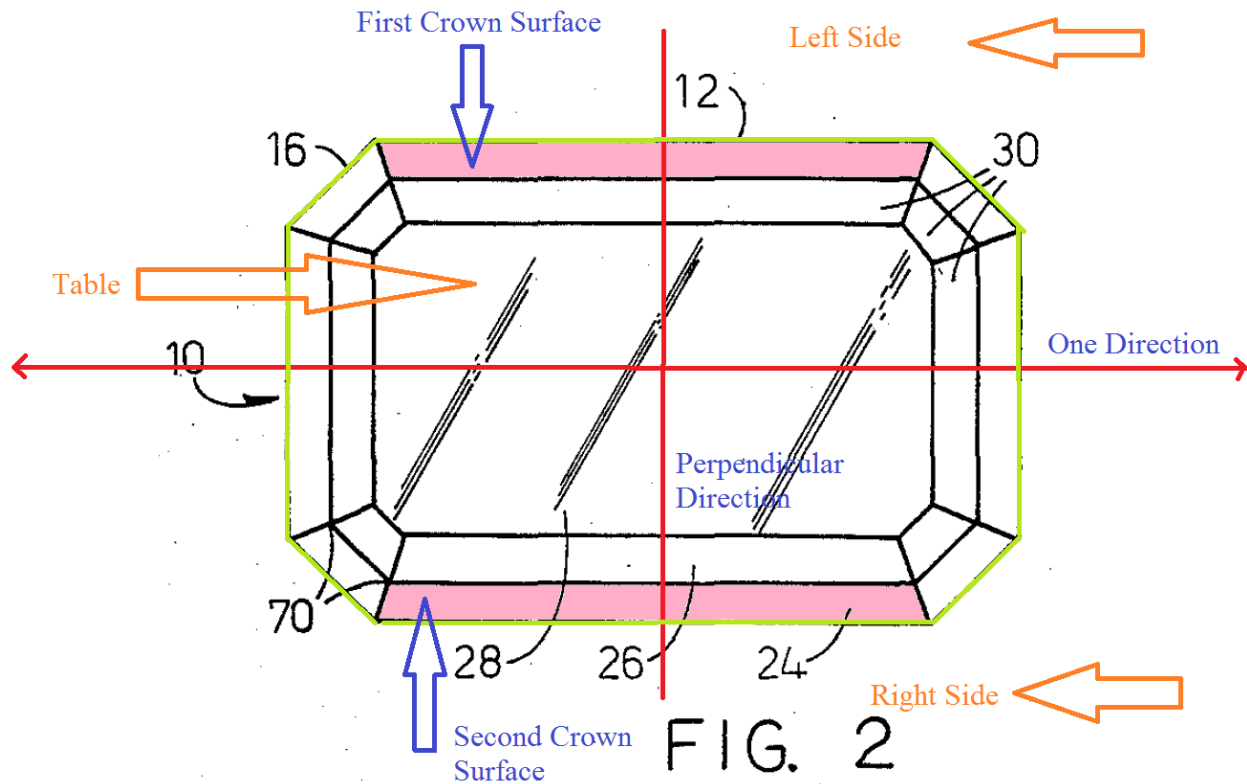
Claim element [1c]:

Grossbard in Fig. 2 discloses a crown having a girdle break 24 (colored in pink), which is elongated in the one direction. (HDL-1006,¶121). The girdle break 24 extends at the left side of diamond 10 and is located between the table 28 and the octagonal girdle. The girdle break 24 refers to the first crown surface of claim 1. (HDL-1006,¶121). Grossbard also discloses that “the angle between the plane of the girdle break of the crown and the table should be in the range from 35° to 45°.” (HDL-1007,2:23-25). Therefore, this angle refers to the crown angle of claim 1. (HDL-1006,¶121).



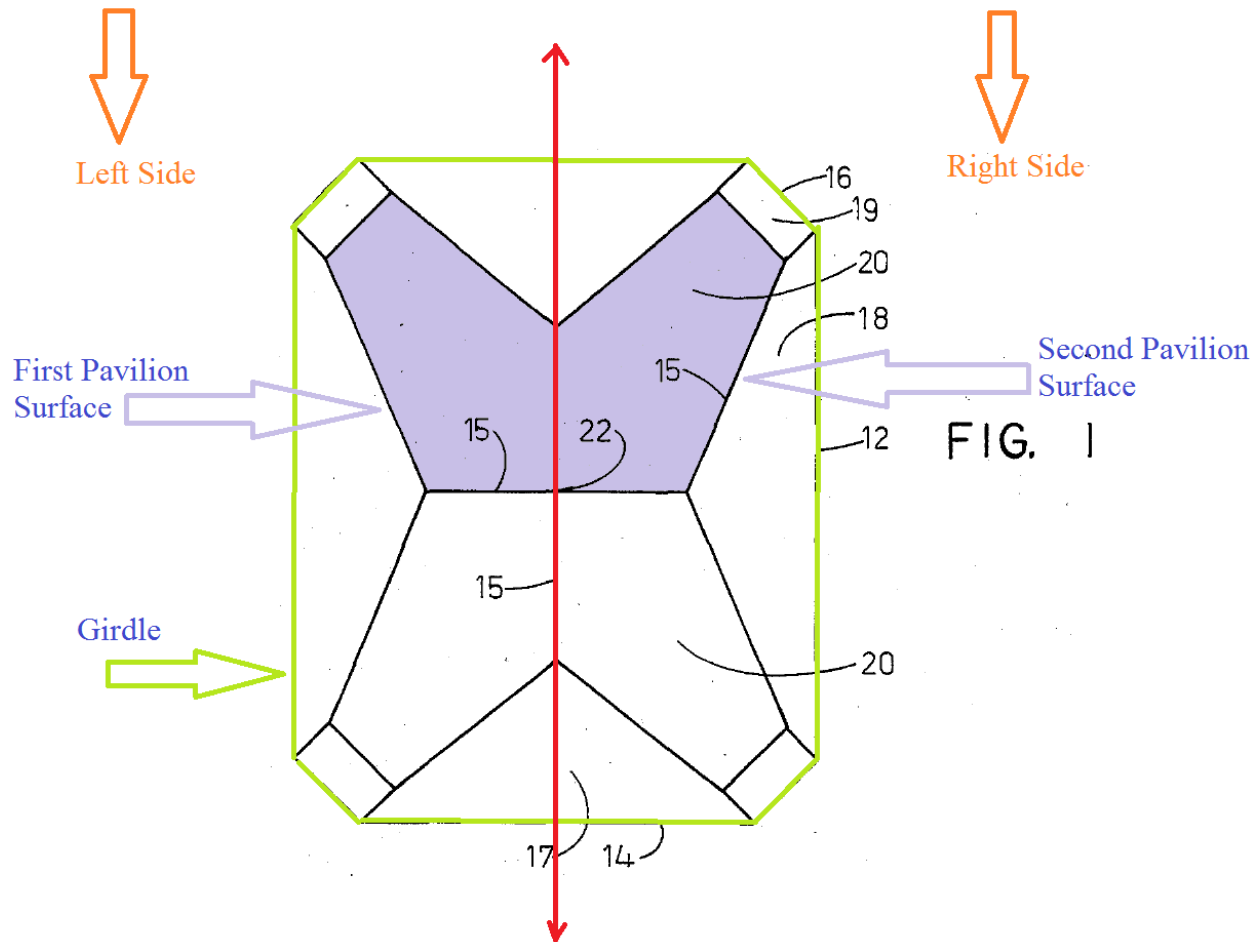
Claim element [1d]:

Grossbard in Fig. 2 discloses a crown having a girdle break 24 (colored in pink), which is elongated in the one direction. (HDL-1006,¶122). The girdle break 24 extends at the right side of diamond 10 and is located between the table 28 and the octagonal girdle. (HDL-1006,¶122). The girdle break 24 is on the opposite side to the girdle break on the left side. The girdle break 24 on the right side of diamond 10 refers to the second crown surface of claim 1. Grossbard also discloses that “the angle between the plane of the girdle break of the crown and the table should be in the range from 35° to 45°.” (HDL-1007,2:23-25). Therefore, this angle refers to the crown angle of claim 1. (HDL-1006,¶122).



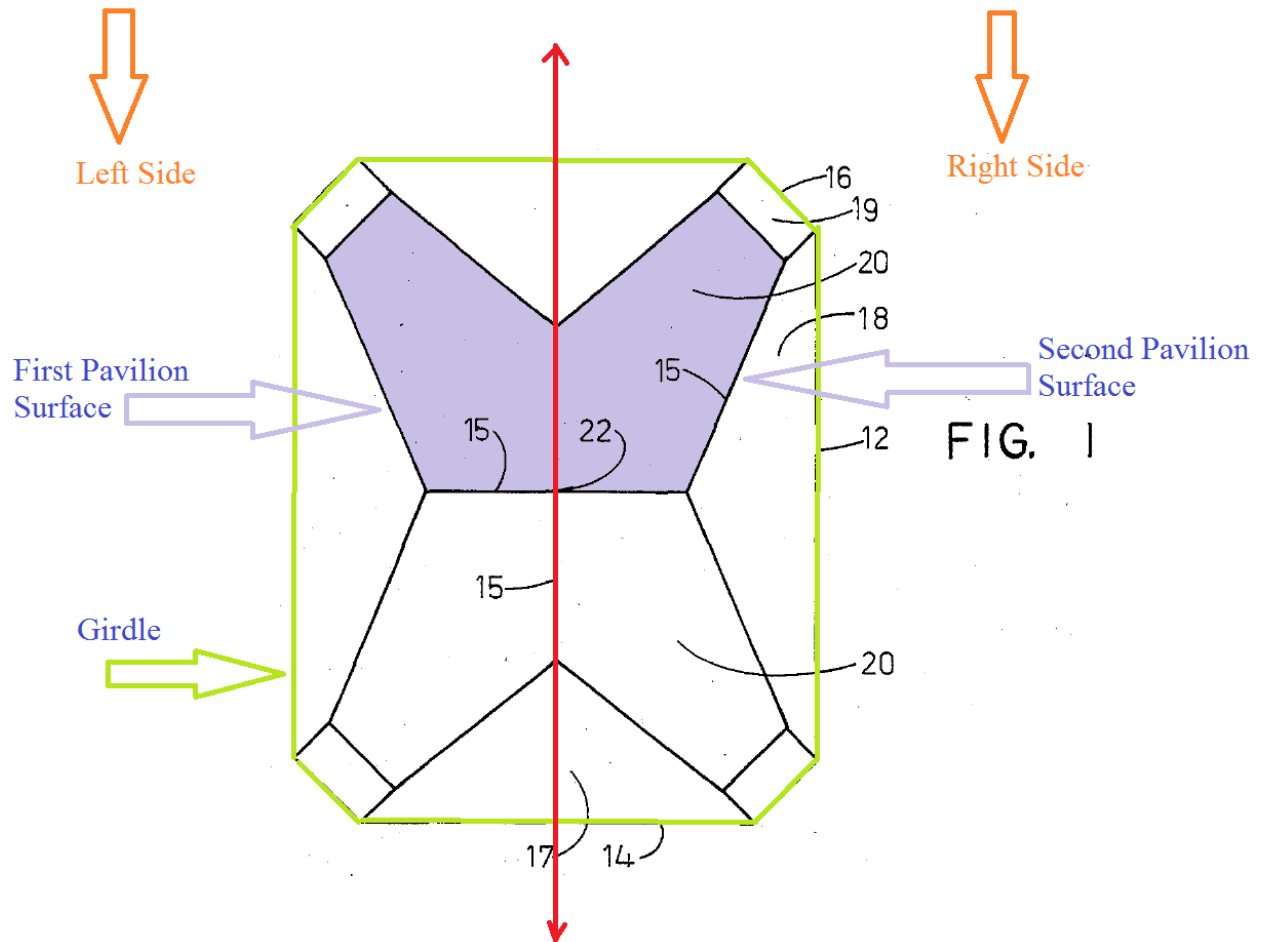
Claim Element [1e]:

Grossbard discloses a culet break 20 (see Fig.1, reproduced below and colored in purple), which is elongated in the one direction. (HDL-1006,¶123). The culet break 20 extends at the left side of the diamond 10. The culet break 20 refers to the first pavilion surface of claim 1. (HDL-1006,¶123). “The angle between the plane of the culet break and the plane of the table is from 33° to 42°.” (HDL-1007,2:28-29). This angle refers to the pavilion angle of claim 1. (HDL-1006,¶123).



Claim element [1f]:

Grossbard discloses a culet break 20 (see Fig.1, reproduced below and colored in purple), which is elongated in the one direction. (HDL-1006,¶124). The culet break 20 extends at the right side of the diamond 10 and opposed to the first pavilion angle. (HDL-1006,¶124). The culet break 20 refers to the second pavilion surface of claim 1. (HDL-1006,¶124). “The angle between the plane of the culet break and the plane of the table is from 33° to 42°.” (HDL-1007,2:28-29). This angle refers to the pavilion angle of claim 1. (HDL-1006,¶124).



Claim element [1g]:

Grossbard discloses that “the angle between the plane of the girdle break of the crown and the table should be in the range from 35° to 45°” and “[t]he angle between the plane of the culet break and the plane of the table is from 33° to 42°.” (HDL-1007,2:23-25;2:28-29). These angles refer to the crown angle and pavilion angle of claim 1, respectively, and they overlap with the ranges that claim 1 provides for the crown angle and the pavilion angle (*i.e.*, the crown angle overlaps in the 35°-36° range and the pavilion angle overlaps in the 33°-34° range). (HDL-1006,¶125).

For the reasons explained above under IV.A.4, Patent Owner has failed to identify any unexpected result in connection with this limitation, and thus, the overlapping ranges anticipate this claim.

Claim element [1h]:

Grossbard discloses the crown angle in the 35°-36° range and the pavilion angle in the 33°-34° range. (See [1g]). In these ranges, the crown angle can be larger than the pavilion angle by less than 6 degrees, *e.g.*, the crown angle of 35° and the pavilion angle of 33°. One of ordinary skill in the art would have been particularly motivated to try these angles because for a shallow or flat rough, these angles preserve most of the rough gem. (HDL-1006,¶126).

3. Grossbard Discloses Claim 5: “The precious stone of claim 1, wherein said pavilion angle is in the range of 31 to 33 degrees.”

Grossbard discloses the pavilion angle of 33°. (HDL-1007,2:28-29) (HDL-1006,¶127).

4. Grossbard Discloses Claim 6: “The precious stone of claim 1, wherein said precious stone is a diamond.”

Grossbard shows a diamond 10 in Figs. 1 and 2. (HDL-1006,¶128).

C. GROUND 3: Claims 1 and 5-12 Are Obvious Over Greeff (HDL-1008) in View of Grossbard (HDL-1007)

1. Greeff

The first prior art reference applied in this Ground is U.S. Design Patent No. 463,315 to Greeff (“Greeff”). (HDL-1008). It has a patent grant date of September

24, 2002 and was filed on May 14, 2001. It therefore qualifies as prior art to the '791 Patent under 35 U.S.C. § 102(a)(1).

