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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/13/2022	Lino DAINESE	1029V-8002	5950

20311 7590 06/18/2024

LUCAS & MERCANTI, LLP
30 BROAD STREET
21st FLOOR
NEW YORK, NY 10004

EXAMINER	
O'NEILL, MATTHEW JAMES	

ART UNIT	PAPER NUMBER
3614	

NOTIFICATION DATE	DELIVERY MODE
06/18/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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info@lmiplaw.com

ALPINESTARS
Ex. 1002 - Page 1

APPLICATION NO.	ISSUE DATE	PATENT NO.
17/757,247	18-Jun-2024	12012065

LUCAS & MERCANTI, LLP
30 BROAD STREET
NEW YORK, NY 10004

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at https://patentcenter.uspto.gov

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit https://www.uspto.gov/electronicgrants

ALPINESTARS
Ex. 1002 - Page 2

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/18/2024	12012065	1029V-8002	5950

20311 7590 05/29/2024

LUCAS & MERCANTI, LLP
30 BROAD STREET
21st FLOOR
NEW YORK, NY 10004

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at https://patentcenter.uspto.gov/. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at https://certifiedcopycenter.uspto.gov/index.html. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Center (https://patentcenter.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional inventors):

Lino DAINESE, Vicenza, ITALY;

APPLICANT(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional applicants):

D-AIR LAB S.R.L., Vicenza, ITALY

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

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Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

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20311 7590 03/28/2024
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NEW YORK, NY 10004

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

Michael N. Mercanti	(Typed or printed name)
/Michael N. Mercanti/	(Signature)
05/10/2024	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/13/2022	Lino DAINESE	1029V-8002	5950

TITLE OF INVENTION: PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0.00	$0.00	$480	06/28/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
O'NEILL, MATTHEW JAMES	3614	280-739000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 LUCAS & MERCANTI, LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: D-AIR LAB S.R.L.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): VICENZA, ITALY

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via the USPTO patent electronic filing system ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 02-2275

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Michael N. Mercanti/ Date 05/10/2024

Typed or printed name Michael N. Mercanti Registration No. 33966

ALPINESTARS
Ex. 1002 - Page 5

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/757,247	05/10/2024 04:24:20 PM Z ET	1029V-8002

Title of Invention

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	5950	FILED BY	Carla Curado
PATENT CENTER #	65474835	AUTHORIZED BY	Michael Mercanti
CUSTOMER #	20311	FILING DATE	06/13/2022
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Lino DAINESE

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1054	E202450G25499078	Carla Curado

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2501	UTILITY ISSUE FEE	480.00	1	480.00
			TOTAL AMOUNT:	$480.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/757,247	**05/10/2024 04:24:20 PM Z ET**	**1029V-8002**

Title of Invention

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	5950	FILED BY	Carla Curado
PATENT CENTER #	65474835	FILING DATE	06/13/2022
CUSTOMER #	20311	FIRST NAMED INVENTOR	Lino DAINESE
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Michael Mercanti

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IssueFee_1029V8002.pdf	1	Issue Fee Payment (PTO-85B)	1202 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
IssueFee_1029V8002.pdf	326633AA6CD6AFC8D304212FC3C8BE0BA3BC3B8ACC7713C572D8ECE23DC708C28C08FC3C9373AF3A8242C71A814154695C45C3AB4A3AB671669B30BEC01D6C56

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/13/2022	Lino DAINESE	1029V-8002	5950

20311 7590 04/08/2024

LUCAS & MERCANTI, LLP
30 BROAD STREET
21st FLOOR
NEW YORK, NY 10004

EXAMINER	
O'NEILL, MATTHEW JAMES	

ART UNIT	PAPER NUMBER
3614	

NOTIFICATION DATE	DELIVERY MODE
04/08/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

info@lmiplaw.com

Corrected ***Notice of Allowability***	**Application No.** 17/757,247	**Applicant(s)** DAINESE, Lino	
	Examiner MATTHEW J O'NEILL	**Art Unit** 3614	**AIA (FITF) Status** Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 3/30/2024.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-4,7-16 and 18-25 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☑ All b) ☐ Some* c) ☐ None of the:

   1. ☑ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in an interview with Alfred Froebrich on 3/13/2024.

3. The application has been amended as follows:

4. Claim 1: "each of said plurality of inner housings intended to house" has been CHANGED to "each of said plurality of inner housings configured to house".

5. Claim 15: "each of the inner housings intended to house" has been CHANGED to "each of the inner housings configured to house".

Allowable Subject Matter

6. Claims 1-4, 7-16, and 18-25 are allowed.

7. The following is an examiner's statement of reasons for allowance: the "tie elements comprise dividing walls defining a plurality of inner housings between said first mesh portion and second said mesh portion . . . 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 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 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" as found in independent claims 1 and 15, is not found in prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J O'NEILL whose telephone number is (571)272-4752. The examiner can normally be reached Mon - Fri: 7AM-4PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Shanske can be reached on (571) 270-5985. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW JAMES O'NEILL/
Examiner, Art Unit 3614

/JASON D SHANSKE/
Supervisory Patent Examiner, Art Unit 3614

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NOTICE OF ALLOWANCE AND FEE(S) DUE

20311 7590 03/28/2024

LUCAS & MERCANTI, LLP
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NEW YORK, NY 10004

EXAMINER
O'NEILL, MATTHEW JAMES

ART UNIT	PAPER NUMBER
3614	

DATE MAILED: 03/28/2024

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/13/2022	Lino DAINESE	1029V-8002	5950

TITLE OF INVENTION: PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0.00	$0.00	$480	06/28/2024

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

ALPINESTARS
Ex. 1002 - Page 15

PART B - FEE(S) TRANSMITTAL

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By fax, send to: (571)-273-2885

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20311 7590 03/28/2024
LUCAS & MERCANTI, LLP
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21st FLOOR
NEW YORK, NY 10004

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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/13/2022	Lino DAINESE	1029V-8002	5950

TITLE OF INVENTION: PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0.00	$0.00	$480	06/28/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
O'NEILL, MATTHEW JAMES	3614	280-739000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via the USPTO patent electronic filing system ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

ALPINESTARS
Ex. 1002 - Page 16

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/13/2022	Lino DAINESE	1029V-8002	5950

20311 7590 03/28/2024

LUCAS & MERCANTI, LLP
30 BROAD STREET
21st FLOOR
NEW YORK, NY 10004

EXAMINER	
O'NEILL, MATTHEW JAMES	
ART UNIT	**PAPER NUMBER**
3614	

DATE MAILED: 03/28/2024

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

ALPINESTARS
Ex. 1002 - Page 17

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).
https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
2) a federal, state, local, or international agency, in response to its request;
3) a contractor of the USPTO having need for the information in order to perform a contract;
4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
9) the Office of Personnel Management (OPM) for personnel research purposes; and
10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 17/757,247	Applicant(s) DAINESE, Lino	
	Examiner MATTHEW J O'NEILL	Art Unit 3614	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 2/28/2024.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-4,7-16 and 18-25 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☑ All b) ☐ Some* c) ☐ None of the:

   1. ☑ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in an interview with Alfred Froebrich on 3/13/2024.

3. The application has been amended as follows:

4. Claim 1: "each of the inner housings intended to house" has been CHANGED to "each of the inner housings configured to house".

5. Claim 15: "each of the inner housings intended to house" has been CHANGED to "each of the inner housings configured to house".

Allowable Subject Matter

6. Claims 1-4, 7-16, and 18-25 allowed.

7. The following is an examiner's statement of reasons for allowance: the "tie elements comprise dividing walls defining a plurality of inner housings between said first mesh portion and said second mesh portion . . . 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 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" as found in independent claims 1 and 15, is not found in prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J O'NEILL whose telephone number is (571)272-4752. The examiner can normally be reached Mon - Fri: 7AM-4PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Shanske can be reached on (571) 270-5985. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW JAMES O'NEILL/
Examiner, Art Unit 3614

/JASON D SHANSKE/
Supervisory Patent Examiner, Art Unit 3614

Examiner-Initiated Interview Summary	**Application No.** 17/757,247	**Applicant(s)** DAINESE, Lino		
	Examiner MATTHEW J O'NEILL	**Art Unit** 3614	**AIA (First Inventor to File) Status** Yes	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
MATTHEW J O'NEILL	Examiner	Telephonic
Alfred Froedrich	Attorney	

Date of Interview: 13 March 2024

Issues Discussed:

Proposed Amendment(s)

Examiner and Attorney discussed proposed amendments to the independent claims to change "intended " to "configured"

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

ALPINESTARS
Ex. 1002 - Page 23

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

CPC - Searched*		
Symbol	**Date**	**Examiner**
A41D13/018	11/27/2023	MJO
B60R21/23	11/27/2023	MJO
B60R21/239	11/27/2023	MJO
B60R21/20	04/25/2023	MJO

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
See attached PE2E SEARCH history	03/12/2024	MJO
Applicant and inventor search	04/25/2023	MJO
Similarity search of application	04/25/2023	MJO
See search history	04/27/2023	KAB

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614

ALPINESTARS
Ex. 1002 - Page 24

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	See attached PE2E SEARCH history	03/12/2024	MJO

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614

ALPINESTARS
Ex. 1002 - Page 25

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

CPC						
Symbol					**Type**	**Version**
B60R	/	21	/	239	F	2013-01-01
A41D	/	13	/	018	I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614 (Assistant Examiner)	12 March 2024 (Date)	**Total Claims Allowed:** 22	
/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614 (Primary Examiner)	14 March 2024 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

INTERNATIONAL CLASSIFICATION				
CLAIMED				
B60R	/	21	/	239

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	12 March 2024	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	22	
/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614	14 March 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No.: 20240312

ALPINESTARS
Ex. 1002 - Page 27

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	8	10	21	19										
2	2	9	11	13	20										
3	3	10	12	22	21										
4	4	11	13	14	22										
	5	12	14	15	23										
	6	18	15	16	24										
5	7	19	16	17	25										
6	8		17												
7	9	20	18												

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	12 March 2024	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	22	
/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614	14 March 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No.: 20240312

ALPINESTARS
Ex. 1002 - Page 28

Bibliographic Data

Application No: 17/757,247

Foreign Priority claimed: (•) Yes ( ) No

35 USC 119 (a-d) conditions met: [✓] Yes [ ] No [ ] Met After Allowance

Verified and Acknowledged: /MATTHEW JAMES O'NEILL/ Examiner's Signature [ ] Initials

Title: PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/13/2022	280	3614	1029V-8002
RULE			

APPLICANTS

D-AIR LAB S.R.L., Vicenza, ITALY

INVENTORS

Lino DAINESE, Vicenza, ITALY

CONTINUING DATA

This application is a 371 of PCT/IB2020/061689 12/09/2020

FOREIGN APPLICATIONS

ITALY IT102019000023958 12/13/2019

ITALY IT102019000023961 12/13/2019

ITALY IT102019000023964 12/13/2019

IF REQUIRED, FOREIGN LICENSE GRANTED**

09/24/2022

**** SMALL ENTITY ****

STATE OR COUNTRY

ITALY

ADDRESS

LUCAS & MERCANTI, LLP
30 BROAD STREET
21st FLOOR
NEW YORK, NY 10004
UNITED STATES

FILING FEE RECEIVED

$830

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	0	((("D-AIR") near3 ("LAB") near3 ("S.R.L"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/04/25 08:35 AM
L2	34	((("DAINESE") near3 ("Lino"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 08:36 AM
L3	4132	B60R21/239.cpc. OR A41D13/018.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 09:09 AM
L4	132	(B60R21/239.cpc. OR A41D13/018.cpc.) AND mesh	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 09:10 AM
L5	404	(B60R21/239.cpc. OR A41D13/018.cpc.) AND mesh	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 09:17 AM
L6	488	(B60R21/20.cpc. OR A41D13/018.cpc.) AND mesh	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:13 AM
L7	13888	B60R21/239.cpc. OR A41D13/018.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2023/04/25 10:15 AM

			MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
L8	1849	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND mesh	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:23 AM
L9	15219	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:27 AM
L10	1042	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND inflat$ AND deflat$	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:28 AM
L11	804	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice) AND	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2023/04/25 10:29 AM

		(casing OR housing) AND inflat$ AND deflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover)	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
L12	804	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND inflat$ AND deflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:29 AM
L13	41	(Artificial Intelligence) Similar to: 17/757,247 with 0 CPC Selections and 0 Text Selections Text: (US-20230001879-A1 OR WO-2021116931-A1 OR EP-4072364-A1 OR JP-2023505721-A OR CN-114980766-A OR EP-4159071-A1 OR US-7784110-B2 OR ES-2390647-T5 OR EP-3434123-A1 OR ES-2390647-T3 OR US-20210112892-A1 OR EP-4066667-A1 OR EP-3432744-A1 OR WO-2017163196-A1 OR EP-3432744-B1 OR EP-3795019-A1 OR US-8608191-B2 OR US-20120011642-A1 OR EP-2575516-A1 OR WO-2011148350-A1 OR US-20120007344-A1 OR EP-2373524-B1 OR WO-2010067285-A1 OR EP-2373524-A1 OR ES-2390011-T3 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/04/25 11:13 AM

		DE-8323662-U1 OR CH-697172-A5 OR JP-5841843-B2 OR WO-2022129528-A1 OR EP-2373189-B2 OR EP-2373189-B1 OR WO-2010067288-A1 OR EP-2373189-A1 OR EP-3847917-A1 OR US-20210212392-A1 OR EP-3912498-A1 OR JP-2012511457-A OR EP-2373190-B1 OR WO-2010067393-A1 OR EP-2373190-A1 OR US-9027170-B2 OR ES-2388411-T3 OR ES-2724427-T3 OR BR-PI0711853-A2 OR EP-3167730-B2 OR EP-3167730-B1 OR DE-202022101296-U1 OR JP-2012511637-A OR US-20120032422-A1 OR JP-5671472-B2).did.					
L14	1480	A41D13/018.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/04/25 11:23 AM
L15	3347	A41D13/018.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 11:23 AM
L16	238	A41D13/018.cpc. AND mesh	(US-PGPUB; USPAT; USOCR; FIT (AP, AT,	OR	ON	ON	2023/04/25 11:23 AM

			AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
L17	34	(Artificial Intelligence) More like doc: WO-2021116931-A1 Text: (US-20230001879-A1 OR EP-4072364-A1 OR JP-2023505721-A OR EP-3835140-B1 OR CN-114980766-A OR EP-3835140-A1 OR EP-3167730-A1 OR EP-3795020-A1 OR JP-2018517599-A OR US-20180132548-A1 OR US-20210076759-A1 OR US-20210112892-A1 OR EP-4159071-A1 OR EP-3291697-B1 OR EP-3795020-B1 OR EP-3291697-A1 OR EP-3167730-B2 OR EP-3167730-B1 OR JP-6770529-B2 OR CN-107567401-B).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/27 02:02 PM
L18	37	(Artificial Intelligence) More like doc: EP-3835140-A1 Text: (EP-3835140-B1 OR US-20230001879-A1 OR WO-2021116931-A1 OR EP-4072364-A1 OR JP-2023505721-A OR CN-114980766-A OR EP-3432744-B1 OR EP-4066667-A1 OR WO-2017163196-A1 OR EP-3432744-A1 OR ES-2724427-T5 OR EP-3167730-A1 OR EP-3167730-B2 OR EP-3167730-B1 OR JP-6770529-B2 OR CN-107567401-B OR EP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/27 02:15 PM

		3291697-B1 OR EP-3795020-B1 OR EP-3291697-A1 OR EP-4197378-A1).did.					
L19	3392	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/11/27 02:44 PM
L20	2	("20040183283" OR "0000002").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/28 04:58 PM
L21	17805	(airbag OR inflat$ OR gas ADJ generat$) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND inflat$ AND deflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 12:33 PM
L22	1704	(airbag) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND inflat$ AND deflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 12:34 PM
L23	4087	(airbag) AND (mesh OR weave OR woven OR lattice OR tie OR wall OR partition) AND (casing OR housing)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2024/03/12 12:37 PM

		AND inflat$ AND deflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
L24	1279	(airbag) AND (mesh OR weave OR woven OR lattice OR tie) AND (wall OR partition) AND (casing OR housing) AND inflat$ AND deflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 12:37 PM
L25	1386	(airbag) AND (mesh OR weave OR woven OR lattice OR tie) AND (wall OR partition OR tie) AND (casing OR housing) AND inflat$ AND deflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 12:37 PM
L26	35101	(airbag) AND (wall OR partition OR tie OR divid$5 OR separat$4 OR compartment$) AND (casing OR housing) AND inflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 01:35 PM
L27	20778	(airbag) AND (wall OR	(US-PGPUB; USPAT;	OR	ON	ON	2024/03/12

		partition OR tie OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) AND inflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest OR clothing OR clothe$)	USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				01:36 PM
L28	18295	(airbag) SAME inflat$ AND (wall OR partition OR tie OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 01:36 PM
L29	17657	(airbag) WITH inflat$ AND (wall OR partition OR tie OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 01:36 PM
L30	4312	inflat$ AND (wall OR partition OR tie OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) AND airbag NEAR (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN,	OR	ON	ON	2024/03/12 01:37 PM

			WO); FPRS; EPO; JPO; DERWENT)				
L31	0	inflat$ AND tie NEAR (wall OR partition OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) AND airbag NEAR (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 01:40 PM
L32	19	inflat$ AND tie WITH (wall OR partition OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) AND airbag NEAR (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 01:41 PM
L33	4295	inflat$ AND (wall OR partition OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) AND airbag NEAR (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 01:41 PM
L34	1479	inflat$ AND (wall OR partition OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) SAME airbag NEAR (garment OR shirt OR jacket OR coat OR outerwear OR cover OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	OR	ON	ON	2024/03/12 01:42 PM

		vest OR clothing OR clothe$)	NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
L35	23	inflat$ AND (wall OR partition OR divid$5 OR separat$4 OR compartment$) SAME (casing OR housing) SAME airbag NEAR (garment OR shirt OR jacket OR coat OR outerwear OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/12 03:41 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	956	inflat$ AND (wall OR partition OR divid$5 OR separat$4 OR compartment$) AND (casing OR housing) AND airbag AND (garment OR shirt OR jacket OR coat OR outerwear OR vest OR clothing OR clothe$)	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/12 03:44 PM

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/757,247	**02/28/2024 12:55:22 PM Z ET**	**1029V-8002**

Title of Invention

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	5950	FILED BY	JAMIE LEVINE
PATENT CENTER #	64480046	FILING DATE	06/13/2022
CUSTOMER #	20311	FIRST NAMED INVENTOR	Lino DAINESE
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Michael Mercanti

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
1029V-8002-Response.pdf	11	Amendment/Request for Reconsideration-After Non-Final Rejection	113 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
1029V-8002-Response.pdf	506C6D59E54403733BF458FB3849D2E998C9DFD93993664B2 06B5CC2F7D70E7A68753E3CD0F6D0840C1DB3AE2C3F81EE6 83C0F27187363EBBF319E7CBB752202

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Our Ref: 1029V-8002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln. Serial No.:	17/757,247	Art Unit:	3614
Filed:	June 13, 2022	Examiner:	Matthew James O'Neill
Inventor(s):	Lino DAINESE	Confirm. No.:	5950
For:	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE		

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE

S I R:

In response to the Office Action of December 5, 2023, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A protective device for the protection of a user, said protective device comprising 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 ~~the~~ said plurality of tie elements; wherein ~~the first mesh portion, the second mesh portion and the tie elements define one or more inner housings of the mesh structure~~ said tie elements comprise dividing walls defining a plurality of inner housings between said first mesh portion and said second mesh portion;

wherein ~~the~~ said protective device includes a casing body arranged at least in an inner housing of said ~~one or more~~ plurality of inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in ~~the~~ said at least one inner housing of ~~the~~ said mesh structure, and wherein in said deflated condition, ~~the~~ said casing body occupies a first space or first region, and wherein in ~~said~~ the deflated condition a second region or second space of said at least one inner housing lacks a casing body, and wherein in ~~said~~ the inflated condition ~~the~~ said casing body occupies the second region or second space.

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 intended to house a corresponding portion of said casing body, and

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. (Currently Amended) 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, ~~the~~ said mesh structure and that said mesh structure is an external structure of ~~the~~ said protective device.

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

4. (Currently Amended) The protective device according to claim 1, wherein the deflated condition of ~~the~~ said casing body corresponds to a slack and loose condition of ~~the~~ said mesh structure and of ~~the~~ said tie elements, and wherein ~~to~~ the inflated condition of ~~the~~ said casing body corresponds to an at least partially tensioned condition of ~~the~~ said tie elements ~~(5)~~ and of ~~the~~ said first mesh portion and ~~the~~ said second mesh portion.

5. (Canceled)

6. (Canceled)

7. (Currently Amended) The protective device according to claim 1, wherein ~~the~~ said casing body has a hand or comb or tree shape, or has tubular shape arranged in a serpentine way.

8. (Currently Amended) The protective device according to claim 1, wherein ~~the~~ said tie elements are arranged between said first mesh portion and said second mesh portion aligned in a plurality of rows of tie elements.

9. (Currently Amended) The protective device according to claim 8, wherein each row of tie elements of ~~the~~ said plurality of rows of tie elements comprises a plurality of tie elements wherein in a condition of at least partial tension, ~~the~~ said tie elements belonging to ~~the~~ a same row of tie elements are arranged substantially parallel to each other.

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

11. (Currently Amended) The protective device according to claim 1, comprising a gas source or inflation source connected to ~~the inflatable~~ said casing body.

12. (Currently Amended) The protective device according to claim 1, wherein said protective device is a wearable device.

13. (Currently Amended) A protective garment or clothing accessory comprising ~~the~~ said protective device according to claim 1.

14. (Currently Amended) The protective garment according to claim 13, 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.

15. (Currently Amended) A method for making a protective device for the protection of a user, said method comprising the steps of:

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 ~~said first mesh portion and said second mesh portion and the plurality of tie elements define one or more housings in the mesh structure~~ the tie elements comprise dividing walls defining a plurality of inner housings between the first mesh portion and the second mesh portion;

arranging a casing body with a plurality of portions in ~~at least one of said housings~~ 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 intended to house a corresponding portion of the casing body; and

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 ~~said~~ 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 ~~said~~ the at least one inner housing lacks ~~said~~ the casing body, and wherein in ~~said~~ the inflated condition the casing body expands and occupies the second region or second space.

16. (Previously Presented) The method according to claim 15, 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.

17. (Canceled)

18. (Previously Presented) The method according to claim 15, wherein the casing body is inflated until the mesh structure is tensioned and the mesh structure bridles and prevents a further expansion of the casing body.

19. (Currently Amended) The method according to claim 15, wherein in ~~said~~ the deflated condition the second region of ~~said~~ 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.

20. (Previously Presented) 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

ALPINESTARS
Ex. 1002 - Page 47

contact, ~~the~~ said mesh structure or that said mesh structure is an external structure of ~~the~~ said protective device.

21. (Previously Presented) The method according to claim 15, 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.

22. (Currently Amended) The protective device according to claim 10, wherein ~~the~~ said inflatable element is shaped like a jacket and is apt to surround an upper area or bust of the user's body.

23. (Currently Amended) The protective device according to claim 1, wherein ~~the~~ said mesh structure is a perforated structure that allows air or other gas to pass.

24. (Currently Amended) The protective device according to claim 1, wherein ~~the~~ said mesh structure, or the mesh portion, is a net.

25. (New) 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.

REMARKS

Request for Reconsideration

Applicants have carefully considered the matters raised by the Examiner in the outstanding Office Action but remain of the position that patentable subject matter is present. Applicants respectfully request reconsideration of the Examiner's position based on the above amendments and the following remarks.

Status of the Claims

Claims 1-4, 7-16, 18-25 are pending with claims 1 and 15 being the only independent claims. Claims 1-4, 7-15, 19,and 21-24 are amended and claim 25 is added by the present communication. Claims 5, 6, and 17 are canceled without prejudice or disclaimer. No new matter is added by the amendments.

Independent claims 1 and 15 are amended to clarify that the tie elements are dividing walls defining a plurality of inner housings in which portions of the casing body are arranged. Support is found in previous claims 5 and 6 and in paragraph [0034] of the PGPub of the present application (US 2023/0001879).

The dependent claims are amended to be consistent with the changes to claims 1 and 15 and to make editorial corrections.

Support for new claim 25 is found in paragraph [0064] and Figures 4, 5, and 6 of the PGPub.

Rejections under 35 U.S.C. §§102 and 103

Claims 1-7, 10-13, and 15-24 are rejected under 35 U.S.C. §102(a)(1) as being anticipated by US 2021/0329986 (Mazzarolo).

Claims 8, 9, and 14 are rejected under 35 U.S.C. §103 as being unpatentable over Mazzarolo in view of US 2012/0032422 (Dainese).

Independent claim 1 is amended to recite that "said tie elements comprise dividing walls defining a plurality of inner housings between said first mesh portion and said second mesh portion", "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 intended to house a corresponding portion of said casing body", and "in the inflated condition, said portions of the casing body are inflated against said first mesh portion, said second mesh portion, and said tie elements so as to form a planar structure."

These limitations are based on previous claims 5 and 6, and further clarify 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.

Mazzarolo fails to disclose the above limitations because Mazzarolo does not disclose dividing walls as now recited in independent claim 1.

Mazzarolo discloses a garment with an inflatable protection device. The garment 1 includes a housing 2 delimited by a pair of surfaces 4, 6 sealed along perimetric edges 8 and defining an inner volume (see paragraph [0028] of Mazzarolo). The garment 1 includes an inflatable protection device 10 with an inflatable bag 12 positioned in the housing 2 (paragraphs [0031]-[0032] of Mazzarolo). In one embodiment, the surfaces 4, 6 of the housing 2 are connected by tie members 38, which are defined as having a thread-like form and limit the distance between the surfaces 4, 6 (paragraphs [0056]-[0058] of Mazzarolo).

The inflatable bag 12 encircles the tie members 38 during inflation (paragraph [0059] and Figure 6b of Mazzarolo).

Since Mazzarolo discloses that the tie members connecting the surfaces 4, 6 are thread-like, 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. Accordingly, independent claim 1 is not anticipated by and is allowable over Mazzarolo.

Independent claim 15 is amended to include limitations similar to the above limitations of independent claim 1. As such, claim 15 is allowable for the same reasons as is independent claim 1.

Dependent claims 2-4, 7-14, 16, and 18-25 are allowable for the same reasons as are claims 1 and 15, as well as for the additional recitations contained therein.

Dainese was not added to cure the deficiencies of the primary reference but to show additional limitations which, even if it were to show, do not cure the deficiencies discussed above. As such, Applicants respectfully submit that the claims are allowable over the cited references.

New claim 25 recites "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." Support for this limitation is found in paragraph [0064] add Figures 4, 5, and 6 of the PGPub of the present application. Mazzarolo does not disclose this feature because Figures 6a and 6b of Mazzarolo indicate that the inflatable bag 12 is not received the space between the tie elements 38 in the deflated condition shown in Figure 6a. Accordingly, claim 25 should be allowable for at least these additional reasons.

Conclusion

In view of the foregoing and the enclosed, it is respectfully submitted that the Application is in condition for allowance and such action is respectfully requested.

Should any further fees or extensions of time be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit account #02-2275.

Respectfully submitted,
LUCAS & MERCANTI, LLP

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AWF/msl

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/757,247	Filing Date 06/13/2022	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $240 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	02/28/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 22	Minus	** 24	= 0		x $40 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $192 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/SHANDA E ROSS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/757,247	06/13/2022	Lino DAINESE	1029V-8002

CONFIRMATION NO. 5950

20311
LUCAS & MERCANTI, LLP
30 BROAD STREET
21st FLOOR
NEW YORK, NY 10004

POA ACCEPTANCE LETTER

OC000000067791603

Date Mailed: 02/02/2024

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/24/2024.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ytdemisse/

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/757,247	06/13/2022	Lino DAINESE	5104.0010003

CONFIRMATION NO. 5950

POWER OF ATTORNEY NOTICE

OC000000067791531

26111
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1101 K Street, NW
10th Floor
WASHINGTON, DC 20005

Date Mailed: 02/02/2024

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/24/2024.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ytdemisse/

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Ex. 1002 - Page 55

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
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Application Number	17/757,247
Filing Date	06/13/2022
First Named Inventor	Lino DAINESE
Title	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE
Art Unit	3614
Examiner Name	MATTHEW JAMES O'NEILL
Attorney Docket Number	1029V-8002

SIGNATURE of Applicant or Patent Practitioner

Signature	/Michael N. Mercanti/	Date (Optional)	
Name	Michael N. Mercanti	Registration Number	33966
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ *Total of 1 forms are submitted.

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Doc Code: PA..
Document Description: Power of Attorney

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

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☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 20311

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

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OR

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City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

D-AIR LAB S.R.L.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	08.01.2014
Name	VITTORIO CAFAGGI		
Title	SPECIAL ATTORNEY		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/757,247	**01/24/2024 08:43:00 AM Z ET**	**5104.0010003**

Title of Invention

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	5950	FILED BY	JAMIE LEVINE
PATENT CENTER #	64063073	FILING DATE	06/13/2022
CUSTOMER #	26111	FIRST NAMED INVENTOR	Lino DAINESE
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Michael Mercanti

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
1029V-8002373.pdf	3	Assignee showing of ownership per 37 CFR 3.73	116 KB
PoA D-Air Lab Srl signed.pdf	2	Power of Attorney	968 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
1029V-8002373.pdf	62C1D127B34022BC9E9E916CBC78E73A10986D38D840DBCC A5E343464C2E2A700FDE79A2EA5D36B217701D12979E98D79

	29037931C4B4DE6D948533E12BAF51F
PoA D-Air Lab Srl signed.pdf	FEAB1E33B02E3924428E4256856FC46D045E9C4E8F4CAB64C193D14445C6C989AC407628C38E017FB01042D3D9453AF611D1A4FCA8156CED73F59E9597FBE2B8

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: D-AIR LAB S.R.L.

Application No./Patent No.: 17/757,247 Filed/Issue Date: 06/13/2022

Titled: PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

D-AIR LAB S.R.L., a Limited Liability Company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 060183, Frame 0289, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: LINO DAINESE To: D-AIR LAB S.R.L.

   The document was recorded in the United States Patent and Trademark Office at

   Reel 060183, Frame 0289, or for which a copy thereof is attached.

2. From: _____ To: _____

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This collectionof information is required by 37CFR 3.73(b). The informationis required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application.Confidentiality isgoverned by 35U.S.C. 122 and37 CFR 1.11and 1.14.This collection is estimated to take 12 minutes to complete, including gathering,preparing, and submitting the completed applicationform to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should besent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETEDFORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA22313-1450** .

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PTO/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

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5. From: _____ To: _____

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6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

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☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Michael N.Mercanti/	2024-01-24
Signature	Date
Michael N. Mercanti	33966
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requiresthat you begiven certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirementsof the Act, please be advised that: (1)the general authority for the collectionof this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary;and (3) the principalpurpose for whichthe informationis used by the U.S. Patent and Trademark Office is to process and/or examine your submission related toa patent application or patent. If you do not furnishthe requested information, the U.S. Patent and Trademark Officemay not be able to process and/or examine yoursubmission, which may result in termination of proceedings orabandonment of the application or expiration of the patent.

Theinformation provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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5. Arecord related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further,a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. Arecord from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/13/2022	Lino DAINESE	5104.0010003	5950

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STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
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EXAMINER	
O'NEILL, MATTHEW JAMES	

ART UNIT	PAPER NUMBER
3614	

NOTIFICATION DATE	DELIVERY MODE
12/05/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

e-office@sternekessler.com

ALPINESTARS
Ex. 1002 - Page 63

Office Action Summary	Application No. 17/757,247	Applicant(s) DAINESE, Lino	
	Examiner MATTHEW J O'NEILL	Art Unit 3614	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 10/2/2023.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-24 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-24 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 6/13/2022 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☑ All b)☐ Some** c)☐ None of the:

1.☑ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Response to Arguments

2. Applicant's arguments, see pages 8-11, filed 10/2/2023, with respect to the rejection(s) of claim(s) 1-19 under U.S.C. 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Mazzarolo (US-20210329986-A1) and Dainese (US-20120032422-A1).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.
>
> (a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

4. Claims 1-7, 10-13, and 15-24 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Mazzarolo (US-20210329986-A1), henceforth referred to as Mazzarolo.

5. Regarding claim 1, Mazzarolo discloses a protective device for the protection of a user, said protective device comprising a mesh structure (Paragraph [0054]: "Preferably, the inflatable protection device 10 can comprise a casing inside which one or more inflatable bags 12 are housed. The casing can be made with a breathable material, for example a mesh material."), comprising a first mesh portion (Figure 4b: surface 4), and a second mesh portion (Figure 4b: surface 6), and a plurality of tie elements (Paragraph [0056]: "Advantageously, the surfaces 4, 6

of the housing 2 or the inner and outer layers of the casing can be connected by means of tie members 38 (see FIGS. 6a and 6b)"), wherein said first mesh portion and said second mesh portion are opposite one another (Figure 4b: surfaces 4 and 6 are opposite each other), and are connected one another by the plurality of tie elements (Figure 6b: tie elements 38 connect surfaces 4 and 6), wherein the first mesh portion, the second mesh portion, and the tie elements define one or more inner housings of the mesh structure (Figure 6b: housing 2 is divided into 3 inner housings, formed by surfaces 4 and 6, ties 38), wherein the protective device includes a casing body arranged at least in an inner housing of said one or more inner housings (Paragraph [0054]: "Preferably, the inflatable protection device 10 can comprise a casing inside which one or more inflatable bags 12 are housed", further, Figure 6b: inflatable bag 12 disposed inside housing 2 of protection device 10), wherein said casing body is configured to assume a deflated condition (Figure 4a: inflatable bag 12 configured in a deflated condition), and an inflated condition in the at least one inner housing of the mesh structure (Figure 4c: inflatable bag 12 configured in an inflated condition inside the mesh structure formed by walls 4 and 6), and wherein in said deflated condition, the casing body occupies a first space or first region (Figure 4a: inflatable bag 12 configured in a deflated condition occupying a first space in the housing), and wherein in said deflated condition a second region or second space of said at least one inner housing lacks a casing body (Figure 4a: second region of housing lacks inflatable bag 12), and wherein in said inflated condition the casing body occupies the second region or second space (Figure 4c: inflatable bag 12 configured in an inflated condition occupying the second region of the housing).

6. Regarding claim 2, Mazzarolo discloses wherein in the inflated condition said casing body is configured to line from the inside, at least partially in contact, the mesh structure (Figure 4c: inflatable bag 12, in the inflated condition, lines and contacts mesh surfaces 4 and 6), and

that said mesh structure is an external structure of the protective device (Figure 5: mesh surfaces 4 and 6 form the external structure of protection device 10).

7. Regarding claim 3, Mazzarolo discloses wherein in said inflated condition the casing body completely occupies the second region or second space and the first region or first space of the housing (Figure 4c: inflatable bag 12 configured in an inflated condition occupying the second region of the housing).

8. Regarding claim 4, Mazzarolo discloses the deflated condition of the casing body corresponds to a slack and loose condition of the mesh structure and of the tie elements (Figures 4a and 6a: deflated condition of housing 2 corresponds to slack in mesh surfaces 4 and 6, and ties 38, further Paragraph [0058]: "Advantageously, the tie members 38 are designed to remain untensioned inside the housing or inside the casing when the inflatable bag is in its rest condition"), and wherein to the inflated condition of the casing body corresponds an at least partially tensioned condition of the tie elements and of the first mesh portion and the second mesh portion (Paragraph [0058]: "The tie members 38 are tensioned when the inflatable bag moves from its rest condition to the operating condition (see FIG. 6b), so as to limit the distance between the inner surface 4 and the outer surface 6").

9. Regarding claim 5, Mazzarolo discloses the tie elements define a plurality of housings between the first mesh portion and the second mesh portion (Figure 6b: tie elements 38 define 3 housings between first and second mesh surfaces 4 and 6), and the casing body comprises a plurality of portions each arranged in a corresponding housing of said housings (Figures 6a and 6b: inflatable bag 12 comprises portions corresponding to the 3 housings formed by the tie elements 38 and surfaces 4 and 6).

10. Regarding claim 6, Mazzarolo discloses the housings have the shape of channels and are arranged side by side one another (Figure 6b: housings are formed in channels by ties 38, and

are arranged next to each other), and each one intended to house a corresponding casing body or casing body portion (Figures 6a and 6b: inflatable bag 12 comprises portions corresponding to the 3 housings formed by the tie elements 38 and surfaces 4 and 6), and wherein in inflated condition, the casing bodies are inflated against each other so as to form a planar structure (Figure 6b: portions of inflatable bag 12 are inflated against each other, forming protective device 10 into a planar structure).

11. Regarding claim 7, Mazzarolo discloses the casing body has a hand or comb or tree shape, or has tubular shape arranged in a serpentine way (Figure 6a and 6b: inflatable bag 12 is formed in a comb shape).

12. Regarding claim 10, Mazzarolo discloses wherein the mesh portions (4, 6) and the casing body (12) define an inflatable element, and wherein an inflated condition of the casing body corresponds to an inflated condition of protection of the inflatable element and a deflated condition corresponds to a rest condition of the inflatable element (Paragraph [0057]: "The function of the tie members 38 is to limit the expansion of the housing 2 or of the casing when the inflatable bag 12 is moving between its rest condition (FIG. 6a) to its operating condition (FIG. 6b)"), and wherein in said deflated condition the second region of said at least one housing is apt to allow a passage of air between the first mesh portion and the second mesh portion passing through the second region of said at least one housing (Paragraph [0045]: "it is possible to leave a large portion of the surfaces 4, 6 of the housing 2 uncovered when the bag 12 is in the rest condition, thus allowing an increased breathability of the garment 1").

13. Regarding claim 11, Mazzarolo discloses comprising a gas source or inflation source connected to the inflatable casing body (Figure 4a: inflation means 14 connected to inflatable bag 12).

14. Regarding claim 12, Mazzarolo discloses said device is a wearable device (Abstract: "A garment (1) comprising an inflatable protection device (10)").

15. Regarding claim 13, Mazzarolo discloses a protective garment or clothing accessory comprising the protective device (Abstract: "A garment (1) comprising an inflatable protection device (10)") according to claim 1 (see the above rejection of claim 1).

16. Regarding claim 15, Mazzarolo discloses a method for making a protective device for the protection of a user said method comprising the steps of providing a mesh structure (Paragraph [0064]: "Preferably, the inflatable protection device 10 can comprise a casing inside which one or more inflatable bags 12 are housed. The casing can be made with a breathable material, for example a mesh material."), comprising a first mesh portion and a second mesh portion opposite the first mesh portion (Figure 4b: surfaces 4 and 6 are opposite each other), and a plurality of tie elements connecting the first mesh portion and the second mesh portion (Paragraph [0056]: "Advantageously, the surfaces 4, 6 of the housing 2 or the inner and outer layers of the casing can be connected by means of tie members 38 (see FIGS. 6a and 6b)"), wherein said first mesh portion and said second mesh portion and the plurality of tie elements define one or more housings in the mesh structure (Figure 6b: housing 2 is divided into 3 inner housings, formed by surfaces 4 and 6, ties 38), arranging a casing body in at least one of said housings to form with the mesh structure an inflatable element (Paragraph [0054]: "Preferably, the inflatable protection device 10 can comprise a casing inside which one or more inflatable bags 12 are housed", further, Figure 6b: inflatable bag 12 disposed inside housing 2 of protection device 10), and inflating the casing body from a first deflated operating condition to a second inflated operating condition (Paragraph [0033]: "In particular the inflatable bag 12 is designed to move between a rest condition, where it is in a deflated status (see FIGS. 1a, 1b, 4a and 6a), and an operating condition, where it is in an inflated status (see FIGS. 2a, 2b, 4c and

6b)"), wherein in said deflated condition, the casing body occupies a first space or region, (Figure 4a: inflatable bag 12 configured in a deflated condition occupying a first space in the housing), and wherein in said deflated condition a second region or second space of said at least one housing lacks said casing body (Figure 4a: second region of housing lacks inflatable bag 12), and wherein in said inflated condition the casing body expands and occupies the second region or second space (Figure 4c: inflatable bag 12 configured in an inflated condition occupying the second region of the housing).

17. Regarding claim 16, Mazzarolo discloses the casing body is inflated until the tie elements and the mesh structure are tensioned (Paragraph [0058]: "The tie members 38 are tensioned when the inflatable bag moves from its rest condition to the operating condition (see FIG. 6b), so as to limit the distance between the inner surface 4 and the outer surface 6"), and until the casing body is at least partially adhered to the first mesh portion and the second mesh portion (Figure 4b: inflatable bag contacts entirety of mesh surfaces 4 and 6).

18. Regarding claim 17, Mazzarolo discloses the tie elements are arranged to form a plurality of side-by-side housings (Figure 6b: tie elements 38 define 3 housings between first and second mesh surfaces 4 and 6), and wherein portions of the casing body or a plurality of casing bodies are arranged side by side one another (Figures 6a and 6b: inflatable bag 12 comprises portions corresponding to the 3 housings formed by the tie elements 38 and surfaces 4 and 6, and are arranged side by side), and wherein in said inflated condition portions of casing body or a plurality of casing bodies push against each other to form a planar structure (Figure 6b: portions of inflatable bag 12 are inflated against each other, forming protective device 10 into a planar structure).

19. Regarding claim 18, Mazzarolo discloses the casing body is inflated until the mesh structure is tensioned and the mesh structure bridles and prevents a further expansion of the

casing body (Paragraph [0058]: "The tie members 38 are tensioned when the inflatable bag moves from its rest condition to the operating condition (see FIG. 6b), so as to limit the distance between the inner surface 4 and the outer surface 6").

20. Regarding claim 19, Mazzarolo discloses wherein in said deflated condition the second region of said at least one housing allows an air passage between the first mesh portion and the second mesh portion passing through the second region (Paragraph [0045]: "it is possible to leave a large portion of the surfaces 4, 6 of the housing 2 uncovered when the bag 12 is in the rest condition, thus allowing an increased breathability of the garment 1").

21. Regarding claim 20, Mazzarolo discloses in the inflated condition said casing body is configured to line from the inside at least partially in contact, the mesh structure (Figure 4c: inflatable bag 12, in the inflated condition, lines and contacts mesh surfaces 4 and 6), or that said mesh structure is an external structure of the protective device (Figure 5: mesh surfaces 4 and 6 form the external structure of protection device 10).

22. Regarding claim 21, Mazzarolo discloses the casing body is inflated until the tie elements and the mesh structure are tensioned (Paragraph [0058]: "The tie members 38 are tensioned when the inflatable bag moves from its rest condition to the operating condition (see FIG. 6b), so as to limit the distance between the inner surface 4 and the outer surface 6"), or until the casing body is at least partially adhered to the first mesh portion and the second mesh portion (Figure 4b: inflatable bag contacts entirety of mesh surfaces 4 and 6).

23. Regarding claim 22, Mazzarolo discloses the inflatable element is shaped like a jacket and is apt to surround an upper area or bust of the user's body (Figure 1b: inflatable protection device 10 is formed in a jacket surrounding the bust of a user).

24. Regarding claim 23, Mazzarolo discloses the mesh structure is a perforated structure that allows air or other gas to pass (Paragraph [0054]: "The casing can be made with a breathable material, for example a mesh material").

25. Regarding claim 24, Mazzarolo discloses the mesh structure or the mesh portion is a net (Paragraph [0054]: "The casing can be made with a breathable material, for example a mesh material").

Claim Rejections - 35 USC § 103

26. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

27. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

28. Claims 8, 9, and 14 are rejected under 35 U.S.C. 103 as being unpatentable over Mazzarolo in view of Dainese (US-20120032422-A1), henceforth referred to as Dainese.

29. Regarding claims 8 and 9, Mazzarolo does not teach rows of tie elements. Dainese discloses the tie elements are arranged between said first mesh portion and said second mesh portion aligned in a plurality of rows of tie elements (Figure 1: tie elements 12 define housings between first and second mesh portions 10 and 11) (claim 8), each row of tie elements of the plurality of rows of tie elements comprises a plurality of tie elements (Figure 2: each row of tie elements 12 comprises a plurality of tie

elements), wherein in a condition of at least partial tension, the tie elements belonging to the same row of tie elements are arranged substantially parallel to each other (Figure 2: tie elements 12 are arranged parallel to each other) (claim 9). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the airbag structure of Mazzarolo with the rows of ties of Dainese in order to increase the stability of the airbag structure when in the inflated condition (Paragraph [0073]: “The stability of the fold P in the inflated condition is also ensured by the presence of the tie members 12 which impart a certain robustness to the whole of the inflatable member 2”).

30. Regarding claim 14, Mazzarolo discloses said protective garment has a covering layer (Figure 3a: jacket outer layer 1B), and wherein said covering layer covers said first region and said second region of said one or more housings (Figures 3a and 3b: jacket outer layer 1b covers all of inflatable protection device 10). However, Mazzarolo does not teach the outer layer being breathable. Dainese discloses wherein said covering layer is of breathable material or includes transpiration openings (Paragraph [0125]: "Moreover, this open ring allows the device 110 to be incorporated into a garment, for example a motorcyclist's jacket or riding suit, which comprises means for opening/closing the garment (for example a zip fastener) along the user's chest"). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the outer garment layer of Mazzarolo with the transpiration openings of Dainese in order to make the garment more comfortable in warmer environments.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J O'NEILL whose telephone number is (571)272-4752. The examiner can normally be reached Mon - Fri: 7AM-4PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Shanske can be reached on (571) 270-5985. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/MATTHEW JAMES O'NEILL/
Examiner, Art Unit 3614

/JASON D SHANSKE/
Supervisory Patent Examiner, Art Unit 3614

Notice of References Cited	Application/Control No. 17/757,247	Applicant(s)/Patent Under Reexamination DAINESE, Lino	
	Examiner MATTHEW J O'NEILL	Art Unit 3614	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-20210329986-A1	10-2021	Mazzarolo; Giovanni	A41D31/185	1/1
*	B	US-20120032422-A1	02-2012	Dainese; Lino	B62J27/20	280/728.1
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

CPC - Searched*		
Symbol	**Date**	**Examiner**
A41D13/018	11/27/2023	MJO
B60R21/23	11/27/2023	MJO
B60R21/239	11/27/2023	MJO
B60R21/20	04/25/2023	MJO

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
See attached PE2E SEARCH history	11/28/2023	MJO
Applicant and inventor search	04/25/2023	MJO
Similarity search of application	04/25/2023	MJO
See search history	04/27/2023	KAB

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614

ALPINESTARS
Ex. 1002 - Page 76

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/JASON D SHANSKE/ Supervisory Patent Examiner, Art Unit 3614

ALPINE ESTARS
Ex. 1002 - Page 77

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	0	((("D-AIR") near3 ("LAB") near3 ("S.R.L"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/04/25 08:35 AM
L2	34	((("DAINESE") near3 ("Lino"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 08:36 AM
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			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
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		AND (garment OR shirt OR jacket OR coat OR outerwear OR cover)	HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
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			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
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L18	37	(Artificial Intelligence) More like doc: EP-3835140-A1 Text: (EP-3835140-B1 OR US-20230001879-A1 OR WO-2021116931-A1 OR EP-4072364-A1 OR JP-2023505721-A OR CN-114980766-A OR EP-3432744-B1 OR EP-4066667-A1 OR WO-2017163196-A1 OR EP-3432744-A1 OR ES-2724427-T5 OR EP-3167730-A1 OR EP-3167730-B2 OR EP-3167730-B1 OR JP-6770529-B2 OR CN-107567401-B OR EP-3291697-B1 OR EP-3795020-B1 OR EP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/27 02:15 PM

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L19	3392	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/11/27 02:44 PM
L20	2	("20040183283" OR "0000002").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/11/28 04:58 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Substitute for form 1449/PTO

FIRST SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Sheet 1 of 1

Complete if Known	
Application Number	17/757.247
371(c) Date	June 13, 2022
First Named Inventor	Lino DAINESE
Art Unit	3614
Examiner Name	O'Neill, Matthew James
Attorney Docket Number	5104.0010003

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	US1	US-20040183283-A1	09-23-2004	BUCKMAN; R.F. et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]–Number[4]–Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	FP4	WO-2011148353-A1	12-01-2011	FRENI BREMBO SPA [IT]		☐
	FP5	EP-2621297-B1	08-09-2017	HOEVDING SVERIGE AB [SE]		☐

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author(in CAPITAL LETTERS),title of the article(when appropriate), title of the item (book,magazine,journal,serial,symposium,catalog,etc.),date,page(s),volume-issue number(s),publisher, city and/or country where published.	T[2]
			☐

Examiner Signature	/MATTHEW JAMES O'NEILL/	Date Considered	11/28/2023

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.J.O./

Bibliographic Data

Application No: 17/757,247

Foreign Priority claimed: (•) Yes ( ) No

35 USC 119 (a-d) conditions met: [✓] Yes [ ] No [ ] Met After Allowance

Verified and Acknowledged: /MATTHEW JAMES O'NEILL/ Examiner's Signature | Initials

Title: PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/13/2022	280	3614	5104.0010003
RULE			

APPLICANTS

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INVENTORS

Lino DAINESE, Vicenza, ITALY

CONTINUING DATA

This application is a 371 of PCT/IB2020/061689 12/09/2020

FOREIGN APPLICATIONS

ITALY IT102019000023958 12/13/2019

ITALY IT102019000023961 12/13/2019

ITALY IT102019000023964 12/13/2019

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(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 621 297 B1

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09.08.2017 Bulletin 2017/32

(21) Application number: **11829687.0**

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A42B 3/04 *(2006.01)*

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(87) International publication number:
WO 2012/044245 (05.04.2012 Gazette 2012/14)

(54) **AIRBAG SUITABLE FOR HEAD PROTECTION**

KOPFSCHUTZ-AIRBAG

AIRBAG ADAPTÉ À LA PROTECTION DE LA TÊTE

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **29.09.2010 SE 1051010**

(43) Date of publication of application:
07.08.2013 Bulletin 2013/32

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(56) References cited:
WO-A1-2007/050024
WO-A1-2010/064057
CA-A1- 1 171 602
DE-A1- 19 754 541
GB-A- 2 296 855
GB-A- 2 352 162
US-A- 4 324 005
US-A- 4 825 469
US-A- 4 977 623
US-A- 6 032 299
US-B1- 6 230 333

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Printed by Jouve, 75001 PARIS (FR)

Description

TECHNICAL FIELD

[0001] The present disclosure relates to airbags. More specifically, the present invention relates to a wearable airbag for protecting a user's head.

BACKGROUND

[0002] Airbags for protection of a person's head are known in the art, for example through WO2007050024A1 and through WO01/54523A1.

[0003] In order to prevent whiplash injuries, the airbag of WO2007050024A1 is inflated in a two-step manner, first around the neck and back head region of a user to stabilize the neck, and then around the skull and crown part of the user's head to form a hood.

[0004] DE 197 54 541 A1 discloses a protecting device, which when activated encases the wearer's head and neck with air cushions of the airbag system. The cushions include a main cushion and auxiliary cushion. A controi computer, an ignitor and a gas generator are integrated into the bottom section of the protector. A vehicle movement measuring system delivers data to the computer via a wireless signal connection.

