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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LULULEMON USA INC.,
Petitioner,

v.

NIKE, INC.,
Patent Owner.

Case IPR2023-01460
Patent 9,730,484

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,730,484

TABLE OF CONTENTS

Page No.

I. MANDATORY NOTICES, GROUNDS FOR STANDING, AND FEE PAYMENT 1

A. Real Party-In-Interest (37 C.F.R. §42.8(b)(1)) 1

B. Related Matters (37 C.F.R. §42.8(b)(2)) 1

C. Lead and Backup Counsel (37 C.F.R. §42.8(b)(3)) 1

D. Service Information (37 C.F.R. §42.8(b)(4)) 2

E. Grounds for Standing (37 C.F.R. §42.104) 2

F. Payment of Fees (37 C.F.R. §42.15(a)) 2

II. INTRODUCTION 3

III. THE ’484 PATENT 8

A. Specification 8

B. Claims 10

C. Prosecution History 10

D. Prosecution in Related European Counterpart 11

IV. LEVEL OF ORDINARY SKILL 12

V. CLAIM CONSTRUCTION 13

VI. RELIEF REQUESTED 14

VII. GROUND 1: LOCKWOOD AND DUA RENDER OBVIOUS CLAIMS 1 AND 5–9 15

A. Overview of Lockwood (Ex.1003) 15

TABLE OF CONTENTS
(*cont'd*)

Page No.

B. Overview of Dua (Ex.1004) 17

C. Lockwood and Dua Render Obvious Claim 1 18

1. Preamble 22

2. Limitation 1[a] 22

3. Limitation 1[b] 25

4. Limitation 1[c] 26

5. Limitation 1[d] 28

6. Limitation 1[e] 29

D. Lockwood and Dua Render Obvious Claim 5 31

E. Lockwood and Dua Render Obvious Claim 6 32

F. Lockwood and Dua Render Obvious Claim 7 33

G. Lockwood and Dua Render Obvious Claim 8 34

H. Lockwood and Dua Render Obvious Claim 9 35

VIII. GROUND 2: LOCKWOOD, DUA, AND NORTON RENDER OBVIOUS CLAIMS 1 AND 5–9 36

A. Overview of Norton (Ex.1011) 36

B. Lockwood, Dua, and Norton Render Obvious Claims 1 and 5–9 38

IX. GROUND 3: DUA, HONG, AND LOCKWOOD RENDER OBVIOUS CLAIMS 1–19 39

TABLE OF CONTENTS
(*cont'd*)

Page No.

A. Overview of Hong (Ex.1005) 39

B. The Combination of Dua, Hong, and Lockwood Renders Obvious Claims 1–19 41

C. Dua, Hong, and Lockwood Render Obvious Claim 1 44

1. Preamble 44

2. Limitation 1[a] 45

3. Limitation 1[b] 46

4. Limitation 1[c] 51

5. Limitation 1[d] 52

6. Limitation 1[e] 53

D. Dua, Hong, and Lockwood Render Obvious Claim 2 55

E. Dua, Hong, and Lockwood Render Obvious Claim 3 58

F. Dua, Hong, and Lockwood Render Obvious Claim 4 58

G. Dua, Hong, and Lockwood Render Obvious Claim 5 59

H. Dua, Hong, and Lockwood Render Obvious Claim 6 59

I. Dua, Hong, and Lockwood Render Obvious Claim 7 60

J. Dua, Hong, and Lockwood Render Obvious Claim 8 61

K. Dua, Hong, and Lockwood Render Obvious Claim 9 62

L. Dua, Hong, and Lockwood Render Obvious Claim 10 64

TABLE OF CONTENTS
(*cont'd*)

Page No.

1. Preamble 64
2. Limitation 10[a] 64
3. Limitation 10[b] 64
4. Limitation 10[c] 65
5. Limitation 10[d] 65
6. Limitation 10[e] 65

M. Dua, Hong, and Lockwood Render Obvious Claim 11 67

1. Preamble 67
2. Limitation 11[a] 67
3. Limitation 11[b] 68
4. Limitation 11[c] 69
5. Limitation 11[d] 69
6. Limitation 11[e] 69

N. Dua, Hong, and Lockwood Render Obvious Claim 12 69

O. Dua, Hong, and Lockwood Render Obvious Claim 13 70

P. Dua, Hong, and Lockwood Render Obvious Claim 14 70

Q. Dua, Hong, and Lockwood Render Obvious Claim 15 71

R. Dua, Hong, and Lockwood Render Obvious Claim 16 71

TABLE OF CONTENTS
(*cont'd*)

Page No.

S. Dua, Hong, and Lockwood Render Obvious Claim 17 72

T. Dua, Hong, and Lockwood Render Obvious Claim 18 73

U. Dua, Hong, and Lockwood Render Obvious Claim 19 74

X. GROUND 4: DUA, HONG, LOCKWOOD, AND VOUGHLOHN RENDER OBVIOUS CLAIMS 2–4, 18, AND 19 74

A. Overview of Voughlohn (Ex.1006) 74

B. The Combination of Dua, Hong, Lockwood, and Voughlohn Renders Obvious Claims 2–4, 18, and 19 75

C. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 2 76

D. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 3 77

E. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 4 78

F. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 18 79

G. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 19 79

XI. THE BOARD SHOULD NOT EXERCISE DISCRETION TO DENY INSTITUTION 79

A. Board Should Not Decline Institution Pursuant to 35 U.S.C. § 325(d) 79

TABLE OF CONTENTS
(*cont'd*)

Page No.

B. Board Should Not Decline Institution Pursuant to 35 U.S.C. § 314(a) 80

Factor 1: Institution Will Increase Likelihood of Stay 81

Factor 2: District Court Schedule 81

Factor 3: Investment In The District Court Proceeding 81

Factor 4: The Petition Raises Unique Issues 82

Factor 5: Overlap Between The Parties In The Parallel Proceeding 82

Factor 6: Other Circumstances Support Institution 82

XII. CONCLUSION 83

TABLE OF AUTHORITIES

Page No(s).

Apple Inc. v. Fintiv, Inc.,
IPR2020-00019 Paper 11, 6 (P.T.A.B. Mar. 20, 2020) 80, 82

Intel Corp. v. Qualcomm Inc.,
21 F.4th 784 (Fed. Cir. 2021) 21, 44

KSR Intern. Co. v. Teleflex Inc.,
550 U.S. 398 (2007) 20, 21, 44

Mars Inc. v. H.J. Heinz Co.,
377 F.3d 1369 (Fed. Cir. 2004) 22

Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.,
868 F.3d 1013 (Fed. Cir. 2017) 14

Phillips v. AWH Corp.,
415 F.3d 1303 (Fed. Cir. 2005) 13

Qualcomm Inc. v. Apple Inc.,
No. 3:17-CV-2402-CAB-MDD, 2018 WL 4104951 (S.D. Cal. Aug. 29, 2018) 81

Sotera Wireless, Inc. v. Masimo Corp.,
IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) 82

TAS Energy, Inc. v. San Diego Gas & Elec. Co.,
No. 12CV2777-GPC BGS, 2014 WL 794215 (S.D. Cal. Feb. 26, 2014) 81

Toyota Motor Corp. v. Cellport Sys., Inc.,
IPR2015-00633, Paper No. 11 14

Uber Technologies, Inc. v. X One, Inc.,
957 F.3d 1334 (Fed. Cir. 2020) 21

Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.,
200 F.3d 795 (Fed. Cir. 1999) 14

LIST OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 9,730,484 to Dua, et al. ("'484 patent")
1002	Declaration of Dr. David S. Brookstein
1003	U.S. Patent No. 3,641,603 to Lockwood ("Lockwood")
1004	U.S. Patent App. Publ. No. 2005/0193592 to Dua, et al. ("Dua")
1005	Hong, et al., "The development of 3D shaped knitted fabrics for technical purposes on a flat knitting machine," IJFTR 19(3), Sept. 1994 ("Hong")
1006	U.S. Patent App. Publ. No. 2006/0053658 to Voughlohn ("Voughlohn")
1007	U.S. Patent No. 3,445,873 to Staden ("Staden")
1008	U.S. Patent No. 3,720,971 to Wyness, et al. ("Wyness")
1009	Excerpts of Prosecution History for U.S. Patent No. 9,730,484
1010	U.S. Patent No. 6,367,168 to Hatfield, et al. ("Hatfield")
1011	U.S. Patent No. 6,558,784 to Norton, et al. ("Norton")
1012	U.S. Patent No. 2,042,149 to Gastrich ("Gastrich")
1013	U.S. Patent No. 669,011 to Kahn ("Kahn")
1014	Spencer, David J., Knitting Technology: A Comprehensive Handbook and Practical Guide, Chapters 8, 12, and 18, Third Edition, 2001
1015	U.S. Patent No. 5,388,430 to Essig ("Essig")
1016	Declaration of Ingrid Hsieh-Yee, Ph.D.
1017	Excerpts of Prosecution History for European Patent App. No. 21166675.5

Exhibit No.	Description
1018	Curriculum Vitae of Dr. David S. Brookstein
1019	Tortora et al., Excerpts of Fairchild's Dictionary of Textiles, Seventh Edition, 1996
1020	Calasibetta et al., Excerpts of Fairchild's Dictionary of Fashion, Third Edition, 2003

Petitioner lululemon usa inc. ("lululemon") requests *inter partes* review ("IPR") of claims 1-19 ("challenged claims") of U.S. Patent 9,730,484 ("the '484 patent," Ex.1001).

I. MANDATORY NOTICES, GROUNDS FOR STANDING, AND FEE PAYMENT

Pursuant to 37 C.F.R. §42.8(a)(1), the mandatory notices identified in 37 C.F.R. § 42.8(b) are provided below as part of this Petition.

A. Real Party-In-Interest (37 C.F.R. §42.8(b)(1))

lululemon usa inc. is the real party in interest for Petitioner. The parent company for lululemon usa inc. is lululemon athletica inc.

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

The parties are currently engaged in district court litigation in the case captioned *Nike, Inc. v. lululemon usa inc.*, C.A. No. 1:23-cv-00771-AS (S.D.N.Y.). Nike, Inc. ("Nike" or "Patent Owner") has asserted the '484 patent against Petitioner in the district court litigation.

C. Lead and Backup Counsel (37 C.F.R. §42.8(b)(3))

Petitioner provides the following designation of counsel, all of whom are included in Customer No. 20,995 identified in Petitioner's Power of Attorney.

Lead Counsel	Back-up Counsel
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D. Service Information (37 C.F.R. §42.8(b)(4))

Please direct all correspondence to lead counsel and back-up counsel at the addresses shown above. Petitioner also consents to electronic service by email to lululemonIPR-484@knobbe.com.

E. Grounds for Standing (37 C.F.R. §42.104)

Petitioner certifies that the '484 patent is available for IPR and is not barred or estopped from requesting IPR on the identified grounds.

F. Payment of Fees (37 C.F.R. §42.15(a))

The Office may charge the §42.15(a) fee to Deposit Account No. 11-1410. Review of nineteen claims is requested. Payment for any additional fees due may be charged to the above-referenced Deposit Account.

II. INTRODUCTION

The ’484 patent is directed to an article of footwear and method of making the same. The footwear includes an upper with a flat-knitted element and three-dimensional features. The ’484 patent’s claims are obvious as set forth herein and claim nothing inventive in view of processes well-known in the art.

According to the ’484 patent, flat knitting can be used to provide a footwear upper having a final shape “such that textile cutting steps can be avoided (which eliminates waste, avoids the need to finish cut edges, saves time, saves money, etc.).” Ex.1001, 4:49-60. Flat knitting was a well-known method for producing knitted material, known long before the 2006 priority date of the ’484 patent. The ’484 patent also explains that flat knitting can provide three-dimensional structures, which avoid the need for additional support structures during construction of footwear. *Id.* Flat knitting three-dimensional structures was also well-known.

Per the ’484 patent’s claims, the flat-knitted element of a footwear upper includes a layer having three portions:

- a central portion having a domed, three-dimensional structure;
- a first side portion; and
- a second side portion.

The side portions are of "unitary construction" with the central portion. Figure 10A from the '484 patent shows a representative upper that includes a flat-knitted element with a central portion 71 and first and second side portions 72. Ex.1002, ¶20.

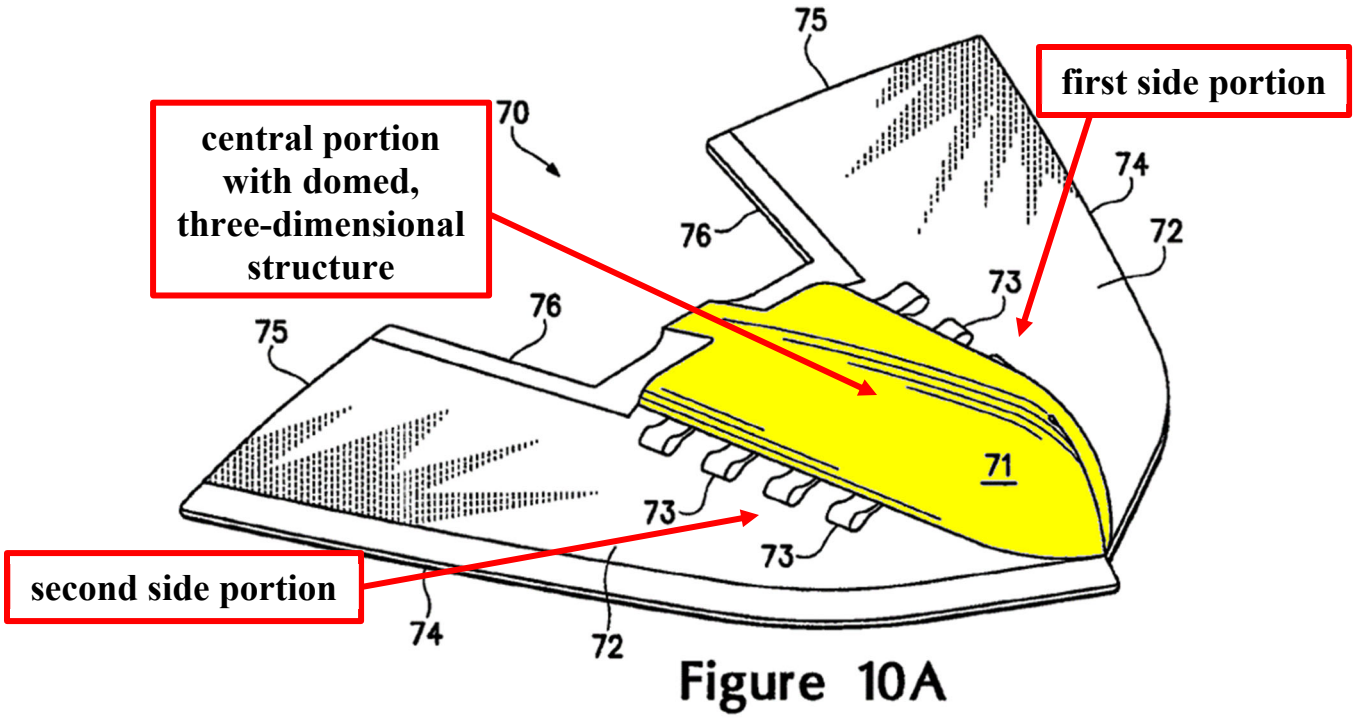


Figure 10A

Id., Fig. 10A (annotated); Ex.1002, ¶20. The central portion 71 has a domed, three-dimensional structure.

The '484 patent claims nothing patentable. The process of flat knitting articles had been used long before the 2006 priority date of the '484 patent.[1] Flat knitting

[1] Flat knitting had known capabilities and benefits long before 2006. Ex.1002, ¶¶31-39. For example, Kahn (Ex.1013) issued in 1901 and describes a flat knit cap and the method for making such a cap. Ex.1013, 1:43-51. As another example, Gastrich (Ex.1012), which issued in 1936, describes common flat-knit stockings made on a flat knitting machine. Ex.1012, 1:1-21(left). As yet another example, Essig (Ex.1015) issued in 1995 and describes a "method of producing a fashioned, one-piece flat knitted article for a garment…." Ex.1015, Abstract, 1:10-32.

was also used specifically to make footwear uppers before the '484 patent. For example, an earlier Nike application (Dua) discloses an upper made by flat knitting. Ex.1004, [0006], [0061]. Dua's Figure 8 below illustrates a unitary flat-knit upper having a central portion and two side portions. *Id*., [0025]; Ex.1002, ¶¶52-53.

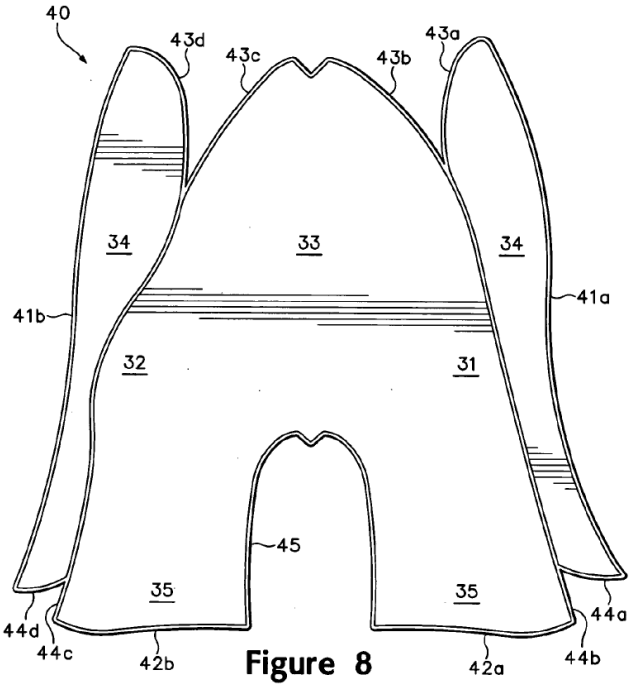


Figure 8

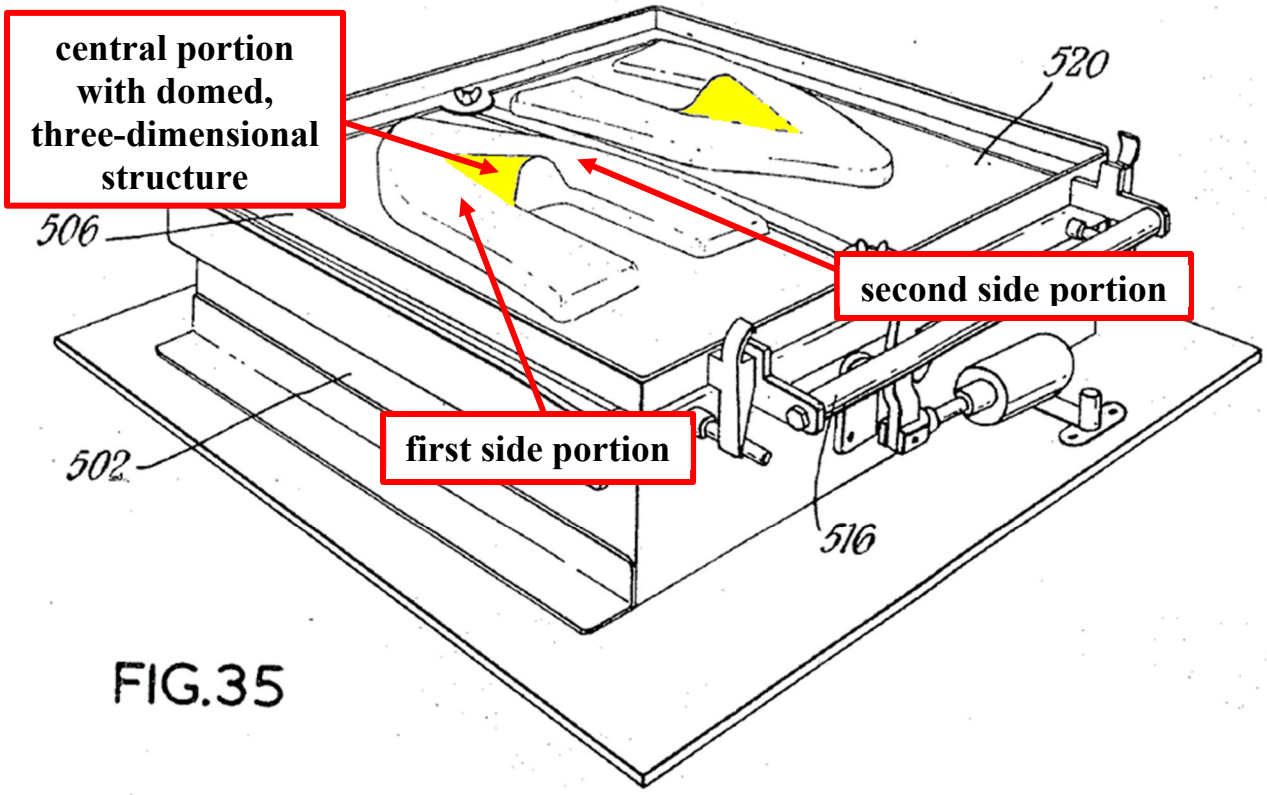
Id., Fig. 8.

Flat knitting three-dimensional structures was also well-known. Ex.1002, ¶¶30, 40. Indeed, Nike[2] admitted this during prosecution of a European application related to the '484 patent. Specifically, Nike admitted "[t]here are numerous prior art documents which disclose that achieving three-dimensional knitted textiles may generally be obtained through flat knitting." Ex. 1017, 8. For support, Nike cited a

[2] NIKE Innovate C.V., which is a subsidiary of Nike, made this admission.