Similar to the '791 Patent, Greeff offers an emerald cut for a gemstone (HDL-1008; *see* HDL-1001 (claim 8)). Figs. 1-6 of Greeff show various views of the gemstone. (HDL-1008,Figs.1-6). Figs. 1, 3 and 5 of the reference are included below. (HDL-1006,¶132).

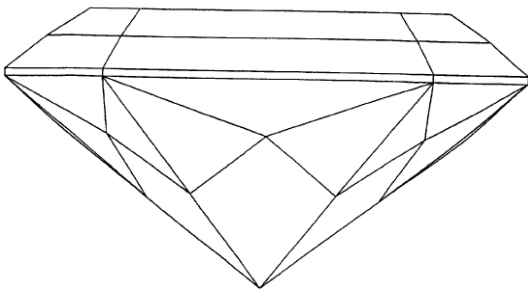


Figure 1

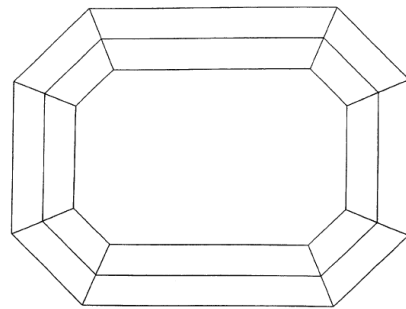


Figure 3

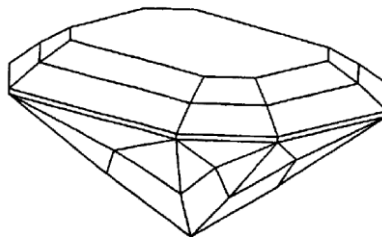


Figure 5

2. Grossbard

U.S. Patent No. 4,555,916 to Grossbard was filed on July 20, 1982 and granted on December 3, 1985 (“Grossbard”). (HDL-1007). It therefore qualifies as prior art

to the '791 Patent under 35 U.S.C. § 102(a)(1). A description of Grossbard is provided above under IV.B.1.

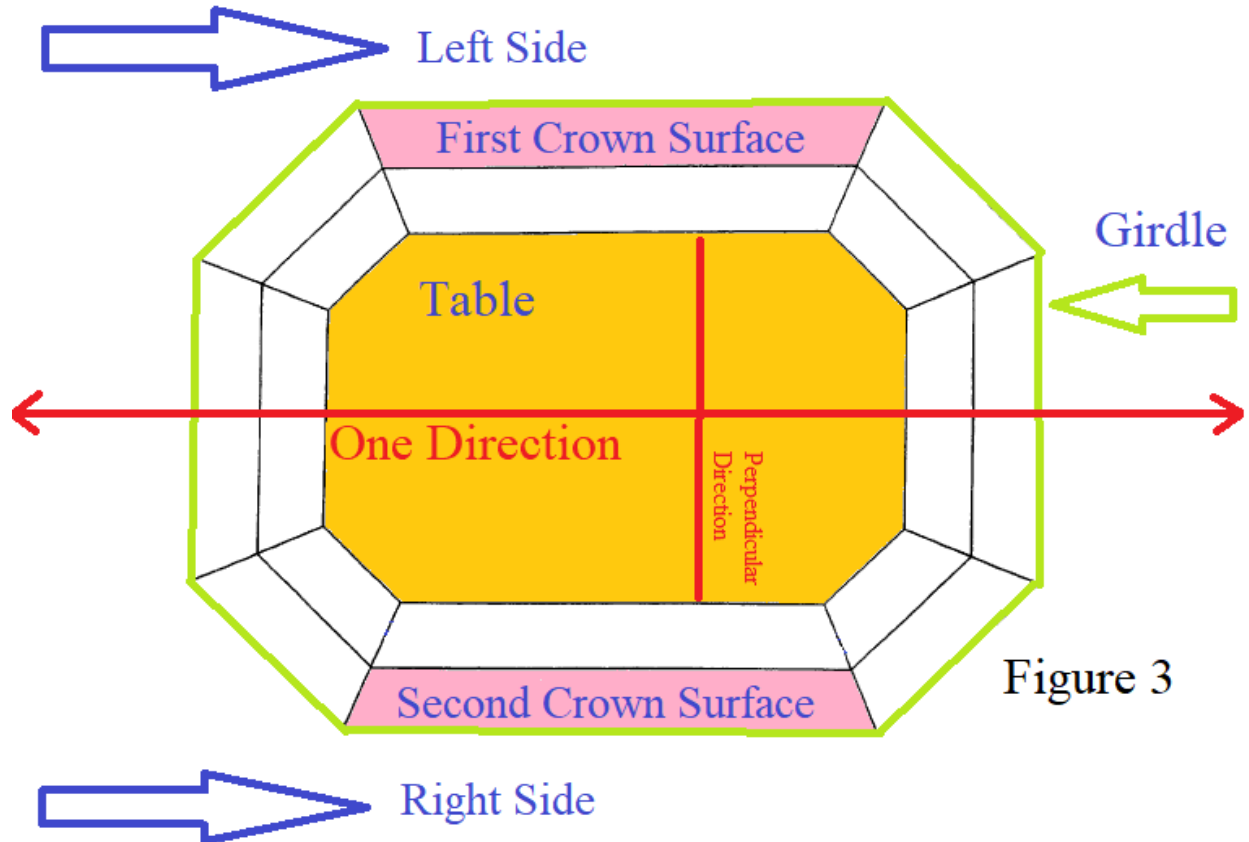
3. Greeff and Grossbard Render the Claims Obvious

Greeff and Grossbard render claims 1 and 6-12 obvious either explicitly or combined with the knowledge of a POSITA. (*See generally* HDL-1006, ¶¶131-156).

4. Greeff and Grossbard Teach Each Element of Independent Claim 1

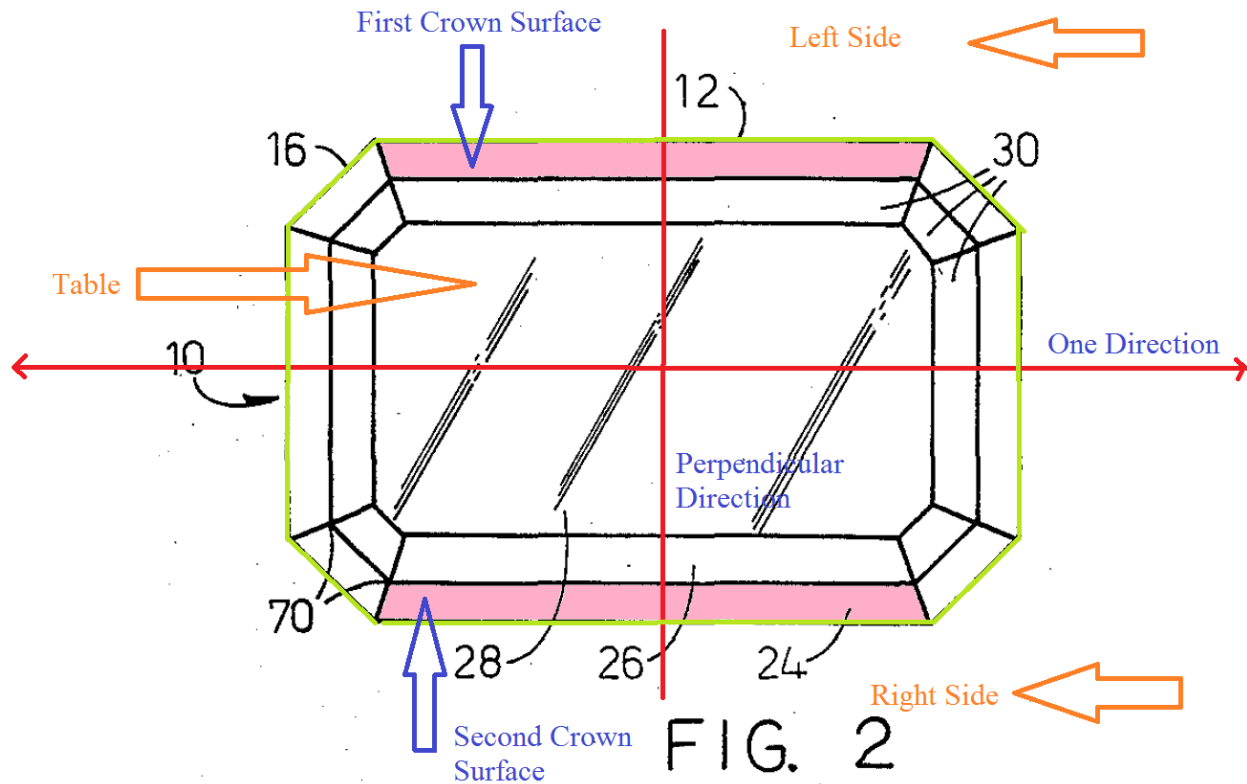
Claim element [1a]:

Figs. 1, 3, and 5 of Greeff show an emerald cut gemstone, which is elongated in one direction and defining a length. (HDL-1008,Figs.1;3;5). The gemstone has a width in a perpendicular direction. (HDL-1006,¶134). The gemstone has a left side and a right side, both of which extend along the length of the stone. (HDL-1006,¶134).



(HDL-1008, Fig. 3(annotated)).

Grossbard also discloses this element. See IV.B.2([1a]).



(HDL-1007, Fig. 2(annotated)).

Claim element [1b]:

Figures 3 and 5 of Greeff show a gemstone with a table having a table plane, that is elongated in the one direction, and a girdle. (HDL-1006, ¶136).