[0005] In order to prevent whiplash injuries it is of high importance that the airbag is inflated in a highly predictable manner, independently of external factors, such as the exact shape of the head of the user and/or the exact folding of the airbag prior to inflation.

[0006] Hence, improved controi of the inflation of the airbag would be advantageous.

SUMMARY

[0007] An object is to provide an improved airbag for protecting the head of a user. A specific object is to provide an airbag enabling improved controi of the inflation of the airbag around the user's head in case of an accident.

[0008] According to a first aspect, an airbag for protecting the head of a user in case of an accident is provided. The airbag comprises an inflatable inner bag surrounded by an outer bag, wherein the structure of the outer bag defines the shape of the airbag when the inner bag is inflated, and wherein said inner bag comprises a plurality of elongate first chambers, each of which elongate first chambers forms a head protective part when inflated. An inflation of the inner bag leads to expansion of the outer bag. The inner bag further comprises a second chamber interconnecting said first chambers, wherein said second chamber is configured to distribute fluid between said first chambers and the second chamber, wherein said second chamber forms a neck protective part when inflated..

[0009] The elongate first chambers may form protective parts for the frontal, parietal, and temporai lobes of the skull when inflated. Further, the elongate first chambers may form protective parts for the neck when inflated.

[0010] Said second chamber may further form a protective part for the occipital lobe of the skull when inflated.

[0011] The outer bag may comprise a plurality of lateral sections extending between predefined portions of the outer bag, and wherein each section is accommodating a first chamber such that the first chamber is prevented to move outside its associated section when inflated.

[0012] Said portions of the outer bag may be formed by means of seams.

[0013] The inner bag may comprise at least one passageway through a first or a second chamber.

[0014] Said at least one passageway may be formed as a non-inflatable part of a first or a second chamber.

[0015] Said portions of the outer bag may be attached to each other through said passageway.

[0016] Said sections may be formed by attaching apredefined portion of a first side of the outer bag with a predefined portion of a second side of the outer bag by means of seams, glue, or straps.

[0017] According to a second aspect, an airbag system is provided comprising an airbag according to the first aspect of the invention, and an inflation device configured to inflate fluid into the inner bag.

[0018] The inflation device may be configured to inflate fluid into the first chambers via the second chamber.

[0019] The airbag system may further comprise a triggering sensor configured to detect abnormal movement of a user corresponding to an accident, wherein said triggering sensor is capable of transmitting a triggering signal to said inflation device.

[0020] According to a third aspect, an apparel to be worn around the neck of a user is provided. The apparel comprises an airbag system according to the second aspect, wherein the airbag of said airbag system is folded within said apparel prior to inflation.

[0021] According to a fourth aspect, a method for providing an apparel for protecting the head of a user in case of an accident is provided. The method comprises the steps of providing an airbag system according to the second aspect, and folding the airbag of said airbag system within said apparel such that the elongate first chambers of said airbag are unfolded upon inflation in order to expand the airbag to cover the head of the user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

Fig. 1 shows an airbag according to an embodiment in its non-inflated state, worn by a user.

Fig. 2 shows an airbag according to an embodiment in a nearly fully inflated state.

Fig. 3 shows a partial cross-sectional view of an airbag according to an embodiment in a nearly fully inflated state.

Fig. 4 shows an inner bag according to an embodi-

ALPINESTARS
Ex. 1002 - Page 87

ment in a non-inflated state laid out flat.

Fig. 5 shows an inner bag according to an embodiment in a non-inflated state laid out flat.

Fig. 6 shows an inner bag according to an embodiment in a non-inflated state laid out flat, in conjunction with an inflation device and a protective sleeve.

DETAILED DESCRIPTION

[0023] An idea is to provide a wearable airbag system for use instead of an ordinary rigid helmet, e.g. when bicycling. Also, an idea is to provide a wearable airbag system being comfortable to wear. Furthermore, it is an idea to provide a wearable airbag system that does not obstruct vision or hearing when worn in its non-inflated state. Moreover, an idea is to provide a wearable airbag system being arranged such that it does not affect the user's hair style when worn. Preferably, the airbag system is enclosed within an apparel surrounding the neck of a user.

[0024] The following description focuses on embodiments applicable to a wearable airbag for protecting the head of a user in case of an accident. However, it will be appreciated 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, but these do not fall within the scope of the claimed invention.

[0025] Fig. 1 shows an airbag system 10 according to an embodiment in its non-inflated state. The airbag system 10 is suitabie for bicycle riders and is configured to be positioned around the neck of a user, in use. The airbag system 10 comprises an apparel 11. Thus, the apparel 11 functions as a collar intended to be worn on top of other clothes around the neck of a user as a preventive measure in case of an accident. The apparel 11 incorporates an airbag 20 for protecting the head region of the user in case of an accident.

[0026] As is shown in Fig. 1, the apparel 11 may comprise a joint portion provided with an interlocking means 12, such as a zipper, Velcro or releasable male/female connectors to connect the ends of the apparel together e.g. adjacently the users throat or neck region. The interlocking means 12 facilitates easy dressing and undressing of the apparel on the user.

[0027] The airbag system 10 may further comprise a detection device (not shown) configured to trigger inflation of the airbag by an inflation device upon detection of an accident situation. The inflation device may be any suitable type of airbag inflation device, such as an inflation device using solid fuel, such as pellets, or a so-called hybrid generator using a combination of compromised gas and solid fuel. In an embodiment, the inflation device is a cold gas inflator. 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.

[0028] Fig. 2 shows an airbag according to an embodiment in a nearly fully inflated state. In an embodiment, according to Fig. 2, the airbag 20 comprises an inner bag 21 suitable for inflation. 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. Further, the inner bag 21 comprises a plurality of separate elongate first chambers 25, 26,27.

[0029] Fig. 3 shows a partial cross-sectional view of an airbag according to an embodiment in a nearly fully inflated state.

[0030] As shown in Figs. 2 and 3, the 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. Inflation of the inner bag 21, 30 leads to expansion of the outer bag 22, 33.

[0031] An outer bag 22 according to an embodiment of the invention is shown in an expanded state in Fig. 2. The outer bag 22 is made of a standard airbag materiai, such as polyamide. 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.

[0032] According to an embodiment, the outer bag 22 comprises a plurality of sections 23, 24, 25, 26, 27 formed by attachment between portions 212,213,214,215, 311, 312, 313, 314, 315, 316 of the outer bag 22. Each respective section 23, 24, 25, 26, 27 is suitable for incorporating at least one of a plurality of elongate first chambers 28, 29, 210, 211 of the inner bag 21 (to be further described below).

[0033] As previously mentioned, Fig. 3 shows a partial cross-sectional view of an airbag according to an embodiment in a nearly fully inflated state. The outer bag 33 comprises a plurality of layers 39, 310 of sheet material defining the inner volume of said bag 33. The layers 39, 40 may be formed by a single piece of sheet materiai folded in two, or by a plurality of pieces of sheet materiai joined together.

[0034] As shown in Fig. 3, 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.

[0035] As an alternative to using straps 34, 35, 36 for joining together said portions 212, 213, 214, 215, 311, 312, 313, 314, 315, 316 of the outer bag 33, the layers 39,310 may be directly joined to each other by stitching or gluing.

[0036] Straps 34, 35, 36 may be utilized to provide improved controi of distance between the layers 39, 40. A distance between the layers 39, 310 may for example be desirable in order to create a fluid filled volume suitable for absorbing a shock directed at the head of a wearer of said airbag.

ALPINESTARS
Ex. 1002 - Page 88

[0037] Direct joining ofportions 212, 213, 214, 215, 311,312, 313, 314, 315, 316 of the outer bag 22, 33 may be useful when sections 37, 38 with small cross-sectional area are desired. For example, a section 23, 25, 26, 27, 37, 38 with small cross-sectional area may be useful for quickly unfolding a portion of the airbag with a relatively low need of supplied fluid.

[0038] No matter what technique is used for creating the sections 23, 24, 25, 26, 27, 37, 38, each section 23, 24, 25, 26, 27, 37, 38 will get a maximum inner volume related to the cross-sectional area and length of the respective section 23, 24, 25, 26, 27, 37, 38. The amount of fluid needed to fully expand/inflate each section 23, 24, 25, 26, 27, 37, 38 relates to the maximum inner volume of the section 23, 24, 25, 26, 27, 37, 38. Hence, the time needed for inflation of each respective section relates to its cross-sectional area.

[0039] Thus, as compared to having no sections, the sections 23, 24, 25, 26, 27, 37, 38 bring about the technical effect that they allow for improved controi of the size and shape of the airbag after expansion. Since each section 23, 24, 25, 26, 27, 37, 38 has a maximum inner volume, certain sections 23, 25, 26, 27, 37, 38 may be fully expanded whilst at the same time other sections, for exampie the section 24 suitable for surrounding the ears, may be left non-expanded, or substantially non-expanded. An advantage of this is that individuai controi of the shape after expansion of individuai sections 23, 24, 25, 26, 27, 37, 38 and portions of the airbag 20 is made possible. Further, the formation of sections 23, 24, 25, 26, 27, 37, 38 give improved controi of the speed of expansion of different portions of the airbag.

[0040] As is illustrated in Figs. 2 and 3, 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.

[0041] The cross-sectional area of each elongate first chamber 28, 29, 210, 211, 31, 32 may vary along the length of each first chamber. 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).

[0042] As previously mentioned, Fig. 3 shows a partial cross-sectional view of an airbag according to an embodiment in a nearlyfully inflated state. The two elongate first chambers 31, 32 are expanded in two adjacent sections 37, 38 of the outer bag 33.

[0043] The materiai ofthe inner bag 30 may be chosen to be a highly elastic materiai, such as thermoplastic polyurethane film. This enables a first chamber 31, 32 to be suitably elastic to fill the full volume of a section 37, 38 upon inflation and thus to expand substantially all parts of the outer bag surrounding each respective section. This in turn enables a tighter and closer fit between the airbag and the head and neck of the person wearing the airbag, when the airbag is in its fully expanded state, since each section may be substantially fully expanded in all directions.

[0044] According to an embodiment, as shown in Fig. 2, the airbag 20 comprises a non-expandable section 24, e.g. provided adjacent to the ears of the user. The non-expandable section 24 may be provided for controlling the relative positions of other sections 23, 25, 26, 27 and portions of the airbag 20 during and after expansion of the airbag 20. Further, the non-expandable sections may be provided for protecting the user against scratches without blocking of the hearing of the user.

[0045] Thus, the structure of the outer bag 22 defines or sets the limitofthe shape ofthe airbag 20 after inflation. Furthermore, 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. Further, the provision of the sections 23, 24, 25, 26, 27 prevents the elongate chambers 28, 29, 210, 211 from moving outside its associated section both in a non-inflated or inflated state. Hence, the shape of the inflated airbag will be defined by the pre-arranged disposition of the sections 23, 24, 25, 26, 27 such that the inflated helmet will have a well-defined shape.

[0046] The inner bag 21 may be made of a fluid impermeable materiai, such as thermoplastic polyurethane film. Since fluid cannot easily leave a fluid impermeable bag, 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 ofthe user for some time, such as when tumbling over after an accident. The inner bag 21 may be flexible and expandable such that it may expand the outer bag 22 upon inflation to a high pressure. Hence, the inner bag 21 may be inflated resulting in a relatively high internal pressure which may be maintained for some time.

[0047] In a preferred embodiment, the inner bag 21 is connected to the outer environment (i.e. atmospheric pressure) via an evacuating means for continuously allowing enclosed fluid to escape from the inner bag 21 when inflated. The evacuating means may be designed to be active, i.e. a valve opening upon a predetermined pressure or elapsed time, or passive, i.e. a channel allowing fluid to escape as soon as the inner bag 21 is subject to an increased pressure. The evacuating means may further be constructed such that the evacuating rate allows a certain pressure providing sufficient protection to a user to be maintained for a specific time after inflation, e.g. 2 seconds. The time for maintaining the protective pressure is preferably adjusted such that the inner bag, when inflated, provides protection during a complete accident sequence, but allows facilitated handling after an accident. Depending on the particular evacuation time,

ALPINESTARS
Ex. 1002 - Page 89

the evacuating means may be a hollow channel extending from the interior of the inner bag 21 to the outer environment, said channel having an interior diameter of approximately 0.5 to 1 mm.

[0048] Fig. 4 shows an inner bag 40 according to an embodiment in a non-inflated state laid out flat. The inner bag 40 comprises a plurality of separate elongate first chambers 41, 42, 43, 44, 45, 46, 47, 48. The inner bag 40 also comprises a second chamber 49 interconnecting the first chambers 41, 42, 43, 44. The second chamber 49 at least serves to distribute fluid between the first chambers 41, 42, 43, 44 and the second chamber 49 such that an efficient and controlled inflation of the inner bag 40 may be performed.

[0049] The first chambers 41, 42, 43, 44, 45, 46, 47, 48 are positioned and shaped to be inserted into sections of an outer bag, such as the outer bag 22 shown in Fig.2, for expanding said sections. For example, some of the first chambers 41, 42 may be positioned and shaped for expanding one or more sections ofthe outer bag suitable for surrounding and stabilizing the neck of a user after expansion, whilst other ones of the first chambers 43, 44, 45, 46, 47, 48 may be configured to expand one or more sections suitable for surrounding a crown part and/or forehead part of a user's head. This means that the elongate first chambers 43, 44, 45, 46, 47, 48 forms protective parts for the frontal, parietal, and temporal lobes of the skull when inflated.

[0050] Also, the second chamber 49 is positioned and shaped for expanding a back head portion of an airbag according to the invention, in order to further protect and stabilize the neck of the user. This means that the second chamber 49 forms a protective part for the neck as well as the occipital lobe of the skull when inflated.

[0051] The inner bag 40 may be formed by joining layers of a flexible film materiai to each other along one or more lines or curves 410, for example by welding or gluing. The inner bag 40 could also be made of a single sheet of film materiai folded in two layers before joining along said lines 42.

[0052] Fig. 5 shows an inner bag according to an embodiment in a non-inflated state laid out flat. The inner bag 50 comprises one or more passageways 51, 52. The passageways 51, 52 may be formed by welding portions of the inner bag 50 to each other. Subsequently, materiai may either be removed from the welded area to form a hole, or the materiai can be left in piace to form an area which may be penetrated by needle and thread without causing fluid leakage from within the inner bag 50. The passageways 51, 52 should in this context be interpreted as paths through the inner bag 50, which paths may be used to guide any substance without causing fluid to leak out from said inner bag 50.

[0053] The passageways 51, 52 allow external objects or materiai to pass through the inner bag 50 without causing fluid leakage from within the inner bag 50. For example, this allows materiai of an outer bag, such as the outer bag 22 shown in Fig. 2, to pass through said passageway for loosely securing/positioning the inner bag 50 within the outer bag. Further, it allows sections to be formed in the outer bag by attachment between portions 212 of the outer bag through said passageway/passageways.

[0054] Fig. 6 shows an inner bag according to an embodiment in a non-inflated state laid out flat, in conjunction with an inflation device and a protective sleeve. The inner bag 60 comprises a neck portion 61 (encircled by a dotted line) suitable for expanding a neck portion of an outer bag, such as the outer bag shown in Fig. 2. The inner bag 60 is adapted for receiving an inflation device 62 by the provision of an opening 63.

[0055] According to an embodiment, the opening 63 is surrounded by a sealing portion 64 for sealing against the inflation device 62. Here, a hose clip, or the like, may be used to press the sealing portion against the inflation device 62 so that no fluid can escape through the opening 63 of the inner bag 60.

[0056] According to another embodiment, there is no opening in the inner bag and instead the inflation device is positioned entirely within the inner bag, wherein the inner bag is sealed around the inflation device.

[0057] Upon activation, the inflation device 62 inflates fluid into the inner bag 60, preferably into the neck portion 61 of the inner bag 60.

[0058] As shown in Fig. 6, the inflation device 62 may be positioned to inflate fluid in two opposite directions from a centrai region of the neck portion 61 in directions straight into first elongate first chambers 65, 66 of the neck portion 61 of the inner bag 60.

[0059] In this way, rapid inflation ofthe neck portion 61 of the inner bag 60 is promoted, thereby enabling rapid expansion of the neck portion of an airbag according to the invention.

[0060] As shown in Fig. 6, an airbag according to an embodiment comprises a T-shaped protective sleeve 67 provided around the inflation device in order to protect the inner bag 60 from hot and harsh fluid streams leaving the inflation device 62. The protective sleeve 67 also helps guiding the fluid leaving the inflation device 62. Suitable materials for the protective sleeve 67 are for example uncoated, or silicon coated, polyamide materials, which are inexpensive, flexible and heat resistant.

[0061] A second chamber 68 may be positioned centrally ofthe neck portion 61, such that a back head portion of the airbag may be expanded by the second chamber 68. This enables controlled symmetric expansion of the airbag, corresponding to the symmetry of the head of a user of the airbag, thereby providing for even and predictable inflation of the airbag. Further, such an arrangement of the second chamber 68 enables improved stabilization of the back head by expansion of a the back head portion of the airbag.

[0062] When a fluid pressure upon inflation starts to build up in the second chamber 68, the second chamber 68 gradually unfolds and eventuallyfluid may start to flow from the second chamber 68 and into each respective elongate first chamber 65, 66, 69,610,611,612,613,614.

ALPINESTARS
Ex. 1002 - Page 90

[0063] Unfolding and expansion of the airbag starts with inflation of the neck portion 61 of the inner bag 60. This expands the neck portion 61 of the airbag.

[0064] Once the neck portion 61 of the airbag is expanded, the pressure in the neck portion 61 of the inner bag 60 rises, wherein the second chamber 68 further unfolds and expands. Thereafter, or gradually during inflation of fluid into the second chamber 68, the rest of the inner bag 60 inflates. If surrounding parts of the airbag, such as protective/decorative cloth, are not open to allow the airbag to easily expand, seams, or the like, are dimensioned and arranged such that the surrounding parts of the airbag rupture in a controlled way due to the inner pressure caused by the expanding inner bag 60.

[0065] Altogether, this leads to inflation of the inner bag 60 from the neck portion 61, upwards around the back head, and further forward around the crown part of the head towards the forehead region of the person wearing the airbag.

[0066] The pressure in the second chamber 68 is high already in the early moments of an accident, even though the airbag 20 is not fully inflated and fluid stili flows from the second chamber 49, 68 and into surrounding elongate first chambers. Since surrounding elongate first chambers 28, 29,210,211, 41, 42, 43, 44, 45, 46, 47, 48, 65, 66, 69, 610, 611, 612, 613, 614 and materiai of the inner- 60 and outer 22 bag are at least partiallyfolded and therefore require both time and work to unfold and allow expansion by inflation of fluid. Therefore, the neck portion of the airbag 20 is expanded early and able to act to prevent whiplash injuries at an early moment of an accident even if the airbag 20 is not fully unfolded and inflated.

[0067] During unfolding of the second chamber 68, inflated fluid flows from the neck portion 61 ofthe inner bag 60 and into the second chamber 68. Hence, inflated fluid typically reaches elongate first chambers 69, 610 close to the neck portion 61 first and other elongate first chambers 611,612,613,614 later on. The inflation order of each elongate first chamber 65, 66, 69,610,611,612, 613,614 may thus be controlled by varying, relative to the second chamber 68, the position of each respective elongate first chamber 65, 66, 69, 610, 611, 612, 613, 614 and the size of its fluid connection/inlet to the second chamber 68.

[0068] By varying the dimensions of each fluid connection/inlet between the second chamber 68 and each respective elongate first chamber 65, 66, 69, 610, 611,612, 613,614, the fluid flow into each respective elongate first chamber 65, 66, 69, 610, 611, 612, 613, 614 may be controlled, thereby enabling improved controi of the speed of inflation of each respective elongate first chamber 65, 66, 69,610,611,612,613,614. Thus, this provides for improved control of the expansion of the airbag.

[0069] The inflation of the inner bag and the unfolding of the airbag is preferably a sequential process, in which three main phases will be discussed. Upon inflation, the airbag is firstly unfolded to form a shape corresponding to a protective helmet. At this point, the airbag has a certain pressure for causing the unfolding and shaping of the helmet, but still not enough pressure for providing sufficient protection. Such first step is preferably performed within approximately 50 ms from the start of the inflation. As a second step, the pressure within the inner bag of the airbag is built up to a protective pressure, i.e. a pressure providing sufficient protection fora user. Typically, the time for achieving this pressure is about 100 - 150 ms from the start of the inflation. As the inflation process is still running, the pressure within the inner bag will increase up to a maximum pressure, which typically is provided after about 300 ms from the start of the inflation. Due to the provision of the evacuation means describes above the pressure will then decrease, however at a much lower rate such that the minimum required protective pressure is maintained for a predetermined time, e.g. 2 seconds.

[0070] During inflation of the inner bag 60, each elongate first chamber 65, 66, 69, 610, 611,612,613, 614 functions to unfold and expand a portion of the outer bag and by guiding inflated fluid towards and into each respective portion of the outer bag in a controlled manner.

[0071] The formation of finger-like elongate first chambers makes it possible to insert the inner bag into the outer bag after manufacturing of the outer bag, or at least by the last steps of manufacturing of the outer bag. This is of advantage since needles are typically used during manufacturing of the outer bag, and since use of needles typically increase the risk puncturing the inner bag.

[0072] Using an inner bag for expanding the outer bag, instead of just inflating the outer bag directly, makes it possible to expand only selected portions of the outer bag, and also to better controi the order and speed in which the portions are inflated. As previously mentioned, the outer bag can be brought from a folded state to an unfolded state more quickly and reliable by means of the elongate first chambers.

[0073] Within the scope of the invention, the inner bag could also be a combination of separote bags which act together to achieve the intended controlled inflation. Also within the scope of the invention, each of the above described chambers could be modified by dividing the chamber into sub chambers or by combining chambers, as long as its function remains substantially intact. For example, the second chamber could be spiit into two partial chambers which could each be combined with one or more of the elongate first chambers.

Claims

1. An airbag (20) for protecting the head of a user in case of an accident, comprising an inflatable inner bag (21, 40, 50, 60) being positioned inside an outer bag (22) such that the inner bag (21) is surrounded by the outer bag (22),
   wherein the structure of the outer bag (22) defines

ALPINESTARS
Ex. 1002 - Page 91

the shape of the airbag (20) when the inner bag (21) is inflated, and
wherein said inner bag (21, 40, 50, 60) comprises a plurality of elongate first chambers (28, 29, 210, 211, 41,42,43,44,45,46,47,48,65, 66, 69,610,611, 612,613,614), each of which elongate first chambers forms a head protective part when inflated, wherein inflation of the inner bag (21) leads to expansion of the outer bag (22), and
characterized in that said inner bag (21, 40, 50, 60) further comprises a second chamber (49, 68) interconnecting said first chambers (28, 29, 210, 211, 41, 42,43,44,45,46,47,48,65, 66,69,610,611, 612, 613, 614), wherein said second chamber is configured to distribute fluid between said first chambers (28,29,210,211,41,42,43,44,45,46,47,48,65, 66, 69, 610, 611, 612, 613, 614) and the second chamber (49), wherein said second chamber (49, 68) forms a neck protective part when inflated.

2. The airbag according to claim 1, wherein said elongate first chambers (28, 29, 210, 211, 41, 42, 43, 44, 45,46,47,48,65, 66,69, 610,611,612,613,614) form protective parts for the frontal, parietal, and temporal lobes of the skull when inflated.

3. The airbag according to claim 2, wherein said elongate first chambers (28, 29, 210, 211, 41, 42, 43, 44, 45,46,47,48,65, 66,69, 610,611,612,613,614) further form protective parts for the neck when inflated.

4. The airbag according to claim 3, wherein said second chamber (49, 68) further forms a protective part for the occipital lobe of the skull when inflated.

5. The airbag according to any one of claims 1 to 4, wherein the outer bag (22) comprises a plurality of lateral sections extending between predefined portions (212,213,214,215,311,312,313,314,315, 316) of the outer bag (22), and wherein each section is accommodating a first chamber (28, 29, 210, 211, 41,42,43,44,45,46,47,48,65, 66, 69,610,611, 612, 613, 614) such that the first chamber is prevented to move outside its associated section when inflated.

6. The airbag according to claim 5, wherein said portions (212,213,214,215,311,312,313,314,315, 316) of the outer bag (22) are formed by means of seams.

7. The airbag according to any one of the preceding claims, wherein the inner bag (21, 40, 50, 60) comprises at least one passageway (51, 52) through a first or a second chamber (49, 68), and wherein said at least one passageway (51, 52) is formed as a non-inflatable part of a first or a second chamber (49, 68).

8. The airbag according to claims 5 and 7, wherein said portions (212, 213, 214, 215, 311, 312, 313, 314, 315, 316) of the outer bag (22) are attached to each other through said passageway (51, 52).

9. The airbag according to any one of claims 5 to 8, wherein said sections are formed by attaching a predefined portion of a first side (310) of the outer bag (33) with a predefined portion of a second side (39) of the outer bag (33) by means of seams, glue, or straps (34, 35, 36).

10. An airbag system (10) comprising
an airbag (20) according to any one of the preceding claims, and
an inflation device (62) configured to inflate fluid into the inner bag (21, 40, 50, 60).

11. The airbag system according to claim 10, wherein the inflation device (62) is configured to inflate fluid into the first chambers (28, 29, 210, 211, 41, 42, 43, 44, 45, 46, 47, 48, 65, 66, 69,610,611,612,613, 614) via the second chamber (49, 68).

12. The airbag system according to claim 10 or 11, further comprising a triggering sensor configured to detect abnormal movement of a user corresponding to an accident, wherein said triggering sensor is capable of transmitting a triggering signal to said inflation device (62).

13. An apparel to be worn around the neck of a user, said apparel comprising an airbag system according to any one of claims 10 to 12, wherein the airbag (20) of said airbag system (10) is folded within said apparel prior to inflation.

14. A method for providing an apparel for protecting the head of a user in case of an accident, comprising the steps of:

providing an airbag system according to anyone of claims 10 to 12, and
folding the airbag of said airbag system within said apparel such that the elongate first chambers of said airbag are unfolded upon inflation in order to expand the airbag to cover the head of the user.

Patentansprüche

1. Airbag (20) zum Schutz des Kopfes eines Verwenders im Falle eines Unfalls, umfassend ein aufblasbares inneres Kissen (21, 40, 50, 60), das innerhalb eines äußeren Kissens (22) so positioniert ist, dass das innere Kissen (21) durch das äußere Kissen (22) umgeben ist,

ALPINESTARS
Ex. 1002 - Page 92

wobei die Struktur des äußeren Kissens (22) die Form des Airbags (20) definiert, wenn das innere Kissen (21) aufgeblasen ist, und
wobei besagtes inneres Kissen (21, 40, 50, 60) eine Vielzahl von länglichen ersten Kammern (28, 29, 210,211,41,42,43,44,45,46,47,48, 65, 66, 69, 610, 611,612,613,614) umfasst, wobei jede der länglichen ersten Kammern ein Kopfschutzteil bildet, wenn es aufgeblasen ist, wobei ein Aufblasen des inneren Kissens (21) zu einer Expansion des äußeren Kissens (22) führt, und
dadurch gekennzeichnet, dass besagtes innere Kissen (21, 40, 50, 60) ferner eine zweite Kammer (49, 68) umfasst, die besagte erste Kammern (28, 29,210,211,41,42,43,44,45,46,47,48, 65, 66, 69,610,611,612,613,614) verbindet, wobei besagte zweite Kammer konfiguriert ist, um Fluid zwischen besagten ersten Kammern (28, 29, 210, 211, 41,42,43,44,45,46,47,48,65, 66, 69,610,611, 612, 613, 614) und der zweiten Kammer (49) zu verteilen, wenn besagte zweite Kammer (49, 68) ein Halsschutzteil bildet, wenn sie aufgeblasen ist.

2. Airbag nach Anspruch 1, wobei besagte längliche erste Kammern (28, 29, 210, 211, 41, 42, 43, 44, 45, 46, 47, 48, 65, 66, 69, 610, 611, 612, 613, 614) Schutzteile für die Vorder-, Parietal- und Temporallappen des Schädels bilden, wenn sie aufgeblasen sind.

3. Airbag nach Anspruch 2, wobei besagte längliche erste Kammern (28, 29, 210, 211, 41, 42, 43, 44, 45, 46,47,48, 65, 66, 69,610,611,612,613, 614)weiter Schutzteile für den Hals bilden, wenn sie aufgeblasen sind.

4. Airbag nach Anspruch 3, wobei besagte zweite Kammer (49, 68) ferner ein Schutzteil für den Occipitallappen des Schädels bildet, wenn sie aufgeblasen ist.

5. Airbag nach einem der Ansprüche 1 bis 4, wobei das äußere Kissen (22) eine Vielzahl von seitlichen Abschnitten umfasst, die sich zwischen vordefinierten Bereichen (212, 213, 214, 215, 311, 312, 313, 314,315, 316) des äußeren Kissens (22) erstrecken, und wobei jeder Abschnitt eine erste Kammer (28, 29,210,211,41,42,43,44,45,46,47,48,65, 66, 69,610,611,612,613,614) so aufnimmt, dass die erste Kammer davon abgehalten wird, sich außerhalb ihres assoziierten Abschnitts zu bewegen, wenn sie aufgeblasen ist.

6. Airbag nach Anspruch 5, wobei besagte Bereiche (212,213,214,215,311,312,313,314,315,316) des äußeren Kissens (22) mittels Säumen gebildet sind.

7. Airbag nach einem der vorangehenden Ansprüche, wobei das innere Kissen (21, 40, 50, 60) wenigstens einen Durchgang (51, 52) durch eine erste oder eine zweite Kammer (49, 68) umfasst, und wobei der wenigstens eine Durchgang (51, 52) als ein nicht aufblasbares Teil einer ersten oder einer zweiten Kammer (49, 68) gebildet ist.

8. Airbag nach Ansprüchen 5 und 7, wobei besagte Bereiche (212,213,214,215,311,312,313,314,315, 316) des äußeren Kissens (22) aneinander durch den Durchgang (51, 52) angefügt sind.

9. Airbag nach einem der Ansprüche 5 bis 8, wobei besagteAbschnitte durch Anfügen eines vordefinierten Bereichs einer ersten Seite (310) des äußeren Kissens (33) an einen vordefinierten Bereich einer zweiten Seite (39) des äußeren Kissens (33) mittels von Säumen, eines Klebstoffs oder eines Streifens (34, 35, 36) gebildet sind.

10. Airbagsystem (10), umfassend:

einen Airbag (20) nach einem der vorangehenden Ansprüche, und
eine Aufblasvorrichtung (62), die konfiguriert ist, um Fluid in das innere Kissen (21, 40, 50, 60) zu blasen.

11. Airbagsystem nach Anspruch 10, wobei die Aufblasvorrichtung (62) konfiguriert ist, um Fluid indie ersten Kammern (28, 29, 210, 211, 41, 42, 43, 44, 45, 46, 47,48,65,66,69,610,611,612,613,614)überdie zweite Kammer (49, 68) zu blasen.

12. Airbagsystem nach Anspruch 10 oder 11, weiter umfassend einen Auslösersensor, der konfiguriert ist, um eine anormale Bewegung eines Verwenders entsprechend einem Unfall zu detektieren, wobei der Auslösersensor in der Lage ist, ein Auslösersignal an besagte Aufblasvorrichtung (62) zu übermitteln.

13. Kleidung, die um den Hals eines Verwenders zu tragen ist, wobei besagte Kleidung ein Airbagsystem nach einem der Ansprüche 10 bis 12 umfasst, wobei der Airbag (20) besagten Airbagsystems (10) innerhalb besagter Kleidung vor dem Aufblasen gefaltet ist.

14. Verfahren zum Bereitstellen einer Kleidung zum Schutz des Kopfes eines Verwenders im Fall eines Unfalls, umfassend die Schritte:

Bereitstellen eines Airbagsystems nach einem der Ansprüche 10 bis 12, und
Falten des Airbags besagten Airbagsystems innerhalb besagter Kleidung, so dass die länglichen ersten Kammern besagten Airbags bei

ALPINESTARS
Ex. 1002 - Page 93

Aufblasen entfaltet werden, um den Airbag zu expandieren, um den Kopf des Verwenders abzudecken.

Revendications

1. Airbag(20) pour protéger la tête d'un utilisateur en cas d'accident, comprenant un sac intérieur gonflable (21, 40, 50, 60) positionné à l'intérieur d'un sac extérieur (22) de sorte que le sac intérieur (21) soit entouré du sac extérieur (22),
dans lequel la structure du sac extérieur (22) définit la forme de l'airbag(20) lorsque le sac intérieur (21) est gonflé, et
dans lequel ledit sac intérieur (21, 40, 50, 60) comprend une pluralité de premières chambres allongées (28, 29,210,211, 41, 42,43, 44, 45, 46,47, 48, 65, 66, 69,610,611,612,613,614), chacune des premières chambres allongées forme une partie protectrice de tête lorsqu'elle est gonflée, et dans lequel un gonfiement du sac intérieur (21) conduit au déploiement du sac extérieur (22), et
caractérisé en ce que ledit sac intérieur (21, 40, 50, 60) comprend en outre une seconde chambre (49, 68) reliant lesdites premières chambres (28, 29, 210, 211,41,42,43,44,45,46,47,48, 65, 66, 69,610, 611, 612, 613, 614), dans lequel ladite seconde chambre est configurée pour distribuer un fluide entre lesdites premières chambres (28, 29,210,211, 41,42,43,44,45,46,47,48,65, 66, 69,610,611, 612, 613, 614) et la seconde chambre (49), dans lequel ladite seconde chambre (49, 68) forme une partie protectrice de cou lorsqu'elle est gonflée.

2. Airbag selon la revendication 1, dans lequel lesdites premières chambres allongées (28, 29, 210, 211, 41,42,43,44,45,46,47,48,65, 66, 69,610,611, 612, 613, 614) forment des parties protectrices pour les lobes frontal, pariétal, et temporai du crâne lorsqu'elles sont gonflées.

3. Airbag selon la revendication 2, dans lequel lesdites premières chambres allongées (28, 29, 210, 211, 41,42,43,44,45,46,47,48,65, 66, 69,610,611, 612,613,614) forment en outre des parties protectrices pour le cou lorsqu'elles sont gonflées.

4. Airbag selon la revendication 3, dans lequel ladite seconde chambre (49, 68) forme en outre une partie protectrice pour le lobe occipital du crâne lorsqu'elle est gonflée.

5. Airbag selon l'une quelconque des revendications 1 à 4, dans lequel le sac extérieur (22) comprend une pluralité de sections latérales s'étendant entre des portions prédéfinies (212,213,214,215,311,312, 313, 314, 315, 316) du sac extérieur (22), et dans lequel chaque section loge une première chambre (28,29,210,211,41,42,43,44,45,46,47,48,65, 66, 69, 610, 611,612,613,614) defaçon à empêcher la première chambre de se déplacer à l'extérieur de sa section associée lorsqu'elle est gonflée.

6. Airbag selon la revendication 5, dans lequel lesdites portions (212, 213, 214, 215, 311, 312, 313, 314, 315, 316) du sac extérieur (22) sont formées au moyen de coutures.

7. Airbag selon l'une quelconque des revendications précédentes, dans lequel le sac intérieur (21, 40, 50, 60) comprend au moins une voie de passage (51, 52) à travers une première ou une seconde chambre (49, 68), et dans lequel ladite au moins une voie de passage (51, 52) est formée en tant que partie non gonflable d'une première ou d'une seconde chambre (49, 68).

8. Airbag selon les revendications 5 et 7, dans lequel lesdites portions (212, 213, 214, 215, 311, 312, 313, 314,315,316) du sac extérieur (22) sont fixées les unes aux autres par l'intermédiaire de ladite voie de passage (51, 52).

9. Airbag selon l'une quelconque des revendications 5 à 8, dans lequel lesdites sections sont formées en fixant une portion prédéfinie d'un premier côté (310) du sac extérieur (33) avec une portion prédéfinie d'un second côté (39) du sac extérieur(33) au moyen de coutures, d'une colle, ou de sangles (34, 35, 36).

10. Système d'airbag(10) comprenant
un airbag (20) selon l'une quelconque des revendications précédentes, et
un dispositif de gonflage (62) configuré pour emplir le sac intérieur (21, 40, 50, 60) de fluide.

11. Système d'airbag selon la revendication 10, dans lequel le dispositif de gonflage (62) est configuré pour emplir les premières chambres (28, 29, 210, 211,41,42,43,44,45,46,47,48, 65,66,69, 610, 611,612, 613, 614) de fluide via la seconde chambre (49, 68).

12. Système d'airbag selon la revendication 10 ou 11, comprenant en outre un capteur de déclenchement configuré pour détecter un mouvement anormai d'un utilisateur correspondant à un accident, dans lequel ledit capteur de déclenchement est capable de transmettre un signal de déclenchement audit dispositif de gonflage (62).

13. Accessoire d'habillement à porter autour du cou d'un utilisateur, ledit accessoire d'habillement comprenant un système d'airbag selon l'une quelconque des revendications 10 à 12, dans lequel l'airbag (20)

ALPINESTARS
Ex. 1002 - Page 94

dudit système d'airbag (10) est plié au sein dudit accessoire d'habillement avant gonflage.

14. Procédé de fourniture d'un accessoire d'habillement pour protéger la tête d'un utilisateur en cas d'accident, comprenant les étapes de :

fourniture d'un système d'airbag selon l'une quelconque des revendications 10 à 12, et
pliage de l'airbag dudit système d'airbag au sein dudit accessoire d'habillement de sorte que les premières chambres allongées dudit airbag soient dépliées lors du gonflage afin de déployer l'airbag pour couvrir la tête de l'utilisateur.

ALPINESTARS
Ex. 1002 - Page 95

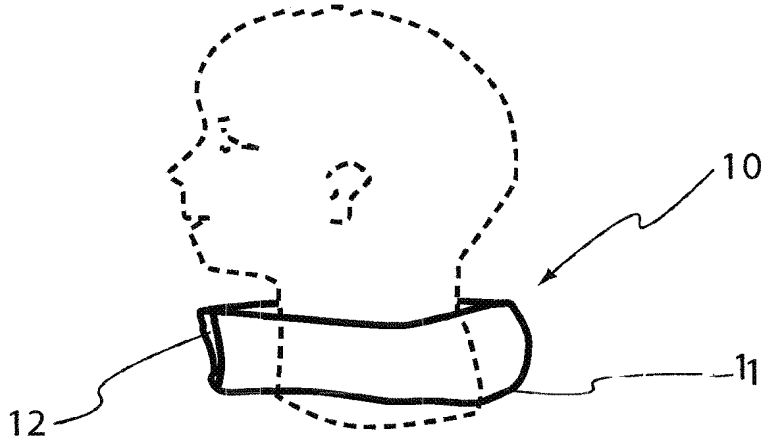


Fig. 1

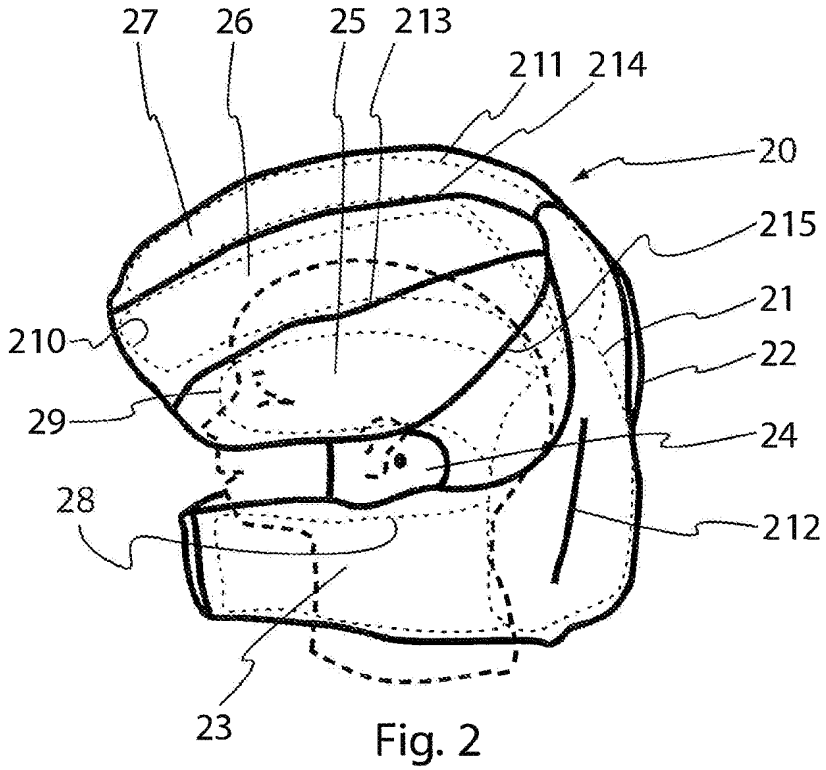


Fig. 2

ALPINESTARS
Ex. 1002 - Page 96

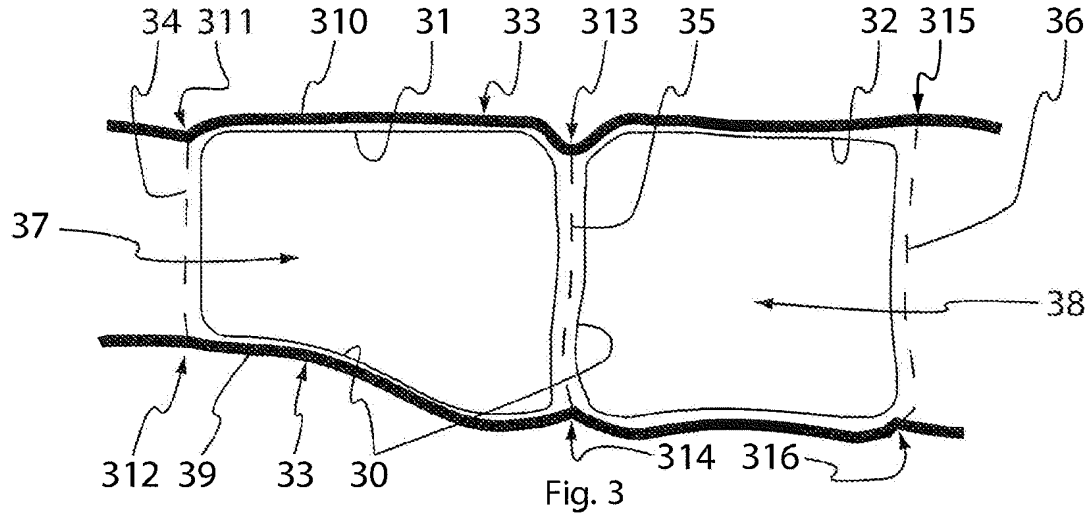


Fig. 3

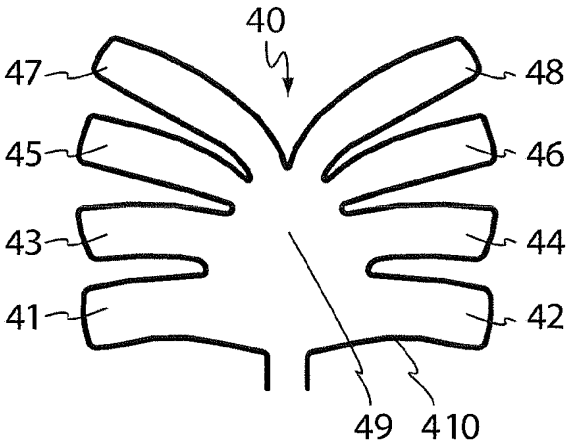


Fig.4

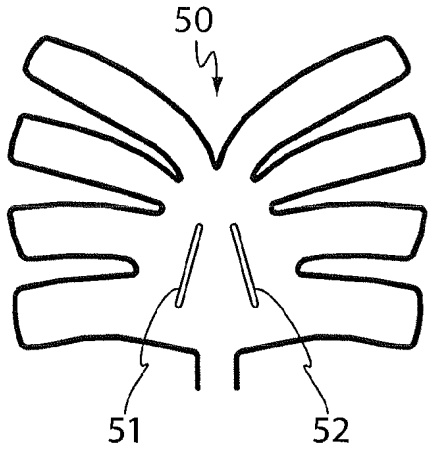


Fig. 5

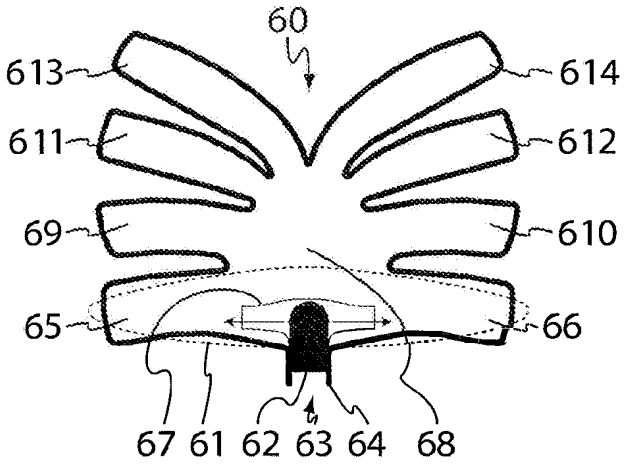


Fig. 6

ALPINESTARS
Ex. 1002 - Page 97

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2007050024 A1 **[0002] [0003]**
- WO 0154523 A1 **[0002]**
- DE 19754541 A1 **[0004]**

ALPINESTARS
Ex. 1002 - Page 98

Substitute for form 1449/PTO

FIRST SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Sheet 1 of 1

Complete if Known	
Application Number	17/757.247
371(c) Date	June 13, 2022
First Named Inventor	Lino DAINESE
Art Unit	3614
Examiner Name	O'Neill, Matthew James
Attorney Docket Number	5104.0010003

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	US1	US-20040183283-A1	09-23-2004	BUCKMAN; R.F. et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]–Number[4]–Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	FP4	WO-2011148353-A1	12-01-2011	FRENI BREMBO SPA [IT]		☐
	FP5	EP-2621297-B1	08-09-2017	HOEVDING SVERIGE AB [SE]		☐

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author(in CAPITAL LETTERS),title of the article(when appropriate), title of the item (book,magazine,journal,serial,symposium,catalog,etc.),date,page(s),volume-issue number(s),publisher, city and/or country where published.	T[2]
			☐

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

UNITED STATES
PATENT AND TRADEMARK OFFICE

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/757,247	**10/02/2023 01:28:30 PM ET**	**5104.0010003**

Title of Invention

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	5950	FILED BY	Debra Colonna
PATENT CENTER #	62908482	AUTHORIZED BY	Paul Calvo
CUSTOMER #	26111	FILING DATE	06/13/2022
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Lino DAINESE

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 1005	**E202302D30057304**	**Debra Colonna**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2252	EXTENSION FOR RESPONSE WITHIN SECOND MONTH -	256.00	1	256.00
2615	EACH CLAIM IN EXCESS OF 20	40.00	4	160.00
			TOTAL AMOUNT:	**$416.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Lino DAINESE	Confirmation No.: 5950
Applicant: D-AIR LAB S.R.L.	Art Unit: 3614
Application No.: 17/757,247	Examiner: O'Neill, Matthew James
371(c) Date: June 13, 2022	Atty. Docket: 5104.0010003

Title: **PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE**

Amendment and Reply Under 37 C.F.R. § 1.111

Mail Stop Amendment

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Commissioner:

In reply to the Office Action dated May 2, 2023, Applicant submits the following Amendment and Remarks.

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 4 of this paper.

Remarks and Arguments begin on page 8 of this paper.

It is not believed that extensions of time are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any additional fees required to continue prosecution or appeal of this application (including issue fee, fees for net addition of claims, or forwarding to appeal) are hereby authorized to be charged to our Deposit Account No. 19-0036.

Amendments to the Specification

Please replace the paragraph beginning at page 2, line 12, and the paragraphs beginning on page 2, line 26 with the following amended paragraphs:

A protective device according to the present disclosure for the protection of a user comprises a mesh structure including a first mesh portion and a second mesh portion, wherein the first mesh portion and the second mesh portion are opposed one another and connected one another by a plurality of tie elements to define one or more housings. Furthermore, the ~~inflatable element~~ protective device comprises at least one inflatable casing body housed in the inner area, therefore in said one or more housings, between the first mesh portion and the second mesh portion. The inflatable casing body is preferably a simple mono-layer structure, similar to a balloon. More particularly, and preferably the casing body is a flexible, preferably mono-layer, extensible body made of elastic material

In other words, the casing body occupies a first region of the housing in a deflated condition and a second region of the housing in an inflated condition. The first region is apt to house the ~~inflatable element~~ casing body in a deflated condition and the second region ~~which~~ lacks or is free of the casing body in a deflated condition. The second region receives the ~~inflatable element~~ casing body in the inflated condition and is open towards the first region to house the casing body, in an inflation step from the deflated condition to the ~~deflated~~ inflated condition… In fact, by inflating the casing body expands as much as possible in the housing until it occupies all the available space, and until it is blocked by the mesh structure and the tie elements that essentially "bridle it".

In other words, the aforementioned technical problem can be solved by means of a mesh structure which houses inside thereof a casing body which is intended to be inflated to also inflate

the mesh structure, and to make the mesh structure an inflatable structure. The mesh structure contains the inflation of the casing body. The casing body in the deflated condition does not form any additional layer for the protective device in the second region. The second region houses the casing body only in the inflated condition and is open towards the first region to receive the ~~inflatable element~~ casing body, for example in an inflation phase from the deflated condition to the inflated condition.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently amended) A protective device for the protection of a user, said protective device comprising 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 the plurality of tie elements; wherein the first mesh portion, the second mesh portion and the tie elements define one or more inner housings of the mesh structure; wherein the protective device includes a casing body arranged at least in an inner housing of said one or more inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in the at least one inner housing of the mesh structure, and wherein in said deflated condition, the casing body occupies a first space or first region, and wherein in said deflated condition a second region or second space of said at least one inner housing lacks a casing body, and wherein in said inflated condition the casing body occupies the second region or second space.

2. (Currently amended) 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, the mesh structure and ~~and/or~~ that said mesh structure is an external structure of the protective device.

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

4. (Previously presented) The protective device according to claim 1, wherein the deflated condition of the casing body corresponds to a slack and loose condition of the mesh structure and of the tie elements, and wherein to the inflated condition of the casing body corresponds an at least partially tensioned condition of the tie elements (5) and of the first mesh portion and the second mesh portion.

5. (Previously presented) The protective device according to claim 1, wherein the tie elements define a plurality of housings between the first mesh portion and the second mesh portion and the casing

body comprises a plurality of portions each arranged in a corresponding housing of said housings.

6. (Currently amended) The protective device according to claim 1, wherein the housings have the shape of channels and are arranged side by side one another and each one intended to house a corresponding casing body or a portion of the casing body ~~portion~~, and wherein in inflated condition, the casing bodies are inflated against each other so as to form a planar structure.

7. (Previously presented) The protective device according to claim 1, wherein the casing body has a hand or comb or tree shape, or has tubular shape arranged in a serpentine way.

