

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALPINESTARS S.P.A. AND ALPINESTARS USA INC.

Petitioners

v.

DAINESE S.P.A.

Patent Owner

Inter Partes Review No.: IPR2025-00750

**PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO.
12,012,065 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.1-100, ET SEQ**

TABLE OF CONTENTS

	Page
I. Introduction.....	1
II. Statement of Precise Relief Requested.....	1
III. The '065 Patent.....	1
A. Overview of the '065 patent.....	1
B. Overview of the '065 patent's File History.....	4
C. Person of Ordinary Skill in the Art	5
D. Claim Construction Under 37 C.F.R. § 42.104(b)(3)	6
1. “mesh structure” / “mesh portion”	7
2. “planar structure”	7
IV. Prior Art References	13
A. EX1004 (“EP’536”)	13
B. EX1005 (“CN’180”).....	13
C. EX1007 (“EP’297”)	13
D. EX1011 (“CN’842”).....	13
E. EX1008 (“Hatton”).....	13
V. GROUND 1: CLAIMS 1-22 ARE OBVIOUS OVER EP’536 IN VIEW OF CN’180; AND GROUND 2: CLAIMS 1-22 ARE OBVIOUS OVER EP’536 IN VIEW OF CN’180 AND HATTON AND/OR THE KNOWLEDGE OF THE POSITA	14
A. Motivation to Combine	14
B. Claim 1	17
1. [1pre].....	17
2. [1a]	18
3. [1b]	26
4. [1c]	26
5. [1d]	31
6. [1e]	32
C. Claim 2	34

D.	Claim 3	37
E.	Claim 4	39
F.	Claim 5	42
G.	Claim 6	44
H.	Claim 7	45
I.	Claim 8	48
J.	Claim 9	51
K.	Claim 10	52
L.	Claim 11	52
M.	Claim 12	53
N.	Claim 13	54
O.	Claim 14	55
P.	Claim 15	55
Q.	Claim 16	55
R.	Claim 17	56
S.	Claim 18	56
	1. [18pre]	56
	2. [18a]	57
	3. [18b]	57
	4. [18c]	57
T.	Claim 19	57
U.	Claim 20	57
V.	Claim 21	59
W.	Claim 22	59
VI.	GROUND 3: EP'297 IN VIEW OF CN'842 RENDERS CLAIMS 1- 22 OBVIOUS.....	59
	A. Motivation to Combine	59
	B. Claim 1	63
	1. 1[pre]	63

2.	[1a]	63
3.	[1b]	67
4.	[1c]	68
5.	[1d]	71
6.	[1e]	72
C.	Claim 2	73
D.	Claim 3	75
E.	Claim 4	75
F.	Claim 5	78
G.	Claim 6	79
H.	Claim 7	80
I.	Claim 8	82
J.	Claim 9	84
K.	Claim 10	85
L.	Claim 11	86
M.	Claim 12	86
N.	Claim 13	88
O.	Claim 14	88
P.	Claim 15	90
Q.	Claim 16	91
R.	Claim 17	92
S.	Claim 18	92
1.	[18pre]	92
2.	[18a]	92
3.	[18b]	92
4.	[18c]	92
T.	Claim 19	93
U.	Claim 20	93
V.	Claim 21	93

W.	Claim 22	93
VII.	Discretionary Denial is not Warranted	94
A.	35 U.S.C. § 314(a) Analysis.....	94
1.	Stay.....	94
2.	Trial Date	94
3.	Parallel Proceeding	95
4.	Issue Overlap.....	95
5.	Same Party	96
6.	Other Considerations	96
B.	35 U.S.C. § 325(b) Analysis	97
VIII.	Compliance with Formal Requirements.....	98
A.	Mandatory Notices Under 37 C.F.R. §§ 42.8(b)(1)-(4)	98
1.	Real Party-In-Interest.....	98
2.	Related Matters	98
3.	Lead and Backup Counsel	98
4.	Service Information.....	99
B.	Proof of Service on the Patent Owner.....	99
C.	Power of Attorney	99
D.	Standing.....	100
E.	Fees.....	100
IX.	Conclusion	100

INDEX OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 12,012,065
1002	File History of U.S. Patent No. 12,012,065
1003	Declaration of Russell K. Davidson, P.E., M.S.E., in Support of Petition for Inter Partes Review of U.S. Patent No. 12,012,065
1004	EP 2879536 B1 (“EP’536”)
1005	Certified Translation of CN108968180 (“CN’180”), including translator Certification by Patrick Chen
1006	CN108968180
1007	EP 2621297 B1 (“EP’297”)
1008	U.S. Patent No. 3,823,711 (“Hatton”)
1009	U.S. Patent Application Publication No. 2021/0329986 A1 (“Mazzarolo’986”)
1010	U.S. Patent Application Publication No. 2021/0360993 A1 (“Mazzarolo’993”)
1011	Certified Translation of CN205695842 (“CN’842”), including translator Certification by Xiongwei Shen
1012	CN205695842
1013	US Patent Application Publication No. 2020/0315277 (“Klein”)
1014	Complaint from <i>Dainese S.p.A. v. Alpinestars USA Inc. et al</i> , 2:24-cv-07066 (CD CA 2024)
1015	American Heritage Dictionary definition of “planar”
1016	Webster’s New Universal Unabridged Dictionary definition of “planar”
1017	Petitioners’ Stipulation

CHART OF CLAIMS
[1pre] A protective device for the protection of a user, said protective device comprising
[1a] a mesh structure comprising a first mesh portion and a second mesh portion and a plurality of tie elements, wherein said first mesh portion and said second mesh portion are opposite one another and are connected one another by said plurality of tie elements;
[1b] wherein said tie elements comprise dividing walls defining a plurality of inner housings between said first mesh portion and said second mesh portion;
[1c] wherein said protective device includes a casing body arranged at least in an inner housing of said plurality of inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in said at least one inner housing of said mesh structure, and wherein in said deflated condition, said casing body occupies a first space or first region, and wherein in the deflated condition a second region or second space of said at least one inner housing lacks a casing body, and wherein in the inflated condition said casing body occupies the second region or second space,
[1d] wherein said casing body comprises a plurality of portions each arranged in a corresponding inner housing of said plurality of inner housings, and wherein said plurality of inner housings define channels arranged side-by-side one another and separated from each other by a tie element of said plurality of tie elements, each of said plurality of inner housings configured to house a corresponding portion of said casing body, and
[1e] wherein in the inflated condition, said portions of said casing body are inflated against said first mesh portion, said second mesh portion, and said tie elements so as to form a planar structure.
[2] The protective device according to claim 1, wherein in the inflated condition said casing body is configured to line from the inside, at least partially in contact, said mesh structure and that said mesh structure is an external structure of said protective device.

CHART OF CLAIMS

[3] The protective device according to claim 1, wherein in said inflated condition said casing body completely occupies the second region or second space and the first region or first space of said inner housing.

[4] The protective device according to claim 1, wherein the deflated condition of said casing body corresponds to a slack and loose condition of said mesh structure and of said tie elements, and wherein the inflated condition of said casing body corresponds to an at least partially tensioned condition of said tie elements and of said first mesh portion and said second mesh portion.

[5] The protective device according to claim 1, wherein said casing body has a hand or comb or tree shape, or has tubular shape arranged in a serpentine way.

[6] The protective device according to claim 1, wherein said tie elements are arranged between said first mesh portion and said second mesh portion aligned in a plurality of rows of tie elements.

[7] The protective device according to claim 6, wherein each row of tie elements of said plurality of rows of tie elements comprises a plurality of tie elements wherein in a condition of at least partial tension, said tie elements belonging to a same row of tie elements are arranged substantially parallel to each other.

[8] The protective device according to claim 1, wherein said mesh portions and said casing body define an inflatable element, and wherein an inflated condition of said casing body corresponds to an inflated condition of protection of said inflatable element, and a deflated condition corresponds to a rest condition of said inflatable element, and wherein in the deflated condition said second region of said at least one inner housing is apt to allow a passage of air between said first mesh portion and said second mesh portion passing through said second region of said at least one inner housing.

[9] The protective device according to claim 1, comprising a gas source or inflation source connected to said casing body.

[10] The protective device according to claim 1, wherein said protective device is a wearable device.

[11] A protective garment or clothing accessory comprising said protective device according to claim 1.

CHART OF CLAIMS

[12] The protective garment according to claim 11, wherein said protective garment has a covering layer, wherein said covering layer is of breathable material or includes transpiration openings, and wherein said covering layer covers said first region and said second region of said one or more inner housings.

[13] The protective device according to claim 1, wherein in the inflated condition said casing body is configured to line from the inside, at least partially in contact, said mesh structure or that said mesh structure is an external structure of said protective device.

[14] The protective device according to claim 8, wherein said inflatable element is shaped like a jacket and is apt to surround an upper area or bust of the user's body.

[15] The protective device according to claim 1, wherein said mesh structure is a perforated structure that allows air or other gas to pass.

[16] The protective device according to claim 1, wherein said mesh structure, or the mesh portion, is a net.

[17] The protective device according to claim 1, wherein each portion of said casing body is at least partially received in a corresponding one of said inner housings in both the deflated condition and in the inflated condition.

[18pre] A method for making a protective device for the protection of a user, said method comprising the steps of:

[18a] providing a mesh structure comprising a first mesh portion and a second mesh portion, opposite the first mesh portion, and a plurality of tie elements connecting the first mesh portion and the second mesh portion, wherein the tie elements comprise dividing walls defining a plurality of inner housings between the first mesh portion and the second mesh portion;

[18b] arranging a casing body with a plurality of portions in the mesh structure to form with the mesh structure an inflatable element, the plurality of portions each arranged in a corresponding inner housing of the plurality of inner housings, and wherein the inner housings form channels arranged side-by-side one another and separated from each other by a tie element of the tie elements, each of the inner housings configured to house a corresponding portion of the casing body; and

CHART OF CLAIMS

[18c] inflating the casing body from a first deflated operating condition to a second inflated operating condition, wherein in the inflated condition, the portions of the casing body are inflated against the first mesh portion, the second mesh portion, and the tie elements so as to form a planar structure, wherein in the deflated condition, the casing body occupies a first space or region, and wherein in said deflated condition a second region or second space of the at least one inner housing lacks the casing body, and wherein in the inflated condition the casing body expands and occupies the second region or second space.

[19] The method according to claim 18, wherein the casing body is inflated until the tie elements and the mesh structure are tensioned and until the casing body is at least partially adhered to the first mesh portion and the second mesh portion.

[20] The method according to claim 18, wherein the casing body is inflated until the mesh structure is tensioned and the mesh structure bridges and prevents a further expansion of the casing body.

[21] The method according to claim 18, wherein in the deflated condition the second region of the at least one inner housing allows an air passage between the first mesh portion and the second mesh portion passing through the second region.

[22] The method according to claim 18, wherein the casing body is inflated until the tie elements and the mesh structure are tensioned or until the casing body is at least partially adhered to the first mesh portion and the second mesh portion.

I. INTRODUCTION

Alpinestars S.p.A. and Alpinestars USA Inc. (“Petitioners”) request *inter partes* review of claims 1-22 (“Challenged Claims”) of U.S. Patent No. 12,012,065 (“’065 patent,” EX1001), owned by Dainese S.p.A. (“PO”).

This petition relies upon the declaration of Russell K. Davidson, P.E., M.S.E. (EX1003) and copies large portions of that declaration herein.

II. STATEMENT OF PRECISE RELIEF REQUESTED

In accordance with 35 U.S.C. § 311, Petitioners request cancelation of claims 1-22 of the ’065 patent in view of the following grounds:

Ground	Claims	Stat. Basis	Prior Art
1	1-22	103 ¹	EP’536 and CN’180
2	1-22	103	EP’536, CN’180 and Hatton
3	1-22	103	EP’297 and CN’842

III. THE ’065PATENT

A. Overview of the ’065 patent

The ’065 patent relates to a “personal protective device,” an embodiment of which is shown here in FIGS. 1-3 of the patent.

¹ AIA 35 U.S.C. §§102 and 103 apply throughout this petition.

The device 10/110² comprises “inflatable element 12, 112 [that] includes a mesh textile structure 11, 111, with a first mesh portion 18,118, and a second mesh portion 19, 119, in which the two mesh portions are opposite one another.” EX1001, 6:38-41; FIGS. 1-3.

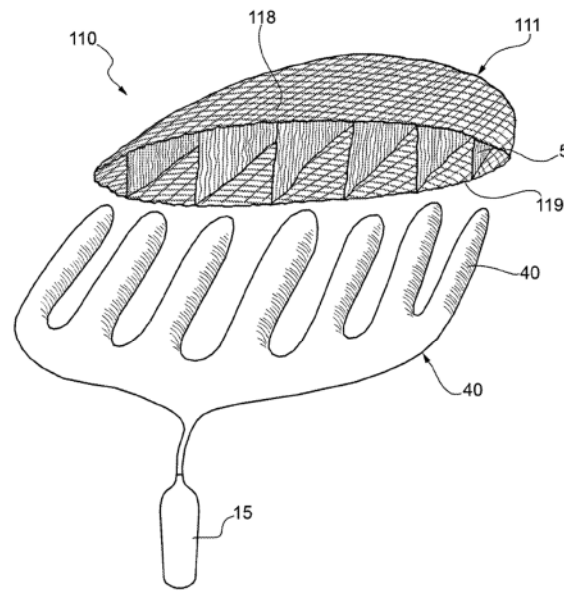


FIG.1

The first mesh portion 118/18 and the second mesh portion 19/119 are “connected to each other by a plurality of tie elements 5” that are arranged as “a plurality of rows 24 of tie elements 5.” EX1001, 7:2-5; FIGS. 4, 5:

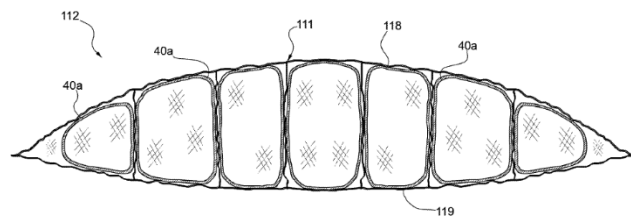


FIG.2

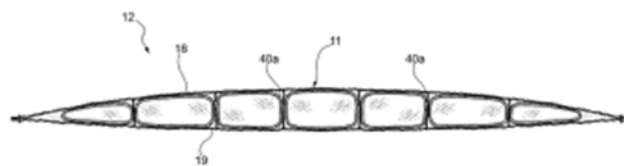


FIG.3

² The '065 patent generally describes two embodiments of the device, devices 10 and 110, at the same time. EX1003, n. 2.

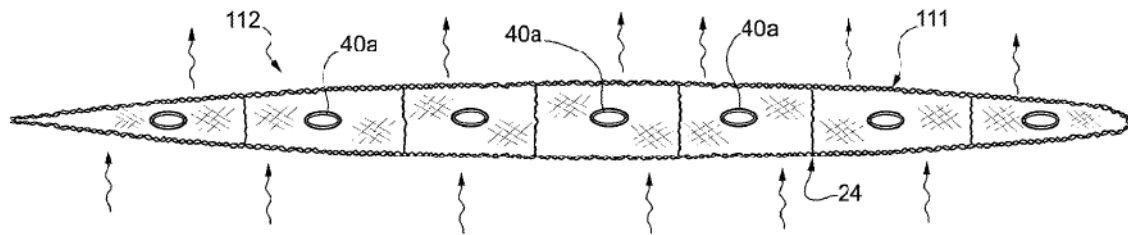


FIG. 4

EX1001, FIG. 4.

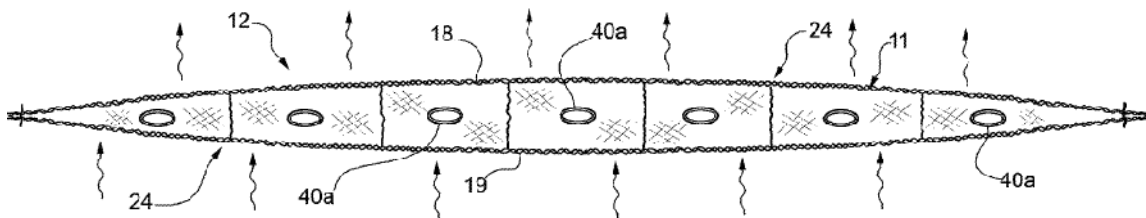


FIG. 5

EX1001, FIG. 5. The “arrangement in rows 24” forms “a plurality of side-by-side housings.” EX1001, 7:5-9. The “inflatable element 12, 112 comprises an inflatable casing body 40, 42, 43 disposed in one or more housings between the first mesh portion 18, 118, and the second mesh portion 19, 119 and connected to a gas source 15, or inflation source.” *Id.*, 7:17-21.

The terms “mesh structure” and “mesh portion” are used throughout the '065 patent, and carry a “broad” meaning – if “capable of creating a frame or cage that can be tensioned around the casing body, and that allows air or other gas to pass” through it, a structure/material is a “mesh structure” or “mesh portion”:

With the expression ***mesh structure***, or preferably mesh textile structure, or ***mesh portion*** it is meant in a ***broad sense*** a real mesh, or even a ***fabric***, even a net. Alternatively, it can be a so-called shuttle-weaved material, or needled materials (non-woven fabric). What is important is that it is a ***perforated structure or*** capable of creating a frame or cage that can be tensioned around the casing body, and ***that allows air or other gas to pass***. Therefore ***the mesh structure is to be considered as a cage structure which traps and blocks or contains expansion of the casing body***.

EX1001, 3:22-31.

B. Overview of the '065 patent's File History

U.S. Application no. 17/757,247 ("247 application"), was filed on June 13, 2022, claiming priority to three foreign applications that were filed on December 13, 2019. EX1001, (21), (30), (86). EX1002, 349-350 (ADS).³

To gain allowance, the claims of the 247 application were amended twice. EX1002, 42-52, 102-112 (2/28/24 and 10/3/23 amendments). In the second amendment, the applicant added numerous limitations to overcome rejections based on Mazzarolo (US20210329986, EX1009). EX1002, 65-73 (12/5/23 office action). The independent claims were "amended to clarify that the tie elements are

³ Petitioners are not here challenging whether any '065 patent claim is entitled to any priority date before June 13, 2022 filing, but may so in another proceeding.

dividing walls defining a plurality of inner housings in which portions of the casing body are arranged.” EX1002, 49. The applicant clarified that “that the tie elements comprise dividing walls defining a plurality of housings and that the portions of the casing body are inflated against the first mesh portion, the second mesh portion, and the tie elements.” *Id.*, at 50.

The tie elements/dividing walls were the only significant distinctions argued by the applicant to gain allowance over the prior art. *Id.* (“Mazzarolo does not disclose dividing walls as now recited in independent claim 1”); *id.*, at 51 (“Mazzarolo does not teach or suggest dividing walls defining a plurality of inner housings between a first mesh portion and a second mesh portion. Mazzarolo further teaches that the inflatable bag circles the tie members as the bag inflates. That would not be possible if the tie members were dividing walls.”).

But, as shown in Sections V-VI below, there was nothing novel or inventive about tie elements or the alleged configuration of tie elements used to gain allowance of the Challenged Claims. EX1003, ¶55. Indeed, these features, as well as the other claimed features, were well known in the art well before the priority date of the ’065 patent.

C. Person of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) at the time of the alleged invention of the ’065 patent (December 13, 2019) would have had a Bachelors’

degree in mechanical engineering or a comparable field of study, plus approximately three years of professional experience with airbag devices or other similar relevant industry experience. Additional graduate education could substitute for professional experience, and significant experience in the field could substitute for formal education. EX1003, ¶41.

D. Claim Construction Under 37 C.F.R. § 42.104(b)(3)

The Challenged Claims are interpreted using the same claim construction standard that is used in a civil action in federal court. 37 C.F.R. § 42.100(b).

Petitioners' proposed constructions are not necessarily complete constructions of these limitations or the claims for any other purpose, including for issues that have been or may be raised in related litigation. Because the prior art asserted herein discloses the preferred embodiment within the indisputable scope of the claims, the Board need not construe the outer bounds of the claims here. The district court may have to address other bounds of the claims in addressing infringement. *See, e.g., Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (only those terms that are in controversy need be construed, and only to the extent necessary).

Any claim terms not listed below should be construed according to their plain and ordinary meanings to a POSITA at the time of the '065 patent.

1. “mesh structure” / “mesh portion”

All '065 patent claims require a “mesh structure” and “mesh portion.” For example, claim 1 recites “a mesh structure comprising a first mesh portion and a second mesh portion and a plurality of tie elements.” EX1001, claim 1. As noted above, the '065 patent explicitly construes these terms in a “broad sense.” See *supra* §III.A; EX1001, 3:22-31.

Accordingly, a POSITA would have understood that “mesh structure” means a structure capable of creating a frame/cage that can be tensioned around a casing body and that allows air or other gas to pass through it. EX1003, ¶58. Likewise, a POSITA would have understood that “mesh portion” means a portion of the structure capable of creating a frame/cage that can be tensioned around a casing body and that allows air or other gas to pass through it. *Id.*

2. “planar structure”

All of the '065 patent claims require a “planar structure.” For example, claim 1 recites that “in the inflated condition, said portions of said casing body are inflated against said first mesh portion, said second mesh portion, and said tie elements so as to form a planar structure.” EX1001, claim 1. Other than the claims, the '065 patent mentions “planar” only twice:

The first mesh portion and the second mesh portion together with the tie elements determine with the casing body the final shape

of the inflatable element. For example the ***inflatable element can reach a generally flat and planar final shape.***

EX1001, 4:19-23.

... Since the channels are placed side by side one another, in the inflated condition the individual casing bodies press against each other, to form a cushion of inflated bodies, having ***a globally planar structure.***

EX1004, 4:67-5:3.

These discussions of planar are not made with respect to any Figure within the '065 patent. EX1003, ¶60. However, the specification clearly indicates that the “globally planar structure”/“generally flat and planar final shape” refers to the “final shape of the inflatable element [elements 12/112 comprising structure 11/111 and casing body 40]” during the inflated condition. *Id.* (citing EX1001, FIGS. 1-3).

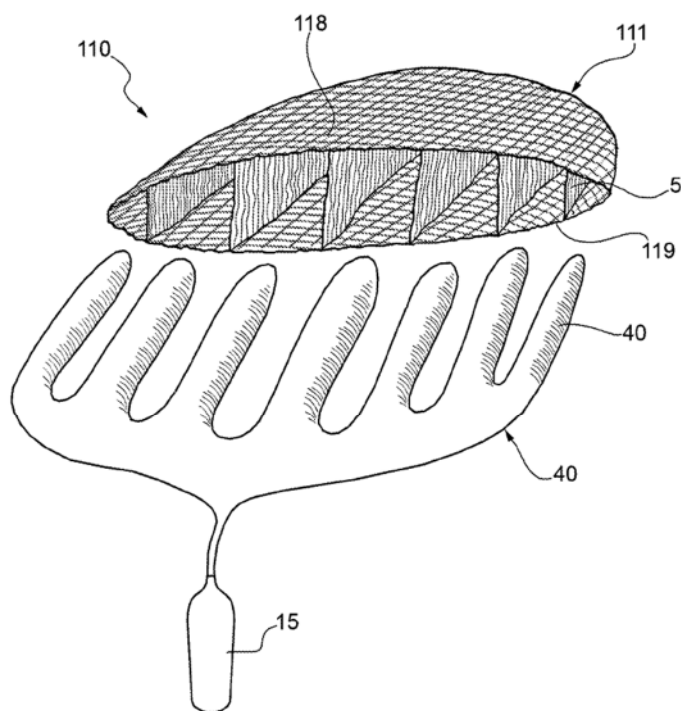


FIG.1

EX1001, FIG. 1.

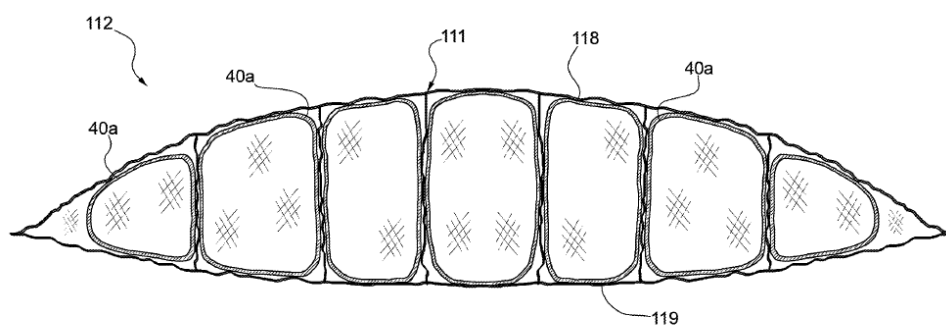


FIG.2

EX1001, FIG. 2.

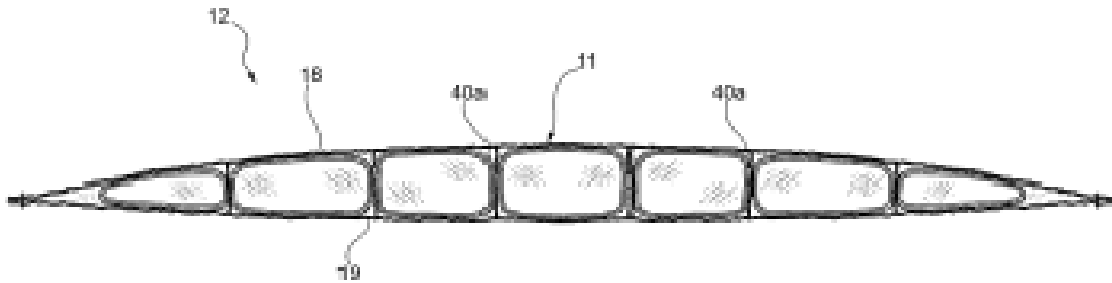


FIG. 3

EX1001, FIG. 3.

The plain and ordinary meaning of “planar” is a flat or level surface.