1994 publication by Hong, et al, titled "The development of 3D shaped knitted fabrics for technical purposes on a flat knitting machine" ("Hong", Ex. 1005). *Id.* Hong explains that such three-dimensional flat knitting processes had known benefits, including "to reduce the waste of expensive materials during cutting as well as in eliminating the additional making up operation." Ex.1005, 1; *see also id.*, 5 ("knitting directly the 3D shapes can overcome fabric waste and the diminish labour cost inherent to the use of two-dimensional fabrics.").

Footwear uppers having a knitted layer with a central domed shape and two side portions were also well-known prior to the '484 patent's priority date. Ex.1002, ¶¶41-42. For example, Lockwood (1972) discloses an upper having a knitted layer with a central domed, three-dimensional shape and two side portions as recited in the '484 patent's claims. In particular, Lockwood discloses pre-shaping the upper with the knitted layer to include a three-dimensional "vamp cone portion" to simplify footwear assembly. Ex.1003, 1:60-64, 2:18-62. The disclosed shape is shown below:



Id., Fig. 35 (annotated); Ex.1002, ¶70.

Similar to the advantages described in the '484 patent, Lockwood teaches that pre-shaping the upper simplifies the manufacturing process, reduces cutting, and reduces waste. Ex.1003, 1:60-64, 2:18-62, 6:40-45, 7:21-37.

The prior art confirms there is nothing inventive in the challenged claims and it would have been obvious to flat knit a knitted element layer of a footwear upper with a central portion having a domed, three-dimensional structure and two side portions. As explained in the prior art, a POSA would have known to use flat knitting processes to make such a knitted element of an upper to reduce material waste, eliminate making up operations, simplify the assembly process, and diminish

labor costs. Accordingly, as described in detail below, the '484 patent's claims should be found unpatentable for obviousness and cancelled.

III. THE '484 PATENT

A. Specification

The '484 patent discloses articles of footwear with uppers[3] that include flat-knitted elements. Ex.1001, 4:28-48; Ex.1002, ¶19. In flat knitting, per the specification, knitted material is produced by knitting from alternating sides, for example by turning the material periodically. Ex.1001, 7:27-30. Flat knitting contrasts with circular knitting, in which the material is knitted from the same side. *Id*., 7:34-36.

The '484 patent states that "flat knitting can be used to provide textile structures for use in footwear uppers of a final desired shape such that textile cutting steps can be avoided (which eliminates waste, avoids the need for finish cut edges, saves time, saves money, etc.)." *Id*., 4:51-55. In one embodiment of a flat-knit structure, an upper 70 includes a "central portion 71, a pair of side portions 72, and eight lace loops 73." *Id*., 10:18-23.

[3] A shoe upper is the part of a shoe that covers a foot and securely receives and positions the foot with respect to a shoe sole. Ex.1001, 1:28-30.

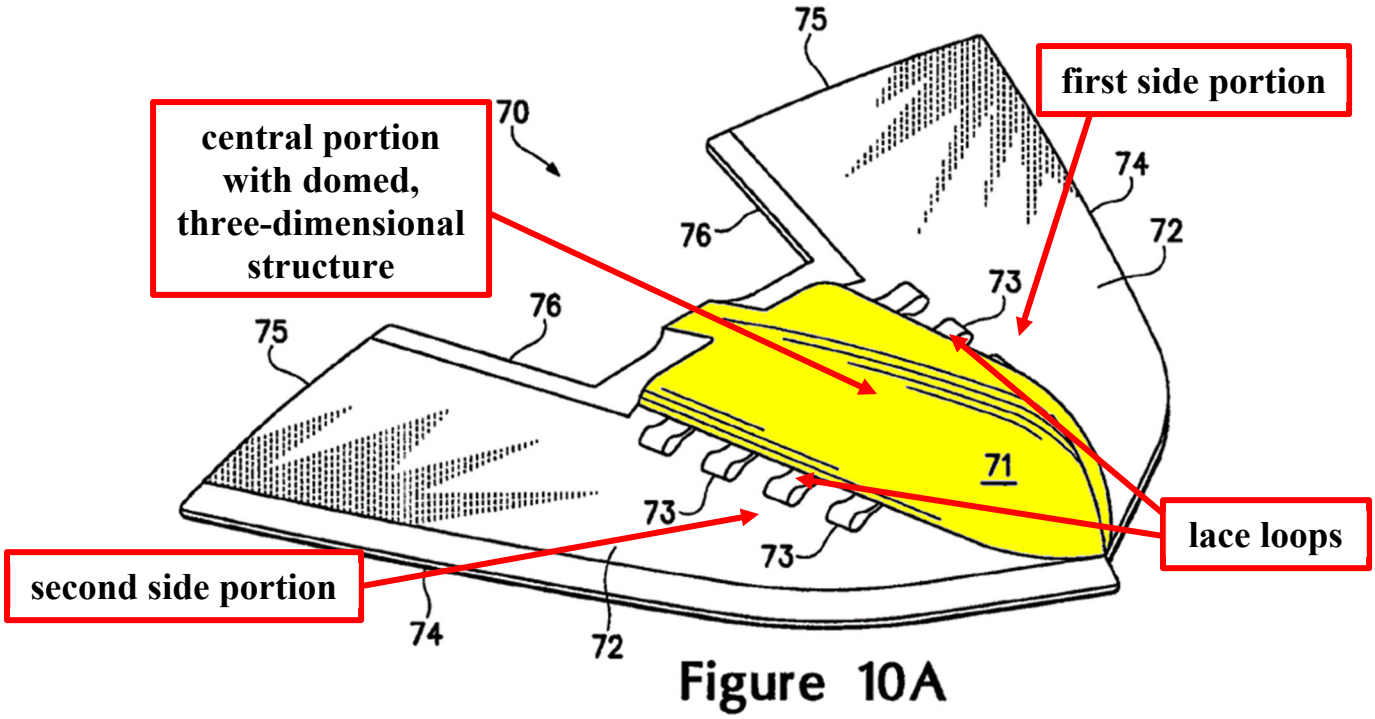


Figure 10A

Id., Fig. 10A (annotated); Ex.1002, ¶20. The central portion 71 has a domed, three-dimensional structure shaped to extend over a foot. Ex.1001, 10:34-38.

The '484 patent illustrates "a domed, three-dimensional structure" feature in only three figures (Figures 10A-10C) and provides only two short paragraphs of description about those figures. *Id.*, Figs. 10A-10C, 10:18-46. The '484 patent provides no detail regarding how to knit such three-dimensional features. Ex.1002, ¶21. When Nike was confronted about this lack of disclosure in related foreign prosecution, Nike asserted that disclosure was unnecessary because knitting such three-dimensional features was well-known. *See* Section III.D.

B. Claims

Claim 1, a representative '484 patent independent claim, is set forth below (with bracketed labels added for reference and three primary elements emphasized).

Claim 1	
1[pre]	An article of footwear comprising
1[a]	an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer having:
1[b]	a ***central portion*** having a domed, three-dimensional structure configured for extending over the top of a foot;
1[c]	a ***first side portion*** being formed of unitary construction with the central portion and extending from a first side of the central portion; and
1[d]	a ***second side portion*** being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion,
1[e]	the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration.

C. Prosecution History

The Patent Office issued only one substantive Office Action. Ex.1009, 40-48. The Examiner rejected the pending claims as anticipated by Dua (Ex.1004) or obvious over Dua in view of Hatfield (Ex.1010). *Id*., 42-46. Dua is the same Dua that is part of Grounds 1-4 in this Petition. The Examiner did not, however, consider Lockwood (Ex.1003) and/or Hong (Ex.1005) that are part of Grounds 1-4 with Dua.

Patent Owner responded to the Office Action by amending the independent claims to add "domed, three-dimensional structure" limitations. Ex.1009, 25-28. The Examiner next issued a Notice of Allowance without providing additional comments regarding the claims. *Id*., 11-15.

D. Prosecution in Related European Counterpart

After issuance of the '484 patent, Nike[4] filed a European counterpart to the '484 patent, which was assigned European Patent Application No. 21166675 ("the EP '675 application"). Claim 1 of the EP '675 application included similar limitations to the '484 patent's claim 1. Ex.1017, 11; Ex.1002, ¶27.

During examination, the Examiner objected to the EP '675 application's claim 1 for multiple reasons, including because the application included insufficient disclosure for a skilled person to carry out the claimed invention. Ex.1017, 15. The Examiner explained that "nothing is described nor disclosed nor explained on how a domed three-dimensional knitted element could be manufactured through a flat-knitting process." *Id*. According to the Examiner, "[i]t is clear to any skilled person that the present subject-matter lacks essential information on how such an effect (domed portion) could be achieved." *Id*.

[4] Nike filed this European counterpart through its subsidiary entity NIKE Innovate C.V.

Nike replied, arguing the objection was unfounded because "[t]here are numerous prior art documents which disclose that achieving three-dimensional knitted textiles may generally be obtained through flat knitting, such as e.g. 'The development of 3D shaped knitted fabrics for technical purposes on a flat knitting machine', Hong et al." *Id*., 8.[5] Hong describes, what was around 1994 a new commercial electronic flat-knitting machine and provides specifics of how it can produce three-dimensional shaped fabrics for a variety of technical purposes. Ex.1005, 1-3; Ex.1002, ¶30. Hong also describes a variety of exemplary three-dimensional shaped knitted fabrics developed on the machine, including tubular forms, spherical forms, and others. Ex.1005, 3-6. Hong explains, "One of the main advantages [of such flat-knitting machines] is the facility of these machines to knit fabric pieces to a particular shape or form." *Id.*, 1. This Hong reference is relied upon for Grounds 3-4 of this Petition.

IV. LEVEL OF ORDINARY SKILL

The '484 patent relates to an article of footwear comprising an upper that includes a flat-knitted element. Ex.1001, 3:10-14. A hypothetical person of ordinary skill in the art ("POSA") would have had at least a bachelor's degree in mechanical engineering, textile engineering, or similar technical degree and at least 3 years of experience working with knitted textiles for use in fabric-based articles, including

[5] The Examiner withdrew the objection in the next communication. Ex.1017, 1-6.

apparel such as footwear. For individuals with different educational backgrounds, a person could still be of ordinary skill in the art provided that person's additional experience compensates for any differences in that person's education as stated above. Ex.1002, ¶¶43-45.

This Petition does not turn on this specific definition of the level of ordinary skill. The claims would been obvious from the perspective of any reasonable definition of a POSA. *Id*., ¶45.

V. CLAIM CONSTRUCTION

The claims should be construed under the same standard as in district court. 37 C.F.R. § 42.100(b). Under this standard, claims "are generally given their ordinary and customary meaning," as understood by a person of ordinary skill. *Phillips v. AWH Corp*., 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (citation omitted).

In the district court, Patent Owner has taken the position that the "flat knitted element formed from at least one yarn mechanically manipulated in a flat knitting process" of claim 1 need not have the claimed "domed, three-dimensional" structure recited in the claim. In particular, Patent Owner contends a flat-knitted element that is knitted in a flat configuration and then formed into a domed, three-dimensional configuration after it is knit would fall within the scope of the claim. Petitioner disagrees and contends the plain and unambiguous language of the claim requires that the flat-knitted element having the claimed features must be formed from a flat-

knitting process. Ex.1002, ¶¶46-48. Nonetheless, Petitioner addresses the challenged claims in Grounds 1-2 based on Patent Owner's interpretation. *Id*. Petitioner addresses the challenged claims in Grounds 3-4 under their plain and ordinary meaning, i.e., that a flat-knitted element having the claimed features is formed from a flat-knitting process. *Id*.

The challenged claims are obvious over the cited art under either Patent Owner's interpretation or the plain and ordinary meaning of the claim terms. *Id*. Consequently, Petitioner submits that the Board need not specially construe any claim terms in this proceeding. *Toyota Motor Corp. v. Cellport Sys., Inc.*, IPR2015-00633, Paper No. 11, p. 16 (PTAB 2015); *see also Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.,* 200 F.3d 795, 803 (Fed. Cir. 1999) ("[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy."); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

VI. RELIEF REQUESTED

Petitioner requests that the Board cancel claims 1–19 of the '484 patent as obvious in view of the following prior art references:

Ex.	Reference	Date	Art Type
1003	Lockwood	Issued: February 15, 1972	§102(b)
1004	Dua	Published: September 8, 2005	§102(b)
1005	Hong	Published: September 1994	§102(b)
1006	Voughlohn	Filed: September 14, 2005	§102(e)
1011	Norton	Filed: May 6, 2003	§102(b)

IPR is requested for the following grounds of unpatentability:

Ground	Reference(s)	Basis	Challenged Claims
1	Lockwood and Dua	§103	1 and 5–9
2	Lockwood, Dua, and Norton	§103	1 and 5–9
3	Dua, Hong, and Lockwood	§103	1–19
4	Dua, Hong, Lockwood, and Voughlohn	§103	2–4, 18, and 19

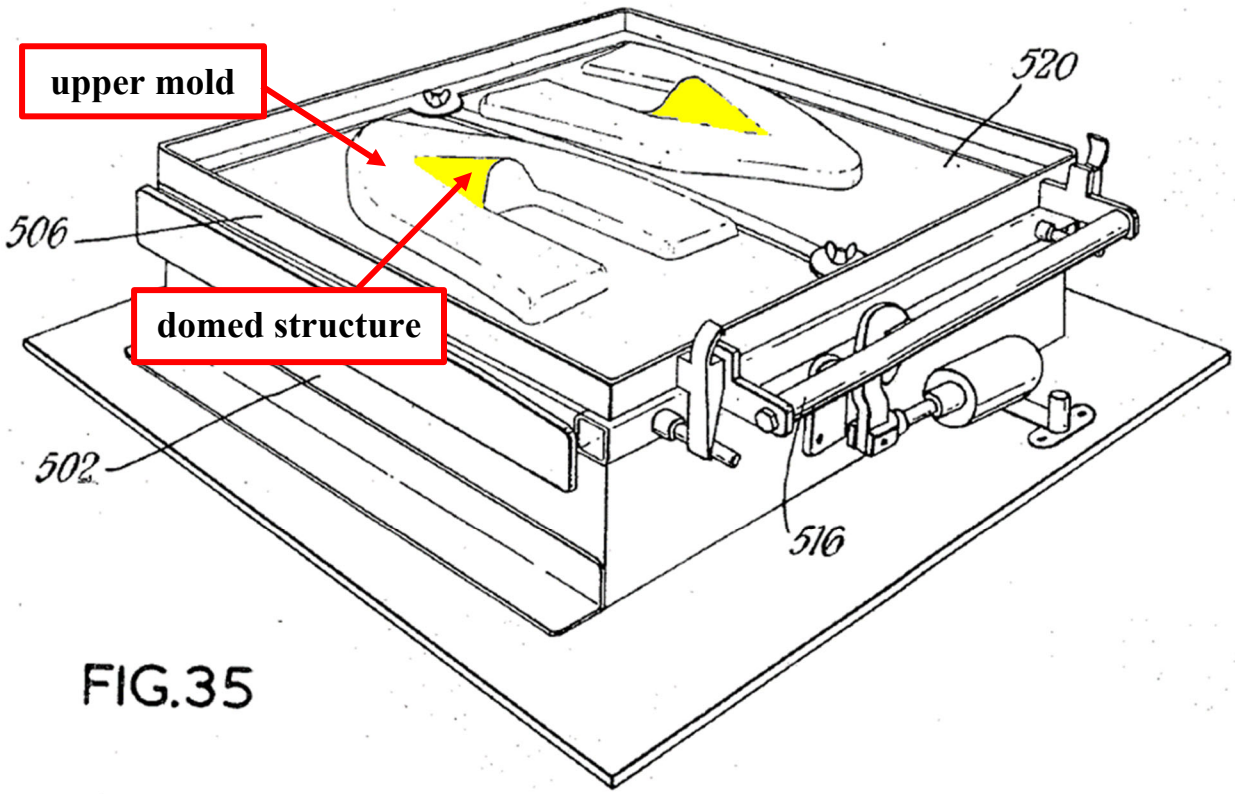
This Petition is supported by the expert declaration of Dr. David S. Brookstein (Ex.1002). Ex.1002, ¶¶1-9, 159-162.

VII. GROUND 1: LOCKWOOD AND DUA RENDER OBVIOUS CLAIMS 1 AND 5–9

A. Overview of Lockwood (Ex.1003)

Lockwood issued in 1972 and was neither considered nor cited during prosecution of the ’484 patent. Ex.1003, Front Page. Lockwood relates to shoe

making and discloses "[m]ethods of preforming shoe uppers … using molds of a novel shape." *Id*., Abstract. Lockwood explains manufacturing an upper that is domed in the area covering a foot simplifies assembly. *Id*., Abstract, 2:60-62, 1:60-64. This domed area is referred to as a "vamp cone portion" of the upper. *Id*., 2:60-64. Lockwood positions its vamp cone portion around an upper's median line. *Id*. Lockwood's Figure 35 illustrates an upper shape with a vamp cone portion which is a domed, three-dimensional structure extending above flattened side portions. Ex.1002, ¶50.



Ex.1003, Fig. 35 (annotated); Ex.1002, ¶50.

Lockwood discloses that footwear uppers can incorporate a knitted element. For example, Lockwood discloses that its shoe uppers may include a "fibrous

reinforcement." Ex.1003, 8:34-39, 8:66-69. The fibrous reinforcement can be a sheet of "woven, nonwoven or knitted textile fabrics" that is adhered to or embedded in a thermoplastic material. *Id*. The fibrous reinforcement and thermoplastic material are placed on a mold that deforms the fibrous reinforcement and thermoplastic material. *Id*., 2:22-30; Ex. 1002, ¶51. This allows "a single-piece integral upper to be formed." Ex.1003, 2:18-19.

B. Overview of Dua (Ex.1004)

Dua published in 2005 and discloses articles of footwear, including uppers produced using a flat-knitting process. Ex.1004, Abstract, [0061]; Ex.1002, ¶¶52-53. As described above, the Examiner relied upon Dua to reject claims during prosecution, but Dua was not considered in combination with Lockwood or Hong. Dua explains that flat knitting is a type of weft knitting, which is one of the two main mechanical processes developed for knitting a textile (i.e., warp and weft knitting). Ex.1004, [0044]. Flat-knitting may be used to "impart various textures, different properties, or different yarn types to the textile element." *Id*., [0061]. Dua discloses that the type of knitting or yarn utilized can vary to impart different properties to different parts of the textile element. *Id*., [0056].

Dua's upper "may be formed from multiple material layers that include an exterior layer, an intermediate layer, and an interior layer." *Id*., [0006]. Dua's

Figure 8 illustrates "a plan view of a textile element that forms at least a portion of the upper" and includes at least one layer. *Id*., [0025].

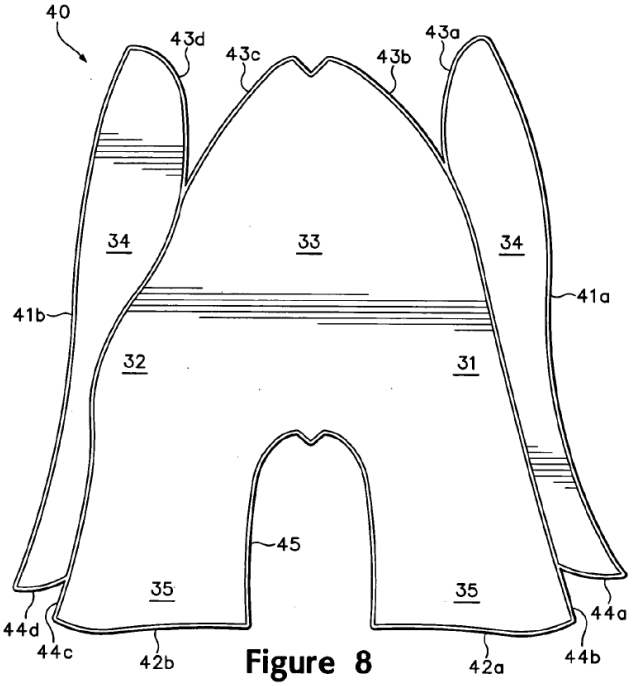


Figure 8

Id., Fig. 8. Dua states that manufacturing efficiency is increased by forming its upper to be a single, unitary element of material rather than numerous jointed elements. *Id*., [0060].

C. Lockwood and Dua Render Obvious Claim 1

Lockwood discloses an upper having a central portion with a domed, three-dimensional structure. Ex.1003, Abstract, 2:60-62, 1:60-64. And Lockwood expressly discloses the upper includes a knitted element. *Id*., 8:34-39, 8:66-69. Lockwood, thus, discloses every element of claim 1 except for the knitted element being ***flat knit***. Ex.1002, ¶54. But flat knitting a knitted element from at least one yarn was well-known, as disclosed in Dua. *Id*. A POSA would have been motivated

for multiple reasons to use a flat-knitted element like Dua's for the knitted element in Lockwood's upper. *Id*.

A POSA would have been motivated to combine the teachings of Lockwood and Dua because they are in the same field of endeavor and address the same problem as the '484 patent. Ex.1002, ¶55. Similar to the '484 patent, Lockwood and Dua are directed to manufacturing uppers for shoes, including uppers having knitted elements. Ex.1003, Abstract; Ex.1004, Abstract. Lockwood and Dua also address the same problem addressed in the '484 patent, namely forming uppers that provide the benefits of reducing cost and increasing efficiency in manufacturing. Ex.1002, ¶55.

A POSA would have understood from Dua the benefits of flat knitting a knitted element of an upper. Ex.1002, ¶56. Dua explains that flat knitting may be used to "impart various textures, different properties, or different yarn types to the textile element." Ex.1004, [0061]. Dua discloses a unitary upper "formed from multiple material layers that include an exterior layer, an intermediate layer, and an interior layer." *Id*., [0006]. By "forming textile element 40 to be a single, unitary element of material, however, efficiency is increased in that upper 20 may include a single textile element, rather than numerous jointed elements." *Id*., [0060]. These motivations and benefits in the prior art are the same as the motivations and benefits of flat knitting referenced in the '484 patent. Ex.1002, ¶56.