8. (Previously presented) The protective device according to claim 1, wherein the tie elements are arranged between said first mesh portion and said second mesh portion aligned in a plurality of rows of tie elements.

9. (Currently amended) The protective device according to claim 8 [[6]], wherein each row of tie elements of the plurality of rows of tie elements comprises a plurality of tie elements wherein in a condition of at least partial tension, the tie elements belonging to the same row of tie elements are arranged substantially parallel to each other.

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

11. (Previously presented) The protective device according to claim 1, comprising a gas source or inflation source connected to the inflatable casing body.

12. (Previously presented) The protective device according to claim 1, wherein said device is a

wearable device.

13. (Previously presented) A protective garment or clothing accessory comprising the protective device according to claim 1.

14. (Currently amended) The protective garment according to claim 13 [[12]], 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 housings.

15. (Previously presented) A method for making a protective device for the protection of a user, said method comprising the steps of:
- 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 said first mesh portion and said second mesh portion and the plurality of tie elements define one or more housings in the mesh structure;
- arranging a casing body in at least one of said housings to form with the mesh structure an inflatable element; and
- inflating the casing body from a first deflated operating condition to a second inflated operating condition, wherein in said deflated condition, the casing body occupies a first space or region, and wherein in said deflated condition a second region or second space of said at least one housing lacks said casing body, and wherein in said inflated condition the casing body expands and occupies the second region or second space.

16. (Currently amended) The method according to claim 15, wherein the casing body is inflated until the tie elements and the mesh structure are tensioned and ~~and/or~~ until the casing body is at least partially adhered to the first mesh portion and the second mesh portion.

17. (Previously presented) The method according to claim 15, wherein the tie elements are arranged to form a plurality of side-by-side housings and wherein portions of the casing body or a plurality of

casing bodies are arranged side by side one another, and wherein in said inflated condition portions of casing body or a plurality of casing bodies push against each other to form a planar structure.

18. (Currently amended) The method according to claim 15, wherein the casing body is inflated until the mesh structure is tensioned and the mesh structure bridles and prevents a further expansion of the casing body.

19. (Previously presented) The method according to claim 15, wherein in said deflated condition the second region of said at least one housing allows an air passage between the first mesh portion and the second mesh portion passing through the second region.

20. (New) 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, the mesh structure or ~~and/or~~ that said mesh structure is an external structure of the protective device.

21. (New) The method according to claim 15, wherein the casing body is inflated until the tie elements and the mesh structure are tensioned or ~~and/or~~ until the casing body is at least partially adhered to the first mesh portion and the second mesh portion.

22. (New) The protective device according to claim 10, wherein the inflatable element is shaped like a jacket and is apt to surround an upper area or bust of the user's body.

23. (New) The protective device according to claim 1, wherein the mesh structure is a perforated structure that allows air or other gas to pass.

24. (New) The protective device according to claim 1, wherein the mesh structure, or the mesh portion, is a net.

Remarks

Reconsideration of this Application is respectfully requested.

The description is sought to be amended to clarify the nature of the disclosure. Specifically, support for amendment to paragraph [0008] can be found on claim 1 as filed. Support for amendment to paragraph [0010] and paragraph [0011] can be found, for example, in originally filed claim 1 and at page 2, lines 26-27 of the description of the PCT application as filed, where it is clearly stated that "the casing body occupies a first region of the housing in a deflated condition and a second region of the housing in an inflated condition". Even the recitation of paragraphs with the amendments (page 2, lines 27-32 and page 3, lines 4-7 of the PCT application as filed) confirm that it is the casing body which expands to the second region when passing from the deflated condition to the inflated condition. ("(the second region) is open towards the first region to house the casing body, in an inflation step from the deflated condition to the deflated condition.") Moreover, according to many paragraphs of the description, such as, for example, page 3 lines 35-36, page 3 line 35 to page 4 lines 5, page 5 lines 10-19, page 7 lines 2-3, page 9 lines 16-19 of the PCT application as filed, it clearly appears that the casing body defines, together with the mesh portions, the "inflatable element". Therefore, the indication of "inflatable element" instead of "casing body" represents a clearly unambiguous error in the disclosure.

Upon entry of the foregoing amendment, claims 1-24 are pending in the application, with claims 1 and 15 being the independent claims. Claims 1-3, 6, 9, 10, 14, 16 and 18 are sought to be amended. New claims 20-24 are sought to be added. Support for the claim amendments and new claims can be found in the claims as originally filed as well as throughout the specification. Specifically, claim 10 has been further amended to clarify that the mesh portions and the casing

body define an inflatable element" so as to create a proper antecedent basis for "inflatable element" of claim 10. Support for this amendment can be found on page 3 line 32 to page 4 line 3, page 5 lines 10-14 and claim 15 of the PCT application as filed. Support for new claim 22 can be found, for example, in originally filed patent application at page 8 lines 16-17 in combination page 3 lines 35-36, page 3 line 35 to page 4 lines 5, page 5 lines 10-19, page 7 lines 2-3, page 9 lines 16-19. Support for new claim 23 can be found in originally filed patent application at page 4 lines 10-12. Support for new claim 24 can be found in originally filed patent application at page 4 line 7. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 112

Claims 2 and 16 are rejected under 35 U.S.C. § 112(b) or 35 U.S.C. § 112 (pre-AIA), second paragraph, as allegedly being indefinite. Not in acquiescence to the propriety of the rejection, but rather solely advance prosecution, Applicant has amended claims 2 and 16 and added claims 20 and 21. Accordingly, Applicant believes the rejection has been overcome and respectfully requests that the rejection be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 103

Claims 1-5, 7, 8, 10-16, and 18-19 are rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Dainese (US PG PUB 20120032422A1), henceforth referred to as Dainese, in view of Mazzarolo (US PG PUB 20210329986A1), henceforth referred to as Mazzarolo. Claims 6, 9, and 17 are rejected under 35 U.S.C. § 103 as being unpatentable over Dainese and Mazzarolo as

applied to claims 1 and 15 above, in view of Azzolin (US PG PUB 20160088883A1), henceforth referred to as Azzolin. Applicant traverses the rejections.

While the Office argues that it would have been obvious for one of ordinary skill in the art to modify the airbag structure of Dainese with the inflated and deflated conditions of Mazzarolo, the Office actually ignores a very significant difference between the claimed invention and the prior art. The protective devices of the prior art include an external impermeable layer and an internal mesh structure provided with threads. However, this is significantly different from the claimed invention. The claimed invention is directed to a protective device including a mesh structure provided with threads and an internal inflatable impermeable case(s) which is/are located inside the mesh structure. This is not taught or suggested by any of the prior art, either alone, or in combination.

If an obviousness rejection is based on a proposed modification that would change the principle of operation of the prior art, then there is no basis for the rejection. As stated in MPEP §2143.01, "if the proposed modification … would change the principle of operation of the prior art invention being modified, then the teachings of the reference are not sufficient to render the claims prima facie obvious." Here, the Office argues that the claimed invention is obvious even though the protective device protective device includes a mesh structure provided with threads and an internal inflatable impermeable case which is located inside the mesh structure. This is not taught or suggested by Dainese.

The deficiencies of Dainese are not remedied by Mazzarolo and/or Azzolin. Mazzarolo is cited for its description of inflation conditions. Azzolin is relied upon for is teaching of the planar structure of the casing bodies. Therefore, none of the combined references teach or suggest a protective device including a mesh structure provided with threads and an internal inflatable impermeable case which is located inside the mesh structure. Accordingly, Applicant respectfully

asserts that prior art does not render the claimed invention unpatentable and request that the rejection be reconsidered and withdrawn.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

/Paul A. Calvo, Reg. No. 57,913/

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20599410.1

PTO/AIA/22 (12-22)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 5104.0010003
Application Number 17/757,247	Filed 371(c) Date: June 13, 2022
For PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE	
Art Unit 3614	Examiner O'Neill, Matthew James

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$220	$88	$44	$
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☐	Five months (37 CFR 1.17(a)(5))	$3,160	$1,264	$632	$

☑ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

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I am the

☐ applicant.

☑ attorney or agent of record. Registration number 57,913.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Paul A. Calvo/ — Signature

10.2.2023 — Date

Paul A. Calvo — Typed or printed name

(202) 371-2600 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Lino DAINESE	Confirmation No.: 5950
Applicant: D-AIR LAB S.R.L.	Art Unit: 3614
Application No.: 17/757,247	Examiner: MATTHEW JAMES O'NEIL
(*U.S. national phase of International Application No. PCT/IB2020/061689*	Atty. Docket: 5104.0010003
International Filing Date: December 9, 2020)	
§ 371(c) Date: June 13, 2022	

Title: **PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE**

First Supplemental Information Disclosure Statement

Mail Stop Amendment

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Commissioner:

Listed on accompanying IDS Forms PTO/SB/08a or its equivalent and/or PTO/SB/08b or its equivalent are documents that may be considered material to the patentability of this application as defined in 37 C.F.R. §1.56, and in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.97 and 1.98. The numbering on this First Supplemental Information Disclosure Statement is a continuation of the numbering in Applicant's Information Disclosure Statement filed on June 13, 2022 in connection with the above-captioned application.

Applicant has listed publication dates on the attached IDS Forms based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicant reserves the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

Filing under 37 C.F.R. § 1.97(c). This Information Disclosure Statement is being filed more than three months after the U.S. filing date AND after the mailing date of the first Office Action on the merits, but before the mailing date of a Final Rejection, or Notice of Allowance, or an action that otherwise closes prosecution in the application. The required fee is provided through online credit card payment authorization in the amount of $104.00 in payment of the fee under 37 C.F.R. § 1.17(p).

Copies of documents **FP4-FP5** are submitted. However, in accordance with 37 C.F.R. § 1.98(a)(2)(ii), no copy of U.S. patents and patent application publications cited as document **US1** on the attached IDS Form is submitted.

It is respectfully requested that the Examiner initial and return a copy of the enclosed IDS Forms, and indicate in the official file wrapper of this patent application that the documents have been considered.

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Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

/Paul A. Calvo, Reg. No. 57,913/

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APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/757,247	**10/02/2023 01:28:30 PM ET**	**5104.0010003**

Title of Invention

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	5950	FILED BY	Debra Colonna
PATENT CENTER #	62908482	FILING DATE	06/13/2022
CUSTOMER #	26111	FIRST NAMED INVENTOR	Lino DAINESE
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Paul Calvo

Documents

TOTAL DOCUMENTS: 9

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
2023-10-02-Amendment-Reply-111-5104-0010003.pdf		11	-	136 KB
2023-10-02-Amendment-Reply-111-5104-0010003-A....pdf	(1-1)	1	Amendment/Request for Reconsideration-After Non-Final Rejection	100 KB
2023-10-02-Amendment-Reply-111-5104-0010003-SPEC.pdf	(2-3)	2	Specification	88 KB
2023-10-02-Amendment-Reply-111-5104-0010003-	(4-7)	4	Claims	93 KB

CLM.pdf				
2023-10-02-Amendment-Reply-111-5104-0010003-REM.pdf	(8-11)	4	Applicant Arguments/Remarks Made in an Amendment	93 KB
2023-10-02-EOT-5104-0010003.PDF		2	Extension of Time	287 KB
2023-10-02-1st-SIDS-Pleading-5104-0010003.pdf		3	Transmittal Letter	124 KB
2023-10-02-1st-SIDS-Form-08a-08b-5104-0010003.pdf		1	Information Disclosure Statement (IDS) Form (SB08)	110 KB

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FOR_5_EP2621297B1.PDF	13	Foreign Reference	2205 KB

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If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

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New International Application Filed with the USPTO as a Receiving Office

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(74) Agents: **CRIPPA, Paolo Ernesto** et al.; c/o Jacobacci & Partners S.p.A., Via Senato, 8, I-20121 Milano (IT).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(54) **Title**: PROTECTIVE GARMENT WITH AN AIRBAG

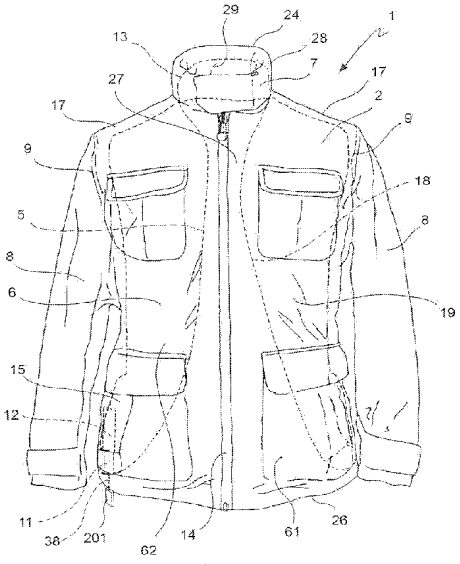


FIG. 2

(57) **Abstract**: A protective garment with an airbag extraordinarily capable of keeping the correct position of the airbag during use, comprises an outer part (2) opposite the user of the garment, an inner part (3) or lining of the garment facing the user, said outer part (2) of the garment and said inner part (3) of the garment defining a gap (4) between them; said garment (1) further comprises an airbag device (5) arranged housed in said gap (5); said garment (1) comprises a bust portion (6), a neck portion (7) and sleeves (8) connected to said bust portion (6), wherein said gap (4) is closed where the sleeves (8) are connected to the bust portion (6), forming a closure of the gap in the shoulder armhole or closure of the shoulder armhole (9), capable of containing lateral movements of said airbag device (5) from a deflated or deactivated state to an inflated or activated state so as to keep it as close as possible to the user's neck; said gap (4) of the garment being in communication with a neck gap (10) where the neck portion (7) of the garment connects to the bust portion (6) of the · garment, leaving the airbag device (5) to inflate in the neck gap (10) of the neck portion (7) of the garment.

WO 2011/148353 A1

DESCRIPTION

PROTECTIVE GARMENT WITH AN AIRBAG

The present invention refers to a protective garment with an airbag suitable for the personal protection of a user should the latter impact or fall from a vehicle or from a pack animal, such as for example a motor-vehicle, whether a road or water motor-vehicle, or a horse, but also suitable for the personal protection of a user which conducts sports or work activities, such as for example a labourer who works on a scaffolding.

Personal protective devices are known, comprising airbags which can be activated should the user move away from a predefined position for using means, such as for example a vehicle or motor-vehicle.

These known devices, comprise inflation means containing an activation mechanism, usually activated by a particular event which detects the danger of an impact or a fall of the user, such as the yanking action of a chord fixedly connected to the vehicle, which opens a tank for pressurised fluid which is fluidically connected with an inflation chamber of the airbag for a rapid filling thereof, typically within a shorter time with respect to the time

required between the activation and the impact or the fall of the user.

Typically, a cable actuates an airbag system within a few hundredths of a second, indicatively ten hundredths of a second, completely inflating the air chambers within the airbag ending up protecting some parts of the body.

However, these devices are particularly efficient when the speed of the vehicle, and in particular of the motor-vehicle, is quite low.

In practice a protective garment with an airbag performs at maximum efficiency when used systematically and for all the movements, even minor movements, typically urban movements. This determines the need for using a protective device with an airbag for daily use in which the garment is worn for a long period without requiring activating the protection thereof and solely occasionally with the airbag charged and ready to be activated.

This implies that one of the main objects of the protective garment with an airbag is the particular comfort and practical use thereof.

However, use thereof in urban environments, mainly for short distances and using it as a vehicle, a moped or a scooter implies a higher risk of impact

or fall of the user involving the chest, particularly the upper part of the chest, particularly straining the neck due to the high probability of impacting the head against obstacles, such impact implying a flexure or torsion of the neck with respect to the bust also determining considerable lesions particularly to the cervix.

Particularly it is suitable to limit the stresses that the user is subjected to on the chest and neck thereof, in that for example in the case of use of a motor-vehicle the interaction between the obstacle and the user implies sudden impacts and sudden movements of the neck leading to stresses known as whiplash.

Documents disclosing garments provided with devices with an airbag are known.

For example, document JP 2004/162224 shows a jacket provided with pockets which can be opened outwards with respect to the garment and containing an airbag device provided scarf-like around the neck and then descend with two substantially parallel portions on the chest at the front part on the user with lower end portions folded backwards upwards, as well as a further V-shaped portion arranged on the back beneath the portion around the neck of the user.

When activated this airbag is released from the pockets of the garment in which it was housed and it is inflated freely outside the garment around the neck of the user particularly protecting the front and low portion of the bust.

Though satisfactory from various points of view, this known solution does not prevent - during the impact between the user and the obstacle - the airbag from moving from the theoretical position thereof leaving the bust and the head exposed to considerable impacts and deformations on the neck of the user.

Also document DE 20311097 shows a jacket containing an airbag.

Document US 7,328,464 also shows a jacket containing an airbag device of the tubular type and arranged around the neck of the user and then going down with two ends on the thorax and then folding to form in this way a belt along the hips of the user. A branch of the airbag departs from this belt to form a life buoy-like element arranged on the back of the user. Though satisfactory from various points of view, also this solution does not provide a particular protection in the movements of the neck in case of collision, given that the portion of the airbag wound around the neck of the user is free to

flex and to move for example towards the back and above all laterally thus leaving the neck of the user exposed to flexure and twisting.

The solution described in document US 2008178370 shows a garment in which there is contained an airbag formed by a single front portion which opens to cover the shoulders before closing in a single chamber on the user's back. Such shape of the airbag seems suitable for protecting the bust however leaving the neck of the user completely exposed. In a particular variant embodiment there is highlighted the need of protecting the stomach and the hips instead of the upper part of the bust and the neck.

An object of the present invention is that of proposing a protective garment with an airbag for personal use capable of overcoming the known art drawbacks and simultaneously being comfortable for use without reducing the safety of the user and suitably protecting the bust, particularly the upper part of the bust of the user and the neck thereof.

These and other objects are attained by means of a protective garment as described in claim 1 attached herein.

The construction and functional characteristics of the protective garment of the present invention

can be understood better from the description outlined hereinafter in which reference is made to the attached drawings representing some preferred exemplifying but non-limiting embodiments, wherein:

figure 1 represents a front axonometric view of a protective garment, for example for a motorcyclist in which the overall dimensions of an airbag device received in a gap of said garment are outlined with a dashed line;

figure 2 illustrates in front view the garment of figure 1 in which there are outlined the elements for fixing the airbag device inside the gap of the garment;

figure 3 illustrates the garment of figure 1 worn by a user, still in a front view, in which the garment is represented with a dashed line and the contained airbag device with a continuous line;

figure 4 illustrates a user represented in a view from the left side thereof in which there are outlined the contours of the airbag device received in the gap of the garment represented by a discontinuous section, according to an embodiment;

figure 5 illustrates a rear view of a user wearing the garment in which there are outlined the overall dimensions of the airbag contained in the gap

of the garment, represented by a discontinuous section, according to a further embodiment;

figure 6 represents a front axonometric view of an airbag device according to a further embodiment suitable to be received in a gap of a garment;

figure 7 represents a rear axonometric view of the airbag device of figure 6 open so as to outline further parts thereof;

figure 8 illustrates according to a further embodiment - in front view - a further garment in which the overall dimensions of an airbag device received in the gap of the garment itself are outlined;

figure 9 represents a rear view of a further embodiment of a garment comprising in its gap an airbag device;

figure 10 represents a section according to the line 10-10 of figure 9 of a detail of the garment outlining the closed edges of the gap at the shoulder armhole of the garment;

figures 11, 12 illustrate a front rear view of a further embodiment of a garment containing an airbag in its gap in which the elements for fixing the airbag device within the gap of the garment are outlined;

figure 13 illustrates a cross-section according to a median vertical plane to the user, which substantially divides the back and chest portion of the garment of the airbag device into two parts so as to outline its arrangement within the gap;

figure 14 illustrates the section of figure 13 in which the airbag device is in its active or inflated state;

figures 15, 16, 17 illustrate three different phases of an collision between a motor-vehicle and a car in side views, wherein three moments of the occurrence of the impact, particularly regarding the activation of the airbag device are highlighted;

figure 18 illustrates - in axonometric view - three portions of the overall dimensions, or pattern, of the sack suitable for containing the inflation chamber of the airbag device;

figure 19 represents a detail of an airbag device according to a further embodiment, in which an inflation device and an activation device are outlined;

figures 20 and 21 illustrate - in axonometric views - a particular embodiment of an activation device containing male and female quick fastening and unfastening buckles, suitable for keeping a firm

connection in case of yanking of the activation device;

figures 22 and 23 illustrate - in axonometric views - the female buckle suitable for being connected through a mini-chord to the activation device;

figures 24 and 25 illustrate - in axonometric views - the male buckle integrated with a winding device of the inertial type suitable for correctly winding and stretching a tape for connection to the vehicle;

figure 26 illustrates - in axonometric view with parts separated - the male buckle of figures 24 and 25;

figure 27 illustrates - in axonometric view - a detail of the garment from which the female buckle projects and to which it is about to be associated using only one hand the male buckle.

As observable from the attached figures, according to an embodiment, a protective garment 1 comprises an outer part 2 of the garment and an inner part 3 of the garment or lining of the garment. For example, the outer part 2 of the garment is made using material adapted to resist against water and abrasions and, according to embodiments, it may have

a multilayer structure, for example suitable for several functions such as imperviousness, resistance to abrasion, heat insulation or, on the contrary, a transpiring capacity. The inner part 3 of the garment is the part to be faced towards the user and, according to an embodiment, it may be made so as to be comfortable and easy to wear, for example guaranteeing an easy wearability thanks to its slidable and/or transpirability characteristics.

According to an embodiment, said garment 1 has a bust 6 and neck 7 portion. According to an embodiment, said bust 6 of the garment has a side portion 15 of the garment and a rear or back portion 16 of the garment adapted to cover the back of the user, as well as a shoulder portion 17 of the garment and a front bust portion 19 of the garment adapted to cover the front part of the bust of a user, for example divided into a front half-portion, a left front half-portion 61 and a right front half-portion 62.

According to an embodiment, the outer part 2 of the garment and the inner part 3 of the garment are firmly connected to form an upper edge 24 of the neck of the garment and/or a lower edge of the back of the bust or abutment element 25, as well as a lower front

edge of the bust or lower edge 26 of the front half-portions 61 and 62. According to an embodiment, said left and right front half-portions 61, 62, define an upper edge - faced therebetween - defining the collar 27 of the garment.

Said half-portions or left and right front half-portions 61, 62 of the garment are suitable to be mutually closed for example by means of a zipper, so as to open and close the garment and allow the user to wear it.

According to an embodiment, said bust portion 6 of the garment has openings for the introduction of the arms or shoulder armholes 45.

According to an embodiment, preferably the outer part 2 and the inner part 3 of the garment are firmly connected also at the shoulder armholes 45 to form a joining closure of the shoulder armhole 9.

According to an embodiment, to said shoulder armholes there are connected sleeves of the garment indicated in the figures with reference 8.

Said outer part 2 of the garment and inner part 3 of the garment mutually define a space or a chamber, hereinafter referred to as gap 4.

According to an embodiment, said gap is defined by the edges for connecting the outer part 2 with the

inner part 3 of the garment defining a partially closed chamber, or preferably substantially closed.

According to an embodiment, the outer part 2 and the inner part 3 of the bust portion of the garment define a bust gap 71 divided into a back gap 30, defined by the outer part and by the inner part of the garment adapted to cover the back of the user, and thorax gap/s 31, defined by the outer part and inner part of the front half-portion 61, 62 of the garment.

Said bust gap 71 is, according to an embodiment, completely closed by the edge for connecting the outer part 2 and inner part 3 of the garment. For example, the lower edge of the bust portion 46 alongside the shoulder armhole 45 and the upper edge of the neck 24, define the bust gaps creating a closed chamber.

According to an embodiment, the base or lower edge of the back 46 of the garment is defined by a lower edge of the back of the bust, or abutment element 25, and a front lower edge of the bust, or lower edge of the front half-portions 26, and said edges define the bust gaps creating a closed chamber.

According to an embodiment, a portion of said gap chamber 4 is defined by the neck 7 of the

garment, which has an outer neck surface 28 and an inner neck surface or portion 29, firmly connected together to form an upper edge 24 of the neck of the garment and opened to be connected with the bust gap 71 forming a neck gap 10, preferably without interruptions with a bust gap 71.

According to an embodiment, said bust gap 71 communicates without interruption with the neck gap 10 forming a single chamber.

According to an embodiment, said protective garment 1 comprises an airbag device 5.

According to an embodiment, said airbag device 5 or airbag 103 has an airbag portion for protecting the neck 13 and in particular for protecting the cervix.

According to an embodiment, said airbag device 5 has an airbag portion for protecting the thorax 18 and preferably two airbag portions for protecting the thorax 18 arranged side-by-side and going down from the neck to the shoulders up to reaching the waist and the side areas of the garment for protecting the thorax of the user.

According to an embodiment, said airbag device 5 has an airbag portion for protecting the back 20 or airbag portion parallel to the spine. Preferably,

according to an embodiment, said portion for protecting the back 20 of the airbag are two side-by-side portions.

According to an embodiment, said airbag device 5 comprises an portion of the airbag for protecting the shoulders or, preferably portions of the airbag for protecting the shoulders 22.

According to an embodiment, said airbag device 5 comprises an portion of the airbag for protecting the side areas 23 or, preferably, portions of the airbag for protecting the side areas 23 of the user.

Advantageously, according to an embodiment, said airbag device 5 forms a single airbag chamber 21 distributed so as to have portions of airbag to protect the neck and the cervix 13, portions of airbag to protect the thorax 18, portions of airbag for protecting the back 20, portions of airbag to protect the shoulders 22 and portions of airbag for protecting the side areas 23.

According to an embodiment, said airbag device 5 has portions arranged side-by-side to protect the thorax 18 extended from the portions of the garment covering the shoulders to the portions of the garment covering the waist.

Advantageously, according to an embodiment, said

airbag portions to protect the thorax 18 have a transverse dimension to the longitudinal extension thereof from the shoulders to the waist which increases passing from the waist until it reaches the shoulders, so as to have an inflation volume of the airbag portion for protecting the thorax which is greater at the top part of the thorax proximal to the shoulders and lower at the bottom part of the thorax near the waist.

According to an embodiment, said airbag device 5 comprises an inflation chamber, preferably elastic, indicated in the figures with the reference 35. According to an embodiment said inflation chamber 35 is made using elastic material, for example made of polyurethane. According to an embodiment, said chamber - when inflated with pressurised fluid - is dilated forming a cushion adapted to absorb the collisions the user is subjected to.

According to an embodiment, said inflation chamber 35 has an opening adapted to be sealingly connected with an inflation device 12.

According to an embodiment, said inflation chamber 35 has one or more further openings suitable for a gradually controlled deflation of the chamber 35 as a result of the absorption of the collision.

Said openings 81 are closed by vent valves 82 specially calibrated for determining a controlled deflation time of chamber 35.

According to an embodiment, said inner chamber 35 of the airbag is received in a sack 36 for containing the airbag. Advantageously, according to an embodiment, said sack 36 has a predetermined shape or form, which defines the dimensions of the different airbag portions in its active or inflated state. According to an embodiment, said containment sack 36 is made using material having a considerably lower elastic characteristic with respect to the elastic characteristic of the inner chamber 35. For example, according to an embodiment said containment sack 36 is made of nylon. According to an embodiment, said containment sack 36 is made using material that can be easily firmly connected with portions of the garment, for example with the edges for connecting the outer part 2 and the inner part 3 of the garment so as to position the airbag 5 as desired inside the gap 4 for covering predetermined portions of the user's body.

According to an embodiment, said airbag device 5 has different portions separated from each other by distribution means for distributing the fluid within

the device.

According to an embodiment, said inner chamber 35 of the airbag has closure means 37 which can be opened at a predetermined pressure threshold of the fluid supplied thereinto.

According to an embodiment, said airbag device comprises an inflation device operatively connected to an activation device. Said device 100 for inflating the airbag comprises a device body 101 fixedly connected to an airbag 103 to which there is fluidically connected pressurised vessel 104 containing a pressurised gas adapted to inflating the airbag 103.

In particular, such device body 101 comprises an inner chamber 102 in which there is slidably received a striker 106 adapted to open the pressurised vessel 104 so as to allow the inflow of the pressurised gas into the airbag 103.

The device 100 comprises an elastic element 108 received in the inner chamber 102 and which allows preloading the striker 106, so that it can transfer its elastic energy to the striker 106 when the activation of the airbag 103 is required and thus push the striker 106 towards the pressurised vessel 104 so as to determine its opening.

In particular said striker 106 comprises a stem 109 which operates as means for locking the striker 106 to hold it in a loaded position by preloading said elastic element 108.

The stem 109 is fixedly connected to an undercut in a lever 110 which allows - in case of imminent collision - to exert traction on the stem 109. Actually, such lever is connected to a chord fixedly connected to a vehicle, for example to a motorbike, so that, in case of a relative strong acceleration between the user of the airbag and the vehicle, the chord is pulled and in turn pulls the lever 110.

According to an embodiment, to the inflation device 12 there is associated an activation device 11, for example, but not necessarily, a yanking device.

According to an embodiment to said yanking device there is associated a chord or mini-belt 32 to which there is fixedly connected, at the opposite end, a female fastening buckle 39.

According to an embodiment, said female fastening buckle 39 comprises a body 201 to which a release button 202 is associated suitable for elastically snap-holding a hooking portion 103 of a male fastening buckle 40 which can be inserted into a

seat 204 provided in the female buckle body 201.

According to an embodiment to the female buckle 39 there can be associated, through releasable snap-fastening, a male fastening buckle 40.

According to an embodiment, said male fastening buckle 40 comprises a male buckle body 205 which defines at an end facing the female buckle body the fastening portion of the male buckle 203 and, on the opposite part, according to an embodiment, integrated in a single piece, a winding device of the inertial type 41.

According to an embodiment, said male buckle body 205 comprises, at the end opposite to the fastening portion of the male buckle 203, a slot for the entrance of a belt suitable for connection to the end opposite to a vehicle, for example to a motor-vehicle.

According to an embodiment, said male buckle body 205 defines a cylindrical housing 206 inside which there is inserted a drum 208 for winding the tape suitable for rotating on two bearings, made for example in the bottom and top end walls of the cylindrical housing, one of which, for example, can be separated cap-like 209 for disassembling the mechanism.

According to an embodiment, said drum 208 for winding the tape is elastically affected with respect to the cylindrical housing 207 for winding the tape exerting a predefined tension thereon.

According to an embodiment, said predefined action for tensioning the tape is obtained by using a spiral spring 210 fixedly connected to the cylindrical housing 207 and at the end opposite the drum 208 for winding the tape.

According to an embodiment, said drum 208 for winding the tape has - at an end thereof - a cam 211 suitable for affecting a follower rotating cylinder 212 coaxial with the drum 208 for winding the tape. Said cam follower has ratchet engagement teeth 213 at an axial face thereof facing towards ratchet engagement counter-teeth 214 fixed to the cylindrical housing 207. Between said rotary ratchet teeth and said fixed ratchet teeth 214 there is interposed an elastic means which keeps the cam follower 212 provided with rotary ratchet teeth 213 on the bottom of the cam 211 rotating with the teeth disengaged from the fixed ratchet 214 as long as the angular acceleration exerted by the drum 208 for winding the tape does not push, through an action greater than that of the spring 215, said cam follower 212 to

fasten to its ratchet teeth 213 of the fixed ratchet teeth 214, blocking the sudden unwinding of the tape and exerting the desired traction action due to activation of the activation device 11 of the inflation device 12 of the airbag 5.

According to a general embodiment, a protective garment 1 of a user through an individual airbag device, comprises an outer part 2 opposite to the user of the garment. Advantageously, said garment further comprises an inner part 3, or lining of the garment, arranged facing the user.

Said outer part 2 of the garment and said inner part 3 of the garment define a gap 4 between them.

Advantageously, said garment 1 comprises an airbag device 5 arranged housed in said gap 5.

According to an embodiment, said garment 1 comprises a bust portion 6, a neck portion 7 and, advantageously, sleeves 8 connected to said bust portion 6.

Preferably, according to an embodiment, said gap 4 is closed where the sleeves 8 are connected to the bust portion 6, forming a closure of the gap in the shoulder armhole portion or joining closure of the shoulder armhole 9, capable of containing lateral movements of said airbag device 5 from a deflated or

deactivated state to an inflated or activated state so as to keep it as close as possible to the user's neck.

According to an embodiment, said gap 4 of the garment is in communication with a neck gap 10 where the neck portion 7 of the garment connects to the bust portion 6 of the garment, allowing the airbag device 5 to inflate in the neck gap 10 of the neck portion 7 of the garment.

According to an embodiment, said gap 4 of the garment is substantially closed with respect to the outside or the inside of the garment. Advantageously, said airbag device 5 is contained entirely in said gap 4, so as to remain inside the gap 4 when it passes from an inactive or deflated configuration to an activated or inflated configuration, apart from its activation portion 11 that alone projects from the garment for activation through inflation means 12 of the airbag device 5.

According to an embodiment, said airbag device 5 comprises a first portion for protecting the neck 13, and in particular for protecting the cervix, which continues by rotating around the neck portion 7 of the garment in the front part of the bust portion 6 of the garment to protect the user's shoulders to

then go down to protect the user's thorax remaining between the shoulder armhole and a device for closing or opening the garment 14, like for example a slide fastener or zipper.

According to an embodiment, said airbag device 5 continues by folding over on one side 15 of the garment passing under joining closure of the shoulder armhole 9 to protect the side of the user, to then rise back up into the bust portion 6 of the garment defining the rear part of the garment 16, to protect the user's back, forming a portion of the airbag device 5 substantially parallel to the user's spine.

According to an embodiment, said airbag portion for protecting the neck 13 continues at both of its ends rotating around the neck of the garment and passing by the shoulders of the garment 17, ant to go down with two portions arranged substantially side-by-side to protect the user's thorax 18, leaving a garment closure device 14 between them.

According to an embodiment, each thorax portion bends back on the sides reaching substantially the base of the gap 4, in the lower part of the garment 1 opposite the neck, continuing rotating under the joining closures of the shoulder armhole 9 up to reaching the portion of the garment that is suitable

for covering the user's back 16.

According to an embodiment, each portion continues by rising up along the portion for protecting the user's back 16 forming two airbag portions for protecting the back 20 arranged substantially parallel to the user's spine.

According to an embodiment, preferably, all of these portions of the airbag form a single airbag chamber 21 and are fluidically connected together.

According to an embodiment, said airbag device 5 has an airbag portion for protecting the neck 13, an airbag portion for protecting the back 20, an airbag portion for protecting the shoulders 22, an airbag portion for protecting the thorax 18, an airbag portion for protecting the sides 23. According to an embodiment, said portion for protecting the neck 13 is connected so as to remain firmly fixed also in inactive or deflated condition and also in active or inflated condition on the upper edge 24 of the neck portion 7 of the garment.

According to an embodiment, said airbag portion for protecting the back 20 is connected so as to remain firmly fixed in inactive or deflated condition and also active or inflated condition to the lower edge of the bust portion 25 of the garment defining

the protection for the back.

According to an embodiment, said portion for protecting the thorax 18 is firmly fixed so as to remain anchored also in inactive or deflated condition and also active or inflated condition to the edge of the gap defining the lower edge 26 of the bust portion of the front garment.

According to an embodiment, said portion for protecting the thorax 18 and said portion for protecting the shoulders 22 are firmly anchored, so as to remain connected also in inactive or deflated condition and also active or inflated condition to the edge portion of the gap defining the collar of the garment 27.

According to an embodiment, said garment comprises a neck portion 7 suitable for wrapping around the user's neck, which comprises an outer neck portion 28 and an inner neck portion 29, or a lining of the neck of the garment, said outer and inner portions of the neck of the garment defining between them a neck gap 10 that is connected without interruption to form a single gap chamber in communication with a gap arranged on the back 30 of the user as well as in communication with two chest gaps 31 arranged on the chest of the user so as to

leave a portion for closing and opening the garment 14 centrally to the user.

According to an embodiment, said airbag portion for protecting the neck 13 is housed in said neck gap 10 formed in the neck portion of the garment.

According to an embodiment, said portion for protecting the neck 13 of the airbag and housed in the neck gap 10 is folded like an accordion, forming folds, so as to leave an outer edge thereof 32, opposite to the back portion of the garment 16, free and accessible for its stable connection in inactive or deflated condition and also active or inflated condition of the airbag to an upper edge 24 of the neck portion of the garment.

According to an embodiment, said airbag device 5 has a side portion 23 arranged below the joining closure of the shoulder armhole 9 between the outer 2 and inner 3 parts of the garment associated with which there is an inflation and activation device 12, 11 connected to said airbag device 5 and arranged outside of the gap 4, so as to be able to be accessible for its activation, for example of the yanking type, when the user is separated from the means with which he/she is associated.

According to an embodiment, preferably, said

airbag device 5 comprises at least one portion for protecting the thorax 18 housed in the chest gap 31 of the bust of the garment 6 in its front portion. According to an embodiment, said portion extends substantially from the waist or hips 15 to the shoulder 17 of the garment.

Advantageously, according to an embodiment, the dimensions 33 transversal to the extension of said portion for protecting the thorax 18 increase passing from the waist or hips 15 to the shoulder 17 of the garment, so that the inflation volume of said portion 18 is mainly in the upper part of the bust of the garment for protecting the upper part of the front bust of the user.

According to an embodiment, said airbag device 5 comprises different portions fluidically connected together. Advantageously, between at least two of these portions there is a substantial throttling 34 of an inflation chamber 35 of the airbag 5 that determines a complete inflation of the portions of the airbag at separate times.

For example, according to an embodiment, said substantial throttling 34 allows an initial inflation of an portion of the airbag arranged to protect the thorax 18 and a subsequent inflation of portion of

the airbag arranged to protect the back 20.

According to an embodiment, said substantial throttlings 34 in the chamber 35 of the airbag are obtained by folding upon itself the inflation chamber 35 of the airbag so that the inflation pressure of the fluid determines its unfurling only once a pressure threshold has been exceeded.

Alternatively, said airbag device comprises an inner inflation chamber 35 and an outer containment sack 36. According to an embodiment, said inner inflation chamber 35 is folded upon itself and said containment sack 36 is fixedly connected determining a small section thereof through means suitable for breaking, or opening 37, once a predetermined pressure has been reached in the folded chamber, so as to determine a subsequent widening of the section of the inflation chamber for a free flow of the inflation fluid at separate times in different portions of the airbag.

According to an embodiment, said airbag device 5 is housed in the gap 4 so as to rest on the edge 25, 26, 9, 32 of the gap to contain its movements during its inflation.

According to an embodiment, said airbag device 5 comprises an inflation device of the airbag 12 and

activator means 11 connected to a mini-belt 38 equipped with a female fastening buckle 39 suitable for connecting to a male fastening buckle 40 equipped with an inertial roller 41 on which a mini-belt 42 is wound which can be connected to the vehicle, so that the roller 41 draws back the mini-belt 42 and it is always taught, leaving the user free to move with low acceleration to then lock in the case of sudden accelerations, for example due to collisions of the vehicle or falling, that cause the airbag to activate.

According to an embodiment, the airbag device 5 has an inflation device 12 associated with it that is activated through an activation device 11 connected to a mini-belt 38 for yanking activation equipped with a female fastening buckle 39. Said female fastening buckle 39 has an ergonomic body and suitable for being gripped with a single hand, to then fasten and unfasten the buckle with a single hand.

According to an embodiment, the body of the female buckle 39 has a housing 43 for the thumb that, by working against the index and middle fingers acting on the male buckle component 40 makes it possible to bring together and fasten the buckle with

a single hand.

To the afore-described embodiments a man skilled in the art, with the aim of meeting contingent requirements, will be able to make modifications, adaptations and replacements of elements with other functionally equivalent elements, without departing from the scope of the following claims.

According to an embodiment, a garment 1 has said portion of airbag substantially parallel to the spine 20 arranged at least partially overlapping the portion of the airbag for protecting the neck or cervix 13 and has an inflation chamber 35 locally, in the partially overlapped portion, fluidically separated from the inflation chamber defining the portion of the airbag for protecting the neck or cervix 13.

Any characteristic described as belonging to a possible embodiment, can be obtained independently from the other described embodiments.

CLAIMS

1. Protective garment (1) for a user through a device with an individual airbag, comprising:

- an outer part (2) opposite the user of the garment;

- an inner part (3) or lining of the garment facing the user;

- said outer part (2) of the garment and said inner part (3) of the garment defining a gap (4) between them;

- said garment (1) comprising an airbag device (5) arranged housed in said gap (4);

- said garment (1) comprising a bust portion (6), a neck portion (7) and sleeves (8) connected to said bust portion (6), wherein

- said gap (4) is closed where the sleeves (8) connect to the bust portion (6), forming a closure of the gap in the shoulder armhole portion or joining closure of the shoulder armhole (9), capable of containing lateral movements of said airbag device (5) from a deflated or deactivated state to an inflated or activated state so as to keep it as close as possible to the user's neck;

- said gap (4) of the garment being in communication with a neck gap (10) where the neck

portion (7) of the garment connects to the bust portion (6) of the garment, allowing the airbag device (5) to inflate in the neck gap (10) of the neck portion (7) of the garment.

2. Garment (1) according to claim 1, wherein said gap (4) of the garment is substantially closed with respect to the outside or inside of the garment and said airbag device (5) is contained entirely inside the gap (4), so as to remain inside the gap (4) when it passes from an inactive or deflated configuration to an active or inflated configuration, apart from its activation portion (11) that alone projects from the garment for activation through inflation means (12) of the airbag device (5).

3. Garment (1) according to any one of the previous claims, wherein said airbag device (5) comprises a first portion for protecting the neck (13), and in particular the cervix, which continues by rotating around the neck portion (7) of the garment in the front part of the bust portion (6) of the garment to protect the user's shoulders to then go down to protect the user's thorax remaining between the shoulder armhole and a device for closing or opening the garment (14), like for example a slide fastener or zip, said airbag device (5) continues by

folding over on one side (15) of the garment passing under the closure of the shoulder join (9) to protect the side of the user to then rise back up into the bust portion (6) of the garment defining the rear part of the garment (16) to protect the user's back forming a portion of the airbag device (5) substantially parallel to the user's spine, preferably in which said airbag portion for protecting the neck (13) continues at both of its ends rotating around the neck of the garment and passing by the shoulders of the garment (17) and to go down with two portions arranged substantially side-by-side to protect the user's thorax (18) leaving a garment closure device (14) between them, each thorax portion bending back on the sides reaching substantially the base of the gap (4) in the bottom part of the garment (1) rotating under the closures of the shoulder joins (9) until the portion of the garment that is suitable for covering the user's back (16) is reached, each portion continuing by rising up along the portion for protecting the user's back (16) forming two airbag portions for protecting the back (20) arranged substantially parallel to the user's spine, preferably in which all of these portions of the airbag form a single airbag

chamber (21) and are fluidically connected together.

4. Garment (1) according to any one of the previous claims, wherein said airbag device (5) has an airbag portion for protecting the neck (13), an airbag portion for protecting the back (20), an airbag portion for protecting the shoulders (22), an airbag portion for protecting the thorax (18), an airbag portion for protecting the sides (23), wherein said airbag portion for protecting the neck (13) is connected so as to remain firmly fixed also in inactive or deflated condition and active or inflated condition to the upper edge (24) of the neck portion (7) of the garment,

wherein said airbag portion for protecting the back (20) is connected so as to remain firmly fixed in inactive or deflated condition and active or inflated condition to the lower edge of the bust portion (25) of the garment defining the protection for the back,

wherein said airbag portion for protecting the thorax (18) is firmly fixed so as to remain anchored also in inactive or deflated condition and active or inflated condition to the edge of the gap defining the lower edge (26) of the bust portion of the front garment

and wherein said portion for protecting the thorax (18) and said portion for protecting the shoulders (22) are firmly anchored, so as to remain connected also in inactive or deflated condition and active or inflated condition to the edge portion of the gap defining the collar of the garment (27).

5. Garment (1) according to any one of the previous claims, wherein said garment comprises a neck portion (7) suitable for wrapping around the user's neck, which comprises an outer neck portion (28) and an inner neck portion (29) or lining of the neck of the garment, said outer and inner portions of the neck of the garment constituting a neck gap (10) between them that is connected without interruption to form a single gap chamber in communication with a gap arranged on the back (30) of the user as well as in communication with two chest gaps (31) arranged on the chest of the user so as to leave a portion for closing and opening the garment (14) centrally to the user, wherein said airbag portion for protecting the neck (13) is housed in said neck gap (10) formed in the neck portion of the garment, and wherein said portion for protecting the neck (13) of the airbag housed in the neck gap (10) is folded like an accordion, forming folds so as to leave an outer edge

thereof (32) opposite to the back portion of the garment (16) free and accessible for its stable connection in inactive or deflated condition and active or inflated condition of the airbag to an upper edge (24) of the neck portion of the garment.

6. Garment (1) according to any one of the previous claims, wherein said airbag device (5) has a side portion (23) arranged below the joining closure of the shoulder armhole (9) between the outer (2) and inner (3) parts of the garment associated with which there is an inflation and activation device (12, 11) connected to said airbag device (5) and arranged outside of the gap (4) so as to be able to be accessible for its activation, for example of the yanking type when the user is separated from the means with which they are associated.

7. Garment (1) according to any one of the previous claims, wherein said airbag device (5) comprises at least one portion for protecting the thorax (18) housed in the chest gap (31) of the bust of the garment (6) in its front portion and wherein said portion extends substantially from the waist or hips (15) to the shoulder (17) of the garment and wherein the dimensions (33) transversal to the extension of said portion for protecting the thorax

(18) increase passing from the waist or hips (15) to the shoulder (17) of the garment so that the inflation volume of said portion (18) is mainly in the upper part of the bust of the garment for protecting the upper part of the front bust of the user.

8. Garment (1) according to any one of the previous claims, wherein said airbag device (5) comprises different portions fluidically connected together and wherein between at least two of these portions there is a substantial throttling (34) of an inflation chamber (35) of the airbag (5) that determines a complete inflation of the portions of the airbag at separate times, for example to allow an initial inflation of a portion of the airbag arranged to protect the thorax (18) and a subsequent inflation of the portion of airbag arranged to protect the back (20).

9. Garment (1) according to claim 8, wherein said substantial throttlings (34) in the chamber (35) of the airbag are obtained by folding upon itself the inflation chamber (35) of the airbag so that the inflation pressure of the fluid determines its unfurling only once a pressure threshold has been exceeded or, alternatively, said airbag device

comprising an inner inflation chamber (35) and an outer containment sack (36), wherein said inner inflation chamber (35) is folded upon itself and said containment sack (36) is fixedly connected determining a smaller section thereof through means suitable for breaking or opening (37), once a predetermined pressure has been reached in the folded chamber so as to determine a subsequent widening of the section of the inflation chamber for a free flow of the inflation fluid at separate times in different portions of the airbag.

10. Garment (1) according to any one of the previous claims, wherein said airbag device (5) is housed by the gap (4) so as to rest on the edge (25, 26, 9, 32) of the gap to contain its movements during its inflation.

11. Garment (1) according to any one of the previous claims, wherein said airbag device (5) comprises an inflation device of the airbag (12) and activator means (11) connected to a mini-belt (38) equipped with a female fastening buckle (39) suitable for connecting to a male fastening buckle (40) equipped with an inertial roller (41) on which a mini-belt (42) is wound, which can be connected to the vehicle so that the roller (41) draws back the

mini-belt (42) and it is always taught leaving the user free to move with low acceleration to then lock in the case of sudden accelerations due to collisions of the vehicle or falling that cause the airbag to activate.

12. Garment (1) according to any one of the previous claims, wherein the airbag device (5) has an inflation device (12) associated with it that is activated through an activation device (11) connected to a mini-belt (38) for yanking activation equipped with a female fastening buckle (39) having an ergonomic body and suitable for being gripped with a single hand to then fasten and unfasten the buckle with a single hand, wherein the body of the buckle has a housing (43) for the thumb that by working against the index and middle fingers acting on the male buckle component (40) makes it possible to bring together and fasten the buckle with a single hand.

13. Garment (1) according to any one of the preceding claims, wherein said portion of airbag substantially parallel to the spine (20) and arranged at least partially overlapping the portion of airbag for protecting the neck or cervix (13) has an inflation chamber (35) locally, in the partially overlapped portion, fluidically separated from the

inflation chamber defining the portion of airbag for protecting the neck or cervix (13).