EX1003, ¶61. As such, the claimed “planar structure” must be a flat or level surface of the final shape of the inflatable element (elements 12/112) during the inflated condition. *Id.* This would include the regions where the outer layer and tie elements intersect the mesh, circled below:

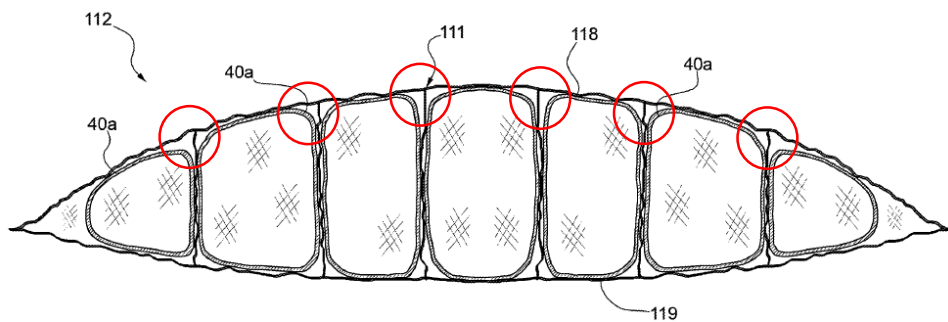


FIG. 2

EX1001, FIG. 2.

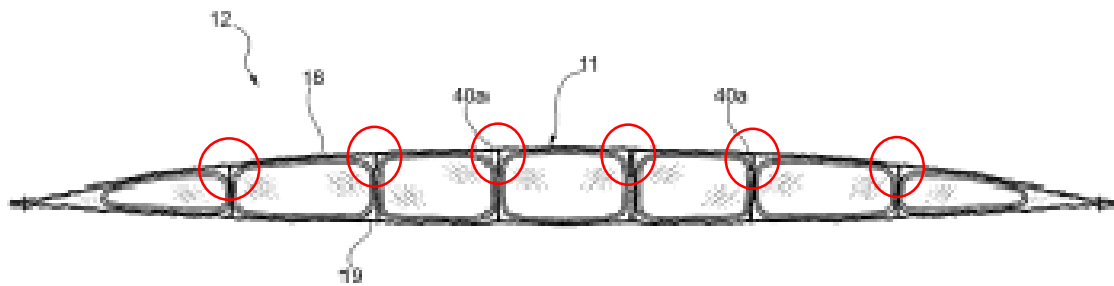


FIG. 3

EX1001, FIG. 3.

But in a related litigation, PO has accused products that do not achieve a flat or level surface during the inflated condition. Specifically, the accused products form a series of curved surfaces, which are separated by indented regions at the points where the outer material intersects the alleged tie elements during the inflated condition:



EX1014, p. 12.

Petitioners submit that PO's litigation position is inconsistent with, and not supported by, the specification or claims of the '065 patent, and is contrary to the plain and ordinary meaning of "planar structure." But PO's apparent interpretation of "planar structure" is broader than the plain and ordinary meaning of "planar

structure,” and thus the Challenged Claims are invalid even under PO’s construction of the term over the art presented herein. EX1003, ¶63.

IV. PRIOR ART REFERENCES

The earliest-filed foreign applications to which priority is claimed were filed on December 13, 2019.

A. EX1004 (“EP’536”)

EP 2879536 B1 (“EP’536”) published on June 8, 2016 and is prior art under AIA sections 102 and 103. EX1004, (45).

B. EX1005 (“CN’180”)

CN108968180 (“CN’180”) published on December 11, 2018 and is prior art under AIA sections 102 and 103. EX1005, front cover, EX1006, front cover.

C. EX1007 (“EP’297”)

EP 2 621 297 B1 (“EP’297”) published on August 9, 2017 and is prior art under AIA sections 102 and 103. EX1007, (45).

D. EX1011 (“CN’842”)

CN 205695842 (“CN’842”) published on November 23, 2016 and is prior art under AIA sections 102 and 103. EX1011, front cover, EX1012, front cover.

E. EX1008 (“Hatton”)

U.S. Patent No. 3,823,711 (“Hatton”) published on July 16, 1974 and is prior art under AIA sections 102 and 103. EX1008, (45).

V. GROUND 1: CLAIMS 1-22 ARE OBVIOUS OVER EP'536 IN VIEW OF CN'180; AND GROUND 2: CLAIMS 1-22 ARE OBVIOUS OVER EP'536 IN VIEW OF CN'180 AND HATTON AND/OR THE KNOWLEDGE OF THE POSITA

Petitioners present Grounds 1 and 2 together below. Ground 1 establishes that claims 1-22 are obvious over EP'536 in view of CN'180 under Petitioners' proposed construction of "mesh structure" and "mesh portion." Ground 2 is essentially the same as Ground 1 except that it based on claims 1-22 being obvious over EP'536 in view of CN'180 and Hatton and/or the knowledge of a POSITA under a potential alternative construction of "mesh structure" and "mesh portion."

A. Motivation to Combine

Motivation for modifying EP'536 with Hatton and/or the knowledge of the POSITA to the extent needed to show "mesh" structure/portions is provided in claim element [1a] below.

A POSITA would have been motivated to, and capable of, modifying EP'536's laminar structure 100 (and therefore its overall protective garment), whether considered alone or as modified by Hatton and/or the knowledge of the POSITA, with teachings from CN'180. EX1003, ¶71. Each reference relates to airbag systems/devices where an inflatable airbag is housed within another structure and the airbag's inflation is constrained/limited by that structure. *See, e.g.*, EX1004, ¶224, FIG. 8a; EX1005, section (57), FIG. 1; EX1008, 2:21-26, 2:37-42; FIG. 1; EX1003, ¶71. Moreover, each reference is directed to airbag

systems/devices that are worn by a user and are therefore analogous art. *See, e.g.*, EX1004, ¶¶1, 14, 154, FIG. 10; EX1005, section (57); EX1008, 1:58-65, 2:21-26, 2:37-42; FIG. 1; EX1003, ¶71.

Significantly, the references use individual pockets/chambers (internal housings) to house portions of the inflatable device/devices in each system. *See, e.g.*, EX1004, EX1004, ¶224; FIG. 8a; EX1005, section (57), ¶20; FIG. 1; EX1008, 1:58-65 (pipes), 2:21-26, 2:37-42; FIG. 1; EX1003, ¶72. EP'536 uses individual envelopes 20, EX1004, ¶224; FIG. 8a, and Hatton uses individual tubes within the pipes, EX1008, 1:58-65, 2:21-26; FIG. 1; while CN'180 uses strip-shaped inflatable units 12 that are part of one bag structure. EX1005, ¶20; FIG. 1.

A POSITA would have been motivated to implement the one-piece airbag 10 and its strip-shaped inflation units 12 as taught by CN'180 into the EP'536 and EP'536-Hatton systems, utilizing individual envelopes 20/tubes, as one mechanism for simplifying the design and operation of the EP'536 and EP'536-Hatton protective devices. EX1003, ¶73. One inflatable device with strip-shaped inflation units 12 connected to one inflation chamber 11 would replace a plurality of individual envelopes 20, each with its own gas generating agent 18 (EX1004, ¶168), or individual tubes (Hatton). *Id.* It would also allow the modified EP'536/EP'536-Hatton device to be easily reusable by having only one mechanism to recharge. *Id.*

The decision to do so would have simply involved combining known prior art elements (i.e., one inflatable mechanism with inflatable units disclosed by CN'180 that could be accepted into respective pockets as required by EP'536/EP'536-Hatton) according to known methods (i.e., the technique by CN'180) to yield predictable results (i.e., a wearable airbag system with a simplified and reuseable inflation mechanism). EX1003, ¶74. Moreover, a POSITA would have understood that implementing the one-piece airbag 10 and its strip-shaped inflation units 12 as taught by CN'180 into the EP'536/EP'536-Hatton system would have required only simple substitution of one known element (i.e., one inflatable mechanism with inflatable units disclosed by CN'180) for another (multiple individual envelopes 20 taught by EP'536/EP'536-Hatton) to obtain predictable results (i.e., a wearable airbag system with a simplified and reuseable inflation mechanism). *Id.*

In addition, a POSITA would have found it obvious to try a one-piece airbag 10 with strip-shaped inflation units 12 in the EP'536-CN'180 airbag system because it would have been a selection from a finite number of identified predictable solutions (i.e., using one chamber with connected individual inflation units 12 versus multiple individual envelopes 20). EX1003, ¶75.

A POSITA would have had a reasonable expectation of success in doing so as EP'536/EP'536-Hatton already disclosed the means (i.e., the pockets 125) for

accepting the strip-shaped inflation units 12 of CN'180's inflation chamber 11.

EX1003, ¶76.

B. Claim 1⁴

1. [1pre]

If the preamble is limiting, EP'536 discloses it. EX1003, ¶¶77-78. EP'536 discloses a “structure [that] may be used in the design of fabrics or textiles, in particular in applications for *personal protective equipment*, e.g. garment, like *protective garment* or other functional garment like gloves.” EX1004, ¶1;⁵ *see also* ¶¶14, 154.

In one embodiment, the EP'536 protective device is a jacket. EX1004, FIG. 10. The protective device includes the structure discussed in limitations [1a]-[1e] (laminar structure 100), which in the jacket embodiment is included within the jacket as part of a fabric composite structure 150.

⁴ Claim language reproduced in the Chart of Claims.

⁵ Unless otherwise noted, all emphasis and coloring added by Petitioners.

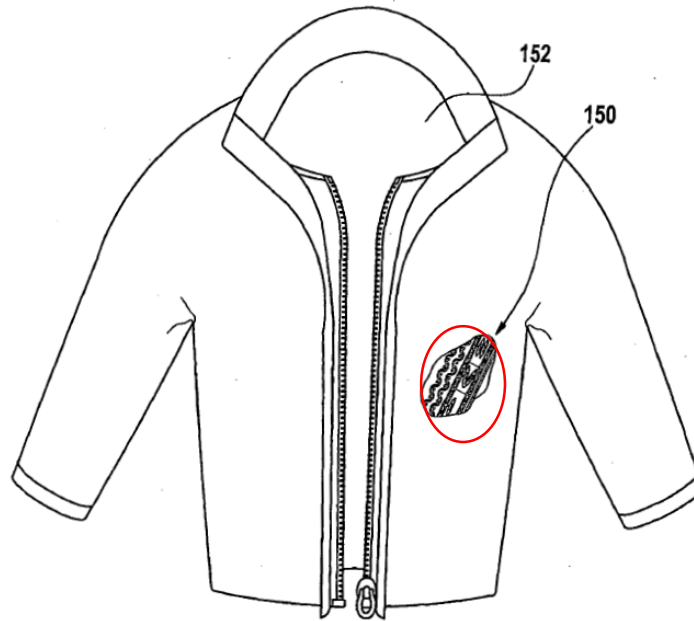


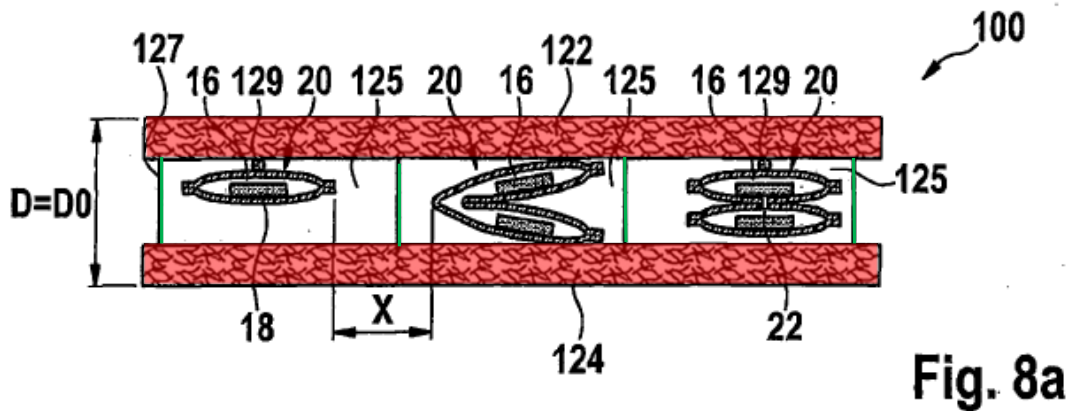
Fig. 10

EX1004, ¶250; FIG. 10 (structure 150 circled in red).

2. [1a]

EP'536 renders this limitation obvious under Petitioners' proposed construction of "mesh structure" and "mesh portion" (Ground 1) or EP'536 in view of Hatton and/or the knowledge of a POSITA renders this limitation obvious under an alternative construction of "mesh structure" and "mesh portion" (Ground 2).

EX1003, ¶79. EP'536 discloses a laminar structure 100 comprising "a first layer 122 and a second layer 124." EX1004, ¶224; FIG. 8a (layers 122, 124 highlighted in red). "Both the first and second layers 122, 124 may be textile layers." *Id.* As shown below, "the textile layers 122, 124 may be connected via stitches 127 in the form of a quilted composite" so that "pockets 125 are formed by the first and second layers 122, 124." *Id.*; FIG. 8a (stitches 127 highlighted in green):



EX1004, FIG. 8a.

Accordingly, the first layer 122 and second layer 124 “are opposite one another and are connected [to] one another by” stitching 127 (plurality of tie elements). EX1003, ¶80. Stitching 127 is the tie element contemplated by the ’065 patent: “tie element is meant [as] an element in the broad sense, that is to say an element which is tensioned between the two mesh portions when the inflatable casing body is inflated. The tie element could also be a stitch.” EX1001, 3:43-46.

According to the EP’536, both “the first layer 122 and the second layer 124 may be ... woven, depending on the application.” EX1004, ¶225. EP’536 also discloses a “functional layer” that can be “air permeable” depending upon the application of the protective device or structure 100. *Id.*, ¶134. EP’536 discloses that in “one embodiment the first layer and/or the second layer comprises said functional layer.” *Id.*, ¶131. A POSITA would have understood that with the first layer 122 and the second layer 124 comprising a functional layer that is “air

permeable,” the layers 122, 124 as well as the laminar structure 100 would comprise fabric or other material “that allows air or other gas to pass” and would thus be a “mesh structure” within the meaning of the ’065 patent. *See, e.g.*, EX1001, 3:22-29; §III.D.1; EX1003, ¶81. Moreover, as discussed below for limitations [1c]-[1e], the layers 122, 124 within the laminar structure 100 form a “cage structure which traps and blocks or contains expansion of [a] casing body [envelope 20],” also within the meaning of “mesh structure” according to the ’065 patent. *See, e.g.*, EX1001, 3:26-31; §III.D.1; EX1003, ¶81.

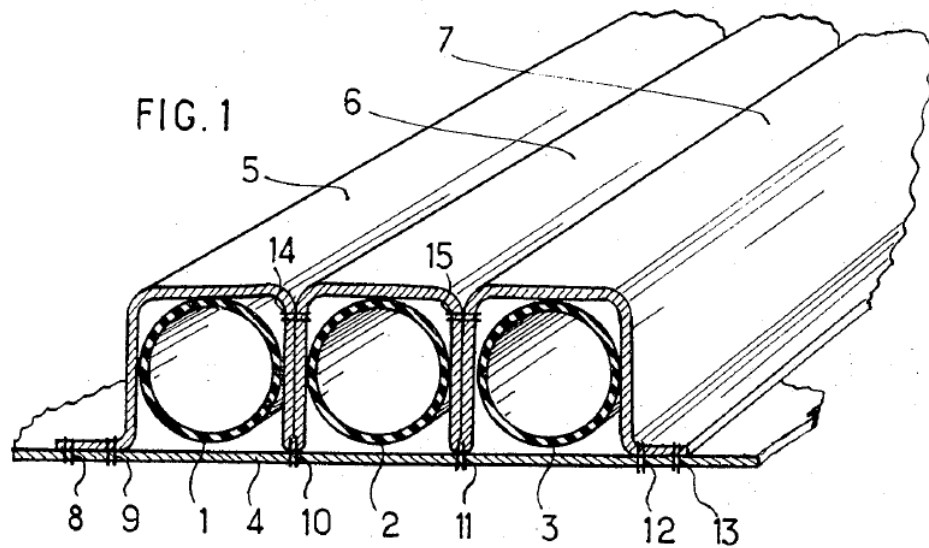
Ground 2: Even if EP’536 does not explicitly disclose or render obvious a “mesh” structure or portions under the Board’s construction, it was well-known to a POSITA to create/use a frame/cage that could be tensioned around an airbag device (casing body) comprising a material that allows air or other gas to pass through it, particularly in a wearable protection device. EX1003, ¶82. Hatton for example discloses a mesh frame/cage that could be tensioned around an airbag device (casing body). EX1003, ¶82. A POSITA would have easily combined this general knowledge of mesh or mesh portion frames and cages tensioned around an airbag casing device with EP’536. A POSITA would have understood that EP’536’s laminar structure 100 (mesh structure) and first and second layers 122, 124 would have easily been implemented with mesh as known in the art (e.g.,

Hatton), particularly in view of EP'536's disclosure that the layers 122, 124 could comprise an "air permeable" functional layer. EX1003, ¶82.

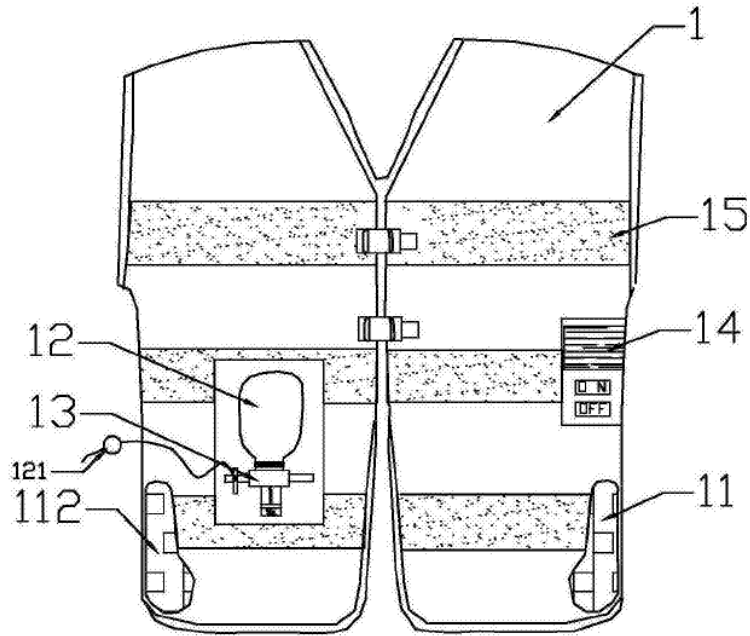
Any modification of EP'536 required would come from Hatton and/or the knowledge of the POSITA. The motivation and skill for any such modification was well within the knowledge and skill of an average POSITA. A POSITA would simply have combined known elements (i.e., mesh outer layers for a cage/frame that houses an airbag or airbag element) according to known methods (i.e., the techniques disclosed in EX1008-EX1011) to yield predictable results (i.e., a wearable airbag system that is air permeable/breathable). EX1003, ¶83. Moreover, a POSITA would have implemented EP'536's laminar structure 100 (mesh structure) and first and second layers 122, 124 with mesh structure/material merely by selecting or simply substituting one known element (i.e., the mesh structures/materials of Hatton and or EX1009-EX1011) for another (for the alleged non-meshed layers 122, 124 forming structure 100) to obtain predictable results (i.e., a wearable airbag system that is air permeable/breathable). EX1003, ¶83. A POSITA would have been explicitly motivated to implement this mesh structure and first and second mesh layers 122, 124 to make the functional layer "air permeable," and therefore more comfortable in warm weather. *Id.*

A POSITA would also have had a reasonable expectation of success in doing so as EP'536 already disclosed the means for implementing mesh

It is beyond dispute that mesh and mesh structures were within the knowledge of a POSITA and replete in the art. Back in 1972, Hatton disclosed such a frame/cage formed from parts 5, 6, 7 to cover inflatable tubes 1, 2, 3 for a wearable garment made from “aerated linen” so that the parts 5, 6, 7 and garment would be “permeable[to] air.” EX1008, 2:38-41; FIG. 1; EX1003, ¶85.



CN'842 likewise discloses that "airbag suit 1 is made of breathable mesh fabric" and is used to cover an airbag 11 worn by motorcyclists, among other users. EX1011, ¶¶1, 15, 23, 25, 29; EX1003, ¶86.



EX1011, FIG. 1.

Mazzarolo'986 (EX1009) and Mazzarolo'993 (EX1010) are in the same field of endeavor as the '065 patent. EX1003, ¶87. Mazzarolo'986 discloses a “protective garment suitable for being worn by a motorcyclist, such as a jacket, a riding suit or a vest suitable in turn to be worn with a suit or a jacket,” EX1009, ¶2, housing “one or more inflatable bags 12” within a casing that “can be made with a breathable material, for example a mesh material.” EX1009, ¶54. “The casing can coincide with the whole housing 2,... or alternatively can be a portion of the housing 2. Alternatively, the casing can be in the form of a closed pocket.” EX1009, ¶55.

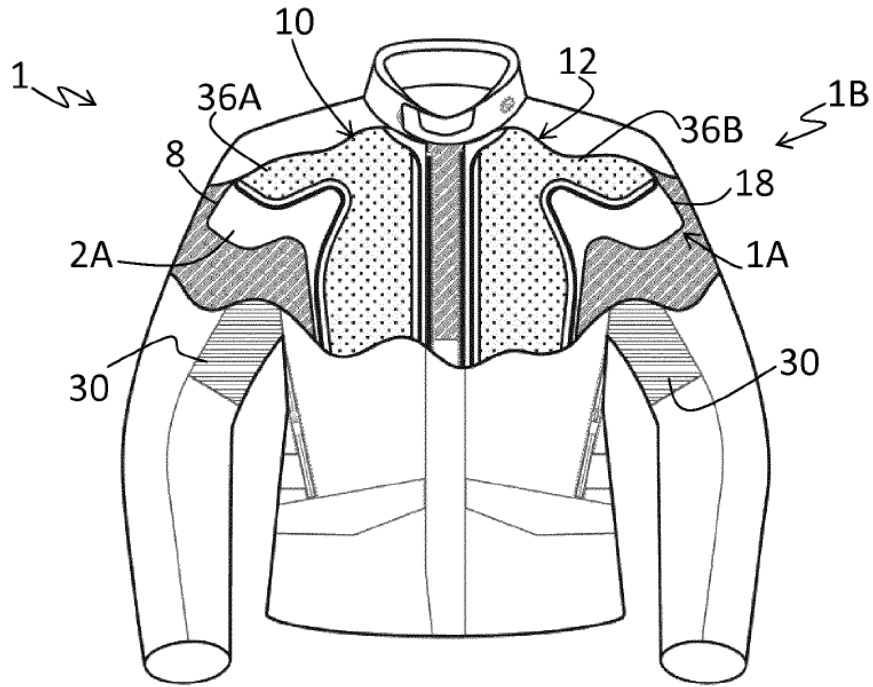


Fig. 3a

EX1009, FIG. 3a.

Mazzarolo'993 similarly discloses “a casing 20 configured to be worn by a motorcyclist and to house the inflatable bag 10,” EX1010, ¶38; FIG. 1, that “can also be made with mesh materials.” *Id.*, ¶40; EX1003, ¶88.

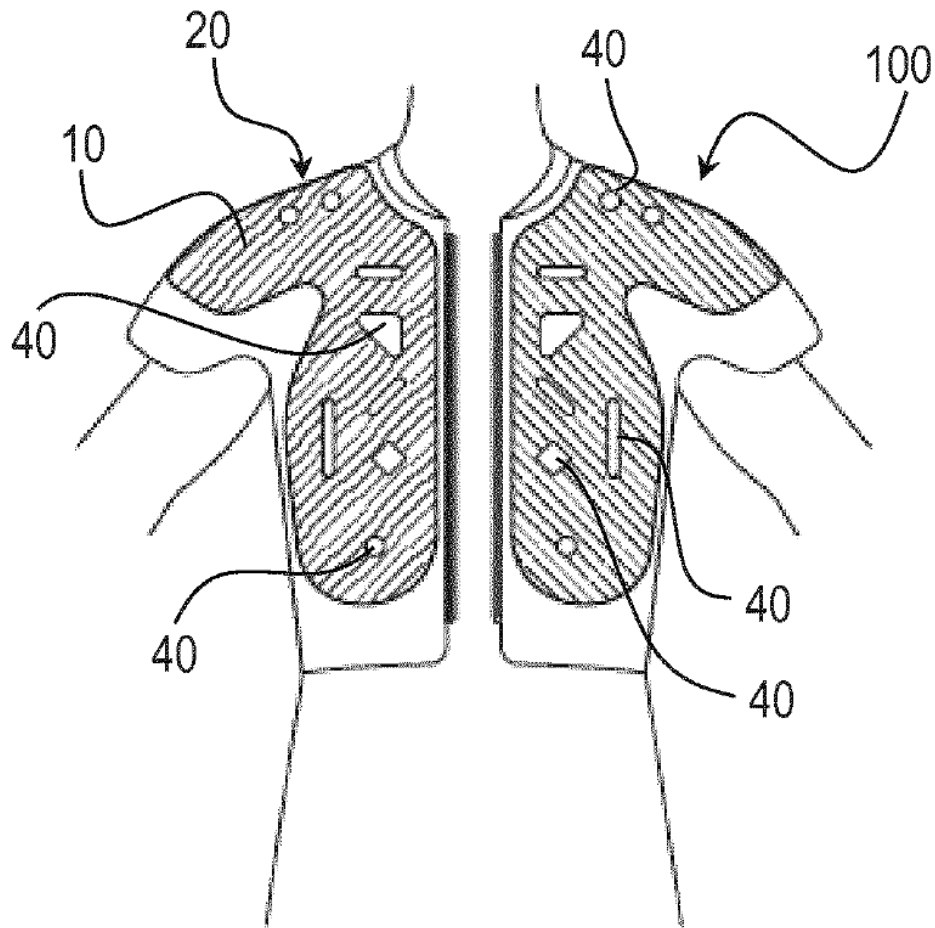
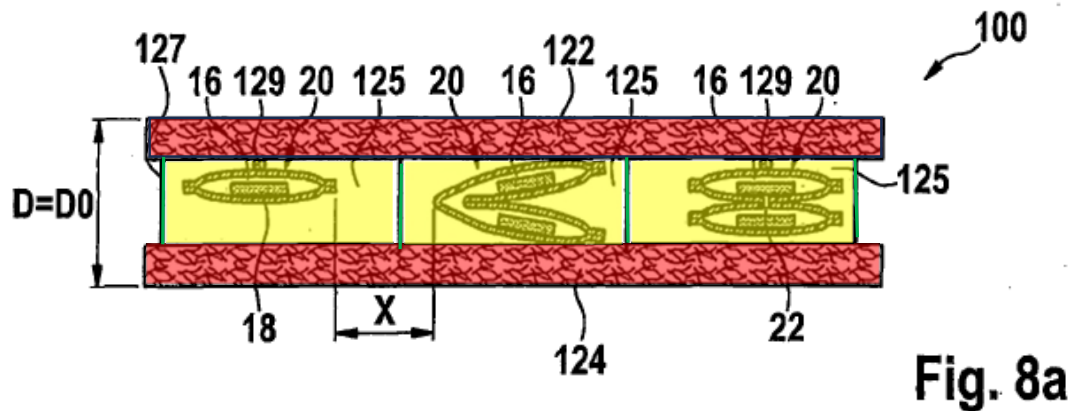


FIG. 1

EX1010, FIG. 1. A POSITA knew of mesh containers for inflatable casings in protective materials. As such, EP'536 in view of Hatton and/or the knowledge of a POSITA renders this limitation obvious under any alternative construction of “mesh structure” and “mesh portion” (Ground 2). EX1003, ¶89.