Lockwood explains that producing a "single-piece integral upper" with a domed, three-dimensional structure "simplif[ies] the assembly of uppers by a technique of preshaping the upper forepart component." Ex.1003, 1:60-64, 2:18-62; Ex.1002, ¶57. According to Lockwood, "preforming uppers for shoes, in which the uppers can be easily cut from a sheet of material after preforming and in which different style shoes can easily be formed from the same shape … is facilitated if the central raised portions 34 of the mold is smoothly curved." Ex.1003, 7:21-28.

A POSA would have also been motivated to use a flat knitting machine to produce Lockwood's knitted element because such machines provided vast knitting design options and ease of use. Ex.1002, ¶58. Flat knitting machines are "the most versatile of the weft knitting machines." Ex.1014, 8. Flat knitting machines facilitate different stitch types and lengths and support a wide range of yarns. *Id*. "The operation and supervision of the machines of the simpler type are less arduous than for other weft knitting machines." *Id*. A POSA would have known that such flat knitting machines could easily be programmed to create a knitted element with specific features and shape. Ex.1014, 13; Ex.1002, ¶58.

A POSA would have also been motivated to look to flat knitting as one of a finite number of options for producing Lockwood's knitted element. Ex.1002, ¶59; *see KSR Intern. Co. v. Teleflex Inc.,* 550 U.S. 398, 421 (2007) ("finite number of identified, predictable solutions" that lead to anticipated success "is likely the

product, not of innovation, but of ordinary skill and common sense"); *see also Uber Technologies, Inc. v. X One*, *Inc*., 957 F.3d 1334, 1341-1342 (Fed. Cir. 2020) (reversing Board's finding that limitation was not obvious because it was one of finite number of known predictable solutions at time of alleged invention). For example, Dua discloses knitting options for uppers, including flat knitting. Ex.1004, [0006], [0061]. The use of flat knitting would have been a use of a known technique to improve similar upper elements in the same way. Ex.1002, ¶59; *see KSR*, 550 U.S. at 417; *see also Intel Corp. v. Qualcomm Inc*., 21 F.4th 784, 797-800 (Fed. Cir. 2021). A POSA would have recognized that Lockwood discloses a textile, knitted element without expressly specifying which knitting process to implement. Ex.1002, ¶59. As described in Dua, a POSA would have known there were a limited number of knitting processes available, and a POSA would have looked to Dua's recitation of the few, basic knitting options, including flat knitting. *Id.*

A POSA would have reasonably expected success in implementing a flat-knitted element like Dua's in Lockwood's upper. *Id*., ¶60. At most this would have involved a mere selection of a flat-knitted element for Lockwood's generic knitted element. *Id*. A POSA would have known that flat-knitting machines could easily create a simple article such as a knitted element with a layer before the '484 patent's earliest priority date. *Id*. Dua confirms that flat knitting was a known manufacturing process for uppers. Ex.1004, [0006], [0061]. Thus, the combination would have

involved no more than the routine selection of one species of knitting from Dua for use in constructing Lockwood's knitted element. Ex.1002, ¶60.

As described below, combining Lockwood and Dua meets each limitation of claims 1 and 5–9 of the '484 patent. *Id*., ¶61.

1. Preamble

The preamble of claim 1 recites: "An article of footwear comprising." Lockwood discloses articles of footwear. Ex.1003, Title ("Shoe Making"), 1:6-10 (shoe includes all forms of footwear), Claim 26; Ex.1002, ¶62. Dua also discloses articles of footwear. Ex.1004, Title ("Article of Footwear Having a Textile Upper"); Ex.1002, ¶62.

2. Limitation 1[a]

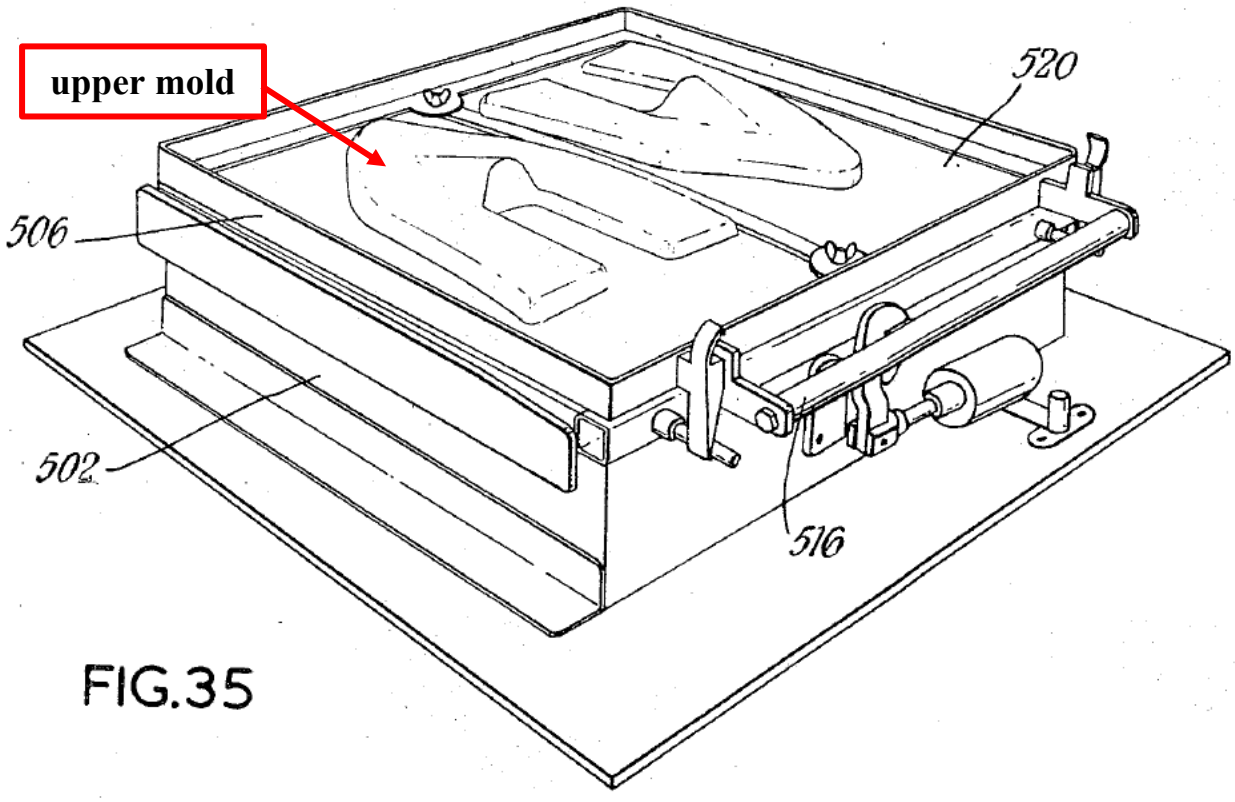
The combination of Lockwood and Dua discloses "an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer." Per limitation 1[a], the upper ***includes*** a flat-knitted element.[6] Thus, neither the entire upper nor the entire footwear article must be flat-knitted. *Mars Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1376, 71 (Fed. Cir. 2004) ("[t]he transitional term 'comprising,' … is

[6] This limitation also recites that the flat-knitted element is "formed from at least one yarn mechanically manipulated in a flat-knitting process." Of course, any flat-knitted element would include a yarn mechanically that was manipulated in a flat-knitting process. Ex.1019, 3; Ex. 1002, ¶63.

synonymous with 'including,' [and] is open-ended and does not exclude additional, unrecited elements or method steps."). Rather, the upper must include a flat-knitted element. That flat-knitted element has a first layer having each limitation recited later in claim 1's body.

Lockwood discloses "[m]ethods of preforming ***shoe uppers***" that "include fibrous reinforcement for example in the form of a woven, ***knitted*** or nonwoven sheet adhered to or embedded in the water vapor permeable thermoplastic material." Ex.1003, Abstract[7], 8:34-39, 8:66-69; *see also id*., 8:38-39 (fibrous reinforcement may include "knitted textile fabrics"). Lockwood's Figure 35 illustrates a mold for making the disclosed upper. Ex.1002, ¶64.

[7] Emphasis added unless otherwise noted.



Ex.1003, Fig. 35 (annotated); Ex.1002, ¶64.

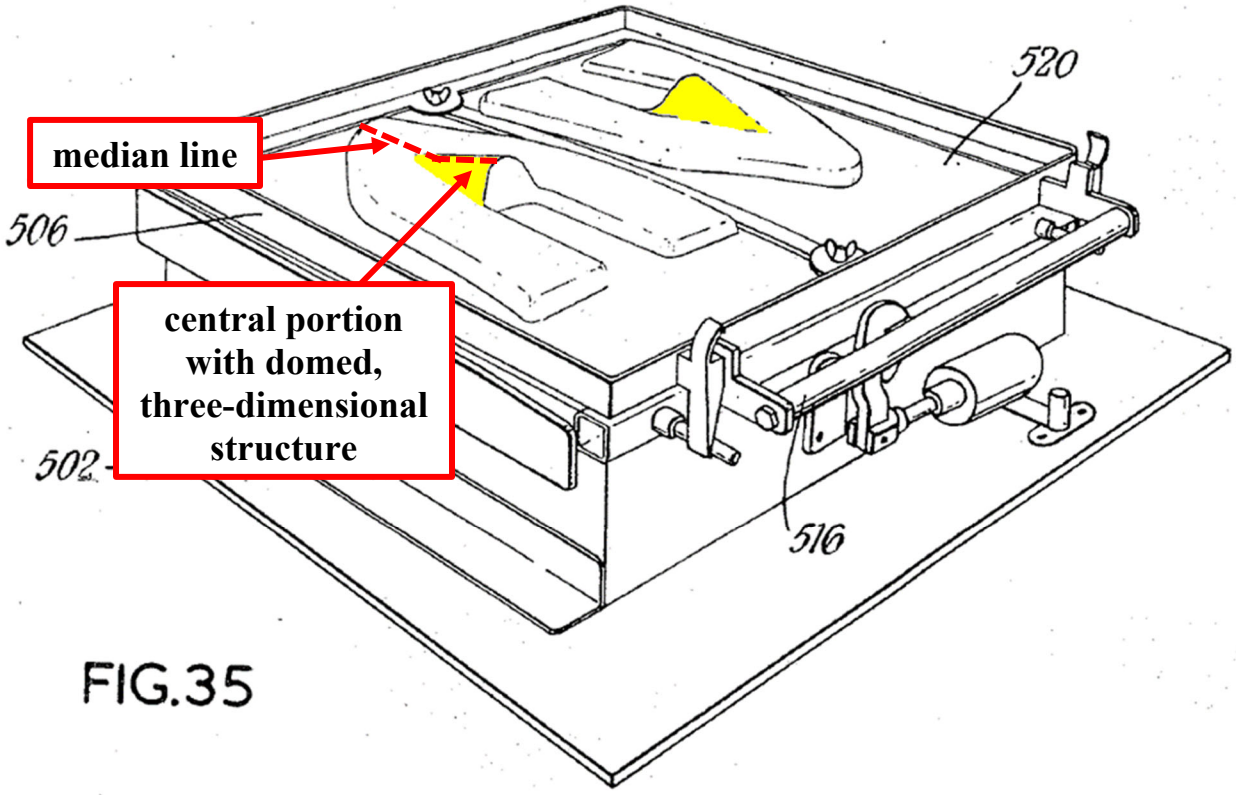
Lockwood describes its knitted reinforcement as a sheet that is layered on a sheet of extensible material. Ex.1003, 8:66-72; Ex.1002, ¶65. The sheets of knitted reinforcement and extensible material together form a composite sheet used to construct Lockwood's upper. Ex.1003, 8:66-72. Thus, Lockwood teaches an upper including a knitted element (knitted reinforcement layer) that includes a first layer. Ex.1002, ¶65.

And Dua discloses an upper having a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer. Ex.1004, [0006], [0008], [0061]; Ex.1002, ¶66. For

the reasons described above, a POSA would have been motivated to use flat knitting as taught by Dua for Lockwood's knitted element (knitted layer). Ex.1002, ¶66. Thus, Lockwood and Dua teach the features recited in limitation 1[a]. *Id*., ¶¶63-66.

3. Limitation 1[b]

Lockwood discloses a knitted element including a first layer that has "a central portion having a domed, three-dimensional structure configured for extending over the top of a foot." For example, Lockwood discloses that "[p]roduction of upper components for mens shoes having a ***vamp cone portion*** will involve the use of molds having a vamp cone protuberance positioned around the median line." Ex.1003, 2:60-64. The "vamp" of the shoe is the portion that extends over the top of the foot. Ex.1020, 3 (vamp is the "[f]ront part of [a] shoe, covering toes and instep"); Ex.1003, 6:15-16 (vamp cone portion 34 "corresponds to the tongue area of the shoe"); Ex.1002, ¶67. Lockwood's Figure 35 illustrates a mold for making an upper with a knitted reinforcement layer that has a central portion with a domed, three-dimensional structure (vamp cone portion). Ex.1002, ¶67.

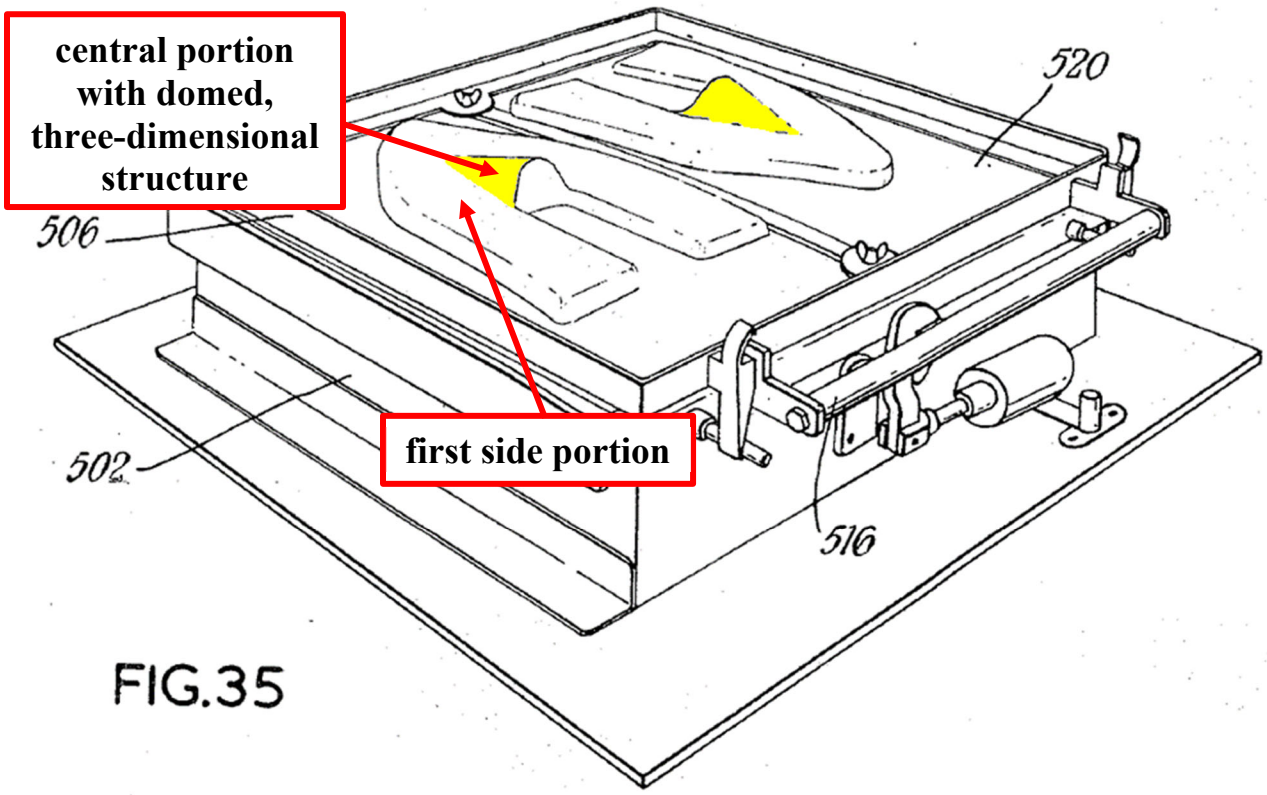


Ex.1003, Fig. 35 (annotated); Ex.1002, ¶67. Thus, Lockwood discloses that its knitted element (knitted layer) includes a first layer having a central portion with a domed, three-dimensional structure (vamp cone portion) and that the domed, three-dimensional structure is configured for extending over the top of a foot. Ex.1002, ¶67.

4. Limitation 1[c]

Lockwood discloses an upper with a knitted element including a first layer that has "a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion." For example, Lockwood's disclosure allows "a ***single-piece integral*** upper to be formed."

Ex.1003, 2:18-19. In connection with Figure 35, Lockwood discloses forming an upper with a knitted reinforcement layer that has a first side portion formed of unitary one-piece construction with the central portion and extending from a first side of the central portion. Ex.1002, ¶68.



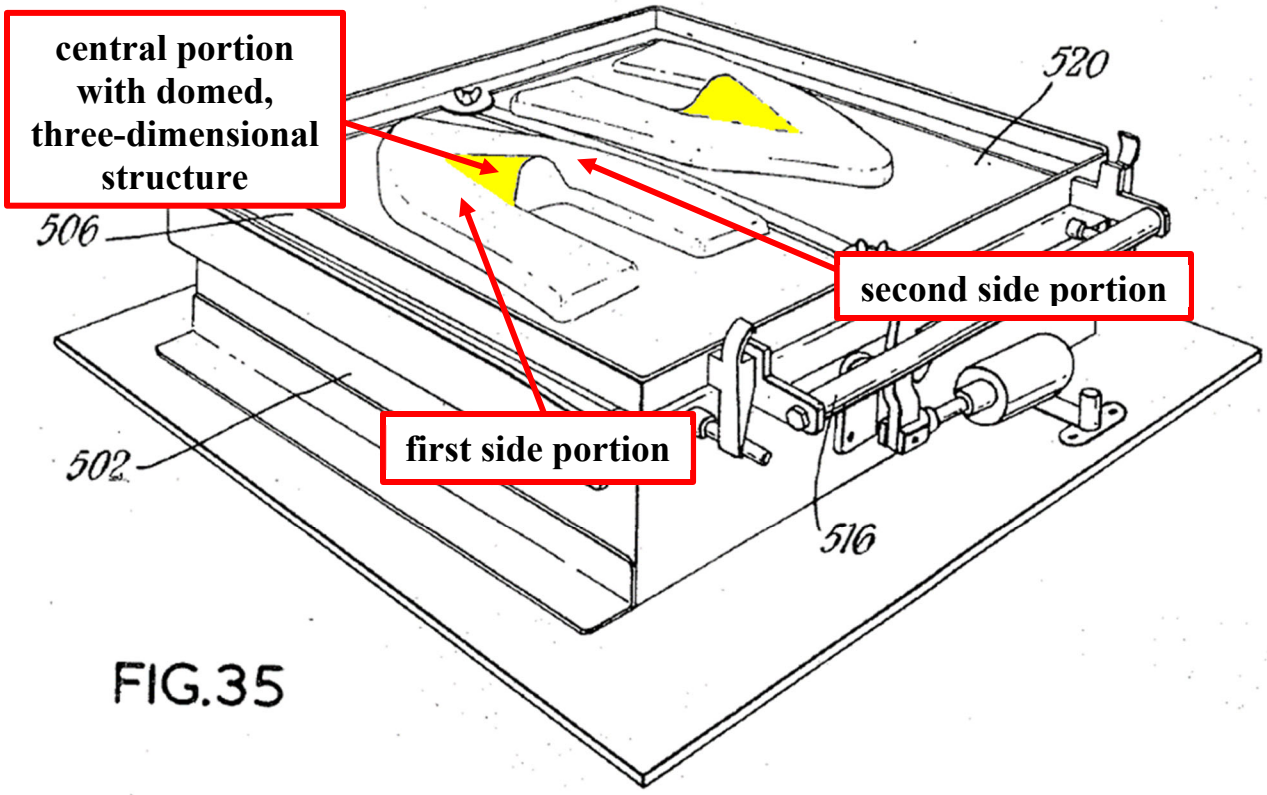
Ex.1003, Fig. 35 (annotated); Ex.1002, ¶68.

Dua also discloses a first portion of unitary construction with the central portion. Ex.1002, ¶69. For example, Dua discloses "[t]extile element 40 is a single material element that is formed to exhibit a ***unitary (i.e., one-piece) construction***, and textile element 40 is formed or otherwise shaped to extend around the foot." Ex.1004, [0037], Fig. 8. According to Dua, by forming the textile element 40 to be

a single, unitary element of material, efficiency is increased because the upper includes a single textile element, rather than numerous jointed elements. *Id*., [0060].

5. Limitation 1[d]

Lockwood discloses a knitted element including a first layer that has "a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion." Lockwood's Figure 35 illustrates making an upper with a knitted reinforcement layer that has a second side portion formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion. Ex.1002, ¶70.