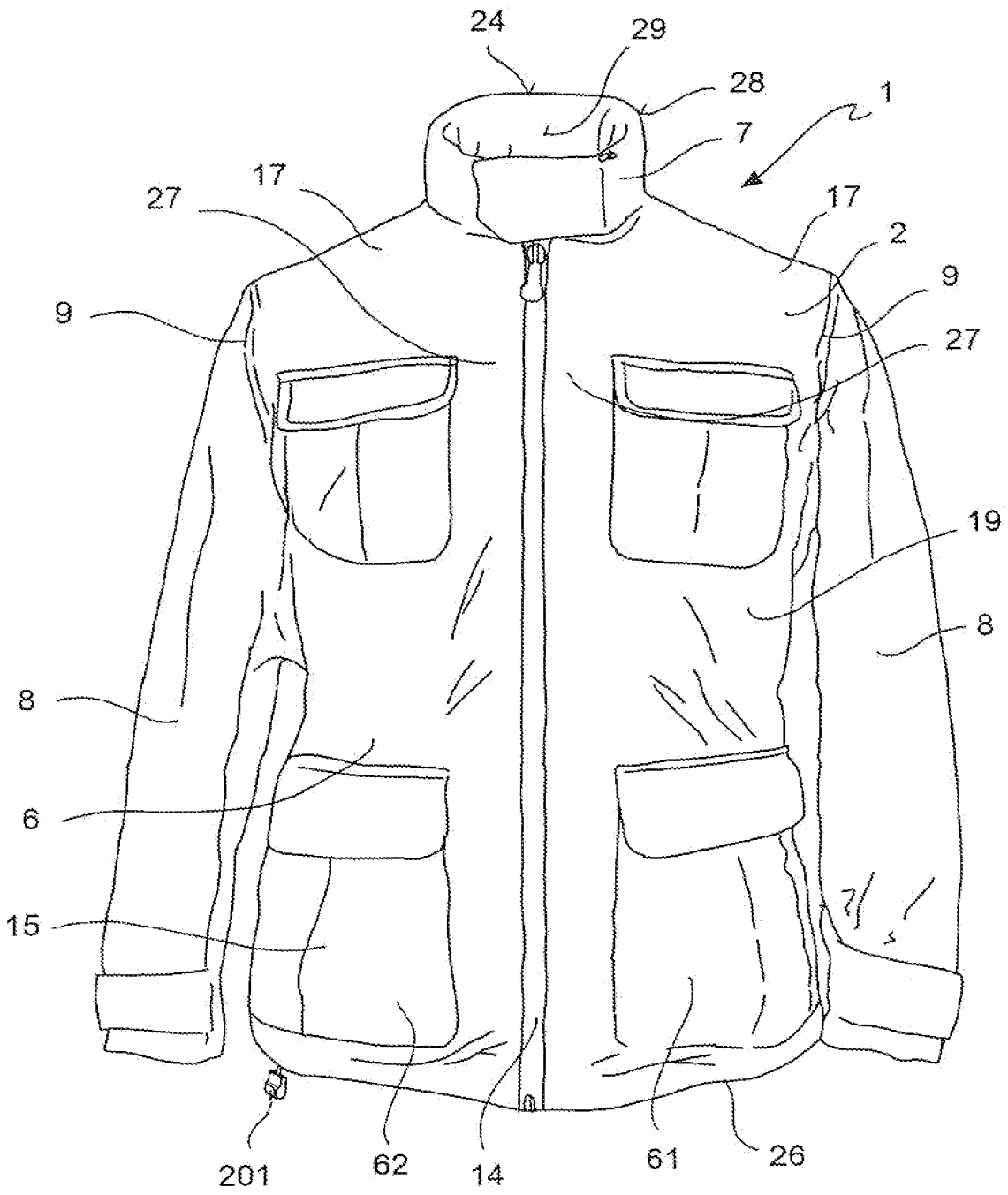


FIG. 1

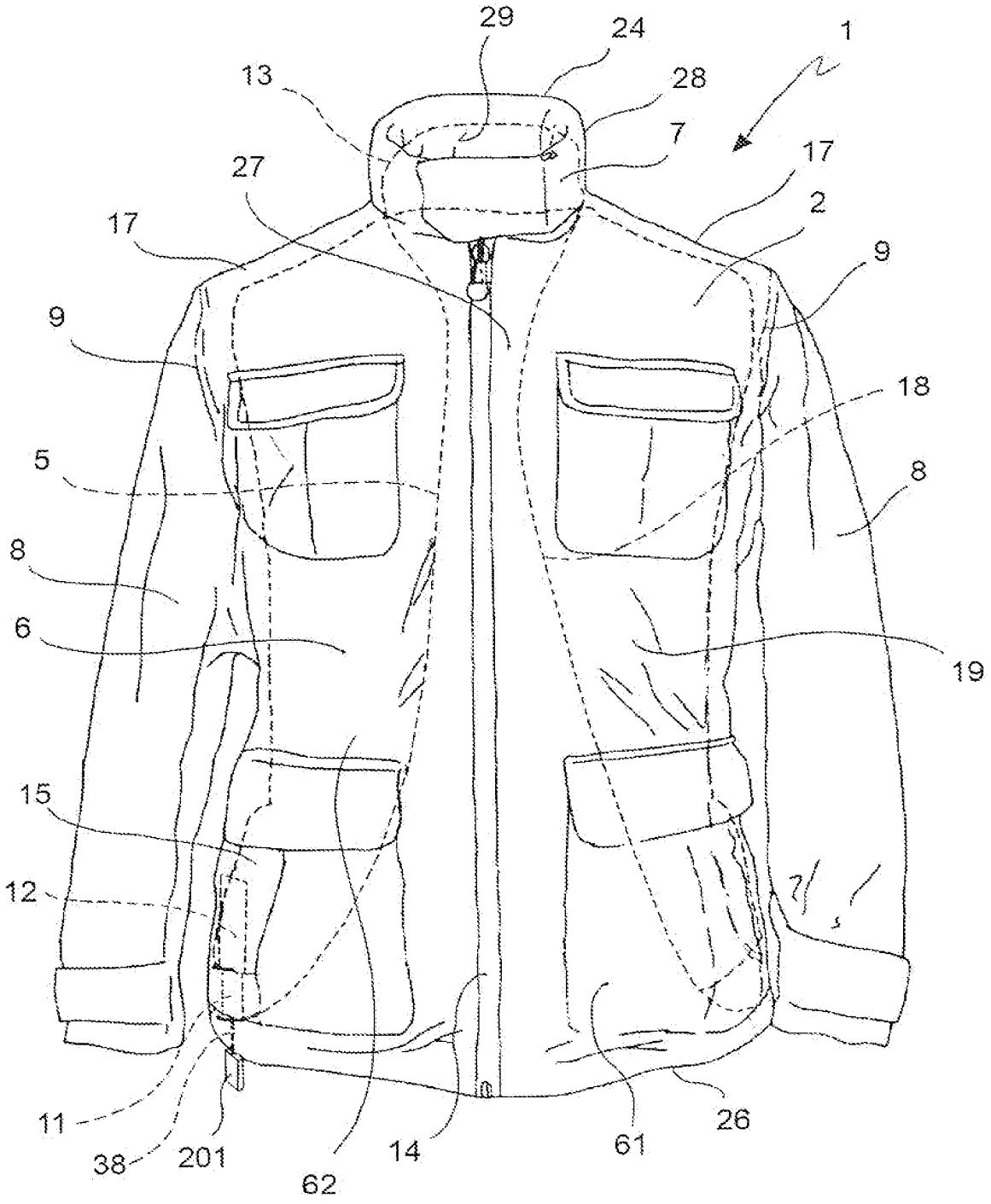


FIG. 2

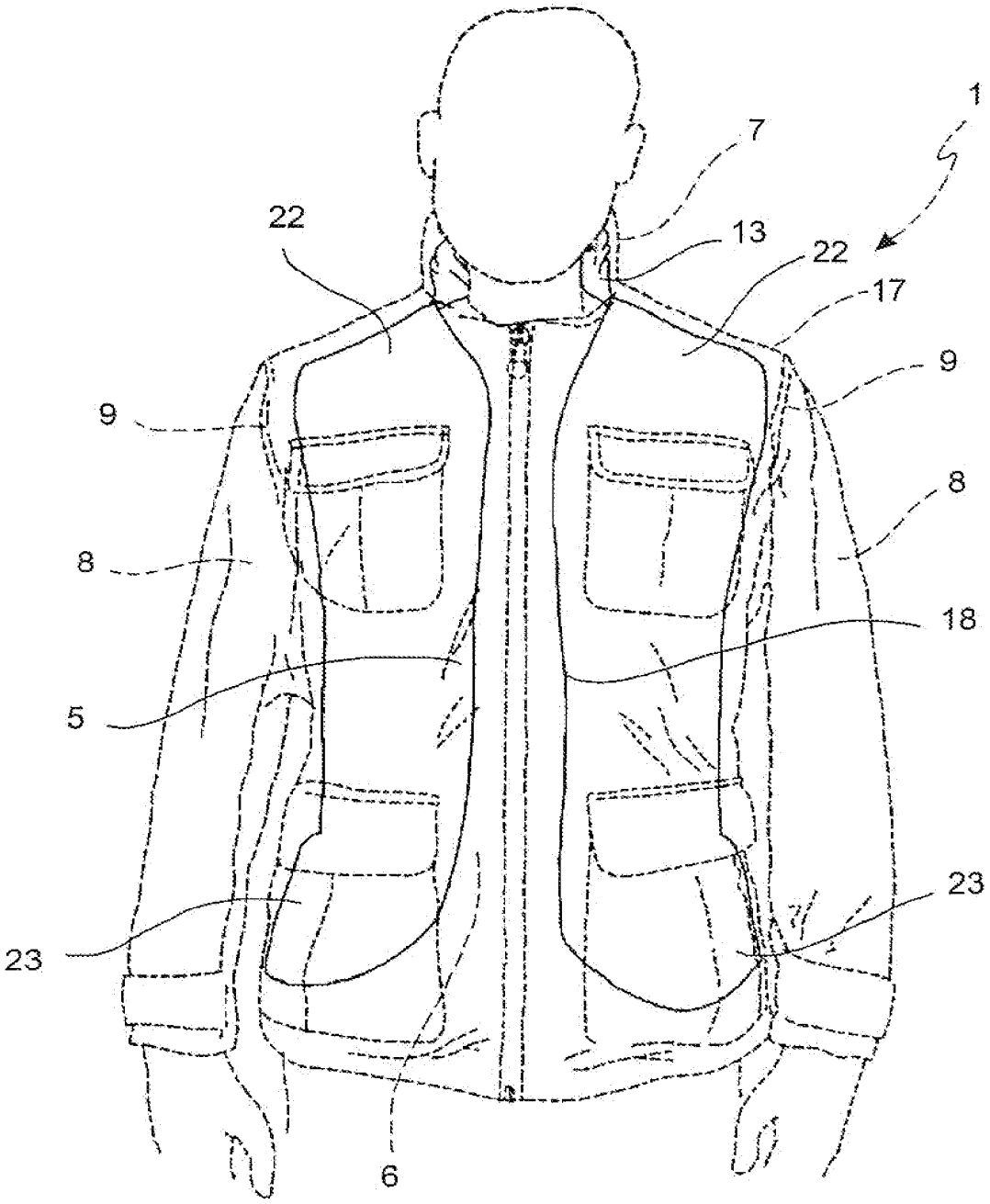


FIG. 3

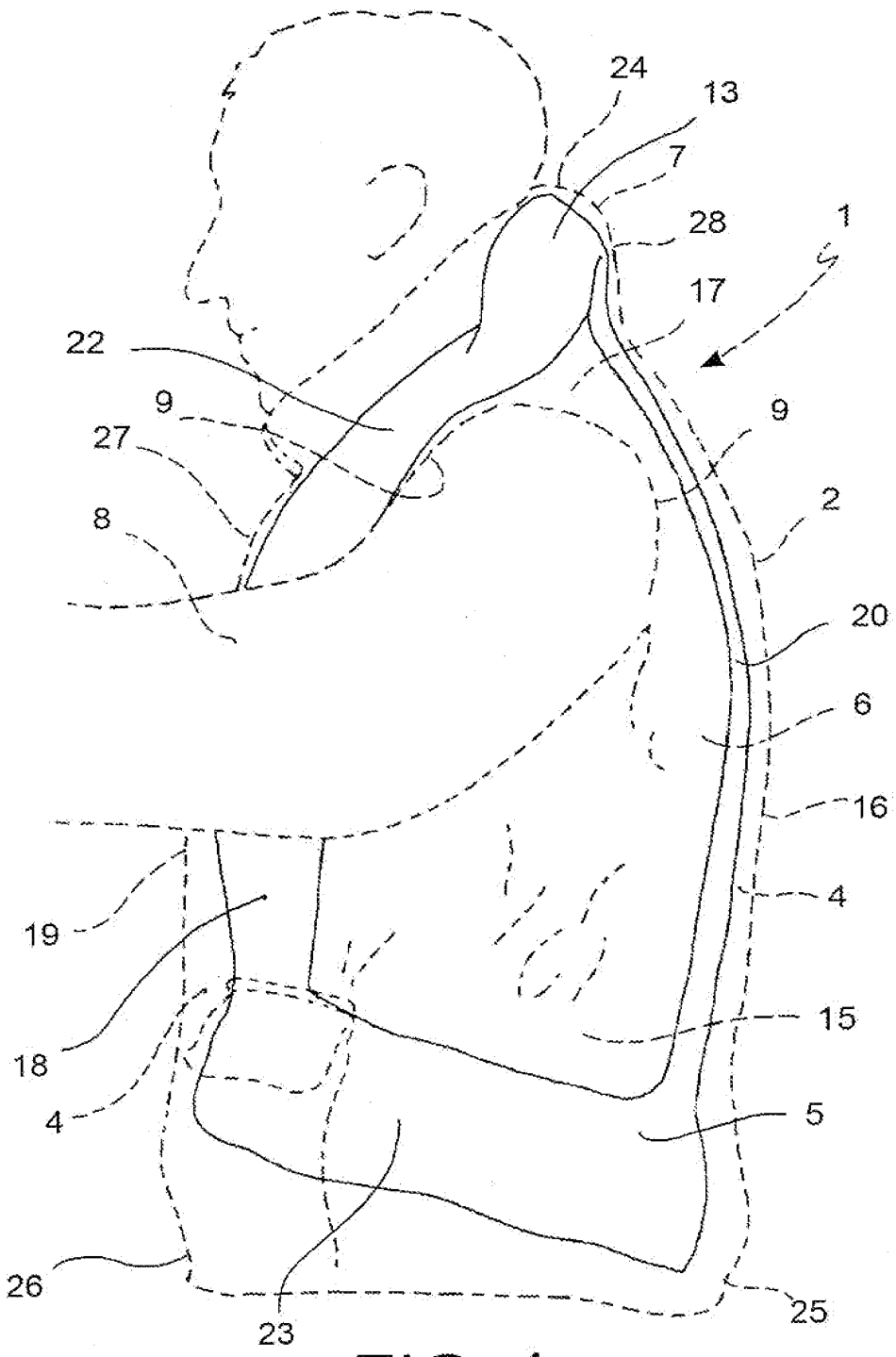


FIG. 4

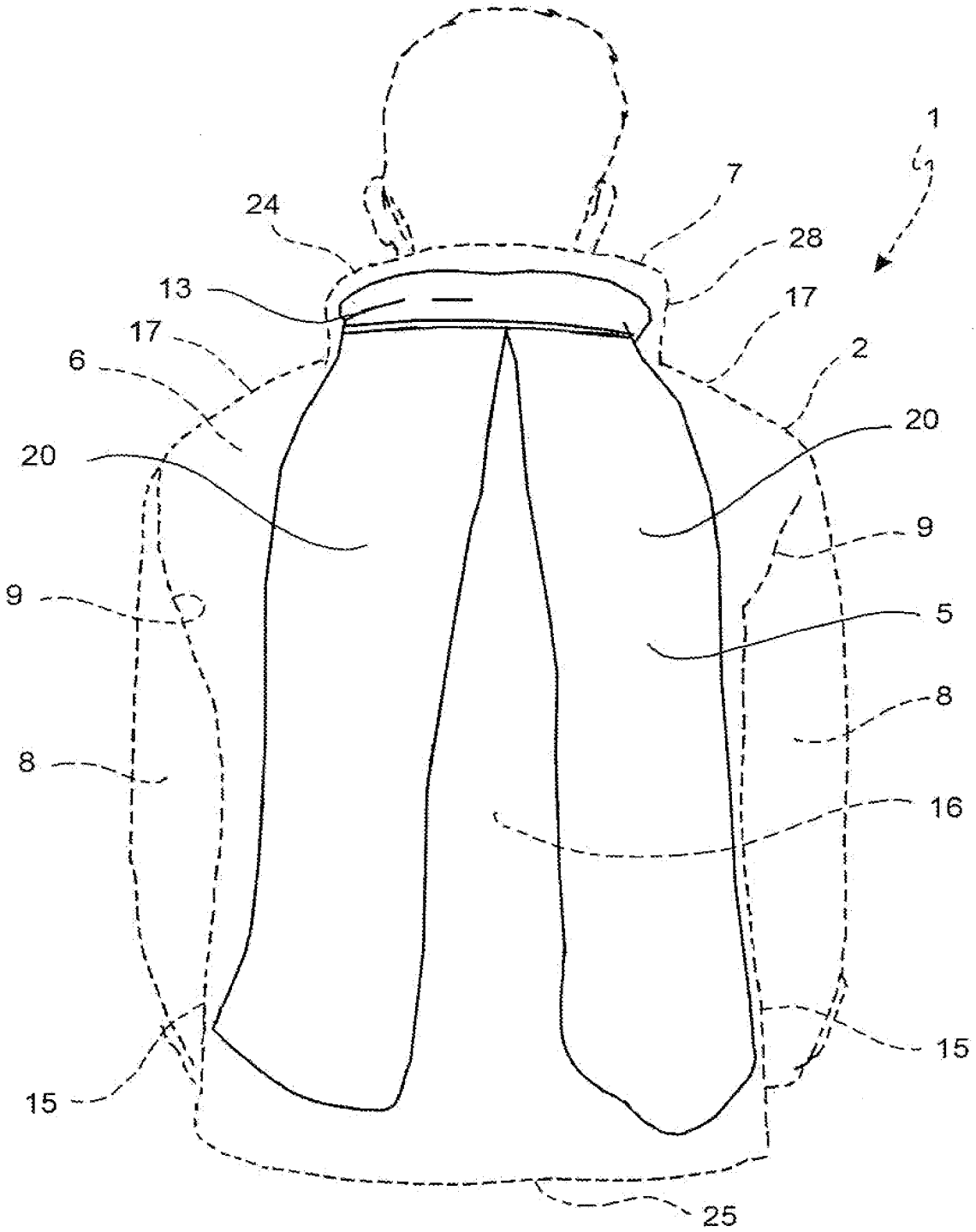


FIG. 5

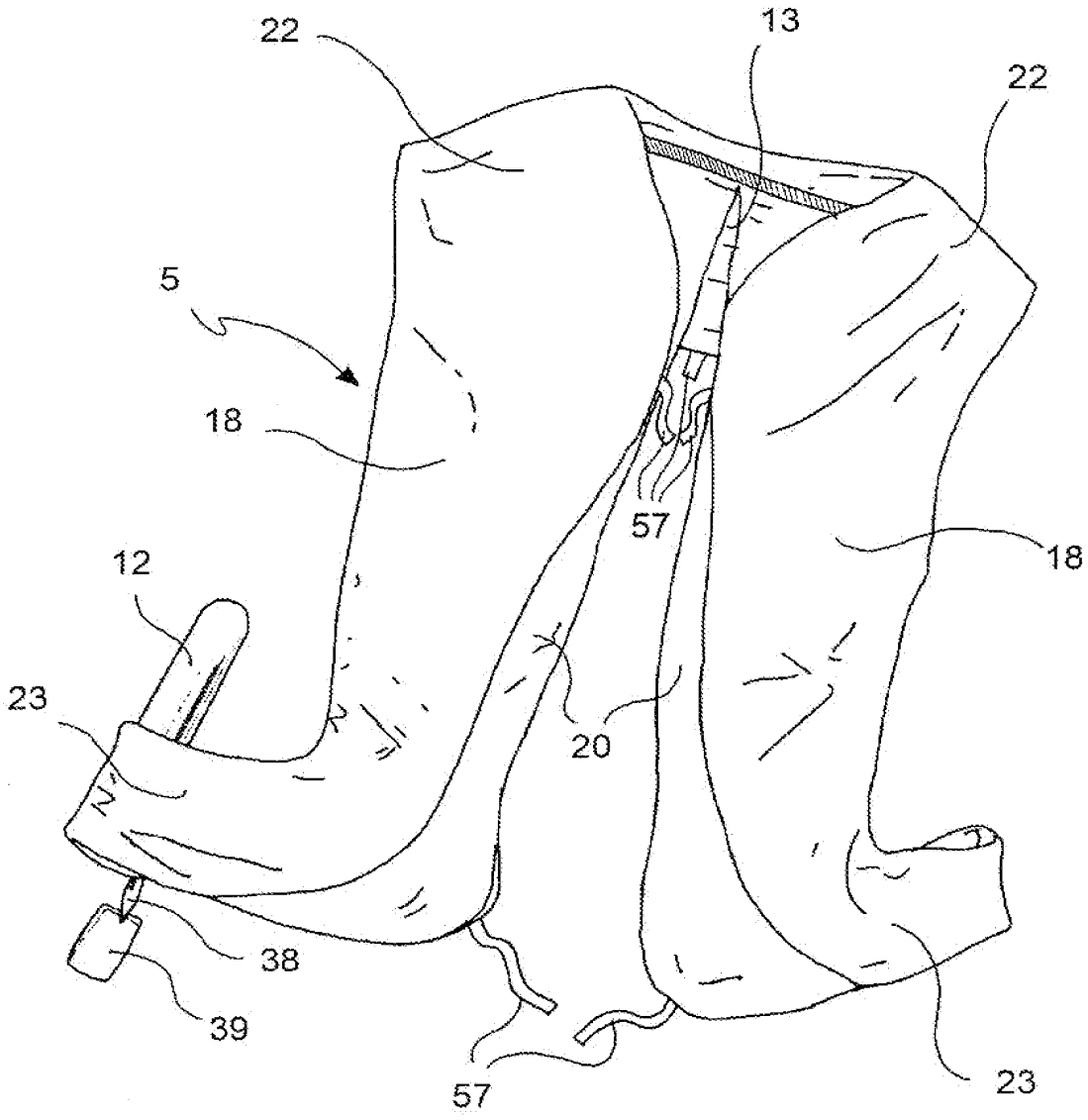


FIG. 6

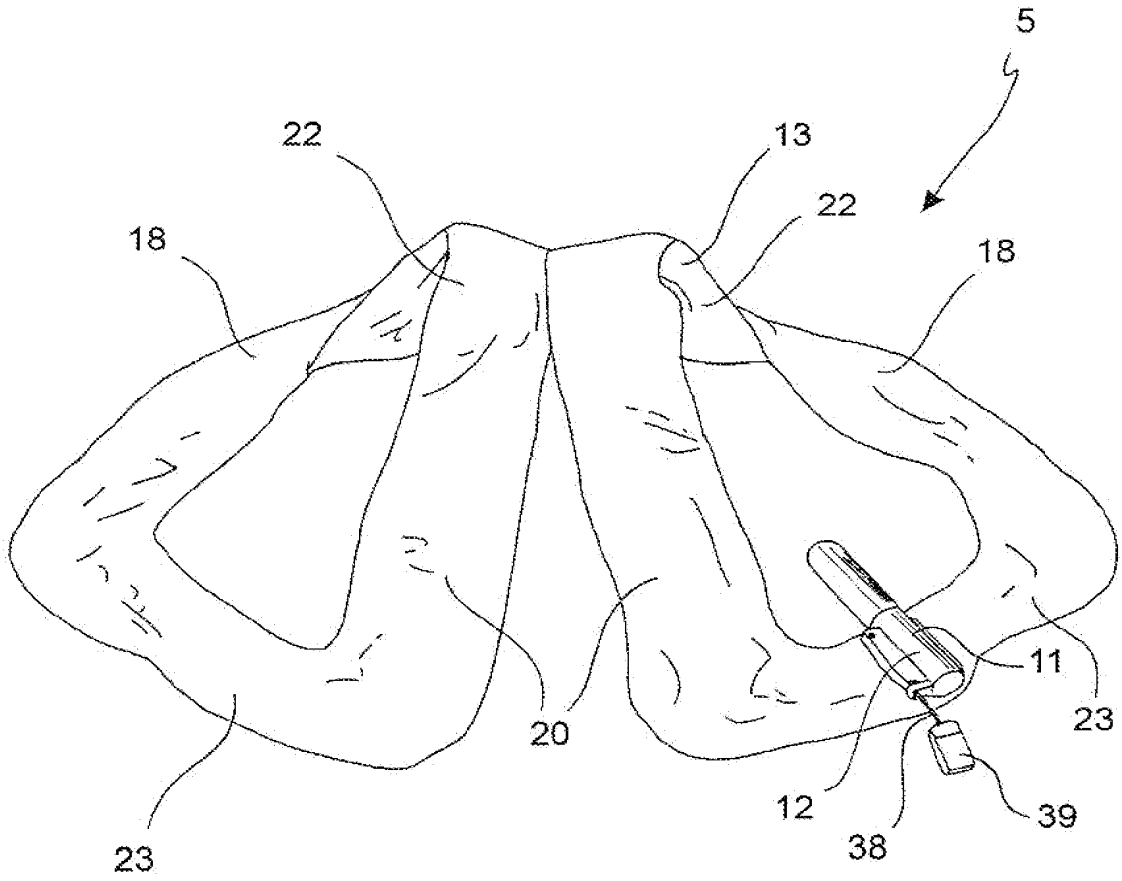


FIG. 7

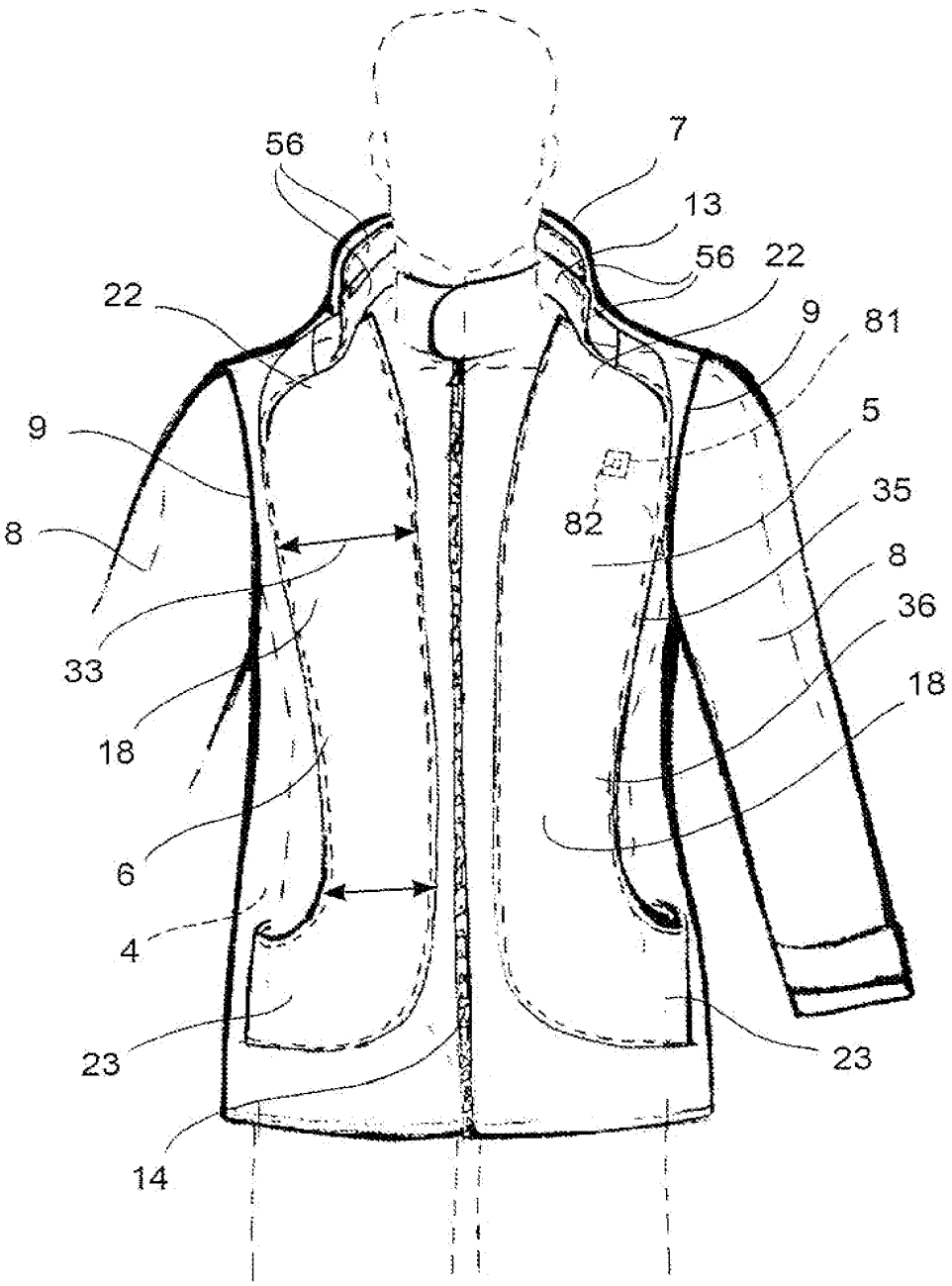


FIG. 8

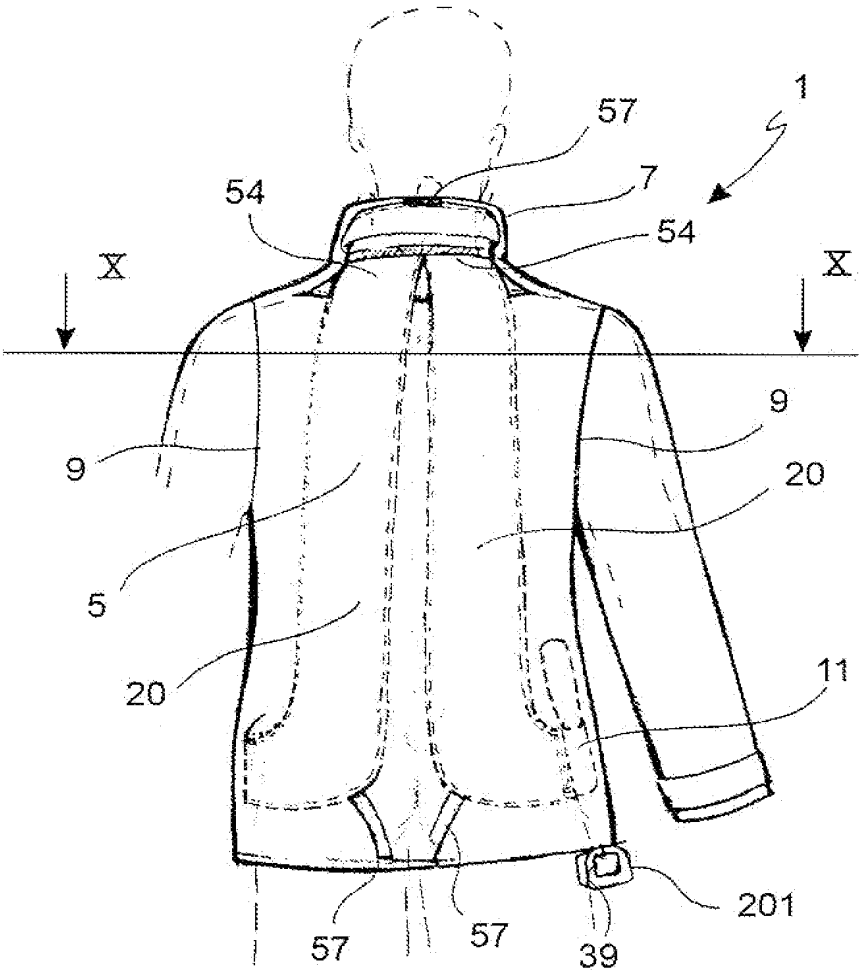

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FIG. 9

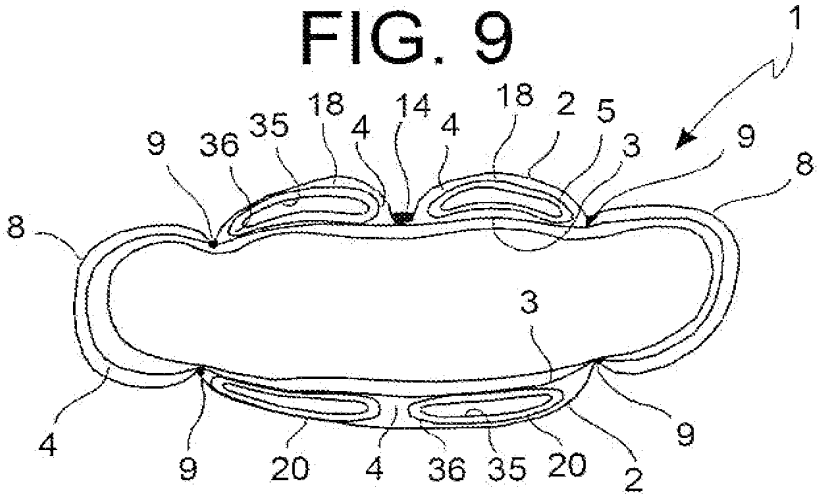

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FIG. 10

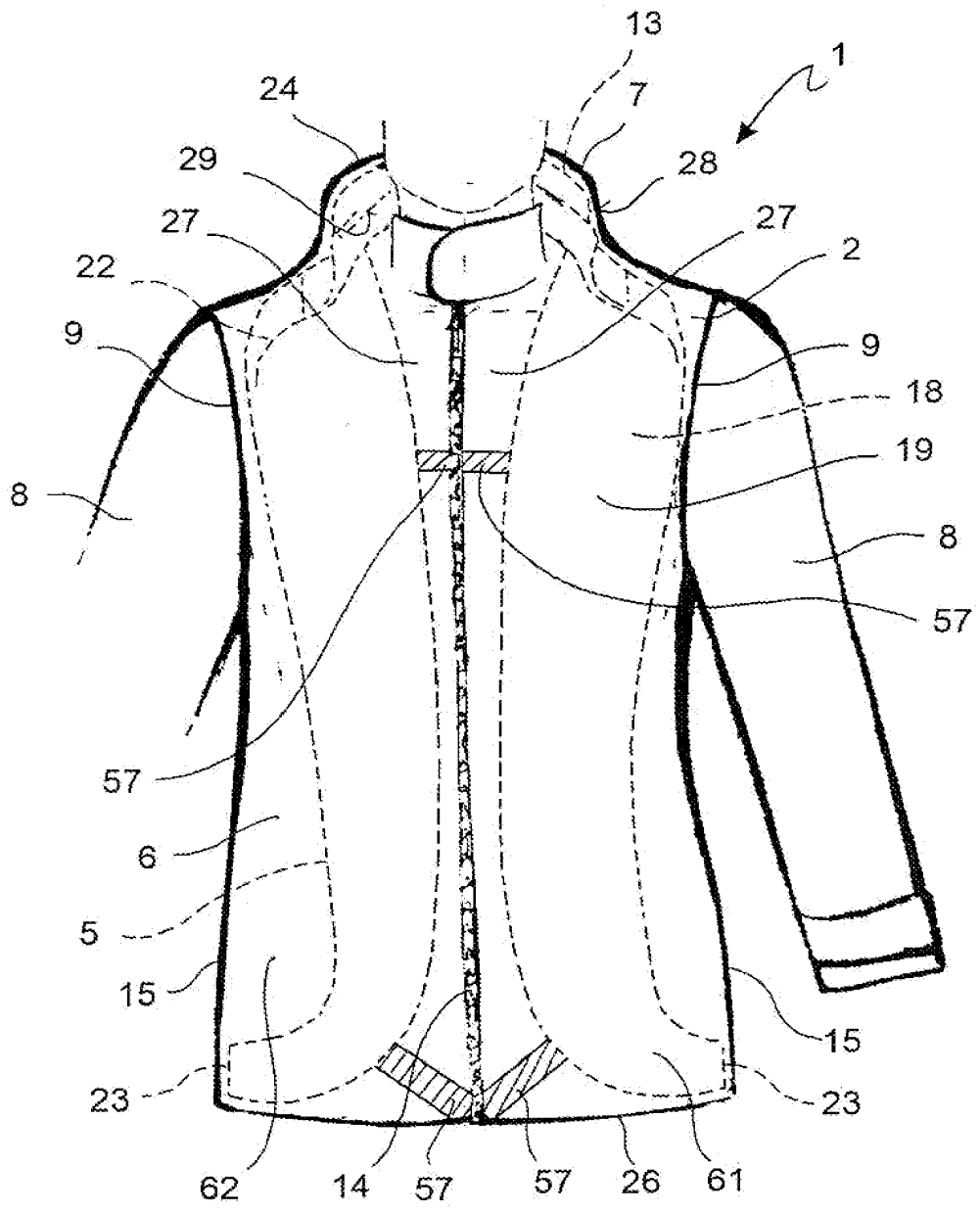

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FIG. 11

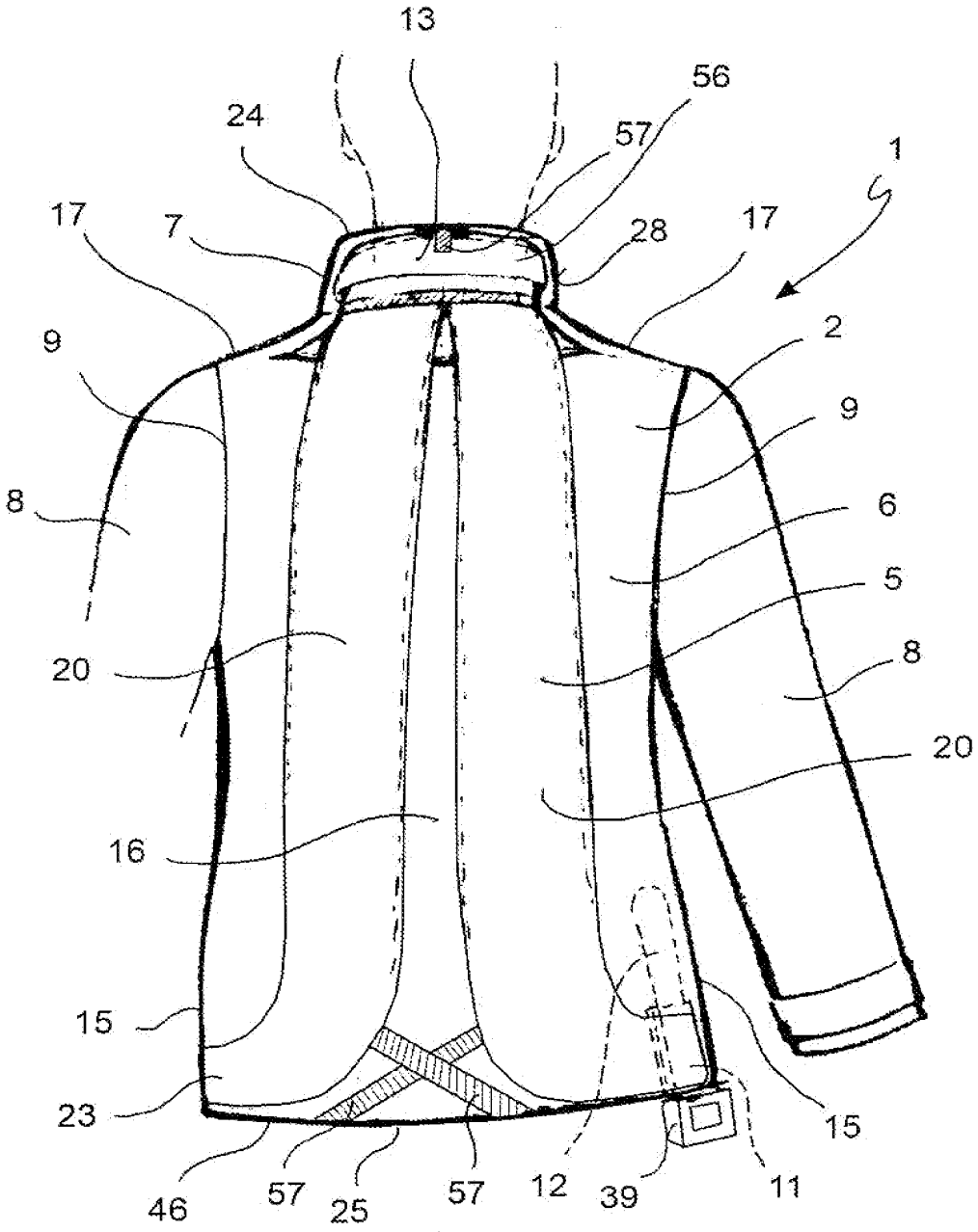


FIG.12

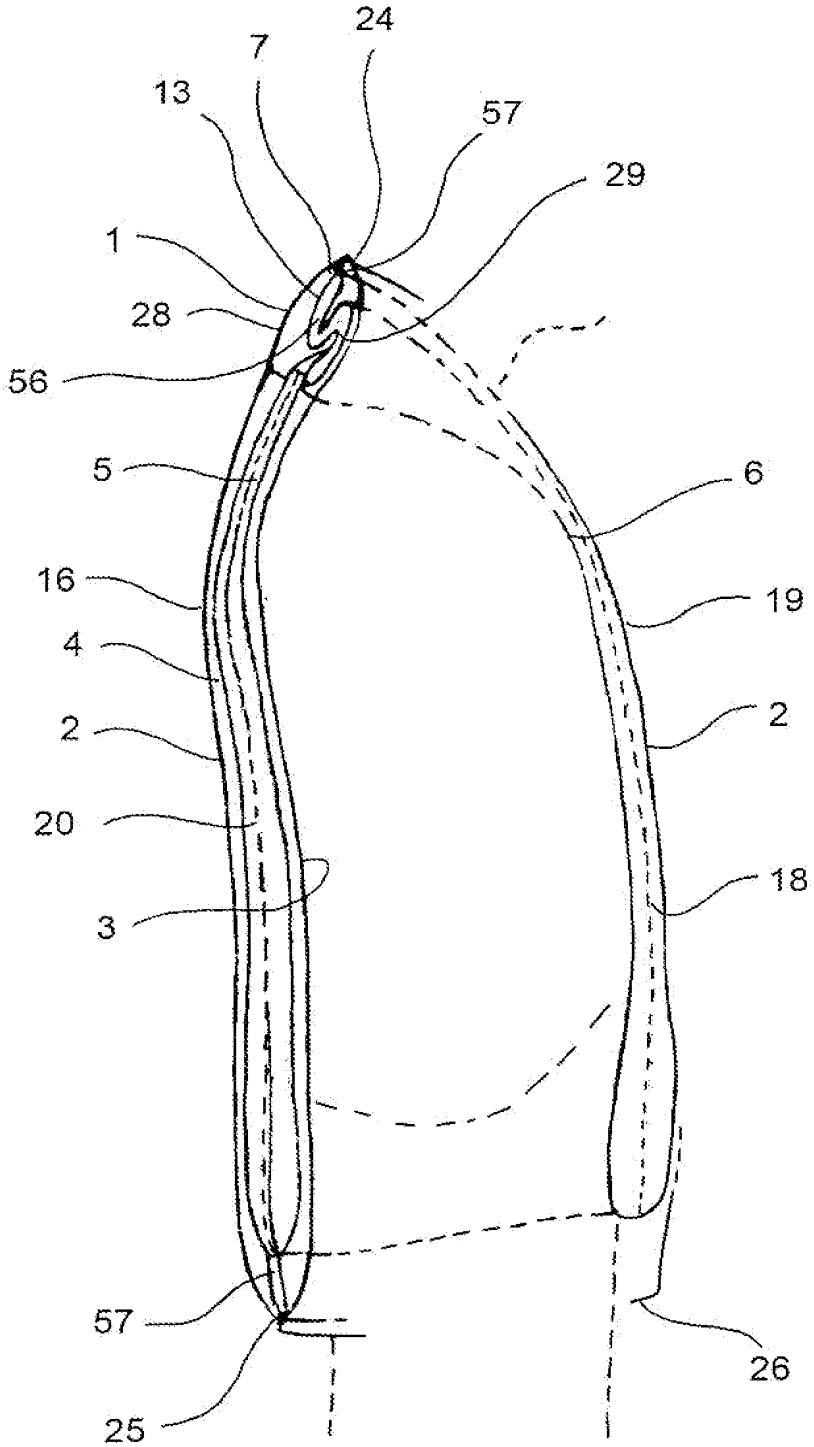


FIG. 13

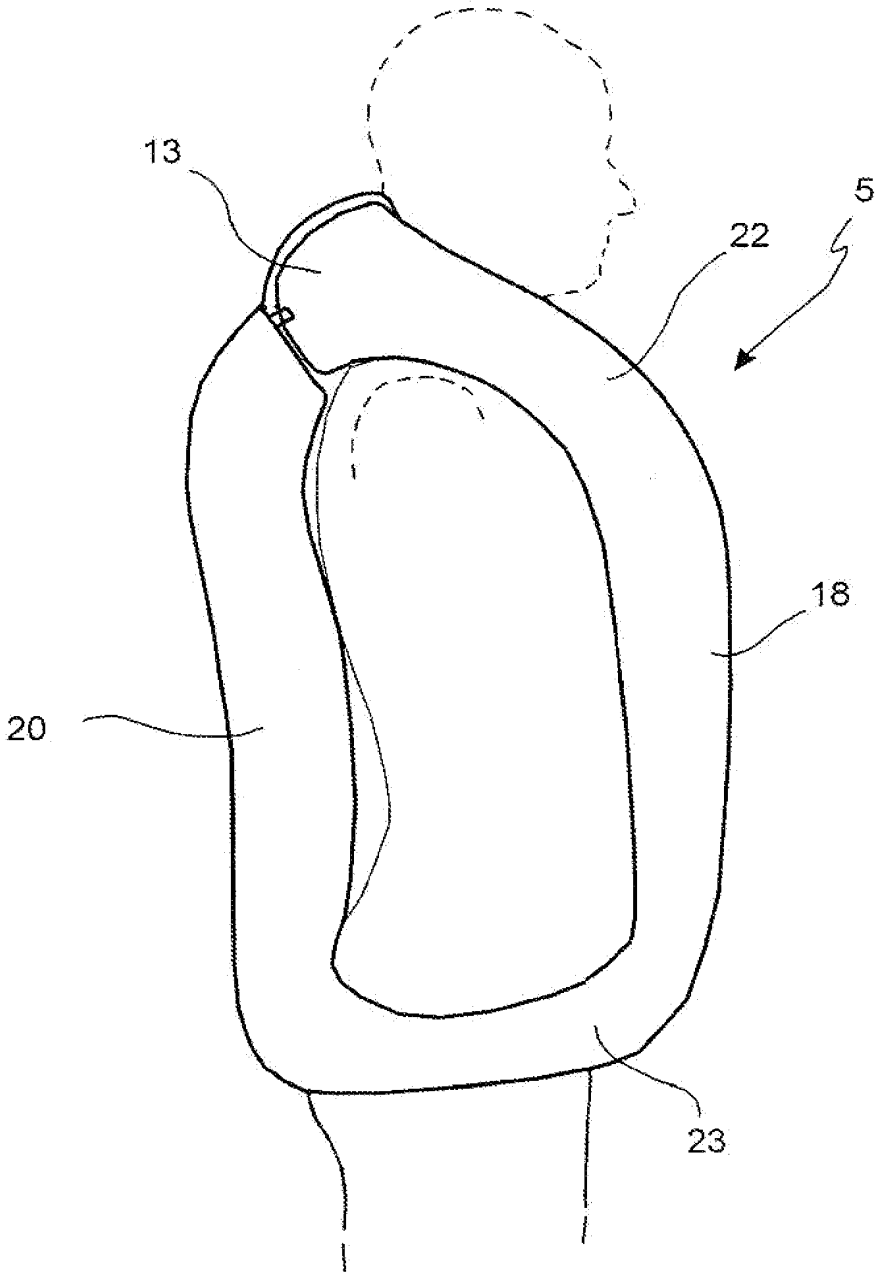


FIG. 14

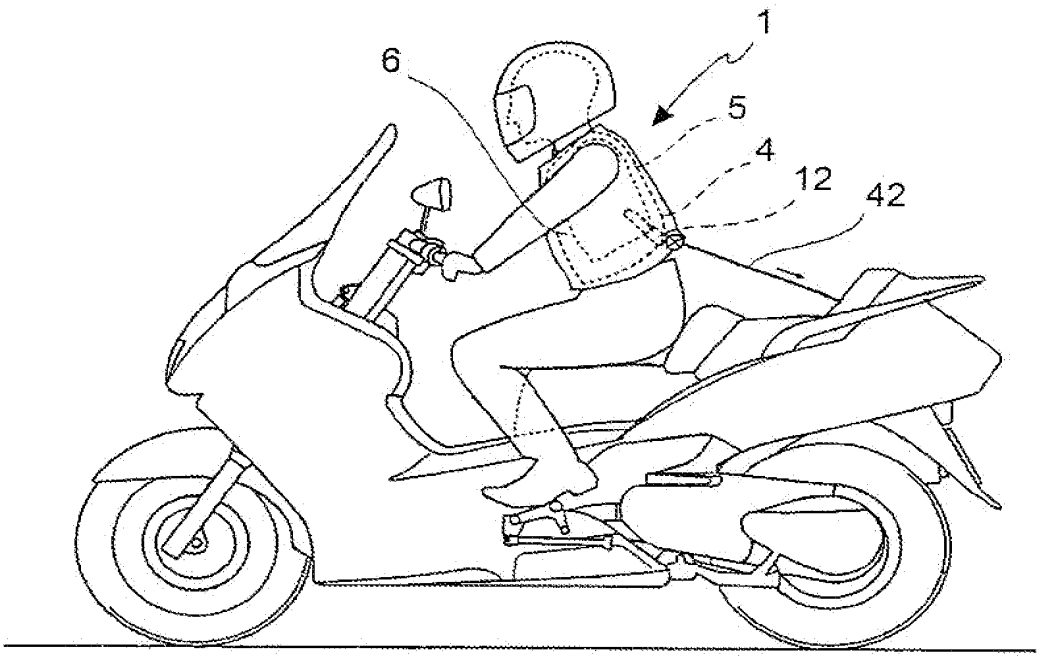


FIG.15

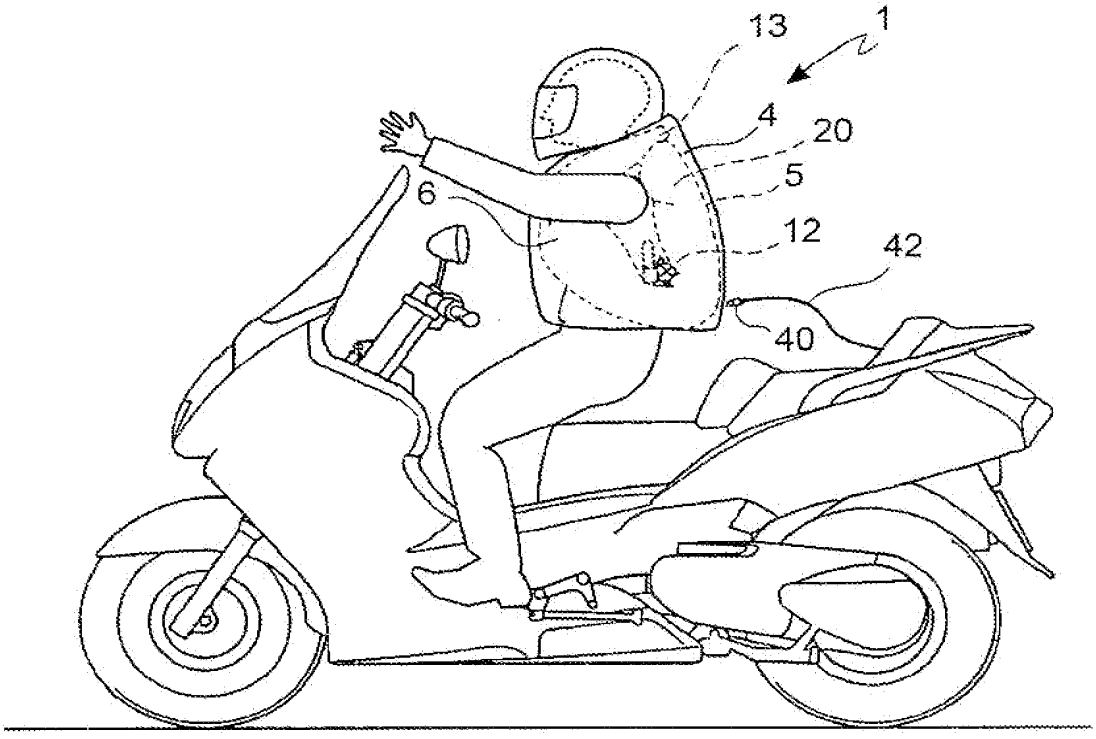


FIG. 16

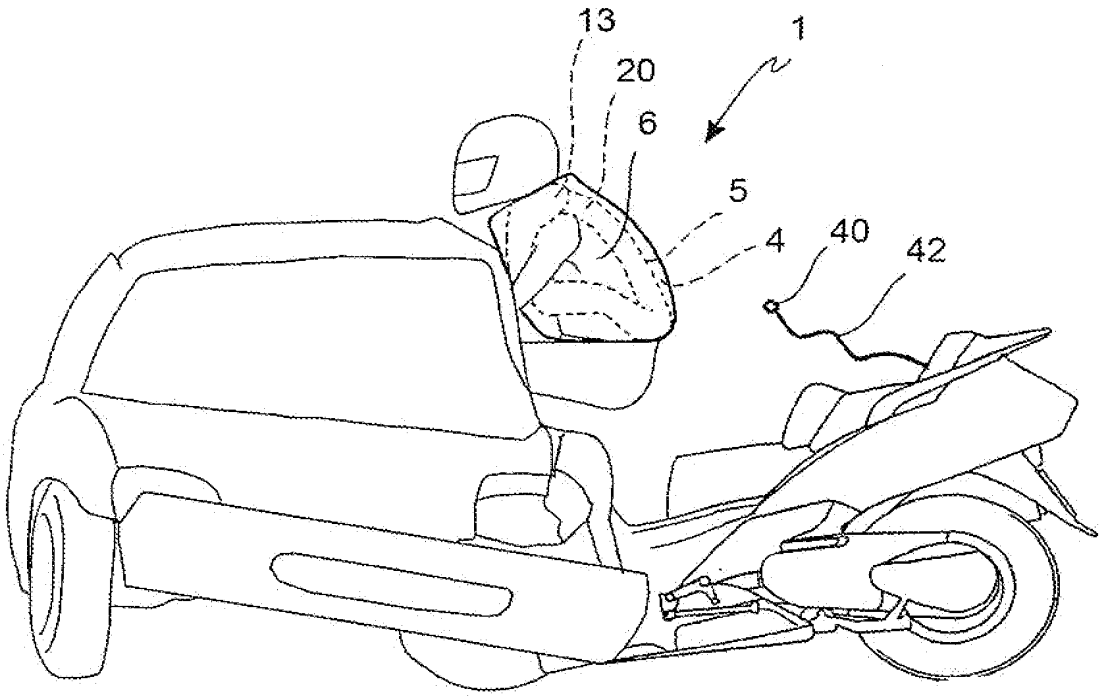


FIG. 17

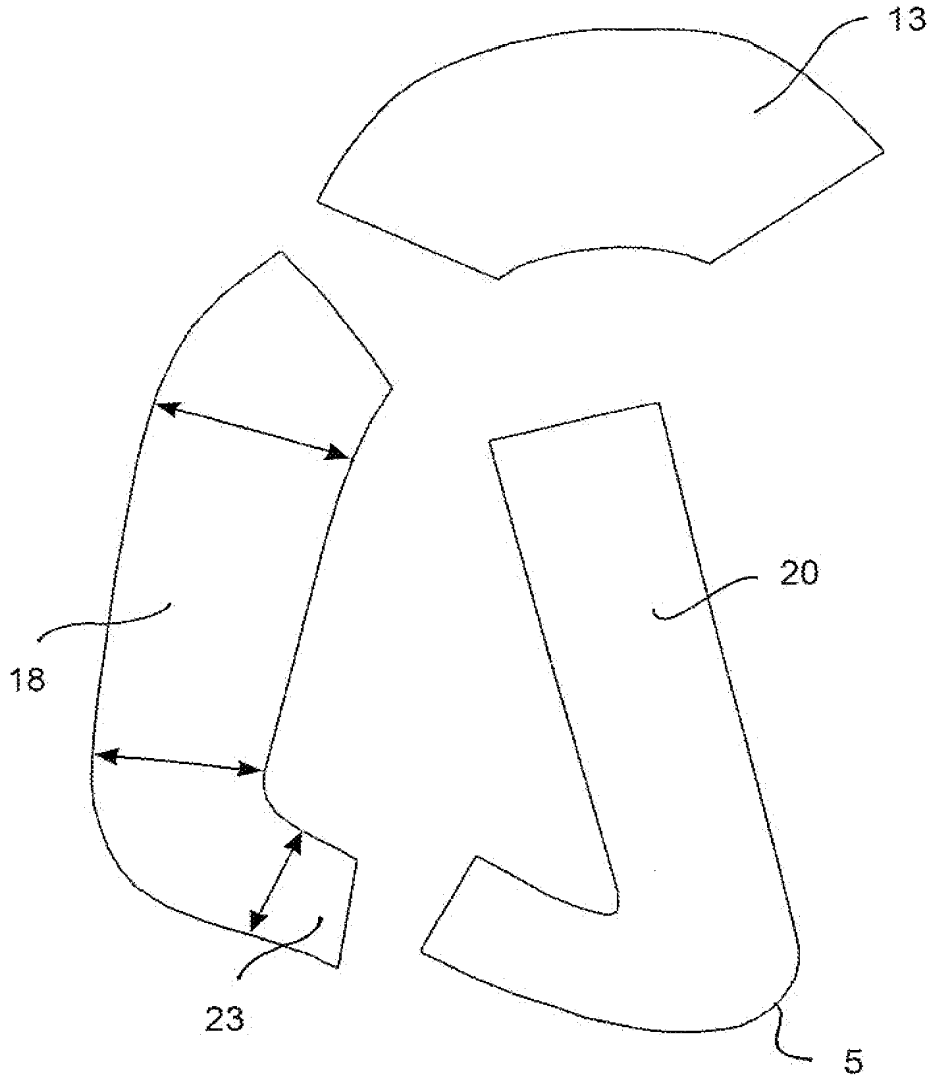


FIG. 18

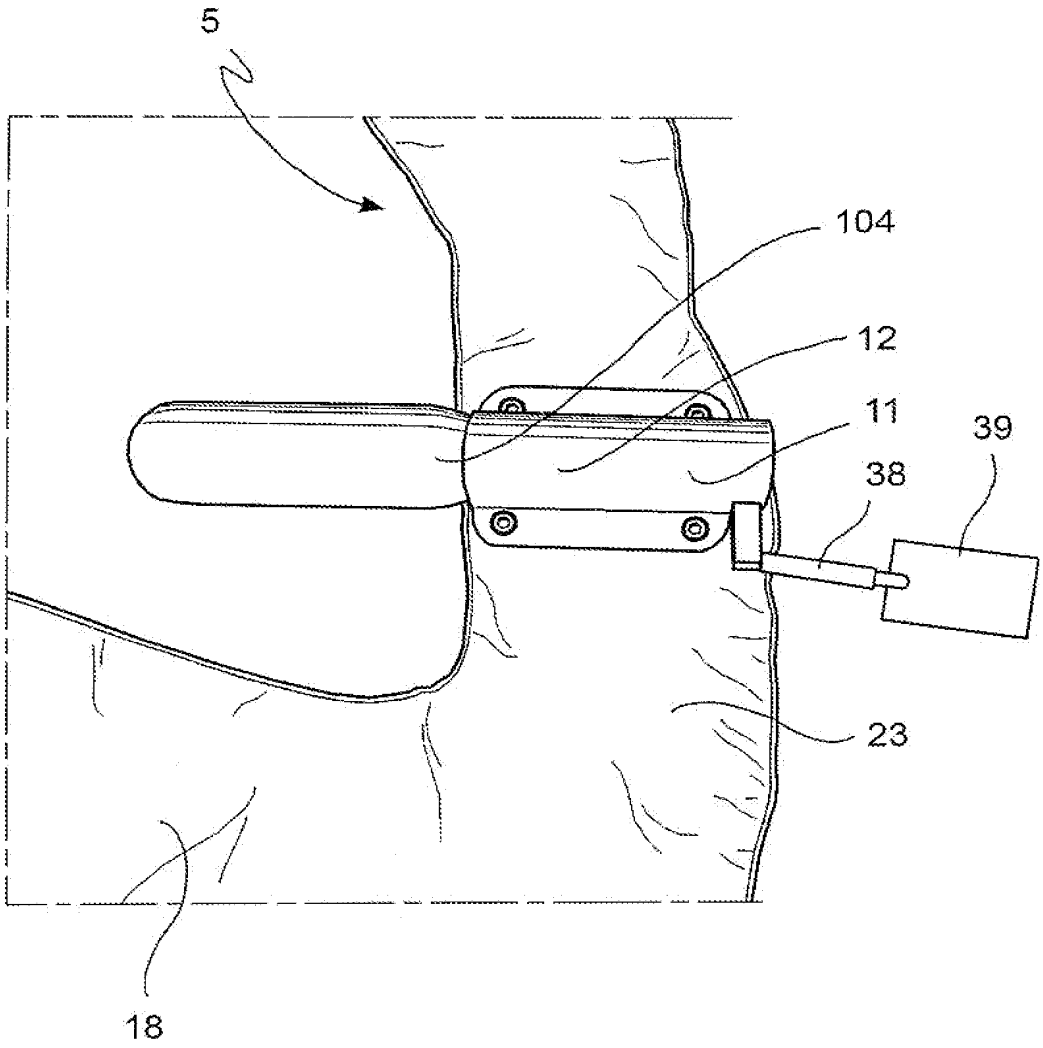


FIG. 19

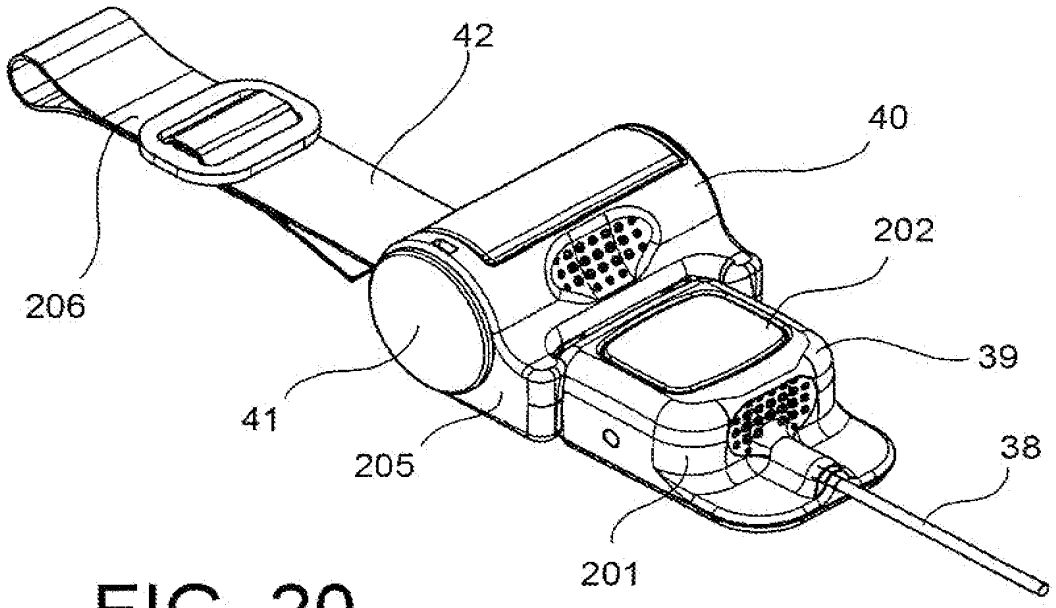


FIG. 20

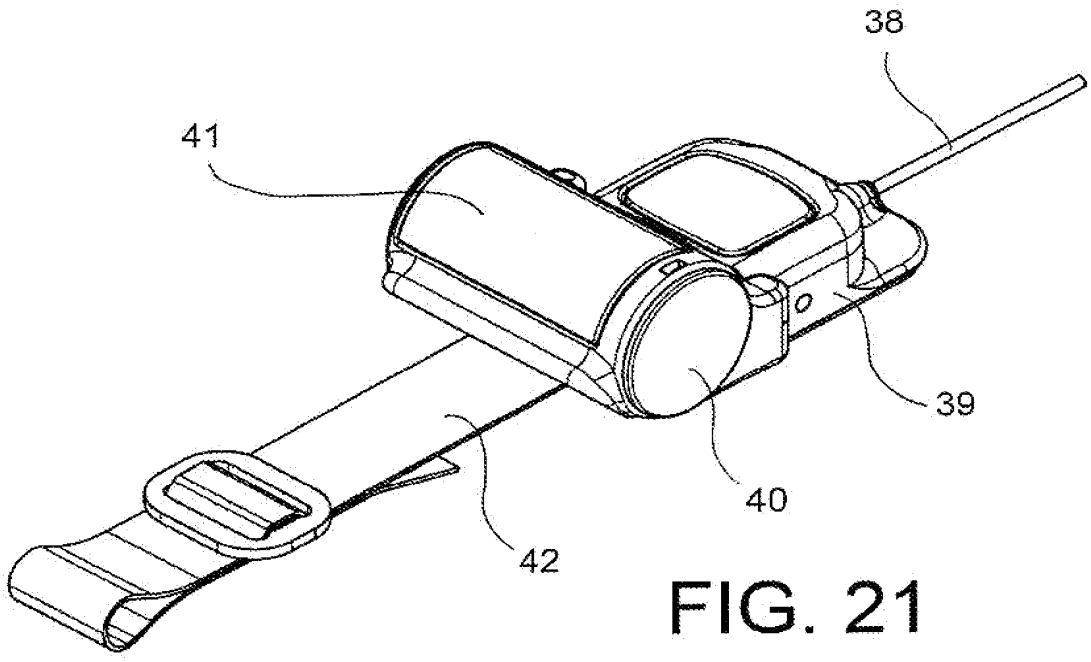


FIG. 21

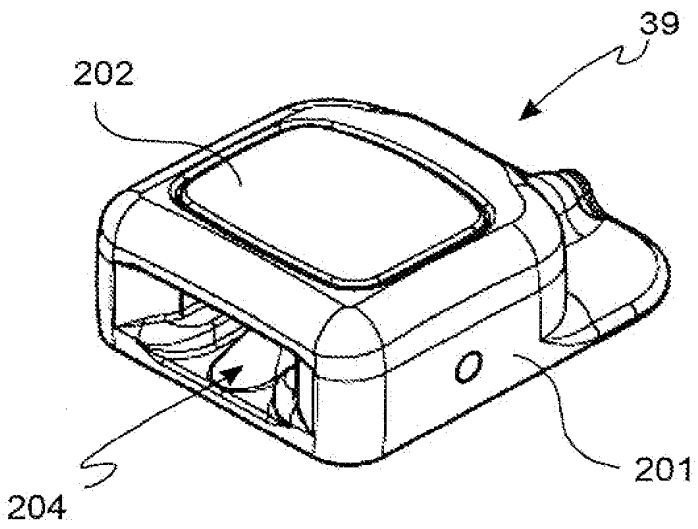


FIG. 22

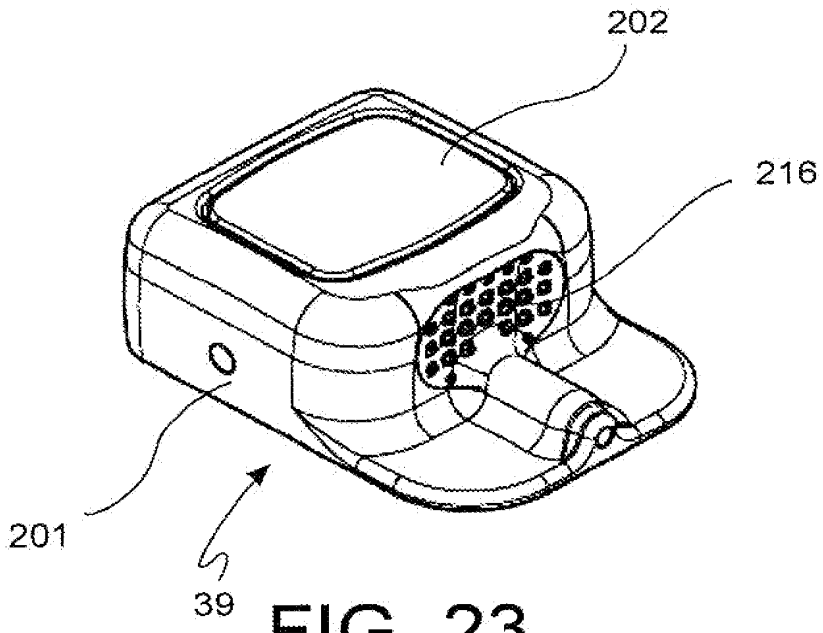


FIG. 23

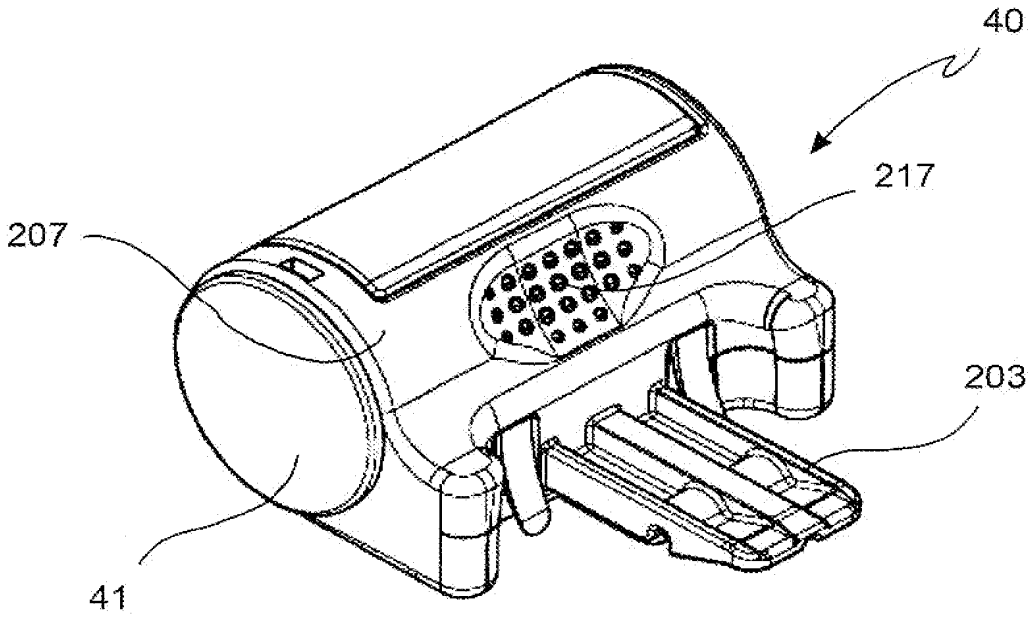


FIG. 24

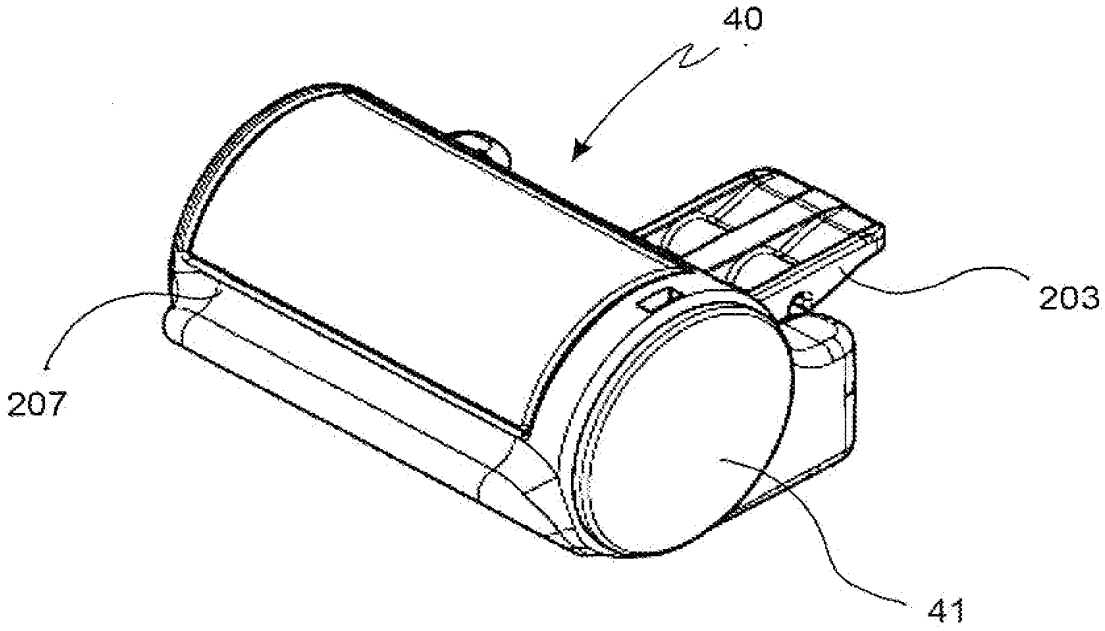


FIG. 25

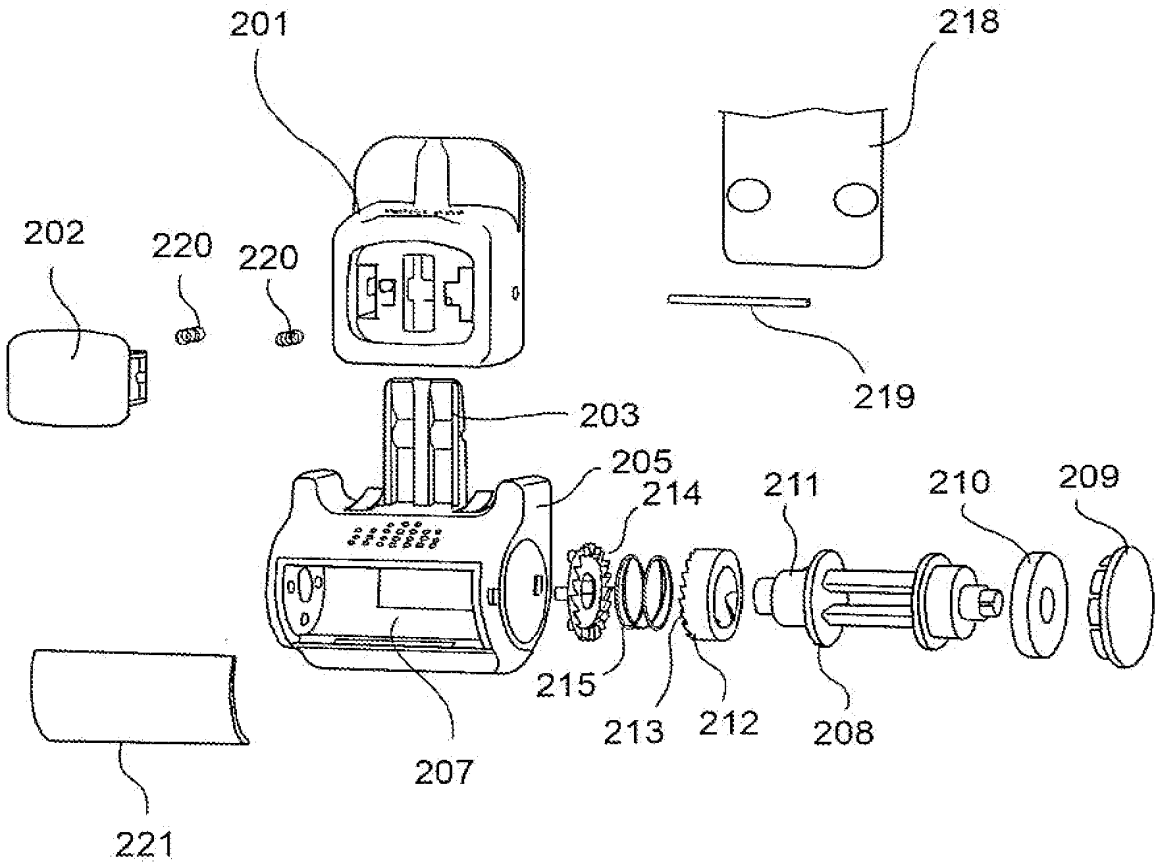

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FIG. 26

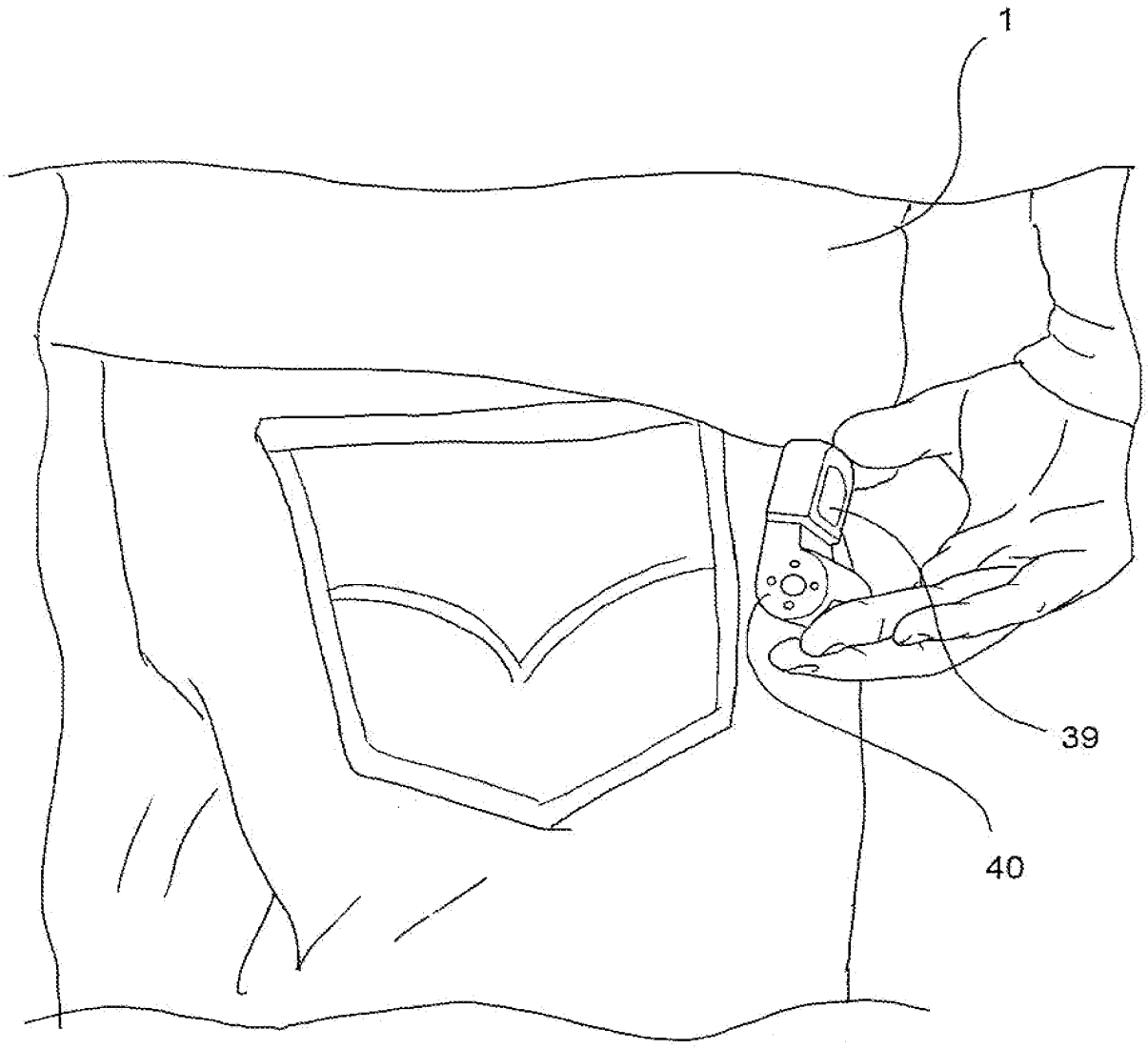


FIG. 27

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2011/052337

A. CLASSIFICATION OF SUBJECT MATTER
INV. A41D13/018
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A41D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 677 856 A1 (DEMARAIS YVES [FR]) 24 December 1992 (1992-12-24) page 3, line 8 - line 15 page 4, line 15 - page 5, line 30; figures 1,2	1-13
X	GB 2 345 031 A (SAFETY CORP [JP]) 28 June 2000 (2000-06-28) page 6, line 1 - page 7, line 7; figures 1-5 page 8, line 4 - page 9, line 7; figures 12-15 page 2, line 16 - page 3, line 4	1-13
A	FR 2 822 028 A1 (MORCILLO ELEZ JOSE [FR]) 20 September 2002 (2002-09-20) the whole document	1-13

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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Date of the actual completion of the international search	Date of mailing of the international search report
22 September 2011	29/09/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Simpson, Estelle

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2011/052337

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007/069507 A1 (KOBAYASHI YUKI [JP] ET AL) 29 March 2007 (2007-03-29) column 1, line 42 - column 2, line 38; figures 1-5	1,6,11, 12

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2011/052337

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2677856 A1	24-12-1992	NONE	
GB 2345031 A	28-06-2000	CN 1259465 A	12-07-2000
		FR 2787337 A1	23-06-2000
		IT MI992620 A1	18-06-2001
		JP 2000185109 A	04-07-2000
		KR 20000047498 A	25-07-2000
		US 6230333 B1	15-05-2001
FR 2822028 A1	20-09-2002	NONE	
US 2007069507 A1	29-03-2007	CN 1931657 A	21-03-2007
		DE 102006041448 A1	29-03-2007
		JP 4590331 B2	01-12-2010
		JP 2007076497 A	29-03-2007

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PTO/SB/06 (09-11)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/757,247	Filing Date 06/13/2022	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $240 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	10/02/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 24	Minus	** 20	= 4		x $40 =	160
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $192 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	160

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/BURNELL L ROSS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/757,247	06/13/2022	Lino DAINESE	5104.0010003	5950

26111 7590 05/02/2023

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1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

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ART UNIT	PAPER NUMBER
3614	

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05/02/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

e-office@sternekessler.com

ALPINESTARS
Ex. 1002 - Page 189

Office Action Summary	Application No. 17/757,247	Applicant(s) DAINESE, Lino	
	Examiner MATTHEW J O'NEILL	Art Unit 3614	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 6/13/2022.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-19 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-19 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 6/13/2022 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☑ All b)☐ Some** c)☐ None of the:

1.☑ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETIALED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 6/13/2022 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2 and 16 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

4. Claims 2 and 16 include limitations linked by the phrase "and/or." This renders the claims indefinite, as it is unclear if the combination of limitations is required or optional. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

6. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 7, 8, 10-16, and 18-19 are rejected under 35 U.S.C. 103 as being anticipated by Dainese (US PG PUB 20120032422A1), henceforth referred to as Dainese, in view of Mazzarolo (US PG PUB 20210329986A1), henceforth referred to as Mazzarolo.

8. Regarding claim 1, Dainese discloses a protective device for the protection of a user, said protective device comprising a mesh structure (Claim 1: " A protection device for protection of a user, said protection device comprising . . . a textile structure"), comprising a first mesh portion (Claim 1: "including a first mesh"), and a second mesh portion (Claim 1: "a second mesh"), and a plurality of tie elements (Claim 1: "and a plurality of tie members"), wherein said first mesh portion and said second mesh portion are opposite one another and are connected one another by the plurality of tie elements (Claim 1: "said first mesh being situated opposite said second mesh and each tie member of said plurality of tie members having opposite ends fixed respectively to said first mesh and to said second mesh"), wherein the first mesh portion, the second mesh portion, and the tie elements define one or more inner housings of the mesh structure (Paragraph [0069]: "The structure 5 includes two meshes 10, 11 basically forming two

layers arranged opposite each other and connected together by means of a plurality of tie members 12"), wherein the protective device includes a casing body arranged at least in an inner housing of said one or more inner housings (Paragraph [0069]: "Basically, the two walls 7, 8 form a casing housing internally the structure 5 which includes the two meshes 10, 11 and the tie members 12"). However, Dainese does not teach the casing body not occupying a space when deflated. Mazzarolo discloses wherein said casing body is configured to assume a deflated condition (Figure 4a: inflatable bag 12 configured in a deflated condition), and an inflated condition in the at least one inner housing of the mesh structure (Figure 4c: inflatable bag 12 configured in an inflated condition inside the mesh structure formed by walls 4 and 6), and wherein in said deflated condition, the casing body occupies a first space or first region (Figure 4a: inflatable bag 12 configured in a deflated condition occupying a first space in the housing), and wherein in said deflated condition a second region or second space of said at least one housing lacks a casing body (Figure 4a: second region of housing lacks inflatable bag 12), and wherein in said inflated condition the casing body occupies the second region or second space (Figure 4c: inflatable bag 12 configured in an inflated condition occupying the second region of the housing). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the airbag structure of Dainese with the inflated and deflated conditions of Mazzarolo in order to increase the breathability of the garment when it is undeployed (Paragraph [0045]: “Thanks to the great expansion of the bag 12 during its moving from the rest condition to the operating condition, it is possible to leave a large portion of the surfaces 4, 6 of the housing 2 uncovered when the bag 12 is in the rest condition, thus allowing an increased breathability of the garment 1, as shown in FIGS. 1a-1b and 4 a”).

9. Regarding claim 2, Dainese as modified discloses wherein in the inflated condition said casing body is configured to line from the inside, at least partially in contact, the mesh structure

(Abstract: "The first mesh (10) lines internally at least partly said first wall"), and/or that said mesh structure is an external structure of the protective device (Abstract: "The protection device (1, 100, 110, 1110) includes at least one seam (3, 300) which connects a surface portion of said first mesh (10)").

10. Regarding claim 3, Dainese does not teach the casing body occupying the second region when inflated. Mazzarolo discloses wherein in said inflated condition the casing body completely occupies the second region or second space and the first region or first space of the housing (Figure 4c: inflatable bag 12 configured in an inflated condition occupying the second region of the housing). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the airbag structure of Dainese with the inflated condition of Mazzarolo in order to increase protection of the garment wearer when in the operating condition (Paragraph [0046]: “in its operating condition is able to completely cover the area of the user body to be protected, without affecting the safety level offered by the garment 1”).

11. Regarding claim 4, Dainese as modified discloses the deflated condition of the casing body corresponds to a slack and loose condition of the mesh structure and of the tie elements (Paragraph [0074]: "In the example, the tie members 12 have a thread-like form and consist of flexible and inextensible members. Therefore, they are suitably designed with dimensions such that, when the inflatable member 2 is in the rest condition, they are preferably untensioned and collapsed inside the internal chamber 9"), and wherein to the inflated condition of the casing body corresponds an at least partially tensioned condition of the tie elements and of the first mesh portion and the second mesh portion (Paragraph [0003]: " Generally, the gas source is able to introduce into the inflatable bag a predefined quantity of compressed gas such as to

inflate, and therefore tension, the inflatable member so as to form an inflated, round-shaped, balloon-like casing").

12. Regarding claim 5, Dainese as modified discloses the tie elements define a plurality of housings between the first mesh portion and the second mesh portion (Figure 1: tie elements 12 define housings between first and second mesh portions 10 and 11), and the casing body comprises a plurality of portions each arranged in a corresponding housing of said housings (Paragraph [0127]: "Each inflatable member 210, 211, 212 has defined internally, between the two walls, an internal chamber 9 in particular comprising the already mentioned pair of meshes 10, 11, each associated with or fixed/glued to a respective wall").

13. Regarding claim 7, Dainese as modified discloses the casing body has a hand or comb or tree shape, or has tubular shape arranged in a serpentine way (Figure 11: protection device 100 formed in a tree shape).

14. Regarding claim 8, Dainese as modified discloses wherein the tie elements are arranged between said first mesh portion and said second mesh portion aligned in a plurality of rows of tie elements (Figure 1: tie elements 12 define housings between first and second mesh portions 10 and 11).