3. [1b]

EP'536 discloses this limitation. EX1003, ¶90. EP'536 discloses that “pockets 125 are formed by the first and second layers 122, 124” because the layers 122, 124 are connected by the stitches 127. EX1004, ¶224; FIG. 8a (pockets 125 highlighted in yellow):



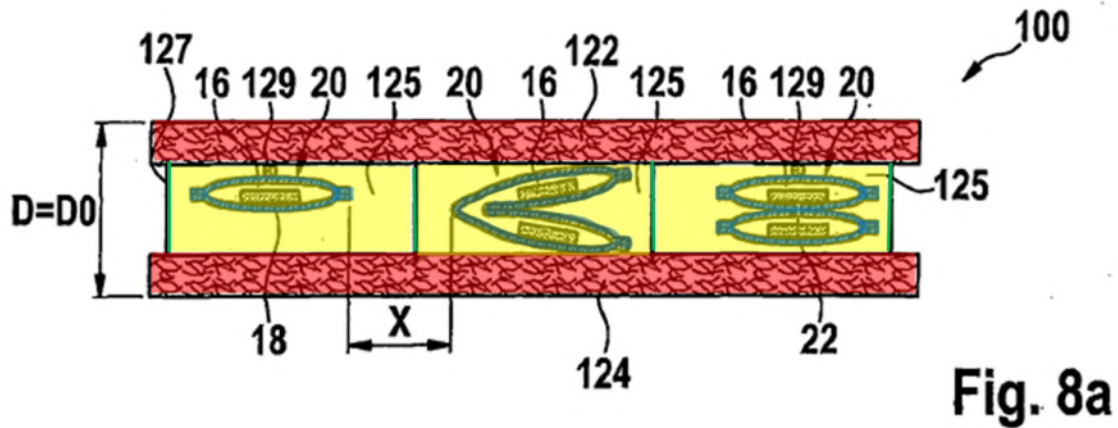
EX1004, FIG. 8a. Each of these “pockets 125 receives a respective one of ... envelopes 20.” EX1004, ¶224. As discussed below in more detail for limitation [1c], the envelopes 20 are the claimed “casing body arranged at least in an inner housing of said plurality of inner housings.” As such, the stitching 127 (tie elements) comprise dividing walls defining a plurality of pockets 125 (inner housings) between the first layer 122 (first mesh portion) and second layer 124 (second mesh portion). EX1003, ¶91.

4. [1c]

EP'536 in view of CN'180 renders this limitation obvious. EX1003, ¶92. EP'536 discloses that “envelopes 20 are received in the pockets 125” formed by

the first layer 122, second layer 124 and stitching 127. EX1004, ¶224; FIG. 8a

(showing three different envelopes 20 configurations highlighted in blue):



EX1004, FIG. 8a.

EP'536 discloses that the envelopes 20 have an “unactivated condition” where the “envelope 20 has an uninflated, essentially flat shape.” EX1004, ¶165, FIG. 2a. EP'536 discloses that the envelopes 20 “chang[e] shape to the shape of an inflated pillow in the activated condition.” *Id.*, ¶130; FIG. 2b:

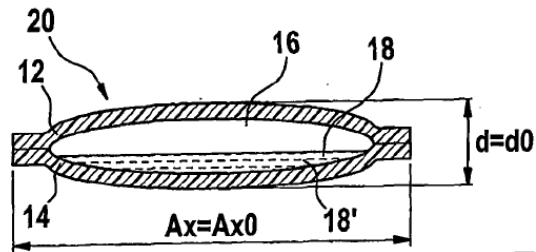


Fig. 2a

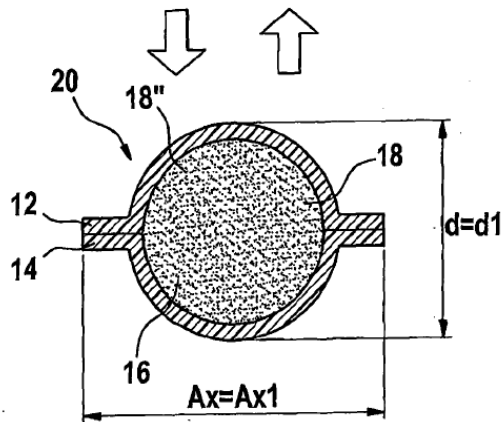


Fig. 2b

EX1004, FIGS. 2a, 2b; ¶156 (“Figs.2a and 2b show an example of an envelope ... in an unactivated condition and in an activated condition”).

For the EP’536 embodiment shown in FIG. 8a, “[a]ctivation of the gas generating agent 18 provides for a volumetric increase (“inflation”) of the envelopes 20 in the pockets 125.” EX1004, ¶156. According to EP’536, “[s]uch inflation of the envelopes 20 induces movement of the first layer 122 and second layer 124 away from each other and increases the distance D between the first layer 122 and the second layer 124 from a first distance D0 to a second distance D1.” *Id.* As such, EP’536 discloses that “said casing body [envelopes 20] is configured to assume a deflated condition [unactivated condition] and an inflated

condition [activated condition] in said at least one inner housing [pockets 125] of said mesh structure [structure 100].” EX1003, ¶¶93-94.

Moreover, when in the deflated/unactivated condition, the envelopes 20 occupy a first space/region of the pockets 125 leaving a second space/region of the pockets 125 that does not include the envelopes 20:

first space/region

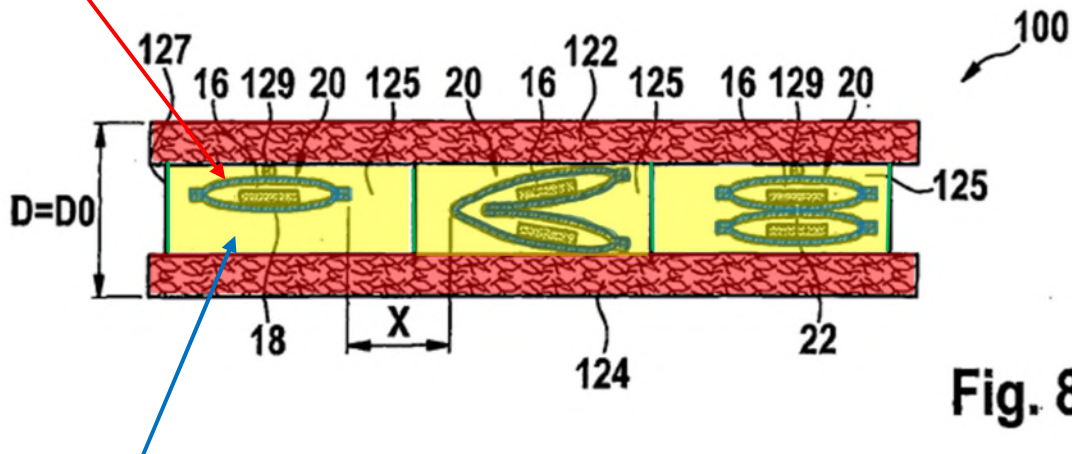
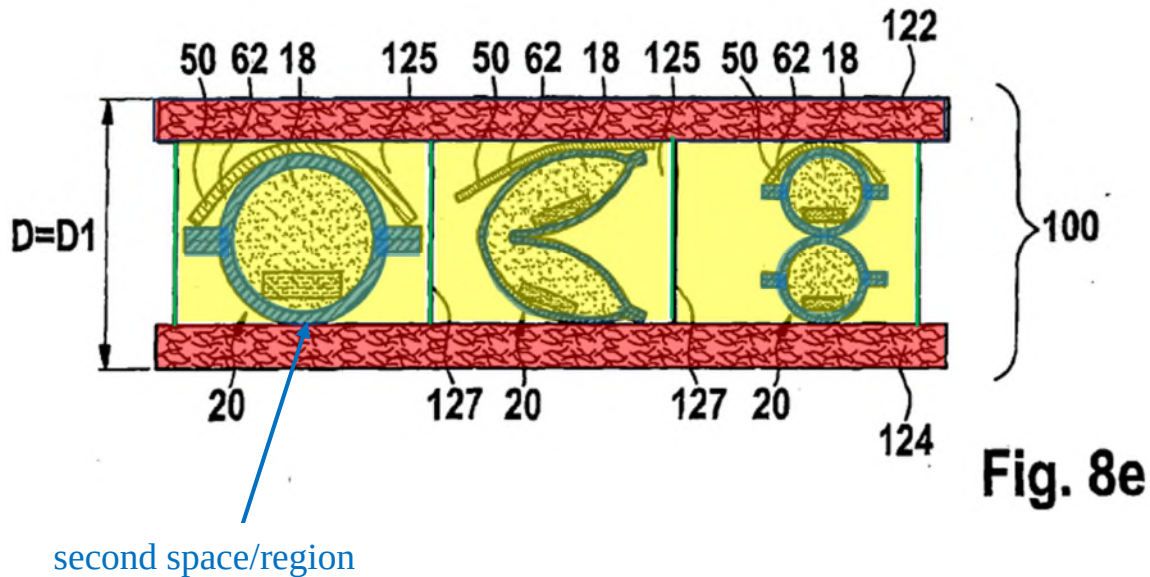


Fig. 8a

second space/region

EX1004, FIG. 8a; EX1003, ¶95. As shown below, when in the inflated/activated condition the envelopes 20 further occupy the second space/region of the pockets 125:

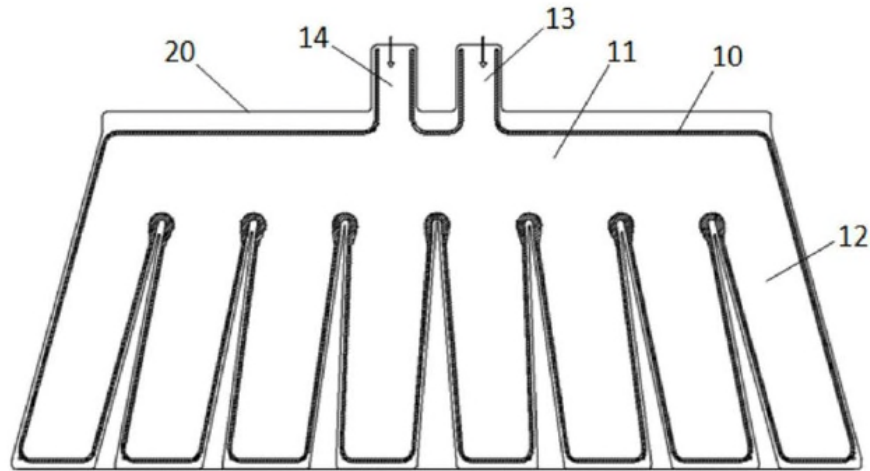


EX1004, FIG. 8e; ¶233 (“Fig. 8e shows the laminar structure 100 in an activated condition in which the gas generating agent 18 included in the envelopes 20 is in the activated configuration thereof”);⁶ EX1003, ¶96.

To the extent individual envelopes 20 do not disclose a single “casing body,” EP’536 in view of CN’180 renders it obvious. EX1003, ¶97. Specifically, CN’180

⁶ FIG. 8e illustrates a laminar structure 100 that “is similar to” the structure shown in FIG. 8a. EX1004, ¶233. FIG. 8e, however, additionally illustrates a shield 50 not used in the embodiment of Fig. 8a. *Id.* EP’536 does not include a figure illustrating the FIG. 8a structure 100 in the activated condition. A POSITA would have understood that the structure 100 of FIG. 8a would achieve the same inflated/activated condition as that shown in FIG. 8e (without the shield 50) as evidenced e.g., by the inflated condition shown in FIG. 2b. EX1003, n. 5.

discloses a one-piece airbag 10 (“casing body”) with strip-shaped inflation units 12 (portions of the casing body). EX1005, ¶20; FIG. 1.

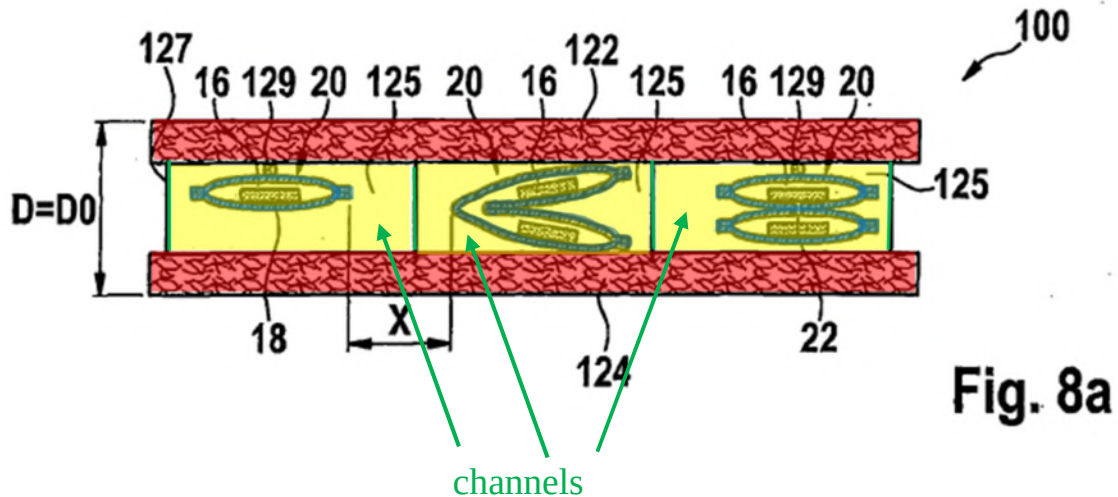


EX1005, FIG. 1. Like the EP’536 envelopes 20, CN’180’s inflation units 12 fit within an inner housing (i.e., accommodating chambers 21), and have deflated and inflated conditions. EX1005, ¶¶20, 23; EX1003, ¶97.

5. [1d]

EP’536 in view of CN’180 renders this limitation obvious. EX1003, ¶98.

There are a plurality of envelopes 20, each arranged in a corresponding pocket 125 (inner housing) of the plurality of pockets 125:



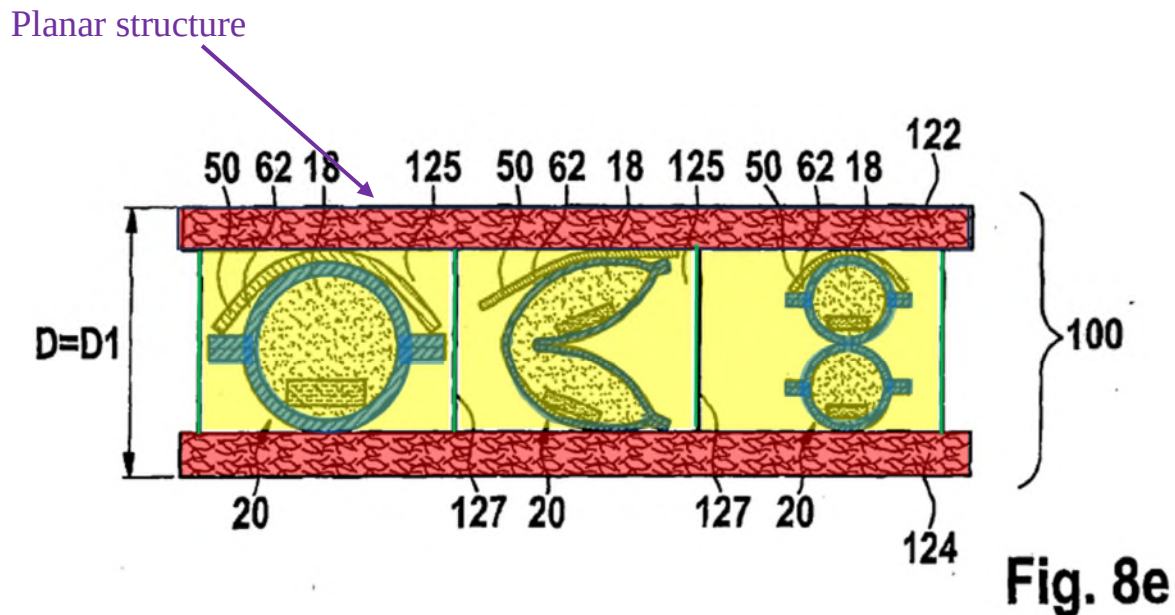
EX1004, FIG. 8a; ¶ 224 (“each of these pockets 125 receives a respective one of the envelopes 20”).

Moreover, the pockets 125 define channels that are arranged side-by-side to each other and that are separated from each other by the stitching 127 (tie element) of the plurality of stitching 127. As also shown above, each pocket 125 is configured to house a corresponding envelope 20. EP’536 in view of CN’180 renders obvious a single casing body (airbag 10) with portions (inflation units 11). EX1005, ¶20; EX1003, ¶99.

6. [1e]

EP’536 in view of CN’180 renders this limitation obvious. EX1003, ¶100. EP’536 discloses that “typically envelopes 20 of a *same* configuration will be used for a laminar structure.” EX1004, ¶224. Accordingly, a POSITA would have understood that the left-most envelope 20 would or could have been used for each pocket 125 as taught by EP’536. EX1003, ¶100.

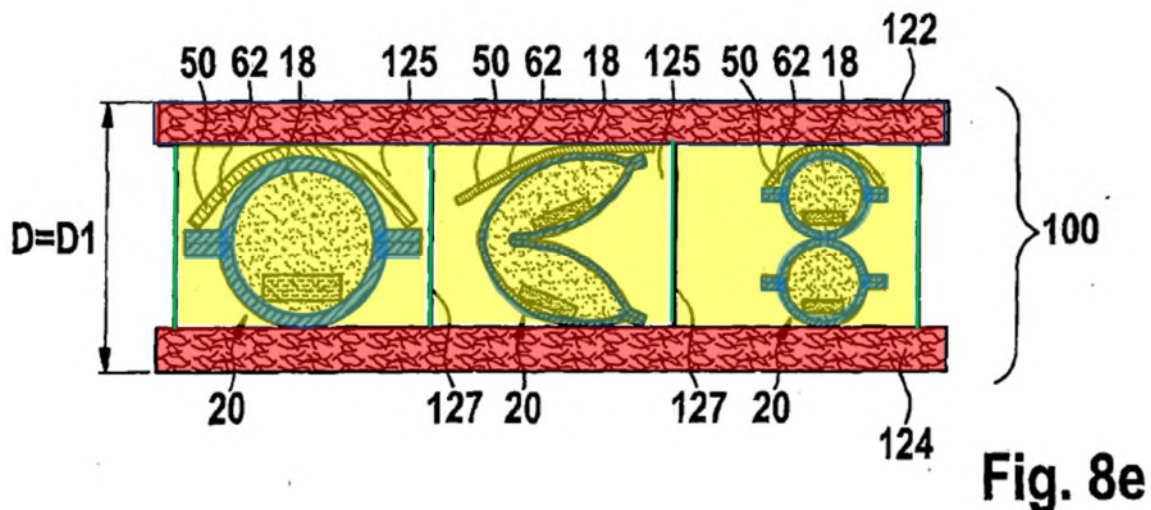
Moreover, as noted above for limitation [1c], FIG. 8e illustrates a shield 50 not present in or required by the FIG. 8a structure 100. As such, a POSITA would have understood that in the inflated condition, envelopes 20 with the left most configuration below would be inflated against the first layer 122 (first mesh portion), second layer 124 (second mesh portion), and the stitching 127 (tie elements to form the below planar structure:



EX1004, FIG. 8e; *see also* §III.D.2. EP'536 in view of CN'180 renders obvious a single casing body (airbag 10) with portions (inflation units 11). EX1005, ¶¶20, 23; EX1003, ¶101.

C. Claim 2

EP'536 in view of CN'180 alone or in combination with Hatton renders the additional limitations of claim 2 obvious. EX1003, ¶102. EP'536 discloses that in the inflated condition the envelopes 20 are configured to line from the inside, and be at least partially in contact with, the laminar structure 100 (mesh structure). *Id.* EP'536 discloses that envelopes 20 (particularly with the left most configuration below) would be inflated against the first layer 122 (first mesh portion), second layer 124 (second mesh portion), and the stitching 127 (tie elements) so as to line from the inside, and at least partially contact, the structure 100 (via layers 122, 124):



EX1004, FIG. 8e; ¶233.

EP'536 in view of CN'180 renders obvious a single casing body with portions. §§V.A, V.B. EP'536 further discloses a jacket that includes the laminar

structure 100, which is within the fabric composite structure 150. EX1004, ¶250;

FIG. 10 (structure 150 circled in red); EX1003, ¶103.

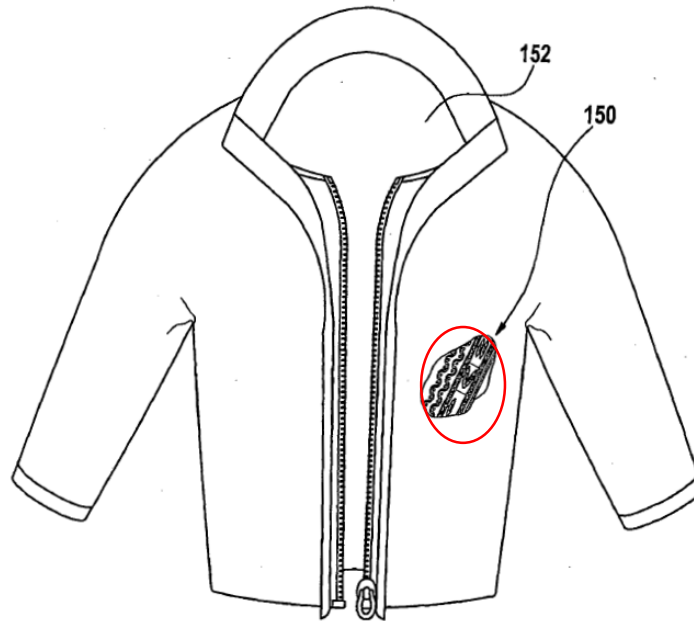
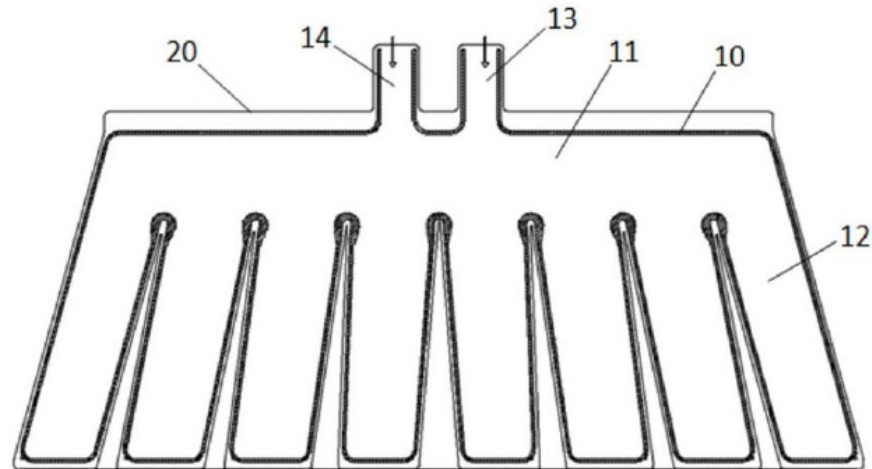


Fig. 10

EX1004, FIG. 10.

Moreover, EP'536 in view of CN'180 renders obvious that the laminar structure 100 (mesh structure) is an external structure of said protective device. EX1003, ¶¶104-105. Specifically, CN'180 discloses an "airbag structure for a fall protection belt" that "includes an airbag 10 and a bag cover 20." EX1005, ¶19. "The airbag 10 is provided with an inflation chamber 11 and a plurality of strip-shaped inflation units 12 connected to the inflation chamber 11." *Id.*

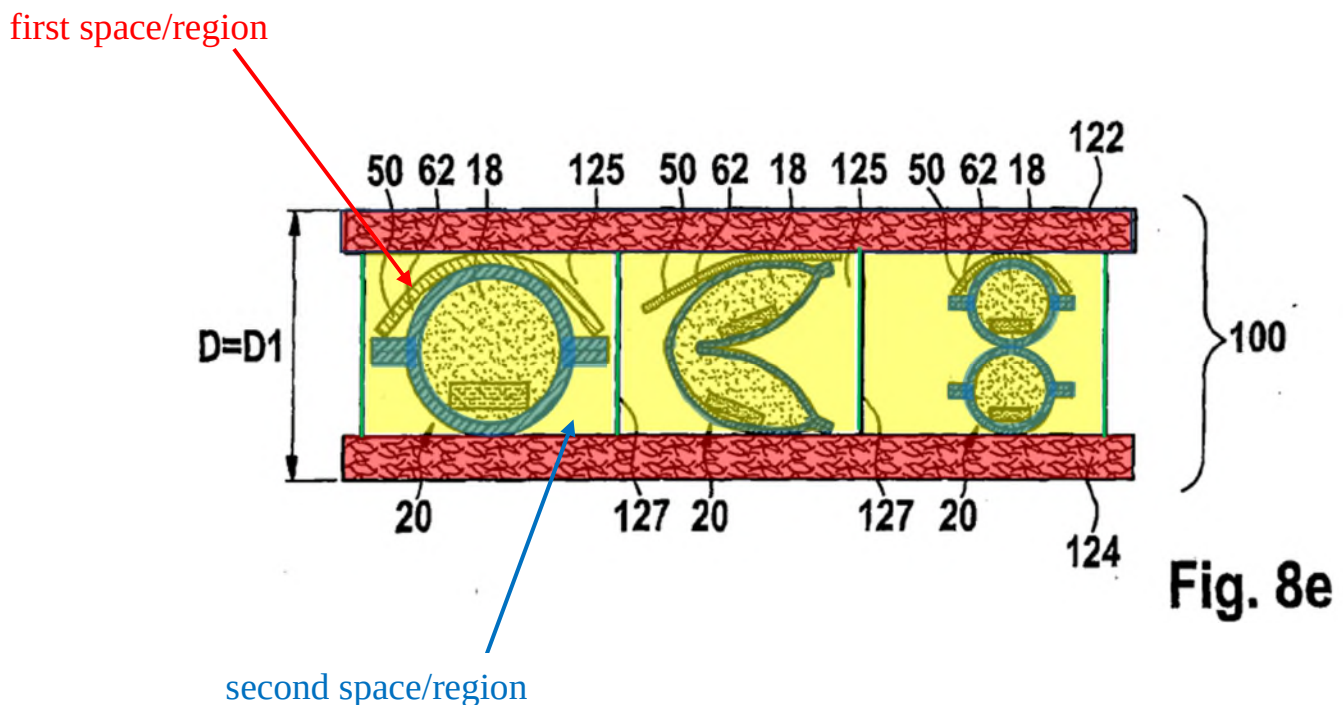


EX1005, FIG. 1.