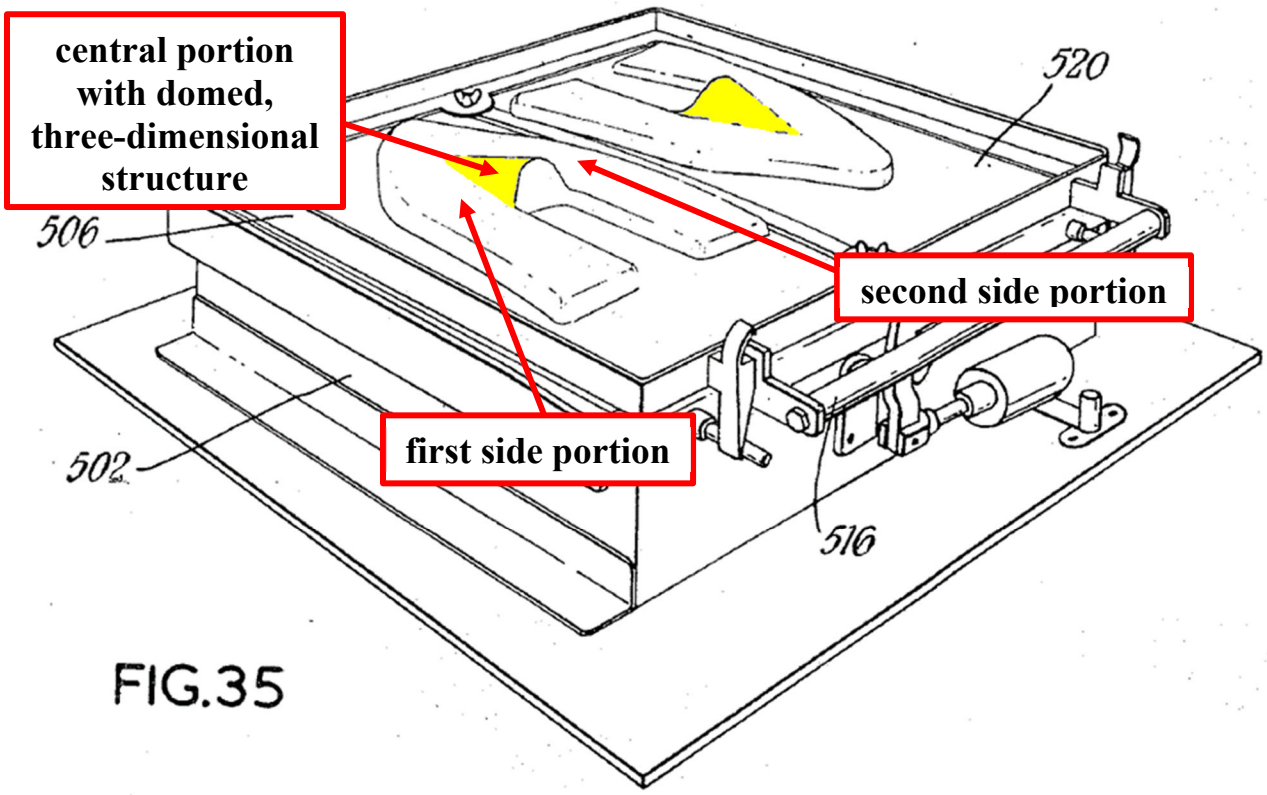


Ex.1003, Fig. 35 (annotated); Ex.1002, ¶70. Lockwood's upper is "a single-piece integral upper." Ex.1003, 2:18-19. Thus, Lockwood discloses that its knitted element (knitted layer) includes this limitation upon completion of the molding process. Ex.1002, ¶¶70-71.

6. Limitation 1[e]

The combination of Lockwood and Dua discloses "the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration." For example, Lockwood explains that its upper can have "a ***vamp cone portion*** … positioned around the median line." Ex.1003, 2:60-64. Lockwood's Figure 35

illustrates the shape of the upper's knitted layer that has a central portion with a domed, three-dimensional structure (vamp cone portion) shaped to extend above the plane of the first and second side portions when the upper and its knitted layer are in a flattened configuration. Ex.1002, ¶72.



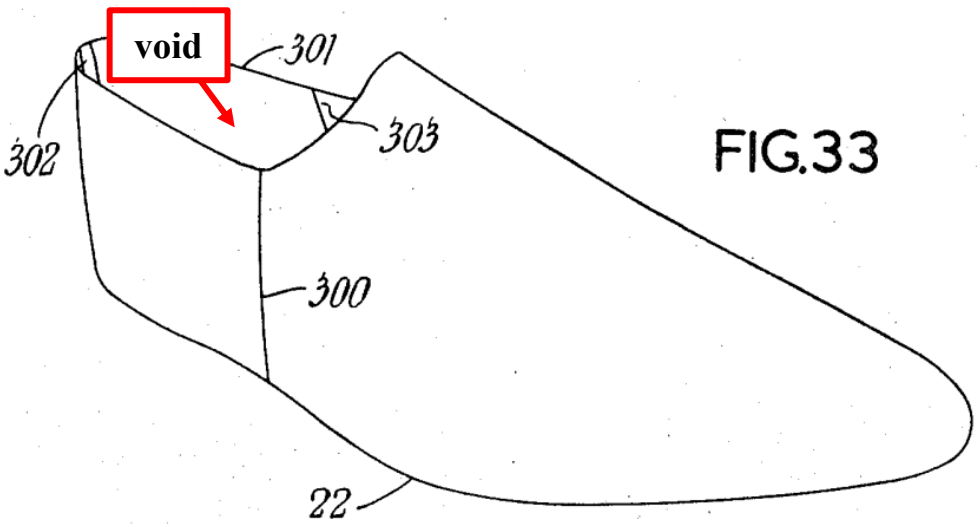
Id., Fig. 35 (annotated); Ex.1002, ¶72. As shown, the upper's knitted layer will have a domed, three-dimensional structure (vamp cone portion) extending above the plane of the first side portion and the second side portion when the rest of the knitted layer is in a flattened configuration. Ex.1002, ¶72. Lockwood discloses that the knitted layer is an additional sheet that is adhered to or embedded in the extensible member to form a composite sheet. Ex.1003, 8:66-9:2. Thus, Lockwood discloses a knitted

element (knitted layer) including a first layer with a domed, three-dimensional structure (vamp cone portion) and flattened first and second side portions. Ex.1002, ¶72.

As discussed with respect to limitation 1[a] in this ground, to the extent Lockwood does not expressly disclose the knitted layer being flat-knitted from at least one yarn, it would have been obvious to flat-knit Lockwood's knitted layer from a yarn in view of Dua. Dua explains "[a] ***textile*** may be defined as any manufacture from fibers, filaments, or ***yarns*** characterized by flexibility, fineness, and a high ratio of length to thickness." Ex.1004, [0008]. Dua identifies flat-knitting as one of a limited number of options for knitting an article, such as a body garment like an upper. *Id*., [0044]. Thus, flat knitting was a well-known process for making a textile, such as for uppers, and it would have been obvious for a POSA to choose flat knitting with a yarn for Lockwood's knitted element (knitted layer). Ex.1002, ¶73.

D. Lockwood and Dua Render Obvious Claim 5

Claim 5 depends from claim 1 and recites "wherein the knitted element defines a void for receiving a foot of a wearer." Lockwood discloses this limitation. For example, Lockwood explains that one disclosed mold is for a foot. Ex.1003, 7:44. Lockwood's Figure 33 shows the shell of a last shape (the shape of a foot) from which Lockwood's shapes are derived. *Id*., 3:73-75.



Id., Fig. 33 (annotated); Ex.1002, ¶74.

As discussed with respect to limitation 1[a] in this ground, Lockwood discloses the knitted layer is a sheet embedded in or adhered to the extensible material that forms a composite sheet used in Lockwood's upper. Ex.1002, ¶75. Thus, upon completion of Lockwood's molding process, Lockwood's knitted element (knitted layer) extends across the entire upper and defines a void (an opening) at the top of the knitted element (knitted layer) for receiving a foot. Ex.1002, ¶¶74-75.

E. Lockwood and Dua Render Obvious Claim 6

Claim 6 depends from claim 1 and recites "wherein the knitted element defines at least a portion of an exterior surface of the upper, and the knitted element defines at least a portion of a void for receiving a foot of a wearer." Lockwood discloses these limitations. For example, Lockwood discloses "the extensible material may include fibrous reinforcement for example in the form of a woven,

knitted or nonwoven sheet ***adhered to*** or embedded in the water vapor permeable thermoplastic material." Ex.1003, 8:34-39, 8:66-69. Lockwood's disclosure of adhering its knitted layer to the extensible material indicates positioning of the knitted layer as either an exterior surface or interior surface of the upper. Ex.1002, ¶76. It would have been obvious to adhere Lockwood's knitted layer to the extensible material so that the knitted layer defines part of an exterior surface of the upper because this would provide benefits and involve no more than selection of one of a finite number of options (i.e., positioning the knitted layer as an exterior or inner layer). *See e.g.*, Ex.1004, [0006] (materials forming exterior layer of upper may be selected based on properties of wear-resistance, flexibility, and air-permeability), [0008] (textile materials often form part of upper's exterior layer); Ex.1002, ¶76.

As described for claim 5 in this ground, Lockwood teaches that the knitted element defines a void for receiving a foot of a wearer. *See also*, Ex. 1002, ¶77.

F. Lockwood and Dua Render Obvious Claim 7

Claim 7 depends from claim 1 and recites "wherein the knitted element includes a first area and a second area, the first area including a first type of knit structure, and the second area including a second type of knit structure, the first type being different than the second type." Lockwood and Dua render obvious these limitations. For example, Dua discloses "an upper incorporating a textile element formed through a weft knitting process" where "the textile element has a first area

and a second area with a unitary construction, the first area being formed of a first stitch type, and the second area being formed of a second stitch type that is different from the first stitch type to impart varying textures to a surface of the textile element." Ex.1004, Claim 7; *see also id*., Claims 47, 66. Dua also explains the degree of stretch or wear resistance may vary in different areas depending upon the stitch used. *Id*., [0055]; *see also id*., [0060].

It would have been obvious for a POSA to vary the type of knit structure at different areas of Lockwood's knitted element (knitted layer) to give the different areas different properties, such as different degrees of stretch or wear resistance. Ex.1002, ¶¶78-79.

G. Lockwood and Dua Render Obvious Claim 8

Claim 8 depends from claim 1 and recites "wherein the at least one mechanically manipulated yarn includes a first yarn and a different second yarn, the first yarn being located in a first area of the upper, and the second yarn being located in a second area of the upper." Lockwood and Dua render obvious these limitations. For example, Dua discloses the ***type of yarn*** utilized in various areas of textile elements may be changed to impart different properties. Ex.1004, [0056]; *see also id*., Claim 66. "[Y]arn may be formed from cotton, wool, elastane, rayon, nylon, and polyester, for example." *Id*., [0056]. Dua also discloses the materials

comprising a yarn may be selected to impart a variety of physical properties, including strength, stretch, support, stiffness, recovery, fit, and form. *Id*., [0052].

It would have been obvious for a POSA to use different yarns at different areas of the knitted element (knitted layer) of Lockwood's upper to give the different areas different properties, such as different degrees of strength, stretch, support, stiffness, recovery, fit, or form. Ex.1002, ¶¶80-81.

H. Lockwood and Dua Render Obvious Claim 9

Claim 9 depends from claim 1 and recites "wherein the knitted element forms a defined shape having finished edges during the flat knitting process." As explained in the '484 patent, "flat knitting can be used to provide textile structures for use in footwear uppers of a final desired shape such that textile cutting steps can be avoided (which eliminates waste, avoids the need to finish cut edges, saves time, saves money, etc.)." Ex.1001, 4:49-55. According to the '484 patent, flat knitting provides edges of textile elements that "do not need to be finished to prevent unraveling," unlike textile elements cut from a larger textile element. *Id*., 8:16-26.

Dua discloses this limitation. Ex.1002, ¶¶82-83. Dua discloses flat knitting as a known process for making its textile elements, which would have a defined shape and finished edges. *Id*., ¶83. For example, Dua explains that "the textile element may be removed from the textile structure and incorporated into footwear 10 … Similarly, other types of knitting, such as a ***flat knitting***, may be utilized within

the scope of the present invention to impart various textures, different properties, or different yarn types to the textile element." Ex.1004, [0061]. A POSA would have understood that, when flat knitted, a knitted element like Dua's and Lockwood's would form a defined shape with finished edges during the flat knitting process. Ex.1002, ¶83. Moreover, it would have been obvious for a POSA to flat knit Dua's upper with a defined shape and finished edges. *Id*. Flat knitting such knitted elements was well-known to a POSA, as confirmed by the lack of disclosure in the '484 patent regarding how to achieve these features with a flat knitting process.

VIII. GROUND 2: LOCKWOOD, DUA, AND NORTON RENDER OBVIOUS CLAIMS 1 AND 5–9

As described above, Lockwood and Dua render obvious claims 1 and 5–9. Ground 2, which adds Norton, addresses the obviousness of the challenged claims in Ground 1 in the event the disclosures of Lockwood and Dua were somehow deemed insufficient for teaching limitations generally relating to the size and structure of Lockwood's knitted reinforcement layer. Ex.1002, ¶84. Norton was cited during prosecution of the '484 patent but was not considered in combination with Lockwood.

A. Overview of Norton (Ex.1011)

Like the '484 patent, Dua, and Lockwood, Norton discloses features related to uppers for shoes, including uppers that include knitted elements. Ex.1002, ¶85. In particular, Norton discloses "[a] method of manufacturing a multi-layer,

composite footwear upper having a three-dimensional geometry." Ex.1011, Abstract. Norton explains that its "composite sheet 16 comprises a first layer 20 of thermoplastic foam, such as EVA foam, and a second layer 22 of thermoplastic urethane (TPU)" and that "a third layer 24 of fabric can be interposed between the first layer 20 and the second layer 22." *Id*., 4:7-13; *see also id*., 4:14-18 (knit fabric is preferred for third layer 24). Norton shows in Figure 3 that the third layer 24 of fabric extends across the entirety of its composite sheet 16 used in the mold. Ex.1002, ¶86.

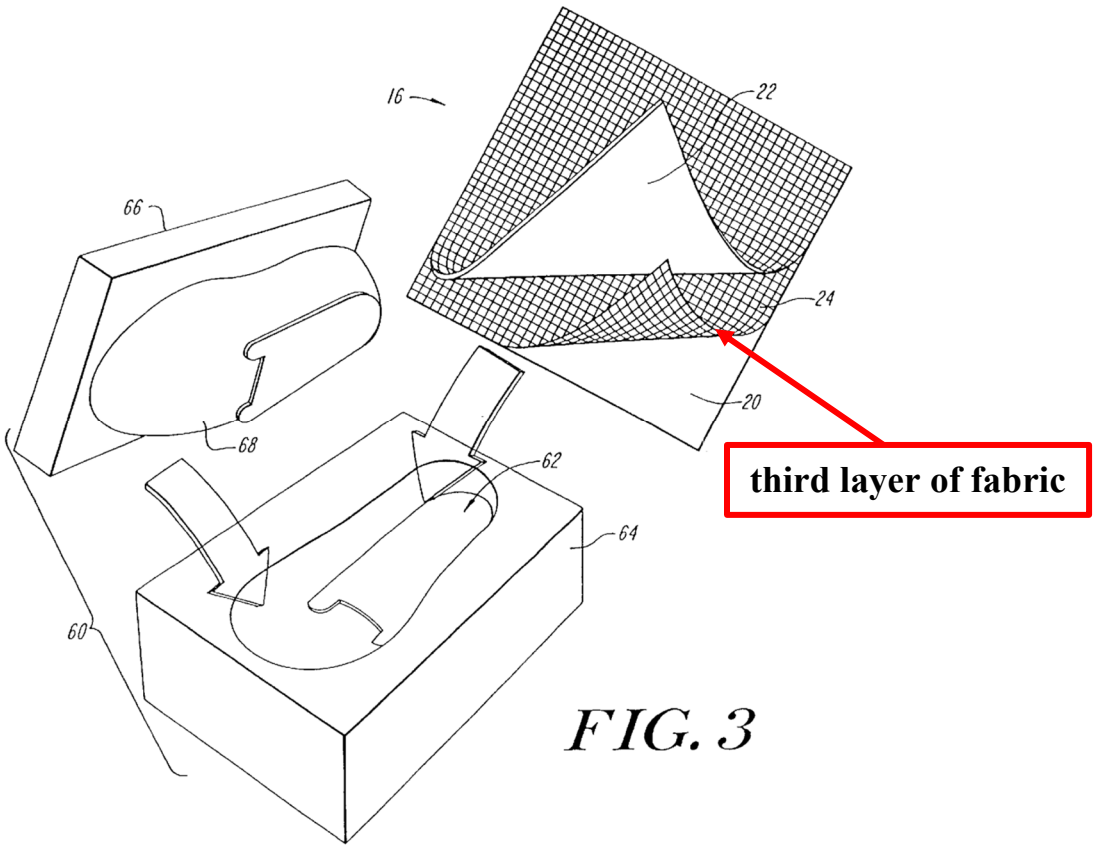
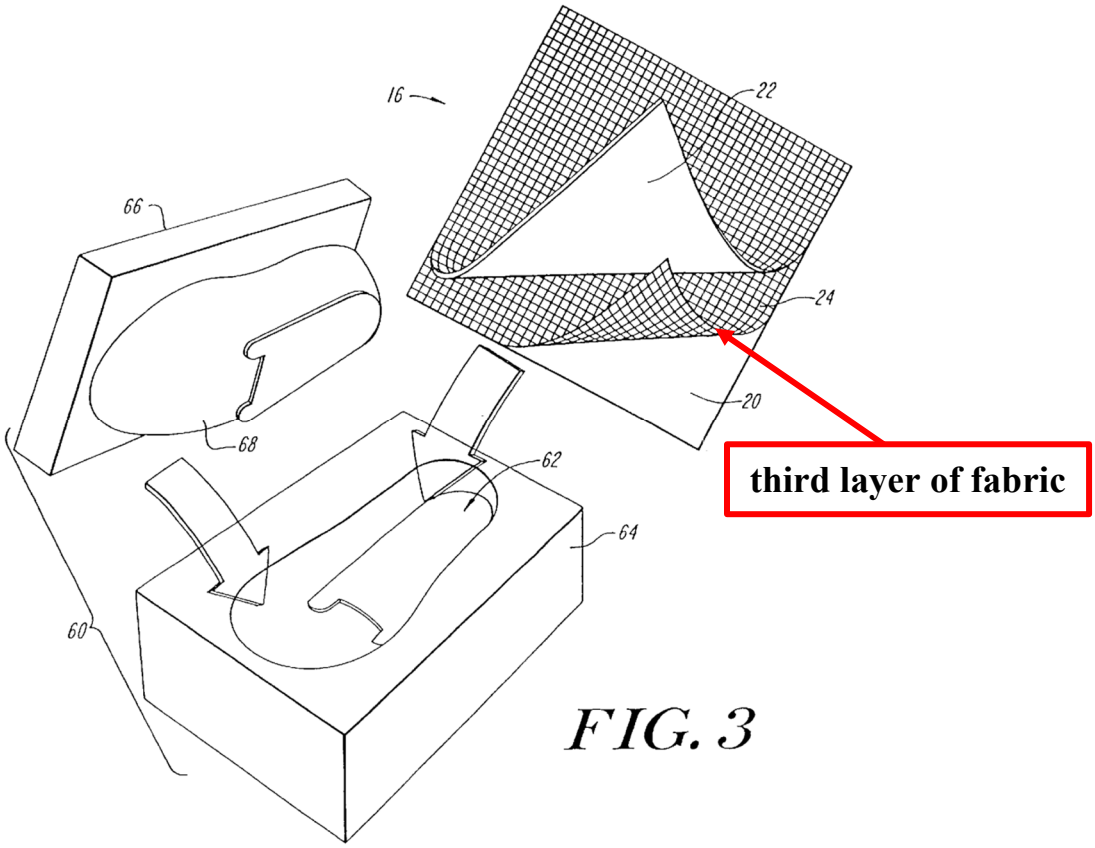


FIG. 3

Ex.1011, Fig. 3 (annotated); Ex.1002, ¶86.

B. Lockwood, Dua, and Norton Render Obvious Claims 1 and 5–9

To the extent that Lockwood does not expressly disclose that a first layer of its knitted element (knitted layer) is coextensive with the other extensible material sheets that form a composite upper, it would have been obvious to a POSA in view of Norton to construct a first layer like Lockwood's to be coextensive with the other extensible material sheets so that the first layer and the knitted element extend across an entire upper and thus take on the shape of the entire upper like Lockwood's after the molding process. Ex.1002, ¶87. As shown in Figure 3, Norton's third layer 24 of fabric extends across the entirety of the composite sheet 16. *Id*.



Ex.1011, Fig. 3 (annotated); Ex.1002, ¶87.

With respect to claims 7-8, Norton confirms the desirability of varying the knit structure and/or yarn of Lockwood's knitted element (knitted layer) or a similar knitted element. Ex.1002, ¶88. Norton discloses its third layer 24 of fabric provides stretchability and wear resistance. Ex.1011, 4:16-22. It would have been obvious in view of Norton to vary the characteristics of the Lockwood's knitted element (knitted layer) at different positions on the knitted element (knitted layer) as described in Dua to adjust the stretchability or wear resistance of different parts of the upper to suit the intended use and features of the different parts. Ex.1002, ¶88.

IX. GROUND 3: DUA, HONG, AND LOCKWOOD RENDER OBVIOUS CLAIMS 1–19

A. Overview of Hong (Ex.1005)

Hong (Ex.1005) dates back to 1994 and describes flat knitting a variety of shapes for a variety of uses, including "protection clothing, transportation related textiles (cars, planes and space crafts), geotextiles, building construction related textiles, packaging materials, military related textiles, medical textiles, sports related textiles, etc." Ex.1005, 1; Ex.1002, ¶¶89-91. Hong was neither cited nor considered during the prosecution of the '484 patent. An example of one flat knit shape from Hong is below.