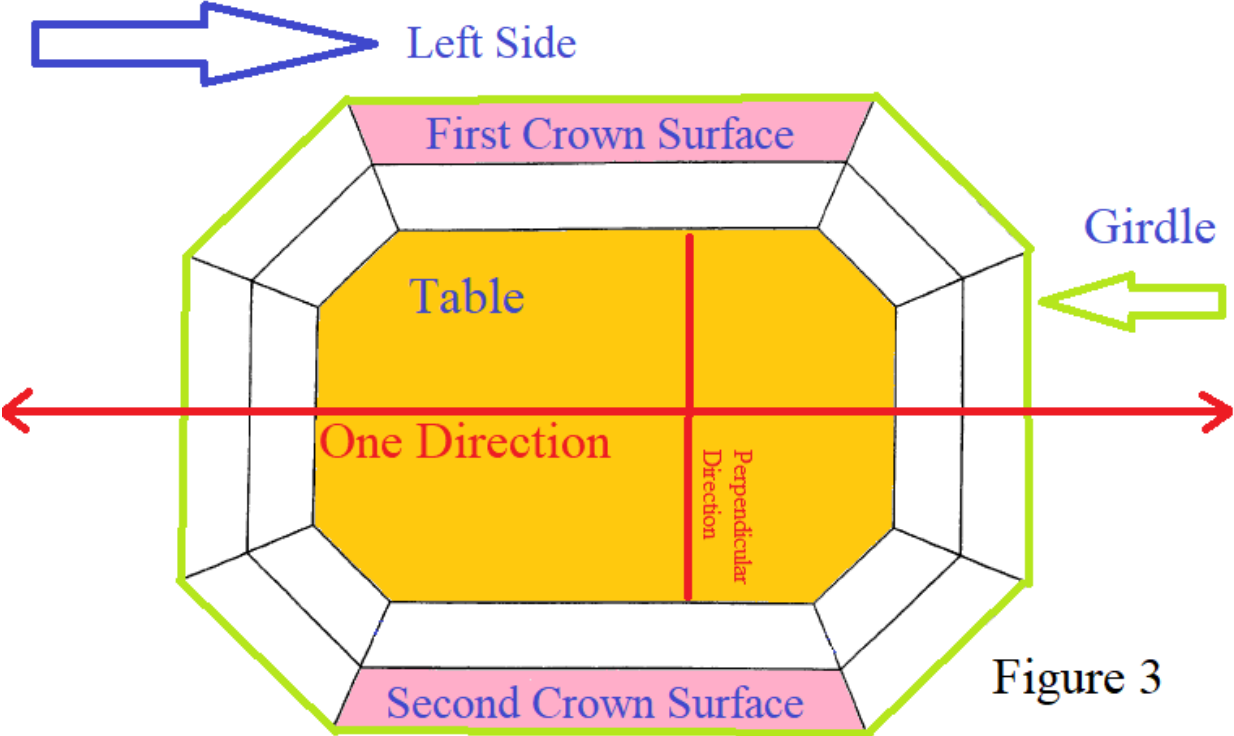


Figure 3

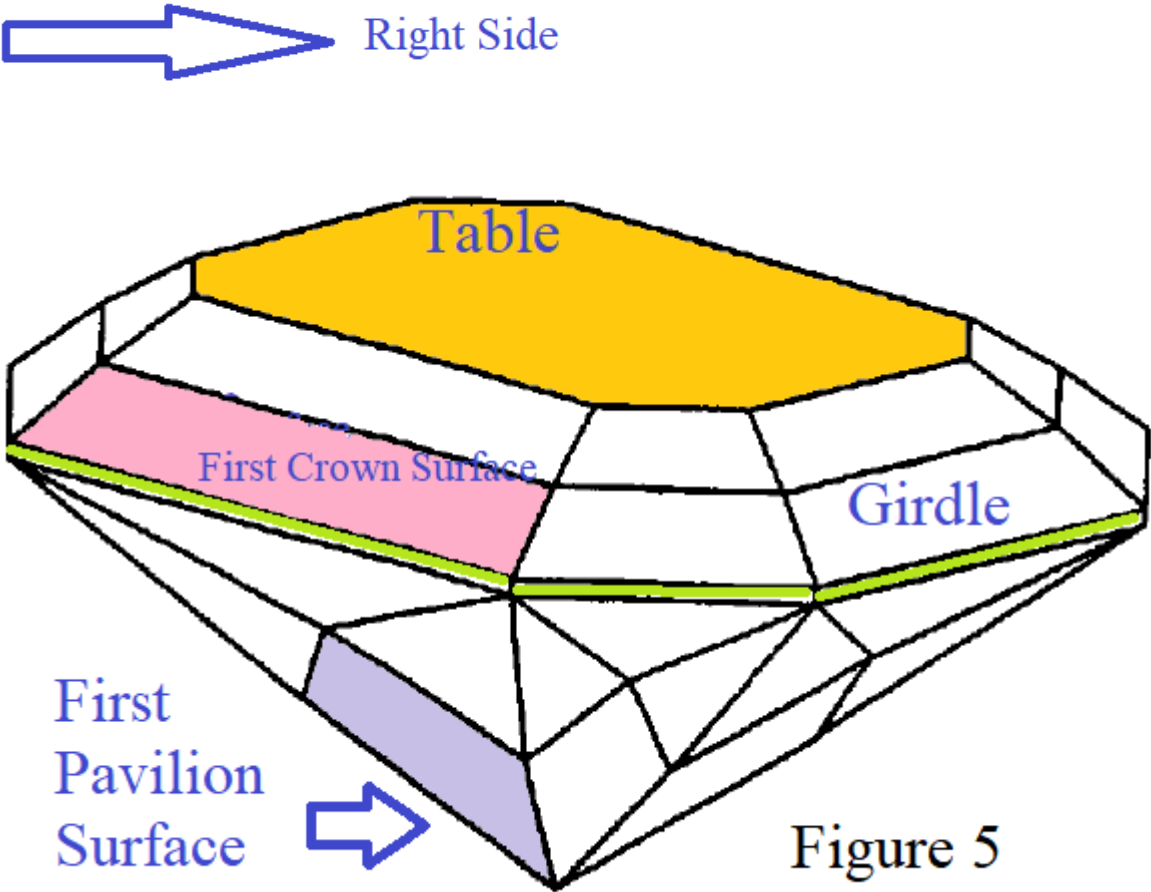
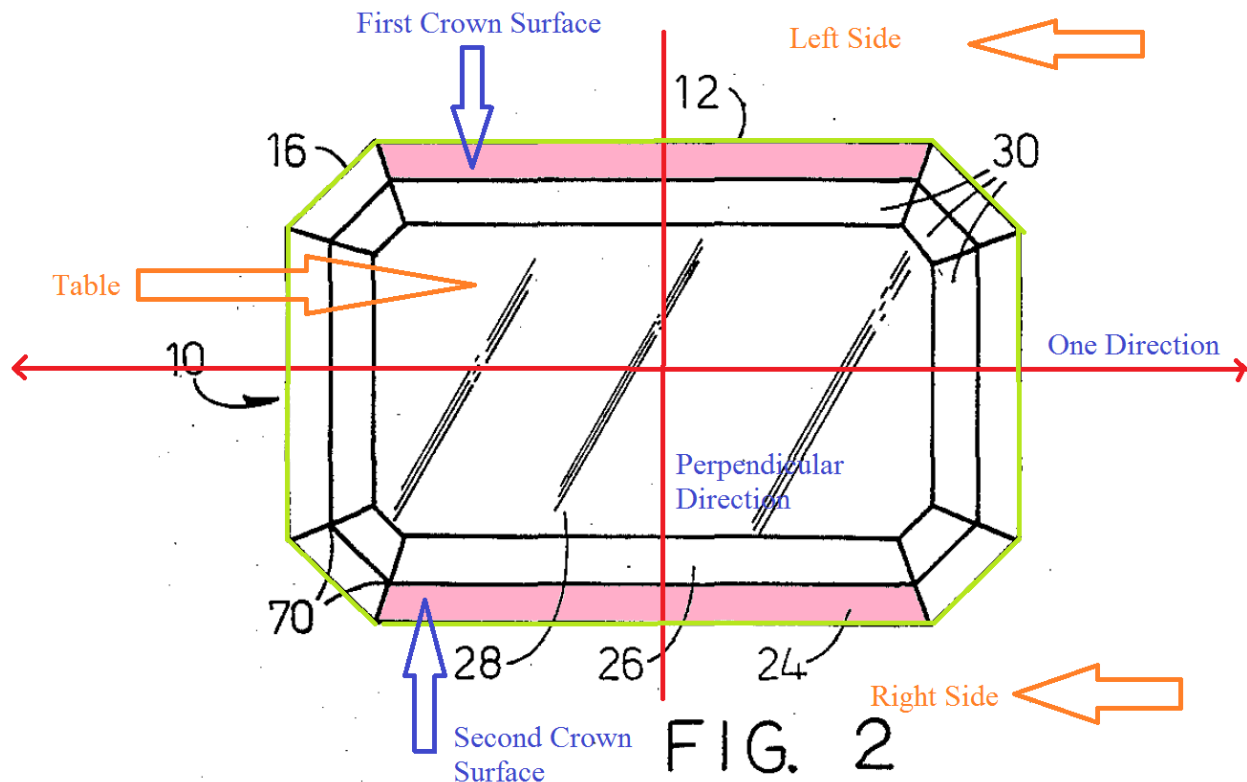


Figure 5

Grossbard also discloses this element. See IV.B.2([1b]).

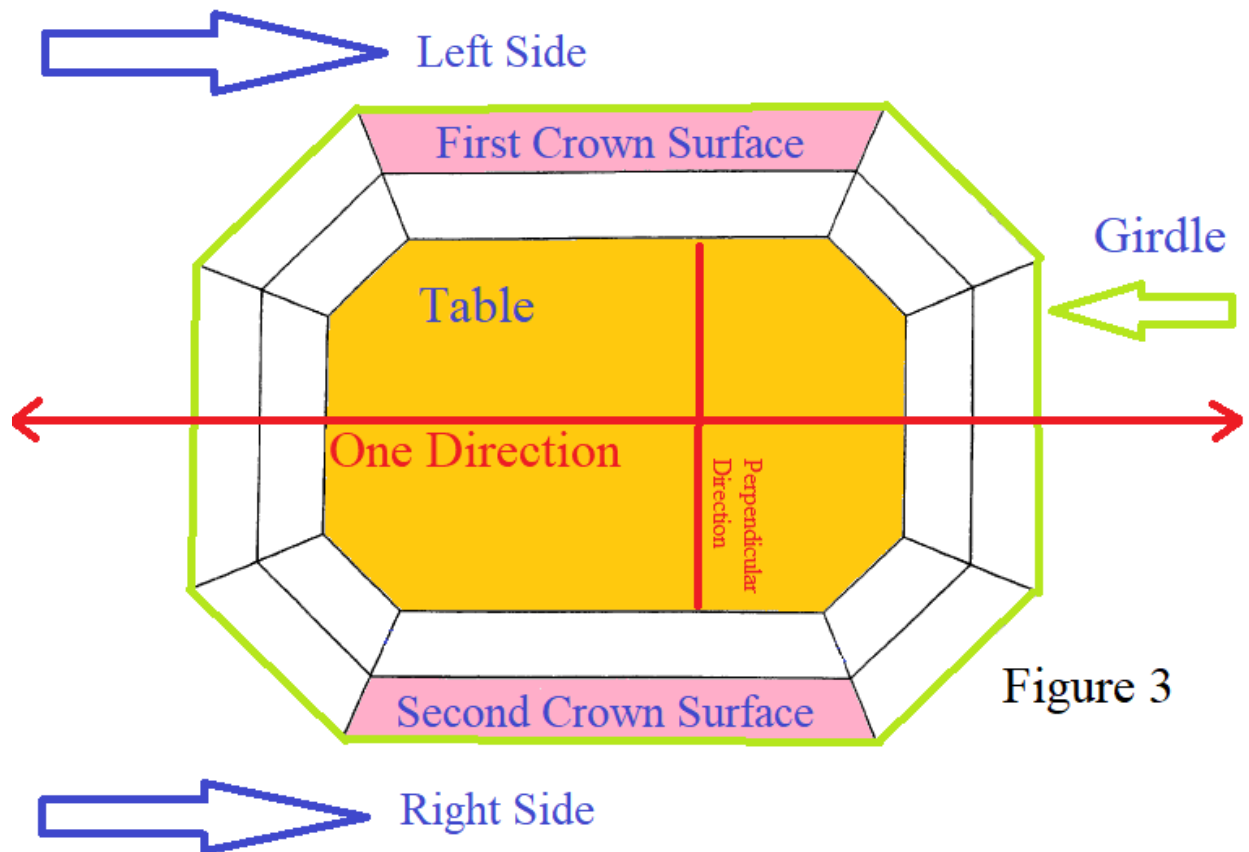


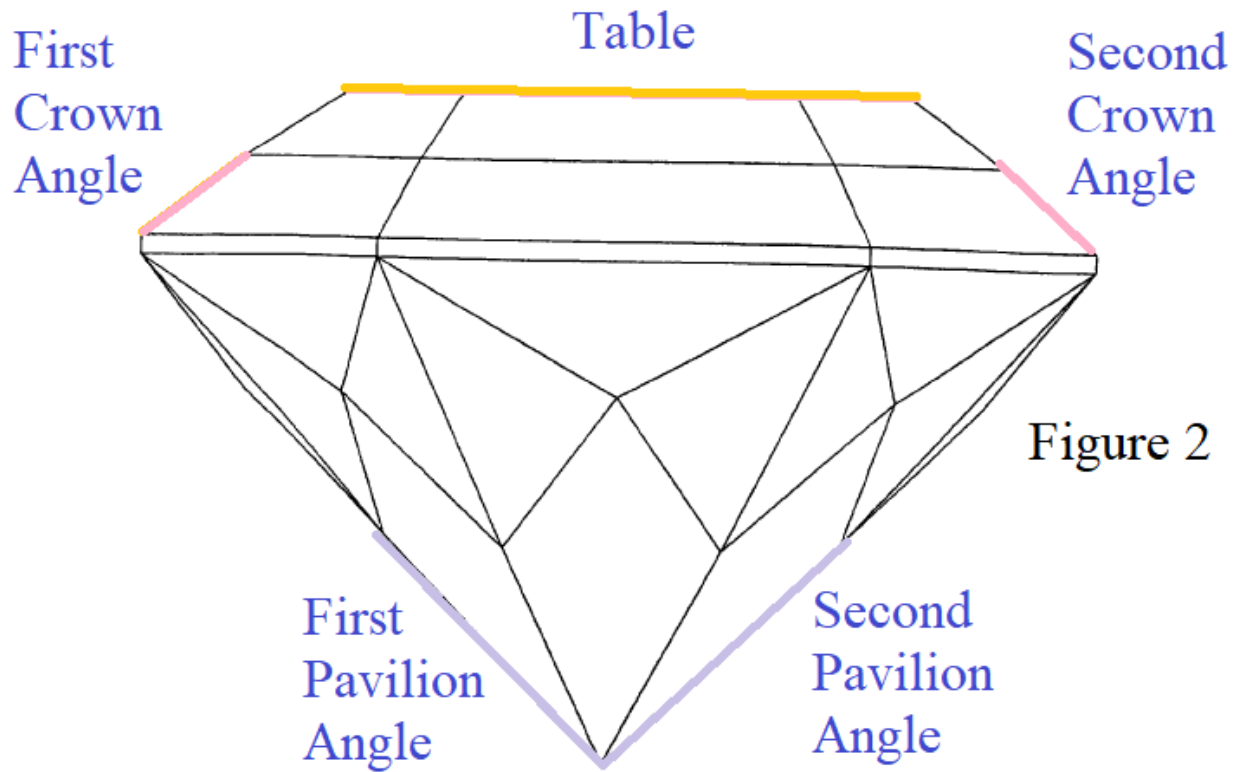
(HDL-1007, Fig. 2(annotated)).

Claim 1 further requires a specific total depth percentage, a specific crown height percentage, a specific girdle height percentage and a specific table percentage, but does not define any value for these parameters. These parameters are merely characteristics that a POSITA would understand all stones to have and are well known and conventional, as admitted by the '791 Patent. (HDL-1006, ¶138); see also IV.B.2([1b]) (discussing that these elements are well known for every emerald cut diamond); IV.A.3([1b]).

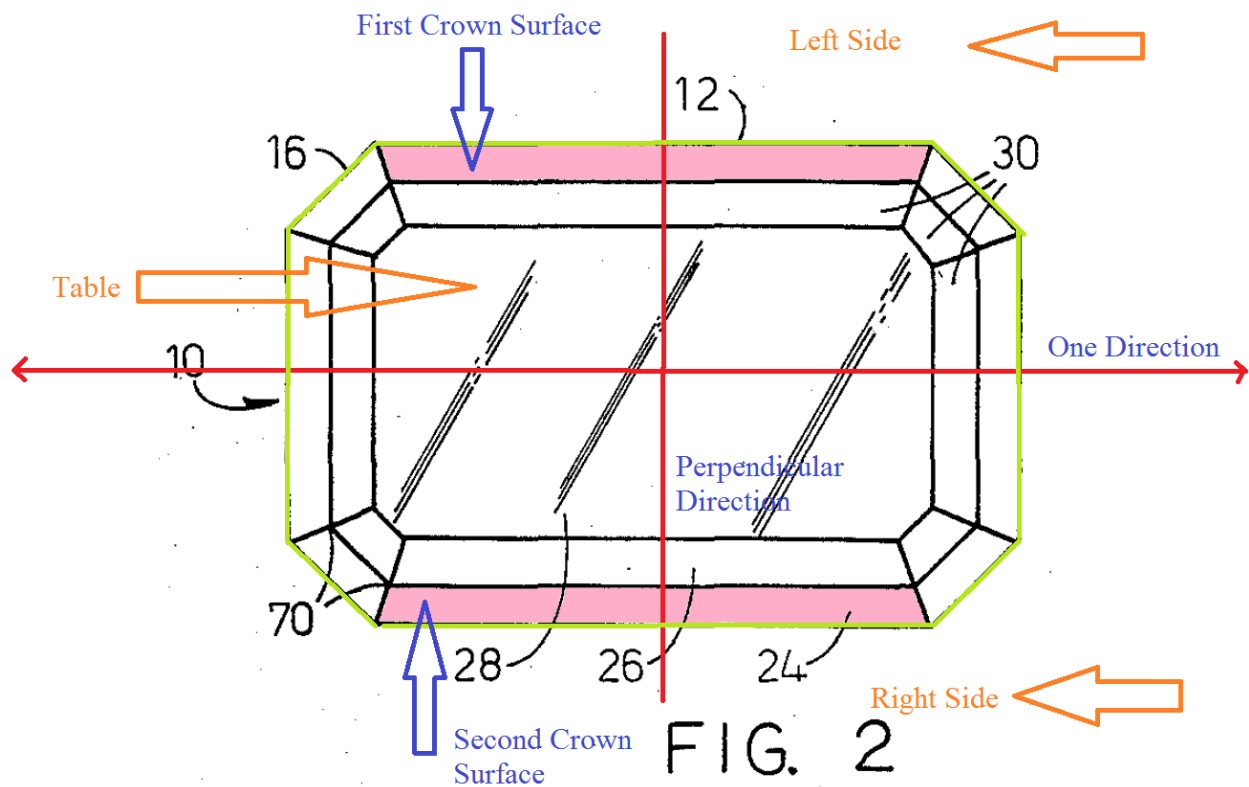
Claim element [1c]:

Fig. 3 of Greeff shows a first crown surface that is elongated in the one direction and extends at the left side of the gemstone. (HDL-1006,¶139). The first crown surface of Greeff is located between the table and the girdle. (HDL-1006,¶139). As Fig. 2 of Greeff shows, the first crown surface extends at a crown angle relative to the table plane. (HDL-1006,¶139).