CN'180 discloses that “[w]hen the waist belt is worn on the human body, the airbag cover 20 is arranged in the waist belt in a strip shape. When the air is inflated from the air inlet 20 to the inflation chamber 10, the strip-shaped inflatable unit 12 opens from top to bottom, and *the airbag cover 20 is a ring structure, wrapped around the hip femur and thigh of the wearer.*” EX1005, ¶23; *see also* ¶24 (“the airbag cover can effectively protect the airbag, and the airbag can quickly form during inflation so that it is not easy to deform and can fit the human body well after opening and effectively protect the wearer.”). A POSITA would have understood that that airbag cover 20, once inflated and unfolded becomes an external structure of the waist belt. EX1003, ¶106.

D. Claim 3

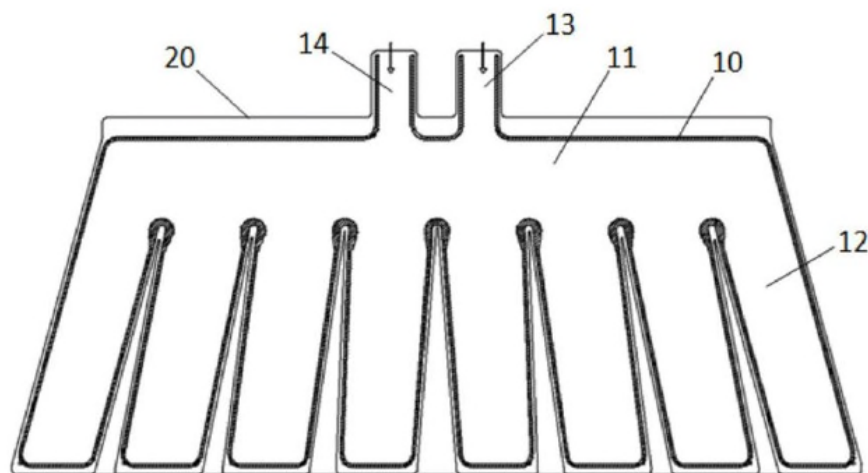
EP'536 in view of CN'180 renders the additional limitations of claim 3 obvious. EX1003, ¶107. As discussed for limitation [1c], EP'536 discloses that when in the inflated/activated condition the envelopes 20 occupy the first and second space/regions of the pockets 125:



EX1004, FIG. 8e; ¶233; §V.B.4. EP'536 in view of CN'180 renders obvious a single casing body with portions. §§V.A, V.B. Moreover, EP'536 in view of CN'180 renders obvious that the casing body “completely” occupies the second region/space and the first region/space of the pockets 125. EX1003, ¶108.

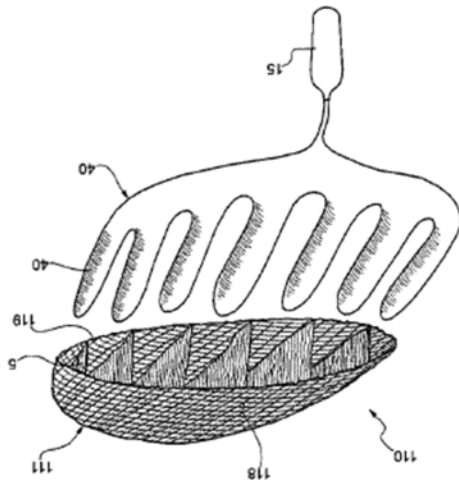
Specifically, CN'180 discloses an “airbag structure for a fall protection belt” that “includes an airbag 10 and a bag cover 20.” EX1005, ¶19. “The airbag 10 is provided with an inflation chamber 11 and a plurality of strip-shaped inflation units 12 connected to the inflation chamber 11.” *Id.* Moreover, a “plurality of sutures 22 are provided on the airbag cover 20” and a “sealing patch is provided on the sutures 22.” EX1005, ¶20. “A plurality of strip-shaped accommodating chambers 21 for accommodating the strip-shaped inflatable units 12 are formed between the sutures 22.” *Id.* According to CN'180, the “number of the strip-shaped accommodating chambers 21 is the same as the number of the strip-shaped inflatable units 12.” *Id.*

CN'180 discloses that the “plurality of strip-shaped inflation units 12 are placed at the lower end of the inflation chamber 11.” EX1005, ¶19. The lower end would correspond to a first region/space of the CN'180 bag 20 and chambers 21. EX1003, ¶¶109-110.

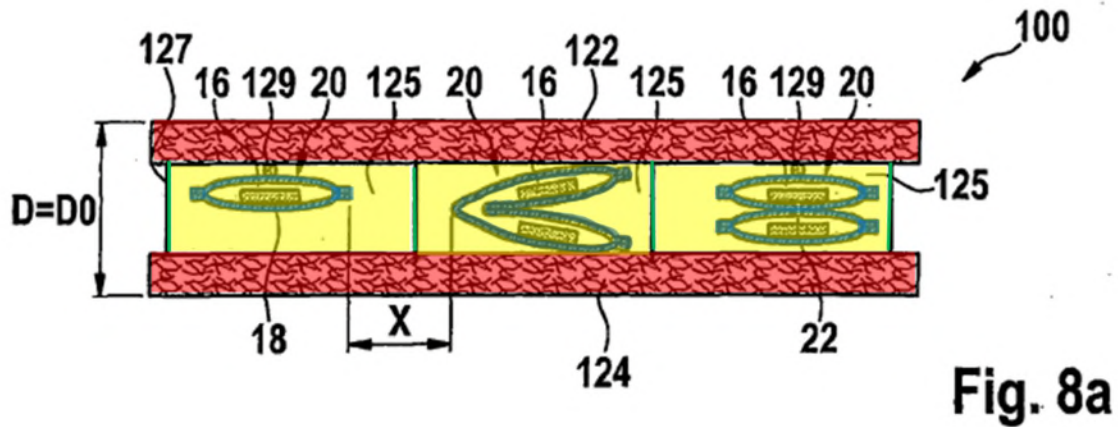


EX1005, FIG. 1.

CN'180 discloses that when inflating, each “strip-shaped inflatable unit 12 opens from top to bottom.” EX1005, ¶23. This inflated structure is substantially the same as the structure disclosed by the '065 patent. EX1003, ¶111:



EX1004, ¶224; FIG. 8a (showing three different envelopes 20 configurations highlighted in blue):



EX1004, FIG. 8a.

EP'536 discloses that the envelopes 20 have an “unactivated condition” where the “envelope 20 has an uninflated, essentially flat shape.” EX1004, ¶165, FIG. 2a. EP'536 discloses that the envelopes 20 “chang[e] shape to the shape of an inflated pillow in the activated condition.” *Id.*, ¶130; FIG. 2b:

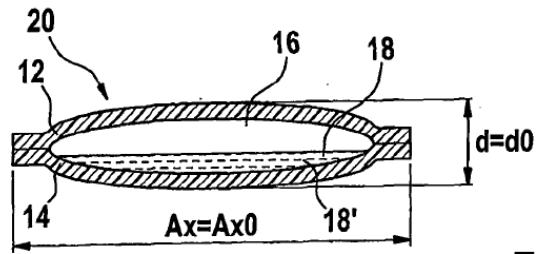


Fig. 2a

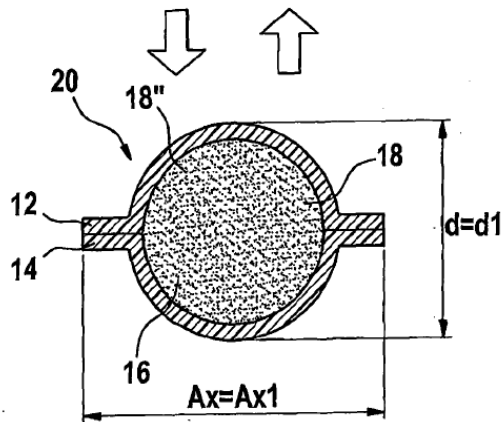


Fig. 2b

EX1004, FIGS. 2a, 2b; ¶156 (“Figs.2a and 2b show an example of an envelope ... in an unactivated condition and in an activated condition”); EX1003, ¶¶113-114.

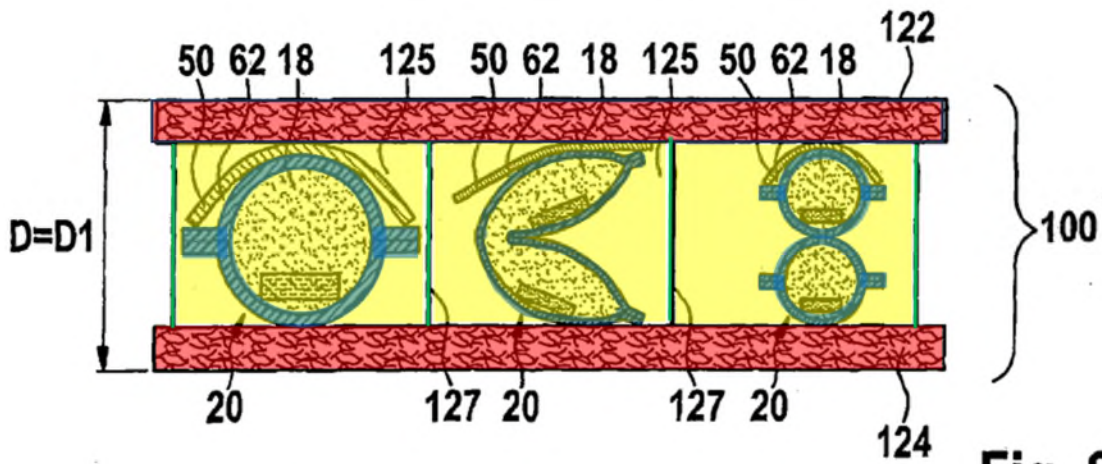


Fig. 8e

EX1004, FIG. 8e.

As shown above, EP’536 discloses that “[a]ctivation of the gas generating agent 18 provides for a volumetric increase (“inflation”) of the envelopes 20 in the

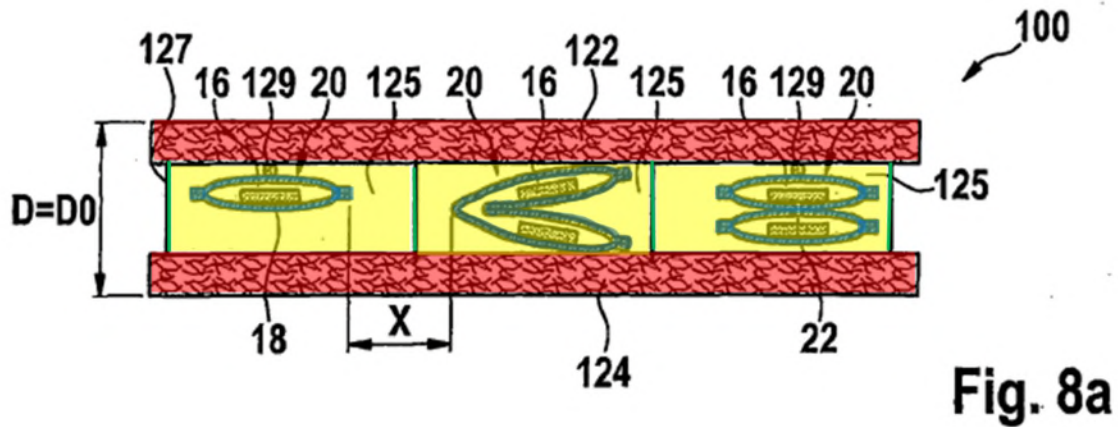
pockets 125.” EX1004, ¶156. According to EP’536, “[s]uch inflation of the envelopes 20 *induces movement of the first layer 122 and second layer 124 away from each other and increases the distance D between the first layer 122 and the second layer 124 from a first distance D0 to a second distance D1.*” *Id.*; EX1003, ¶115.

As such the deflated condition of the envelopes 20 (as shown in FIG. 8a) corresponds to a slack and loose condition of the laminar structure 100 and its stitching 127 because there is room in these structures allowing “the first layer 122 and second layer 124 [to move] away from each other and increase[] the distance D between the first layer 122 and the second layer 124” when the envelopes 20 are in the inflated condition. EX1003, ¶116. Moreover, when the envelopes 20 are in the inflated condition, there is at least a partially tensioned condition of the stitching 127 and the first and second layers 122, 124 because the layers 122, 124 are moved away from each other and the stitching 127 restricts the amount of movement. *Id.* EP’536 in view of CN’180 renders obvious a single casing body with portions. §§V.A, V.B.

F. Claim 5

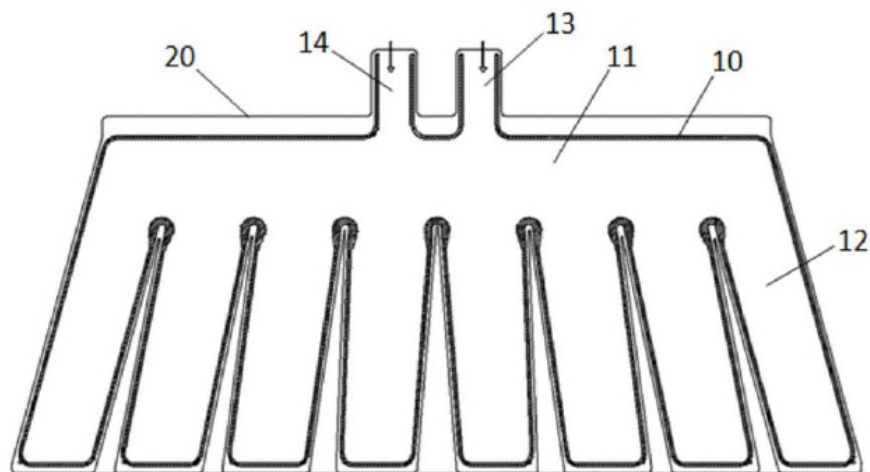
EP’536 in view of CN’180 renders the additional limitations of claim 5 obvious. EX1003, ¶117. EP’536 discloses that “envelopes 20 are received in the pockets 125” formed by the first layer 122, second layer 124 and stitching 127.

EX1004, ¶224; FIG. 8a (showing three different envelopes 20 configurations highlighted in blue):



EX1004, FIG. 8a.

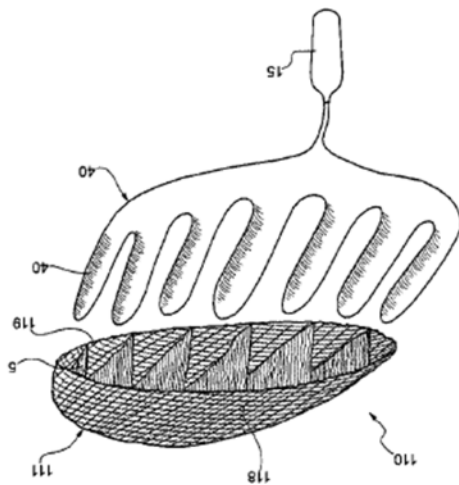
EP'536 in view of CN'180 renders obvious a single casing body with portions. §§V.A, V.B. Moreover, EP'536 in view of CN'180 renders obvious that the casing body has a hand/comb/tree shape EX1003, ¶118.



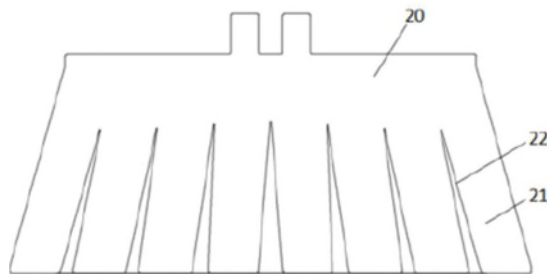
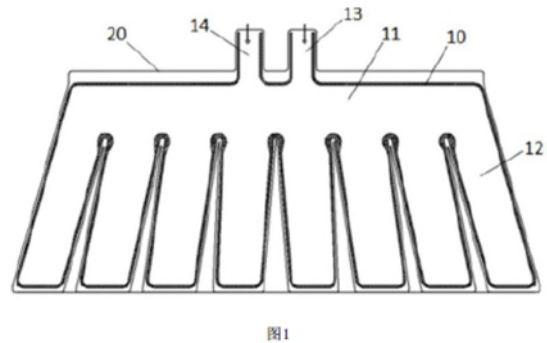
EX1005, FIG. 1.

Specifically, CN'180 discloses an “airbag 10... provided with an inflation chamber 11 and a plurality of strip-shaped inflation units 12 connected to the inflation chamber 11.” EX1005, ¶19. Moreover, CN'180 discloses a “plurality of strip-shaped accommodating chambers 21 for accommodating the strip-shaped inflatable units 12.” EX1005, ¶20; EX1003, ¶119.

The CN'180 structure is substantially the same as the structure disclosed by the '065 patent. EX1003, ¶120:



'065 Patent FIG. 1 (inverted)



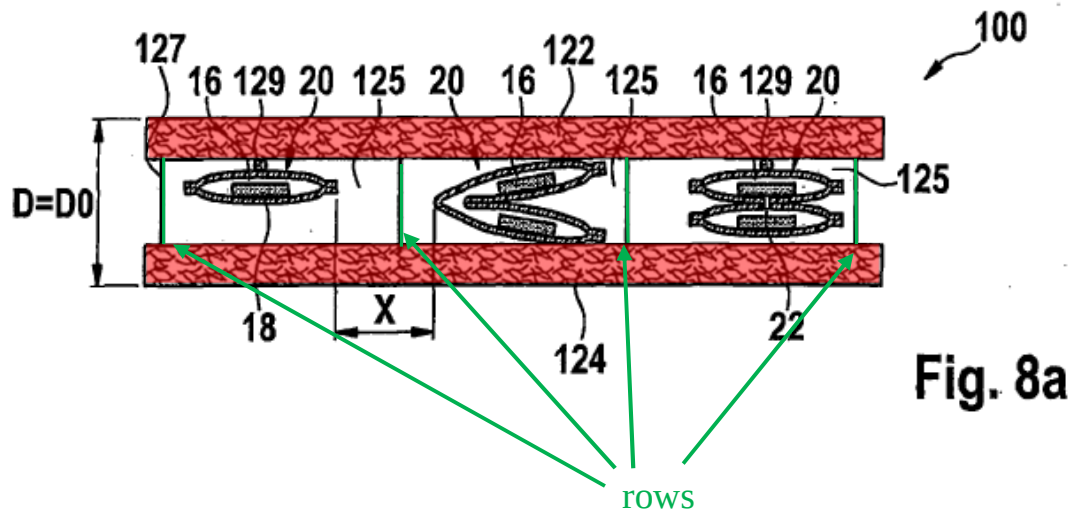
CN'180 FIGS. 1 and 2

G. Claim 6

EP'536 discloses the additional limitations of claim 6. EX1003, ¶121.

EP'536 discloses a laminar structure 100 comprising “a first layer 122 and a

second layer 124.” EX1004, ¶224; FIG. 8a (layers 122, 124 highlighted in red). As shown below, “the textile layers 122, 124 may be connected via stitches 127 in the form of a quilted composite” so that “pockets 125 are formed by the first and second layers 122, 124.” *Id.*; FIG. 8a (stiches 127 highlighted in green):



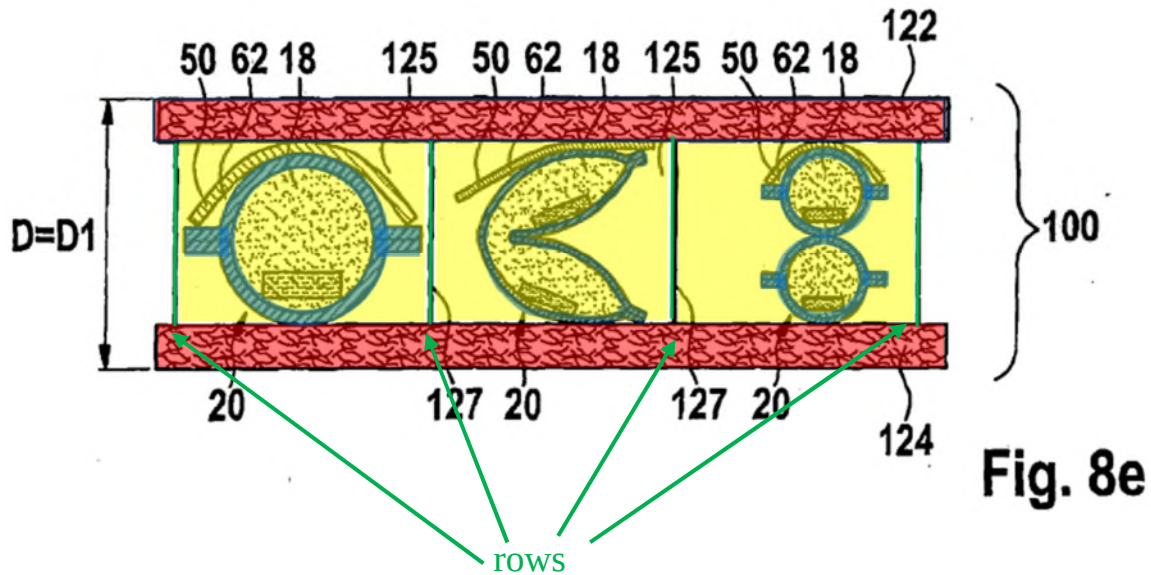
EX1004, FIG. 8a.

The stitches 127 are aligned in a plurality of rows. EX1003, ¶122.

H. Claim 7

EP’536 discloses the additional limitations of claim 7. EX1003, ¶123.

EP’536 discloses a laminar structure 100 comprising “a first layer 122 and a second layer 124.” EX1004, ¶224; FIG. 8a (layers 122, 124 highlighted in red). In addition, “the textile layers 122, 124 may be connected via stitches 127 in the form of a quilted composite” so that “pockets 125 are formed by the first and second layers 122, 124.” *Id.*; FIG. 8e (stiches 127 highlighted in green):



EX1004, FIG. 8e.

As discussed above for claim 4, in the activated condition, the stitches 127 are at least partially tensioned. §V.E. Moreover, EP'536 describes the arrangement of the layers 122, 124 and stitches 127 as forming “a quilted composite.” EX1004, ¶224. According to EP'536, this means that “first and second layers 122, 124 are connected by a plurality of stitched seams.” *Id.*, ¶271; EX1003, ¶124. An example of “stitched seams 72a - 72d, 74a - 74d” is shown below:

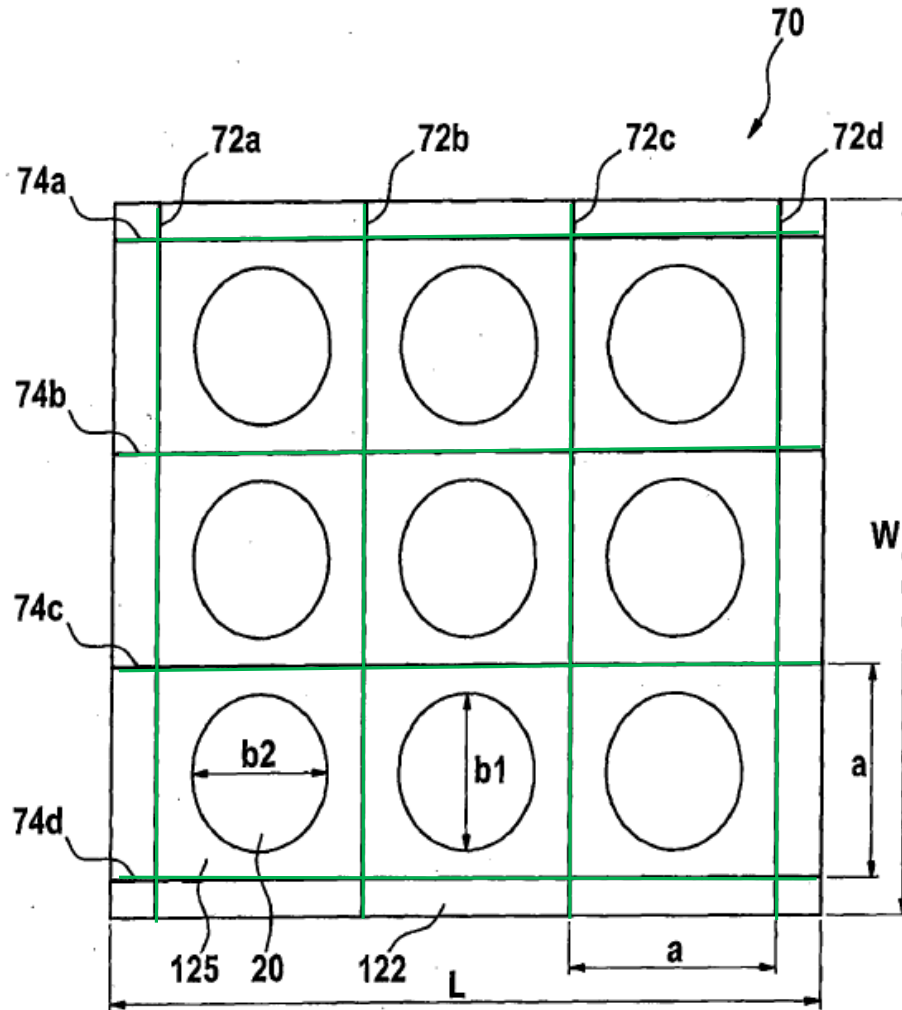


Fig. 12

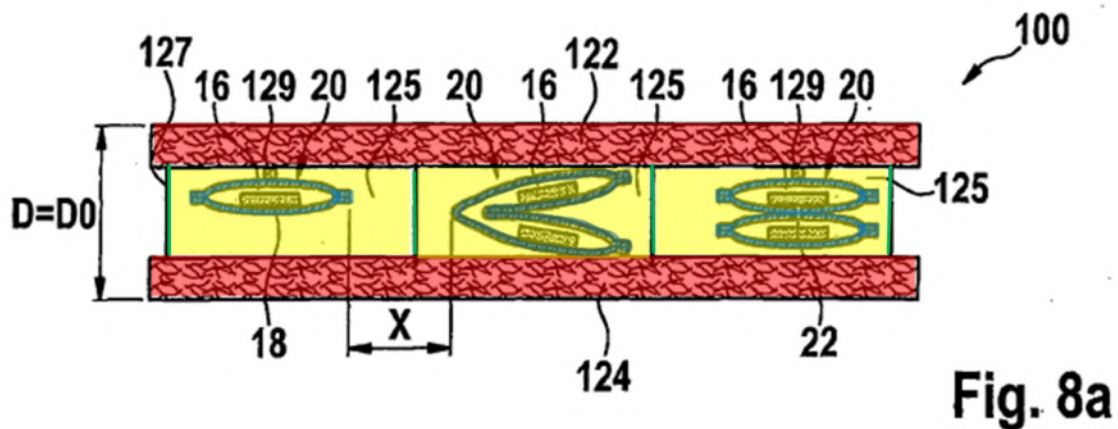
EX1004, FIG. 12 (seams 72a - 72d, 74a - 74d highlighted in green).