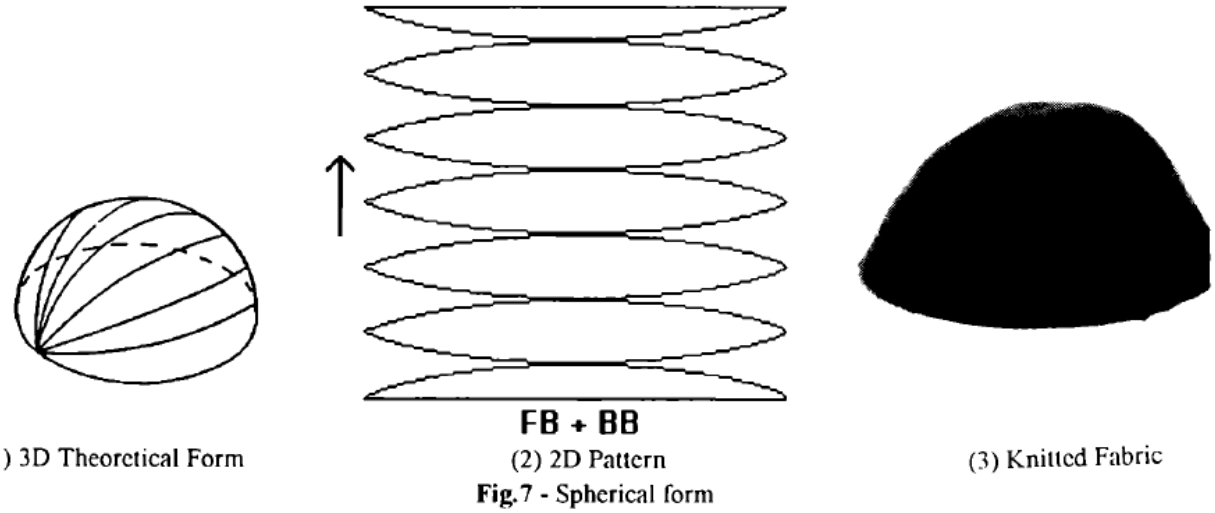


Fig.7 - Spherical form

Ex.1005, Fig. 7. Hong explains how a three-dimensional concept (e.g., above left) may be transferred to a two-dimensional pattern (e.g., above middle), which is used by an electronic flat knitting machine to produce a knitted three-dimensional shaped fabric (e.g., above right). *Id*., 1, 4-5. Hong discusses three different methods for flat knitting three-dimensional shapes, including "using different structural combinations, using different loop lengths, and altering the number of knitting needles and knitted courses." *Id*., 1.

Hong discloses that "[f]lat knitting machines are traditionally used for producing pullovers and other outerwear garments. One of the main advantages is the facility of these machines to knit fabric pieces to a particular shape or form." *Id*. "By using the new flat knitting machines, it is possible not only to knit the new loop structures which are not possible on the conventional flat knitting machines, but also knit fully fashioned garments." *Id*.

Hong also explains that the ability to flat knit fully fashioned garments "is very important to reduce the waste of expensive materials during cutting as well as in eliminating the additional making up operation." *Id*. "[K]nitting directly the 3D shapes can overcome fabric waste and diminish the labour cost inherent to the use of two-dimensional fabrics which have to fit the variable geometry of a three-dimensional seat bum." *Id*., 5.

Hong concludes by stating that its disclosure presents various examples of three-dimensional shaped knitted fabrics and encouraging a skilled artisan to exploit the capacity of a flat knitting machine to "knit more types of three-dimensional knitted fabrics." *Id*., 6.

B. The Combination of Dua, Hong, and Lockwood Renders Obvious Claims 1–19

Dua discloses an upper including a flat-knitted element that has a first layer. The first layer has a central portion and first and second side portions that extend from opposite sides of the central portion. Dua, thus, discloses every element of claim 1 except for the central portion having a domed, three-dimensional structure. Ex.1002, ¶92. Hong discloses flat knitting three-dimensional structures, including domed, three-dimensional structures, and a POSA would have been motivated to include such a three-dimensional structure in Dua's upper or a similar upper. *Id*. This is confirmed by Lockwood which discloses an upper with a domed, three-dimensional structure in the claimed location. *Id*. Lockwood explains that such a

domed, three-dimensional structure desirably simplifies assembly of the upper, reduces the necessary cutting, and reduces waste. Ex.1003, 1:60-64, 2:18-62, 6:40-45, 7:21-37; *see also* Ex.1007, 2:33-45; Ex.1008, Abstract. A POSA would have been motivated for multiple reasons to incorporate a domed, three-dimensional structure in an upper such as Dua's as taught by Lockwood. Ex.1002, ¶92.

A POSA would have been motivated to combine the teachings of Dua, Hong, and Lockwood. *Id*., ¶93. All three references are directed to manufacturing textile articles with knitted elements, such as clothing or footwear and specific shaping features. Ex.1003, Abstract; Ex.1004, Abstract; Ex.1005, 1. Like the '484 patent, both Lockwood and Dua are directed to manufacturing uppers for shoes, including uppers that include knitted elements. Ex.1003, Abstract; Ex.1004, Abstract. And Hong, like the '484 patent, is directed to flat knitting articles to a desired shape "to reduce the waste of expensive materials during cutting as well as in eliminating the additional making up operation." Ex.1005, 1. Hong states that "knitting directly the 3D shapes can overcome fabric waste and diminish the labour cost inherent to the use of two-dimensional fabrics which have to fit the variable geometry of a three-dimensional seat bum." *Id*., 5. Nike previously acknowledged that Hong's teachings were within the knowledge of one skilled in the art of the '484 patent. Ex.1017, 8. Nike specifically cited Hong to demonstrate that a skilled person would know how

to create a three-dimensional, flat-knitted upper as of the filing date of the '484 patent. *Id*.

As admitted by Nike, a POSA would have been motivated to look to Hong's disclosure about flat knitting three-dimensional structures to achieve a domed, three-dimensional structure in an upper such as Dua's. Moreover, a POSA would have been motivated to include a domed, three-dimensional structure (vamp cone portion) in the central portion of an upper, such as Dua's upper, to "simplify[] the assembly of uppers by a technique of preshaping the upper forepart component" as disclosed in Lockwood. Ex.1003, 1:60-64; Ex.1002, ¶94. Lockwood confirms that "formation of different style shoes by simply providing different cut lines as the lines 60, 62 and 70 is facilitated if the central raised portions 34 of the mold is smoothly curved." Ex.1003, 7:21-28.

A POSA would have reasonably expected success in forming Dua's upper or a similar upper with a domed, three-dimensional structure (vamp cone portion) as taught in Lockwood by flat knitting, in accordance with Hong. Ex.1002, ¶95. Hong explains the wide range of three-dimensional structures that may be flat knit and how such three-dimensional structures provide benefits, including reducing material waste, eliminating additional making up operation, diminishing labor cost, and knitting fully fashioned garments. Ex.1005, 1, 5. Nike admitted that "[t]here are numerous prior art documents which disclose that achieving three-dimensional

knitted textiles may generally be obtained through flat knitting, such as e.g. 'The development of 3D shaped knitted fabrics for technical purposes on a flat knitting machine', Hong et al." Ex.1017, 8. Lockwood describes how its domed, three-dimensional structure (vamp cone portion) "simplif[ies] the assembly of uppers by a technique of preshaping the upper forepart component." Ex.1003, 1:60-64. Thus, the combination would have involved no more than implementing a known approach to flat knitting to achieve a known domed, three-dimensional structure (vamp cone portion) that is well understood to provide benefits like improving the assembly process for an upper such as Dua's upper. Ex.1002, ¶95; *see KSR*, 550 U.S. at 417; *see also Intel,* 21 F.4th at 797-800 (Fed. Cir. 2021).

As described below, combining Dua, Hong, and Lockwood meets each limitation of claims 1–19 of the '484 patent.

C. Dua, Hong, and Lockwood Render Obvious Claim 1

1. Preamble

The preamble of claim 1 recites: "An article of footwear comprising." Dua discloses articles of footwear. Ex.1004, Title ("Article of Footwear Having a Textile Upper"); Ex.1002, ¶96. Lockwood also discloses articles of footwear. Ex.1003, Title, 1:6-10, Claim 26; Ex.1002, ¶96.

2. Limitation 1[a]

Dua discloses "an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer having."

For example, Dua provides that "[a]n ***article of footwear*** and a method of manufacturing the article of footwear are disclosed. The footwear may include an ***upper*** and a sole structure." Ex.1004, Abstract. Dua explains that ***flat knitting*** "may be utilized within the scope of the present invention to impart various textures, different properties, or different ***yarn*** types to the textile element." *Id*., [0061]. Dua also discloses "[t]he upper of an article of athletic footwear, for example, may be formed from multiple material ***layers*** that include an exterior layer, an intermediate layer, and an interior layer." *Id*., [0006].

Dua's Figure 8 illustrates "a plan view of a textile element that forms at least a portion of the upper" and includes at least one layer. *Id*., [0025]; *see also id.*, [0008], Claim 11.

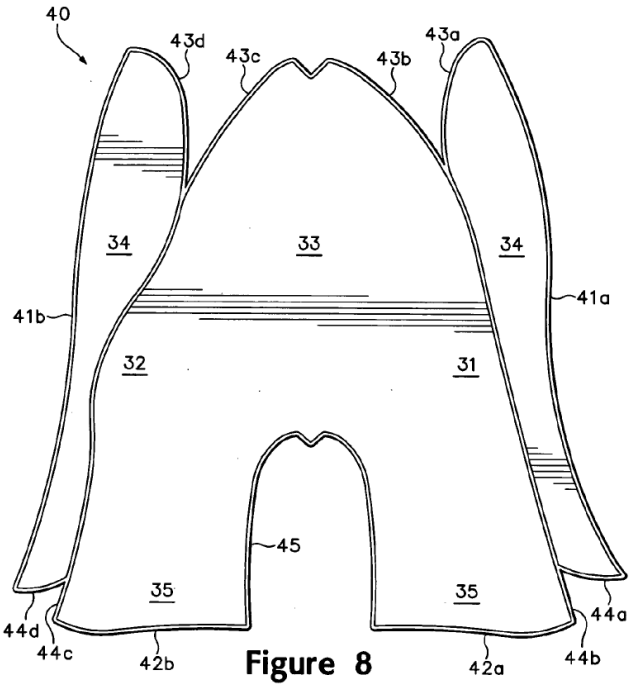


Figure 8

Ex.1004, Fig. 8. Thus, Dua discloses an article of footwear with an upper including a flat-knitted element formed from yarn in a flat-knitting process, and the flat-knitted element includes a first layer. Ex.1002, ¶¶97-98.

3. Limitation 1[b]

The combination of Dua, Hong, and Lockwood render obvious "a central portion having a domed, three-dimensional structure configured for extending over the top of a foot." As shown below in Dua's Figure 8, Dua's first layer has a central portion configured for extending over the top of a foot. Ex.1002, ¶99.

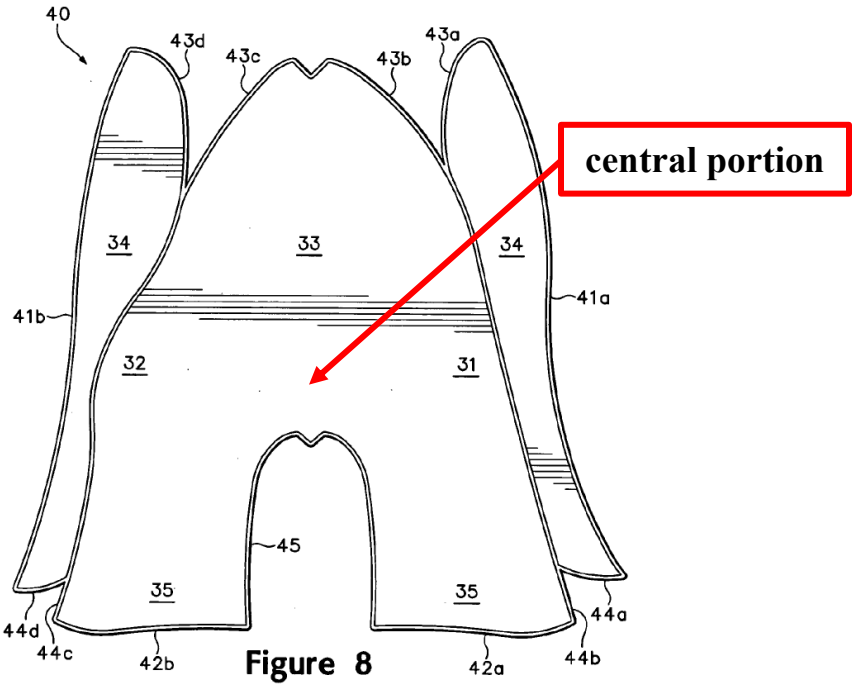


Figure 8

Ex.1004, Fig. 8 (annotated); Ex.1002, ¶99. It would have been obvious to incorporate a domed, three-dimensional structure in the central portion of Dua's upper (or a similar upper) configured for extending over the top of the foot in view of the express teachings of Hong and Lockwood. Ex.1002, ¶99.

Hong explains that flat knitting a three-dimensional structure was well-known and common. *Id*., ¶100. For example, Hong discloses "[t]echnical textiles have been applied in different fields such as protection clothing, transportation related textiles (cars, planes and space crafts), geotextiles, building construction related textiles, packaging materials, military related textiles, medical textiles, sports related textiles, etc." Ex.1005, 1. Hong explains that "[f]lat knitting machines are traditionally used for producing pullovers and other outerwear garments. One of the

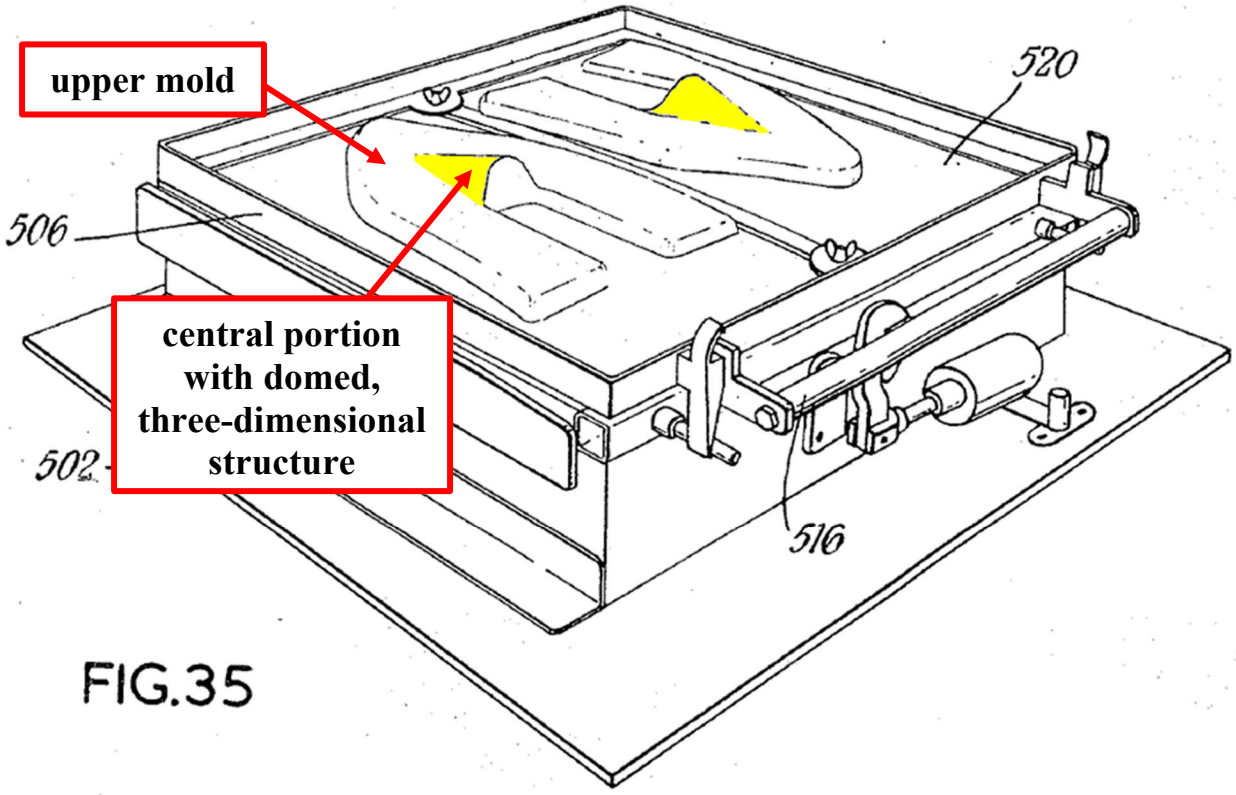
main advantages is the facility of these machines to knit fabric pieces to a particular shape or form." *Id*.

Hong also discloses that by using flat knitting machines, it is possible to knit fully fashioned garments. *Id*. "This is very important to ***reduce the waste of expensive materials*** during cutting as well as in ***eliminating the additional making up operation***." *Id*. In addition, "knitting directly the 3D shapes can ***overcome fabric waste*** and ***diminish the labour cost*** inherent to the use of two-dimensional fabrics which have to fit the variable geometry of a three-dimensional seat bum." *Id*., 5. Thus, Hong expressly confirms that flat knitting three-dimensional shapes in knitted elements was well-known and had known benefits, such as reducing fabric waste and labor costs. Ex.1002, ¶101. Moreover, as explained above, Nike admitted during prosecution of an application related to the '484 patent that flat knitting a three-dimensional structure was well-known and common in view of Hong. *See* Section III.D.

Lockwood describes an upper including a knitted element that has the specific claimed three-dimensional structure, namely a central portion with a domed, three-dimensional structure configured for extending over the top of the foot. Ex.1002, ¶102. For example, Lockwood discloses production of pre-shaped uppers having a ***vamp cone portion***. Ex.1003, 2:60-62. According to Lockwood, this pre-shaping separates and simplifies manufacturing steps for uppers and reduces the necessary

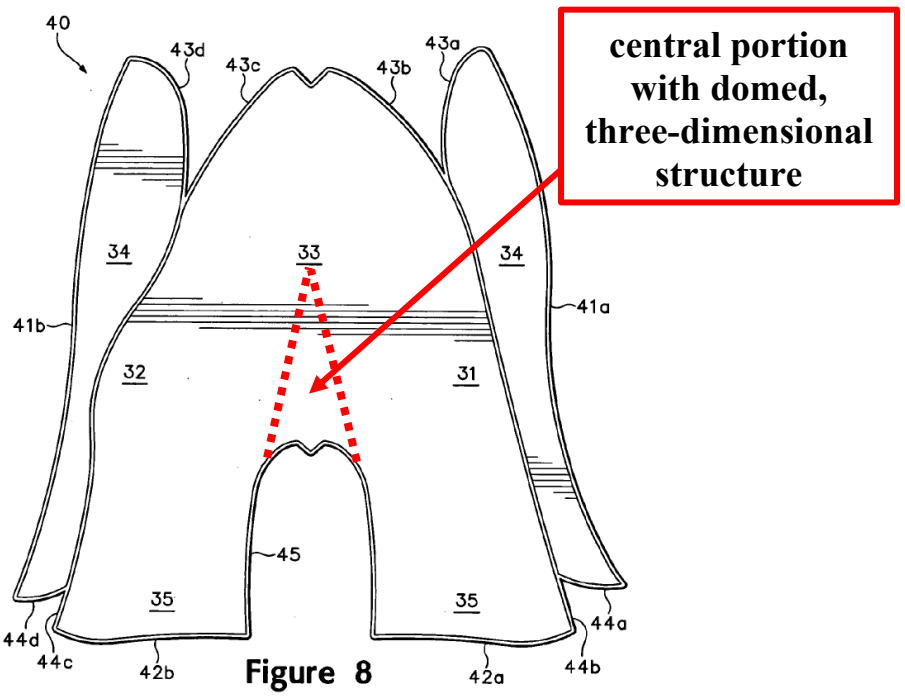
cutting and waste. *Id*., 1:60-64, 2:18-62, 6:40-45, 7:21-37; Ex.1002, ¶102; *see also* Ex.1007, 2:33-45 ("preforming a blank intended for use as a shoe upper forepart, in which the blank is deformed from a generally planar or multiplanar shape into a shape more readily deformable into the shape subsequently required"); Ex.1008, Abstract ("the preformed upper is convertible to the shape of the last merely by a bending operation"). Lockwood thus discloses pre-shaping Dua's upper (or a similar upper) to incorporate a central domed structure, and a POSA would have understood the desirability of implementing such a structure and pre-shaping the upper for the benefit of simplifying assembly of the upper. Ex.1002, ¶102.

Lockwood's Figure 35 below illustrates an upper shape with a central portion that has a domed, three-dimensional structure (vamp cone portion). *Id*., ¶103.



Ex.1003, Fig. 35 (annotated); Ex.1002, ¶103.

Accordingly, in view of Hong and Lockwood, it would have been desirable and obvious to flat knit a domed, three-dimensional structure in the central portion of Dua's first layer (or the first layer of a similar upper) to simplify the assembly process, reduce the waste of expensive materials, eliminate additional making up operation, and diminish labor cost. Ex.1002, ¶¶99-104. The below modified Figure 8 from Dua shows the incorporation of the domed, three-dimensional structure in the central portion of Dua's first layer. *Id*., ¶104.



Ex.1004, Fig. 8 (annotated); Ex.1002, ¶104.

4. Limitation 1[c]

Dua discloses "a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion." For example, Dua discloses "[t]extile element 40 is a single material element that is formed to exhibit a ***unitary (i.e., one-piece) construction***, and textile element 40 is formed or otherwise shaped to extend around the foot." Ex.1004, [0037]; *see also id.*, [0060]. As shown in Dua's Figure 8, Dua's first layer has a first side portion that is formed of unitary construction with the central portion and extends from a first side of the central portion. Ex.1002, ¶105.