15. Regarding claim 10, Dainese discloses an inflated condition of the casing body corresponds to an inflated condition of protection of the inflatable element (Paragraph [0062]: "FIG. 19 shows another embodiment of a protection device according to the present disclosure in an inflated condition"), and a deflated condition corresponds to a rest condition of the inflatable element, (Paragraph [0064]: "FIG. 21 shows a front view of a vehicle including a protection device contained inside a respective housing and in a deflated condition"). However, Dainese does not teach breathability through the housing in a deflated condition. Mazzarolo discloses wherein in said deflated condition the second region of said at least one housing is apt

to allow a passage of air between the first mesh portion and the second mesh portion passing through the second region of said at least one housing (Paragraph [0045]: "it is possible to leave a large portion of the surfaces 4, 6 of the housing 2 uncovered when the bag 12 is in the rest condition, thus allowing an increased breathability of the garment 1"). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the airbag structure of Dainese with the inflated and deflated conditions of Mazzarolo in order to increase the breathability of the garment when it is undeployed (Paragraph [0045]: “Thanks to the great expansion of the bag 12 during its moving from the rest condition to the operating condition, it is possible to leave a large portion of the surfaces 4, 6 of the housing 2 uncovered when the bag 12 is in the rest condition, thus allowing an increased breathability of the garment 1, as shown in FIGS. 1a-1b and 4 a”).

16. Regarding claim 11, Dainese as modified discloses comprising a gas source or inflation source connected to the inflatable casing body (Paragraph [0003]: " Generally, the gas source is able to introduce into the inflatable bag a predefined quantity of compressed gas such as to inflate, and therefore tension, the inflatable member so as to form an inflated, round-shaped, balloon-like casing").

17. Regarding claim 12, Dainese as modified discloses said device is a wearable device (Paragraph [0125]: "Moreover, this open ring allows the device 110 to be incorporated into a garment").

18. Regarding claim 13, Dainese as modified discloses a protective garment or clothing accessory comprising the protective device (Paragraph [0125]: "Moreover, this open ring allows the device 110 to be incorporated into a garment").

19. Regarding claim 14, Dainese as modified discloses wherein said protective garment has a covering layer (Paragraph [0080]: "the walls 7, 8 are made of a laminate comprising a layer of

fabric 7 a"), 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 housings (Paragraph [0125]: "Moreover, this open ring allows the device 110 to be incorporated into a garment, for example a motorcyclist's jacket or riding suit, which comprises means for opening/closing the garment (for example a zip fastener) along the user's chest").

20. Regarding claim 15, Dainese discloses a method for making a protective device for the protection of a user said method comprising the steps of providing a mesh structure (Claim 1: " A protection device for protection of a user, said protection device comprising . . . a textile 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 (Claim 1: "said first mesh being situated opposite said second mesh and each tie member of said plurality of tie members having opposite ends fixed respectively to said first mesh and to said second mesh"), wherein said first mesh portion and said second mesh portion and the plurality of tie elements define one or more housings in the mesh structure (Paragraph [0069]: "The structure 5 includes two meshes 10, 11 basically forming two layers arranged opposite each other and connected together by means of a plurality of tie members 12"), arranging a casing body in at least one of said housings to form with the mesh structure an inflatable element (Paragraph [0069]: "Basically, the two walls 7, 8 form a casing housing internally the structure 5 which includes the two meshes 10, 11 and the tie members 12"), and inflating the casing body from a first deflated operating condition to a second inflated operating condition (Claim 15: "The protection device according to claim 1, further comprising means for inflating said inflatable member"). However, Dainese does not teach a second region lacking a casing body in a deflated condition. Mazzarolo discloses wherein in said deflated condition, the casing body occupies a first space or region, (Figure 4a: inflatable bag 12 configured in a deflated

condition occupying a first space in the housing), and wherein in said deflated condition a second region or second space of said at least one housing lacks said casing body (Figure 4a: second region of housing lacks inflatable bag 12), and wherein in said inflated condition the casing body expands and occupies the second region or second space (Figure 4c: inflatable bag 12 configured in an inflated condition occupying the second region of the housing). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the airbag structure of Dainese with the inflated and deflated conditions of Mazzarolo in order to increase the breathability of the garment when it is undeployed (Paragraph [0045]: “Thanks to the great expansion of the bag 12 during its moving from the rest condition to the operating condition, it is possible to leave a large portion of the surfaces 4, 6 of the housing 2 uncovered when the bag 12 is in the rest condition, thus allowing an increased breathability of the garment 1, as shown in FIGS. 1a-1b and 4 a”).

21. Regarding claim 16, Dainese as modified discloses the casing body is inflated until the tie elements and the mesh structure are tensioned (Paragraph [0003]: " Generally, the gas source is able to introduce into the inflatable bag a predefined quantity of compressed gas such as to inflate, and therefore tension, the inflatable member so as to form an inflated, round-shaped, balloon-like casing"), and/or until the casing body is at least partially adhered to the first mesh portion and the second mesh portion (Paragraph [0027]: "Preferably, each mesh is glued with a layer of adhesive to the respective wall").

22. Regarding claim 18, Dainese as modified discloses the casing body is inflated until the mesh structure is tensioned (Paragraph [0003]: " Generally, the gas source is able to introduce into the inflatable bag a predefined quantity of compressed gas such as to inflate, and therefore tension, the inflatable member so as to form an inflated, round-shaped, balloon-like casing"), and the mesh structure bridles and prevents a further expansion of the casing body (Paragraph

[0016]: "Basically, the shape and size of the inflatable member may be controlled and determined beforehand since the maximum expansion of the inflatable member and its local thickness can be controlled by means of a suitable choice of the length and maximum extension of the tie members").

23. Regarding claim 19, Dainese does not teach breathability through the housing in a deflated condition. Mazzarolo discloses wherein in said deflated condition the second region of said at least one housing is apt to allow a passage of air between the first mesh portion and the second mesh portion passing through the second region of said at least one housing (Paragraph [0045]: "it is possible to leave a large portion of the surfaces 4, 6 of the housing 2 uncovered when the bag 12 is in the rest condition, thus allowing an increased breathability of the garment 1"). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the airbag structure of Dainese with the inflated and deflated conditions of Mazzarolo in order to increase the breathability of the garment when it is undeployed (Paragraph [0045]: “Thanks to the great expansion of the bag 12 during its moving from the rest condition to the operating condition, it is possible to leave a large portion of the surfaces 4, 6 of the housing 2 uncovered when the bag 12 is in the rest condition, thus allowing an increased breathability of the garment 1, as shown in FIGS. 1a-1b and 4 a”).

24. Claims 6, 9, and 17 are rejected under 35 U.S.C. 103 as being unpatentable over Dainese and Mazzarolo as applied to claims 1 and 15 above, in view of Azzolin (US PG PUB 20160088883A1), henceforth referred to as Azzolin.

25. Regarding claim 6, Dainese discloses the housings have the shape of channels (Figure 11: inflatable members formed as channels), and are arranged side by side one another (Figure 11: inflatable members formed as channels arranged side by side), and each one intended to house a corresponding casing body or casing body portion (Paragraph [0127]: "Each inflatable member 210, 211,

212 has defined internally, between the two walls, an internal chamber 9 in particular comprising the already mentioned pair of meshes 10, 11, each associated with or fixed/glued to a respective wall"). However, Dainese and Mazzarolo do not teach the bodies inflated against each other to form a plane. Azzolin discloses wherein in inflated condition, the casing bodies are inflated against each other so as to form a planar structure (Figure 3: inflatable members 20 inflated against each other to form a planar structure). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the airbag structure of Dainese and Mazzarolo with the planar form of Azzolin in order to provide continuous protection to the user while maintaining a uniform thickness (Paragraph [0015]: “in order to avoid superficial discontinuities, two portions of a same inflatable member or of two inflatable members having a smaller height or thickness than a remaining part of the personal protection device are superimposed. These inflatable member portions may be terminal or end portions facing each other when the inflatable member is worn”).

26. Regarding claim 9, Dainese as modified discloses each row of tie elements of the plurality of rows of tie elements comprises a plurality of tie elements (Figure 2: each row of tie elements 12 comprises a plurality of tie elements), wherein in a condition of at least partial tension, the tie elements belonging to the same row of tie elements are arranged substantially parallel to each other (Figure 2: tie elements 12 are arranged parallel to each other).

27. Regarding claim 17, Dainese discloses the tie elements are arranged to form a plurality of side-by-side housings (Figure 1: tie elements 12 define a plurality of housings between first and second mesh portions 10 and 11), and wherein portions of the casing body or a plurality of casing bodies are arranged side by side one another (Figure 11: inflatable members formed as channels arranged side by side). However, Dainese and Mazzarolo do not teach the bodies inflated against each other to form a plane. Azzolin discloses wherein in inflated condition, the casing bodies are inflated against each other so as to form a planar structure (Figure 3: inflatable members 20 inflated against each other to form a planar

structure). It would have been obvious for one of ordinary skill in the art before the effective filing date of the claimed invention to modify the airbag structure of Dainese and Mazzarolo with the planar form of Azzolin in order to provide continuous protection to the user while maintaining a uniform thickness (Paragraph [0015]: "in order to avoid superficial discontinuities, two portions of a same inflatable member or of two inflatable members having a smaller height or thickness than a remaining part of the personal protection device are superimposed. These inflatable member portions may be terminal or end portions facing each other when the inflatable member is worn").