The stitches 127 (tie elements) in each row of stitches 127 would comprise a plurality of stitches 127 to form a stitched seam. EX1003, ¶125. Moreover, as shown above in FIGS. 8e and 12, the stitches 127 belonging to a same row of stitches 127 (e.g., seams 74a - 74d) are arranged substantially parallel to each other when in the partial tension condition. *Id.*

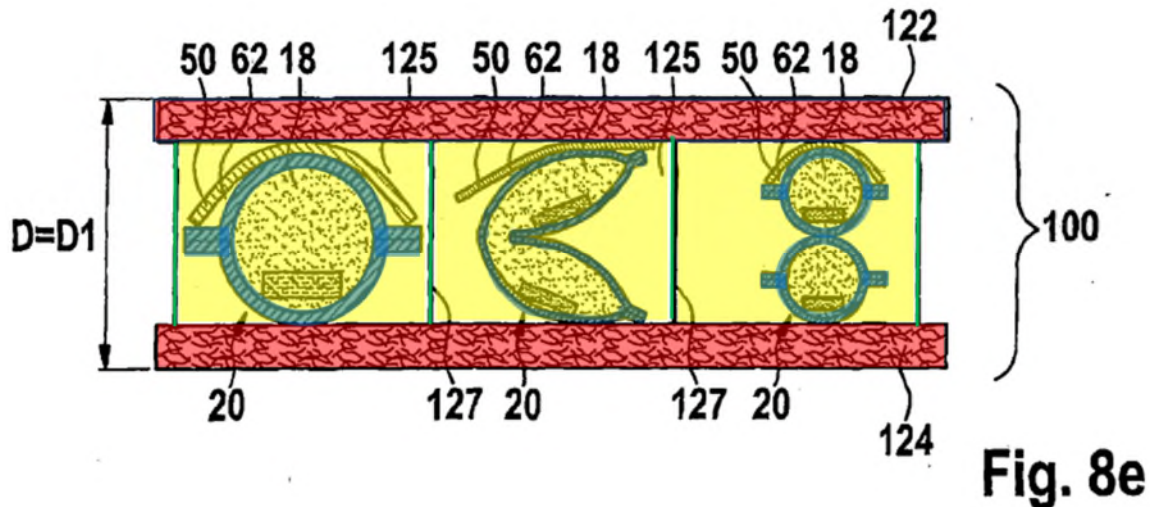
This is consistent with the '065 patent, which teaches that “when the inflatable element 2 is in the inflated condition, tie threads 5 are parallel to each other in the respective row 24 and substantially orthogonal to the direction of the row.” EX1001, 7:10-14; EX1003, ¶126.

I. Claim 8

EP'536 in view of CN'180 renders the additional limitations of this claim obvious. EX1003, ¶127. As shown below, the first and second layers 122, 124 (mesh portions) and the casing body formed by the envelopes 20 define an inflatable element (inflatable mesh structure 100):



EX1004, FIG. 8a (deflated condition).

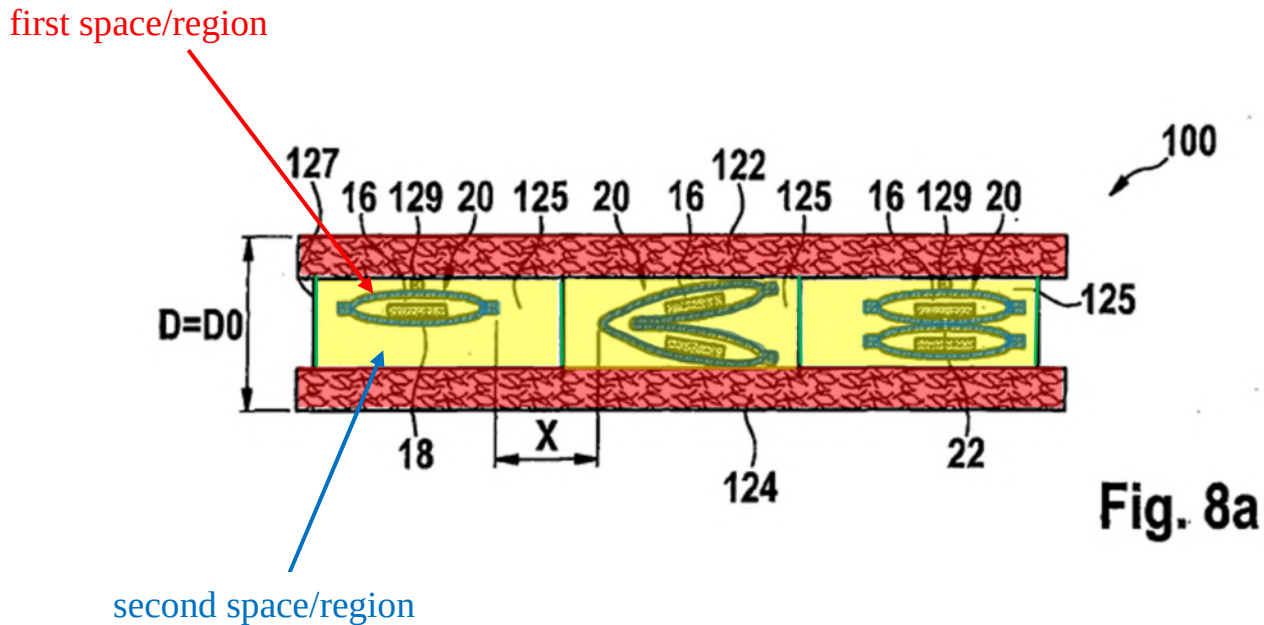


EX1004, FIG. 8e (inflated condition); EX1003, ¶128.

EP'536 discloses “structures providing adaptive thermal insulation, and in particular relates to an envelope for a laminar structure providing adaptive thermal insulation.” EX1004, ¶1. According to EP'536, “[s]uch laminar structure may be used in the design of fabrics or textiles, in particular in applications for personal protective equipment, e.g. garment, like protective garment or other functional garment like gloves.” *Id.* The adaptive thermal insulation, and therefore protection provided by the EP'536 structure 100, arises when the structure 100 and casing body formed by the envelopes 20 are in the activated/inflated condition. *Id.*, ¶¶15-16; EX1003, ¶129.

Likewise, the adaptive thermal insulation is not triggered when the structure 100 and casing body formed by the envelopes are in the deflated/unactivated condition. EX1004, ¶¶15-16. A POSITA would have understood this to be a “rest condition” of the inflatable element. EX1003, ¶130.

Moreover, when in the deflated/unactivated condition, the envelopes 20 occupy a first space/region of the pockets 125 leaving a second space/region of the pockets 125 that lack the envelopes 20:



EX1004, FIG. 8a; EX1003, ¶131; *see also* §V.B.4.

Therefore, in the deflated condition the second region of at least one pocket 125 (inner housing) allows passage of air between the first and second layers 122, 124 (first and second mesh portions) passing through the second region of the at least one at least one pocket 125. EX1003, ¶132. EP'536 discloses increasing air within the pockets 125 during the inflated/activated condition. EX1004, ¶¶19 (“air layer” formed by “increase[ing] the distance between the first layer and the second layer”), 122 (“additional air gap”). A POSITA would have understood that to **increase air** during the inflated/activated condition, air was already present and

passing through the second region during the deflated/unactivated condition, based on these teachings from EP'536. EX1003, ¶132. EP'536 in view of CN'180 renders obvious a single casing body with portions. §§V.A, V.B.

J. Claim 9

EP'536 in view of CN'180 renders the additional limitation of claim 9 obvious. EX1003, ¶133. EP'536 discloses that each envelope 20 “encloses cavity 16 which is filled with gas generating agent 18.” EX1004, ¶168; FIGS. 2a, 8a (gas generating agent 18 highlighted in orange):

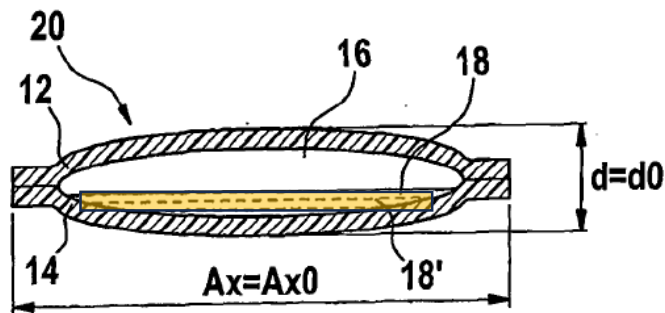


Fig. 2a

EX1004, FIG. 2a.

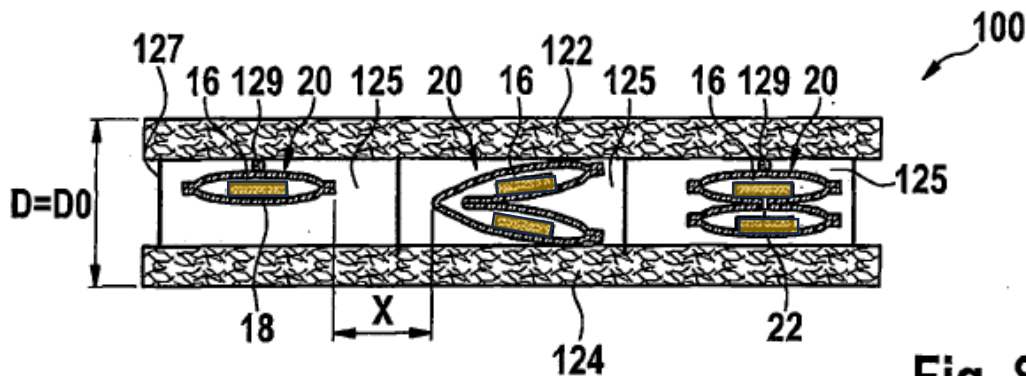


Fig. 8a

EX1004, FIG. 8a. EP'536 in view of CN'180 renders obvious a single casing body with portions. §§V.A, V.B.

K. Claim 10

EP'536 discloses the additional limitation of claim 10. EX1003, ¶134. In one embodiment, the protective device is a jacket. EX1004, FIG. 10. The jacket includes the laminar structure 100, which is within the fabric composite structure 150. EX1004, ¶250; FIG. 10 (structure 150 circled in red).

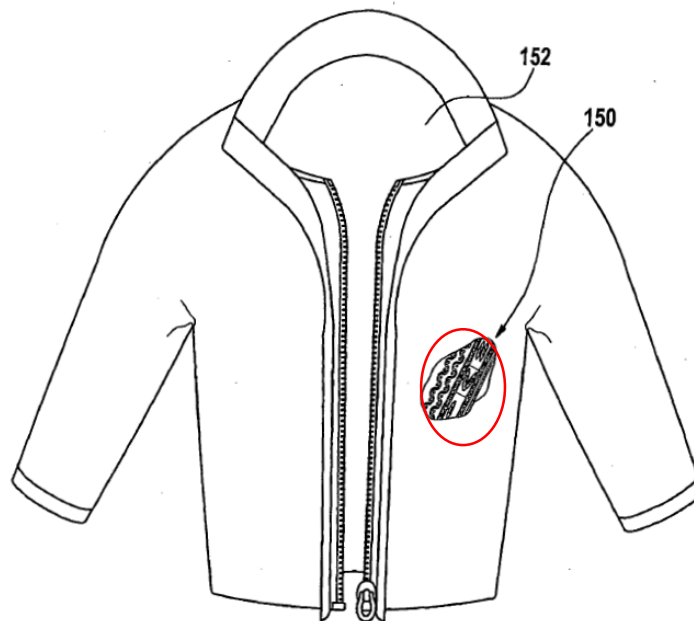


Fig. 10

EX1004, FIG. 10.

L. Claim 11

EP'536 in view of CN'180 alone or in combination with Hatton or the knowledge of the POSITA renders this claim obvious for the reasons discussed for claims 1 and 10. §§V.B, V.K.

M. Claim 12

EP'536 discloses the additional limitations of claim 12. EX1003, ¶136. For example, jacket (protective garment) includes the laminar structure 100, which is within the fabric composite structure 150. EX1004, ¶250; FIG. 10 (structure 150 circled in red).

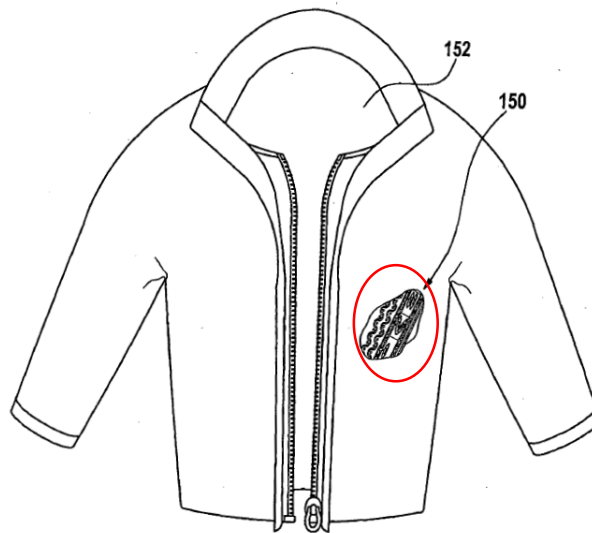


Fig. 10

EX1004, FIG. 10.

One embodiment of the composite structure 150 includes a functional layer 140. EX1004, ¶254; FIG. 9e (functional layer highlighted in red):

first space/region

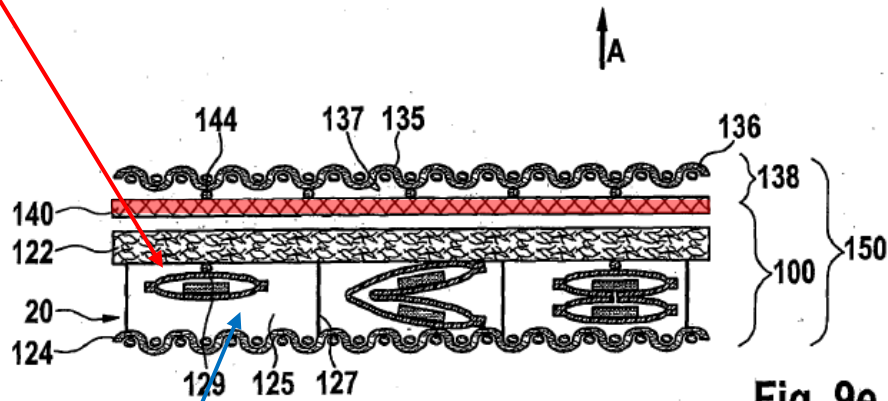


Fig. 9e

second space/region

EX1004, FIG. 9e; EX1003, ¶137.

The functional layer 140 (covering layer) covers the first region and said second region of the pockets 125 (one or more inner housings). EX1004, ¶248; FIG. 9e. EP’536 also discloses that a “functional layer” can be “air permeable” depending upon the application of the protective device or structure 100. *Id.*, ¶134. As such, the functional layer (covering layer) is formed of a breathable material. EX1003, ¶138.

N. Claim 13

EP’536 in view of CN’180 alone or in combination with Hatton renders this claim obvious for the reasons discussed for claim 2. §V.C.

O. Claim 14

EP'536 discloses this claim for the reasons discussed for claim 10. § V.K.

P. Claim 15

EP'536 discloses the additional limitations of claim 15. EX1003, ¶141.

EP'536 discloses that in at least “one embodiment the first layer and/or the second layer comprises [a] functional layer.” EX1004, ¶131; §V.B.2. In addition, EP'536 also discloses that a “functional layer” can be “air permeable” depending upon the application of the protective device or structure 100. EX1004, ¶134. As such, structure 100 (mesh structure) is a perforated structure that allows air to pass through it. EX1003, ¶141.

Q. Claim 16

EP'536 renders the additional limitations of this claim obvious. EX1003, ¶142. EP'536 discloses that in at least “one embodiment the first layer and/or the second layer comprises [a] functional layer.” EX1004, ¶131; §V.B.2. EP'536 also discloses that a “functional layer” can be “air permeable” depending upon the application of the protective device or structure 100. EX1004, ¶134. EP'536 admittedly does not explicitly disclose a “net.”

However, a POSITA would have understood that a net could be used as the mesh structure 100 or its layers 122, 124 (mesh portions). Nets have been used in similar devices, before the priority date of the '065 patent, and would be well within the knowledge of a POSITA. EX1003, ¶143 (citing Klein as an example). A

POSITA would have found it obvious to try using a net as the mesh structure in the EP'536 structure because it would have been a selection from a finite number of identified predictable solutions (i.e., using a net as taught by Klein versus another perforated material). EX1003, ¶143. A POSITA would have been motivated to use a net both for increased breathability, as well as reduced weight and increased garment flexibility. *Id.*

A POSITA would have understood that there would have been a reasonable expectation of success in doing so as EP'536 already disclosed the means (i.e., air permeable functional layer) for implementing a net (as known to a POSITA and taught by Klein); EX1003, ¶144.

R. Claim 17

EP'536 in view of CN'180 alone or in combination with Hatton or the knowledge of the POSITA renders this claim obvious for the reasons discussed for limitations [1c]-[1e]. §§V.B.4-V.B.6.

S. Claim 18

1. [18pre]

To the extent the preamble is a limitation, EP'536 discloses it. EX1003, ¶146. EP'536 discloses a “structure [that] may be used in the design of fabrics or textiles, in particular in applications for *personal protective equipment*, e.g. garment, like *protective garment* or other functional garment like gloves.” EX1004, ¶1; *see also* ¶¶14, 154; §V.B.

2. [18a]

EP'536 alone or in combination with Hatton or the knowledge of the POSITA renders this limitation obvious for the reasons set forth for limitations [1a]-[1b]. §§V.B.2, V.B.3.

3. [18b]

EP'536 in view of CN'180 alone or in combination with Hatton or the knowledge of the POSITA renders this limitation obvious for the reasons set forth for limitations [1c]-[1d]. §§V.B.4, V.B.5.

4. [18c]

EP'536 in view of CN'180 alone or in combination with Hatton or the knowledge of the POSITA renders this limitation obvious for the reasons set forth for limitations [1c]-[1e]. §§V.B.4-V.B.6.

T. Claim 19

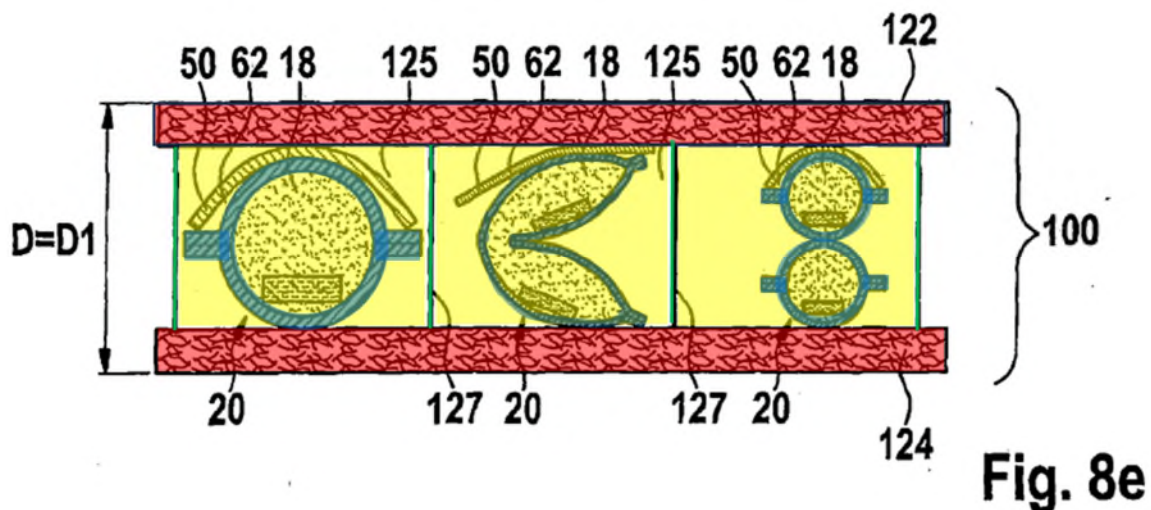
EP'536 in view of CN'180 alone or in combination with Hatton or the knowledge of the POSITA renders claim 18 obvious. §V.S. In addition, EP'536 in view of CN'180 renders this claim obvious for the reasons set forth for claim 4. §V.E.

U. Claim 20

EP'536 in view of CN'180 renders the additional limitations of this claim obvious for the reasons set forth for claim 4. §V.E. EP'536 discloses that the “envelopes 20 are thus fixed by their respective pocket 125 with respect to

movement in the length/width plane defined by the layers 122, 124.” EX1004,

¶224. Moreover, “[a]ctivation of the gas generating agent 18 provides for a volumetric increase (“inflation”) of the envelopes 20 in the pockets 125. Such inflation of the envelopes 20 induces movement of the first layer 122 and second layer 124 away from each other and increases the distance D between the first layer 122 and the second layer 124 from a first distance D0 to a second distance D1.” *Id.*, ¶226; FIG. 8e.



EX1004, FIG. 8e.

Accordingly, EP’536 discloses that when the envelopes 20 forming the casing body are inflated, and the mesh structure 100 is tensioned, the mesh structure 100 bridles and prevents a further expansion of the envelopes 20. EX1003, ¶¶ 151-152. EP’536 in view of CN’180 renders obvious a single casing body with portions. §§V.A, V.B.

V. Claim 21

EP'536 in view of CN'180 renders the additional limitations of this claim obvious for the reasons set forth for claim 8. §V.I.

W. Claim 22

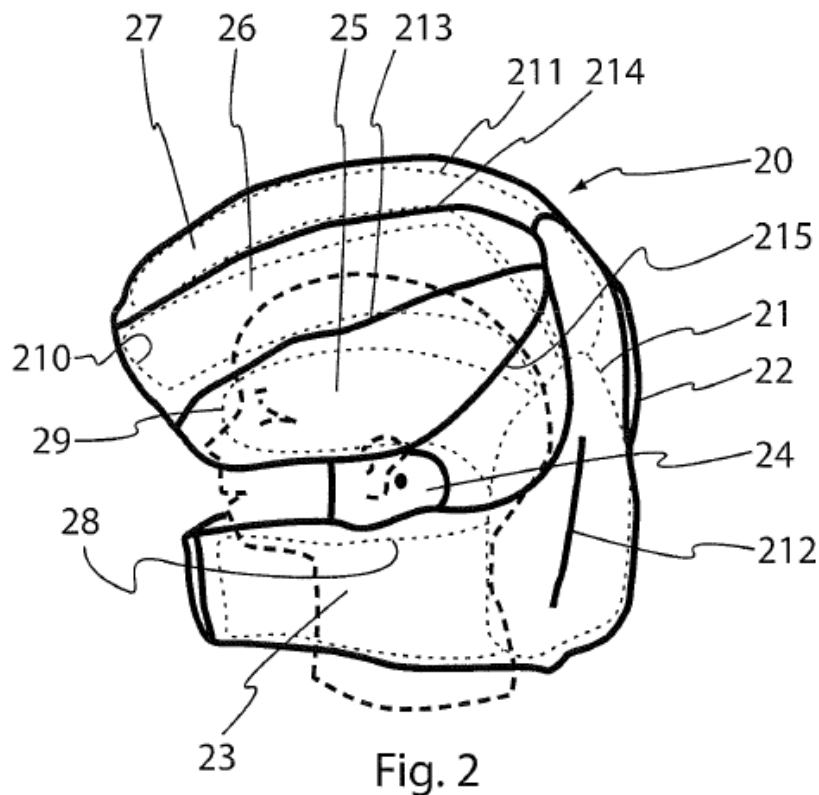
EP'536 in view of CN'180 renders the additional limitations of this claim obvious for the reasons set forth for claim 4. §V.E.

VI. GROUND 3: EP'297 IN VIEW OF CN'842 RENDERS CLAIMS 1-22 OBVIOUS

A. Motivation to Combine

As discussed below for claim 1, EP'297 discloses that that its “airbag 20 comprises an inner bag 21, 30 (shown with thin dashed lines in Fig. 2) positioned inside an outer bag 22, 33 such that the inner bag 21, 30 is surrounded, or at least partially surrounded, by the outer bag 22, 33.” EX1007, ¶30.⁷

⁷ EP'297 refers to the inner bag with two reference numerals 21/30 in the text and uses numeral 21 in FIG. 2 and numeral 30 in FIG. 3. EP'297 refers to the outer bag with two reference numerals 22/33 in the text and uses numeral 22 in FIG. 2 and numeral 33 in FIG. 3. EX1003, n. 6. Unless quoting specific language from EP'297, Petitioners use “inner bag 30” and “outer bag 33” throughout this Petition.