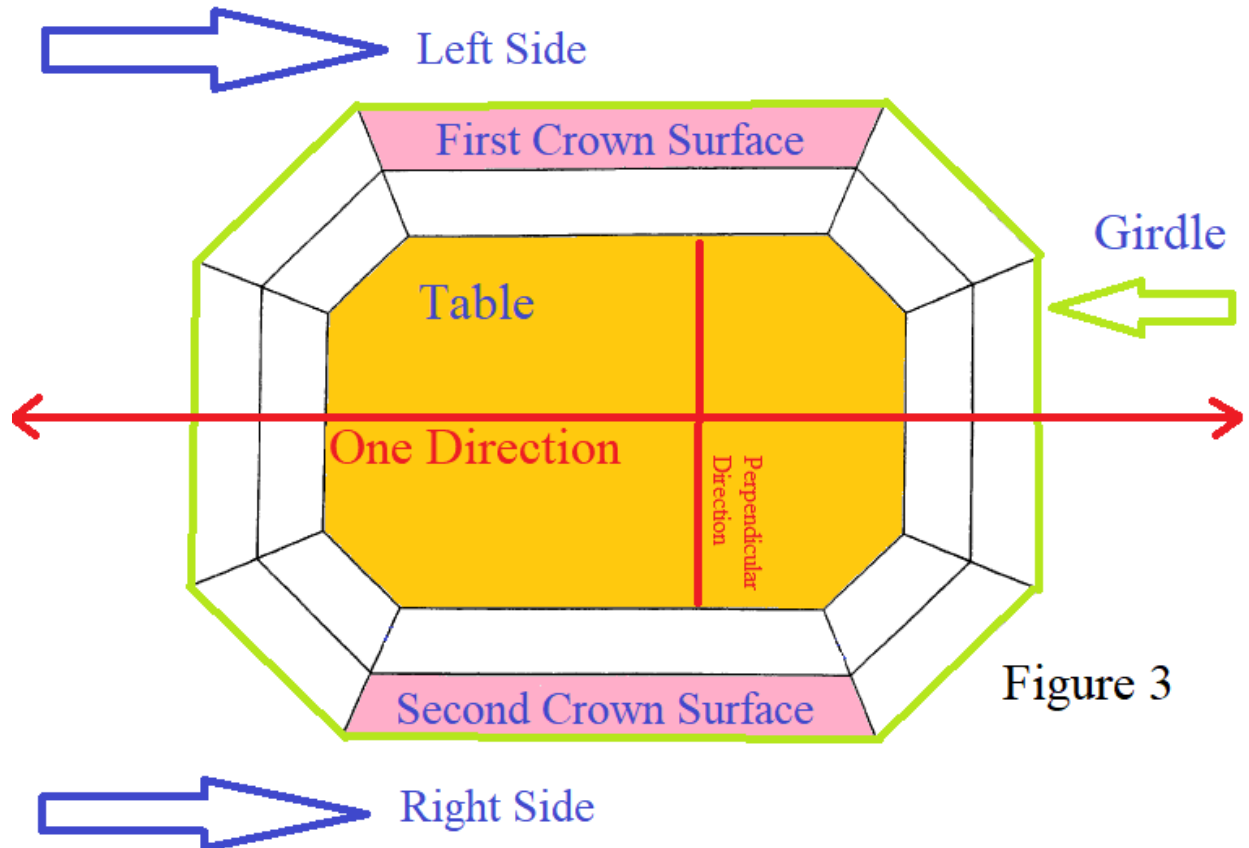
Grossbard also discloses this element. See IV.B.2([1c]).



(HDL-1007, Fig. 2(annotated)).

Claim element [1d]:

Fig. 3 of Greeff shows a second crown surface that is elongated in the one direction and extends at the right side of the gemstone. (HDL-1006, ¶141). The second crown surface of Greeff is located between the table and the girdle. (HDL-1006, ¶141). As Fig. 2 of Greeff shows, the second crown surface extends at a crown angle relative to the table plane. (HDL-1006, ¶141).



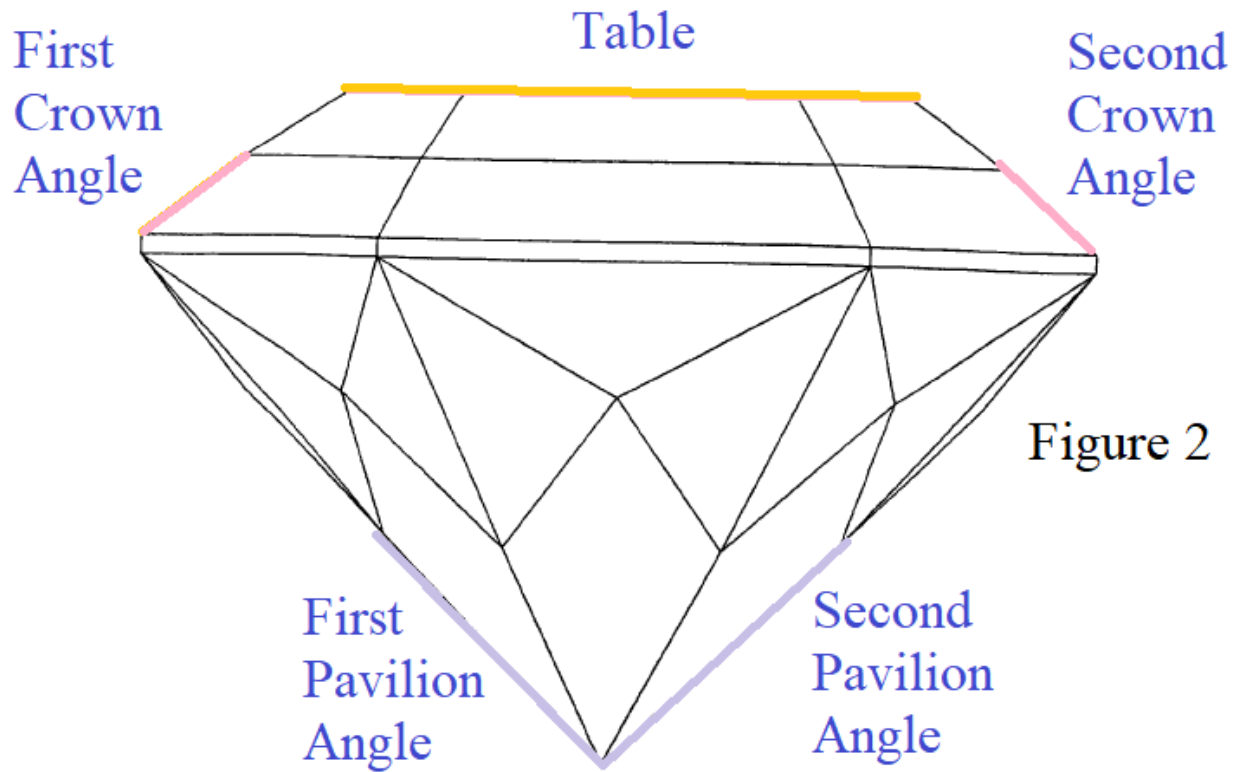
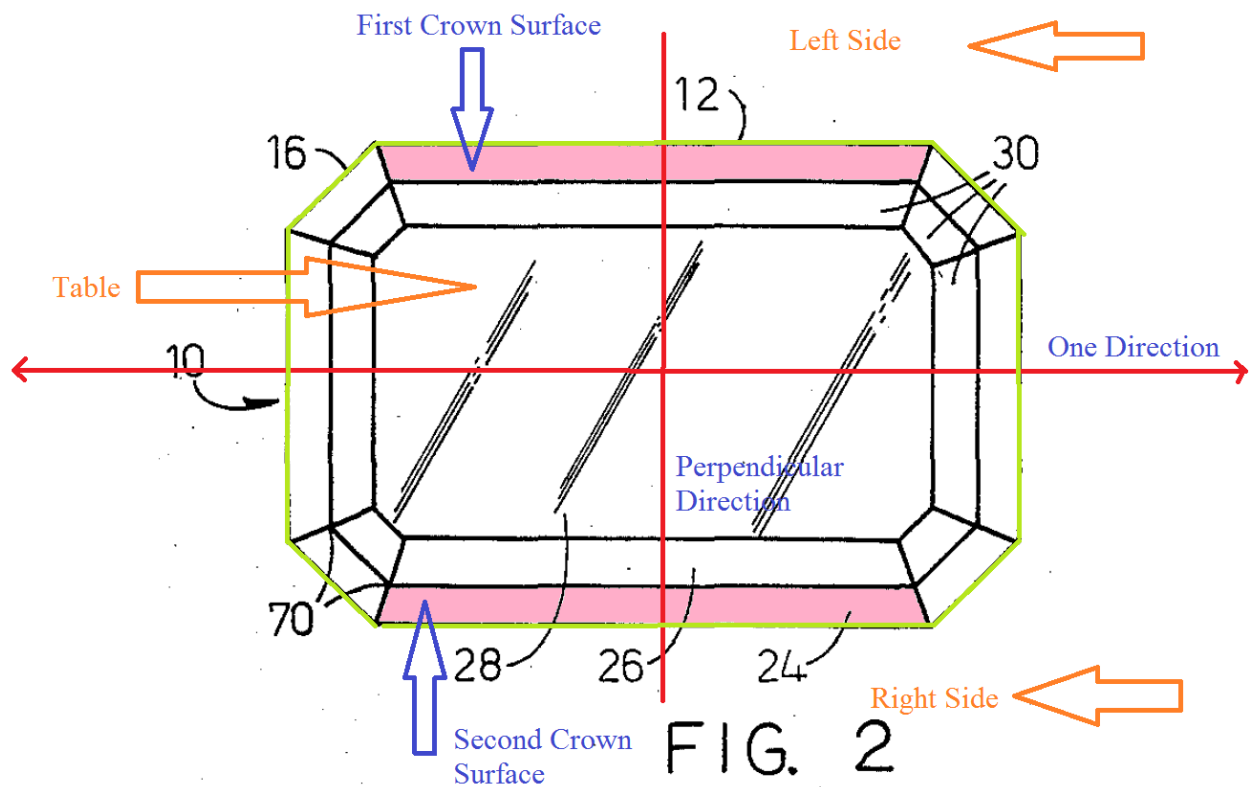


Figure 2

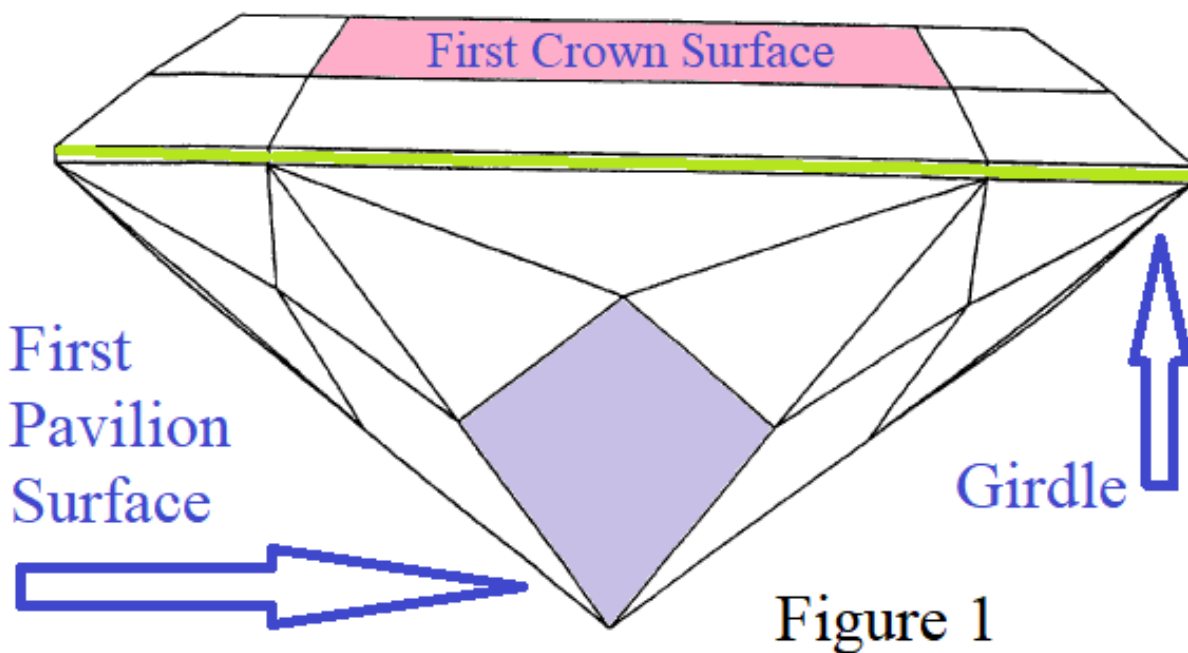
Grossbard also discloses this element. See IV.B.2([1d]).



(HDL-1007, Fig. 2(annotated)).

Claim element [1e]:

Fig. 1 of Greeff shows a first pavilion surface that is elongated in the one direction and extends at the left side of the gemstone. (HDL-1006, ¶143). Fig. 2 of Greeff shows that the first pavilion surface extends at a pavilion angle relative to the table plane. (HDL-1006, ¶143).