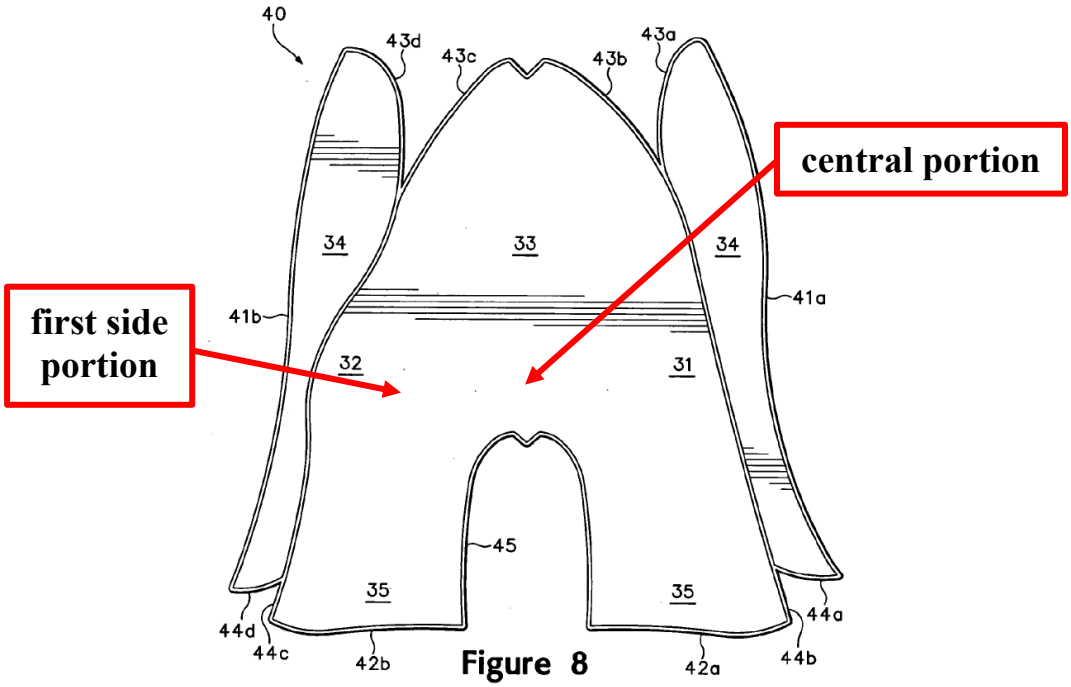


Figure 8

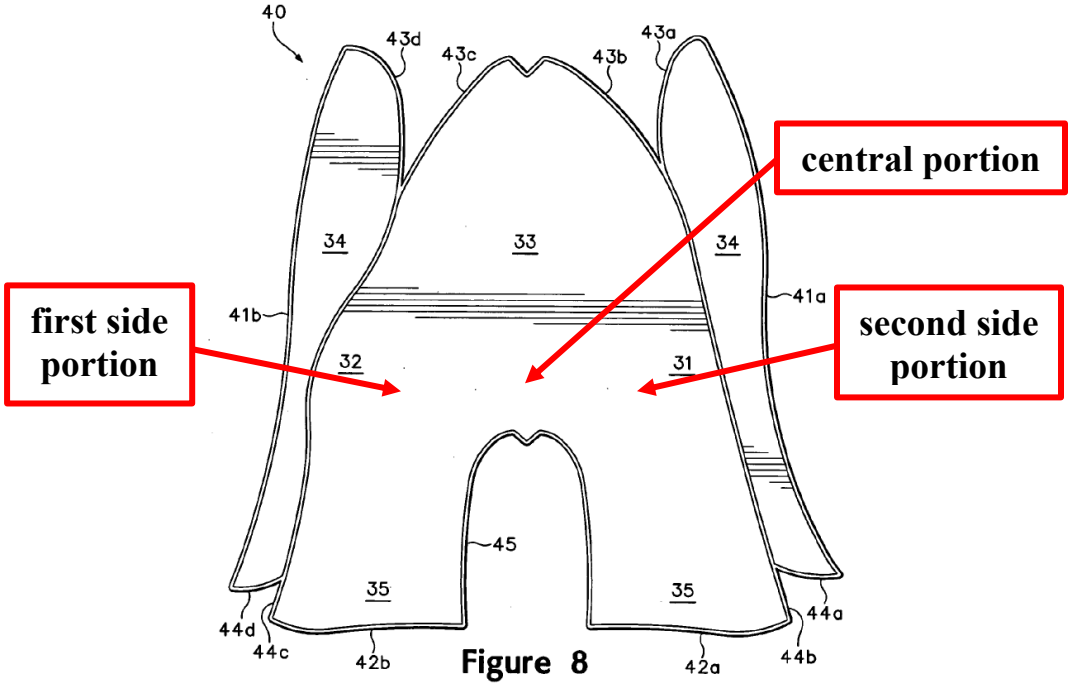
Ex.1004, Fig. 8 (annotated); Ex.1002, ¶105.

Accordingly, Dua discloses this limitation, and it would have been obvious for a first layer such as Dua's first layer to have a first side portion formed of unitary construction with the central portion such that the first side portion extends from a first side of the central portion. Ex.1002, ¶¶105-106.

5. Limitation 1[d]

Dua discloses "a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion," for at least the reasons provided above with respect to limitation 1[c]. Moreover, as shown in Dua's Figure 8, Dua's first layer has a second side portion that is formed of unitary construction with the central portion and extends

from a second side of the central portion opposite the first side of the central portion. Ex.1002, ¶107.



Ex.1004, Fig. 8 (annotated); Ex.1002, ¶107.

Accordingly, Dua discloses this limitation, and it would have been obvious for a first layer such as Dua's first layer to have a second side portion formed of unitary construction with the central portion such that the second side portion extends from a second side of the central portion opposite the first side. Ex.1002, ¶¶107-108.

6. Limitation 1[e]

The combination of Dua, Hong, and Lockwood renders obvious "the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened

configuration" for at least the reasons provided with respect to limitations 1[a]-[d] in this ground. The first layer of an upper such as Dua's upper's first layer, as modified in view of Hong and Lockwood, would include a domed, three-dimensional structure (vamp cone portion) as shown in the below modified Figure 8 from Dua. Ex.1002, ¶109.

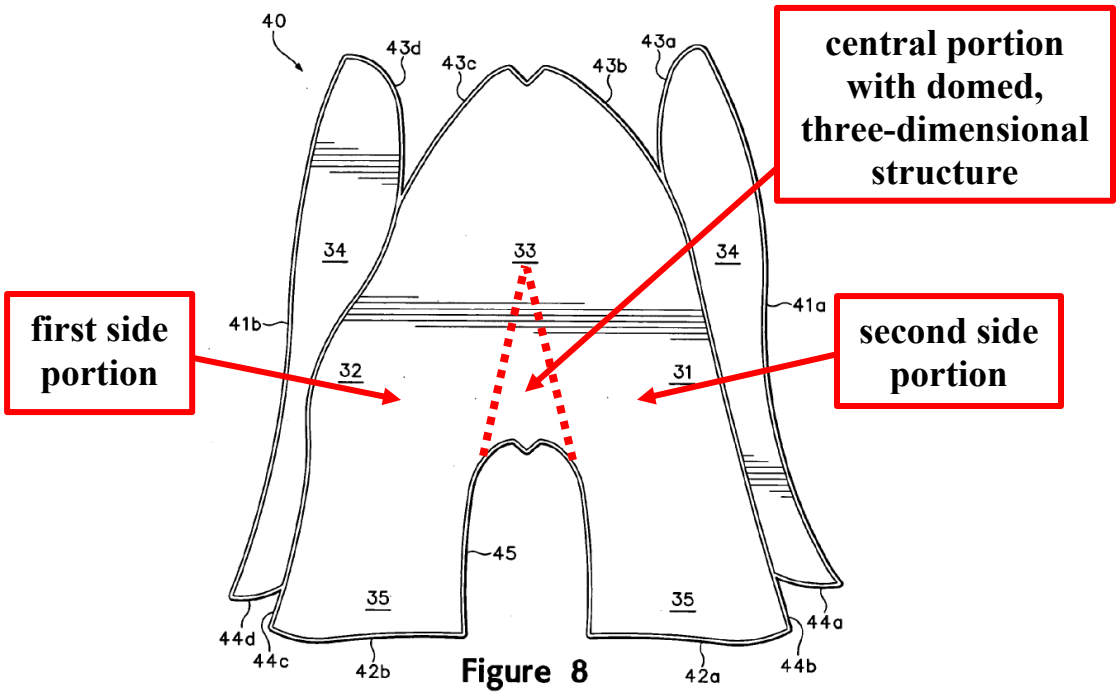
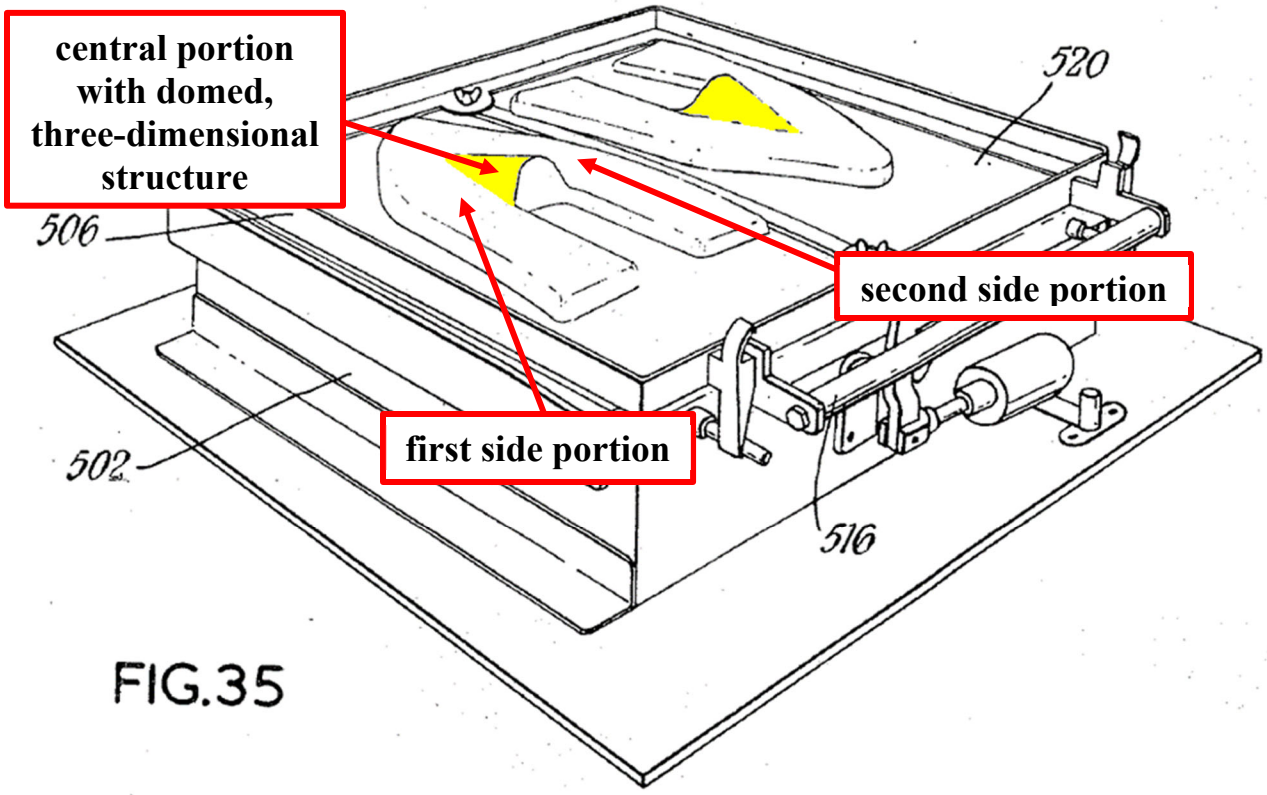


Figure 8

Ex.1004, Fig. 8 (annotated); Ex.1002, ¶109. As can be seen, when Dua's upper with the modified first layer is in a flattened configuration, the first layer's domed, three-dimensional structure (vamp cone portion) is shaped to extend above the plane of the first side portion and the second side portion. Ex.1002, ¶109.

This extension of the domed structure above the plane of the side portions is illustrated in annotated Figure 35 of Lockwood below. *Id.*



Ex.1003, Fig. 35 (annotated); Ex.1002, ¶109.

D. Dua, Hong, and Lockwood Render Obvious Claim 2

Claim 2 depends from claim 1 and recites "further comprising a first loop being formed as a second layer of unitary construction with the first layer." In the '484 patent, each of lace loops 73 is a first loop formed as a second layer of unitary construction with the first layer, as shown in Figure 10A below. Ex.1002, ¶110.

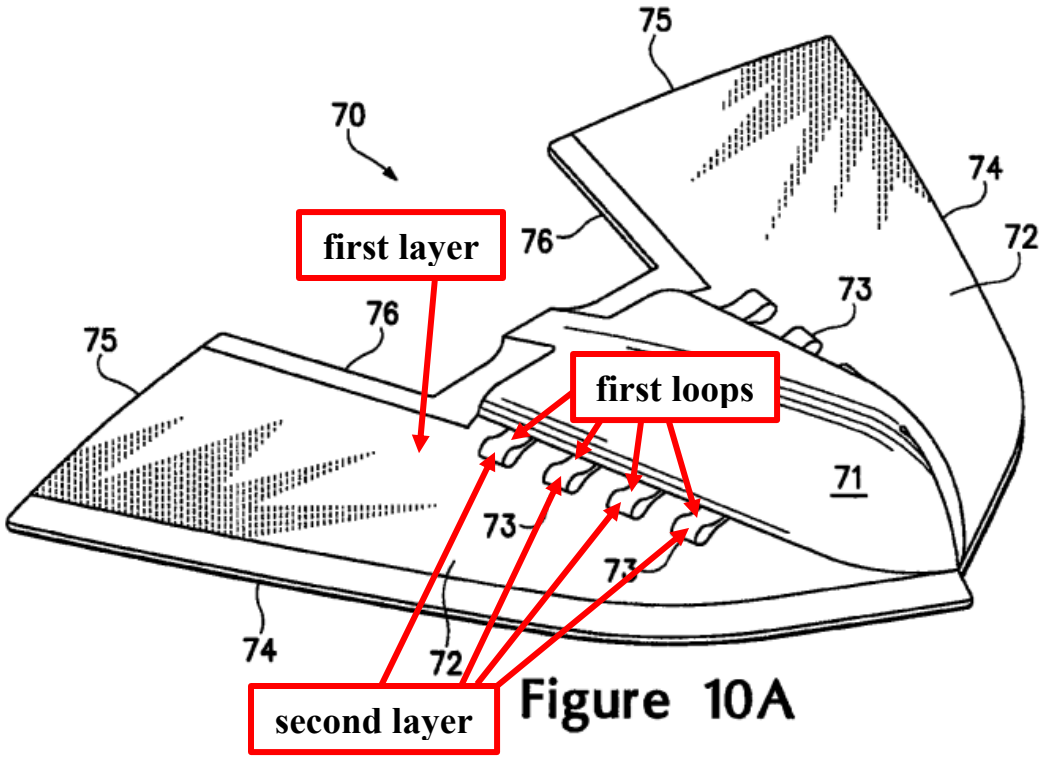
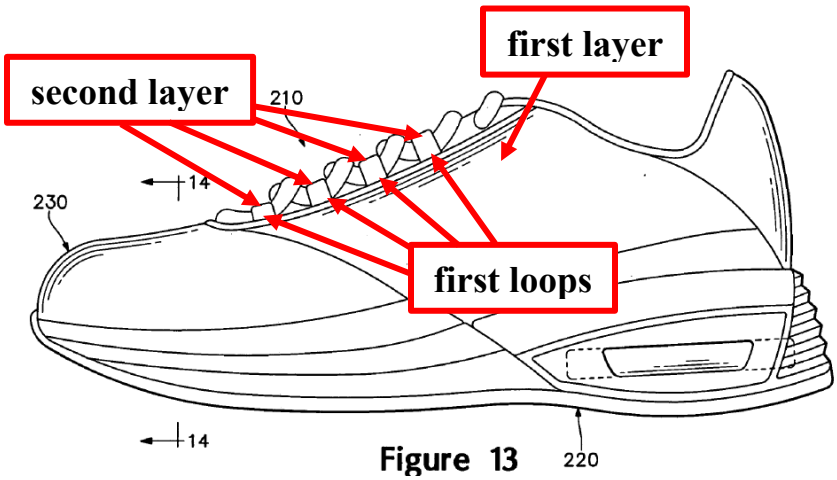


Figure 10A

Ex.1001, Fig. 10A (annotated); Ex.1002, ¶110.

Dua discloses this limitation. For example, Dua discloses textile element 40 may include laces and be "a single material element that is formed to exhibit a ***unitary (i.e., one-piece) construction***." Ex.1004, [0037]; *see also id.*, [0041], [0060]. Dua's Figure 13 below illustrates first loops for laces that are formed as a second layer of unitary construction with the first layer. Ex.1002, ¶111.



Id., Fig. 13 (annotated); Ex.1002, ¶111.

Hong confirms that such loops were known and could be produced as a unitary structure with a knitted element. Ex.1002, ¶112. In particular, Hong explains that flat knitting machines facilitate knitting of loop structures as part of fully fashioned garments. Ex.1005, 1. Thus, Hong provides further evidence that flat knitting a loop formed as a second layer of unitary construction with a first layer, as disclosed by Dua, was well-known and obvious long before the '484 patent. Ex.1002, ¶112.

Thus, Dua discloses this limitation. Ex.1002, ¶¶110-111. Alternatively, it would have been obvious in view of Hong to form a first loop as a second layer and form the first loop as a unitary construction with a first layer such as Dua's first layer to flat knit the first layer closer to fully fashioned article of footwear. Ex.1002, ¶¶110-113.

E. Dua, Hong, and Lockwood Render Obvious Claim 3

Claim 3 depends from claim 2 and recites "wherein the first loop extends outward from the central portion." Dua discloses this limitation. Dua's Figure 13 illustrates the first loops that extend outward from the central portion of Dua's first layer. Ex.1002, ¶114.

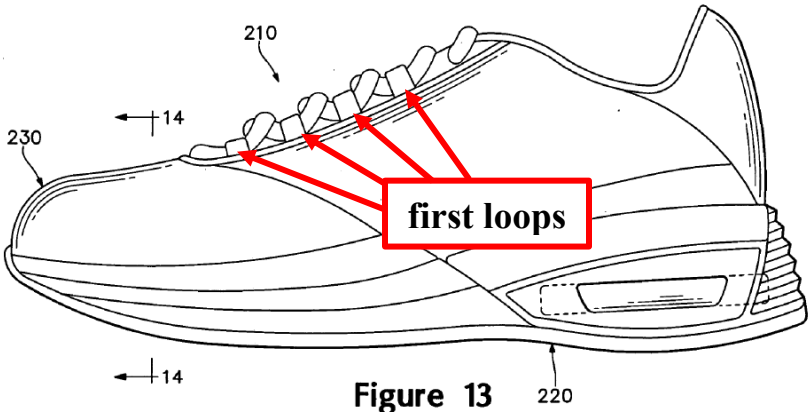


Figure 13

Ex.1004, Fig. 13 (annotated); *see also id.*, [0005], [0037], [0041]; Ex.1002, ¶114.

F. Dua, Hong, and Lockwood Render Obvious Claim 4

Claim 4 depends from claim 2 and recites "further comprising eight loops being formed as a second layer of unitary construction with the first layer." Dua discloses this limitation for at least the reasons provided above with respect to claim 2. Moreover, Dua's Figure 13 illustrates four first loops for laces on one side of the article of footwear. Ex.1002, ¶115.

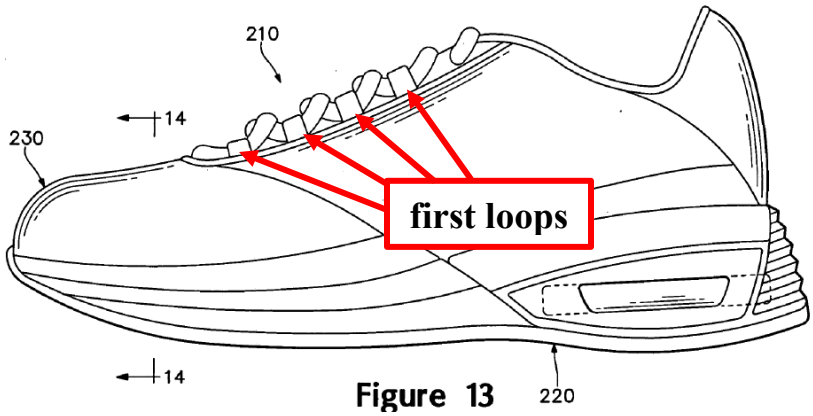


Figure 13

Ex.1004, Fig. 13 (annotated); Ex.1002, ¶115. The other side of Dua's article of footwear that is not shown in Figure 13 would also have four first loops for laces. Ex.1002, ¶115. Dua thus inherently discloses an article of footwear with eight loops for laces extending from the first layer. It also would have been obvious for a POSA to incorporate eight loops for laces on an upper such as Dua's upper to ensure that the upper is sufficiently secured by the laces. *Id*.

G. Dua, Hong, and Lockwood Render Obvious Claim 5

Claim 5 depends from claim 1 and recites "wherein the knitted element defines a void for receiving a foot of a wearer." Dua discloses this limitation. Ex.1002, ¶116. For example, Dua discloses "[t]he upper forms a void on the interior of the footwear for receiving the foot." Ex.1004, [0005]; *see also id.*, Abstract, [0033], Claim 1.