EX1007, FIG. 2; EX1003, ¶155.

According to EP'297, the “outer bag 22 does not necessarily have to be fluid-impermeable, since the inner bag 21 is capable of expanding the outer bag 22.” EX1007, ¶31. Stated differently, EP'297 discloses that the outer bag 22, 33 and the layers forming the outer bag (layers 39, 310) could be fluid permeable. EX1003, ¶156. A POSITA would have understood that with the outer bag 33 being fluid permeable, its layers and the outer bag 33 would comprise some form of fabric or other material “that allows air or other gas to pass” and would be a “mesh structure” within the meaning of the '065 patent. *See, e.g.*, EX1001, 3:22-29; §III.D.1; EX1003, ¶156.

CN'842 explicitly discloses a “mesh” or “mesh” portions. EX1011, ¶¶1, 15, 23, 25, 29; EX1003, ¶157.

A POSITA would have been motivated to modify EP'297's outer bag 33 (and therefore its overall protective garment) with teachings from CN'842. EX1003, ¶158. For example, both references relate to airbag systems/devices where an inflatable airbag is housed within another structure and the airbag's inflation is constrained/limited by that structure. *See, e.g.*, EX1007, ¶¶36, 40, FIG. 3; EX1011, section (57), ¶¶1, 21-23, 25, 27, FIG. 1; EX1003, ¶158. Both references are directed to airbag systems/devices that are worn by a user and are therefore analogous art. *See, e.g.*, EX1007, ¶¶1, 7, 8, 25, FIG. 2; EX1011, section (57), ¶1; EX1003, ¶158. A POSITA would have been motivated to modify EP'297's outer bag 33 with CN'842 “mesh” or “mesh” portions to reduce weight, reduce size, increase breathability, and for manufacturability. EX1003, ¶158. Mesh covers are used in other protective helmets for these same reasons – e.g. bicycle helmets. *Id.*

A POSITA would have understood that EP'297's outer bag 33 (mesh structure) and first and second layers 39, 310 (mesh portions) would have easily been implemented with the mesh structure disclosed by CN'842, particularly in view of EP'297's disclosure that the outer bag 33 may be fluid-permeable. EX1003, ¶159.

The decision to do so would have simply involved combining prior art elements (i.e., mesh outer bag as a cage/frame that houses an airbag or airbag elements) according to known methods (i.e., the techniques disclosed in CN'842) to yield predictable results (i.e., a wearable airbag system that is more air permeable/breathable). EX1003, ¶160. Moreover, a POSITA would have understood that implementing EP'297's outer bag 33 (mesh structure) and first and second layers 39, 310 with mesh structure/material (to the extent they are not considered mesh structures/material already) would have merely involved the simple substitution of one known element (i.e., the mesh structures/materials of CN'842) for another (for the alleged non-meshed layers 39, 310 forming outer bag 33) to obtain predictable results (i.e., a wearable airbag system that is air permeable/breathable). EX1003, ¶160.

A POSITA would have had a reasonable expectation of success in doing so as EP'297 already disclosed the means for implementing mesh structures/materials into the outer bag 33 and its first and second layers 39, 310 (i.e., with material that can be fluid-permeable). EX1003, ¶161. And because other helmets (e.g. bicycle helmets) already use mesh coverings in the same way. *Id.*

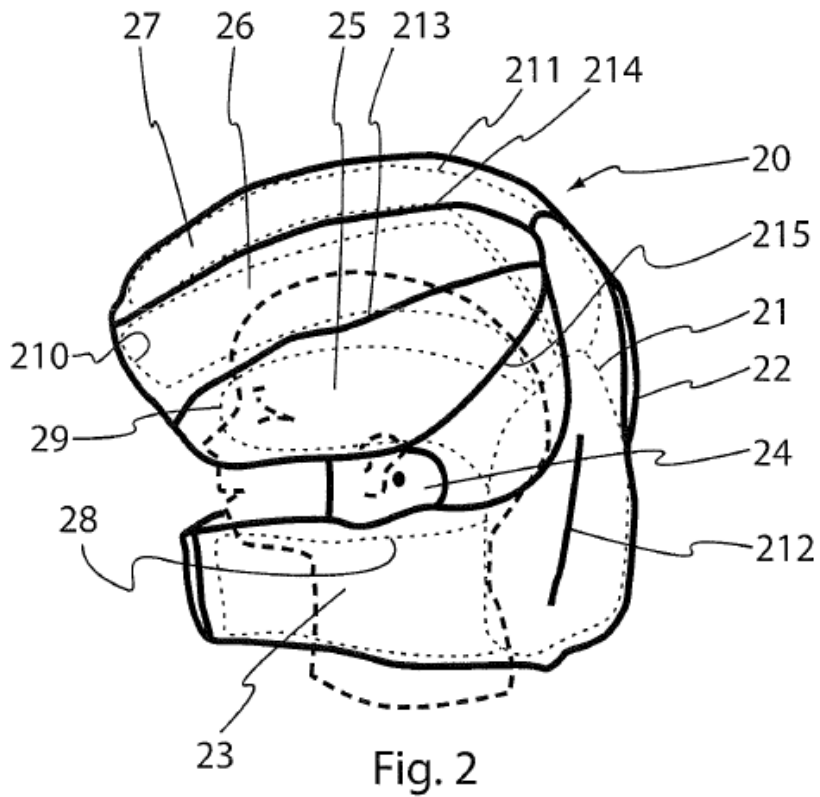
B. Claim 1

1. 1[pre]

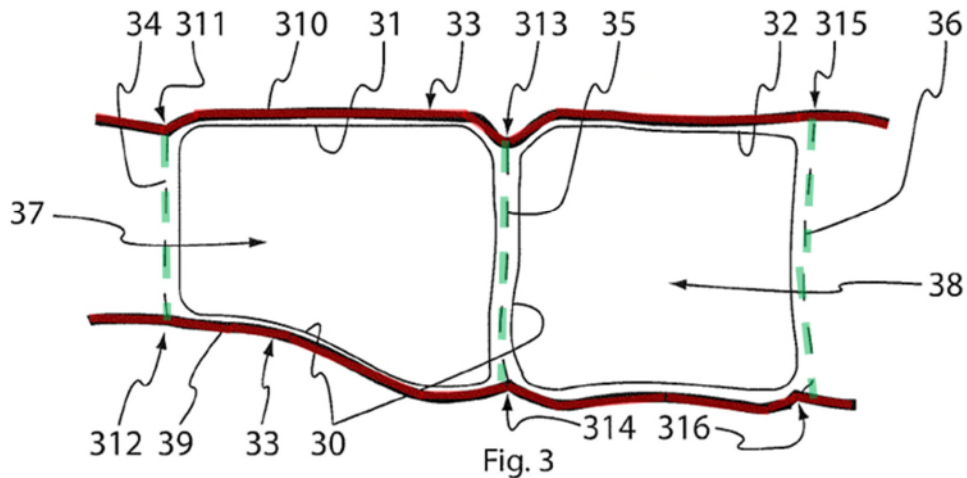
If the preamble is limiting, EP'297 discloses it. EX1003, ¶162. EP'297 discloses “a wearable airbag for protecting a user's head.” EX1007, ¶1; *see also* ¶¶7, 8, 25.

2. [1a]

EP'297 discloses, or EP'297 in view of CN'842 render obvious, this limitation. EX1003, ¶163. EP'297 discloses that its “airbag 20 comprises an inner bag 21, 30 (shown with thin dashed lines in Fig. 2) positioned inside an outer bag 22, 33 such that the inner bag 21, 30 is surrounded, or at least partially surrounded, by the outer bag 22, 33.” EX1007, ¶30.



EX1007, FIG. 2. The outer bag 33 includes “a first 39 and a second 310 layer” that are joined together by “one or more straps 34, 35, 36.” EX1007, ¶34; FIG. 3 (layers 39, 310 highlighted in red, straps 34, 35, 36 highlighted in green); EX1003, ¶164.



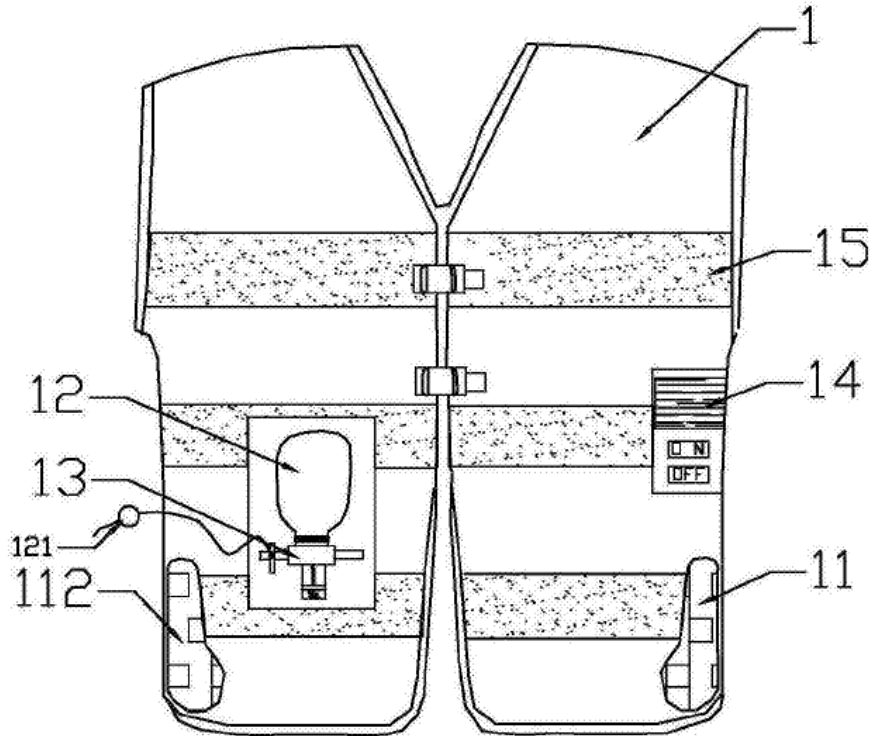
EX1007, FIG. 3.

The first layer 39 and second layer 310 “are opposite one another and are connected [to] one another by” the straps 34, 35, 36 (plurality of tie elements).

EX1007, ¶34; FIG. 3; EX1003, ¶165. The “[s]traps 34, 35, 36 may be utilized to provide improved control of distance between the layers” 39, 310 “to create a fluid filled volume suitable for absorbing a shock directed at the head of a wearer of said airbag.” EX1007, ¶36. The straps 34, 35, 36, therefore, are tie elements according to the '065 patent, which states that “the term tie element is meant [as] an element in the broad sense, that is to say an element which is tensioned between the two mesh portions when the inflatable casing body is inflated.” EX1001, 3:43-46; EX1003, ¶165.

According to EP'297, the "outer bag 22 does not necessarily have to be fluid-impermeable, since the inner bag 21 is capable of expanding the outer bag 22." EX1007, ¶31. Stated differently, EP-297 discloses that the outer bag 22, 33 and the layers forming the outer bag (layers 39, 310) could be fluid permeable. EX1003, ¶166. A POSITA would have understood that with the first and second layers 39, 310 and the resultant bag 33 being fluid permeable, these layers and the outer bag would comprise some form of fabric or other material "that allows air or other gas to pass" and would be a "mesh structure" within the meaning of the '065 patent. *See, e.g.*, EX1001, 3:22-29; §III.D.1; EX1003, ¶166. Layers 39, 310 within the outer bag 33 form a "cage structure which traps and blocks or contains expansion of [a] casing body [inner bag 30]," also within the meaning of "mesh structure" according to the '065 patent. *See, e.g.*, EX1001, 3:26-31; EX1003, ¶166.

Even if the Board finds that EP'297 does not explicitly disclose a "mesh" or "mesh" portions, CN'842 certainly does. For example, CN'842 discloses that an "airbag suit 1 is made of breathable mesh fabric" and used to cover an airbag 11 worn by motorcyclists, among other users. EX1011, ¶¶1, 25, 29; EX1003, ¶167.

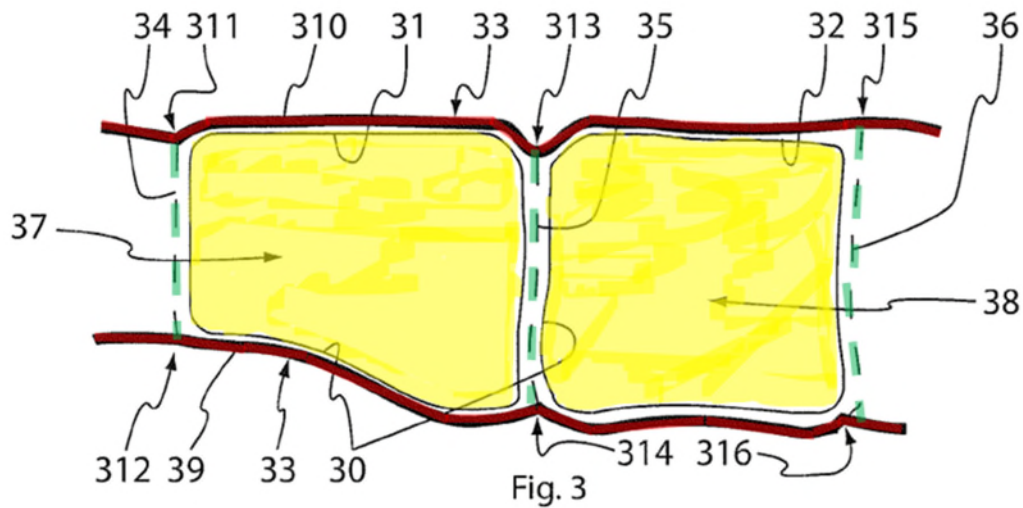


EX1011, FIG. 1.

Thus, to the extent EP'297 fails to disclose or render obvious this limitation, EP'297 in view of CN'842 renders it obvious. EX1003, ¶168.

3. [1b]

EP'297 discloses this limitation. EX1003, ¶169. EP'297 discloses that “sections 37, 38 may be formed in the outer bag 33 by joining together portions 212, 213, 214, 215, 311, 312, 313, 314, 315, 316 of a first 39 and a second 310 layer of the outer bag 33 by means of one or more straps 34, 35, 36 connecting the portions 212, 213, 214, 215, 311, 312, 313, 314, 315, 316.” EX1007, ¶34; FIG. 3 (sections 37, 38 highlighted in yellow):



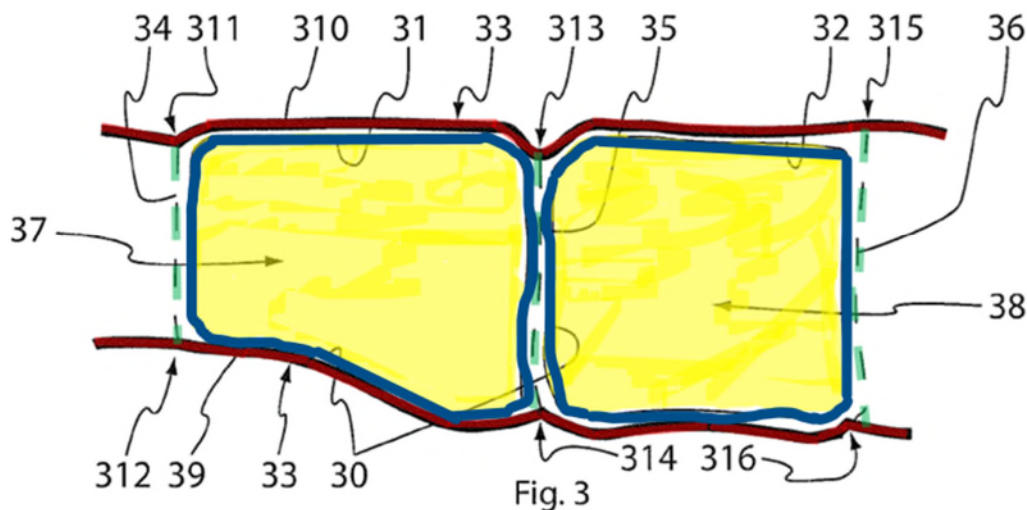
EX1007, FIG. 3.

In the above illustrated embodiment, “inflation of an elongated first chamber 28, 29, 210, 211, 31, 32 of the inner bag 21, 30 results in an expansion of a corresponding section 23, 24, 25, 26, 27, 37, 38 of the outer bag 22, 33, *since each elongated first chamber is positioned within a corresponding section 23, 24, 25, 26, 27, 37, 38.*” EX1007, ¶40. As such, the straps 34, 35, 36 (tie elements) comprise dividing walls defining a plurality of sections 37, 38 (inner housings) between the first layer 39 (first mesh portion) and second layer 310 (second mesh portion). EX1003, ¶170.

4. [1c]

EP’297 discloses this limitation. EX1003, ¶171. EP’297 discloses that “inflation of an elongated first chamber 28, 29, 210, 211, 31, 32 of the inner bag

21, 30 results in an expansion of a corresponding section 23, 24, 25, 26, 27, 37, 38 of the outer bag 22, 33, *since each elongated first chamber is positioned within a corresponding section 23, 24, 25, 26, 27, 37, 38.* EX1007, ¶40; FIG. 3 (showing two elongated first chambers 31, 32 highlighted in blue).



EX1007, FIG. 3.

The elongated first chambers 31, 32 are part of the inner bag 30, which is the claimed “casing body.” EX1003, ¶172. EP’297 discloses that FIG. 3 “shows a partial cross-sectional view of an airbag according to an embodiment in a *nearly fully inflated state.*” EX1007, ¶42. In that state, the illustrated “two elongate first chambers 31, 32 are expanded in two adjacent sections 37, 38 of the outer bag 33.” *Id.* FIG. 4 illustrates a more detailed view of one embodiment of the inner bag and chambers (using different reference numerals) “in a non-inflated state laid out flat.” EX1007, ¶48; FIG. 4:

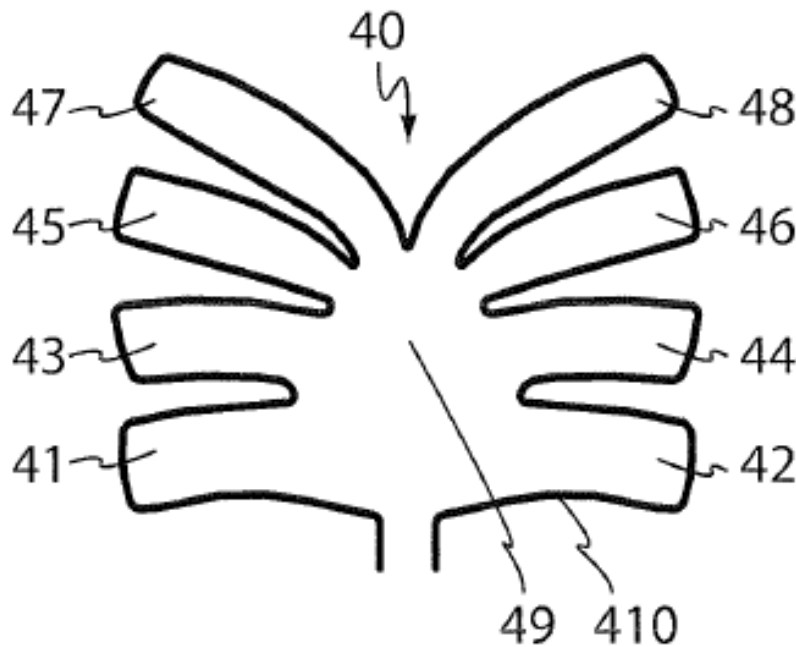


Fig. 4

EX1007, FIG. 4.

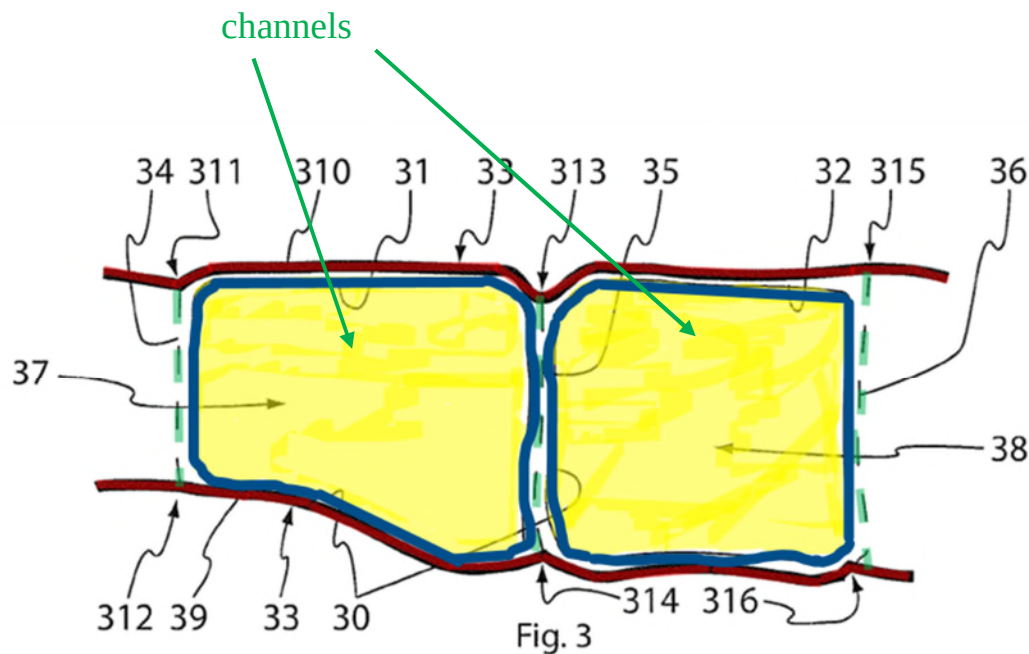
Thus, the chambers 31, 32 are configured to assume a non-inflated/deflated condition and an inflated condition in at least one section (inner housing) of the outer bag 33 (mesh structure). EX1003, ¶173.

According to EP'297, “[t]ypically, **the cross-sectional area of each elongate first chamber 28, 29, 210, 211, 31, 32 is smaller than the cross sectional area of each respective section 23, 24, 25, 26, 27, 37, 38** around the first chamber 28, 29, 210, 211, 31, 32.” EX1007, ¶41. A POSITA would have understood that in the deflated condition, the chambers 31, 32 occupy only a first space/region of the sections 37, 38, leaving a second space/region of the sections 37, 38 that does not include the chambers 31, 32. EX1003, ¶174. Moreover, the chambers 31, 32 “fill

the full volume of a section 37, 38 upon inflation,” EX1007, ¶43. Chambers 31, 32 would necessarily occupy the entire second space/region of the sections 37, 38 during the inflated condition. *Id.*

5. [1d]

EP’297 discloses this limitation. EX1003, ¶175. As shown below, there are a plurality of chambers 31, 32, each arranged in a corresponding section 37, 38 (inner housing) of the plurality of sockets:



EX1007, FIG. 3.

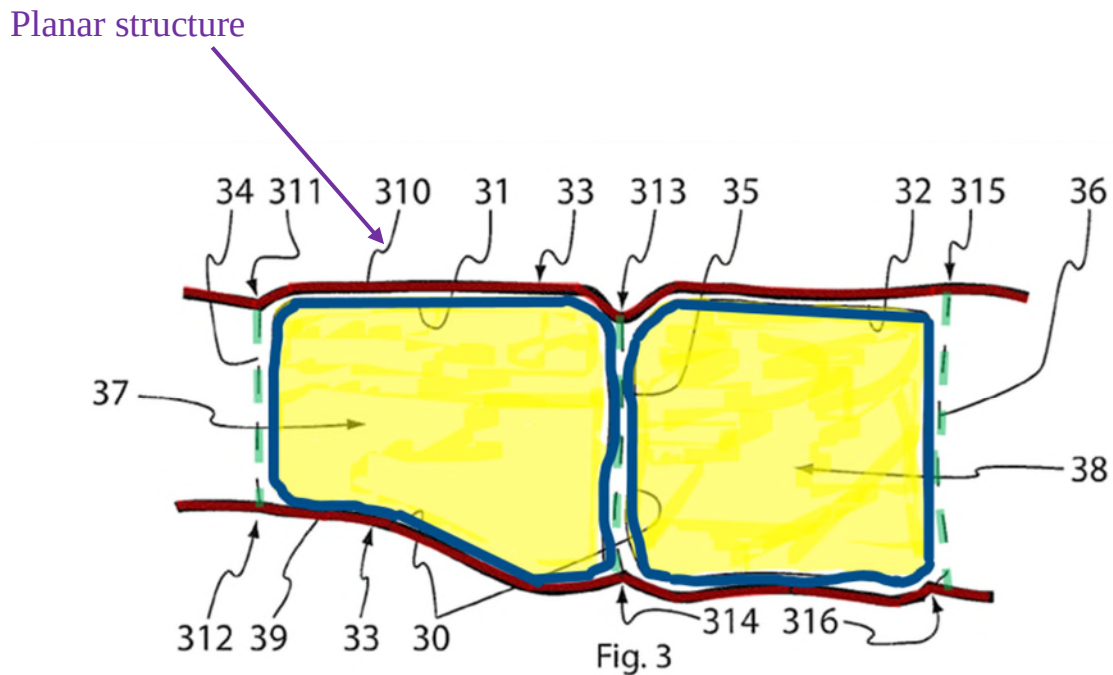
Moreover, the sockets 37, 38 define channels that are arranged side-by-side to each other and that are separated from each other by the straps 34, 35, 36 (tie

element) of the plurality of straps. As also shown above, each section 37, 38 is configured to house a corresponding chamber 31, 32, forming the inner bag 30 (casing body); EX1003, ¶176.

6. [1e]

EP'297 discloses this limitation. EX1003, ¶177. EP'297 discloses that the chambers 31, 32 “fill the full volume of a section 37, 38 upon inflation.” EX1007, ¶43. As such, a POSITA would have understood that in the inflated condition, the chambers 31, 32 would be inflated against the first layer 39 (first mesh portion), second layer 310 (second mesh portion), and the straps 34, 35, 35 (tie elements) so as to form the below illustrated structure. EX1003, ¶177. While there are indents in the structure at portions where the straps 34, 35, 36 intersect the layer 310, this is a “planar structure” under the PO’s interpretation currently advanced in litigation.