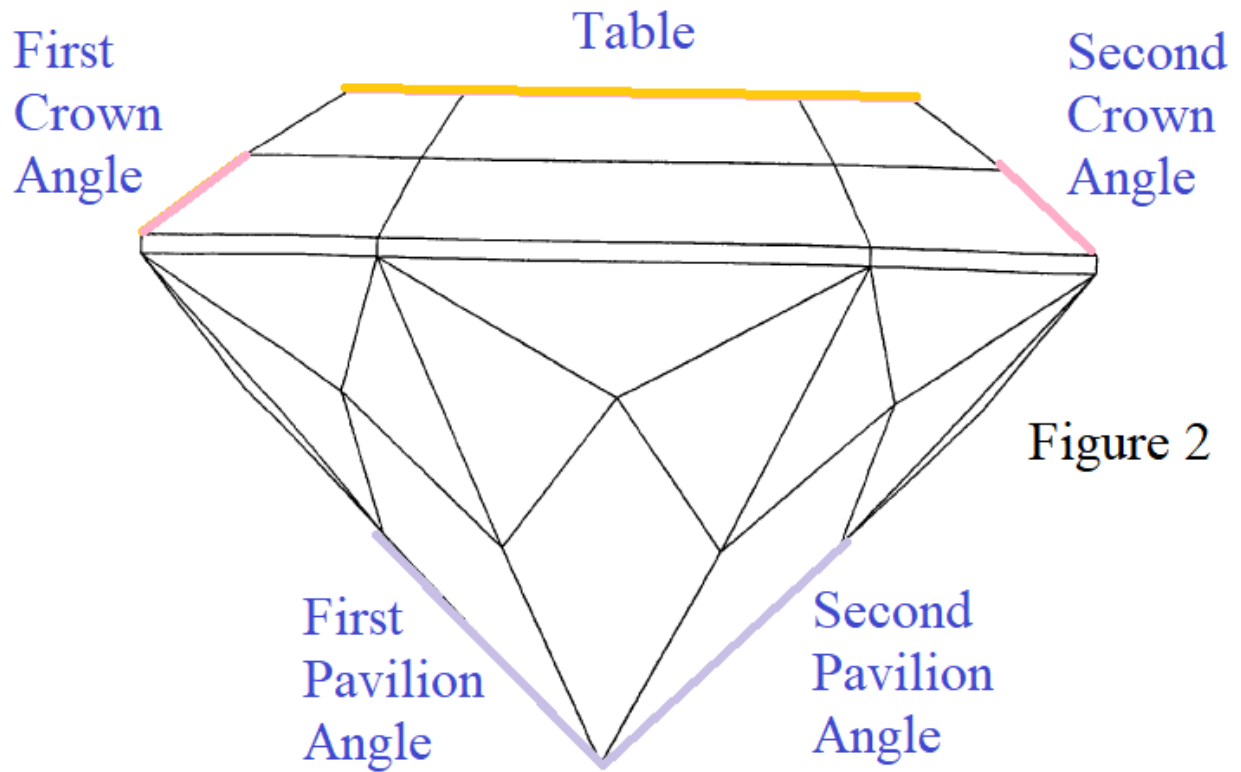
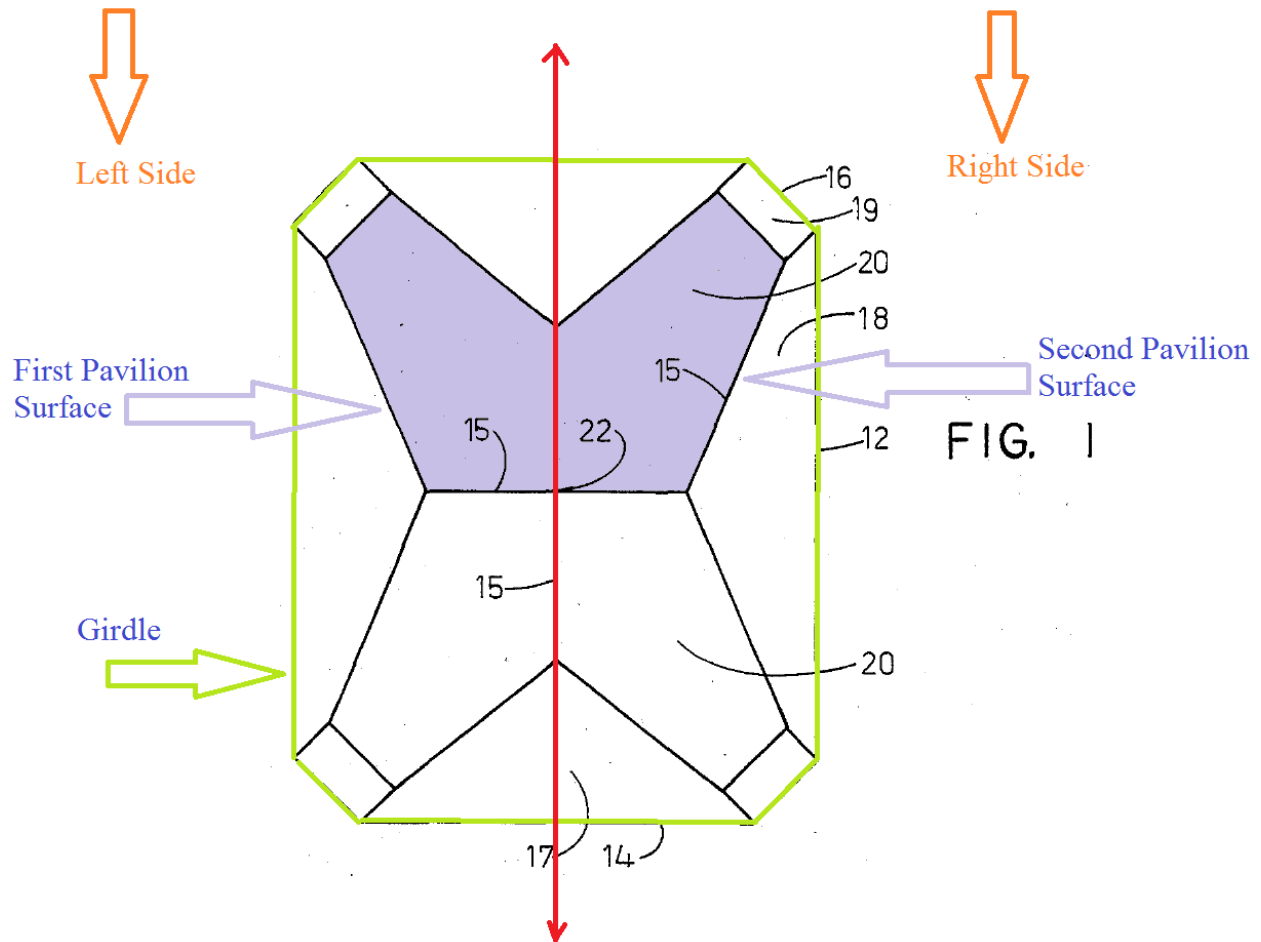


Figure 2

Grossbard also discloses this element. See IV.B.2([1e]).



(HDL-1007, Fig. 1(annotated)).

Claim element [1f]:

Greeff shows the first pavilion angle. Greeff does not show the second pavilion surface, but one of ordinary skill in the art, looking at Fig. 5 of Greeff, understands that there is a second pavilion surface, opposite the first pavilion surface. (HDL-1006, ¶145). Similar to the first pavilion surface, the second pavilion surface is elongated in the one direction and extends at the pavilion angle relative to the table plane. (HDL-1006, ¶145).

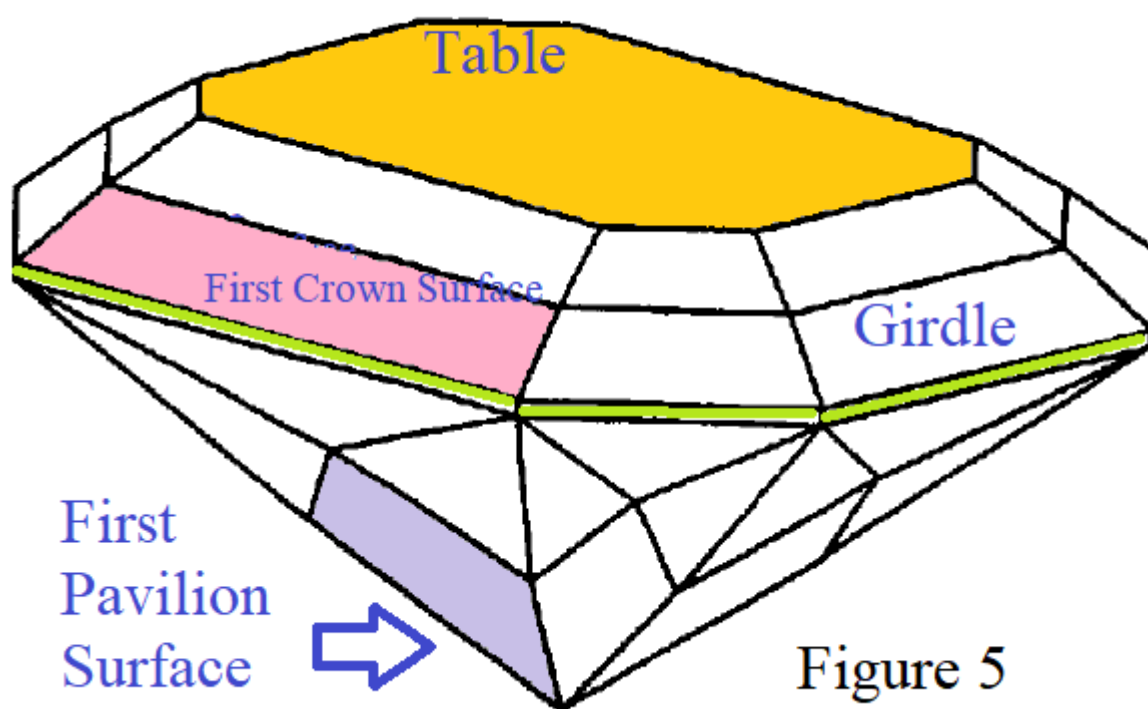


Figure 5

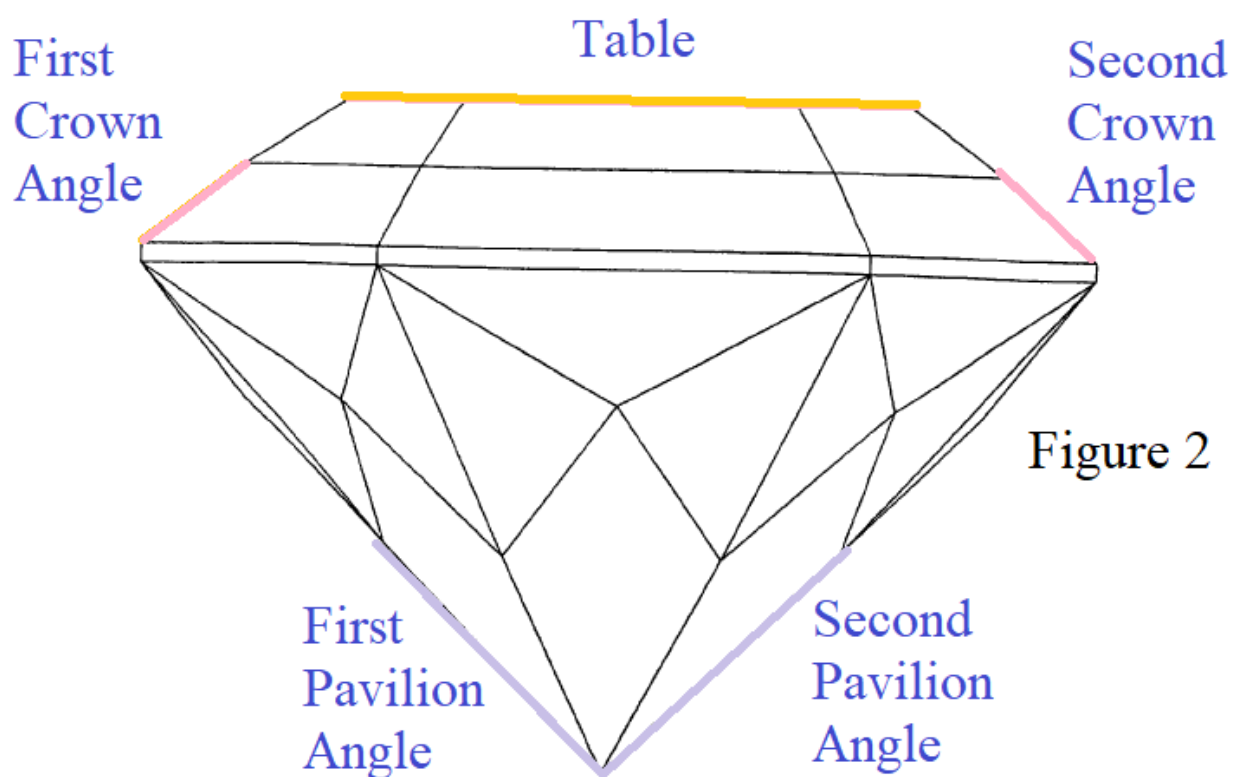
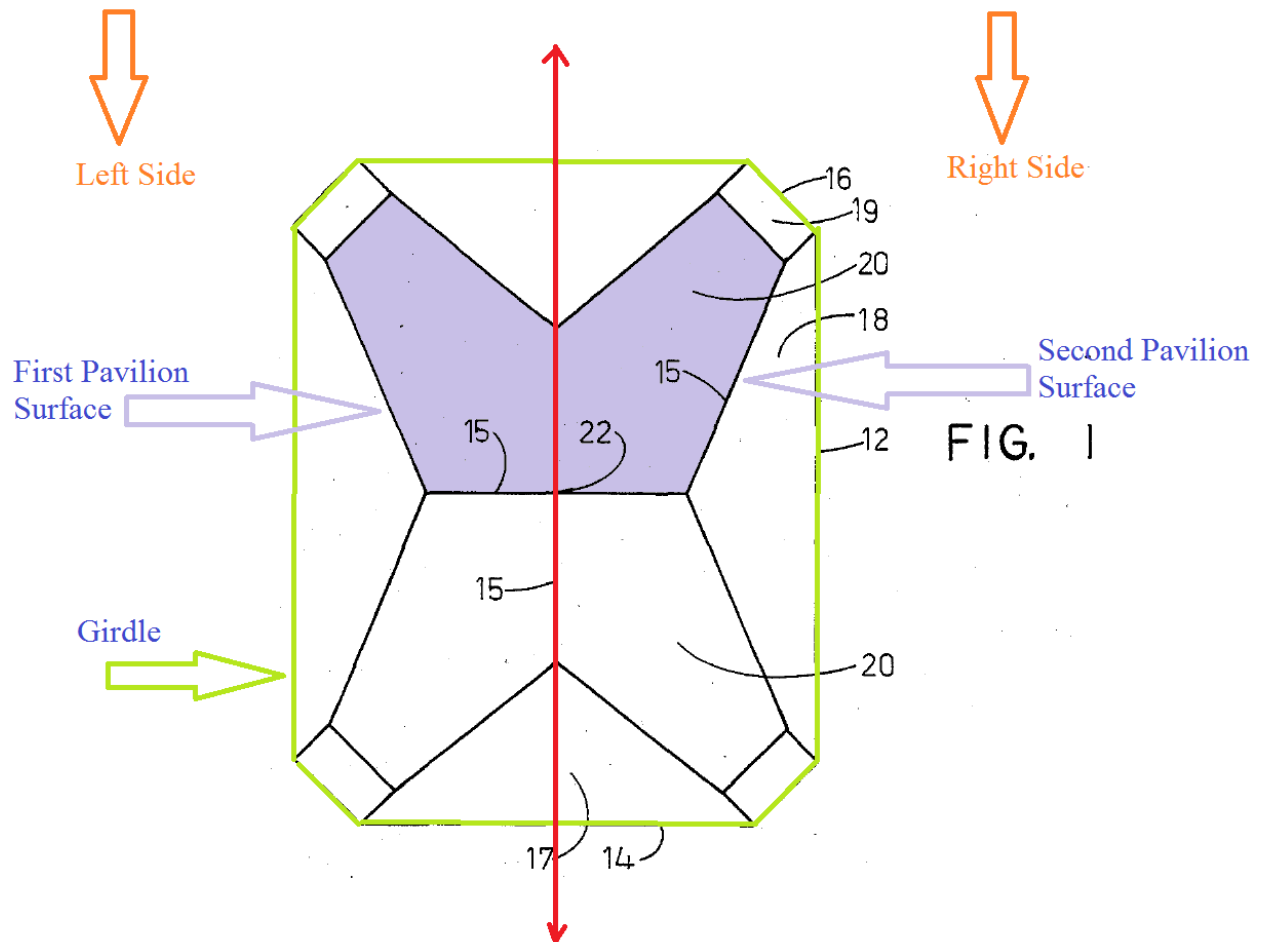


Figure 2

Grossbard also discloses this element. See IV.B.2([1f]).