Cited Prior Art not Relied Upon

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure includes Alston (US 7574755 B1), which discloses a wearable airbag apparatus.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J O'NEILL whose telephone number is (571)272-4752. The examiner can normally be reached Mon - Fri: 7AM-4PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Dickson can be reached on 571-272-7742. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW JAMES O'NEILL/
Examiner, Art Unit 3614

/KAREN BECK/
Primary Examiner, Art Unit 3614

Notice of References Cited	Application/Control No. 17/757,247	Applicant(s)/Patent Under Reexamination DAINESE, Lino	
	Examiner MATTHEW J O'NEILL	Art Unit 3614	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20120032422-A1	02-2012	Dainese; Lino	B62J27/20	280/728.1
*	B	US-20160088883-A1	03-2016	AZZOLIN; Andrea	A41D13/018	2/455
*	C	US-7574755-B1	08-2009	Alston; Lester	B62J27/20	2/463
*	D	US-20210329986-A1	10-2021	Mazzarolo; Giovanni	A41D31/185	1/1
	E					
	F					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/25/2023								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
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	18	✓								
	19	✓								

ALPINESTARS
Ex. 1002 - Page 204

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

CPC - Searched*		
Symbol	**Date**	**Examiner**
A41D13/018	04/25/2023	MJO
B60R21/23	04/25/2023	MJO
B60R21/239	04/25/2023	MJO
B60R21/20	04/25/2023	MJO

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
See attached PE2E SEARCH history	04/25/2023	MJO
Applicant and inventor search	04/25/2023	MJO
Similarity search of application	04/25/2023	MJO
See search history	04/27/2023	KAB

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/KAREN BECK/ Primary Examiner, Art Unit 3614

ALPINESTARS
Ex. 1002 - Page 205

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/757,247	DAINESE, Lino
	Examiner	**Art Unit**
	MATTHEW J O'NEILL	3614

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

/MATTHEW JAMES O'NEILL/ Examiner, Art Unit 3614	/KAREN BECK/ Primary Examiner, Art Unit 3614

ALPINESTARS
Ex. 1002 - Page 206

Bibliographic Data

Application No: 17/757,247

Foreign Priority claimed: (•) Yes ( ) No

35 USC 119 (a-d) conditions met: [✓] Yes [ ] No [ ] Met After Allowance

Verified and Acknowledged: /MATTHEW JAMES O'NEILL/ Examiner's Signature | Initials

Title: PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/13/2022	280	3614	5104.0010003
RULE			

APPLICANTS

D-AIR LAB S.R.L., Vicenza, ITALY

INVENTORS

Lino DAINESE, Vicenza, ITALY

CONTINUING DATA

This application is a 371 of PCT/IB2020/061689 12/09/2020

FOREIGN APPLICATIONS

ITALY IT102019000023958 12/13/2019

ITALY IT102019000023961 12/13/2019

ITALY IT102019000023964 12/13/2019

IF REQUIRED, FOREIGN LICENSE GRANTED**

09/24/2022

**** SMALL ENTITY ****

STATE OR COUNTRY

ITALY

ADDRESS

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005
UNITED STATES

FILING FEE RECEIVED

$830

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	0	((("D-AIR") near3 ("LAB") near3 ("S.R.L"))).AS,AANM.	(USPAT)	OR	ON	ON	2023/04/25 08:35 AM
L2	34	((("DAINESE") near3 ("Lino"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 08:36 AM
L3	4132	B60R21/239.cpc. OR A41D13/018.cpc.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 09:09 AM
L4	132	(B60R21/239.cpc. OR A41D13/018.cpc.) AND mesh	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 09:10 AM
L5	404	(B60R21/239.cpc. OR A41D13/018.cpc.) AND mesh	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 09:17 AM
L6	488	(B60R21/20.cpc. OR A41D13/018.cpc.) AND mesh	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:13 AM
L7	13888	B60R21/239.cpc. OR A41D13/018.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	OR	ON	ON	2023/04/25 10:15 AM

			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
L8	1849	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND mesh	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:23 AM
L9	15219	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:27 AM
L10	1042	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND inflat$ AND deflat$	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:28 AM
L11	804	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND inflat$ AND deflat$	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2023/04/25 10:29 AM

		AND (garment OR shirt OR jacket OR coat OR outerwear OR cover)	HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				
L12	804	(B60R21/23$.cpc. OR A41D13/018.cpc.) AND (mesh OR weave OR woven OR lattice) AND (casing OR housing) AND inflat$ AND deflat$ AND (garment OR shirt OR jacket OR coat OR outerwear OR cover OR vest)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 10:29 AM
L13	41	(Artificial Intelligence) Similar to: 17/757,247 with 0 CPC Selections and 0 Text Selections Text: (US-20230001879-A1 OR WO-2021116931-A1 OR EP-4072364-A1 OR JP-2023505721-A OR CN-114980766-A OR EP-4159071-A1 OR US-7784110-B2 OR ES-2390647-T5 OR EP-3434123-A1 OR ES-2390647-T3 OR US-20210112892-A1 OR EP-4066667-A1 OR EP-3432744-A1 OR WO-2017163196-A1 OR EP-3432744-B1 OR EP-3795019-A1 OR US-8608191-B2 OR US-20120011642-A1 OR EP-2575516-A1 OR WO-2011148350-A1 OR US-20120007344-A1 OR EP-2373524-B1 OR WO-2010067285-A1 OR EP-2373524-A1 OR ES-2390011-T3 OR DE-8323662-U1 OR CH-697172-A5 OR JP-	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/04/25 11:13 AM

		5841843-B2 OR WO-2022129528-A1 OR EP-2373189-B2 OR EP-2373189-B1 OR WO-2010067288-A1 OR EP-2373189-A1 OR EP-3847917-A1 OR US-20210212392-A1 OR EP-3912498-A1 OR JP-2012511457-A OR EP-2373190-B1 OR WO-2010067393-A1 OR EP-2373190-A1 OR US-9027170-B2 OR ES-2388411-T3 OR ES-2724427-T3 OR BR-PI0711853-A2 OR EP-3167730-B2 OR EP-3167730-B1 OR DE-202022101296-U1 OR JP-2012511637-A OR US-20120032422-A1 OR JP-5671472-B2).did.					
L14	1480	A41D13/018.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO))	OR	ON	ON	2023/04/25 11:23 AM
L15	3347	A41D13/018.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)	OR	ON	ON	2023/04/25 11:23 AM
L16	238	A41D13/018.cpc. AND mesh	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2023/04/25 11:23 AM

			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT)				

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	*To Be Assigned*
Filing Date	*Herewith*
First Named Inventor	Lino DAINESE
Art Unit	*To Be Assigned*
Examiner Name	*To Be Assigned*
Attorney Docket Number	

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		NONE			

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]–Number[4]–Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	FP1	CN 109998200 A	07-12-2019	KUNSHAN ZHENGGONG MOULD CO. LTD.		☒
	FP2	EP 3291697 B1	12-05-2018	DAINESE S.P.A. [IT]		☐
	FP3	KR 20170123046 A	11-07-2017	UNIV INDUSTRY FOUNDATION YONSEI UNIV WONJU CAMPUS [KR]		☒

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author(in CAPITAL LETTERS),title of the article(when appropriate), title of the item (book,magazine,journal,serial,symposium,catalog,etc.),date,page(s),volume-issue number(s),publisher, city and/or country where published.	T[2]
	NPL1	International Search Report and Written Opinion for International Application No. PCT/IB2020/061689, European Patent Office, Netherlands, mailed May 3, 2021, 9 pages	☐

Examiner Signature	/MATTHEW JAMES O'NEILL/	Date Considered	04/25/2023

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /M.J.O./

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	6	"17757247"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/04/26 09:32 AM
L2	8	"20120032422"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/04/26 09:33 AM
L3	16	"7370370"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/04/26 12:57 PM
L4	37	(Artificial Intelligence) More like doc: US-20230001879-A1 Text:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2023/04/26 01:18 PM

		(EP-4072364-A1 OR WO-2021116931-A1 OR JP-2023505721-A OR CN-114980766-A OR EP-3835140-A1 OR EP-3795020-A1 OR EP-3167730-A1 OR JP-2018517599-A OR US-20180132548-A1 OR EP-4159071-A1 OR US-20210076759-A1 OR US-20210112892-A1 OR EP-3291697-B1 OR EP-3795020-B1 OR WO-2016178143-A1 OR EP-3291697-A1 OR EP-3167730-B2 OR EP-3167730-B1 OR JP-6770529-B2 OR CN-107567401-B).did.	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L5	35	(Artificial Intelligence) More like doc: US-20120032422-A1 Text: (EP-2373190-A1 OR WO-2010067393-A1 OR EP-2373190-B1 OR JP-5486607-B2 OR JP-2012511458-A OR EP-2373524-A1 OR WO-2010067285-A1 OR EP-2373524-B1 OR US-8608191-B2 OR US-20120007344-A1 OR US-20120011642-A1 OR ES-2388411-T3 OR EP-2373189-B1 OR EP-2373189-B2 OR EP-2373189-A1 OR WO-2010067288-A1 OR JP-2012511457-A OR JP-5841843-B2 OR JP-2012511637-A OR ES-2390011-T3).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/04/26 01:32 PM
L6	69	EP4072364A1 WO2021116931A1 JP2023505721A EP3835140A1 CN114980766A WO2017163196A1 EP3432744A1 EP3432744B1 EP4066667A1 EP3434123A1 ES2390647T5 ES2390011T3 EP3434123B1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2023/04/26 01:48 PM

		ES2390647T3 ES2388411T3 EP3795019A1 EP2373190A1 WO2010067393A1 US20120032422 EP2373190B1 EP3167730A1 US20120007344 US8608191 EP3167730B2 EP3167730B1 WO2010067285A1 EP2373524A1 EP3417730A1 EP2373189B2 ES2714623T3 EP2373524B1 ES2724427T5 EP3417730B1 CN107567401B EP3847917A1 US20210212392 JP5486607B2 US9027170 DE202009019147U1 US20120011642 US20210112892 WO2021260002A1 EP3291697B1 WO2016178143A1 EP3291697A1 JP5671472B2 EP2373189B1 EP2373189A1 WO2010067288A1 US20210329986 US20180132548 EP3890537A1 WO2020115158A1 JP5841843B2 US20210077889 ES2460920T3 JP2012511457A JP2018517599A JP2012511637A JP2012511458A ES2724427T3 WO2022129528A1 EP3912498A1 US20210076759 EP3795020A1 EP2412257B1 EP4051041A1 WO2021083877A1 US20220361598 EP2412257A2 EP2373188A2	VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				

		WO2010067289A2 JP6770529B2 EP2373188B1 EP3795020B1 US20120023648 KR20210102303A US9554602 US8910319 US20150074882 ES2381709T3 JP2014198929A CN113271800A EP3007572B1 EP3007573B1 JP2012511638A JP5901696B2 EP3007573A1 CN114641215A CN107567401A WO2014199309A1 EP3287026B1 US20160088883 JP5557847B2 US9775389 EP3287026A1 US20160081403 EP3007572A1 WO2014199308A1 EP2329732A2 EP4094608A1 CN113194772A EP3498117B1 EP3498117A1 EP3918935A1 CN203063891U EP3148356B1 US20210360993 CN202980202U CN115835793A WO2015181734A9 EP3662772A1 EP3148356A1 WO2015181734A1 EP3890536A1 WO2020115137A1 CN102822015B US8485551 IN2012CN07814A WO2011110982A1 US20130093224 EP2544923A1 ES2788701T3 EP3482646A1 EP2544923B1 EP2740376B1 JP2022554080A EP2740376A1 EP3482646B1				

		WO2022013103A1 JP2016526612A EP2933400A1 ES2431629T3 DE19830574A1 KR20210097778A JP2022524258A EP3649879B1 KR20220086683A JP2016528395A EP3649879A1 MXPA99008260A US20100300344 EP4088604A1 EP2802228B1 ES2550708T3 EP4029396A1 US11576446 DE2217889A1 EP2091365B1 EP4159071A1					
L7	33	(Artificial Intelligence) More like doc: WO-2014199309-A1 Text: (US-20160088883-A1 OR EP-3007573-B1 OR US-9775389-B2 OR EP-3007573-A1 OR US-20160081403-A1 OR EP-3287026-B1 OR EP-3287026-A1 OR WO-2014199308-A1 OR EP-3007572-A1 OR EP-3007572-B1 OR JP-2016528395-A OR JP-2016526612-A OR EP-3649879-A1 OR EP-3649879-B1 OR EP-2994002-B1 OR US-20160073707-A1 OR WO-2014181235-A1 OR EP-2994002-A1 OR JP-2016521321-A OR JP-6378751-B2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/04/26 02:00 PM
L8	39	(Artificial Intelligence) More like doc: WO-2020115158-A1 Text: (US-20210329986-A1 OR EP-3890537-A1 OR CN-113271800-A OR KR-20210102303-A OR JP-2022524258-A OR EP-3498117-A1 OR EP-3918935-A1 OR EP-3498117-B1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK,	OR	ON	ON	2023/04/26 02:29 PM

		WO-2022129528-A1 OR KR-20150013578-A OR AU-2013261071-A1 OR EP-2091365-B1 OR CA-2873545-A1 OR WO-2013171674-A1 OR EP-2849591-A1 OR AU-2013261071-B2 OR US-20150128334-A1 OR EP-2939555-A1 OR EP-2849591-B1 OR EP-2939555-B1).did.	TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L9	2	"20210329986"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/04/26 02:29 PM
L10	4	("20120032422").pn.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/04/27 12:02 PM
L11	2	"20210329986"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2023/04/27 12:02 PM

			VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/757,247	06/13/2022	Lino DAINESE	5104.0010003

CONFIRMATION NO. 5950

26111
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

PUBLICATION NOTICE

OC000000137144457

Title:PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Publication No.US-2023-0001879-A1
Publication Date:01/05/2023

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

ALPINESTARS
Ex. 1002 - Page 221

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

Substitute for Form PTO-1360
(For use with Form PTO/SB/06)

Application Number	Filing Date
17757247	

Applicant(s) Lino DAINESE

* May be used for additional claims or amendments

CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT			*		*		*	
	Indep	Depend	Indep	Depend	Indep	Depend		Indep	Depend	Indep	Depend	Indep	Depend
1	1		1				51						
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3		2		1			53						
4		(1)		1			54						
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6		(1)		1			56						
7		(1)		1			57						
8		(1)		1			58						
9		(1)		1			59						
10		(1)		1			60						
11		(1)		1			61						
12		(1)		1			62						
13		(1)		1			63						
14		(1)		1			64						
15	1		1				65						
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48							98						
49							99						
50							100						
Total Indep	2		2		0								
Total Depend	18	↵	17	↵	0	↵							
Total Claims	20		19		0								

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 17/757,247

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	160		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	270		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	400		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	19 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*	x 240 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	830		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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U.S. APPLICATION NO.	FIRST NAMED INVENTOR	ATTY. DOCKET NO.
17/757,247	Lino DAINESE	TBD

26111
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
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WASHINGTON, DC 20005

INTERNATIONAL APPLICATION NO.	
PCT/IB2020/061689	
I.A. FILING DATE	PRIORITY DATE
12/09/2020	12/13/2019

CONFIRMATION NO. 5950
371 ACCEPTANCE LETTER

OC000000136400101

Date Mailed: 09/27/2022

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office, in its capacity as a Designated / Elected Office (37 CFR 1.495), has ACCEPTED the above identified international application for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above. A Filing Receipt will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE or 371(c) DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1) and (c)(2) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN BELOW.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363)

06/13/2022
DATE OF RECEIPT OF 35 U.S.C.
371(c)(1) and (c)(2) REQUIREMENTS

The following items have been received:

- Indication of Small Entity Status
- Copy of the International Application filed on 06/13/2022
- Copy of the International Search Report filed on 06/13/2022
- Preliminary Amendments filed on 06/13/2022
- Information Disclosure Statements filed on 06/13/2022
- Inventor's Oath or Declaration filed on 06/13/2022
- Request for Immediate Examination filed on 06/13/2022
- U.S. Basic National Fees filed on 06/13/2022
- Assignee Statement for PGPUB filed on 06/13/2022
- Authorize Access to Search Results filed on 06/13/2022
- Priority Documents filed on 06/13/2022
- Power of Attorney filed on 06/13/2022
- Authorization to Permit Access filed on 06/13/2022
- Application Data Sheet (37 CFR 1.76) filed on 06/13/2022

ALPINESTARS
Ex. 1002 - Page 224

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

INDIA L EVANS

Telephone: (571) 272-9085

ALPINESTARS
Ex. 1002 - Page 225

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/757,247	06/13/2022		830	TBD	19	2

CONFIRMATION NO. 5950

FILING RECEIPT

26111
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

OC000000136400100

Date Mailed: 09/27/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Lino DAINESE, Vicenza, ITALY;

Applicant(s)

D-AIR LAB S.R.L., Vicenza, ITALY

Assignment For Published Patent Application

D-AIR LAB S.R.L., Vicenza, ITALY

Power of Attorney: The patent practitioners associated with Customer Number 26111

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/IB2020/061689 12/09/2020

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
ITALY 102019000023958 12/13/2019
ITALY 102019000023964 12/13/2019
ITALY 102019000023961 12/13/2019

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

ALPINESTARS
Ex. 1002 - Page 226

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 09/24/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/757,247**

Projected Publication Date: 01/05/2023

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

ALPINESTARS
Ex. 1002 - Page 227

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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NOT GRANTED

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Ex. 1002 - Page 228

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Ex. 1002 - Page 229

CLAIMS

1. Protective device (10, 110) for the protection of a user, said protective device (10) comprising a mesh structure (11, 111) comprising a first mesh portion (18, 118) and a second mesh portion (19, 119) and a plurality of tie elements (5), wherein said first mesh portion (18, 118) and said second mesh portion (19, 119) are opposite one another and are connected one another by the plurality of tie elements (5); wherein the first mesh portion, the second mesh portion and the tie elements define one or more inner housings of the mesh structure (11, 111);

wherein the protective device (10, 110) includes a casing body (40, 42, 43) arranged at least in an inner housing of said one or more inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in the at least one inner housing of the mesh structure (11, 111), and wherein in said deflated condition, the casing body (40, 42, 43) occupies a first space or first region, and wherein in said deflated condition a second region or second space of said at least one housing lacks a casing body, and wherein in said inflated condition the casing body occupies the second region or second space.

2. Protective device (10, 110) according to claim 1, wherein in the inflated condition said casing body is configured to line from the inside, at least partially in contact, the mesh structure (11, 111) and/or that said mesh structure is an external structure of the protective device (10, 110).

3. Protective device according to claim 1 or 2, wherein in said inflated condition the casing body completely occupies the second region or second space and the first region or first space of the housing.

4. Protective device (10, 110) according to any one of the preceding claims, wherein the deflated condition of the casing body corresponds to a slack and loose condition of the mesh structure (11, 111) and of the tie elements (5), and wherein to the inflated condition of the casing body corresponds an at least partially tensioned condition of the tie elements (5) and of the first mesh portion (18, 118) and the second mesh portion (19, 119).

5. Protective device (10, 110) according to any one of the preceding claims, wherein the tie elements define a plurality of housings between the first mesh portion (18, 118) and the second mesh portion (19, 119) and the casing body (40, 42, 43) comprises a plurality of portions (40a) each arranged in a corresponding housing of said housings.

6. Protective device (10, 110) according to any one of the preceding claims, wherein the housings have the shape of channels and are arranged side by side one another and each one intended to house a corresponding casing body or casing body

portion, and wherein in inflated condition, the casing bodies are inflated against each other so as to form a planar structure.

7. Protective device (10, 110) according to any one of the preceding claims, wherein the casing body (40, 42, 43) has a hand or comb or tree shape, or has tubular shape arranged in a serpentine way.

8. Protective device (10, 110) according to any one of the preceding claims, wherein the tie elements (5) are arranged between said first mesh portion (18, 118) and said second mesh portion (19, 119) aligned in a plurality of rows (24) of tie elements (5).

9. Protective device (10) according to claim 6, wherein each row (24) of tie elements (5) of the plurality of rows of tie elements (5) comprises a plurality of tie elements (5) wherein in a condition of at least partial tension, the tie elements (5) belonging to the same row (24) of tie elements (5) are arranged substantially parallel to each other.

10. Protective device (10, 110) according to any one of the preceding claims, wherein an inflated condition of the casing body corresponds to an inflated condition of protection of the inflatable element, and a deflated condition corresponds to a rest condition of the inflatable element, and wherein in said deflated condition the second region of said at least one housing is apt to allow a passage of air between the first mesh portion and the second mesh portion passing through the second region of said at least one housing.

11. Protective device (10, 110) according to any one of the preceding claims, comprising a gas source (15) or inflation source connected to the inflatable casing body.

12. Device according to any one of claims 1 to 11, wherein said device is a wearable device or use of said device according to any one of claims 1 to 11 on a user.

13. Protective garment (50) or clothing accessory comprising a protective device (10) according to any of the preceding claims.

14. Protective garment (50) according to claim 12, wherein said protective garment (50) 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 housings.

15. Method for making a protective device (10) for the protection of a user, said method comprising the steps of:

- provide a mesh structure (11, 111) comprising a first mesh portion (18, 118) and a second mesh portion (19, 119), opposite the first mesh portion (18, 118), and a plurality of tie elements (5) connecting the first mesh portion (18, 118) and the second mesh portion (19, 119), wherein said first mesh portion (18,

118) and said second mesh portion (19, 119) and the plurality of tie elements (5) define one or more housings in the mesh structure (11, 111);

- arranging a casing body (40, 42, 43) in at least one of said housings to form with the mesh structure (11, 111) an inflatable element (12, 112);

- inflate the casing body (40, 42, 43) from a first deflated operating condition to a second inflated operating condition, wherein in said deflated condition, the casing body (40, 42, 43) occupies a first space or region, and wherein in said deflated condition a second region or second space of said at least one housing lacks said casing body, and wherein in said inflated condition the casing body expands and occupies the second region or second space.

16. Method according to the preceding claim, wherein the casing body is inflated until the tie elements (5) and the mesh structure (11, 111) are tensioned and/or until the casing body is at least partially adhered to the first mesh portion (18, 118) and the second mesh portion (19, 119).

17. Method according to claim 15 or 16, wherein the tie elements (5) are arranged to form a plurality of side-by-side housings and wherein portions of the casing body or a plurality of casing bodies are arranged side by side one another, and wherein in said inflated condition portions of casing body or a plurality of casing bodies push against each other to form a planar structure.

18. Method according to any one of the preceding claims 15 to 17, the casing body is inflated until the mesh structure is tensioned and the mesh structure (11, 111) bridles and prevents a further expansion of the casing body.

19. Method according to any one of claims 15 to 18, wherein in said deflated condition the second region of said at least one housing allows an air passage between the first mesh portion and the second mesh portion passing through the second region.

PCT

(Original in Electronic Form)

VIII-3-1	**Declaration: Entitlement to claim priority** Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	**In relation to this international application** **D-AIR LAB S.R.L.** **is entitled to claim priority of earlier application No. IT 102019000023958 by virtue of the following:**
VIII-3-1 (iv)		**an assignment from LD 72 S.R.L. to D-AIR LAB S.R.L., dated 02 November 2020 (02.11.2020)**

PCT

(Original in Electronic Form)

VIII-3-2	**Declaration: Entitlement to claim priority** Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	**In relation to this international application** **D-AIR LAB S.R.L.** **is entitled to claim priority of earlier application No. IT 102019000023961 by virtue of the following:**
VIII-3-2 (iv)		**an assignment from LD 72 S.R.L. to D-AIR LAB S.R.L., dated 02 November 2020 (02.11.2020)**

PCT

(Original in Electronic Form)

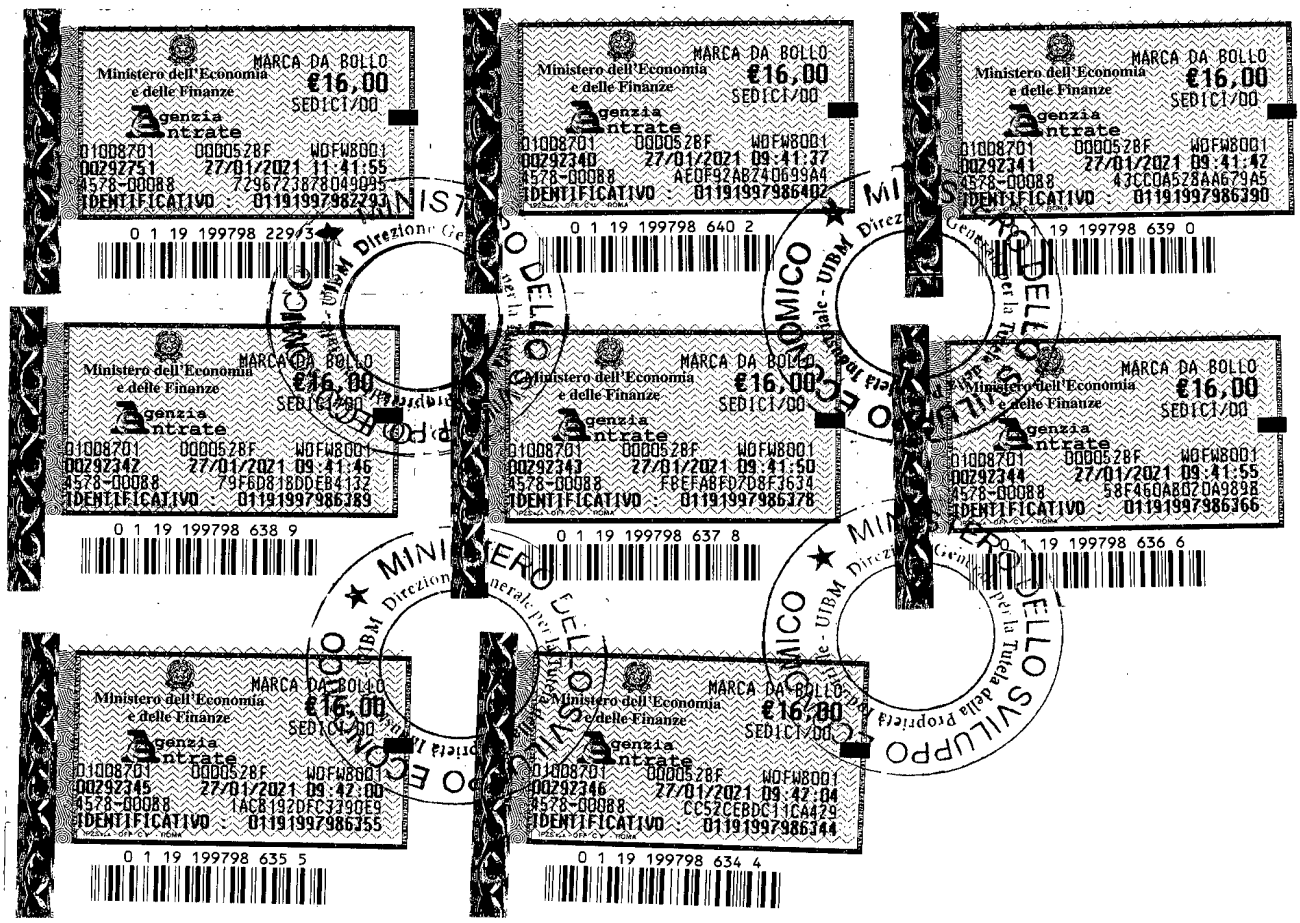
VIII-3-3	**Declaration: Entitlement to claim priority** Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	**In relation to this international application** **D-AIR LAB S.R.L.** **is entitled to claim priority of earlier application No. IT 102019000023964 by virtue of the following:**
VIII-3-3 (iv)		**an assignment from LD 72 S.R.L. to D-AIR LAB S.R.L., dated 02 November 2020 (02.11.2020)**

IB 20/ 61689

Ministero dello Sviluppo Economico

Direzione Generale Per la tutela della proprietà industriale
Ufficio Italiano Brevetti e Marchi – *Div. V*

Autenticazione di copia di documenti relativi alla domanda di brevetto per:
INVENZIONE INDUSTRIALE N. 102019000023958.



Copia della documentazione di origine cartacea e/o riproduzione cartacea della documentazione di origine informatica debitamente firmata e depositata presso questo ufficio.

Si compone di pagg. 29 (compreso il frontespizio).

ROMA li. 11 FEB 2021

IL FUNZIONARIO

Dr.ssa Cristina Papadia

ALPINESTARS
Ex. 1002 - Page 236

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Direzione Generale per la Lotta alla Contraffazione
Ufficio Italiano Brevetti e Marchi

Attestato di deposito

di

Invenzione industriale

Numero di domanda: 102019000023958

Data di deposito: 13/12/2019

Ministero dello Sviluppo Economico

Ricevuta di presentazione

per

Brevetto per invenzione industriale

Domanda numero: 102019000023958

Data di presentazione: 13/12/2019

DATI IDENTIFICATIVI DEL DEPOSITO

Ruolo	Mandatario
Depositante	marta manfrin
Data di compilazione	13/12/2019
Riferimento depositante	BI782E
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Esenzione	NO
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Autorità depositaria	

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Autorizzo il trattamento dei dati personali, inseriti all'interno del deposito, ai sensi del GDPR (Regolamento UE 2016/679) e del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali"

RICHIEDENTE/I

Natura giuridica	Persona giuridica
Denominazione	LD 72 S.r.l.
Partita IVA	00727080244
Tipo Società	societa' a responsabilita' limitata
Nazione sede legale	Italia
Comune sede legale	Vicenza (VI)
Indirizzo	Via dell'Economia
Civico	64/C

CAP	36100
Telefono	
Fax	
Email	
Pec	
Quota percentuale	100.0%

DOMICILIO ELETTIVO

Cognome/R.sociale	Società Italiana Brevetti S.p.A.
Indirizzo	Stradone San Fermo 21 sc.B
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MANDATARI/RAPPRESENTANTI

Cognome	Nome
Manfrin	Marta
Barbaro	Gaetano
Bardini	Marco Luigi
Brazzini	Silvia
Cicci	Jacopo
Concone	Emanuele Enrico Maria
De Benedetti	Jacopo
De Benedetti	Fabrizio
De Giorgi	Michele
Di Giovine	Paolo
Germinario	Claudio

Moscone	Francesca
Papa	Elisabetta
Pietri	Simona
Pizzoli	Antonio Mario
Predazzi	Valentina
Romano	Giuseppe
Soldatini	Andrea

INVENTORI

Cognome	Nome	Nazione residenza
Dainese	Lino	Italia

CLASSIFICAZIONI

Sezione	Classe	Sottoclasse	Gruppo	Sottogruppo
A	41	D		

NUMERO DOMANDE COLLEGATE

DOCUMENTAZIONE ALLEGATA

Tipo documento	Riserva	Documento
Rivendicazioni	NO	BI782E - riv.pdf.p7m hash: 6dcc19040504b41a67f79b0d71a81343
Riassunto	NO	BI782E - ria.pdf.p7m hash: fa5f52c392c74501edb7e035bb8d40fb
Descrizione in italiano*	NO	BI782E - des.pdf.p7m hash: 97855a2e0323f723677ccd97a0471bfa
Disegni provvisori	NO	BI782E-di provv.pdf.p7m hash: b2e2f0d808c2111c090b280889262349

ALPINESTARS
Ex. 1002 - Page 241

Rivendicazioni in inglese	SI	hash:
Disegni	SI	hash:

RIFERIMENTI AL DEPOSITO DELL'INCARICO

Numero Domanda

802016000048977

DOVUTO

Gli importi indicati non tengono conto delle eventuali esenzioni applicabili

Importo Tasse:	€ 410,00

NOTE

ALPINESTARS
Ex. 1002 - Page 242

DISPOSITIVO DI PROTEZIONE E METODO PER REALIZZARE TALE DISPOSITIVO DI PROTEZIONE

DESCRIZIONE

La presente divulgazione si riferisce in generale ad un dispositivo di protezione per una protezione di un utilizzatore. Si tratta preferibilmente di un dispositivo di protezione indossabile. Il dispositivo di protezione include un elemento gonfiabile che, in condizione gonfiata, è configurato per proteggere da impatti e/o cadute un passeggero, un pilota di motoveicolo o un simile utilizzatore, durante un'attività sportiva e/o lavorativa e/o una qualsiasi altra attività.

Un dispositivo di protezione noto è per esempio come quello descritto nel brevetto europeo EP3291697B1. Un tale dispositivo include un elemento gonfiabile atto ad assumere una condizione gonfiata attiva ed una condizione sgonfiata di riposo. L'elemento gonfiabile include un corpo realizzato a maglia, vale a dire realizzato mediante una lavorazione a maglia. Detto corpo realizzato a maglia è una struttura chiusa, o almeno tubolare, definente una regione, o area, o camera, interna. Tale camera interna è occupata almeno parzialmente da una pluralità di fili di unione che connettono tra di loro porzioni opposte del corpo lavorato a maglia. Il fatto di realizzare un corpo unico a maglia ha il vantaggio di limitare scarti di lavorazione e di minimizzare i tempi di produzione; infatti fili di unione e maglie possono essere lavorati con un'unica macchina da maglieria. I fili di unione sono parte di un unico filo collegato alle porzioni opposte del corpo lavorato a maglia. In particolare, il filo passa a tratti alterni, e continuativamente, tra una prima porzione ed una seconda porzione del corpo lavorato a maglia.

L'elemento gonfiabile include inoltre pareti impermeabilizzanti disposte esternamente che consentono di contenere il fluido di gonfiaggio per un determinato periodo di tempo. Le pareti sono, ad esempio, un primo foglio, o prima parete, ed un secondo foglio, o seconda parete, fissati l'uno con l'altro lungo rispettivi bordi perimetrali. Detto primo e secondo foglio ricoprono e rivestono su un lato esterno o superficie esterna il corpo lavorato a maglia.

Un elemento gonfiabile così realizzato, pur essendo molto vantaggioso sotto molti punti di vista, presenta tuttavia lo svantaggio di non consentire sempre una adeguata traspirazione in un capo di abbigliamento in cui è integrato o inserito. In particolare, l'elemento gonfiabile in condizione sgonfiata può creare una sorta di sacchetto intorno al corpo dell'utente che non consente un passaggio di aria di ventilazione adeguato. Per ovviare a questo problema è stato proposto di ripiegare l'elemento gonfiabile in condizione sgonfiata e di farlo espandere ed occupare una

posizione maggiormente estesa in condizione gonfiata in modo che quando l'elemento gonfiabile è a riposo e non utilizzato si abbiano minime zone con poca traspirazione. Anche questa soluzione, pur vantaggiosa sotto molti punti di vista, presenta alcuni inconvenienti, in quanto non sempre è possibile riporre l'elemento gonfiabile in posizione sgonfiata e in ogni caso è richiesto un controllo della espansione dell'elemento gonfiabile al momento del gonfiaggio.

Un problema tecnico alla base della presente divulgazione risiede nel mettere a disposizione un dispositivo di protezione per la protezione di un utente in grado di superare gli inconvenienti della tecnica nota e che consenta una maggiore traspirazione e/o di conseguire ulteriori vantaggi, e di mettere a disposizione un indumento includente detto dispositivo per la protezione personale.

Tale problema viene risolto da un dispositivo di protezione per la protezione di un utilizzatore, da un indumento protettivo o accessorio per capo di abbigliamento, e da un metodo produttivo per la realizzazione di un dispositivo di protezione secondo le rispettive rivendicazioni indipendenti.

Caratteristiche secondarie dell'oggetto della presente divulgazione sono definite nelle rispettive rivendicazioni dipendenti.

Un dispositivo di protezione secondo la presente divulgazione per la protezione di un utilizzatore comprende una struttura a maglia includente una prima porzione a maglia ed una seconda porzione a maglia, in cui la prima porzione a maglia e la seconda porzione a maglia sono contrapposte tra loro e collegate tra loro con una pluralità di elementi tiranti a definire uno o più alloggiamenti. Inoltre, l'elemento gonfiabile comprende almeno un corpo ad involucro gonfiabile alloggiato nella zona interna, quindi in detto uno o più alloggiamenti, tra la prima porzione a maglia e la seconda porzione a maglia. Il dispositivo di protezione include preferibilmente ancora una sorgente di gas collegata al corpo ad involucro gonfiabile per gonfiare il corpo ad involucro gonfiabile tra una prima condizione sgonfiata ed una seconda condizione gonfiata.

Il corpo ad involucro gonfiabile è pertanto un corpo flessibile, che in condizione gonfiata tiene tale condizione almeno un per determinato periodo. Preferibilmente si tratta di un corpo impermeabile al gas di gonfiaggio. In tal caso, per sgonfiare il corpo ad involucro è prevista una valvola di sfiato. Il corpo ad involucro è preferibilmente un corpo tubolare o includente porzioni tubolari, avente preferibilmente elevate capacità di espansione.

Gli alloggiamenti sono preferibilmente sagomati a canali, per favori inserimento del corpo ad involucro.

In condizione sgonfiata il corpo ad involucro può occupare un minimo spazio tra

le porzioni a maglia, e quindi consentire una massima ventilazione del capo di abbigliamento, o indumento. Come corpo ad involucro si può utilizzare un corpo in materiale preferibilmente molto elastico e espansibile, e che può garantire la tenuta al gas per almeno un certo tempo. Si tratta, per esempio, di una membrana o film in lattice, poliuretano, polipropilene, poliestere, poliammide. Il gonfiaggio avviene al momento dell'impatto o quando vi è necessità.

Quando il corpo a involucro gonfiabile viene gonfiato va preferibilmente a occupare tutto o quasi l'alloggiamento dove è alloggiato fino a portare in tensione gli elementi tiranti. La massima tensione degli elementi tiranti determina la massima distanza possibile tra la prima porzione a maglia e la seconda porzione a maglia. Si ottiene pertanto un dispositivo di protezione in cui le porzioni a maglia ed il corpo ad involucro definiscono un elemento gonfiabile, vale a dire un elemento che è configurato per assumere almeno una configurazione gonfiata attiva ed una configurazione sgonfiata di riposo.

Le porzioni a maglia rappresentano un lato esterno dell'elemento gonfiabile e il corpo gonfiabile ad involucro rappresentano un lato interno dell'elemento gonfiabile. Non sono quindi vantaggiosamente presenti pareti esterni che possono irrigidire troppo il componente gonfiabile. Eventualmente possono essere presenti strati di rinforzo, eventualmente di minime dimensioni.

Con l'espressione struttura a maglia, o preferibilmente struttura tessile a maglia, o porzione a maglia si intende in senso lato una maglia vera e propria, oppure anche un tessuto, anche una rete, ciò che è importante è che sia una struttura forata o in grado di creare un telaio o gabbia tensionabile intorno al corpo ad involucro, e che fa passare aria o altro gas. Quindi la struttura a maglia è da ritenersi come una struttura a gabbia che intrappola e blocca o limita espansione del corpo ad involucro. Quindi, sagomando in modo opportuno la struttura o corpo includente le due porzioni a maglia con gli elementi tiranti ed eventualmente prevedendo lunghezze diverse per gli elementi tiranti a seconda della loro collocazione nella camera stessa, è possibile determinare a priori la forma assunta dall'elemento gonfiabile in condizione gonfiata (sia in termini di distanza tra le due maglie, sia in termini di sagoma perimetrale delle due porzioni a maglia).

Si può trattare di una struttura che può essere più facilmente personalizzata per un utente, con ampia varietà in termini di resistenza, flessibilità, colori, tipologia di fili e filati etc...

Anche con il termine tirante si intende un elemento in senso lato, vale a dire un elemento che va in tensione tra le due porzioni a maglia quando il corpo a involucro gonfiabile viene gonfiato. Il tirante potrebbe essere anche un punto di cucitura.

I tiranti possono essere alternativamente fili, oppure pezze in tessuto, oppure fettucce, in altre parole possono essere delle pareti divisorie che collegano porzioni a maglia della struttura a maglia. Anche dette pareti divisorie possono essere poste in tensione. I tiranti possono essere disposti in modo che un primo gruppo di tiranti è disposto ad incrocio o in condizione obliqua rispetto ad un secondo gruppo di tiranti.

Alla prima condizione sgonfiata del corpo ad involucro corrisponde la condizione sgonfiata di riposo dell'elemento gonfiabile e la seconda condizione gonfiata del corpo ad involucro corrisponde alla condizione gonfiata attiva dell'elemento gonfiabile. Ne consegue che la prima porzione a maglia e la seconda porzione a maglia, unitamente ai tiranti, fungono da gabbia o telaio di tenuta del gonfiaggio del corpo ad involucro gonfiabile. Il corpo ad involucro di fatto fodera da dentro la struttura tessile a maglia, al momento del gonfiaggio, mentre è lasco in condizione sgonfiata.

In altre parole, è da notare che alla configurazione gonfiata attiva dell'elemento gonfiabile corrisponde una condizione di almeno parziale tensione degli elementi tiranti, e alla configurazione sgonfiata di riposo dell'elemento gonfiabile corrisponde una condizione di almeno parziale allentamento, e condizione lasca in genere, degli elementi tiranti e della struttura a maglia. Il corpo ad involucro o i corpi ad involucro sono disposti quindi con gioco nella zona interna della struttura a maglia in condizione sgonfiata.

In questo modo, preferibilmente, quando il corpo ad involucro va in tensione, tutto l'elemento gonfiabile va in tensione. In questo modo, calibrando opportunamente la forma degli alloggiamenti, la forma del corpo ad involucro, la lunghezza dei tiranti, la configurazione delle porzioni a maglia, si può calcolare a priori la forma finale dell'elemento gonfiabile.

In condizione gonfiata, il corpo ad involucro fodera almeno parzialmente la prima porzione a maglia e la seconda porzione a maglia, a contatto.

La prima porzione a maglia e la seconda porzione a maglia unitamente agli elementi tiranti determinano con il corpo ad involucro la forma finale dell'elemento gonfiabile. Per esempio l'elemento gonfiabile può raggiungere una forma finale generalmente piatta e piana. Inoltre, grazie al controllo della forma, l'elemento gonfiabile può essere facilmente accoppiato ad altri dispositivi o elementi di protezione indipendenti dall'elemento gonfiabile, ed aventi una forma coniugata a quella dell'elemento gonfiabile in condizione gonfiata.

Un ulteriore vantaggio risiede nel fatto che gli elementi tiranti garantiscono un'espansione limitata dell'elemento gonfiabile in una condizione gonfiata in modo da ottenere un ingombro ridotto, ed in particolare uno spessore limitato, ed al tempo

stesso assicurando una adeguata protezione per un utilizzatore.

Trattandosi di fatto di un dispositivo gonfiabile tale soluzione è particolarmente vantaggiosa.

Tale ridotto ingombro consente, in caso di gonfiaggio fortuito dell'elemento gonfiabile, un minore disagio e rischio per un utente mentre guida un veicolo. In altre parole, un'espansione limitata dell'elemento gonfiabile non pregiudica il controllo di un veicolo da parte dell'utilizzatore, e pertanto non costituisce rischio di incidente.

Un altro vantaggio risiede nel fatto che controllando la forma dell'elemento gonfiabile è possibile controllare (ed in particolare limitare) anche una quantità di gas necessario per il gonfiaggio dell'elemento gonfiabile.

Secondo un aspetto preferito della presente divulgazione, al fine di avere una struttura più piatta possibile, gli alloggiamenti sono affiancati fra loro, in modo che porzioni di corpo ad involucro siano affiancate fra loro nella struttura a maglia, oppure una pluralità di corpi ad involucro sono affiancati fra loro. A tal fine, per esempio, gli elementi tiranti sono disposti tra detta prima porzione a maglia e detta seconda porzione a maglia allineati in una pluralità di file di elementi tiranti a definire una pluralità di alloggiamenti affiancati. Preferibilmente, ciascuna fila di elementi tiranti della pluralità di file di elementi tiranti comprende una pluralità di elementi tiranti. Il corpo ad involucro è sagomato in modo tale da essere disposto tra le file di tiranti.

Secondo un aspetto preferito della presente divulgazione, nella condizione di almeno parziale tensione, gli elementi tiranti si estendono lungo una direzione di sviluppo sostanzialmente perpendicolare alla direzione di estensione delle file di elementi tiranti. Secondo un altro aspetto preferito della presente divulgazione, nella condizione di almeno parziale tensione, gli elementi tiranti appartenenti ad una stessa fila di elementi tiranti sono disposti sostanzialmente paralleli tra loro.

Secondo un aspetto preferito della presente divulgazione, il corpo ad involucro gonfiabile è sagomato a mano o a pettine per avere così una pluralità di porzioni disposte tra gli elementi tiranti.

In una forma di realizzazione operativa il corpo ad involucro è sagomato come un corpo tubolare o condotto inserito, per esempio, a serpentina tra gli elementi tiranti, oppure una forma a albero.

In una ulteriore forma di realizzazione, sono previsti una pluralità di corpi ad involucro gonfiabili ciascuno alloggiato tra una porzione a maglia e la contrapposta porzione a maglia.

La prima porzione a maglia e la seconda porzione a maglia definiscono di fatto

uno strato dell'elemento gonfiabile all'interno del quale è predisposto il corpo ad involucro gonfiabile. In una forma di realizzazione della presente divulgazione, l'elemento gonfiabile comprende almeno una terza porzione a maglia sovrapposta alla prima porzione a maglia e alla seconda porzione a maglia, a definire un secondo strato dell'elemento gonfiabile. E' possibile prevedere di disporre porzioni di corpo ad involucro in modo alternato tra i due strati in modo da controllare in modo mirato la forma finale dell'elemento gonfiabile, senza occupare troppo posto tra le maglie, e quindi garantire la ventilazione.

Si può quindi osservare che l'elemento gonfiabile secondo la presente divulgazione si presta ad una elevata modularità e adattamento alle esigenze costruttive del dispositivo di protezione.

Altri vantaggi, caratteristiche e modalità di impiego dell'oggetto della presente divulgazione risulteranno evidenti dalla seguente descrizione dettagliata di alcune sue forme di realizzazione preferite, date a scopo esemplificativo e non limitativo. È comunque evidente come ciascuna forma di realizzazione possa presentare uno o più dei vantaggi sopra elencati; in ogni caso non è comunque richiesto che ciascuna forma di realizzazione presenti simultaneamente tutti i vantaggi elencati.

Verrà fatto riferimento alle figure dei disegni allegati, in cui:

La figura 1 mostra una vista schematica parzialmente in sezione di un dispositivo di protezione secondo una forma di realizzazione della presente divulgazione;

La figura 1A mostra una vista schematica di un dispositivo di protezione secondo una forma di realizzazione della presente divulgazione;

La figura 2 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione gonfiata;

La figura 3 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione gonfiata secondo un'ulteriore forma di realizzazione;

La figura 4 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione sgonfiata;

La figura 5 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione sgonfiata secondo un'ulteriore forma di realizzazione;

La figura 6 mostra una vista schematica parzialmente in sezione di un dispositivo di protezione secondo una forma di realizzazione della presente divulgazione;

La figura 7 mostra una vista di un indumento includente un dispositivo di protezione personale;

La figura 8 mostra una vista schematica in sezione lungo la linea II-II del

dispositivo di protezione di figura 1A in condizione gonfiata secondo un'ulteriore forma di realizzazione;

La figura 9 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione gonfiata secondo un'ulteriore forma di realizzazione;

La figura 10 mostra una vista schematica di un involucro per un dispositivo secondo la presente divulgazione.

Con riferimento alle figure allegate 1-10, con il numero di riferimento 10, 100 viene indicato un dispositivo di protezione personale secondo la presente divulgazione in accordo a rispettive forme di realizzazione della presente divulgazione. Si tratta preferibilmente di un dispositivo di protezione indossabile.

Le forme di realizzazione si differenziano prevalentemente per la struttura tessile a maglia 11, 111 descritta come verrà descritto nel seguito. Per componenti identici e aventi la medesima struttura, i due dispositivi di protezione mantengono numeri di riferimento identici.

Il dispositivo di protezione personale 10 , 110 comprende un elemento gonfiabile 12, 112 il quale è atto ad assumere sostanzialmente una prima condizione di riposo o condizione sgonfiata, ed una seconda condizione attiva o condizione gonfiata. Le modalità di gonfiaggio saranno descritte nel seguito della descrizione.

In una forma di realizzazione della presente divulgazione l'elemento gonfiabile 12, 112 può essere conformato a giacchino ed è atto a cingere una zona superiore o busto del corpo di un utilizzatore. Nulla vieta di realizzare l'elemento gonfiabile 12 secondo una qualsiasi sagoma.

L'elemento gonfiabile 12, 112 include una struttura tessile a maglia 11, 111, con una prima porzione a maglia 18,118, ed una seconda porzione a maglia 19, 119, in cui le due porzioni a maglia sono tra loro contrapposte.

La struttura tessile a maglia 11 può essere realizzata secondo la tecnologia descritta nella domanda di brevetto PCT/IB2009/055512 e nella domanda di brevetto PCT/IT2009/000547, qui incorporate per riferimento nella loro interezza nella presente divulgazione, oppure la struttura tessile a maglia 111 può essere realizzata secondo la tecnologia descritta nella domanda di brevetto WO2016178143A1, o nella domanda di brevetto WO2017163196A1, qui incorporate per riferimento nella loro interezza nella presente divulgazione. Vale a dire si tratta preferibilmente di una struttura tessile a maglia con fili, formata da maglie e fili tiranti come descritto in queste domande di brevetto. La differenza più significativa rispetto a tali domande di brevetto risiede nel fatto che l'elemento gonfiabile qui descritto

non presenta le medesime pareti esterne di contenimento del gas descritte nelle suddette domande di brevetto.

Più in particolare secondo la tecnologia, per esempio, della domanda di brevetto PCT/IB2009/055512 la struttura a maglia 11 comprende una prima porzione a maglia 18 ed una seconda porzione a maglia 19 unite lungo il perimetro. Secondo la tecnologia della domanda di brevetto WO2016178143A1 la struttura a maglia 111 comprende una prima porzione a maglia 118 ed una seconda porzione a maglia 119 che sono parte di un corpo ad involucro a maglia lavorato in un corpo unico. Ciò che rileva per la presente domanda di brevetto è il fatto che la prima porzione a maglia 118, 18 e la seconda porzione a maglia 19, 119 sono contrapposte tra loro e sono collegate tra loro da una pluralità di elementi tiranti 5.

Preferibilmente, gli elementi tiranti 5 sono disposti tra detta prima porzione a maglia 18 e detta seconda porzione a maglia 19 allineati in una pluralità di file 24 di elementi tiranti 5. La disposizione in file 24 consente di regolare meglio la disposizione dei fili e controllare ulteriormente l'espansione dell'elemento gonfiabile, nonché formare una pluralità di alloggiamenti affiancati. Si hanno quindi nella struttura a maglia 11, 111 alloggiamenti conformati di fatto a canali.

Per controllare ancora meglio l'espansione dell'elemento gonfiabile, in condizione attiva, quando l'elemento gonfiabile 2 è in condizione gonfiata, i fili tiranti 5 sono paralleli fra loro nella rispettiva fila 24 e sostanzialmente ortogonali rispetto alla direzione della fila. I fili sono preferibilmente più corti nella zona di bordo, vale a dire diminuiscono in lunghezza mano a mano che si avvicinano verso la zona di bordo.

Secondo un aspetto della presente divulgazione, l'elemento gonfiabile 12, 112 comprende un corpo ad involucro gonfiabile 40, 42, 43 disposto in uno o più alloggiamenti tra la prima porzione a maglia 18, 118, e la seconda porzione a maglia 19, 119 e collegato ad una sorgente di gas 15, o sorgente di gonfiaggio. Secondo la forma di realizzazione di figura 1 il corpo ad involucro gonfiabile 40 ha una forma a mano o a pettine e include una pluralità di porzioni 40a di corpo ad involucro gonfiabile 40 inserite tra le file di tiranti 5. Secondo la forma di realizzazione di figura 6 il corpo ad involucro gonfiabile 42 ha una forma tubolare ed è inserito a serpentina tra i tiranti. Nella forma di realizzazione di figura 10, il corpo ad involucro ha forma di albero, ovvero presenta ramificazioni laterali ed è anch'esso inserito tra i canali di una struttura a maglia 11, 111.

Il corpo ad involucro 40, 42, 43 sta in condizione sgonfiata durante una situazione di riposo dell'elemento gonfiabile 2, 102 e occupa il minor spazio possibile consentendo quindi il passaggio di aria tra le porzioni a maglia 18, 19, 118, 119. Al momento del gonfiaggio, il corpo ad involucro 40, 42, 43 va a gonfiarsi fino a portare

in tensione i tiranti e le porzioni a maglia, e quindi ottenere una tensione massima dell'elemento gonfiabile. La struttura tessile a maglia 11, 111 funge di fatto da gabbia di contenimento del corpo ad involucro 40, 42, 43 in condizione gonfiata.

E' da intendersi che il corpo ad involucro 40, 42, 43 e gli elementi tiranti 5 possono essere scelti e disposti in modo adeguato per consentire l'inserimento del corpo ad involucro gonfiabile 40, 42, 43 e il raggiungimento di una forma voluta finale.

Il fatto di prevedere un corpo ad involucro gonfiabile 40, 42, 43 con una pluralità di porzioni 40a che stanno affiancate tra file di elementi tiranti 5 consente di ottenere una configurazione finale sostanzialmente piatta dell'elemento gonfiabile dovuta al fatto che le varie porzioni 40a in condizione gonfiata sono forzate a stare una affianco all'altra, bloccate dalle porzioni a maglia 18, 118, 19, 119.

In una forma di realizzazione alternativa come quella di figura 8 si prevede la presenza di una terza porzione a maglia 120 sovrapposta alla prima porzione a maglia 118 e alla seconda porzione a maglia 119. Tale terza porzione a maglia 120 consente di realizzare un secondo strato di elemento gonfiabile e avere a disposizione pertanto una pluralità di alloggiamenti per il corpo ad involucro gonfiabile 40, 42, 43, e consentire una ancora maggiore variabilità di disposizione del corpo ad involucro gonfiabile o delle sue porzioni all'interno della struttura tessile a maglia 11, 111.

La presente divulgazione riguarda anche un indumento protettivo 50 comprendente un dispositivo di protezione 10, 110 come sopra definito. Il dispositivo di protezione 10, 110 può essere alloggiato in una tasca dell'indumento.

La presente divulgazione riguarda anche un metodo per realizzare un dispositivo di protezione 10, 110 per la protezione di un utilizzatore.

Il metodo comprende le fasi di:

- fornire un elemento gonfiabile 12, 112 configurato per assumere una configurazione gonfiata attiva ed una configurazione sgonfiata di riposo, in cui detto elemento gonfiabile 12 comprende una prima porzione a maglia 18 ed una seconda porzione a maglia 19, 119 opposta alla prima porzione a maglia 18, 119 a definire almeno un alloggiamento interno;
- collegare detta prima porzione a maglia 18 a detta seconda porzione a maglia 19 con una pluralità di elementi tiranti 5 a definire uno o più alloggiamenti interni;
- disporre nell'alloggiamento interno un corpo ad involucro 40, 42, 43 e preferibilmente collegare il corpo ad involucro 40, 42, 43 ad una sorgente di gas.

Preferibilmente, la fase di collegare la prima porzione a maglia 18 alla seconda porzione a maglia 19 con la pluralità di elementi tiranti 5 è effettuata disponendo gli elementi tiranti 5 allineati in una pluralità di file 24 di elementi tiranti, in cui ciascuna fila 24 di elementi tiranti 5 comprende una pluralità di elementi tiranti 5 e il corpo ad involucro viene disposto tra le file 24.

Di fatto il corpo ad involucro riveste da dentro la struttura a maglia 11, 111, senza richiedere pareti esterne impermeabilizzanti.

In relazione al gonfiaggio, per realizzare il gonfiaggio del corpo ad involucro 40, 42, 43, in caso di caduta e/o scivolata e/o impatto imprevisto da parte di un utilizzatore o di un veicolo su cui esso procede, il dispositivo di protezione 10, 110 è atto a cooperare con appositi mezzi di attivazione (non illustrati) collegati operativamente ad esempio alla sorgente di gas 15, come una bomboletta di gas freddo compresso, quale per esempio elio. La bomboletta può essere provvista di una rispettiva valvola di intercettazione (non mostrata).

Alternativamente, la sorgente di fluido di gonfiaggio può comprendere generatori di gas di tipo pirotecnico o di tipo ibrido o di altre tipologie note allo stato della tecnica.

L'apertura della valvola di intercettazione di ciascuna bomboletta di gonfiaggio è preferibilmente comandata da una centralina di controllo sulla base della rilevazione dello stato del sistema veicolo/pilota; ad esempio detta centralina di controllo può implementare un sistema di predizione della caduta che consenta un'identificazione tempestiva dell'evento caduta ed un'affidabile predizione di questa per mezzo di sensori accelerometrici solidali al veicolo (o al pilota) ed un'unità di elaborazione dei segnali prodotti dai sensori stessi.

In alternativa, il dispositivo secondo la presente divulgazione può trovare anche applicazione utilizzando un cavo di attivazione connesso ad un veicolo guidato da un utilizzatore, il quale cavo comanda il gonfiaggio dell'elemento gonfiabile a seguito dell'allontanamento dell'utilizzatore dal veicolo, ad esempio, a seguito di una caduta o di un impatto imprevisto. L'impiego del cavo è particolarmente impiegato nel settore dell'equitazione.

In ogni caso i suddetti mezzi di attivazione e gonfiaggio possono essere integrati nel dispositivo di protezione secondo la presente invenzione oppure collocati esternamente allo stesso.

Si noti anche che le modalità di attivazione, pur essendo un aspetto di particolare rilevanza per un efficace funzionamento del dispositivo, non saranno ulteriormente descritte con maggiore dettaglio essendo metodi essenzialmente già noti ad un tecnico del settore della protezione di un individuo da impatti imprevisti.

L'oggetto della presente divulgazione è stato fin qui descritto con riferimento a sue forme di realizzazione. È da intendersi che possano esistere altre forme di realizzazione che afferiscono al medesimo nucleo inventivo, tutte rientranti nell'ambito di protezione delle rivendicazioni qui di seguito esposte.