Id.; see also §III.D.2:

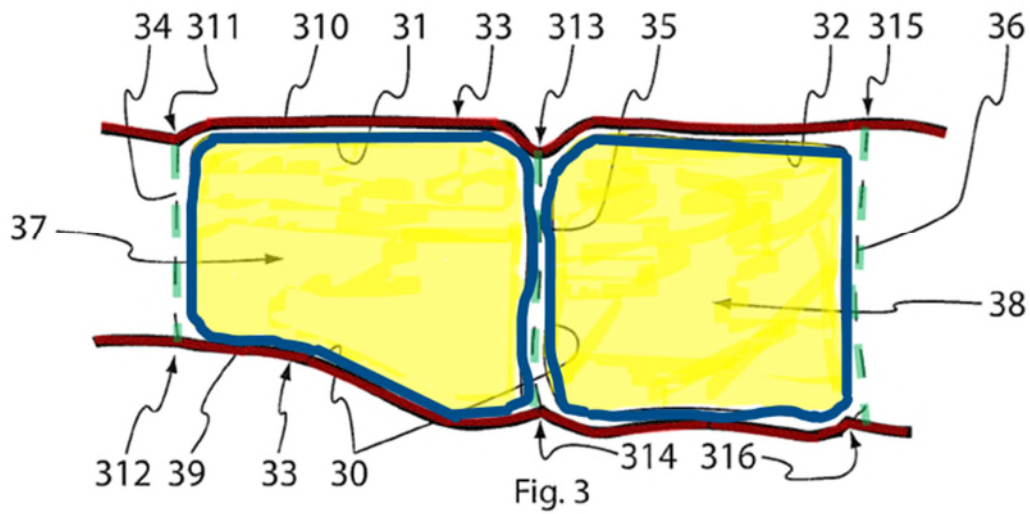


EX1007, FIG. 3.

C. Claim 2

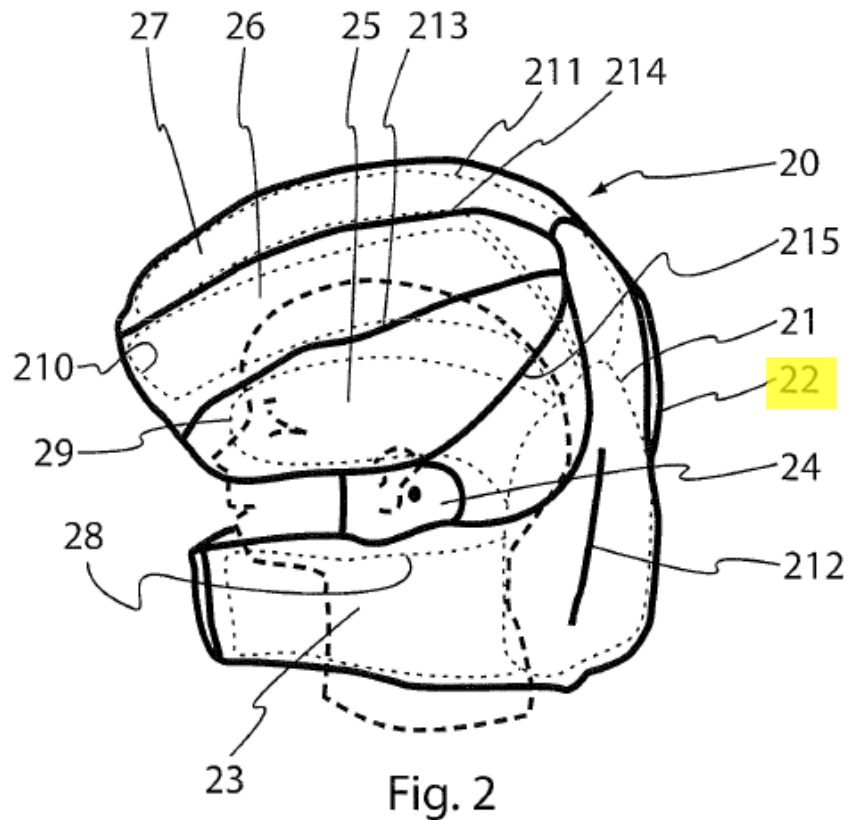
EP'297 discloses the additional limitations of claim 2. EX1003, ¶178.

EP'297 discloses that the chambers 31, 32 “fill the full volume of a section 37, 38 upon inflation.” EX1007, ¶43. As such, in the inflated condition, the chambers 31, 32 (forming the inner bag/casing body) would be configured to line from the inside, at least partially in contact, the outer bag 33 (mesh structure). EX1003, ¶178.



EX1007, FIG. 3.

Moreover, as shown below, the outer bag (mesh structure) is an external structure of said protective device (e.g., helmet). EX1003, ¶179.

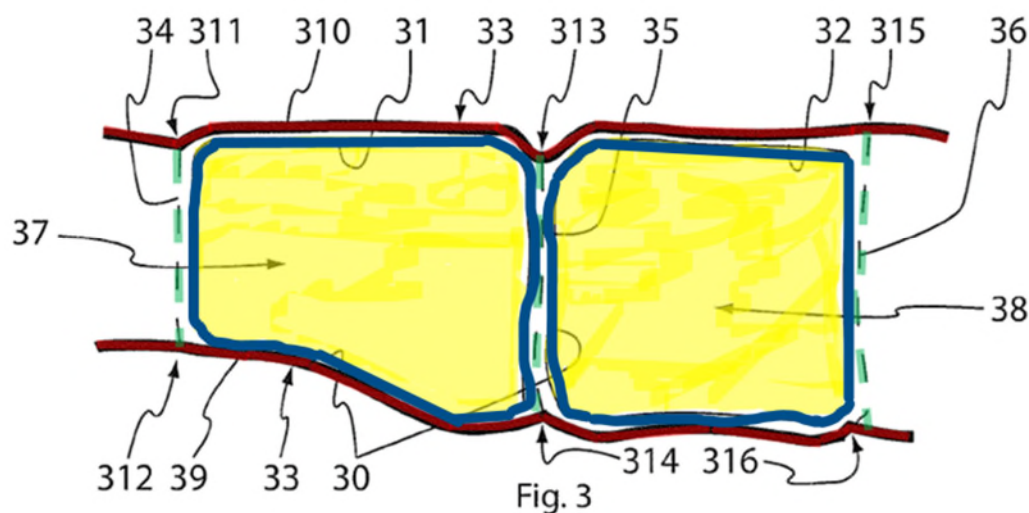


EX1007, FIG. 2; *see also* EX1007, ¶28 (“The inner bag 21 is surrounded by an outer bag 22 and the structure of the outer bag 22 defines the shape of the airbag at inflation of the inner bag.”).

D. Claim 3

EP’297 discloses the additional limitations of claim 3. EX1003, ¶180.

EP’297 discloses that the chambers 31, 32 “*fill the full volume of a section 37, 38* upon inflation.” EX1007, ¶43. As such, in the inflated condition, the chambers 31, 32 (forming the inner bag/casing body) completely occupy the second region/space and the first region/space of the sections 37, 38 (inner housings). EX1003, ¶180.



EX1007, FIG. 3.

E. Claim 4

EP’297 discloses the additional limitations of claim 4. EX1003, ¶181.

EP’297 FIG. 4 illustrates a more detailed view of one embodiment of the inner bag

and its chambers (using different numerals) (forming the casing body) “in a non-inflated state laid out flat” (deflated condition). EX1007, ¶48; FIG. 4:

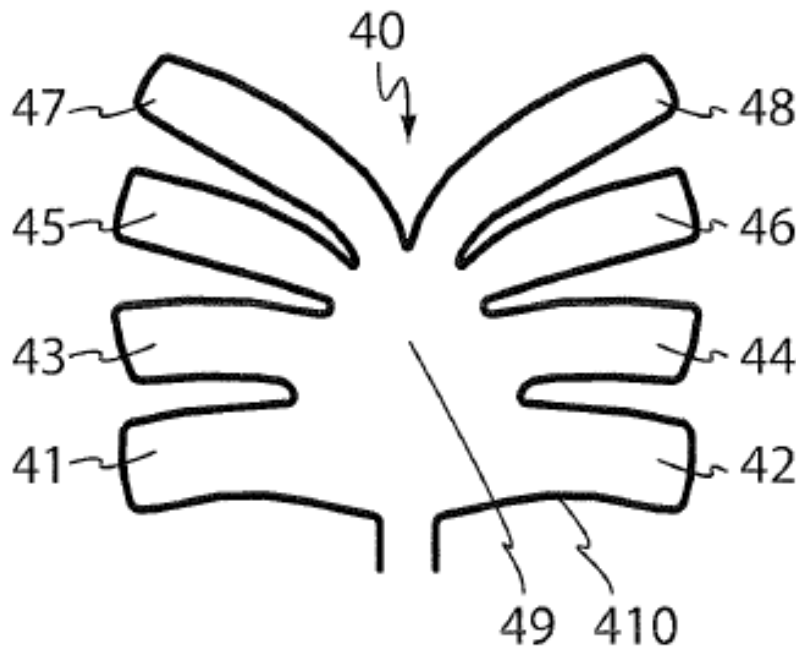


Fig. 4

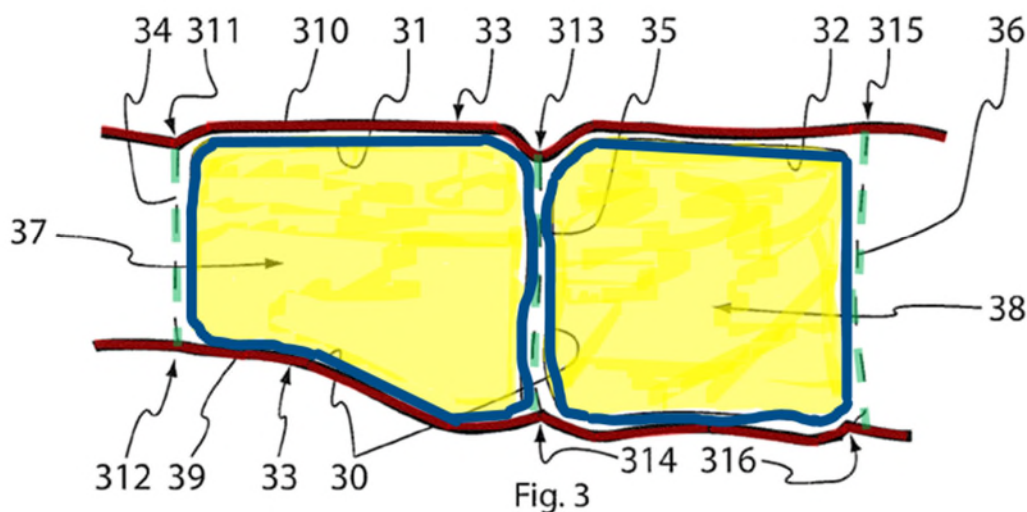
EX1007, FIG. 4.

EP'297 also discloses that “each elongated first chamber is positioned within a corresponding section 23, 24, 25, 26, 27, 37, 38.” EX1007, ¶40; FIG. 3.

“Typically, the cross-sectional area of each elongate first chamber 28, 29, 210, 211, 31, 32 is smaller than the cross sectional area of each respective section 23, 24, 25, 26, 27, 37, 38 around the first chamber 28, 29, 210, 211, 31, 32. ***This allows for the technical effect that a section 23, 24, 25, 26, 27 of the outer bag 22, 33 can be brought from a folded, non-inflated state to an unfolded, inflated state more quickly*** and with a relatively low volume of supplied air (as compared

of directly inflating the outer bag 22, 33).” EX1007, ¶41. As such, the deflated condition of the inner bag 30 (casing body) corresponds to a slack and loose condition of the outer bag 33 (mesh structure) and its straps 34, 35, 36 (tie elements) because until the inner bag chambers 31, 32 are inflated the volume of the outer bag sections 37, 38 would not be filled and the straps 34, 35, 36 would not be tensioned. EX1003, ¶182.

Moreover, EP’297 discloses that the chambers 31, 32 “**fill the full volume** of a section 37, 38 upon inflation.” EX1007, ¶43. As such, in the inflated condition, the chambers 31, 32 (forming the inner bag/casing body) correspond to an at least partially tensioned condition of the straps 34, 35, 36 (tie elements) and of the first layer 39 (first mesh portion) and second layer 310 (second mesh portion). EX1003, ¶183.

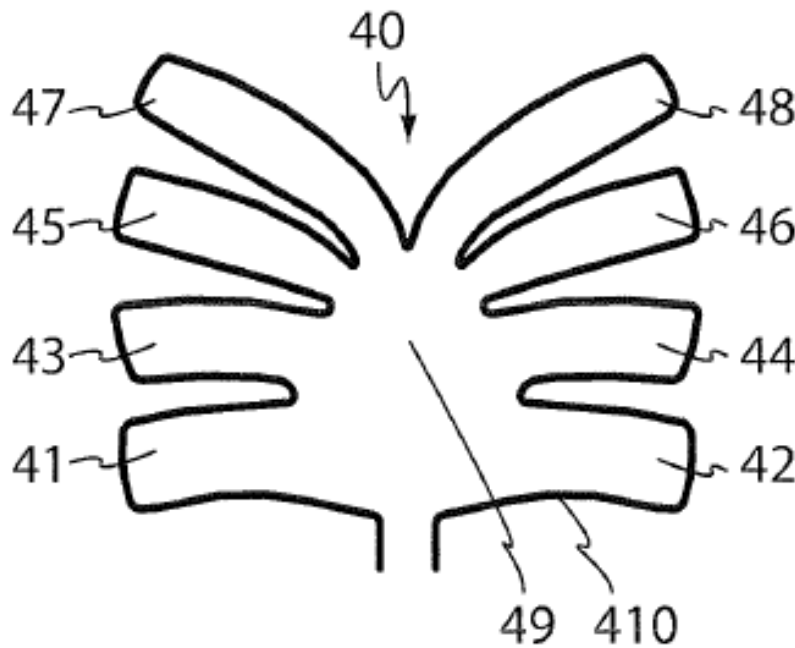


EX1007, FIG. 3.

F. Claim 5

EP'297 discloses the additional limitations of claim 5. EX1003, ¶184.

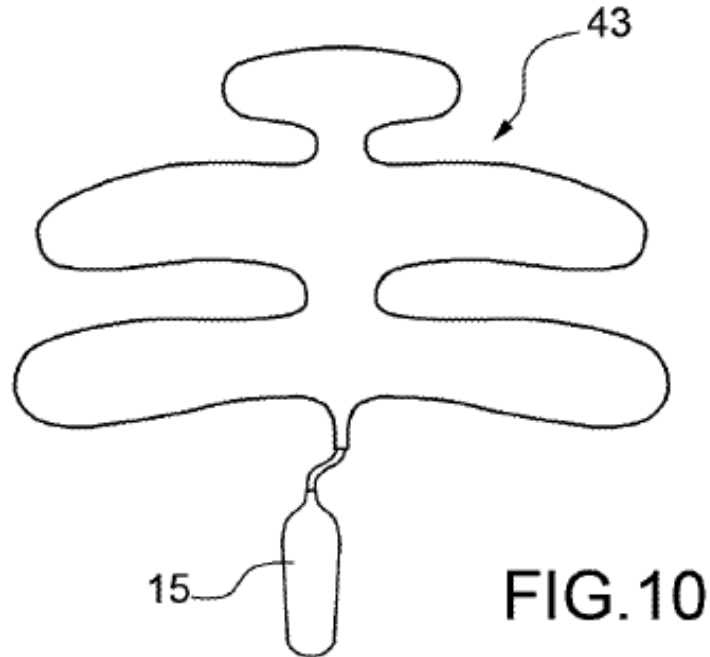
EP'297 FIG. 4 illustrates a more detailed view of one embodiment of the inner bag and its chambers (forming the casing body) “in a non-inflated state laid out flat” (deflated condition). EX1007, ¶48; FIG. 4:



EX1007, FIG. 4; *see also* FIGS. 5 and 6.

This arrangement of the “separate elongate first chambers 41, 42, 43, 44, 45, 46, 47, 48” shown in FIG. 4, and FIGS. 5-6, would at a minimum be a tree or comb shape according to the '065 patent because it has “lateral branches,” EX1003, ¶185 (citing EX1001, 7:28-31) or it has “a plurality of portions 40a of the inflatable casing body 40 inserted between the rows of tie elements 5.” EX1003, ¶185 (citing

EX1001, 7:22-25). It is also similar to FIG. 10 of the '065 patent, in which “the casing body has the shape of a tree.” EX1001, 7:28-31; FIG. 10:

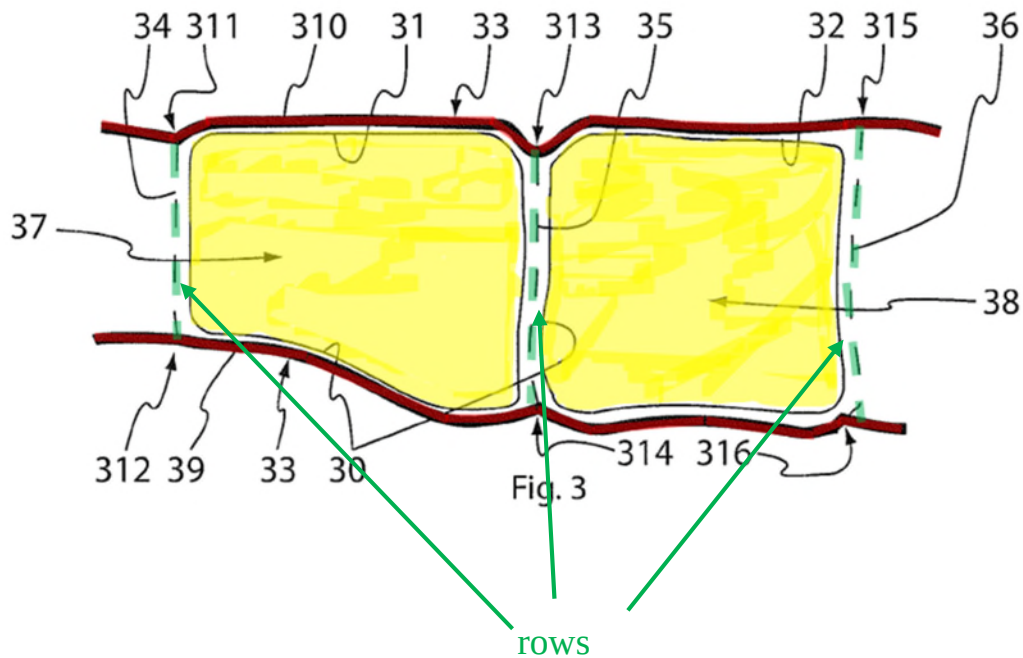


EX1001, FIG. 10.

G. Claim 6

EP'297 discloses the additional limitations of claim 6. EX1003, ¶186.

EP'297 discloses that “sections 37, 38 may be formed in the outer bag 33 by joining together portions 212, 213, 214, 215, 311, 312, 313, 314, 315, 316 of a first 39 and a second 310 layer of the outer bag 33 by means of one or more straps 34, 35, 36 connecting the portions 212, 213, 214, 215, 311, 312, 313, 314, 315, 316.” EX1007, ¶34; FIG. 3 (sections 37, 38 highlighted in yellow):



EX1007, FIG. 3.

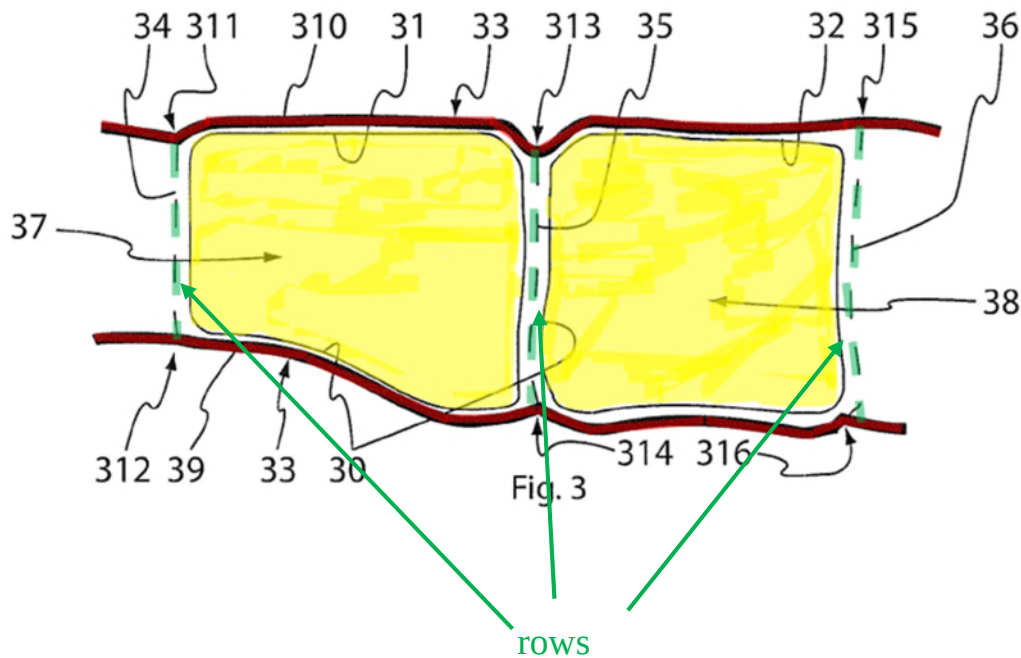
The straps 34, 35, 36 are aligned in a plurality of rows. EX1003, ¶187.

H. Claim 7

EP'297 discloses the additional limitations of claim 7. EX1003, ¶188.

EP'297 discloses that “sections 37, 38 may be formed in the outer bag 33 by joining together portions 212, 213, 214, 215, 311, 312, 313, 314, 315, 316 of a first 39 and a second 310 layer of the outer bag 33 by means of one or more straps 34, 35, 36 connecting the portions 212, 213, 214, 215, 311, 312, 313, 314, 315, 316.”

EX1007, ¶34; FIG. 3 (sections 37, 38 highlighted in yellow):



EX1007, FIG. 3.

The straps 34, 35, 36 are aligned in a plurality of rows. EX1003, ¶189.

As discussed above for claim 4, in the activated condition, the straps 34, 35, 36 are at least partially tensioned. §VI.E; EX1003, ¶190.

The reference to “one or more straps 34, 35, 36 connecting the portions 212, 213, 214, 215, 311, 312, 313, 314, 315, 316” means that one or more straps could be used to form rows as shown in the annotated version of FIG. 3 above. EX1003, ¶191. In addition, this disclosure, among others, also indicates that one or more straps could be used to make up a row (although not illustrated), satisfying the claim language that “each row of tie elements of said plurality of rows of tie elements comprises a plurality of tie elements.” *Id.* This is consistent with

EP'297's disclosure that "stitching" could be used instead of the straps. EX1007,

¶35. Stitching discloses more than one stitch per row, which also satisfies the claim language that "each row of tie elements of said plurality of rows of tie elements comprises a plurality of tie elements." EX1003, ¶191.

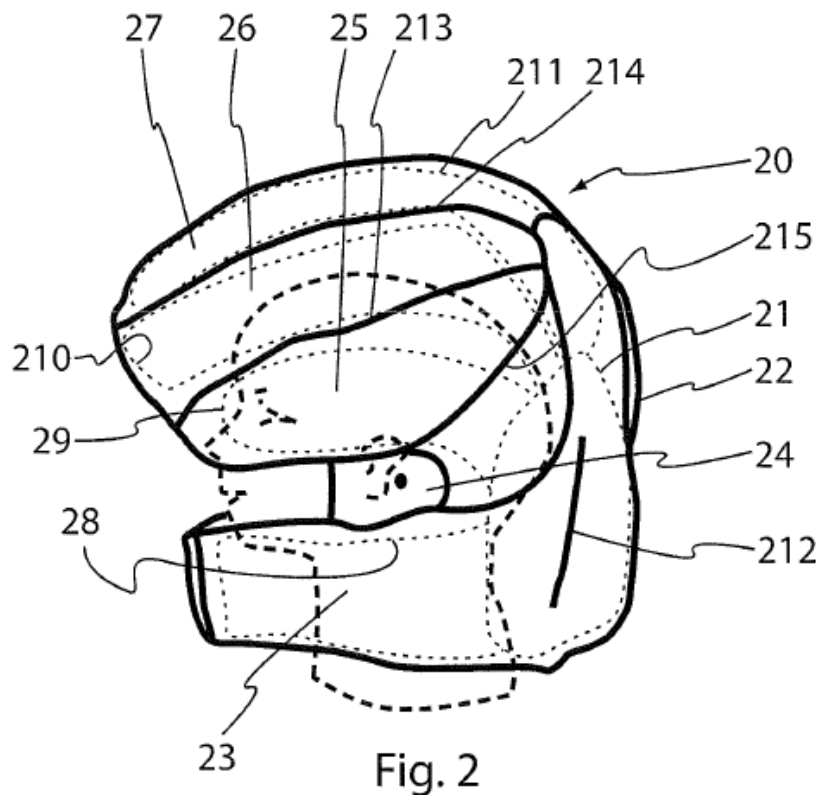
As such, the straps or stitching (tie elements) in each row of straps/stitching would comprise a plurality of straps/stitching to form a dividing wall for the sections 37, 38. EX1003, ¶192. Moreover, the straps/stitching belonging to a same row are arranged substantially parallel to each other when in the partial tension condition. *Id.*

This is consistent with the '065 patent, which states that "when the inflatable element 2 is in the inflated condition, tie threads 5 are parallel to each other in the respective row 24 and substantially orthogonal to the direction of the row."

EX1001, 7:10-14; EX1003, ¶193.

I. Claim 8

EP'297 discloses the additional limitations of claim 8. EX1003, ¶194. As shown below, the outer bag and its layers (mesh portions) and the inner bag (casing body) define an airbag 20 (inflatable element). EX1007, ¶28; FIG. 2:



EX1007, FIG. 2.

EP'297 describes FIG. 2 as showing "an airbag according to an embodiment in a nearly fully inflated state." EX1007, ¶28. According to EP'297, "a person wearing an airbag 20 according to the invention will be protected by said airbag 20 for some time after expansion of the airbag 20, effectively protecting the head of the user for some time, such as when tumbling over after an accident." EX1007, ¶46. Accordingly, the inflated condition of the inner bag (casing body) corresponds to an inflated condition of protection of the airbag 20 (inflatable element). EX1003, ¶195.