(HDL-1007, Fig. 1(annotated)).

Claim element [1g]:

Greeff does not disclose this limitation of claim 1. Grossbard, however, discloses that “the angle between the plane of the girdle break of the crown and the table should be in the range from 35° to 45°” and “[t]he angle between the plane of the culet break and the plane of the table is from 33° to 42°.” (HDL-1007,2:23-25,2:28-29). These angles refer to the crown angle and pavilion angle of claim 1,

respectively, and they overlap with the ranges claim 1 provides for the crown angle and the pavilion angle (*i.e.*, the crown angle overlaps in the 35°-36° range and the pavilion angle overlaps in the 33°-34° range). (HDL-1006,¶147). These angles create a presumption of obviousness and the Patent Owner has failed to show any unexpected result. *See* IV.B.2.

Claim element [1h]:

Grossbard discloses the crown angle in the 35°-36° range and the pavilion angle in the 33°-34° range. (HDL-1007,2:23-25;2:28-29); (HDL-1006,¶148). In these ranges, the crown angle is larger than the pavilion angle by less than 6 degrees. *See* IV.B.2.

5. Motivation to Combine Greeff and Grossbard

As explained above, Greeff discloses a relatively flat emerald gemstone with first and second crown surfaces extending in the elongated direction of the gemstone. (HDL-1006,¶149). Greeff also discloses first and second pavilion surfaces extending in the elongated direction of the gemstone. (HDL-1006,¶149). Greeff, however, does not disclose any crown or pavilion angles for the crown surface or the pavilion surfaces. One of ordinary skill in the art would have been motivated to look at Grossbard to cut the gemstone in Greeff in accordance with the angle parameters provided in Grossbard. (HDL-1006,¶149).

A POSITA would have had several reasons to make this combination. For example, a POSITA would have utilized Grossbard to enhance the fire of the gemstone and enhance the yield of the cut. (HDL-1006,¶150). Grossbard recognizes that traditional brilliant “cut is the most wasteful of diamond raw material.” (HDL-1007,1:9-11). Grossbard also explains that “step cut stones such as square cut diamonds and emerald cut diamonds while being more conservative of diamond raw material have none of the fire of brilliant cut diamonds.” (HDL-1007,1:12-16). Thus, Grossbard provides “a diamond which is, on the one hand, more brilliant than the heretofore known conventional or hybrid square or emerald cut colored diamonds and, on the other hand, is less wasteful of raw material than conventional brilliant cut or the afore-mentioned hybrid cut diamonds.” (HDL-1007,1:43-47). Therefore, a POSITA would have utilized the teachings in Grossbard to cut a brilliant gemstone using the gemstone disclosed in Greeff. (HDL-1006,¶150). This cut would have preserved as much of the rough gem as possible. (HDL-1006,¶150).

Grossbard discloses that “the angle between the plane of the girdle break of the crown and the table should be in the range from 35° to 45°” and “[t]he angle between the plane of the culet break and the plane of the table is from 33° to 42°.” (HDL-1007,2:23-25;2:28-29). These ranges overlap with the ranges provided in claim 1, and the crown angle of 33° and pavilion angle of 35° falls squarely within the claimed limitations of claim 1. (HDL-1006,¶151).

It would have been a matter of routine optimization to try these angles. (HDL-1006,¶152). “The normal desire of artisans to improve upon what is already generally known can provide the motivation to optimize variables such as the percentage of a known [ingredient] for use in a known product.” *In re Ethicon, Inc.*, 844 F.3d 1344, 1351 (Fed. Cir. 2017); *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1368 (Fed. Cir. 2007) (emphasizing that “the discovery of an optimum value of a variable in a known process is usually obvious”).

A POSITA would have been particularly motivated to try 33° and 35° because these angles are the lower limit for the crown and pavilion angle taught by Grossbard. (HDL-1006,¶153). For a rough gem with a relatively small crown and a relatively small pavilion, a POSITA would have tried the lower limit of the crown angle to maximize the yield of the rough gem. (HDL-1006,¶153). A POSITA would also have tried the lower limit for the pavilion angle to ensure that the contemplated design fits within the rough gem. (HDL-1006,¶153). Therefore, cutting the rough gem at 33° and 35° would have been a routine optimization by one of ordinary skill in the art. (HDL-1006,¶153).

For the reasons explained above, Patent Owner’s Section 1.132 declaration does not show any unexpected results. See IV.A.4.

6. **Grossbard Teaches Claim 5: “The precious stone of claim 1, wherein said pavilion angle is in the range of 31 to 33 degrees.”**

See IV.B.3. (HDL-1006,¶154).

7. **Grossbard Teaches Claim 6: “The precious stone of claim 1, wherein said precious stone is a diamond.”**

See IV.B.4. (HDL-1006,¶155).

8. **Greef in view of Grossbard and Admitted Prior Art Teach Claims 7-12: “The precious stone of claim 1, wherein said precious stone has a . . . [cushion-cut shape, emerald-cut shape, radiant shape, oval shape, marquis shape, or princess shape].”**

See IV.A.10 (discussing admitted prior art). Grossbard also discloses an emerald cut diamond. (HDL-1006,¶156).

D. GROUND 4: Claims 1, 5-12 Are Obvious Over Sung (HDL-1009) in View of Grossbard (HDL-1007)

1. Sung

The first prior art reference applied in this Ground is U.S. Design Patent No. 524,682 to Sung (“Sung”). (HDL-1009). It has a patent grant date of July 11, 2006 and was filed on February 7, 2005. It therefore qualifies as prior art to the ’791 Patent under 35 U.S.C. § 102(a)(1).

Similar to the ’791 Patent, Sung offers an emerald cut for a diamond (HDL-1009; see HDL-1001 (claim 8)). Figs. 1-5 of Sung show various views of the diamond. Figs. 1, 2 and 4 of the reference are included below.

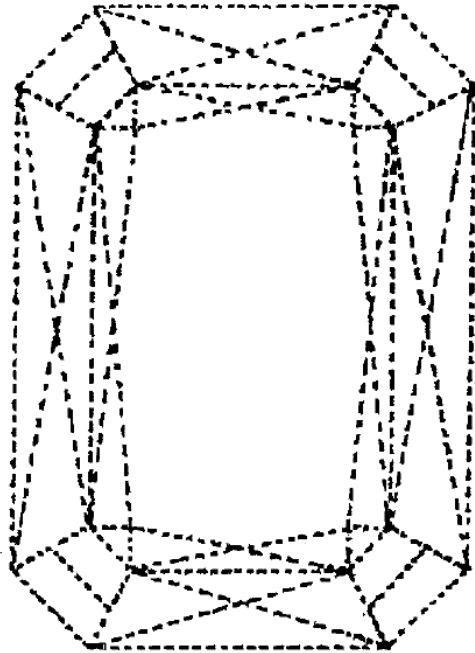


Fig. 1

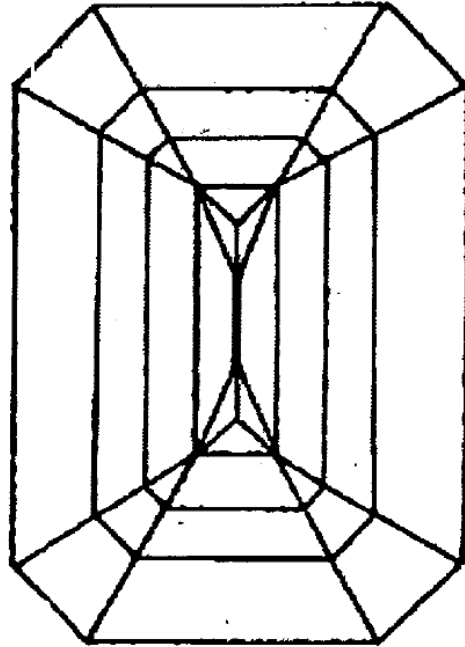


Fig. 2

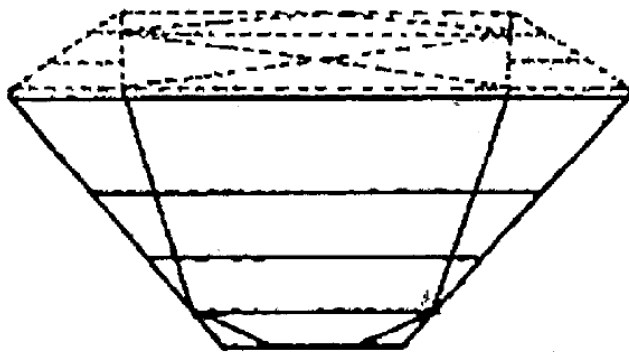


Fig. 4

2. Grossbard

U.S. Patent No. 4,555,916 to Grossbard was filed on July 20, 1982 and granted on December 3, 1985 (“Grossbard”). (HDL-1007). It therefore qualifies as prior art

to the '791 Patent under 35 U.S.C. § 102(a)(1). A description of Grossbard is provided under IV.B.1.

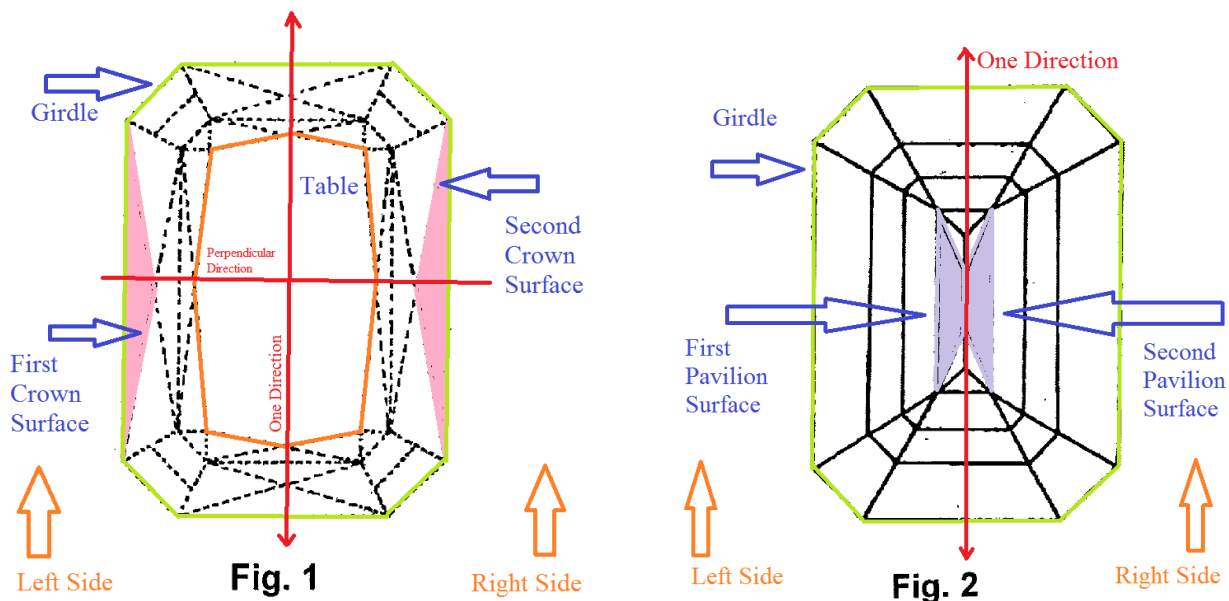
3. Sung and Grossbard Render the Claims Obvious

Sung and Grossbard render claims 1 and 6-12 obvious either explicitly or combined with the knowledge of a POSITA. *See generally* (HDL-1006, ¶¶159-180).

4. Sung and Grossbard Teach Each Element of Independent Claim 1

Claim element [1a]:

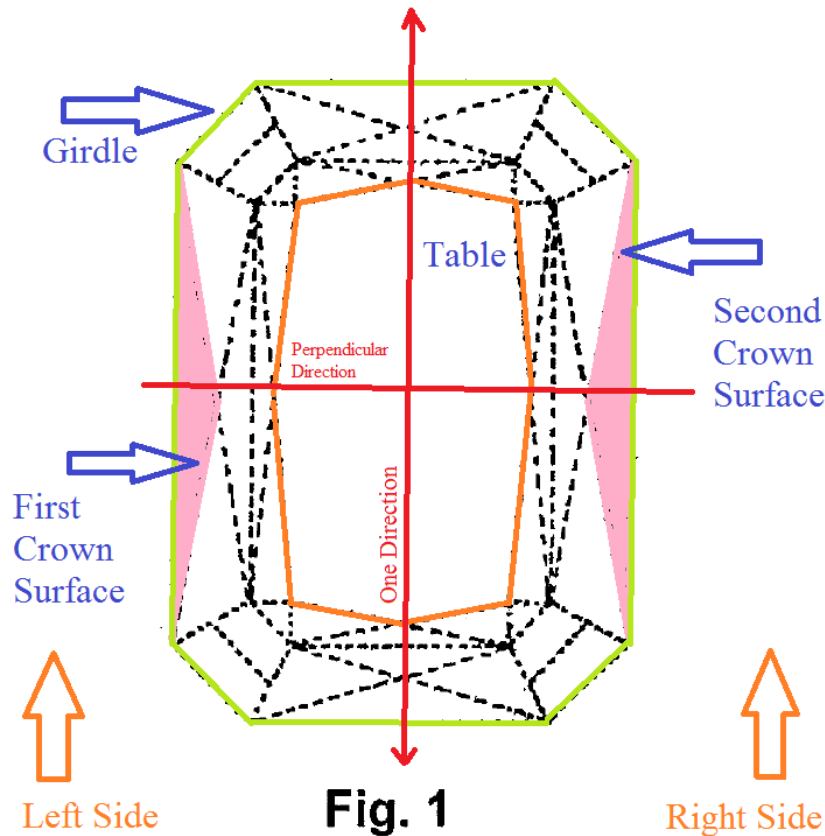
Figs. 1 and 2 of Sung show an emerald cut diamond, which is elongated in one direction and defining a length. (HDL-1009, Figs. 1; 2). The diamond has a width in a perpendicular direction. (HDL-1006, ¶162). The diamond has a left side and a right side, both of which extend along the length of the stone. (HDL-1006, ¶162).



Grossbard also discloses this element. *See* IV.B.2([1a]).

Claim element [1b]:

Figure 1 of Sung shows a diamond with a table having a table plane, that is elongated in the one direction, and a girdle. (HDL-1006,¶164).