H. Dua, Hong, and Lockwood Render Obvious Claim 6

Claim 6 depends from claim 1 and recites "wherein the knitted element defines at least a portion of an exterior surface of the upper, and the knitted element

defines at least a portion of a void for receiving a foot of a wearer." Dua discloses these limitations. Ex.1002, ¶117. For example, Dua discloses "[t]he upper of an article of athletic footwear, for example, may be formed from multiple material layers that include an ***exterior layer***, an intermediate layer, and an interior layer." Ex.1004, [0006]. Dua states that textile materials often form part of an upper's exterior layer. *Id*., [0008]; *see also id.*, Claim 11. Dua also confirms "[t]he upper forms a void on the interior of the footwear for receiving the foot." *Id*., [0005].

Lockwood also discloses these limitations, as explained in Ground 1. It would have been obvious to position the knitted element so that the knitted element defines part of an exterior surface of an upper such as Dua's upper. Ex.1002, ¶117.

I. Dua, Hong, and Lockwood Render Obvious Claim 7

Claim 7 depends from claim 1 and recites "wherein the knitted element includes a first area and a second area, the first area including a first type of knit structure, and the second area including a second type of knit structure, the first type being different than the second type." Dua discloses these limitations. Ex.1002, ¶118. For example, Dua discloses "an upper incorporating a textile element formed through a weft knitting process" where "the textile element has a first area and a second area with a unitary construction, the first area being formed of a first stitch type, and the second area being formed of a second stitch type that is different from the first stitch type to impart varying textures to a surface of the textile element."

Ex.1004, Claim 7; *see also id*., Claims 47, 65. Dua also explains the degree of stretch or wear resistance may vary in different areas depending upon the stitch used. *Id*., [0055]; *see also id*., [0060]. It would have been obvious to vary the type of knit structure at different areas of the upper to give the different areas different properties, such as different textures or different degrees of stretch or wear resistance. Ex.1002, ¶118.

J. Dua, Hong, and Lockwood Render Obvious Claim 8

Claim 8 depends from claim 1 and recites "wherein the at least one mechanically manipulated yarn includes a first yarn and a different second yarn, the first yarn being located in a first area of the upper, and the second yarn being located in a second area of the upper." Dua discloses this limitation. Ex.1002, ¶119. For example, Dua discloses "the ***type of yarn*** utilized in various areas of textile elements 40′ [below left] and 40″ [below right] may be changed to impart different properties." Ex.1004, [0056]; *see also id*., Claim 66.

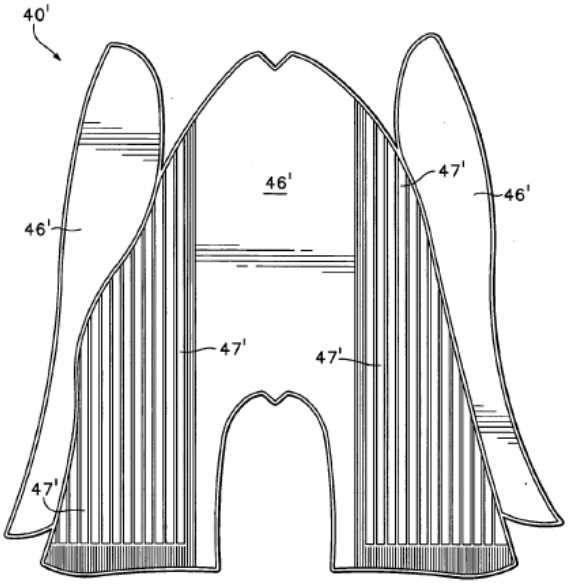


Figure 10

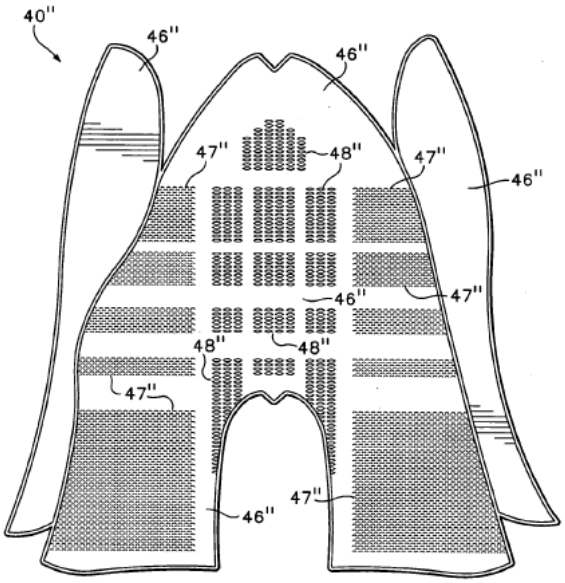


Figure 11

Id., Figs. 10-11. Dua explains the materials comprising a yarn may be selected to impart a variety of physical properties to a textile element, such as strength, stretch, support, stiffness, recovery, fit, and form. *Id*., [0052]. It would have also been obvious to use different yarns at different areas of the upper to give the different areas different properties, such as different degrees of strength, stretch, support, stiffness, recovery, fit, or form. Ex.1002, ¶120.

K. Dua, Hong, and Lockwood Render Obvious Claim 9

Claim 9 depends from claim 1 and recites "wherein the knitted element forms a defined shape having finished edges during the flat knitting process." As explained in the '484 patent, "flat knitting can be used to provide textile structures for use in footwear uppers of a final desired shape such that textile cutting steps can be avoided (which eliminates waste, avoids the need to finish cut edges, saves time, saves

money, etc.)." Ex.1001, 4:49-55. According to the '484 patent, flat knitting provides edges of textile elements that "do not need to be finished to prevent unraveling," unlike textile elements cut from a larger textile element. *Id*., 8:16-26.

Dua discloses this limitation. Ex.1002, ¶¶121-122. Dua discloses flat knitting as a known process for making its textile elements, which would have a defined shape and finished edges. For example, Dua explains that "the textile element may be removed from the textile structure and incorporated into footwear 10 … Similarly, other types of knitting, such as a ***flat knitting***, may be utilized within the scope of the present invention to impart various textures, different properties, or different yarn types to the textile element." Ex.1004, [0061]. A POSA would have understood that, when flat knitted, a knitted element like Dua's or Lockwood's would form a defined shape with finished edges during the flat knitting process. Ex.1002, ¶122. Moreover, it would have been obvious for a POSA to flat knit an upper such as Dua's upper with a defined shape and finished edges. *Id*. Flat knitting such knitted elements was well-known to a POSA, as confirmed by the lack of disclosure in the '484 patent regarding how to achieve these features with a flat knitting process.

L. Dua, Hong, and Lockwood Render Obvious Claim 10

1. Preamble

The preamble of claim 10 recites: "An article of footwear comprising." Dua and Lockwood disclose this feature for at least the reasons provided with respect to the preamble of claim 1 in this ground. Ex.1002, ¶123.

2. Limitation 10[a]

The combination of Dua, Hong, and Lockwood renders obvious "an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer and a second layer, the first layer including." Dua discloses all of these features for at least the reasons provided with respect to limitation 1[a] in this ground. Ex.1002, ¶124. Moreover, Dua discloses the upper of an article of athletic footwear may be formed from ***multiple material layers***, including exterior, intermediate, and interior layers where the exterior and interior layers commonly include textile materials. Ex.1004, [0006], [0008]; *see also id.*, [0037], Claim 11; Ex.1002, ¶124.

3. Limitation 10[b]

The combination of Dua, Hong, and Lockwood renders obvious "a central portion having a domed, three-dimensional structure configured for extending over the top of a foot" for the reasons provided with respect to limitation 1[b] in this ground. Ex.1002, ¶125.

4. Limitation 10[c]

Dua discloses "a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion" for the reasons provided with respect to limitation 1[c] in this ground. Ex.1002, ¶126.

5. Limitation 10[d]

Dua discloses "a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion" for the reasons provided with respect to limitation 1[d] in this ground. Ex.1002, ¶127.

6. Limitation 10[e]

In the '484 patent, each of the lace loops 73 includes a second layer that is flat-knitted with the first layer at opposite ends of the second layer to form an overlapped loop, as shown in Figure 10A below. Ex.1002, ¶129.

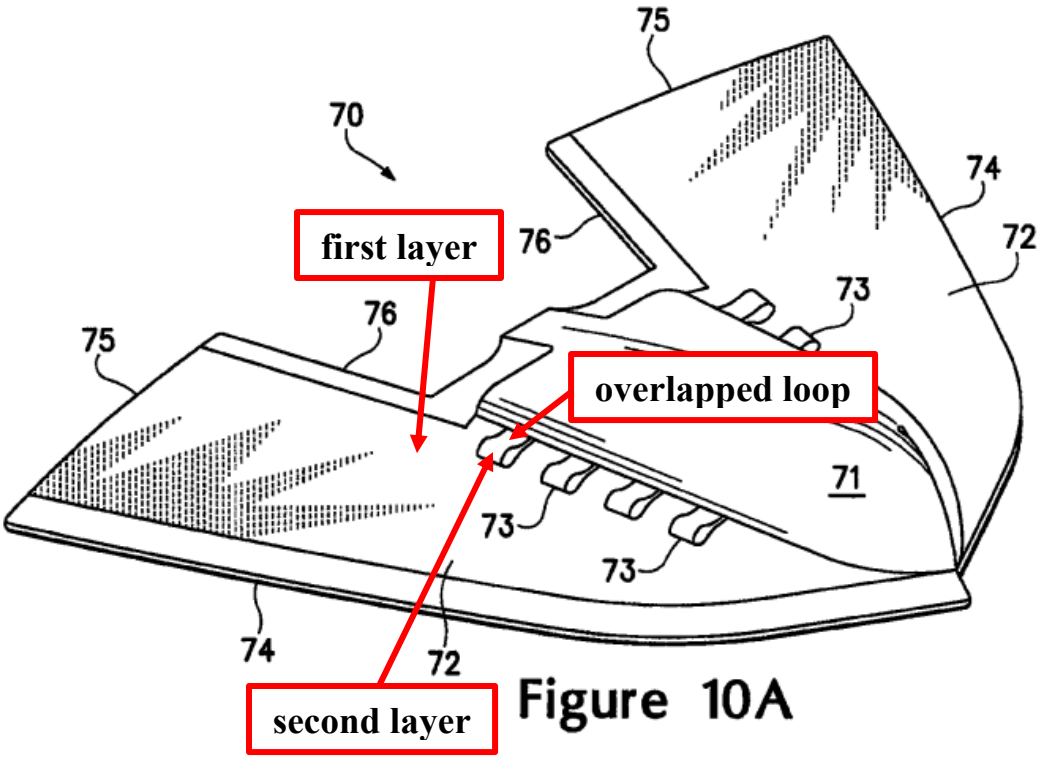


Figure 10A

Ex.1001, Fig. 10A (annotated); Ex.1002, ¶129. Dua discloses "the second layer being flat-knitted with the first layer at opposite ends of the second layer to form an overlapped loop" for at least the reasons provided with respect to claim 2 in this ground. Ex.1002, ¶128. For example, Dua's Figure 13 illustrates lace loops that are knit with the first layer at opposite ends of the second layer to form an overlapped loop. *Id.*, ¶130. It also would have been obvious in view of Hong to form an overlapped loop as a second layer and form the overlapped loop as a unitary construction with the first layer to flat knit Dua's first layer (or a first layer of a similar upper) closer to fully fashioned article of footwear, for at least the reasons provided with respect to claim 2 in this ground. *Id.*, ¶131.

M. Dua, Hong, and Lockwood Render Obvious Claim 11

1. Preamble

The preamble of claim 11 recites: "A method of manufacturing an article of footwear." Dua and Lockwood disclose such a method. Ex.1002, ¶132. Dua explains "[a]n article of footwear and a ***method of manufacturing the article of footwear*** are disclosed." Ex.1004, Abstract. Lockwood similarly discloses "[m]ethods of preforming shoe uppers." Ex.1003, Abstract.

2. Limitation 11[a]

Dua discloses "forming during a flat-knitting process an upper including a flat-knitted element including a first layer" for the reasons provided with respect to the preamble of claim 1. Ex.1002, ¶133. For example, Dua explains ***flat knitting*** "may be utilized within the scope of the present invention to impart various textures, different properties, or different ***yarn*** types to the textile element." Ex.1004, [0061]. Dua also discloses the upper of an article of athletic footwear may be formed from multiple material ***layers***, including exterior and interior layers formed of textile materials. *Id*., [0037]; *see also id.*, [0006], Claim 11. Moreover, Dua discloses "[a]n article of footwear comprising: an upper incorporating a textile element formed through a flat knitting process…." *Id*., Claim 65.

3. Limitation 11[b]

The combination of Dua, Hong, and Lockwood renders obvious "a central portion having a domed, three-dimensional structure configured for extending over the top of a foot" for the reasons provided with respect to limitation 1[b] in this ground. Ex.1002, ¶134. For example, as shown in Dua's Figure 8, Dua's first layer has a central portion configured for extending over the top of a foot. *Id*.

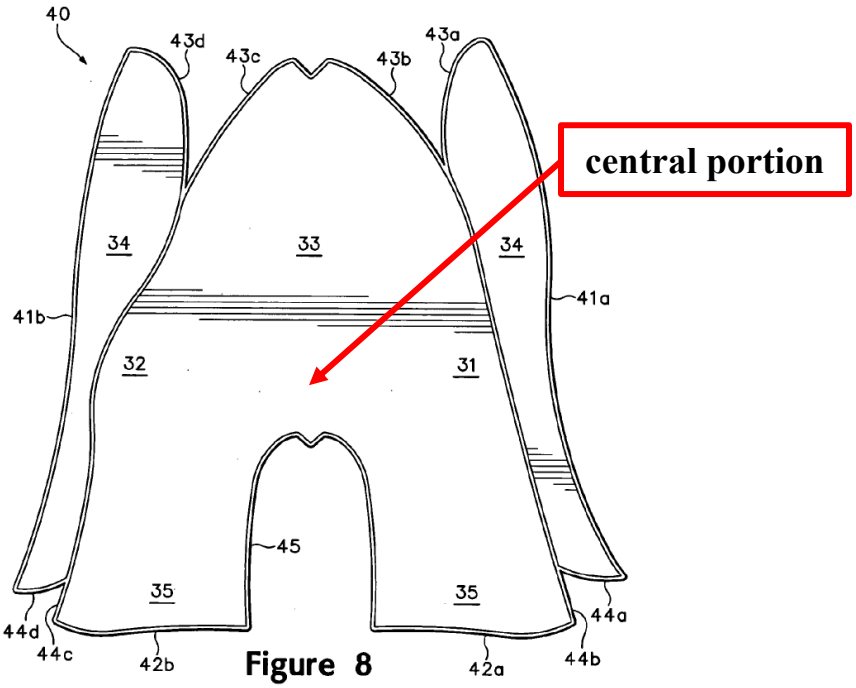


Figure 8

Ex.1004, Fig. 8 (annotated); Ex.1002, ¶134. It would have been obvious to incorporate a domed, three-dimensional structure in the central portion of Dua's upper (or a similar upper) configured for extending over the top of the foot in view of the express teachings of Hong and Lockwood. Ex.1002, ¶134.

4. Limitation 11[c]

Dua discloses "a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion" for the reasons provided with respect to limitation 1[c] in this ground. Ex.1002, ¶135.

5. Limitation 11[d]

Dua discloses "a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion" for the reasons provided with respect to limitation 1[d] in this ground. Ex.1002, ¶136.

6. Limitation 11[e]

The combination of Dua, Hong, and Lockwood renders obvious "wherein the domed, three-dimensional structure is shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration" for the reasons provided with respect to limitation 1[e] in this ground. Ex.1002, ¶137.

N. Dua, Hong, and Lockwood Render Obvious Claim 12

Claim 12 depends from claim 11 and recites "wherein the flat knitting process includes forming a first area and a second area, a stitch type of the first area being different that a stitch type of the second area." Dua discloses this limitation. Ex.1002, ¶138. For example, Dua discloses "an upper incorporating a textile

element formed through a weft knitting process" where "the textile element has a first area and a second area with a unitary construction, the first area being formed of a first stitch type, and the second area being formed of a second stitch type that is different from the first stitch type." Ex.1004, Claim 7; *see also id*., Claims 20, 30, 66. Dua explains that different textures, aesthetics, degrees of stretch, and degrees of wear resistance are formed by varying the type of stitch. *Id*., [0055]; *see also id*., [0060]. It would have also been obvious to vary the type of stitch used at different areas of the upper to give the different areas different characteristics, such as different textures, aesthetics, structures, or wear resistance. Ex.1002, ¶138.

O. Dua, Hong, and Lockwood Render Obvious Claim 13

Claim 13 depends from claim 11 and recites "wherein the flat knitting process includes forming a first area and a second area, a yarn type of the first area being different than a yarn type of the second area." Dua discloses this limitation for the reasons provided with respect to claim 8 in this ground. Ex.1002, ¶139.

P. Dua, Hong, and Lockwood Render Obvious Claim 14

Claim 14 depends from claim 11 and recites "wherein the flat knitting process includes forming a first area and a second area, a stitch type and a yarn type of the first area being different than a stitch type and a yarn type of the second area." Dua discloses this limitation for the reasons provided with respect to claims 8 and 12 in this ground. Ex.1002, ¶140. Moreover, Dua specifically discloses "an upper

incorporating a textile element formed through a flat knitting process, the textile element having a first area and a second area with a unitary construction, the first area having a first set of properties, and the second area having a second set of properties that are different from the first set of properties" and "the first set of properties and the second set of properties are ***at least one of*** a stitch configuration ***and*** a yarn type." Ex.1004, Claim 66; Ex.1002, ¶140.

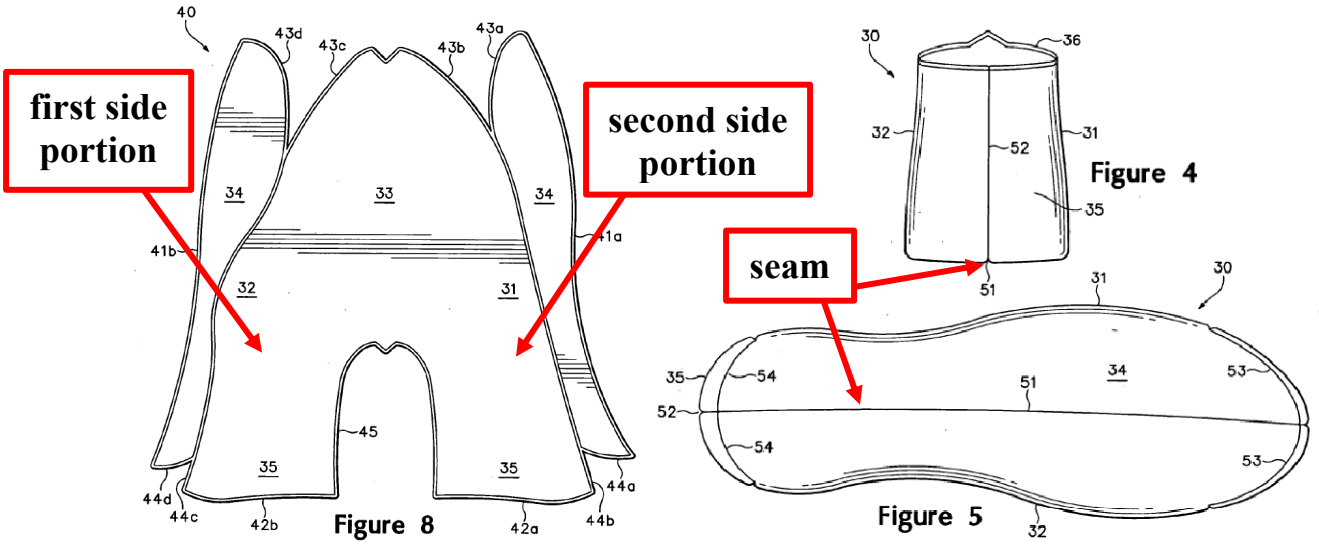
Q. Dua, Hong, and Lockwood Render Obvious Claim 15

Claim 15 depends from claim 11 and recites "further comprising assembling the flat-knitted element into an article of footwear." Dua discloses this limitation for the reasons provided with respect to the preamble of claim 11 in this ground. Ex.1002, ¶141. Dua also discloses different assembly techniques may be used to prepare upper material for incorporation into footwear. Ex.1004, [0012].

R. Dua, Hong, and Lockwood Render Obvious Claim 16

Claim 16 depends from claim 15 and recites "wherein the assembling includes joining side edges of the first side portion and the second side portion to form a seam extending under a foot and along a longitudinal length of the foot." Dua discloses this limitation. For example, Dua discloses "the textile element has edges that are joined together to define at least a portion of a void for receiving a foot." Ex.1004, [0013]. Dua also discloses "[a] plurality of seams 51-54 are formed, therefore, when joining the edges of the textile element. ***Seam 51 extends along the longitudinal***

length of lower region 34 and is centrally-located with respect to lateral region 31 and medial region 32." *Id.*, [0037]. Dua's Figures 4, 5, and 8 illustrate Dua's upper and seam 51. Ex.1002, ¶143.