EP'297 further discloses "a detection device (not shown) configured to trigger inflation of the airbag by an inflation device upon detection of an accident situation." EX1007, ¶27. "The detection device is preferably configured to detect the movements of the user and, when determining that the user's movements correspond to an accident situation, to transmit a triggering signal to the inflation device. The airbag will consequently be inflated when the inflation device receives the triggering signal and is activated." *Id.* Thus, prior to activation, the airbag 20 is in a deflated condition that corresponds to a "rest condition" of the airbag 20. EX1003, ¶196.

As noted above for limitation [1c], when the inner bag 30 is deflated, there is a second space/region within each section 37, 38 that is not occupied by the uninflated elongated first chambers 31, 32 of the inner bag 30. §VI.B.4. With this configuration, in the deflated condition, the second region of the sections 37, 38 (at least one inner housing) are apt to allow a passage of air between the first layer 39 (first mesh portion) and second layer 310 (second mesh portion) passing through the second region of the sections 37, 38. EX1003, ¶197.

J. Claim 9

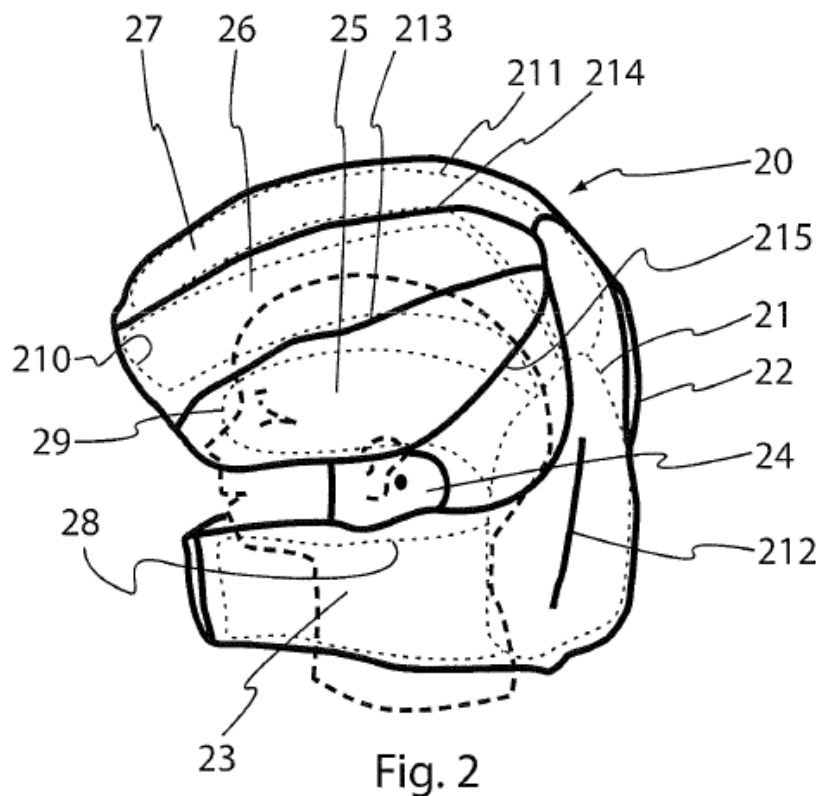
EP'297 discloses the additional limitation of claim 9. EX1003, ¶198. EP'297 discloses "a detection device (not shown) configured to trigger inflation of the airbag by an inflation device upon detection of an accident situation." EX1007,

¶27. “The inflation device may be any suitable type of airbag inflation device” and in “an embodiment, the inflation device is a cold gas inflator.” *Id.* “The airbag will consequently be inflated when the inflation device receives the triggering signal and is activated. 27.” *Id.* EP’297 makes clear that the “inner bag 21 [is] suitable for inflation” by the inflation device. EX1007, ¶¶28; 46.

K. Claim 10

EP’297 discloses the additional limitation of claim 10. EX1003, ¶199.

EP’297 discloses “a wearable airbag for protecting the head of a user in case of an accident.” EX1007, ¶24; FIG. 2.



EX1007, FIG. 2.

L. Claim 11

EP'297 alone or in view of CN'842 renders this claim obvious for the reasons discussed for claims 1 and 10. §§VI.B, VI.K.

M. Claim 12

EP'297 in view of CN'842 and the knowledge of a POSITA renders the additional limitations of claim 12 obvious. EX1003, ¶201. Both EP'297 and CN'842 disclose wearable airbag systems in which the system's outer layer is part of the "mesh structure." *See, e.g.*, EX1007, ¶28, FIG. 2; EX1011, ¶25, FIG. 1; §VI.C. Neither reference, however, explicitly discloses that it also includes a covering layer or a covering layer formed of breathable material or including transpiration openings. EX1003, ¶201.

These type of covering layers were well known to a POSITA at the time of the '065 invention. EX1003, ¶202. For example, as shown by Klein, in the field of safety helmets, it was already well known to include "a minimally elastic fabric or fabric like material" as a cover to inflatable air bag elements (referred to as "lobes" in Klein). EX1013, ¶60; FIG. 3 (showing "top lobes" 12, 14, 16, 18, 20):

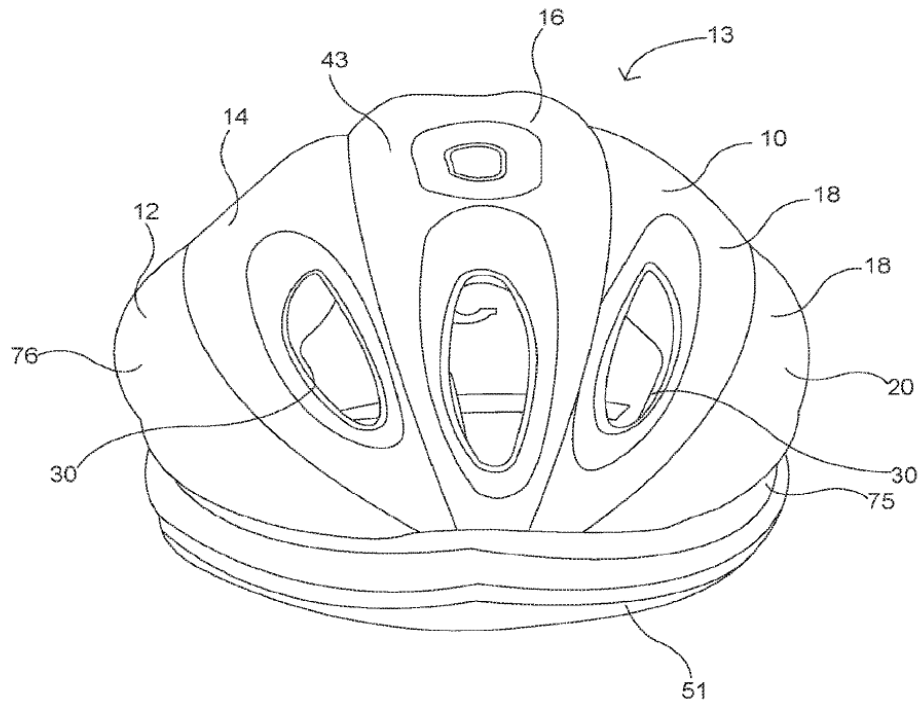


FIG. 2

EX1013, FIG. 2; ¶44.

According to Klein, this “minimally elastic fabric or fabric like material ... tends to thwart the deformation of the lobe(s) when in an accident” and “seeks to maintain the air cushion between the point of impact and the head to minimize damage and injury to the head.” EX1013, ¶60. Klein further discloses that this “fabric can be a netting” and can be configured/shaped with “air vents or openings allowing breathing of the head for comfort.” *Id.*; EX1003, ¶203.

Accordingly, a protective garment having a covering layer of breathable material (or including transpiration openings) was well within the knowledge of a POSITA. EX1003, ¶204. A POSITA would have found it obvious to try a covering layer on the EP’297-CN’842 airbag system because it would have been a selection

from a finite number (two) of identified predictable solutions (i.e., use a covering layer versus not using it). EX1003, ¶204. There would have been a reasonable expectation of success in doing so as the EP'297-CN'842 airbag system was amendable to a covering layer as the outer bag 33 was exposed and could have easily been adapted to include such a layer. *Id.* In doing so, the final system would have included a feature to “thwart the deformation of” the outer bag 33 during an accident and “maintain the air cushion between the point of impact and the head to minimize damage and injury to the head” as taught by Klein. *Id.*

A POSITA would have also understood that having the well-known covering layer on over or the outer bag 33 in the EP'297-CN'842 airbag system, would also mean that the covering layer covers the first and second sections 37, 38 (inner housings) and therefore their respective first and second regions (discussed for element [1c]). EX1003, ¶205.

N. Claim 13

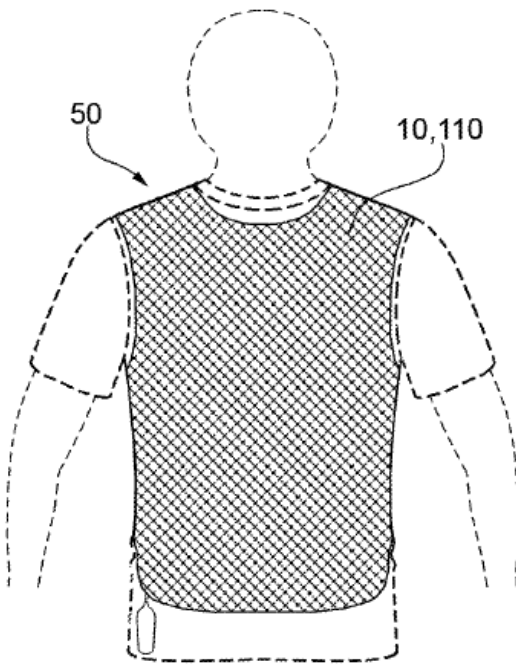
EP'297 discloses the additional limitations of claim 13 for the reasons discussed for claim 2. §VI.C.

O. Claim 14

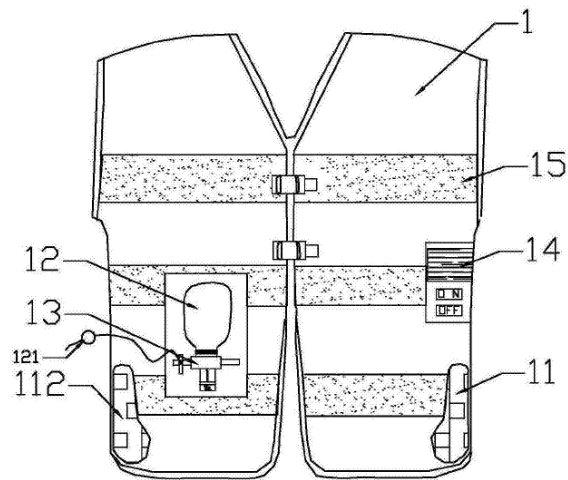
EP'297 in view of CN'842 render the additional limitations of claim 14 obvious. EX1003, ¶207. While EP'297 “focuses on embodiments applicable to a wearable airbag for protecting the head of a user in case of an accident,” it

explicitly states that “the invention is not limited to this application but may be applied to other applications wherein it is suitable to protect an object in case of an accident.” EX1007, ¶24. EP’297, however, does not explicitly disclose that its airbag 20 (inflatable element) is shaped like a jacket or is apt to surround an upper area or bust of the user’s body. But CN’842 does. EX1003, ¶207.

CN’842 discloses an “airbag suit” for motorcyclists, among other users. EX1011, section (57), ¶¶1, 21-23, 25, 27, FIG. 1. While CN’842 does not use the term “jacket,” a POSITA would have understood that what CN’842 discloses is the same type of jacket disclosed by the ’065 patent (see below). EX1003, ¶208. CN’842 discloses that its “airbag suit 1 is equipped with a waist adjustment strap on its sides” where a “rigid foam pad is attached to the back” and “blow-molded plates are attached to the left and right sides of the chest.” EX1011, ¶25.



EX10001, FIG. 7



EX1011, FIG. 1

As such, CN'842 discloses suit is shaped like a jacket and is apt to surround an upper area or bust of the user's body. EX1003, ¶209. Accordingly, EP-297 in view of CN'842 renders this claim obvious. *Id.*

P. Claim 15

EP'297 in view of CN'842 renders the additional limitations of claim 15 obvious. EX1003, ¶210. As noted above, EP'297 discloses that the "outer bag 22 does not necessarily have to be fluid-impermeable, since the inner bag 21 is capable of expanding the outer bag 22." EX1007, ¶31. Stated differently, EP-297 discloses that the outer bag 22, 33 (mesh structure) could be fluid permeable. EX1003, ¶210. A POSITA would have understood that with the outer bag 33 being

fluid permeable, these layers and the outer bag would comprise some form of “perforated structure that allows air or other gas to pass.” *Id.*

Moreover, and as discussed above, CN’842 discloses that its “airbag suit 1 is made of breathable mesh fabric.” EX1011, ¶25. A POSITA would have understood that with the airbag suit 1 being “made of breathable mesh fabric,” it would comprise some form of “perforated structure that allows air or other gas to pass.” EX1003, ¶211.

Q. Claim 16

EP’297 in view of CN’842 render the additional limitations of claim 16 obvious. EX1003, ¶212. EP’297 alone or in view of CN’842 disclose or render obvious the claimed mesh structure and mesh portions. *Id.* Neither reference, however, explicitly discloses a “net.”

A POSITA would have understood that a net could be used as the mesh structure or its mesh portions in the EP’297 or EP’297/CN’842 systems. Nets have been used in similar devices, years before the priority date of the ’065 patent, and would be well within the knowledge of a POSITA. EX1003, ¶213 (citing Klein as an example). A POSITA would have found it obvious to try using a net as the mesh structure in the EP’297 or EP’297/CN’842 structure because it would have been a selection from a finite number of identified predictable solutions (i.e., using a net as taught by Klein versus another perforated material). EX1003, ¶213.

A POSITA would have understood that there would have been a reasonable expectation of success in doing so as EP'297 and EP'297/CN'842 already disclosed the means (i.e., air permeable outer bags) for implementing a net (as known to a POSITA and taught by Klein); EX1003, ¶214.

R. Claim 17

EP'297 in view of CN'842 renders this claim obvious for the reasons discussed for limitations [1c]-[1e]. §§VI.B.4-VI.B.6.

S. Claim 18

1. [18pre]

To the extent that this preamble is a limitation, EP'297 discloses it. EX1003, ¶216. EP'297 discloses “a wearable airbag for protecting a user's head.” EX1007, ¶1; *see also* ¶¶7, 8, 25; §VI.B.

2. [18a]

EP'297 in view of CN'842 renders this limitation obvious for the reasons discussed for limitations [1a]-[1b]. §§VI.B.2-VI.B.3.

3. [18b]

EP'297 discloses this limitation for the reasons discussed for limitations [1c]-[1d]. §§VI.B.4-VI.B.5.

4. [18c]

EP'297 discloses this limitation for the reasons discussed for limitations [1c]-[1e]. §§VI.B.4-VI.B.6.

T. Claim 19

EP'297 discloses the additional limitations of this claim for the reasons set forth for claim 4. §§VI.E.

U. Claim 20

EP'297 discloses the additional limitations of this claim for the reasons set forth for claim 4. §VI.E. EP'297 discloses that the chambers 31, 32 “fill the full volume of a section 37, 38 upon inflation.” EX1007, ¶43. In addition, “the structure of the outer bag 22 defines or sets the limit of the shape of the airbag 20 after inflation” and that “the structure of the outer bag 22 controls the movement of the airbag 20 during inflation from a non-expanded state to an expanded state.” EX1007, ¶45. As such, EP'297 discloses that when the chambers 31, 32 forming the inner bag 30 (casing body) are inflated, and the outer bag 33 is tensioned, the outer bag 33 bridles and prevents a further expansion of the inner bag 30. EX1003, ¶221.

V. Claim 21

EP'297 discloses the additional limitations of this claim for the reasons set forth for claim 8. §VI.I.

W. Claim 22

EP'297 discloses the additional limitations of this claim for the reasons set forth for claim 4. §VI.E.

VII. DISCRETIONARY DENIAL IS NOT WARRANTED

A. 35 U.S.C. § 314(a) Analysis

The *Fintiv* factors weigh against discretionary denial. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, 5-6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”); *Sand Revolution II, LLC v. Continental Intermodal Group - Trucking LLC*, IPR2019-01393 (June 16, 2020) (“*Sand Revolution*”).

1. Stay

Petitioners will promptly seek a stay in the parallel district court proceeding, *Dainese S.p.A. v. Alpinestars USA Inc. et al*, 2:24-cv-07066 (CD CA 2024), if the Board institutes this IPR. As of this filing, no depositions have been taken, the *Markman* hearing has not been conducted, and expert discovery has not begun. Thus, a stay is likely, and this factor weighs against a discretionary denial. *See, e.g., Nike, Inc. v. Skechers U.S.A., Inc.*, No. CV 23-09346-AB (PVCx), 2025 U.S. Dist. LEXIS 24909, at *13 (C.D. Cal. Feb. 4, 2025) (staying the action “at least pending institution decisions from the PTAB”).

2. Trial Date

The trial date has been set for January 2026; after the date for an institution decision. Petitioners will promptly seek a stay in the parallel district court proceeding, *Dainese S.p.A. v. Alpinestars USA Inc. et al*, 2:24-cv-07066 (CD CA 2024), if the Board institutes this IPR.

3. Parallel Proceeding

In *Sand Revolution*, the parties had already “exchanged infringement and invalidity contentions, and the district court [had] conducted a *Markman* hearing and entered a related Order.” IPR2019-01393, Paper 24 at 10. Despite these facts, the Board found that the third *Fintiv* factor “weighs only marginally, if at all, in favor of exercising discretion to deny institution.” *Id.* Here, the parallel proceeding is at a substantially earlier phase – no infringement or invalidity contentions have been exchanged, no depositions taken, and no *Markman* briefing or hearing has occurred. Moreover, no “substantive orders have been entered.” IPR2024-01421, paper 8, 11-12 (PTAB March 14, 2025) (*citing Fintiv*, paper 11 at 10 “If, at the time of the institution decision, the district court has not issued orders related to the patent at issue in the petition, this fact weighs against exercising discretion to deny institution under *NHK*.”). Thus, this factor weighs against a discretionary denial. *Id.*

4. Issue Overlap

Petitioners stipulate (EX1017) that if the Board institutes *inter partes* review on the grounds presented in this petition, Petitioners will not pursue in the parallel district court proceeding an invalidity defense that the patent claims subject to the instituted IPR are invalid based on those grounds that were raised in the IPR. “The Board often considers stipulations of this nature to weigh against denying

institution.” *Samsung Display Co. Ltd. V. Pictiva Displays International Ltd.*, IPR2024-01095, paper 12 at 10-11 (PTAB Jan. 23, 2025)(citing *Sand Revolution* and *Nokia of Am. Corp. v. Soto*, IPR2023-00680, Paper 30 at 13 (PTAB Dir. Review Dec. 3, 2024)).

5. Same Party

The Petitioners and the parties in the litigation are the same parties, although the same fact applies to the vast majority of IPR petitions and thus adds little, if any, weight towards a discretionary denial.

6. Other Considerations

Other considerations also weigh strongly against a discretionary denial. The Challenged Claims are clearly invalid, the '650 patent has never been challenged in a post-issuance proceeding, all but one of the references were not cited during prosecution of the '650 patent, and the teachings used here from the only cited reference were not contested during the original prosecution.

In sum, all but one of the *Fintiv* factors weigh strongly against a discretionary denial and the remaining factor is the “same party” factor that applies to nearly all IPR petitions and should be given little weight. Accordingly, the Board should not issue a discretionary denial under §314(a).

B. 35 U.S.C. § 325(b) Analysis

Applying the two-part framework discussed in *Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GMBH*, IPR2019-01469, Pap. 6, *8-9, the Board should not exercise its §325(d) discretion to deny institution.

None of the challenges are substantially the same as those considered during prosecution. The primary challenges in this Petition rely on EP'536 in view of CN'180, EP'536 in view of CN'180 and Hatton, and EP'297 in view of CN'842. EP'536, CN'180, Hatton, and CN'842 were not reviewed or considered by the examiner. While EP'297 was submitted in an IDS by the Applicant during prosecution, EX1002, 86-99, the examiner did not base any rejections on it, nor was EP'297 considered in combination with CN'842 during prosecution.

To the extent that the challenges herein are found to be based on prior art that is the same as or cumulative to prior art considered by the examiner during prosecution, the examiner has made a clear error in allowing the claims over such prior art, which prior art clearly shows the “distinguishing” features that led to the allowance of the '065 patent. This is at least because the challenges in this Petition satisfy the compelling merits standard, and allowing the claims over such prior art is therefore clear error.

VIII. COMPLIANCE WITH FORMAL REQUIREMENTS

A. Mandatory Notices Under 37 C.F.R. §§ 42.8(b)(1)-(4)

1. Real Party-In-Interest

Alpinestars S.p.A. and Alpinestars USA Inc. are the real parties-in-interest.

2. Related Matters

The '065 patent is subject to the following actions: *Dainese S.p.A. v.*

Alpinestars USA Inc. et al, 2:24-cv-07066 (CD CA 2024).

3. Lead and Backup Counsel

Lead Counsel	Backup Counsel
Gianni Minutoli Reg. No. 41,198 DLA Piper LLP One Fountain Square 11911 Freedom Drive, Suite 300 Reston, VA 20190-5602 Phone: + 1 703 773 4000 Fax: + 1 703 773 5000 Gianni.Minutoli@us.dlapiper.com	Paul R. Steadman Reg. No. 43,932 DLA Piper LLP 444 West Lake Street, Suite 900 Chicago, IL 60606-0089 Phone: + 1 312 368 4000 Fax: + 1 312 236 7516 Paul.Steadman@us.dlapiper.com Martin Ellison DLA Piper LLP (US) 2000 Avenue of the Stars, Suite 400 North Tower Los Angeles, CA 90067-4735 Tel: 310.595.3000 Fax: 310.595.3300 Martin.Ellison@us.dlapiper.com

4. Service Information

Please address correspondence to counsel at the addresses above. Petitioners consent to electronic service to: dla-alpinestars-IPR@us.dlapiper.com and the email addresses listed above.

B. Proof of Service on the Patent Owner

In accordance with 37 C.F.R. §§42.6(e) and 42.105, as identified in the attached Certificate of Service, a copy of this Petition in its entirety is being served on prosecution counsel for the Patent Owner:

Michael Mercanti, Esq.
Lucas & Mercanti, LLP
30 Broad Street
21st Floor
New York, Ny 10004

In addition, a courtesy copy of this Petition in its entirety is being served electronically on Patent Owner's counsel in the District Court Litigation.

Paul N. Tauger, Esq. (ptauger@addyhart.com)
Meredith Martin Addy, Esq. (meredith@addyhart.com)
Charles A. Panell, III, Esq. (epannell@addyhart.com)
Caren A. Yusem, Esq. (caren@addhart.com)

C. Power of Attorney

Powers of attorney are being filed with designation of counsel in accordance with 37 C.F.R. § 41.10(b).

D. Standing

In accordance with 37 C.F.R. §42.104(a), Petitioners certify that the '065 patent is available for *inter partes* review and that Petitioners are not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

E. Fees

The undersigned authorizes the Director to charge the fee specified by 37 C.F.R. § 42.15(a) and any additional fees that might be due in connection with this Petition to Deposit Account No. 503266.

IX. CONCLUSION

All Challenged Claims should be found unpatentable for the reasons discussed herein.

Dated: March 27, 2025

Respectfully submitted,

/s/ Gianni Minutoli

Gianni Minutoli

Reg. No. 41,198

DLA Piper LLP

One Fountain Square

11911 Freedom Drive, Suite 300

Reston, VA 20190-5602

Phone: + 1 703 773 4000

Fax: + 1 703 773 5000

Gianni.Minutoli@us.dlapiper.com

Attorney for Petitioners.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioners certify that this petition includes 13,868 words, as measured by Microsoft Word, exclusive of the table of contents, mandatory notices under § 42.8, certificates of service, word count, claim listing, and exhibits.

Date: March 27, 2025

/s/ Gianni Minutoli
Gianni Minutoli
Reg. No. 41,198
DLA Piper LLP
One Fountain Square
11911 Freedom Drive, Suite 300
Reston, VA 20190-5602
Phone: + 1 703 773 4000
Fax: + 1 703 773 5000
Gianni.Minutoli@us.dlapiper.com

Attorney for Petitioners.

CERTIFICATE OF SERVICE

The undersigned certifies pursuant to 37 C.F.R. §§ 42.6(e) and 42.105 that on March 27, 2025, a true and correct copy of the *Petition for Inter Partes Review of U.S. Patent No. 12,012,065 Under 35 U.S.C. §§ 311-319 and 37 C.F.R. §§ 42.1-100, et seq* was served by UPS overnight to the following attorneys for the Patent

Owner:

Michael Mercanti
mnm@lmiplaw.com
LUCAS & MERCANTI LLP
30 Broad Street, 21st Floor
New York, NY 10004
Tel: 212-661-8000
Fax: 212-661-8002

A courtesy copy was sent to the below counsel via electronic mail:

Paul N. Tauger
ptauger@addyhart.com
AddyHart P.C.
515 California Street, Suite 100
Irvine, CA 92617
Tel: 949-438-3218

Meredith Martin Addy
meredith@addyhart.com
Charles A. Panell, III
epannell@addyhart.com
AddyHart P.C.
10 Glenlake Parkway, Suite 130
Atlanta, GA 30328
Tel: 312-320-4200

Caren Yusem Sterne
caren@addyhart.com
AddyHart P.C.
1101 Pennsylvania Ave., N.W.
Suite 300
Washington, DC 20004
Tel: 312-804-4885

Dated: March 27, 2025

Respectfully Submitted,

/s/ Gianni Minutoli

Gianni Minutoli

Reg. No. 41,198

DLA Piper LLP

One Fountain Square

11911 Freedom Drive, Suite 300

Reston, VA 20190-5602

Phone: + 1 703 773 4000

Fax: + 1 703 773 5000

Gianni.Minutoli@us.dlapiper.com

Attorney for Petitioners