RIVENDICAZIONI

1. Dispositivo di protezione (10, 110) per la protezione di un utilizzatore, detto dispositivo di protezione (10) comprendendo una struttura a maglia (11, 111) comprendente una prima porzione a maglia (18, 118) ed una seconda porzione a maglia (19, 119) ed una pluralità di tiranti (5), in cui detta prima porzione a maglia (18, 118) e detta seconda porzione a maglia (19, 119) sono contrapposte e sono collegate tra loro dalla pluralità di elementi tiranti (5); in cui la prima porzione a maglia, la seconda porzione a maglia e gli elementi tiranti definiscono uno o più alloggiamenti interni della struttura a maglia (11, 111);

in cui il dispositivo di protezione (10, 110) include un corpo ad involucro (40, 42, 43) disposto in uno o più di detti alloggiamenti interni, in cui detto corpo ad involucro è configurato per assumere una condizione sgonfiata ed una condizione gonfiata nell'uno o più alloggiamenti interni della struttura a maglia (11, 111).

2. Dispositivo di protezione (10, 110) secondo la rivendicazione 1, in cui detto corpo ad involucro è configurato per rivestire da dentro, almeno parzialmente a contatto, la struttura a maglia (11, 111) in condizione gonfiata e/o che detta struttura a maglia è una struttura esterna del dispositivo di protezione (10, 110).

3. Dispositivo di protezione secondo la rivendicazione 1 o 2, in cui il corpo ad involucro (40, 42, 43) occupa un primo spazio nella condizione sgonfiata atto a consentire un passaggio di aria tra la prima porzione a maglia e la seconda porzione a maglia e occupa, in condizione gonfiata, un secondo spazio più ampio o grande del primo spazio.

4. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui alla condizione sgonfiata del corpo ad involucro corrisponde una condizione lasca e rilassata della struttura a maglia (11, 111) e degli elementi tiranti (5), ed in cui alla condizione gonfiata del corpo ad involucro corrisponde una condizione almeno parzialmente di tensione gli elementi tiranti (5) e della prima porzione a maglia (18, 118) e la seconda porzione a maglia (19, 119).

5. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui gli elementi tiranti definiscono una pluralità di alloggiamenti tra la prima porzione a maglia (18, 118) e la seconda porzione a maglia (19, 119) ed il corpo ad involucro (40, 42, 43) comprende una pluralità di porzioni (40a) disposte ciascuna in un corrispondente alloggiamento di detti alloggiamenti.

6. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui gli alloggiamenti sono tra loro affiancati e/o hanno forma di canali.

7. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui il corpo ad involucro (40, 42, 43) ha una forma a mano o a pettine o albero, o ha una forma tubolare disposta a serpentina.

8. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui gli elementi tiranti (5) sono disposti tra detta prima porzione a maglia (18, 118) e detta seconda porzione a maglia (19, 119) allineati in una pluralità di file (24) di elementi tiranti (5).

9. Dispositivo di protezione (10) secondo la rivendicazione 6, in cui ciascuna fila (24) di elementi tiranti (5) della pluralità di file di elementi tiranti (5) comprende una pluralità di elementi tiranti (5) in cui in una condizione di almeno parziale tensione, gli elementi tiranti (5) appartenenti ad una stessa fila (24) di elementi tiranti (5) sono disposti sostanzialmente paralleli tra loro.

10. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui una condizione gonfiata del corpo ad involucro corrisponde ad una condizione gonfiata di protezione dell'elemento gonfiabile, ed una condizione sgonfiata corrisponde ad una condizione di riposo dell'elemento gonfiabile.

11. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, comprendente una sorgente di gas (15) o sorgente di gonfiaggio collegata al corpo a involucro gonfiabile.

12. Indumento protettivo (50) o accessorio di abbigliamento comprendente un dispositivo di protezione (10) secondo una qualsiasi delle rivendicazioni precedenti.

13. Metodo per realizzare un dispositivo di protezione (10) per la protezione di un utilizzatore, detto metodo comprendendo le fasi di:

- fornire una struttura a maglia (11, 111) comprendente una prima porzione a maglia (18, 118) ed una seconda porzione a maglia (19, 119), opposta alla prima porzione a maglia (18, 118), ed una pluralità di elementi tiranti (5) che collegano la prima porzione a maglia (18, 118) e la seconda porzione a maglia (19, 119), in cui detta prima porzione a maglia (18, 118) e detta seconda porzione a maglia (19, 119) e la pluralità di elementi tiranti (5) definiscono uno o più alloggiamenti nella struttura a maglia (11, 111);
- disporre un corpo ad involucro (40, 42, 43) in uno o più di detti alloggiamenti a formare con la struttura a maglia (11, 111) un elemento gonfiabile (12, 112);
- gonfiare il corpo ad involucro (40, 42, 43) da una prima condizione operativa sgonfiata a una seconda condizione operativa gonfiata.

14. Metodo secondo la rivendicazione precedente, in cui il corpo ad involucro viene gonfiato fino a portare in tensione gli elementi tiranti (5) e la struttura a maglia (11, 111) e/o fino a far aderire il corpo ad involucro almeno parzialmente alla prima porzione a maglia (18, 118) e la seconda porzione a maglia (19, 119).

15. Metodo secondo la rivendicazione 13 o 14 in cui gli elementi tiranti (5) sono organizzati in modo da formare una pluralità di alloggiamenti affiancati.

16. Metodo secondo una qualsiasi delle rivendicazioni precedenti da 13 a 15, in cui porzioni di corpo ad involucro sono disposte affiancate una a fianco dell'altra.

17. Metodo secondo una qualsiasi delle rivendicazioni precedenti da 13 a 15, il corpo ad involucro viene gonfiato fino a portare in tensione la struttura a maglia e la struttura a maglia (11, 111) imbriglia e blocca una ulteriore espansione del corpo ad involucro.

18. Dispositivo secondo una qualsiasi delle rivendicazioni da 1 a 11, in cui detto dispositivo è un dispositivo indossabile o uso di detto dispositivo secondo una qualsiasi delle rivendicazioni da 1 a 11 addosso ad un utente.

RIASSUNTO

La presente divulgazione riguarda un dispositivo di protezione (10, 110) per la protezione di un utilizzatore. Il dispositivo di protezione (10) comprende una struttura a maglia (11, 111) comprendente una prima porzione a maglia (18, 118) ed una seconda porzione a maglia (19, 119) ed una pluralità di tiranti (5), in cui detta prima porzione a maglia (18, 118) e detta seconda porzione a maglia (19, 119) sono contrapposte e sono collegate tra loro dalla pluralità di elementi tiranti (5); in cui la prima porzione a maglia, la seconda porzione a maglia e gli elementi tiranti definiscono uno o più alloggiamenti interni della struttura a maglia (11, 111). Il dispositivo di protezione (10, 110) include un corpo ad involucro (40, 42, 43) disposto in uno o più di detti alloggiamenti interni, in cui detto corpo ad involucro è configurato per assumere una condizione sgonfiata ed una condizione gonfiata nell'uno o più alloggiamenti interni della struttura a maglia (11, 111).

(Figura 1)

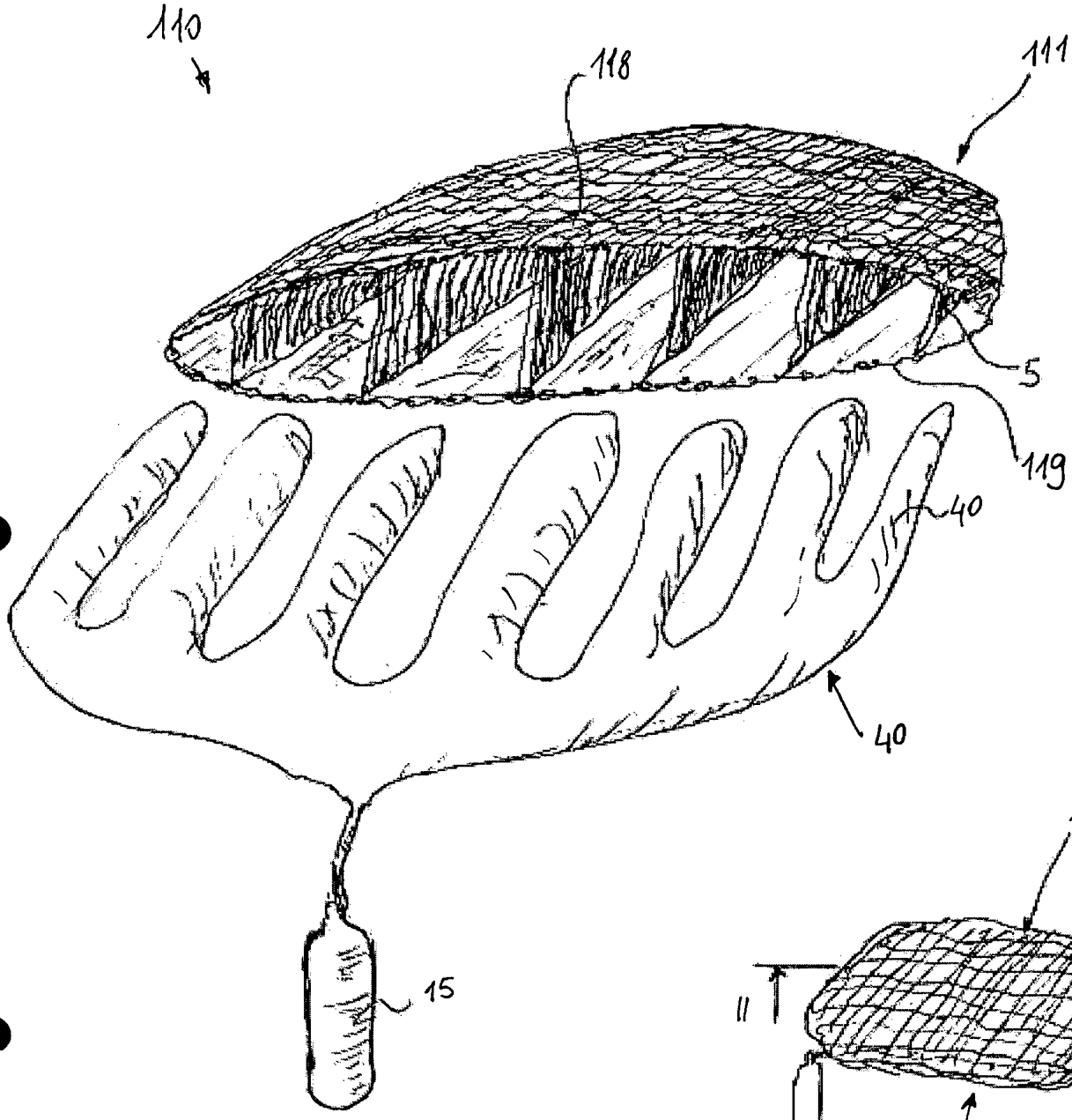


Fig. 1

Fig. 1A

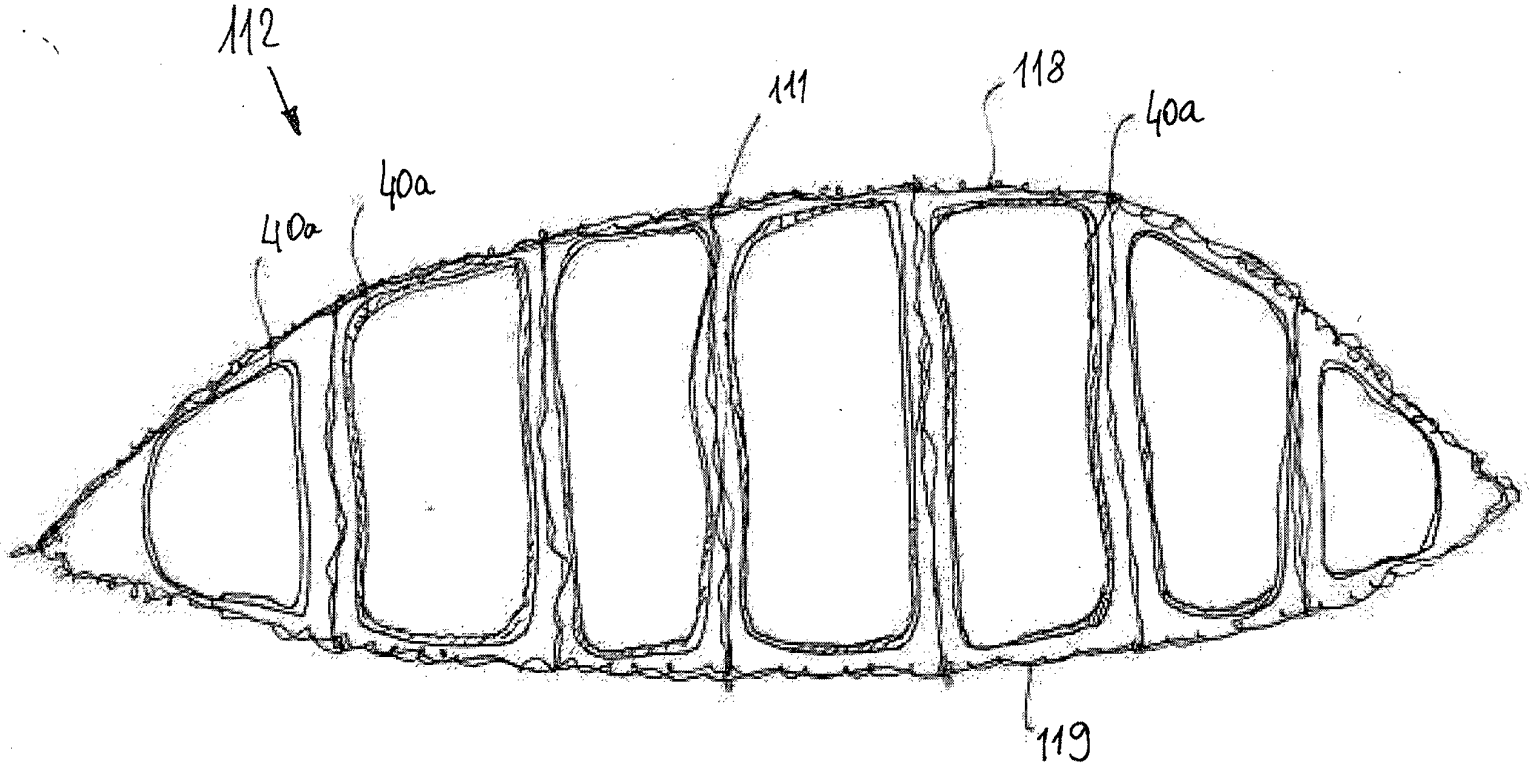


Fig. 2

ALPINESTARS
Ex. 1002 - Page 259

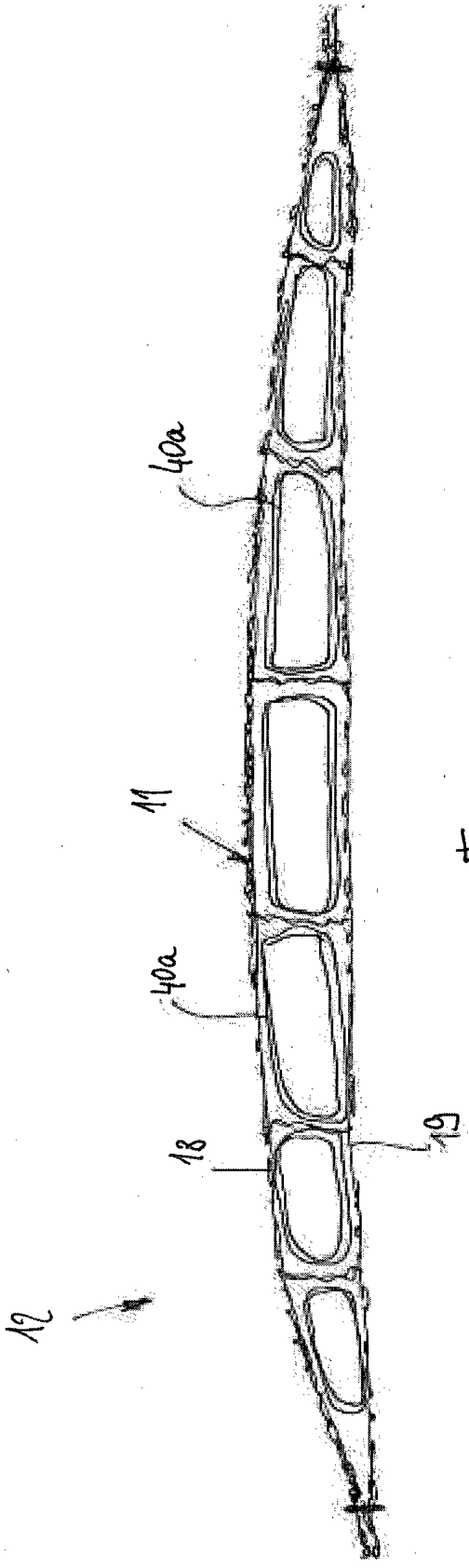


Fig. 3

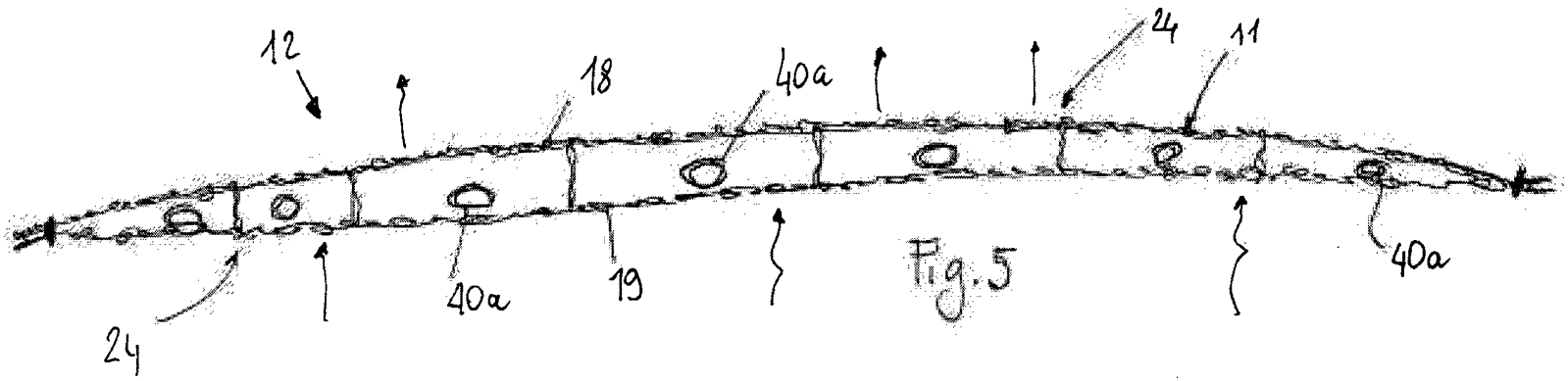


Fig. 5

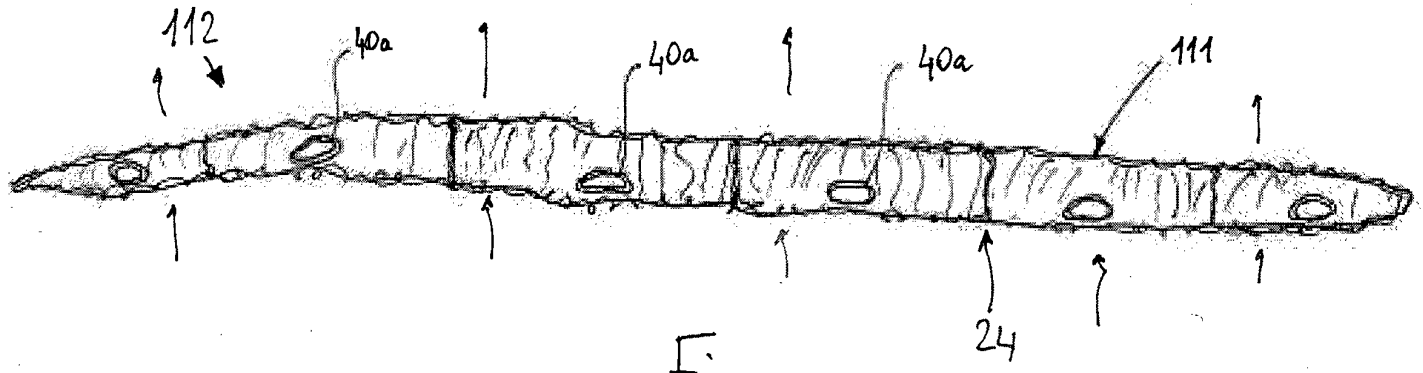


Fig. 4

ALPINESTARS
Ex. 1002 - Page 261

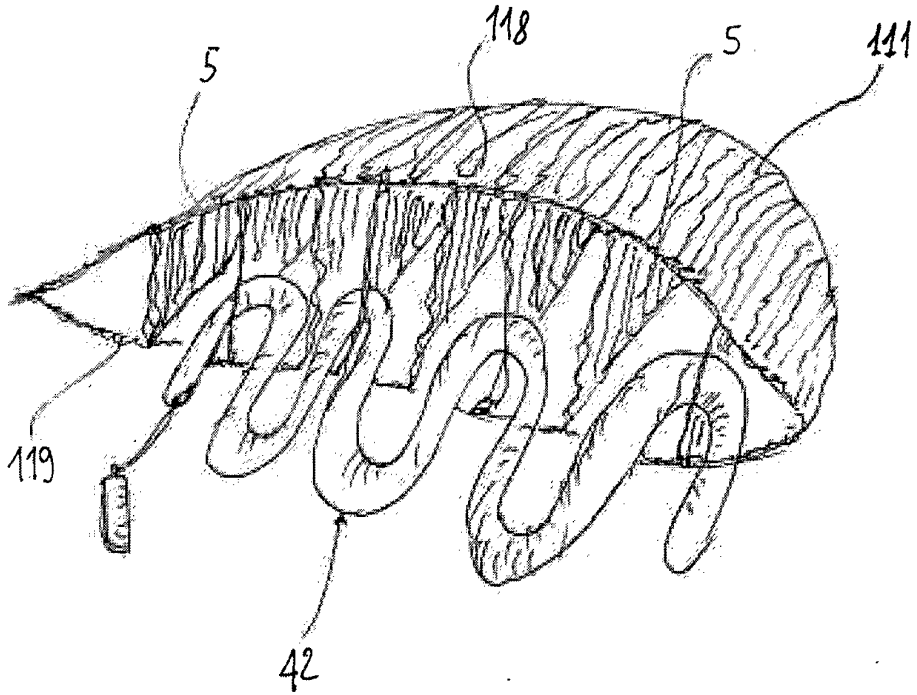


Fig. 6

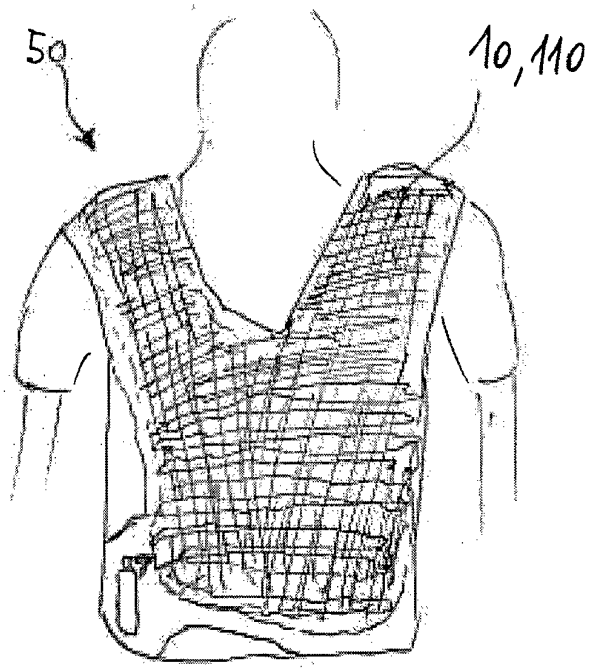


Fig. 7

ALPINESTARS
Ex. 1002 - Page 262

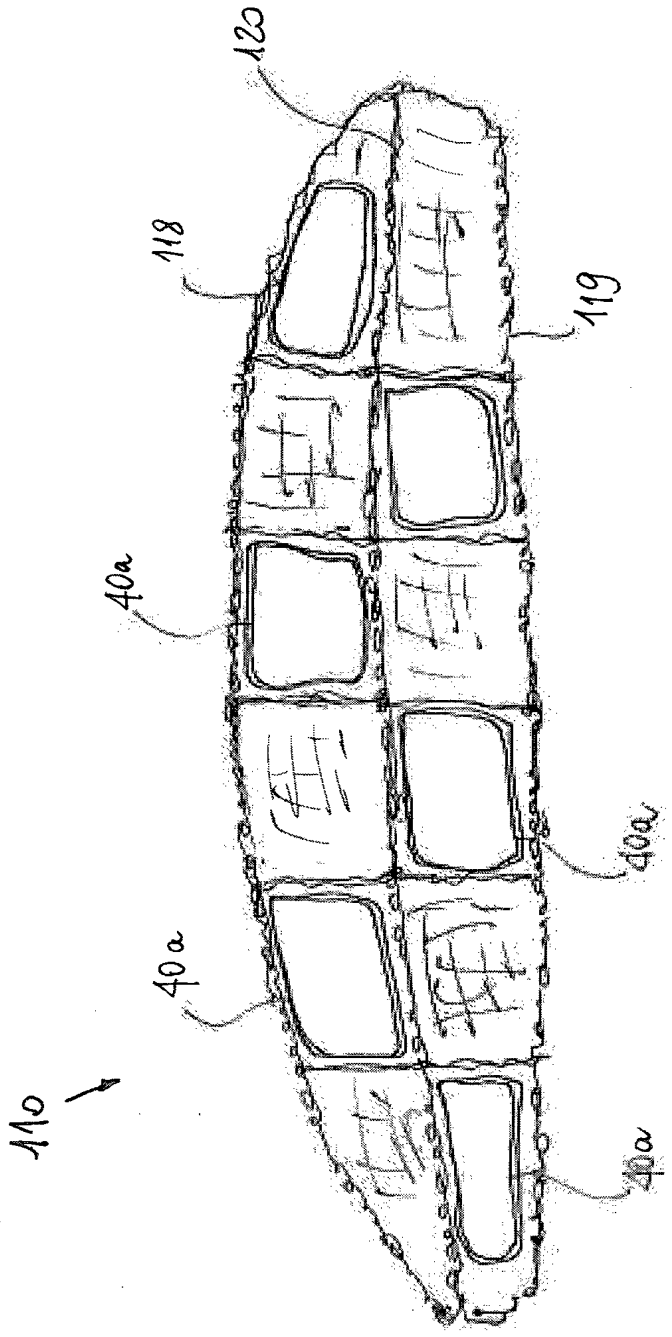


Fig. 8

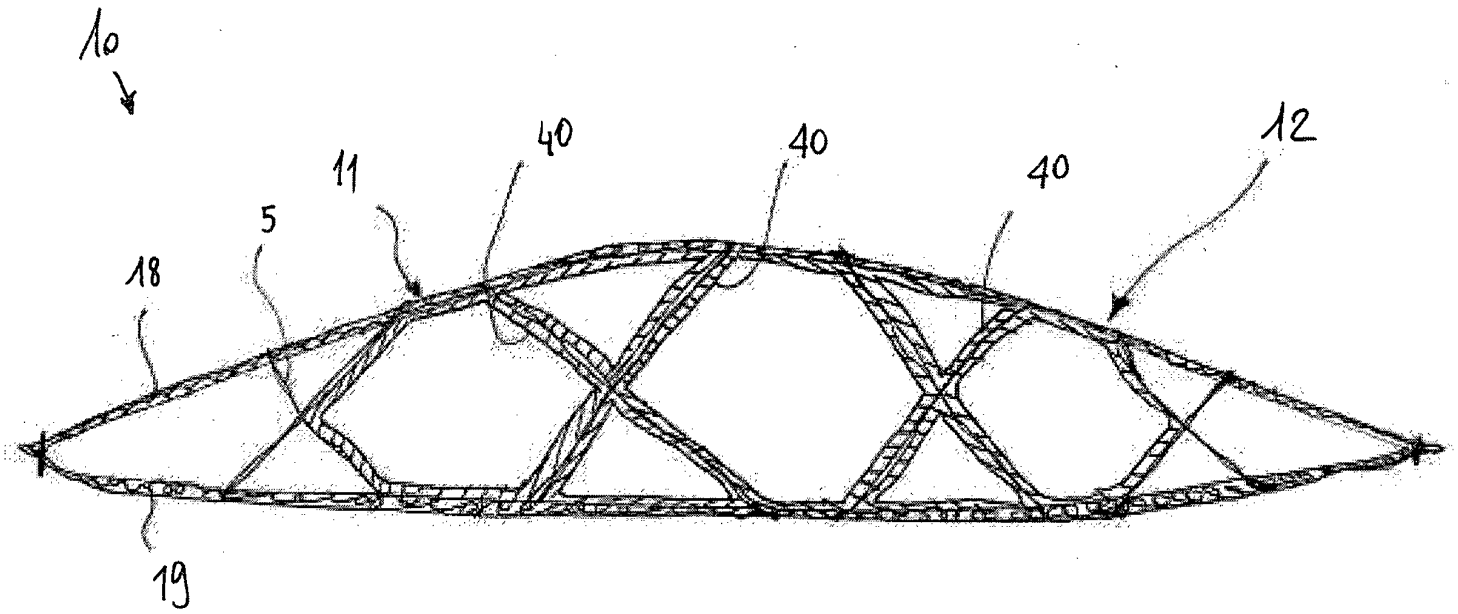


Fig. 9

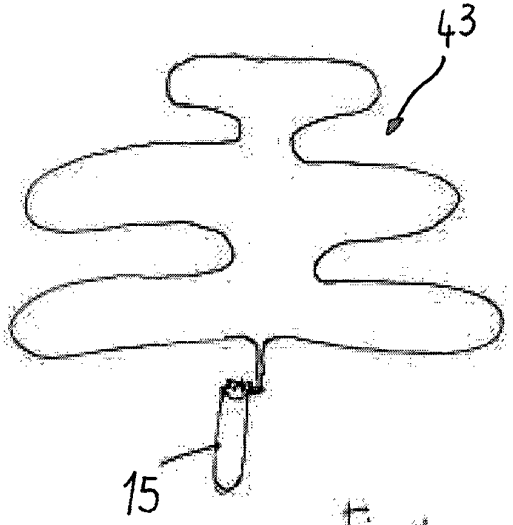


Fig. 10

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Ex. 1002 - Page 264

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Application Number	To Be Assigned
Filing Date	I.A. Filing Date: December 9, 2020
First Named Inventor	Lino DAINESE
Title	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE
Art Unit	To Be Assigned
Examiner Name	To Be Assigned
Attorney Docket Number	TBD

SIGNATURE of Applicant or Patent Practitioner

Signature	/Paul A. Calvo/	Date (Optional)	
Name	Paul A. Calvo	Registration Number	57,913
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)	D-AIR LAB S.R.L.		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ *Total of _____ forms are submitted.

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Application Number	Filing Date
PCT/IB2020/061689	9 December 2020

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I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

D-AIR LAB S.R.L.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	/ [signature] /	Date (Optional)	13.06.2022
Name		Vittorio CATAGNI	
Title		SPECIAL ATTORNEY	

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Sheet 1 of 1

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Application Number	*To Be Assigned*
Filing Date	*Herewith*
First Named Inventor	Lino DAINESE
Art Unit	*To Be Assigned*
Examiner Name	*To Be Assigned*
Attorney Docket Number	

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		NONE			

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	FP1	CN 109998200 A	07-12-2019	KUNSHAN ZHENGGONG MOULD CO. LTD.		☒
	FP2	EP 3291697 B1	12-05-2018	DAINESE S.P.A. [IT]		☐
	FP3	KR 20170123046 A	11-07-2017	UNIV INDUSTRY FOUNDATION YONSEI UNIV WONJU CAMPUS [KR]		☒

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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371

Attorney Docket No.	
TBD	
U.S. Application No. (if known, see 37 CFR 1.5)	
To Be Assigned	

International Application No.	International Filing Date	Priority Date Claimed
PCT/IB2020/061689	09 December 2020	13 December 2019

Title of Invention
PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

First Named Inventor
Lino DAINESE

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required), and the oath or declaration of the inventor(s) have been received.
2. ☒ A copy of the International Application (35 U.S.C. 371(c)(2)) is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)).
3. An English language translation of the International Application (35 U.S.C. 371(c)(2))
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
4. An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))
   a. ☒ is attached.
   b. ☐ was previously filed in the international phase under PCT Rule 4.17(iv).

Items 5 to 8 below concern amendments made in the international phase.

PCT Article 19 and 34 amendments

5. ☐ Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)).
6. ☐ English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)).
7. ☐ English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)).

Cancellation of amendments made in the international phase

8a. ☐ Do not enter the amendment made in the international phase under PCT Article 19.

8b. ☐ Do not enter the amendment made in the international phase under PCT Article 34.

NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).

The following items 9 to 17 concern a document(s) or information included.

9. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
10. ☒ A preliminary amendment.
11. ☒ An Application Data Sheet under 37 CFR 1.76.
12. ☐ A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b).
13. ☒ A power of attorney and/or change of address letter.
14. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13*ter*.3 and 37 CFR 1.821-1.825 (not required if sequence listing in text format was indicated on the PCT Request as part of the International Application and the sequence listing was published as part of the international application).
15. ☐ Assignment papers *(cover sheet and document(s))*. Name of Assignee: _____
16. ☐ 37 CFR 3.73(c) Statement *(when there is an Assignee)*.

This collection of information is required by 37 CFR 1.414 and 1.491-1.492. The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 15 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

U.S. APPLN. No. (if known – see 37 CFR 1.5)	INTERNATIONAL APPLICATION No.	ATTORNEY DOCKET No.
To Be Assigned	PCT/IB2020/061689	TBD

17. ■ Other items or information:

Authorization to Treat a Reply as Incorporating an Extension of Time Under 37 CFR 1.136(a)(3)

The following fees have been submitted.	CALCULATIONS
18. ■ Basic national fee (37 CFR 1.492(a)) **$320**	$ 320
19. ■ Examination fee (37 CFR 1.492(c)) • If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4)..... **$0** • All other situations **$800**	$ 800
20. ■ Search fee (37 CFR 1.492(b)) • If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4)..... **$0** • Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority ..... **$140** • International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB..... **$540** • All other situations **$700**	$ 540
TOTAL OF 18, 19, and 20 =	$ 1,660
☐ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)). Fee for each additional 50 sheets of paper or fraction thereof **$420**	$

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof (round **up** to a whole number)	RATE
- 100 =	/ 50 =		x **$420**

Surcharge for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h))..... **$160**	$

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	- 20 =		x **$100**	$
Independent claims	- 3 =		x **$480**	$
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			**+ $860**	$

Fee for submission of Sequence Listing text file of 300 MB to 800 MB (37 CFR 1.21(o)(1))..... **$1,060**	$
Fee for submission of Sequence Listing text file of more than 800 MB (37 CFR 1.21(o)(2))..... **$10,500**	$
Processing fee for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i))..... **$140 +**	$
TOTAL OF ABOVE CALCULATIONS =	$ 1,660
■ **Applicant asserts small entity status.** See 37 CFR 1.27. Fees above are reduced by ½.	
☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Fees above are reduced by ¾. Applicant must attach form PTO/SB/15A or B or equivalent.	
TOTAL NATIONAL FEE =	$ 830
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31)..... **$50.00** per property **+**	$
TOTAL FEES ENCLOSED =	$ 830

ALPINESTARS
Ex. 1002 - Page 270

a. ☐ A check in the amount of $_____ to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $_____ to cover the above fees.

c. ☒ The Director is hereby authorized to charge additional fees which may be required, or credit any overpayment, to Deposit Account No. 19-0036 as follows:

i. ☒ any required fee.

ii. ☐ any required fee except for excess claims fees required under 37 CFR 1.492(d) and (e) and multiple dependent claim fee required under 37 CFR 1.492(f).

d. ☒ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. The PTO-2038 should only be mailed or faxed to the USPTO. However, when paying the basic national fee, the PTO-2038 may NOT be faxed to the USPTO.

ADVISORY: If filing by EFS-Web, do **NOT** attach the PTO-2038 form as a PDF along with your EFS-Web submission. Please be advised that this is **not** recommended and by doing so your **credit card information may be displayed via PAIR**. To protect your information, it is recommended to pay fees online by using the electronic payment method.

NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013, and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE 1: By providing this statement under 37 CFR 1.55 or 1.78, **this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA**.

NOTE 2: A U.S. national stage application may not claim priority to the international application of which it is the national phase. The filing date of a U.S. national stage application is the international filing date. See 35 U.S.C. 363.

Correspondence Address

☒ The address associated with Customer Number: 26111 **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country			Telephone		
Email					

Signature	/Paul A. Calvo/	Date	6.13.2022
Name (Print/Type)	Paul A. Calvo	Registration No. (Attorney/Agent)	57,913

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/757,247	06/13/2022 02:09:46 PM ET	TBD

Title of Invention

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	5950	FILED BY	Debra Colonna
PATENT CENTER #	60715190	AUTHORIZED BY	Paul Calvo
CUSTOMER #	26111	FILING DATE	-
INTL. APPLICATION #	PCT/IB2020/061689	INTL. FILING DATE	12/09/2020
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Lino DAINESE

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 3007	E20226CE12082015	Debra Colonna

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2631	BASIC NATIONAL STAGE FEE	160.00	1	160.00
2633	NATIONAL STAGE EXAMINATION FEE - ALL OTHER SITUATIONS	400.00	1	400.00
2642	NATIONAL STAGE SEARCH FEE - SEARCH REPORT PREPARED AND PROVIDED TO USPTO	270.00	1	270.00
			TOTAL AMOUNT:	$830.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/757,247	**06/13/2022 02:09:46 PM ET**	**TBD**

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INTL. APPLICATION #	PCT/IB2020/061689	INTL. FILING DATE	12/09/2020
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Paul Calvo

Documents

TOTAL DOCUMENTS: 20

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
2022-06-13-ADS-PCT-IB2020-061689.PDF		8	Application Data Sheet	2224 KB
2022-06-13-EOT-Authorization-PCT-IB2020-061689.pdf		1	Authorization for Extension of Time all replies	109 KB
2022-06-13-Preliminary-Amendment-PCT-IB2020-061689.pdf		7	-	144 KB
2022-06-13-Preliminary-Amendment-PCT-IB2020-	(1-1)	1	Preliminary Amendment	124 KB

061689-A.PE.pdf				
2022-06-13-Preliminary-Amendment-PCT-IB2020-061689-CLM.pdf	(2-6)	5	Claims	83 KB
2022-06-13-Preliminary-Amendment-PCT-IB2020-061689-REM.pdf	(7-7)	1	Applicant Arguments/Remarks Made in an Amendment	96 KB
2022-06-13-Declaration-PCT-IB2020-061689.PDF		1	Oath or Declaration filed	710 KB
2022-06-13-POA-82A-PCT-IB2020-061689.PDF		1	Power of Attorney	413 KB
2022-06-13-POA-82B-PCT-IB2020-061689.PDF		1	Power of Attorney	866 KB
2022-06-13-Published-Application-PCT-IB2020-061689.PDF		26	-	1118 KB
2022-06-13-Published-Application-PCT-IB2020-061689-ABST.pdf	(1-2)	2	Abstract	82 KB
2022-06-13-Published-Application-PCT-IB2020-061689-SPEC.pdf	(3-14)	12	Specification	625 KB
2022-06-13-Published-Application-PCT-IB2020-061689-CLM.pdf	(15-17)	3	Claims	146 KB
2022-06-13-Published-Application-PCT-IB2020-061689-DRW.pdf	(18-24)	7	Drawings-only black and white line drawings	210 KB
2022-06-13-Published-	(25-26)	2	Documents submitted with 371	56 KB

Application-PCT-IB2020-061689-371P.pdf		(National Stage) Applications	
2022-06-13-IDS-Pleading-PCT-IB2020-061689.pdf	3	Transmittal Letter	120 KB
2022-06-13-IDS-Form-08a-08b-PCT-IB2020-061689.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	124 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
FP1_CN109998200A.PDF	11	Foreign Reference	408 KB
FP2_EP3291697B1.PDF	18	Foreign Reference	298 KB
FP3_KR1020170123046A.PDF	16	Foreign Reference	392 KB
NPL1_ISR.PDF	9	Non Patent Literature	93 KB
2022-06-13-Transmittal-371-PCT-IB2020-061689.pdf	4	Transmittal of New Application	213 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2022-06-13-ADS-PCT-IB2020-061689.PDF	9284C4A3A36C10733AEAC2C8AC53517A49A0F20772CBC50B0C54C42E9AFA2F41E6514E6C59C00DBB4EC2FC2023E64E26609D37C0332610F6651F16F0F5724518
2022-06-13-EOT-Authorization-PCT-IB2020-061689.pdf	8BC67709C7C4543710AED411EFAE3E76A95025C0AC18D4DFA02761E7A5C762ED30610FAE8D27676B8963C4AD464CD3C5191AE78DA1387D1368FBE6D219AA85FF
2022-06-13-Preliminary-Amendment-PCT-IB2020-	13723886570F8206FFA3C23E6DC89EEF4EB5467EE1B7DF1ED01BAF56ED64B35038AE56022336A6732E0BEC9F05198A6654C

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2022-06-13-Preliminary-Amendment-PCT-IB2020-061689-REM.pdf	37D08DA6B783BB5D954E371151DCBD9B2F57FE7E346CE17C4DE54AEDD414F9EC767A1CEA7C19D5AE8A5129F1F3F8E44BAA8A9CCE818F270C4078F8F5C291D943
2022-06-13-Declaration-PCT-IB2020-061689.PDF	5583CE1917A1B727FB745D2B686CECF384C36BDBDD03A7A349BF10AC02B41FCC75D227611500A6B75DFF944905EB4A4C585C63D4AEB3816632442B6B6A6A2999
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2022-06-13-Published-Application-PCT-IB2020-061689.PDF	FB6D5968DD25331FABEA884C578EF058B57A8198A2DB665499509412B9E01D2D354AAF47F99F85BA890DFA8BDCB1F4A840E2B513E759E33DB2897AE5CA816241
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2022-06-13-Published-Application-PCT-IB2020-061689-SPEC.pdf	0B787306ECCFB8058B885083B21B00DC07C806E4E71E3A14C88BA44044BB9BDCCFAA9E33579DE051E65F61F232870EB3B0088C5BF80D892CB8BEAB4E58C4A4AF
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as

described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Lino DAINESE	Confirmation No.: *To Be Assigned*
Applicant: D-AIR LAB S.R.L.	Art Unit: *To Be Assigned*
Application No.: *To Be Assigned*	Examiner: *To Be Assigned*
371(c) Date: *Herewith*	Atty. Docket: TBD
(U.S. National Phase of Int'l Appl. No. PCT/IB2020/061689; Int'l Filing Date: December 9, 2020)	

Title: **PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE**

Information Disclosure Statement

Mail Stop Amendment

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Commissioner:

Listed on the accompanying IDS Form equivalent to PTO/SB/08a and PTO/SB/08b are documents that may be considered material to the patentability of this application as defined in 37 C.F.R. §1.56, and in compliance with the duty of disclosure requirements of 37 C.F.R. §§ 1.97 and 1.98.

Applicant has listed publication dates on the attached IDS Forms based on information presently available to the undersigned. However, the listed publication dates should not be construed as an admission that the information was actually published on the date indicated.

Applicant reserves the right to establish the patentability of the claimed invention over any of the information provided herewith, and/or to prove that this information may not be prior art, and/or to prove that this information may not be enabling for the teachings purportedly offered.

This statement should not be construed as a representation that a search has been made, or that information more material to the examination of the present patent application does not exist. The Examiner is specifically requested not to rely solely on the material submitted herewith.

Statement under 37 C.F.R. 1.704(d). Each item of information contained in this Information Disclosure Statement: (i) was first cited in any communication from a patent office in a counterpart[1] foreign or international application or from the Office; and this communication was not received by any individual designated in Sec. 1.56(c) more than thirty days prior to the filing of this information disclosure statement;

Filing under 37 C.F.R. § 1.97(b). This Information Disclosure Statement is being filed within three months of the date of entry of the national stage as set forth in 37 C.F.R. § 1.491 in an international application. No statement or fee is required.

A concise explanation of the relevance of the non-English language document(s) appears below in accordance with 37 C.F.R. § 1.98(a)(3).

Document **FP1**, CN 109998200 A, is believed to be in a foreign language. An English language abstract is appended to the face page of document **FP1**.

Document **FP3**, KR 20170123046 A, is believed to be in a foreign language. An English language abstract is appended to the face page of document **FP3**.

Copies of documents **FP1-FP3** and **NPL1** are submitted.

[1] The term counterpart foreign patent application means that a claim for priority has been made in either the U.S. application or a foreign application based on the other, or that the disclosures of the U.S. and foreign patent applications are substantively identical (e.g., an application filed in the European Patent Office claiming the same U.K. priority as claimed in the U.S. application).

It is respectfully requested that the Examiner initial and return a copy of the enclosed IDS Forms, and indicate in the official file wrapper of this patent application that the documents have been considered.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

/Paul A. Calvo, Reg. No. 57913/

Paul A. Calvo
Agent for Applicant
Registration No. 57,913

Date: 6.13.2022

1100 New York Avenue, N.W.
Washington, D.C. 20005-3934
(202) 371-2600

18579428.1

Atty. Dkt. No.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
BW158E		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/IB2020/061689	9 December 2020 (09-12-2020)	13 December 2019 (13-12-2019)
Applicant		
D-AIR LAB S.R.L.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language,** the international search was carried out on the basis of:

[X] the international application in the language in which it was filed

[ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**

[X] the text is approved as submitted by the applicant

[ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

[X] the text is approved as submitted by the applicant

[ ] the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

[X] as suggested by the applicant

[ ] as selected by this Authority, because the applicant failed to suggest a figure

[ ] as selected by this Authority, because this figure better characterizes the invention

b. [ ] none of the figures is to be published with the abstract

ALPINESTARS
Ex. 1002 - Page 284

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2020/061689

A. CLASSIFICATION OF SUBJECT MATTER
INV. A41D13/018 B60R21/239
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A41D B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 3 291 697 B1 (DAINESE SPA [IT]) 5 December 2018 (2018-12-05) cited in the application figure 2	1-19
A	KR 2017 0123046 A (UNIV INDUSTRY FOUNDATION YONSEI UNIV WONJU CAMPUS [KR]) 7 November 2017 (2017-11-07) paragraph [0040] - paragraph [0042]; figures 1a,1b,2	1-19
A	CN 109 998 200 A (KUNSHAN ZHENGGONG MOULD CO LTD) 12 July 2019 (2019-07-12) figures 1-3	1-19

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 February 2021	05/03/2021

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	van Voorst, Frank

Form PCT/ISA/210 (second sheet) (April 2005)

ALPINESTARS
Ex. 1002 - Page 285

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2020/061689

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3291697 B1	05-12-2018	CN 107567401 A	09-01-2018
		EP 3291697 A1	14-03-2018
		ES 2714623 T3	29-05-2019
		JP 6770529 B2	14-10-2020
		JP 2018517599 A	05-07-2018
		US 2018132548 A1	17-05-2018
		WO 2016178143 A1	10-11-2016
KR 20170123046 A	07-11-2017	NONE	
CN 109998200 A	12-07-2019	CN 109008022 A	18-12-2018
		CN 109998200 A	12-07-2019

ALPINESTARS
Ex. 1002 - Page 286

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB2020/061689	09.12.2020	13.12.2019

International Patent Classification (IPC) or both national classification and IPC
INV. A41D13/018 B60R21/239

Applicant
D-AIR LAB S.R.L.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	van Voorst, Frank Telephone No. +31 70 340-0

ALPINESTARS
Ex. 1002 - Page 287

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

ALPINESTARS
Ex. 1002 - Page 288

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-19
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-19
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-19
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1 EP 3 291 697 B1 (DAINESE SPA [IT]) 5 December 2018 (2018-12-05)cited in the application

D2 KR 2017 0123046 A (UNIV INDUSTRY FOUNDATION YONSEI UNIV WONJU CAMPUS [KR]) 7 November 2017 (2017-11-07)

D3 CN 109 998 200 A (KUNSHAN ZHENGGONG MOULD CO LTD) 12 July 2019 (2019-07-12)

2 D1 is regarded as being the prior art closest to the subject-matter of claim1, and discloses (references in parenthesis applying to this document, fig 1-4):

Protective device (1) for the protection of a user, said protective device (1) comprising a mesh structure (3) comprising a first mesh portion (3a) and a second mesh portion (3b) and a plurality of tie elements (5), wherein said first mesh portion (3a) and said second mesh portion (3b) are opposite one another and are connected one another by the plurality of tie elements (5); wherein the first mesh portion (3a), the second mesh portion (3b) and the tie elements (5) define one or more inner housings of the mesh structure;

The subject-matter of claim1 therefore differs from this known protective device in that the protective device (1) includes a casing body (40, 42, 43) arranged at least in an inner housing of said one or more inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in the at least one inner housing of the mesh structure (11, 111), and wherein in said deflated condition, the casing body (40, 42, 43) occupies a first space or first region, and wherein in said deflated condition a second region or second space of said at least one housing lacks a casing body, and wherein in said inflated condition the casing body occupies the second region or second space.

The technical effect of this difference is that the protective device allows an adequate passage of ventilation air (see paragraph [0004]).

The problem to be solved by the present invention may therefore be regarded as the provision of an improved protective device allowing an adequate passage of ventilation air thereby allowing an adequete transpiration in a garment in which it is inserted.

The solution proposed in claim1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: document D1 discloses a casing which surrounds the mesh structure comprising the tie elements. The present invention proposes to insert the casing in between the two opposite mesh portions. Documents D2 and D3 disclose casing bodies comprising a comb structure similar to the casing body depicted in figure 1 of the present application. Documents D2 and D3 do, however, not disclose the mesh structure comprising tie elements according to the present invention.

3 D1 is regarded as being the prior art closest to the subject-matter of claim 15, and discloses (references in parenthesis applying to this document, fig 1-4):

Method for making a protective device (1) for the protection of a user, said method comprising the steps of:
- provide a mesh structure (3) comprising a first mesh portion (3a) and a second mesh portion (3b), opposite the first mesh portion (3a) and a plurality of tie elements (5) connecting the first mesh portion (3a) and the second mesh portion (3b), wherein said first mesh portion (3a) and said second mesh portion (3b) and the plurality of tie elements (5) define one or more housings in the mesh structure (3);

The subject-matter of claim 15 therefore differs from this known method by:
- arranging a casing body (40, 42, 43) in at least one of said housings to form with the mesh structure (11, 111) an inflatable element (12, 112);
- inflate the casing body (40, 42, 43) from a first deflated operating condition to a second inflated operating condition, wherein in said deflated condition, the casing body (40, 42, 43) occupies a first space or region, and wherein in said deflated condition a second region or second space of said at least one housing lacks said casing body, and wherein in said inflated condition the casing body expands and occupies the second region or second space.

The technical effect of this difference is that the protective device allows an adequate passage of ventilation air (see paragraph [0004]).