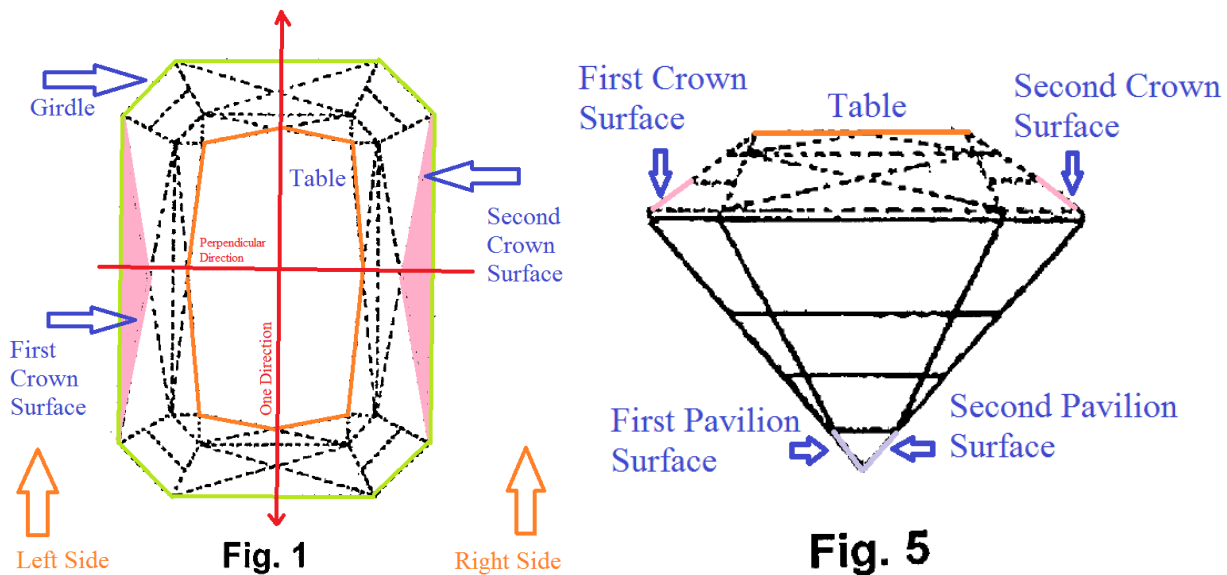


Grossbard also discloses this element. *See* IV.B.2([1b]).

Claim 1 further requires a specific total depth percentage, a specific crown height percentage, a specific girdle height percentage and a specific table percentage, but does not define any value for these parameters. (HDL-1006,¶166). These parameters are merely characteristics that a POSITA would understand all stones to have and are well known and conventional, as admitted by the '791 Patent. (HDL-1006,¶166); *see also* IV.B.2([1b]).

Claim element [1c]:

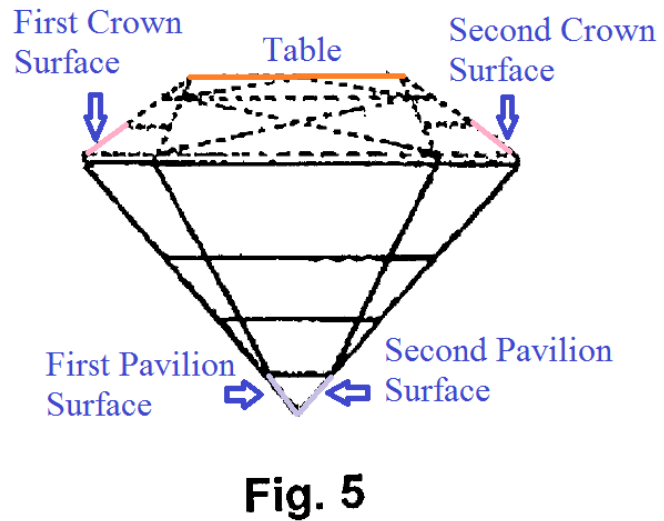
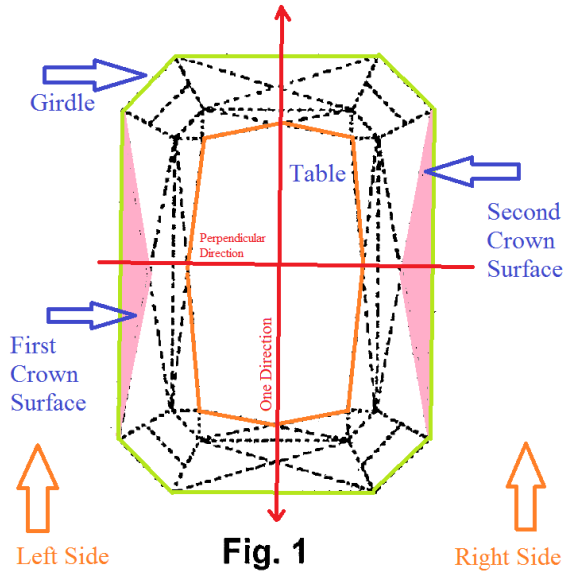
Fig. 1 of Sung shows a first crown surface that is elongated in the one direction and extends at the left side of the gemstone. (HDL-1006,¶167). The first crown surface of Sung is located between the table and the girdle. (HDL-1006,¶167). As Fig. 5 of Sung shows, the first crown surface extends at a crown angle relative to the table plane. (HDL-1006,¶167).



Grossbard also discloses this element. See IV.B.2([1c]).

Claim element [1d]:

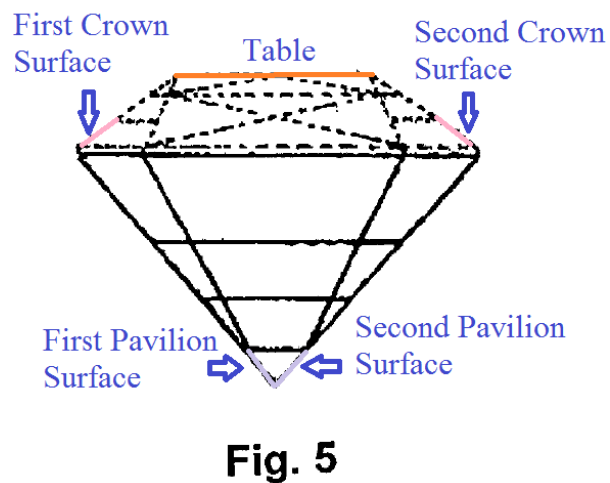
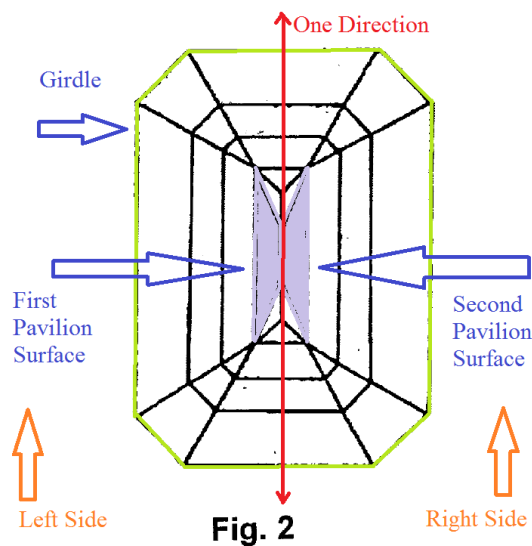
Fig. 1 of Sung shows a second crown surface that is elongated in the one direction and extends at the right side of the gemstone. (HDL-1006,¶169). The second crown surface of Sung is located between the table and the girdle. (HDL-1006,¶169). As Fig. 5 of Sung shows, the second crown surface extends at a crown angle relative to the table plane. (HDL-1006,¶169).



Grossbard also discloses this element. See IV.B.2([1e]).

Claim element [1e]:

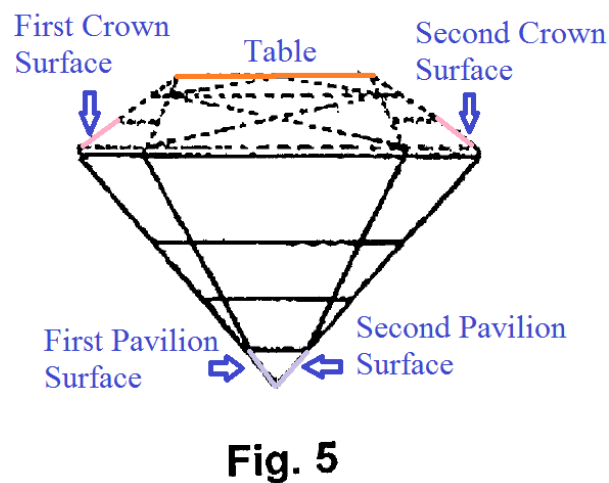
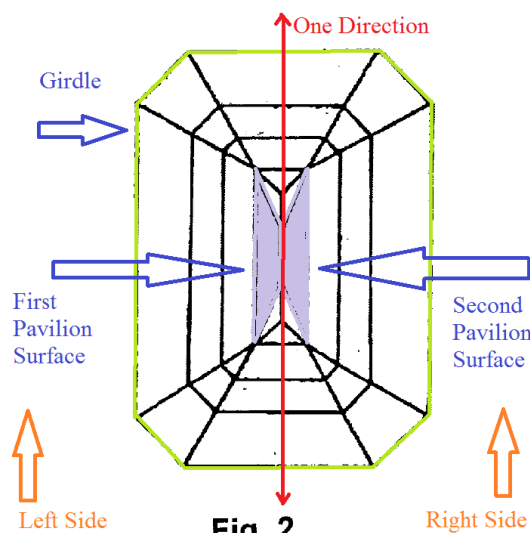
Fig. 2 of Sung shows a first pavilion surface that is elongated in the one direction and extends at the left side of the diamond. (HDL-1006,¶171). Fig. 5 of Sung shows that the first pavilion surface extends at a pavilion angle relative to the table plane. (HDL-1006,¶171).



Grossbard also discloses this element. See IV.B.2([1e]).

Claim element [1f]:

Sung also shows a second pavilion surface, opposite the first pavilion surface. (HDL-1006,¶173). Similar to the first pavilion surface, the second pavilion surface is elongated in the one direction and extends at the pavilion angle relative to the table plane. (HDL-1006,¶173).



Grossbard also discloses this element. See IV.B.2([1f]).

Claim element [1g]:

See IV.B.2 [1g] (discussing the crown angle overlaps in the 35°-36° range and the pavilion angle overlaps in the 33°-34° range). (HDL-1006,¶175).

Claim element [1h]:

See IV.B.2 [1h] (discussing the crown angle being larger than the pavilion angle). (HDL-1006,¶176).

5. Motivation to Combine Sung and Grossbard

See IV.C.5 (discussing the motivation to combine Greeff and Grossbard; the same reasoning is equally applicable to Sung and Grossbard). (HDL-1006,¶177).

6. Grossbard Teaches Claim 5: “The precious stone of claim 1, wherein said pavilion angle is in the range of 31 to 33 degrees.”

See IV.B.3. (HDL-1006,¶178).

7. Grossbard Teaches Claim 6: “The precious stone of claim 1, wherein said precious stone is a diamond.”

See IV.B.4. (HDL-1006,¶179).

8. Sung in view of Grossbard and Admitted Prior Art Teach Claims 7-12: “The precious stone of claim 1, wherein said precious stone has a . . . [cushion-cut shape, emerald-cut shape, radiant shape, oval shape, marquise shape, or princess shape].”

See IV.A.10 (discussing admitted prior art). Grossbard also discloses an emerald cut diamond. (HDL-1006,¶180).

E. GROUND 5: Claims 2-4, 13 and 14 Are Obvious In View of Grossbard and Schmidt

As explained above under IV.B in Ground 2, claims 1, 5 and 6 are anticipated by Grossbard. The combination of Grossbard and Schmidt renders claims 2-4, 13 and 14 obvious. (HDL-1006,¶181).

1. Schmidt Teaches Claim 2: “The precious stone of claim 1, wherein said total depth percentage is in the range of 36.00 to 57.00.”

Grossbard does not teach the total depth percentage for its diamond. Schmidt however, a total depth percentage of approximately 41.18%, which falls within the claimed range of 36 to 57. *See also* IV.A.5. One of ordinary skill in the art would have combined these references to enhance the diamond provided by Grossbard with the brilliance and large appearance of Schmidt while at the same time preserving the rough gem. (HDL-1006,¶183). Both references are in the same field of endeavor and seek to provide brilliance to shallow cut diamonds. (HDL-1006,¶183).

2. Schmidt Teaches Claim 3: “The precious stone of claim 1 wherein the total depth percentage is in the range of 40 to 50.”

As explained above under (IV.A.6) in connection with claim 3, Schmidt discloses the total depth percentage of 41.18%, which falls within the claimed range of 40 to 50. (HDL-1006,¶184).

3. Schmidt Teaches Claim 4: “The precious stone of claim 1, wherein said crown angle is in the range of 31-34 degrees.”

As explained above under (IV.A.7) in connection with claim 4, Schmidt discloses a crown angle in the range of 31-32° which overlaps with the claimed range of 31-34 degrees. A POSITA would have been motivated to cut the diamond of Grossbard to the lower crown angle of 32° to provide it with enhanced brilliance and enlarged appearance while preserving the rough stone. (HDL-1006,¶185).

4. **Schmidt Teaches Claim 13: “The precious stone of claim 1, wherein said crown height percentage in the range of 6-15, said girdle height percentage in the range of 3-5, said table percentage in the range of 70-79, and said total depth percentage in the range of 36-57.”**

As explained above under (IV.A.11), Schmidt discloses a table percentage of at least 70%, and a total depth percentage of 41.18%, which overlap and fall within the claimed ranges, respectively. (HDL-1006,¶186). Schmidt also discloses a combined crown height percentage and a girdle height percentage: $K/D = 0.11/1.7 \approx 6.4\%$. (HDL-1005,4:30-45). It would have been obvious to a POSITA before the filing date of the '791 Patent to shape the gemstone, as claimed, to optimize the light properties of the precious stone. (HDL-1006,¶186). Discovering an optimum value of a result effective variable involves only routine skill in the art. (HDL-1006,¶186). It is further noted that Patent Owner has not disclosed that the crown height percentage and a girdle height percentage create any unexpected result. (HDL-1006,¶186).

5. **Schmidt Teaches Claim 14: “The precious stone of claim 13, wherein said crown height percentage is in the range of 8-13, said girdle height percentage is in the range of 3.5-4.5, said table percentage is in the range of 72-77, and said total depth percentage is in the range of 40-50.”**

See IV.E.4; (HDL-1006,¶187).

F. GROUND 6: Claims 2-4, 13 and 14 Are Obvious In View of Greeff, Grossbard, and Schmidt

As explained above under IV.C in Ground 3, claims 1, 5-12 are obvious in of Greeff and Grossbard. The combination of Greeff, Grossbard and Schmidt renders claims 2-4, 13 and 14 obvious. *See* IV.E (Ground 5); (HDL-1006,¶188).