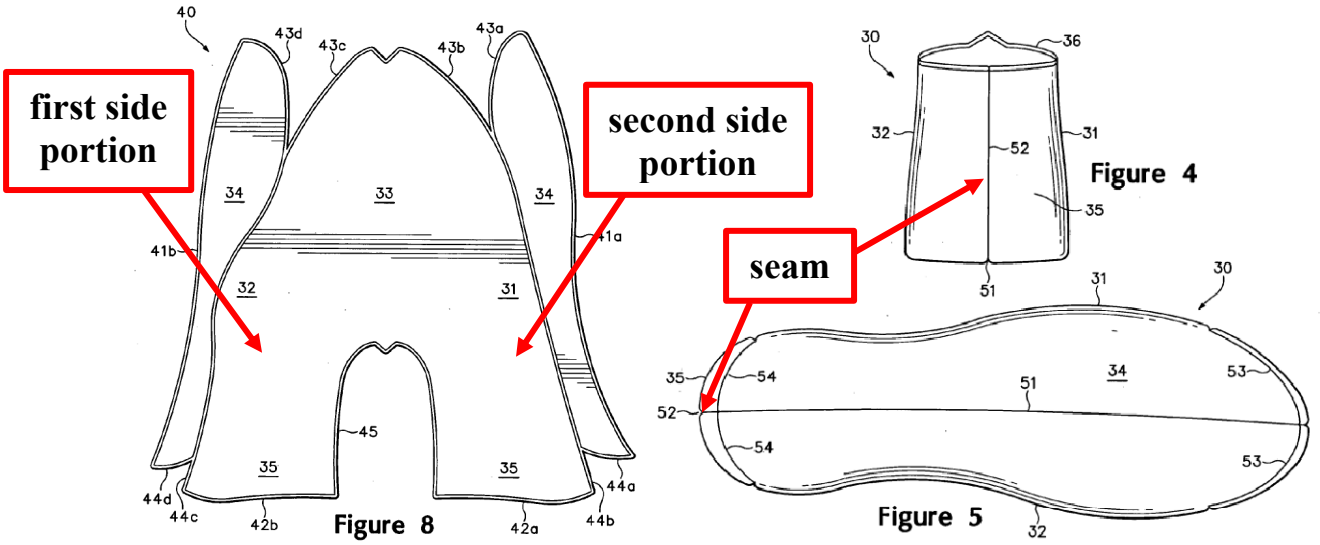
Ex.1004, Figs. 4-5 (annotated), 8 (annotated); Ex.1002, ¶143.

Accordingly, Dua discloses the assembling includes joining side edges of the first side portion and the second side portion to form a seam (seam 51) extending under a foot and along a longitudinal length of the foot. Ex.1002, ¶¶142-143.

S. Dua, Hong, and Lockwood Render Obvious Claim 17

Claim 17 depends from claim 15 and recites "wherein the assembling includes joining rear edges of the first side portion and the second side portion to form a seam that extends upward along a heel." Dua discloses this limitation. For example, Dua discloses "***[s]eam 52*** is also centrally-located and extends upward along ***heel region***

35." Ex.1004, [0037]. Dua's Figures 4, 5, and 8 illustrate Dua's upper and seam 52. Ex.1002, ¶144.



Ex.1004, Figs. 4-5 (annotated), 8 (annotated); Ex.1002, ¶144.

Accordingly, Dua discloses this limitation, including a seam (seam 52) along a heel. Ex.1002, ¶144.

T. Dua, Hong, and Lockwood Render Obvious Claim 18

Claim 18 depends from claim 11 and recites "wherein the flat knitting process includes forming a first loop of unitary construction in the textile element." Dua discloses this limitation for at least the reasons provided with respect to claim 2 in this ground. Ex.1002, ¶145. This limitation would also have been obvious in view of Hong for at least the reasons provided with respect to claim 2 in this ground. *Id*.

U. Dua, Hong, and Lockwood Render Obvious Claim 19

Claim 19 depends from claim 18 and recites "further comprising extending a lace element through the first loop." Dua discloses this limitation for the reasons provided with respect to claim 2 in this ground. Ex.1002, ¶146. Dua also explains its "upper 130 includes a lace 131 and a plurality of elements 132-135 that also form a portion of the exterior surface. ***Lace 131 extends through a plurality of apertures*** formed in textile element 140." Ex.1004, [0057]; *see also id.*, [0005], [0037], [0041]. Lockwood similarly discloses receiving laces via holes in an upper. Ex.1003, 6:74-75; Ex.1002, ¶146.

X. GROUND 4: DUA, HONG, LOCKWOOD, AND VOUGHLOHN RENDER OBVIOUS CLAIMS 2–4, 18, AND 19

As described above, Dua, Hong, and Lockwood render obvious claims 2–4, 18, and 19. Ground 4 addresses the obviousness of the challenged claims in Ground 3 in the event the disclosures of Dua, Hong, and Lockwood were somehow deemed insufficient for teaching limitations relating to producing one or more loops of unitary construction with first layer of an upper such as Dua's upper. Ex.1002, ¶147.

A. Overview of Voughlohn (Ex.1006)

Like the '484 patent, Dua, and Lockwood, Voughlohn discloses features related to fabric-based apparel articles such as footwear, including fastening footwear composed of fabric. Ex.1006, Title, [0345]; Ex.1002, ¶148. Voughlohn's

Figures 1A and 10 illustrate embodiments of footwear with different fasteners for laces.

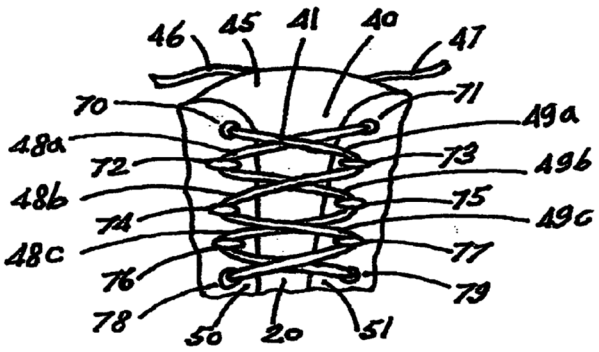


Fig. 1A

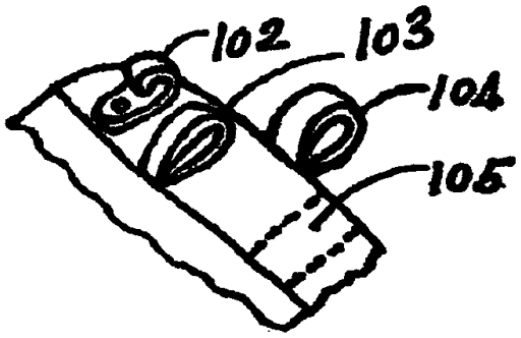


Fig. 10

Id., Figs. 1A, 10. Regarding Figure 10, Voughlohn explains "[t]he lace receiver and/or a part of the lace-section fastener can comprise: … a plastic or fabric ring 103, 104, or 105, attached to or integrated into the under-side of a footwear with rivet(s) or thread(s) (each of rings 103, 104, and 105 is a strip of material riveted or sewn to the footwear to create a fixed or movable ring)." *Id*., [0377]-[0379].

B. The Combination of Dua, Hong, Lockwood, and Voughlohn Renders Obvious Claims 2–4, 18, and 19

Voughlohn discloses various options for producing lace receivers, including fabric rings that are attached to or integrated into a footwear upper. Ex.1006, [0377]-[0379]. A POSA would have been motivated to incorporate Voughlohn's fabric rings in Dua's upper (or a similar upper) for multiple reasons, including to realize the benefits described in Voughlohn like providing "a convenient, safe, and aesthetic

system, which could fasten a footwear quickly and easily, and is affordable, compact, and simple without exposing a bow knot." *Id*., [0001]; Ex.1002, ¶149.

A POSA would have reasonably expected success in integrating Voughlohn's lace receivers (loops for laces) in an upper such as Dua's upper. Ex.1002, ¶150. Voughlohn discloses its lace receivers are advantageously integrated into an upper. Ex.1006, [0001], [0377]-[0379]. Dua discloses its upper components are desirably formed of a unitary construction. Ex.1004, [0037], [0060]. The combination would have involved no more than integrating a known structure in the upper for a readily understood benefit. Ex.1002, ¶150.

As described below, combining Dua, Hong, Lockwood, and Voughlohn meets each limitation of claims 2–4, 18, and 19 of the '484 patent.

C. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 2

Claim 2 depends from claim 1 and recites "further comprising a first loop being formed as a second layer of unitary construction with the first layer." As discussed in the previous ground, Dua discloses this limitation and Hong renders obvious this limitation. Ex.1002, ¶151. However, to the extent Dua and Hong are somehow insufficient, the limitation is disclosed by Voughlohn. *Id*., ¶¶151-152.

For example, Voughlohn discloses an upper wherein "[t]he lace receiver and/or a part of the lace-section fastener can comprise: … a plastic or ***fabric ring*** 103, 104, or 105, attached to or ***integrated into*** the under-side of a footwear with

rivet(s) or thread(s) (each of rings 103, 104, and 105 is a strip of material riveted or ***sewn to the footwear*** to create a fixed or movable ring). Rings 103, 104, and 105 are ***disposed on the top-side*** of, at the edge of, and on the under-side of one of the two opposite sides of the footwear, respectively." Ex.1006, [0377]-[0379]. Voughlohn's Figure 10 illustrates rings 103 and 104.

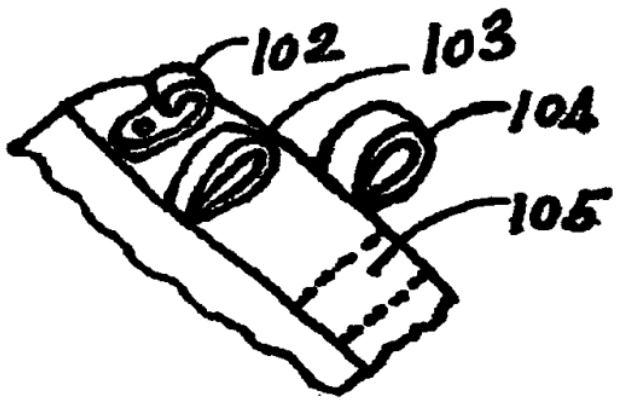


Fig. 10

Id., Fig. 10. Thus, it would also have been obvious in view of Voughlohn to form a first loop as a second layer and form the first loop as a unitary construction with the first layer to flat knit a first layer such as Dua's first layer closer to fully fashioned article of footwear. Ex.1002, ¶¶151-152.

D. <u>Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 3</u>

Claim 3 depends from claim 2 and recites "wherein the first loop extends outward from the central portion." As discussed in the previous ground, Dua discloses this limitation. Ex.1002, ¶153. However, to the extent Dua is somehow

insufficient, the limitation is disclosed by and would have been obvious in view of Voughlohn. *Id.*, ¶¶153-154.

Voughlohn discloses its "[r]ings 103, 104, and 105 are disposed on the top-side of, at the edge of, and on the under-side of one of the two opposite sides of the footwear, respectively." Ex.1006, [0379]. Voughlohn's Figure 1A illustrates lace-receivers that extend outward from a central portion of Voughlohn's upper. Ex.1002, ¶154.

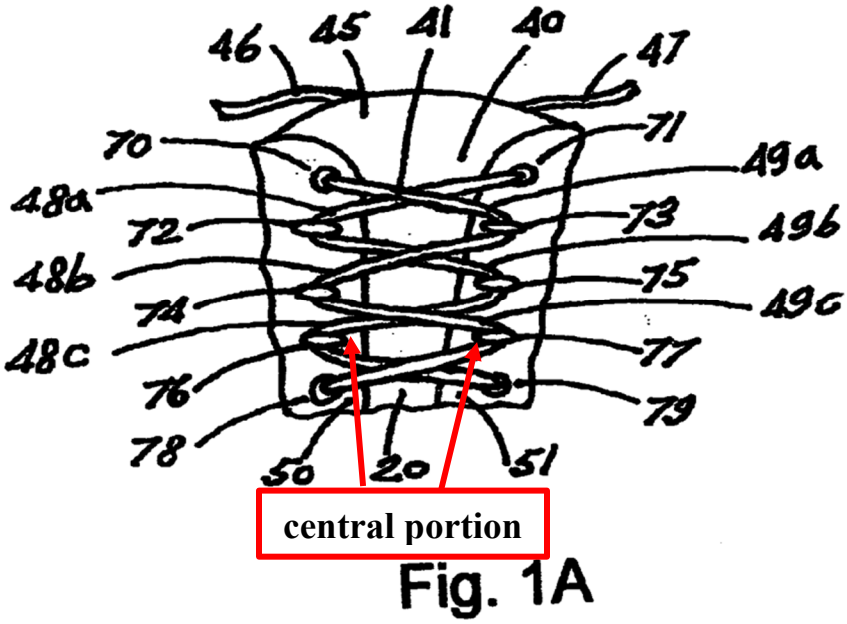


Fig. 1A

Id., Fig. 1A (annotated); Ex.1002, ¶154.

E. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 4

Claim 4 depends from claim 2 and recites "further comprising eight loops being formed as a second layer of unitary construction with the first layer." As discussed in the previous ground, Dua discloses this limitation. Ex.1002, ¶155.

Moreover, in view of Voughlohn's Figure 10, it would have been obvious for a POSA to form eight loops as a second layer of unitary construction with the first layer to ensure that the upper is sufficiently secured. *Id*.

F. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 18

Claim 18 depends from claim 11 and recites "wherein the flat knitting process includes forming a first loop of unitary construction in the textile element." As explained in the previous ground, Dua and Hong disclose this limitation. Ex.1002, ¶156. It also would have been obvious in view of Voughlohn for the reasons provided with respect to claim 2 in this ground. *Id*.

G. Dua, Hong, Lockwood, and Voughlohn Render Obvious Claim 19

Claim 19 depends from claim 18 and recites "further comprising extending a lace element through the first loop." As explained in the previous ground, Dua and Lockwood both disclose this limitation. Ex.1002, ¶157. Voughlohn also discloses this limitation. *Id*., ¶158. For example, Voughlohn discloses "[l]acing-type footwear is an important part of our life, but adjusting, tying, and untying a lace are time-consuming and frustrating." Ex.1006, [0001].

XI. THE BOARD SHOULD NOT EXERCISE DISCRETION TO DENY INSTITUTION

A. Board Should Not Decline Institution Pursuant to 35 U.S.C. § 325(d)

This is the first petition from Petitioner challenging the '484 patent. Although Dua (Ex.1004) was considered during examination of the '484 patent, Lockwood

(Ex.1003) and/or Hong (Ex.1005) in Grounds 1-4 and the arguments set forth above were not considered during examination of the '484 patent. The Petition makes a strong showing that all claims are unpatentable. Accordingly, the factors do not favor exercising discretionary denial.

B. Board Should Not Decline Institution Pursuant to 35 U.S.C. § 314(a)

This Petition raises a compelling case of unpatentability for all claims of the '484 patent. Per the Director's June 21, 2022, Memorandum on the "Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation" ("Guidance Memorandum"), this fact "alone demonstrates that the [Board] should not discretionarily deny institution under *Fintiv*." Guidance Memo. at 5. Further, as described below, Petitioner stipulates that if IPR is instituted Petitioner will not pursue in the district court proceeding the same grounds of invalidity raised in this Petition or any grounds that it could have reasonably raised in this Petition. And per the Guidance Memorandum, the Board also should not discretionarily deny institution for this additional reason. Guidance Memo. at 7. These factors are dispositive against any discretionary denial, but for completeness each of the *Fintiv* factors[8] are addressed below.

[8] *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019 Paper 11, 6 (P.T.A.B. Mar. 20, 2020) (precedential).

Factor 1: Institution Will Increase Likelihood of Stay

Institution will enable the Board to resolve the issue of validity, and a finding of invalidity may relieve the district court of the need to continue litigation related to this patent. Petitioner intends to file a motion to stay upon institution of IPR. The district court action is still in its relatively early stages. The district court has not conducted a claim construction hearing (now scheduled for December 11, 2023) and no trial date has been set. The opportunity for such simplification increases the likelihood that the court will grant a stay in view of IPR institution. *Qualcomm Inc. v. Apple Inc.*, No. 3:17-CV-2402-CAB-MDD, 2018 WL 4104951 (S.D. Cal. Aug. 29, 2018); *TAS Energy, Inc. v. San Diego Gas & Elec. Co.*, No. 12CV2777-GPC BGS, 2014 WL 794215 (S.D. Cal. Feb. 26, 2014).

Factor 2: District Court Schedule

No trial date is scheduled in the district court action. Based on the 18-month IPR schedule, a Final Written Decision ("FWD") in an IPR arising from the present Petition would issue around February 2025.

Factor 3: Investment In The District Court Proceeding

The district court proceeding is still at an early phase. No *Markman* hearing has been conducted. In addition, discovery is not scheduled to close until March 2024.

Patent Owner first asserted the ’484 patent against Petitioner on January 30, 2023 when it filed a complaint in the district court action. Petitioner prepared and filed the instant Petition prior to the statutory period provided by Congress under 35 U.S.C. § 315(b).

Factor 4: The Petition Raises Unique Issues

Petitioner hereby stipulates that it will not assert in the district court proceeding that the challenged claims are invalid based on any ground raised or that could have reasonably been raised in this Petition if the Petition is instituted. Thus, there will be no overlap of invalidity issues between the district court action and the IPR. *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020). This factor militates against any discretionary denial. Guidance Memo. at 7.

Factor 5: Overlap Between The Parties In The Parallel Proceeding

While the same parties are involved here and the district court action, this factor is not determinative.

Factor 6: Other Circumstances Support Institution

Petitioner has presented a compelling case of invalidity for all claims. This fact “alone demonstrates that the [Board] should not discretionarily deny institution under *Fintiv*.” Guidance Memo. at 5.

XII. CONCLUSION

Petitioner respectfully requests that the Board institute an IPR and cancel claims 1–19 of the '484 patent.

Dated: September 27, 2023 By: */Ali S. Razai/*
Ali S. Razai (Reg. No. 60,771)
KNOBBE MARTENS OLSON & BEAR, LLP

Attorney for Petitioner lululemon usa inc.

APPENDIX 1

Listing of Claims from U.S. 9,730,484	
Claim 1[9]	
1[pre]	An article of footwear comprising
1[a]	an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer having:
1[b]	a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;
1[c]	a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and
1[d]	a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion,
1[e]	the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration.
Claim 2	
--	The article of footwear of claim 1, further comprising a first loop being formed as a second layer of unitary construction with the first layer.
Claim 3	
--	The article of footwear of claim 2, wherein the first loop extends outward from the central portion.

[9] Bracketed labels have been added for convenient referencing to the claim limitations.

Listing of Claims from U.S. 9,730,484	
Claim 4	
--	The article of footwear of claim 2, further comprising eight loops being formed as a second layer of unitary construction with the first layer.
Claim 5	
--	The article of footwear of claim 1, wherein the knitted element defines a void for receiving a foot of a wearer.
Claim 6	
--	The article of footwear of claim 1, wherein the knitted element defines at least a portion of an exterior surface of the upper, and the knitted element defines at least a portion of a void for receiving a foot of a wearer.
Claim 7	
--	The article of footwear of claim 1, wherein the knitted element includes a first area and a second area, the first area including a first type of knit structure, and the second area including a second type of knit structure, the first type being different than the second type.
Claim 8	
--	The article of footwear of claim 1, wherein the at least one mechanically manipulated yarn includes a first yarn and a different second yarn, the first yarn being located in a first area of the upper, and the second yarn being located in a second area of the upper.

Listing of Claims from U.S. 9,730,484	
Claim 9	
--	The article of footwear of claim 1, wherein the knitted element forms a defined shape having finished edges during the flat knitting process.
Claim 10	
10[pre]	An article of footwear comprising
10[a]	an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer and a second layer, the first layer including:
10[b]	a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;
10[c]	a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and
10[d]	a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion; and
10[e]	the second layer being flat-knitted with the first layer at opposite ends of the second layer to form an overlapped loop.
Claim 11	
11[pre]	A method of manufacturing an article of footwear, the method comprising
11[a]	forming during a flat-knitting process an upper including a flat-knitted element including a first layer having:

Listing of Claims from U.S. 9,730,484	
11[b]	a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;
11[c]	a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and
11[d]	a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion,
11[e]	wherein the domed, three-dimensional structure is shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration.
Claim 12	
--	The method recited in claim 11, wherein the flat knitting process includes forming a first area and a second area, a stitch type of the first area being different that a stitch type of the second area.
Claim 13	
--	The method recited in claim 11, wherein the flat knitting process includes forming a first area and a second area, a yarn type of the first area being different than a yarn type of the second area.
Claim 14	
--	The method recited in claim 11, wherein the flat knitting process includes forming a first area and a second area, a stitch type and a yarn type of the first area being different than a stitch type and a yarn type of the second area.

Listing of Claims from U.S. 9,730,484	
Claim 15	
--	The method recited in claim 11, further comprising assembling the flat-knitted element into an article of footwear.
Claim 16	
--	The method recited in claim 15, wherein the assembling includes joining side edges of the first side portion and the second side portion to form a seam extending under a foot and along a longitudinal length of the foot.
Claim 17	
--	The method recited in claim 15, wherein the assembling includes joining rear edges of the first side portion and the second side portion to form a seam that extends upward along a heel.
Claim 18	
--	The method recited in claim 11, wherein the flat knitting process includes forming a first loop of unitary construction in the textile element.
Claim 19	
--	The method recited in claim 18, further comprising extending a lace element through the first loop.

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,730,484 contains 13,761 words according to the word-processing program used to prepare this paper. The foregoing word count complies with the 14,000-word type-volume limit specified by 37 C.F.R. § 42.24(a)(1).

Dated: September 27, 2023 By: */Ali S. Razai/*
Ali S. Razai (Reg. No. 60,771)
KNOBBE MARTENS OLSON & BEAR, LLP

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the date below a copy of this PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,730,484, PETITIONER'S POWER OF ATTORNEY, AND EXHIBITS 1001-1020, were served by FedEx on the Patent Owner at the correspondence address of record for the subject patent as follows:

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A courtesy copy has been sent by email on this day to Patent Owner's counsel of record in the matter identified in Section I.B of the Petition as follows:

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Dated: September 27, 2023 By: */Ali S. Razai/*
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