G. GROUND 7: Claims 2-4, 13 and 14 Are Obvious In View of Sung, Grossbard, and Schmidt

As explained above under IV.D in Ground 4, claims 1, 5-12 are obvious in of Sung and Grossbard. The combination of Sung, Grossbard and Schmidt renders claims 2-4, 13 and 14 obvious. *See* IV.E (Ground 5); (HDL-1006,¶190).

H. GROUND 8: Claims 2-4, 13 and 14 Are Obvious In View of Grossbard, and Alburger

As explained above under IV.B in Ground 2, claims 1, 5 and 6 are anticipated by Grossbard. The combination of Grossbard and Alburger renders claims 2-4, 13 and 14 obvious.

1. Alburger

The prior art applied in this Ground is US Patent No. 4,708,001 to Alburger (“Alburger”). (HDL-1010). It has an issue date of November 24, 1987 and was filed on September 4, 1985. Alburger therefore qualifies as prior art to the ’791 Patent under 35 U.S.C. § 102(a)(1).

Similar to the ’791 Patent, Schmidt and Grossbard, Alburger also deals with the problem of faceting shallow diamonds. Alburger explains that:

a gemstone which is too shallow in the rough, and which is cut to excessively low main angles, will fail to reflect light properly, and will lack brilliance. In the past, there has been only one solution to the problem presented by a shallow stone, this being to reduce the size of the girdle diameter so as to permit cutting correct angles on crown and pavillion, that is if correct main angles are to be maintained. This may often result in a loss in stone size of as much as 75%, or more.

(HDL-1010,2:5-14).

Accordingly, Alburger discloses “a method and design for modifying the shape of the pavillion of a faceted gemstone, whereby stones having a depth of less than one half the girdle diameter can be cut to yield full brilliance in the finished gem.” (HDL-1010,2:15-19). Alburger explains that a benefit of his cut is “that very large stones which are intended to be used as pendants may be cut from shallow material” (HDL-1010,2:20-22).

Alburger refers to the Tables located in column 6, providing the various dimensions and specification for the embodiments. (HDL-1006,¶197). Regarding these tables, Alburger states the tables contain “[d]imensional ranges and preferred values given as percentages of girdle diameter, are set forth in Table I. Angles, ranges and preferred values, are set forth in Table II.” (HDL-1010,5:47-6:3). An image of those tables follows:

TABLE I

DIMENSIONAL RANGES		
Feature	Range - %	Preferred Value - %
Total stone depth	37-75	38
Crown height	10-25	20
Table diameter	40-60	50
Girdle thickness	0-4	2
Pavillion depth	20-40	25
Cone depth	5-50	25
Cone base diameter	10-75	50
Initial drill hole	Cone depth plus .020"	

TABLE II

ANGLE RANGES		
Feature	Range - °	Preferred Value - °
Crown mains	15-45	30
Pavillion mains	31-60	42
Cone included angle	60-118	90

(HDL-1010,6:4-23). Alburger explains that its disclosure can be applied to “any selected gemstone shape” including oval shapes. (HDL-1010,1:56-57).

2. Alburger Teaches Claim 2: “The precious stone of claim 1, wherein said total depth percentage is in the range of 36.00 to 57.00.”

Grossbard does not teach the total depth percentage for its diamond. Alburger discloses, in Table I, a “Total stone depth” range of 37-75%. (HDL-1010,6:8). This meets the claim limitation as the range contains the claimed range of 36.00 to 57.00. (HDL-1006,¶198). A POSITA would have been motivated to cut the diamond of Grossbard with the total depth percentage provided by Alburger to further enhance

the brilliance of the diamond cut according to Grossbard, and at the same time maximize the yield of the rough gem. (HDL-1006,¶198). Doing so would yield predictable results. (HDL-1006,¶198).

3. Alburger Teaches Claim 3: “The precious stone of claim 1 wherein the total depth percentage is in the range of 40 to 50.”

Grossbard does not teach the total depth percentage for its diamond. Alburger discloses, in Table I, a “Total stone depth” range of 37-75%. (HDL-1007,6:8). This meets the claim limitation as the range contains the claimed range of 40 to 50. (HDL-1006,¶199). A POSITA would have been motivated to cut the diamond of Grossbard with the total depth percentage provided by Alburger to further enhance the brilliance of the diamond cut according to Grossbard, and at the same time maximize the yield of the rough gemstone. (HDL-1006,¶199). Doing so would yield predictable results. (HDL-1006,¶199).

4. Alburger Discloses Claim 4: “The precious stone of claim 1, wherein said crown angle is in the range of 31-34 degrees.”

Grossbard does not teach the recited crown angle for its diamond. Alburger discloses, in Table II, a “Crown mains” angle range of 15-45°. (HDL-1007,6:20). This meets the claim limitation as the range contains the claimed range of 31 to 34 degrees. (HDL-1006,¶200). A POSITA would have been motivated to cut the diamond of Grossbard with the crown angle provided by Alburger to further enhance the brilliance of the diamond cut according to Grossbard, and at the same time

maximize the yield of the rough gemstone. (HDL-1006,¶200). Doing so would yield predictable results. (HDL-1006,¶200).

5. **Alburger Discloses Claim 13: “The precious stone of claim 1, wherein said crown height percentage in the range of 6-15, said girdle height percentage in the range of 3-5, said table percentage in the range of 70-79, and said total depth percentage in the range of 36-57.”**

Grossbard does not teach the characteristics for its diamond. Alburger discloses, in Table I, a “Total stone depth” range of 37-75%, a “Crown height” of 10-25%, a “Table diameter” of 40-60%, and a “Girdle thickness” of 0-4%. (HDL-1007,6:8-11). Thus, Alburger’s crown height contains the claimed range of 6-15, the girdle thickness overlaps with the claimed range of 3-5, and the total stone depth contains the claimed range of 36-57. (HDL-1006,¶201). The table diameter does not overlap or contain the claimed range of 70-79, but it would have been obvious to a POSITA before the filing date of the ’791 Patent to shape the table, as claimed, to change the light properties of the diamond. (HDL-1006,¶201). Discovering an optimum value of a result effective variable involves only routine skill in the art. (HDL-1006,¶201). A POSITA would have been motivated to cut the diamond of Grossbard with the characteristics provided by Alburger. (HDL-1006,¶201).

6. **Alburger Discloses Claim 14: “The precious stone of claim 13, wherein said crown height percentage is in the range of 8-13, said girdle height percentage is in the range of 3.5-4.5,**

said table percentage is in the range of 72-77, and said total depth percentage is in the range of 40-50.”

Grossbard does not teach the characteristics for its diamond. Alburger discloses, in Table I, these elements of claim 14. *See* IV.H.5 (discussing these elements for claim 13). A POSITA would have been motivated to cut the diamond of Grossbard with the characteristics provided by Alburger. (HDL-1006,¶202).

I. GROUND 9: Claims 2-4, 13 and 14 Are Obvious In View of Greeff, Grossbard and Alburger

As explained above under IV.C in Ground 3, claims 1, 5-12 are obvious in view of Greeff and Grossbard. The combination of Greeff, Grossbard and Alburger renders claims 2-4, 13 and 14 obvious. (HDL-1006,¶203).

J. GROUND 10: Claims 2-4, 13 and 14 Are Obvious In View of Sung, Grossbard and Alburger

As explained above under IV.D in Ground 4, claims 1, 5-12 are obvious in view of Sung and Grossbard. The combination of Sung, Grossbard and Alburger renders claims 2-4, 13 and 14 obvious. (HDL-1006,¶205).

V. SECONDARY CONSIDERATIONS CANNOT OVERCOME THE STRONG EVIDENCE OF OBVIOUSNESS

Where, as here, a strong *prima facie* case of obviousness, secondary considerations may not dislodge the final conclusion of obviousness. *See, e.g., Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). At this stage, because of the “absence of a complete evidentiary record,” Petitioner need not further address secondary considerations. *Ranir, LLC v. The Procter &*

Gamble Co., IPR2017-01878, Paper 7, at 32 (PTAB Feb. 7, 2018). Petitioner reserves the right to respond to any evidence of alleged secondary considerations Patent Owner of Record proffers.

VI. PTAB DISCRETION SHOULD NOT PRECLUDE INSTITUTION

A. The *Fintiv* Factors Favor Institution—§314(a)

On April 26, 2024, Patent Owner's exclusive licensee filed suit against Petitioner. The Board should not discretionarily deny this Petition based on the *Fintiv* factors.

Factor 1 is neutral. Neither party has requested a stay in co-pending litigation. (HDL-1011). The Board has indicated that it “will not attempt to predict” how a district court might adjudicate a future motion to stay, if/when filed. *Sand Revolution II, LLC v. Cont'l Intermodal Group – Trucking LLC*, IPR2019-01393, Paper 24, 7 (PTAB Jun. 16, 2020) (informative); *Sotera Wireless Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, 14 (PTAB Dec. 1, 2020) (precedential).

Factor 2 favors institution. No trial date has been set in the district court litigation. Currently, a motion to dismiss is pending before the court and the parties have not responded to any discovery requests or exchanged any discovery. (HDL-1011). Based on Patent Owner's 4/26/2024 filing date, an average time-to-trial of 39.3 months, and the 18-month IPR schedule, the Board is expected to issue its Final Written Decision in September 2026, ten months ahead of the statistically-indicated

July 2027 district court trial date. (See HDL-1012,p.11). Moreover, the District Court still have not decided a motion to dismiss with the case effectively being stayed during its pendency, so any reasonable time-to-trial estimation cannot be calculated from the original complaint.

Factor 3 favors institution. Petitioner has diligently filed this Petition ahead of the one-year time bar, while the district court litigation is still in its early stages. The parties have made minimal investment in the parallel proceeding. (HDL-1011). A motion to dismiss is pending in the district court action, and there are no court ordered deadlines to brief claim construction, or exchange infringement contentions or invalidity contentions. The parties have exchanged discovery requests, but they have agreed to delay responding to those requests. The parties have not exchanged any discovery. Similarly, no depositions have been taken. By any objective standard, Petitioner filed this petition at an early stage of the litigation, which “weigh[s] against exercising the authority to deny institution under NHK.” *Apple Inc. v. SEVEN Networks, LLC*, IPR2020-00255, Paper 13, 11-12 (PTAB Jul. 28, 2020) (quoting *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, 6 (PTAB Mar. 20, 2020)).

Factor 4 favors institution. If the Board institutes trial, Petitioner stipulates not to pursue in the parallel District Court proceeding the same grounds as in this Petition or any grounds that could have reasonably been raised in the Petition.

Moreover, Patent Owner's complaint only alleges infringement of claims 1-3, 5-7 and 13, while this Petition challenges claims 1-14. Accordingly, a material number of Challenged Claims will likely be unaddressed in the litigation. *See SEVEN Networks, LLC*, IPR2020-00255, Paper 13, 15-20.

Factor 5 is neutral. The parties in the parallel litigation are essentially same, with the '791 Patent being asserted by the purported exclusive licensee of the '791 Patent, Christopher Designs, Inc. (See HDL-1013, ¶13).

Factor 6 favors institution. The Petition presents a compelling case of invalidity. *Fintiv, Inc.*, IPR2020-00019, Paper 11, 14-15 (noting under Factor 6 that “if the merits of a ground raised in the petition seem particularly strong ... institution of a trial may serve ... overall system efficiency and integrity”).

B. The *Advanced Bionics* Test Favors Institution—§325(d)

This Petition presents new prior art and arguments against the Challenged Claims for which the file history contains no indication that the Office ever previously considered in connection with the '791 Patent. Indeed, based on the file history, the art cited in the Grounds of Rejection was not presented to, nor considered by, the Patent Office during the prosecution of the application that lead to the '791 Patent.

VII. CONCLUSION

The Challenged Claims are unpatentable.

VIII. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8(a)(1)**A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)**

Petitioner, Henri Daussi, LLC, is the real party-in-interest.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

Petitioner is not aware of any disclaimers, reexamination certificates or petitions for *inter partes* review for the '791 Patent.

The '791 Patent is the subject of a pending civil action: *Christopher Designs, Inc. v. Henri Daussi, LLC*, No. 24-cv-03186 (S.D.N.Y), filed on April 26, 2024.

C. Lead and Backup Counsel Under 37 C.F.R. § 42.8(b)(2)

Petitioner provides the following designation of counsel:

Lead Counsel	Backup Counsel
Armin Ghiam Reg. No. 71,727 200 Park Avenue New York, NY 10166 Tel: 212.908.6207 Email: aghiam@Hunton.com	Gary Avelev Reg. No. 40,479 200 Park Avenue New York, NY 10166 Tel: 212.850.2881 Email: garyavelev@Hunton.com Steven L. Wood Reg. No. 63,176 2200 Pennsylvania Avenue NW Washington, DC 20037 Tel: 202.955.1965 Email: swood@Hunton.com

Petitioner may be served via email to its lead and backup counsel at the email addresses above.

D. Payment of Fees Under 37 C.F.R. § 42.103

This Petition requests review of claims 1-14 of the '791 Patent and is accompanied by a payment of \$41,500, which includes the \$19,000 IPR request fee and the \$22,500 post- institution fee. See 37 C.F.R. § 42.15(a). Thus, this Petition meets the fee requirements under 35 U.S.C. § 312(a)(1). The Board is hereby authorized to charge any additional fees required or refund any excess fees paid in this action to Deposit Account No. 50-0206.

E. Power of Attorney 37 C.F.R. § 42.10

Powers of attorney are filed herewith in accordance with 37 C.F.R. § 42.10(b).

Dated: March 28, 2025

Respectfully Submitted,

/Armin Ghiam/
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Henri Daussi, LLC

CERTIFICATE OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. § 42.24(d) that the foregoing Petition excluding any table of contents, table of authorities, certificates of service or word count, or appendix of exhibits or claim listing, contains 13,837 words according to the word-processing program used to prepare this paper (Microsoft Word). Petitioner certifies that this Petition does not exceed the applicable type-volume limit of 37 C.F.R. § 42.24(a)(1)(i); that is, a 14,000 word limit.

Dated: March 28, 2025

Respectfully Submitted,

/Armin Ghiam/

Armin Ghiam

HUNTON ANDREWS KURTH LLP

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e)(4), lead counsel for Petitioner hereby certifies that on March 28, 2025, a copy of this PETITION FOR *INTER PARTES* REVIEW and all supporting exhibits were provided by Federal Express the Patent Owner's correspondence address of record as follows:

Max Moskowitz
Ostrolenk Faber LLP
845 Third Avenue, 17th Floor
New York, NY 10022

The Petition has also been served via email to lead trial counsel for litigation at the following addresses:

Howard A. Kroll
Tucker Ellis LLP
515 South Flower Street, Forty-Second Floor
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Dated: March 28, 2025

Respectfully Submitted,

/Armin Ghiam/

Armin Ghiam

HUNTON ANDREWS KURTH LLP