The problem to be solved by the present invention may therefore be regarded as the provision of an improved protective device allowing an adequate passage of ventilation air thereby allowing an adequete transpiration in a garment in which it is inserted.

The solution proposed in claim 15 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: document D1 discloses a casing which surrounds the mesh structure comprising the tie elements. The present invention proposes to insert the casing in between the two opposite mesh portions. Documents D2 and D3 disclose casing bodies comprising a comb structure similar to the casing body depicted in figure 1 of the present application. Documents D2 and D3 do, however, not disclose the mesh structure comprising tie elements according to the present invention.

4 Claims 2-14 and 16-19 are dependent on claims 1 or 15 and as such also meets the requirements of the PCT with respect to novelty and inventive step.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Lino DAINESE

Applicant: D-AIR LAB S.R.L.

Application No.: *To Be Assigned*

(U.S. national phase of International Appl. No. PCT/IB2020/061689; Int'l Filing Date: 09 December 2020)

Filing Date: *Herewith*

Confirmation No.: *To Be Assigned*

Art Unit: *To Be Assigned*

Examiner: *To Be Assigned*

Atty. Docket: TBD

Title: **PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE**

Preliminary Amendment Under 37 C.F.R. § 1.115

Mail Stop PCT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Commissioner:

In advance of prosecution, Applicant submits the following amendments and remarks.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

It is not believed that extensions of time are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any additional fees required to continue prosecution or appeal of this application (including issue fee, fees for net addition of claims or forwarding to appeal) are hereby authorized to be charged to our Deposit Account No. 19-0036.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently amended) A protective~~Protective~~ device ~~(10, 110)~~ for the protection of a user, said protective device [[(10)]] comprising a mesh structure ~~(11, 111)~~ comprising a first mesh portion ~~(18, 118)~~ and a second mesh portion ~~(19, 119)~~ and a plurality of tie elements [[(5)]], wherein said first mesh portion ~~(18, 118)~~ and said second mesh portion ~~(19, 119)~~ are opposite one another and are connected one another by the plurality of tie elements [[(5)]]; wherein the first mesh portion, the second mesh portion and the tie elements define one or more inner housings of the mesh structure ~~(11, 111)~~;
wherein the protective device ~~(10, 110)~~ includes a casing body ~~(40, 42, 43)~~ arranged at least in an inner housing of said one or more inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in the at least one inner housing of the mesh structure ~~(11, 111)~~, and wherein in said deflated condition, the casing body ~~(40, 42, 43)~~ occupies a first space or first region, and wherein in said deflated condition a second region or second space of said at least one housing lacks a casing body, and wherein in said inflated condition the casing body occupies the second region or second space.

2. (Currently amended) The protective device ~~Protective device (10, 110)~~ according to claim 1, wherein in the inflated condition said casing body is configured to line from the inside, at least partially in contact, the mesh structure ~~(11, 111)~~ and/or that said mesh structure is an external structure of the protective device ~~(10, 110)~~.

3. (Currently amended) The protective device according to claim 1~~Protective device according to claim 1 or 2~~, wherein in said inflated condition the casing body completely occupies the second region or second space and the first region or first space of the housing.

4. (Currently amended) The protective device according to claim 1 ~~Protective device (10, 110)~~

~~according to any one of the preceding claims~~, wherein the deflated condition of the casing body corresponds to a slack and loose condition of the mesh structure ~~(11, 111)~~ and of the tie elements [[(5)]], and wherein to the inflated condition of the casing body corresponds an at least partially tensioned condition of the tie elements (5) and of the first mesh portion ~~(18, 118)~~ and the second mesh portion ~~(19, 119)~~.

5. (Currently amended) The protective device according to claim 1 ~~Protective device (10, 110) according to any one of the preceding claims~~, wherein the tie elements define a plurality of housings between the first mesh portion ~~(18, 118)~~ and the second mesh portion ~~(19, 119)~~ and the casing body ~~(40, 42, 43)~~ comprises a plurality of portions ~~(40a)~~ each arranged in a corresponding housing of said housings.

6. (Currently amended) The protective device according to claim 1 ~~Protective device (10, 110) according to any one of the preceding claims~~, wherein the housings have the shape of channels and are arranged side by side one another and each one intended to house a corresponding casing body or casing body portion, and wherein in inflated condition, the casing bodies are inflated against each other so as to form a planar structure.

7. (Currently amended) The protective device according to claim 1 ~~Protective device (10, 110) according to any one of the preceding claims~~, wherein the casing body ~~(40, 42, 43)~~ has a hand or comb or tree shape, or has tubular shape arranged in a serpentine way.

8. (Currently amended) The protective device according to claim 1 ~~Protective device (10, 110) according to any one of the preceding claims~~, wherein the tie elements [[(5)]] are arranged between said first mesh portion ~~(18, 118)~~ and said second mesh portion ~~(19, 119)~~ aligned in a plurality of rows ~~(24)~~ of tie elements [[(5)]].

9. (Currently amended) The protective device ~~Protective device (10)~~ according to claim 6, wherein each row ~~(24)~~ of tie elements [[(5)]] of the plurality of rows of tie elements [[(5)]] comprises a

plurality of tie elements [[(5)]] wherein in a condition of at least partial tension, the tie elements [[(5)]] belonging to the same row ~~(24)~~ of tie elements [[(5)]] are arranged substantially parallel to each other.

10. (Currently amended) The protective device according to claim 1 ~~Protective device (10, 110) according to any one of the preceding claims~~, wherein an inflated condition of the casing body corresponds to an inflated condition of protection of the inflatable element, and a deflated condition corresponds to a rest condition of the inflatable element, and wherein in said deflated condition the second region of said at least one housing is apt to allow a passage of air between the first mesh portion and the second mesh portion passing through the second region of said at least one housing.

11. (Currently amended) The protective device according to claim 1 ~~Protective device (10, 110) according to any one of the preceding claims~~, comprising a gas source ~~(15)~~ or inflation source connected to the inflatable casing body.

12. (Currently amended) The protective device according to claim 1 ~~Device according to any one of claims 1 to 11~~, wherein said device is a wearable device ~~or use of said device according to any one of claims 1 to 11 on a user~~.

13. (Currently amended) A protective garment ~~Protective garment (50)~~ or clothing accessory comprising [[a]] the protective device according to claim 1 ~~(10) according to any of the preceding claims~~.

14. (Currently amended) The protective garment ~~Protective garment (50)~~ according to claim 12, wherein said protective garment ~~(50)~~ 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 housings.

15. (Currently amended) A method ~~Method~~ for making a protective device ~~(10)~~ for the protection

of a user, said method comprising the steps of:

- providing ~~provide~~ a mesh structure ~~(11, 111)~~ comprising a first mesh portion ~~(18, 118)~~ and a second mesh portion ~~(19, 119)~~, opposite the first mesh portion ~~(18, 118)~~, and a plurality of tie elements [[(5)]] connecting the first mesh portion ~~(18, 118)~~ and the second mesh portion ~~(19, 119)~~, wherein said first mesh portion ~~(18, 118)~~ and said second mesh portion ~~(19, 119)~~ and the plurality of tie elements [[(5)]] define one or more housings in the mesh structure ~~(11, 111)~~;
- arranging a casing body ~~(40, 42, 43)~~ in at least one of said housings to form with the mesh structure ~~(11, 111)~~ an inflatable element ~~(12, 112)~~; and
- inflating~~inflate~~ the casing body ~~(40, 42, 43)~~ from a first deflated operating condition to a second inflated operating condition, wherein in said deflated condition, the casing body ~~(40, 42, 43)~~ occupies a first space or region, and wherein in said deflated condition a second region or second space of said at least one housing lacks said casing body, and wherein in said inflated condition the casing body expands and occupies the second region or second space.

16. (Currently amended) The method according to claim 15 ~~Method according to the preceding claim~~, wherein the casing body is inflated until the tie elements [[(5)]] and the mesh structure ~~(11, 111)~~ are tensioned and/or until the casing body is at least partially adhered to the first mesh portion ~~(18, 118)~~ and the second mesh portion ~~(19, 119)~~.

17. (Currently amended) The method according to claim 15~~Method according to claim 15 or 16~~, wherein the tie elements [[(5)]] are arranged to form a plurality of side-by-side housings and wherein portions of the casing body or a plurality of casing bodies are arranged side by side one another, and wherein in said inflated condition portions of casing body or a plurality of casing bodies push against each other to form a planar structure.

18. (Currently amended) The method according to claim 15 ~~Method according to any one of the preceding claims 15 to 17~~, the casing body is inflated until the mesh structure is tensioned and the mesh structure ~~(11, 111)~~ bridles and prevents a further expansion of the casing body.

19. (Currently amended) The method according to claim 15 ~~Method according to any one of claims 15 to 18~~, wherein in said deflated condition the second region of said at least one housing allows an air passage between the first mesh portion and the second mesh portion passing through the second region.

Remarks

Upon entry of the foregoing amendment, claims 1-19 are pending in the application, with claims 1 and 15 being the independent claims. Claims 1-19 are sought to be amended to remove multiple dependencies and to place the claims in proper US format. Support for the amendments and new claim can be found throughout the specification, *inter alia,* in the claims as originally filed.

Conclusion

Prompt and favorable consideration of this Preliminary Amendment is respectfully requested. Applicant believes the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Respectfully submitted,

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18573880.1

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2020/061689

A. CLASSIFICATION OF SUBJECT MATTER
INV. A41D13/018 B60R21/239
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A41D B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 3 291 697 B1 (DAINESE SPA [IT]) 5 December 2018 (2018-12-05) cited in the application figure 2	1-19
A	KR 2017 0123046 A (UNIV INDUSTRY FOUNDATION YONSEI UNIV WONJU CAMPUS [KR]) 7 November 2017 (2017-11-07) paragraph [0040] - paragraph [0042]; figures 1a,1b,2	1-19
A	CN 109 998 200 A (KUNSHAN ZHENGGONG MOULD CO LTD) 12 July 2019 (2019-07-12) figures 1-3	1-19

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 February 2021	05/03/2021

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	van Voorst, Frank

Form PCT/ISA/210 (second sheet) (April 2005)

ALPINESTARS
Ex. 1002 - Page 300

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2020/061689

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3291697 B1	05-12-2018	CN 107567401 A	09-01-2018
		EP 3291697 A1	14-03-2018
		ES 2714623 T3	29-05-2019
		JP 6770529 B2	14-10-2020
		JP 2018517599 A	05-07-2018
		US 2018132548 A1	17-05-2018
		WO 2016178143 A1	10-11-2016
KR 20170123046 A	07-11-2017	NONE	
CN 109998200 A	12-07-2019	CN 109008022 A	18-12-2018
		CN 109998200 A	12-07-2019

ALPINESTARS
Ex. 1002 - Page 301

Espacenet

KR20170123046A FALL PROTECTION AIRBAGS

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Classifications:

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CPC **A41D13/015 (KR); A41D13/018 (KR); A41D13/0506 (KR); A41D13/0525 (KR); A41D13/0537 (KR); A62B35/04 (KR);**

Priorities: KR20160052193A 2016-04-28

Application: KR20160052193A·2016-04-28

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FALL PROTECTION AIRBAGS

Abstract

A fall preventing airbag is disclosed, including: an air bag inner skin which receives gas from an airbag gas injection device; an airbag outer skin for accommodating the airbag inner skin thereinside; and an airbag belt worn on the waist of a user and on which the airbag outer skin is mounted on the back of the user. The airbag inner skin includes: a longitudinally corresponding expanding portion extending in a vertical direction; and a plurality of laterally corresponding expanding portions branched and extending from the longitudinally corresponding expanding portion in a lateral direction, and spaced apart from each other at a predetermined interval in a vertical direction.

ALPINESTARS
Ex. 1002 - Page 302

(19) 대한민국특허청(KR)
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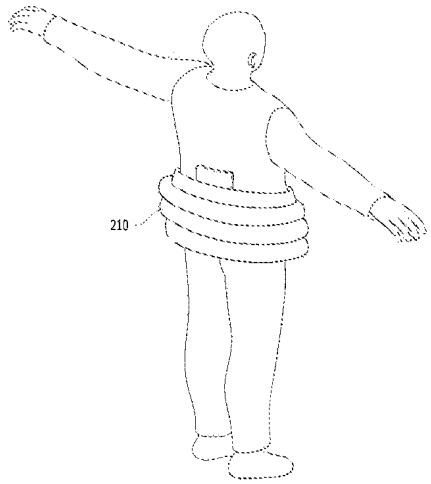
전체 청구항 수 : 총 18 항

(54) 발명의 명칭 **낙상 보호 에어백**

(57) 요 약

낙상 방지 에어백이 개시되며, 본원의 낙상 방지 에어백은 에어백 가스주입장치로부터 가스를 주입받는 에어백 내피와, 상기 에어백 내피를 내측에 수용하는 에어백 외피 및 사용자의 허리에 착용되고, 상기 에어백 외피가 사용자의 등쪽에 장착되는 에어백 벨트를 포함하고, 상기 에어백 내피는, 상하 방향으로 연장 형성되는 종 방향 대응 팽창부와 상기 종 방향 대응 팽창부로부터 횡 방향으로 분기하여 연장되고, 상하 방향으로 간격을 두고 복수개 구비되는 횡 방향 대응 팽창부를 포함할 수 있다.

대 표 도 - 도3



ALPINESTARS
Ex. 1002 - Page 303

(52) CPC특허분류
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연구과제명 움직임 감지 센서 시스템을 이용한 고령자의 낙상 예측 알고리즘 및 보호 에어백 개발
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ALPINESTARS
Ex. 1002 - Page 304

명 세 서

청구범위

청구항 1

팽창용 가스가 주입되는 에어백 내피;

상기 에어백 내피를 내측에 수용하는 에어백 외피; 및

상기 에어백 외피가 사용자의 뒤편에 장착되도록 사용자의 허리에 착용되는 에어백 벨트를 포함하고,

상기 에어백 내피는,

상하 방향으로 연장 형성되는 종 방향 대응 팽창부; 및

상기 종 방향 대응 팽창부로부터 횡 방향으로 분기하여 연장되고, 상하 방향으로 간격을 두고 복수개 구비되는 횡 방향 대응 팽창부를 포함하는 것인, 낙상 보호 에어백.

청구항 2

제1항에 있어서,

상기 에어백 외피는, 상기 에어백 내피의 팽창시 형성되는 압력이 상승되도록 상기 에어백 내피의 신축률보다 작은 신축률을 갖는 것인, 낙상 보호 에어백.

청구항 3

제1항에 있어서,

상기 에어백 외피는 팽창시 사용자의 골반을 감싸는 형태로 팽창되는 것인, 낙상 보호 에어백.

청구항 4

제3항에 있어서,

상기 에어백 벨트는 상기 에어백 외피가 사용자의 골반을 감싸는 형태로 팽창되도록 가이드 하는 것인, 낙상 보호 에어백.

청구항 5

제1항에 있어서,

상기 에어백 외피는 최대 팽창부피를 제한 가능한 직물소재로 구비되는 것인, 낙상 보호 에어백.

청구항 6

제1항에 있어서,

상기 에어백 내피는 우레탄 소재로 구비되는 것인, 낙상 보호 에어백.

청구항 7

제 1 항에 있어서,

상기 에어백 외피는 지퍼부를 포함하고,

상기 에어백 내피는, 상기 지퍼부를 통해 상기 에어백 외피 내부에 삽입되는 것인 낙상 보호 에어백.

청구항 8

제 1 항에 있어서,

ALPINESTARS
Ex. 1002 - Page 305

상기 종 방향 대응 팽창부의 일단에는 에어백 가스주입장치가 연결되고,

상기 에어백 외피는 상기 종 방향 대응 팽창부의 일단 및 상기 에어백 가스주입장치가 수용되는 수납부를 포함하는 것인, 낙상 보호 에어백.

청구항 9

제1항에 따른 낙상 보호 에어백; 및

상기 낙상 보호 에어백의 에어백 내피에 가스를 주입 가능하도록 장착되는 에어백 가스주입장치를 포함하는 낙상 보호 에어백 장치.

청구항 10

제 9 항에 있어서,

상기 에어백 가스주입장치는,

외부의 충격을 감지하는 센서부;

상기 센서부의 감지에 따라 구체를 격발하는 격발부;

격발된 상기 구체가 이동하는 이동경로와, 상기 이동경로의 말단에 배치되는 공이를 포함하는 인플레이터; 및

상기 에어백 내피를 팽창시키는 압축가스를 포함하는 카트리지를 포함하되,

격발된 상기 구체의 상기 공이의 타격에 의해, 상기 카트리지는 커버가 파열되어 상기 압축가스를 배출하는 것인, 낙상 보호 에어백 장치.

청구항 11

제 10 항에 있어서,

상기 공이의 말단인 뾰족한 부분은 상기 커버와 대향하고, 상기 구체는 격발되어 상기 공이의 배면을 타격하는 것인 낙상 보호 에어백 장치.

청구항 12

제 10 항에 있어서,

상기 인플레이터는,

상기 커버가 상기 공이의 말단과 대향하여 배치되도록 상기 카트리지와 탈착가능하게 결합되는 연결부; 및

상기 커버와 상기 공이 사이에 형성되고 상기 에어백 내피와 연결되는 주입구를 더 포함하는 것인 낙상 보호 에어백 장치.

청구항 13

제 10 항에 있어서,

상기 격발부는,

상기 구체의 상기 이동경로 진입을 방지하도록 상기 구체를 선택적으로 고정하는 트리거 유닛;

상기 트리거 유닛에 구동력을 제공하는 구동력 제공유닛; 및

상기 구체의 고정 해제시 상기 구체에 대한 격발력을 제공할 수 있도록 상기 구체가 고정된 상태에서 압축 상태를 유지하는 탄성 부재를 포함하고,

상기 트리거 유닛의 구동에 의해, 상기 구체는 고정이 해제되어 격발되는 것인 낙상 보호 에어백 장치.

청구항 14

제 10 항에 있어서,

ALPINESTARS
Ex. 1002 - Page 306

상기 센서부는,

인체의 낙상을 감지하여 낙상 신호를 생성하는 낙상 센서를 포함하되,

상기 격발부는 상기 낙상 신호에 대응하여 전원을 공급받아 구동되는 것인 낙상 보호 에어백 장치.

청구항 15

제 10 항에 있어서,

상기 이동경로는, 격발된 상기 구체가 선회되도록 소정의 곡률반경을 갖는 곡선경로를 포함하는 것인 낙상 보호 에어백 장치.

청구항 16

제 15 항에 있어서,

상기 곡선경로는, 격발된 상기 구체가 진입되는 상기 이동경로의 선단과, 상기 공이가 배치되는 상기 이동경로의 말단이 동일한 일측에 위치하도록 구부러져 형성되는 경로인 것인 낙상 보호 에어백 장치.

청구항 17

제 10 항에 있어서,

상기 카트리지 및 상기 센서부를 수용하는 보호 하우징을 더 포함하는 낙상 보호 에어백 장치.

청구항 18

제 17 항에 있어서,

상기 센서부는 상기 이동경로의 선단 측에 배치되고,

상기 카트리지는 상기 이동경로의 말단 측에 배치되며,

상기 이동경로의 곡선경로는 상기 센서부와 상기 카트리지가 서로 이웃하도록 소정의 곡률반경을 가지고 구부러져 형성되는 것인, 낙상 보호 에어백 장치.

발명의 설명

기 술 분 야

[0001] 본원은 낙상 보호 에어백에 관한 것이다.

배 경 기 술

[0002] 일반적으로 거동이 불편한 노약자나 환자들은 건강한 젊은 사람에 비해 신체가 많이 쇠약해진 상태이기 때문에 계단이나 언덕과 같은 경사진 장소 및 겨울철 빙판길과 같은 위험한 장소는 물론이고, 거실이나 병원 내부 또는 바닥이 평평하고 고른 평지와 같은 비교적 안전한 장소에서도 직접 걸어서 이동시 균형을 잃어 넘어지는 낙상사고가 빈번하게 발생할 수 있다.

[0003] 이러한 사태를 방지하기 위하여 외부충격으로부터 노인들을 보호하는 장비들이 연구되고 있다. 종래에는 공기층이 구비된 의류가 제안된 바 있다. 그러나 일상생활을 하는 노인들의 의류에는 일정 수준의 착용감과 활동성이 보장될 필요가 있는데, 의류에 구비된 공기층에 의해 이러한 조건을 만족하지 못하는 문제점이 발생한다. 특히 사용자가 의류에 구비된 공기층으로 인해 이물감 및 불편한 착용감을 느끼게 되므로, 실용적이지 못한 점이 있다.

[0004] 본원의 배경이 되는 기술은 한국공개특허공보 제2006-7003685호(2006.11.08 공개)에 개시되어 있다.

발명의 내용

해결하려는 과제

[0005] 본원은 전술한 종래 기술의 문제점을 해결하기 위한 것으로서, 낙상으로부터 인체를 보호할 수 있는 충분한 압

ALPINESTARS
Ex. 1002 - Page 307

력 및 효율적인 형태를 가지도록 단시간에 팽창될 수 있는 낙상 보호 에어백을 제공하는 것을 목적으로 한다.

[0006] 본원은 전술한 종래 기술의 문제점을 해결하기 위한 것으로서, 골반의 둘레를 충격으로부터 보호할 수 있는 낙상 보호 에어백을 제공하는 것을 목적으로 한다.

[0007] 다만, 본원의 실시예가 이루고자 하는 기술적 과제는 상기된 바와 같은 기술적 과제들도 한정되지 않으며, 또 다른 기술적 과제들이 존재할 수 있다.

과제의 해결 수단

[0008] 상기한 기술적 과제를 달성하기 위한 기술적 수단으로서, 본원의 일 실시예에 따른 낙상 보호 에어백은, 에어백 가스주입장치로부터 가스를 주입받는 에어백 내피, 상기 에어백 내피를 내측에 수용하는 에어백 외피 및 사용자의 허리에 착용 되고, 상기 에어백 외피가 사용자의 등 쪽에 장착되는 에어백 벨트를 포함하고, 상기 에어백 내피는, 상하 방향으로 연장 형성되는 종 방향 대응 팽창부 및 상기 종 방향 대응 팽창부로부터 횡 방향으로 분기하여 연장되고, 상하 방향으로 간격을 두고 복수개 구비되는 횡 방향 대응 팽창부를 포함할 수 있다.

[0009] 본원의 일 실시예에 따르면, 상기 에어백 외피는, 상기 에어백 내피의 팽창시 형성되는 압력이 상승되도록 상기 에어백 내피의 신축률보다 작은 신축률을 가질 수 있다.

[0010] 본원의 일 실시예에 따르면, 상기 에어백 외피는 팽창시 사용자의 골반을 감싸는 형태로 팽창될 수 있다.

[0011] 본원의 일 실시예에 따르면, 상기 에어백 벨트는 상기 에어백 외피가 사용자의 골반을 감싸는 형태로 팽창되도록 가이드 할 수 있다.

[0012] 본원의 일 실시예에 따르면, 상기 에어백 외피는 최대 팽창부피를 제한 가능한 직물소재로 구비될 수 있다.

[0013] 본원의 일 실시예에 따르면, 상기 에어백 내피는 우레탄 소재로 구비될 수 있다.

[0014] 본원의 일 실시예에 따르면, 상기 에어백 외피는, 지퍼부를 포함하고, 상기 에어백 내피는, 상기 지퍼부를 통해 상기 에어백 외피 내부에 삽입될 수 있다.

[0015] 본원의 일 실시예에 따르면, 상기 종 방향 대응 팽창부의 일단에는 에어백 가스주입장치가 연결되고, 상기 에어백 외피는 상기 종 방향 대응 팽창부의 일단 및 상기 에어백 가스주입장치가 수용되는 수납부를 포함할 수 있다.

[0016] 본원의 다른 실시예에 따른 낙상 방지 에어백은, 에어백 가스주입장치, 상기 에어백 가스주입장치로부터 가스를 주입받는 에어백 내피, 상기 에어백 내피를 내측에 수용하는 에어백 외피 및 사용자의 허리에 착용 되고, 상기 에어백 외피가 사용자의 등 쪽에 장착되는 에어백 벨트를 포함하고, 상기 에어백 내피는, 상하 방향으로 연장 형성되는 종 방향 대응 팽창부; 및 상기 종 방향 대응 팽창부로부터 횡 방향으로 분기하여 연장되고, 상하 방향으로 간격을 두고 복수개 구비되는 횡 방향 대응 팽창부를 포함할 수 있다.

[0017] 본원의 다른 실시예에 따르면, 상기 에어백 가스주입장치는, 외부의 충격을 감지하는 센서부, 상기 센서부의 감지에 따라 구체를 격발하는 격발부, 격발된 상기 구체가 이동하는 이동경로와, 상기 이동경로의 말단에 배치되는 공이를 포함하는 인플레이터 및 상기 에어백 내피를 팽창시키는 압축가스를 포함하는 카트리지를 포함하되, 격발된 상기 구체의 상기 공이의 타격에 의해, 상기 카트리지는 커버가 파절되어 상기 압축가스를 배출할 수 있다.

[0018] 상술한 과제 해결 수단은 단지 예시적인 것으로서, 본원을 제한하려는 의도로 해석되지 않아야 한다. 상술한 예시적인 실시예 외에도, 도면 및 발명의 상세한 설명에 추가적인 실시예가 존재할 수 있다.

발명의 효과

[0019] 전술한 본원의 과제 해결 수단에 의하면, 에어백 내피가 종 방향 대응 팽창부 및 그로부터 분기되는 횡 방향 대응 팽창부를 가지도록 구비됨으로써, 낙상 이전에 낙상으로부터 인체를 보호할 수 있는 충분한 압력에 신속하게 도달할 수 있고, 팽창시 골반 등을 감쌀 수 있는 효율적인 팽창 형태를 갖출 수 있다.

[0020] 또한, 전술한 본원의 과제 해결 수단에 의하면, 팽창되는 내피를 수용하는 외피를 구비하여, 낙상으로 인한 충격 발생시 내피의 손상을 방지하여 내피의 팽창이 유지될 수 있는 낙상 보호 에어백을 제공할 수 있다.

[0021] 또한, 전술한 본원의 과제 해결 수단에 의하면, 에어백 벨트가 에어백 외피를 골반을 감싸는 형태로 팽창되도록

ALPINESTARS
Ex. 1002 - Page 308

가이드 하여 골반의 둘레를 충격으로부터 보호할 수 있는 낙상 보호 에어백을 제공할 수 있다.

도면의 간단한 설명

[0022] 도 1a는 본원의 일 실시예에 따른 낙상 보호 에어백의 에어백 내피의 팽창된 상태를 도시한 도면이다.

도 1b는 본원의 일 실시예에 따른 낙상 보호 에어백의 에어백 내피의 팽창되지 않은 상태를 도시한 도면이다.

도 2는 본원의 일 실시예에 따른 낙상 보호 에어백의 에어백 외피를 도시한 도면이다.

도 3은 본원의 일 실시예에 따른 낙상 보호 에어백을 착용한 사시도이다.

도 4는 본원의 일 실시예에 따른 에어백 가스주입장치의 블록도이다.

도 5는 본원의 일 실시예에 따른 에어백 가스주입장치의 단면도이다.

도 6은 본원의 일 실시예에 따른 에어백 가스주입장치의 사시도이다.

도 7a는 본원의 일 실시예에 따른 트리거 유닛의 고정상태를 도시한 에어백 가스주입장치의 단면도이다.

도 7b는 본원의 일 실시예에 따른 트리거 유닛의 고정 해제 상태를 도시한 에어백 가스주입장치의 단면도이다.

발명을 실시하기 위한 구체적인 내용

[0023] 아래에서는 첨부한 도면을 참조하여 본원이 속하는 기술 분야에서 통상의 지식을 가진 자가 용이하게 실시할 수 있도록 본원의 실시예를 상세히 설명한다. 그러나 본원은 여러 가지 상이한 형태로 구현될 수 있으며 여기에서 설명하는 실시예에 한정되지 않는다. 그리고 도면에서 본원을 명확하게 설명하기 위해서 설명과 관계없는 부분은 생략하였으며, 명세서 전체를 통하여 유사한 부분에 대해서는 유사한 도면 부호를 붙였다.

[0024] 본원 명세서 전체에서, 어떤 부분이 다른 부분과 "연결"되어 있다고 할 때, 이는 "직접적으로 연결"되어 있는 경우뿐 아니라, 그 중간에 다른 소자를 사이에 두고 "전기적으로 연결"되어 있는 경우도 포함한다.

[0025] 본원 명세서 전체에서, 어떤 부재가 다른 부재 "상에", "상부에", "상단에", "하에", "하부에", "하단에" 위치하고 있다고 할 때, 이는 어떤 부재가 다른 부재에 접해 있는 경우뿐 아니라 두 부재 사이에 또 다른 부재가 존재하는 경우도 포함한다.

[0026] 본원 명세서 전체에서, 어떤 부분이 어떤 구성요소를 "포함" 한다고 할 때, 이는 특별히 반대되는 기재가 없는 한 다른 구성요소를 제외하는 것이 아니라 다른 구성 요소를 더 포함할 수 있는 것을 의미한다.

[0027] 본원은 낙상 보호 에어백에 관한 것이다. 낙상 보호 에어백은 에어백 가스주입장치(10)가 낙상을 감지하면, 압축가스를 주입받아 사용자가 바닥 면에 닿기 전에 팽창하여 낙상으로 인한 충격을 완화 시킬 수 있다. 상기 낙상 보호 에어백은 허리에 착용하여 낙상 시 허리와 골반을 보호할 수 있다.

[0028] 본원의 낙상 보호 에어백은 에어백 내피(110), 에어백 외피(210), 에어백 벨트(220)를 포함할 수 있다.

[0029] 도 1a는 본원의 일 실시예에 따른 팽창된 에어백 내피를 도시한 도면이고, 도 1b는 본원의 일 실시예에 따른 팽창되지 않은 에어백 내피를 도시한 도면이다.

[0030] 도 1a를 참조하면, 에어백 내피(110)는 팽창용 가스를 주입받는 구성이다. 도 1a는 에어백 가스주입장치(10)에 의해 팽창된 에어백 내피(110)를 도시한다. 예시적으로, 에어백 내피(110)는 에어백 가스주입장치(10)로부터 배출되는 압축가스를 통해 팽창될 수 있다. 에어백 내피(110)는 비닐 소재(예를 들면, 우레탄 소재)로 구비될 수 있다. 상기 압축가스는 에어백 가스주입장치(10)의 카트리지에서 배출될 수 있는데, 카트리지에서 저온 고압의 압축가스가 배출될 수 있다. 따라서, 에어백 내피(110)는 저온 고압의 압축가스에 의해 파손되지 않는 우레탄 소재로 형성될 수 있다. 상기 우레탄 소재는 압축가스의 저온 고압을 견딜 수 있을 뿐만 아니라 충분한 연신율을 가지므로, 주입되는 압축가스에 대응하여 에어백 내피(110)의 부피가 팽창될 수 있다. 상기 에어백 내피(110)는 우레탄 소재 이외에도, 저온 고압에 의해 파손되지 않고 소정의 연신율을 가지는 소재로 형성될 수 있다.

[0031] 도 1b는 팽창되기 이전의 에어백 내피(110)를 도시한다. 도 1b를 참조하면, 에어백 내피(110)는 상하 방향으로 연장 형성되는 종 방향 대응 팽창부(111)를 포함할 수 있다. 이때 상하 방향이란 도 1b를 기준으로 12시 방향이 상향을 의미할 수 있고, 6시 방향이 하향을 의미할 수 있다. 본원에서 상하 방향은 인체 착용시 척추의 연장 방향에 대응하는 방향을 의미하는 것으로 이해될 수도 있을 것이다. 이러한 방향과 관련하여 설정된 용어들은 본

ALPINESTARS
Ex. 1002 - Page 309

명세서 전반에서 동일 내지 유사한 개념으로 사용된다. 종 방향 대응 팽창부(111)의 일단에는 에어백 가스주입장치(10)가 연결될 수 있다. 예시적으로, 도 1a에 도시된 바와 같이 에어백 가스주입장치(10)는 종 방향 대응 팽창부(111)의 상단에 연결될 수 있다. 에어백 내피(110)는 종 방향 대응 팽창부(111)에 연결된 에어백 가스주입장치(10)로부터 주입된 압축가스를 통해 종 방향 대응 팽창부(111) 및 후술하는 횡 방향 대응 팽창부(112)가 팽창될 수 있다.

[0032] 에어백 내피(110)는 종 방향 대응 팽창부(111)로부터 횡 방향으로 분기하여 연장되고, 상하 방향으로 간격을 두고 복수개 구비되는 횡 방향 대응 팽창부(112)를 포함할 수 있다. 횡 방향 대응 팽창부(112)는 도 1b에 도시된 바와 같이, 종 방향 대응 팽창부(111)와 직교하는 좌측 또는 우측 방향으로 분기되고, 각 방향으로 연장되어 형성될 수 있다. 상기 좌측 및 우측 방향이란, 도 1b를 기준으로 9시 방향이 좌측 방향, 3시 방향이 우측 방향을 의미할 수 있다. 즉 횡 방향 대응 팽창부(112)는 종 방향 대응 팽창부(111)를 기준으로 좌측 또는 우측 분기하고 연장되어 형성될 수 있다.

[0033] 또한, 횡 방향 대응 팽창부(112)는 상하 방향으로 간격을 두고 복수개 구비될 수 있다. 예시적으로, 도 1b를 참조하면, 횡 방향 대응 팽창부(112)는 상하 방향으로 간격을 두고 이웃하여 3개 형성 될 수 있으나 이에 한정되는 것은 아니다.

[0034] 본원의 일 실시예에 따르면, 에어백 내피(110)는 종 방향 대응 팽창부(111) 및 종 방향 대응 팽창부(111)에서 분기된 횡 방향 대응 팽창부(112)를 포함함으로써, 주입되는 압축가스에 의해 일정한 크기로 팽창할 수 있고, 에어백 내피(110)의 압력이 일정하게 형성될 수 있다. 예시적으로, 에어백 내피(110)가 분기되지 않은 일체형으로 형성된 경우, 가장자리 영역에 비해 중심 영역이 과도하게 팽창할 수 있다. 이는 에어백 내피(110)의 압력이 중심 영역에 집중되는 것을 의미할 수 있다. 예를 들어, 낙상시 에어백 내피(110)의 가장자리 영역이 먼저 바닥면에 닿은 경우, 가장자리 영역은 충격을 흡수하기 위한 충분한 압력을 가지지 못하므로, 사용자의 안전을 보장할 수 없다. 더욱이, 낙상시 에어백 내피(110)의 중심 영역이 먼저 바닥 면에 닿는 경우라 하더라도, 에어백 내피(110) 내부의 압력과, 사용자의 체중에 의한 압력이 더해져, 충격을 흡수하지 못하고 터져버리는 불상사가 발생할 수도 있다.

[0035] 따라서, 도 1a에 도시된 바와 같이 에어백 내피(110)가 상하 및 좌우 방향으로 분기된 종 방향 대응 팽창부(111) 및 횡 방향 대응 팽창부(112)를 포함함으로써, 에어백 내피(110)의 두께 내지 부피가 전체적으로 소정 이하로 제한될 수 있어, 낙상으로부터 보호하는 충분한 압력이 형성되는데 소요되는 시간을 크게 단축할 수 있다.

[0036] 본원의 일 실시예에 따르면, 에어백 내피(110)의 둘레 즉 가장자리는 초음파 융착으로 (양면이) 접착될 수 있다. 에어백 내피(110)는 상기 초음파 융착으로 접착됨으로써, 저온 고압으로 주입되는 압축가스에 의해 접착부위가 손상되는 것을 방지될 수 있다.

[0037] 도 2는 본원의 일 실시예에 따른 에어백 외피를 도시한 도면이다.

[0038] 도 2를 참조하면 에어백 외피(210)는 에어백 벨트(220)와 함께 사용자에 장착될 수 있다. 에어백 벨트(220)는 에어백 외피(210)가 사용자의 뒤편에 장착되도록 사용자의 허리에 착용 될 수 있다. 또한, 에어백 벨트(220)는 도 2에 도시된 바와 같이 양단에 벨크로(221)를 포함할 수 있다. 에어백 벨트(220)는 허리를 감쌀 수 있고, 한 쌍의 벨크로(221)의 암수 결합을 통해 사용자의 허리에 착용 될 수 있다.

[0039] 에어백 외피(210)는 에어백 내피(110)를 내측에 수용할 수 있다. 에어백 외피(210)는 내부에 형성된 공간으로 에어백 내피(110)를 수용할 수 있다. 에어백 외피(210)가 에어백 내피(110)를 내측에 수용함으로써, 낙상시 바닥 면에 의한 에어백 내피(110)의 손상을 방지할 수 있다. 예시적으로, 에어백 외피(210)가 구비되지 않은 경우, 에어백 내피(110)가 외부에 노출되므로, 바닥면에 날카로운 물체에 의해 낙상시 에어백 내피(110)가 손상되어 완충기능을 수행하지 못할 수도 있다. 따라서, 압축가스로 팽창되는 에어백 내피(110)와, 에어백 내피(110)를 내부에 수용하고, 보호하는 에어백 외피(210)를 구비함으로써, 충격이 발생하더라도, 에어백 내피(110)가 팽창된 상태를 유지할 수 있으므로, 충격이 흡수 또는 완화될 수 있다.

[0040] 도 2를 참조하면, 에어백 외피(210)는 지퍼부(211)를 포함하고, 에어백 내피(110)는 지퍼부(211)를 통해 에어백 외피(210) 내부에 삽입될 수 있다. 예시적으로, 에어백 내피(110)는 연결된 에어백 가스주입장치(10)의 카트리지의 압축가스가 소진된 경우, 에어백 외피(210)로부터 분리될 수 있다. 이후 에어백 가스주입장치(10)는 새로운 카트리지로 교환하여 에어백 내피(110)에 연결될 수 있고, 에어백 내피(110)는 지퍼부(211)를 통해 에어백 외피(210)의 내측에 삽입될 수 있다.

[0041] 에어백 외피(210)는 종 방향 대응 팽창부(111)의 일단 및 에어백 가스주입장치(10)가 수용되는 수납부(212)를

ALPINESTARS
Ex. 1002 - Page 310

포함할 수 있다. 수납부(212)는 종 방향 대응 팽창부(111)와 연결된 에어백 가스주입장치(10)를 수용하기 위해, 도 2에 도시된 바와 같이 에어백 외피(210)의 일부가 돌출 형성될 수 있다. 예시적으로, 수납부(212)는 에어백 벨트(220) 착용시 사용자의 척추 부분과 대응하는 위치에 형성될 수 있다.

[0042] 에어백 외피(210)는 에어백 내피(110)의 팽창시 형성되는 압력이 상승되도록 에어백 내피(110)의 신축률보다 작은 신축률을 가질 수 있다. 에어백 외피(210)는 에어백 내피(110)보다 작은 신축률을 가짐으로써, 에어백 내피(110)가 에어백 외피(210)의 신축률에 의해 제한받는 부피 한도 내에서 팽창되기 때문에, 에어백 내피(110)가 제한된 부피 한도까지 팽창되고 나면 그 이후에는 에어백 내피(110) 내부의 압력이 상승되어 에어백 내피(110)가 낙상 보호에 적정한 팽팽한 상태에 도달하게 될 수 있다. 에어백 외피(210)는 최대 팽창부피를 제한 가능한 직물 소재로 구비될 수 있다. 예시적으로, 에어백 외피(210)는 신축률이 낮고 얇은 직물 소재로 구비됨으로써, 에어백 내피(110)의 최대 팽창부피를 제한할 수 있다. 이로 인해, 에어백 내피(110)에 압축가스 주입시 에어백 내피(110) 내부에 높은 압력이 신속하게 형성될 수 있다. 에어백 내피(110)에 형성된 고압력은 낙상시 인체를 보호하여 바닥면으로부터 가해지는 충격을 완화시킬 수 있다.

[0043] 도 3은 본원의 일 실시예에 따른 낙상 보호 에어백을 착용한 사시도이다. 도 3을 참조하면, 에어백 가스주입장치(10)에 의해 팽창된 낙상 보호 에어백은 사용자의 골반을 보호할 수 있다. 에어백 외피(210)는 팽창시 골반을 감싸는 형태로 팽창될 수 있다. 예시적으로 도 3을 참조하면, 에어백 외피(210)는 팽창시 골반을 감싸도록 곡선의 형태로 형성될 수 있다. 예를 들어, 에어백 외피(210)는 팽창시 외측면이 내측면 측으로 휘어지는 곡선 형태를 띄도록 내측면이 외측면보다 짧은 둘레를 가지도록 제조될 수 있다. 에어백 외피(210)가 곡선 형태로 형성됨에 따라 에어백 내피(110) 또한 골반을 감싸는 곡선의 형태로 굽혀질 수 있다.

[0044] 다시 도 1a를 참조하면, 에어백 내피(110)는 소정 이상의 신축률을 가지므로, 팽창시의 형태가 원하는 형태로 제한되기 어려울 수 있으며, 이에 따라 직선 형태로 팽창할 수 있다. 다만, 상술한 바와 같이, 에어백 외피(220)는 에어백 내피(110)의 팽창을 제한하는 작은 신축률을 가지고, 팽창시 골반을 감싸는 형태로 팽창될 수 있으므로, 에어백 내피(110) 또한 골반의 둘레를 보호하는 형태로 팽창할 수 있다.

[0045] 에어백 벨트(220)는 에어백 외피(210)가 사용자의 골반을 감싸는 형태로 팽창되도록 가이드 할 수 있다. 에어백 벨트(220)는 에어백 외피(210)가 골반과 가까이 이웃하여 팽창되도록 가이드 할 수 있다. 에어백 벨트(220)는 에어백 외피(210)를 가이드 함과 동시에 허리를 감싸면서 착용 되므로, 에어백 외피(210)가 효과적으로 골반을 보호할 수 있도록 골반에 밀착시킬 수 있다.

[0046] 에어백과 같이 인체를 보호하기 위한 장치는 충격이 인체로 전달되기 이전에 충격을 완화하거나 흡수할 수 있는 신뢰성이 확보될 필요가 있다. 예를 들면, 낙상시 에어백 가스주입장치가 낙상을 감지한 시점으로부터 인체가 바닥 면에 닿는 시간은 400ms 내지 500ms 정도가 소요된다. 따라서, 400ms 이전에 에어백이 팽창하고, 충격을 흡수하기 위한 충분한 압력이 형성됨이 바람직하다. 본원의 일 실시예에 따르면, 낙상 보호 에어백은 상술한 에어백 내피(110)의 분기형 팽창 구조에 의해, 에어백 가스주입장치가 낙상을 감지한 순간부터 인체에 충격이 전달되기 전(예를 들면, 400ms)까지 충격을 완화 및 흡수할 수 있는 압력으로 팽창될 수 있다. 또한, 충격이 전달되기 전까지 골반을 감싸면서 팽창될 수 있다.

[0047] 한편, 본원은 상술한 본원의 일 실시예에 따른 낙상 보호 에어백 및 에어백 가스주입장치를 포함하는 낙상 보호 에어백 장치를 제공할 수 있다.

[0048] 도 4는 본원의 일 실시예에 따른 에어백 가스주입장치의 블록도이고, 도 5는 본원의 일 실시예에 따른 에어백 가스주입장치의 단면도이다.

[0049] 에어백 가스주입장치(400)는 상기 낙상 보호 에어백의 에어백 내피(110)에 가스를 주입 가능하도록 장착되는 구성이다. 에어백 가스주입장치(400)는 센서부(410), 격발부(420), 인플레이터(430) 및 카트리지(440)를 포함할 수 있다.

[0050] 센서부(410)는 외부의 충격을 감지할 수 있다. 또한, 센서부(410)는 인체의 낙상을 감지하여 낙상 신호를 생성하는 낙상 센서를 포함할 수 있다.

[0051] 격발부(420)는 센서부(410)의 감지에 따라 구체를 격발할 수 있다. 격발부(420)는 트리거 유닛(421), 구동력 제공유닛(422) 및 탄성 부재(423)를 포함할 수 있다 격발부(420)는 센서부(410)에서 생성된 상기 낙상 신호에 기초하여 구체(450)를 격발할 수 있다. 트리거 유닛(421)은 구체(450)의 이동경로 진입을 방지하도록 구체(450)를 선택적으로 고정할 수 있다. 구동력 제공유닛(422)은 트리거 유닛(421)에 구동력을 제공할 수 있다. 구동력 제

ALPINESTARS
Ex. 1002 - Page 311

공유닛(422)은 트리거 유닛(421)이 구체(450)의 고정을 해제할 수 있도록 구동력을 제공할 수 있다

[0052] 도 7a는 본원의 일 실시예에 따른 트리거 유닛의 고정 상태를 도시한 에어백 가스주입장치의 단면도이고, 도 7b는 본원의 일 실시예에 따른 트리거 유닛의 고정 해제 상태를 에어백 가스주입장치의 단면도이다.

[0053] 도 7a를 참조하면, 트리거 유닛(421)은 구체(450)를 지지하여, 구체(450)가 이동경로(431)로 진입하지 못하도록 고정을 유지할 수 있다. 한편, 센서부(410)에서 인체의 낙상을 감지한 경우, 구동력 제공유닛(422)은 트리거 유닛(421)에 구동력을 제공하여, 도 7b에 도시된 바와 같이 트리거 유닛(421)이 구동되어 구체(450)의 고정을 해제할 수 있다.

[0054] 탄성부재(423)는 구체(450)의 고정 해제시 구체(450)에 대한 격발력을 제공할 수 있도록 구체(450)가 고정된 상태에서 압축상태를 유지할 수 있다. 탄성 부재(423)는 예를 들면, 탄성(격발)력을 제공할 수 있는 스프링일 수 있으나, 이에 한정된 것은 아니다.

[0055] 구체(450)는 트리거 유닛(421)의 구동에 의해 고정이 해제되어 격발될 수 있다. 또한, 격발부(420)는 낙상 신호에 대응하여 전원을 공급받아 구동될 수 있다. 구체(450)의 고정이 해제되면, 구체(450)는 탄성 부재(423)에 의해 격발력을 제공받아 격발될 수 있다.

[0056] 인플레이터(430)는 격발된 구체(450)가 이동하는 이동경로(431)와 이동경로(431)의 말단에 배치되는 공이(432)를 포함할 수 있다. 격발된 구체(450)는 이동경로(431)를 따라 이동하여 공이(432)를 타격할 수 있다. 타격된 공이(432)는 카트리지(440)의 커버(441)를 파절하여, 카트리지(440)에 포함된 압축가스를 배출할 수 있다.

[0057] 이동경로(431)는 격발된 구체(450)가 선회하도록 소정의 곡률반경을 갖는 곡선 경로를 포함할 수 있다. 도 5를 참조하면, 격발된 구체(450)는 곡선경로를 따라 구체(450)의 진행 방향이 선회될 수 있다. 예시적으로, 격발된 구체(450)는 진행 방향이 180°로 선회하는 U턴 경로를 따라 진행될 수 있다. 상기 곡선경로는 격발된 구체(450)가 진입되는 이동경로(431)의 선단과, 공이(432)가 배치되는 이동경로(431)의 말단이 동일한 일측에 위치하도록 구부러져 형성되는 경로일 수 있다. 여기서 선단은, 도 5를 참조하면, 트리거 유닛(421), 구동력 제공유닛(422) 및 탄성 부재(423)를 포함하는 격발부(420)와 구체(450)가 위치하는 방향일 수 있고, 말단은, 격발된 구체(450)가 도달하여 공이(432)를 타격하는 방향일 수 있다. 즉 도 5의 이동경로(431)를 기준으로 이동경로(431)의 6시 방향에 위치한 일단이 선단이고, 12시 방향에 위치한 일단이 말단을 의미할 수 있다.

[0058] 한편 센서부(410)는 이동경로(431)의 선단 측에 배치될 수 있고, 카트리지(440)는 이동경로(431)의 말단 측에 배치될 수 있다. 이동경로(431)의 곡선경로는 센서부(410)와 카트리지(440)가 서로 이웃하도록 소정의 곡률반경을 가지고 구부러져 형성될 수 있다.

[0059] 카트리지(440)는 에어백 내피(110)를 팽창시키는 압축가스를 포함할 수 있다. 도 5를 참조하면, 카트리지(440)는 격발된 구체(450)의 공이(432)의 타격에 의해 커버(441)가 파절되어 압축가스를 배출할 수 있다. 커버(441)는 공이(432)의 말단인 뾰족한 부분과 대향할 수 있다. 커버(441)는 후술하는 인플레이터(430)의 연결부(434)에 고정되어 공이(432)의 말단과 대향할 수 있다. 격발된 구체(450)는 공이(432)의 배면을 타격할 수 있다. 커버(441)는 구체(450)의 타격 방향으로 진행된 공이(432)에 의해 파절되어 압축가스를 배출할 수 있다.

[0060] 본원의 일 실시예에 따르면, 인플레이터(430)는 공이(432)가 커버(441)와 정면으로 대향하도록 공이(432)를 지지하는 공이 지지부재(433)를 포함할 수 있다. 예시적으로, 공이 지지부재(433)는 격발된 구체(450)에 의해 배면이 타격되어 구체(450)의 에너지를 공이(432)로 전달할 수 있다. 공이(432)는 공이 지지부재(433)로부터 에너지를 전달받아 구체(450)의 타격 방향으로 진행하여 커버(441)를 파절할 수 있다.

[0061] 도 6은 본원의 일 실시예에 따른 에어백 가스주입장치의 사시도이다. 도 6을 참조하면, 인플레이터(430)는 카트리지(440)에서 배출된 압축가스가 에어백 내피(110)로 향하도록 하는 주입구(435)를 포함할 수 있다. 주입구(435)는 커버(441)와 상기 공이(432) 사이에 형성되고 에어백 내피(110)와 연결될 수 있다. 예시적으로 인플레이터(430)는 2개의 주입구(435)를 포함할 수 있으나 이에 한정되는 것은 아니다.

[0062] 또한, 인플레이터(430)는 커버(441)가 공이(432)의 말단과 대향하여 배치되도록 카트리지(440)와 탈착가능하게 결합되는 연결부(434)를 포함할 수 있다. 연결부(434)는 스크류, 클램프, 클립 등 다양한 결합구조를 이용하여 카트리지(440)와 탈착가능하도록 결합될 수 있다.

[0063] 에어백 가스주입장치(400)는 카트리지(440) 및 센서부(410)를 수용하는 보호 하우징(460)을 포함할 수 있다. 보호 하우징(460)은 카트리지(440)를 수용하여, 낙상 또는 다른 외부충격에 의해 카트리지(440)가 인플레이터

ALPINESTARS
Ex. 1002 - Page 312

(430)의 연결부(434)로부터 탈착되지 않도록 보호할 수 있다.

[0064] 전술한 본원의 설명은 예시를 위한 것이며, 본원이 속하는 기술분야의 통상의 지식을 가진 자는 본원의 기술적 사상이나 필수적인 특징을 변경하지 않고서 다른 구체적인 형태로 쉽게 변형이 가능하다는 것을 이해할 수 있을 것이다. 그러므로 이상에서 기술한 실시예들은 모든 면에서 예시적인 것이며 한정적이 아닌 것으로 이해해야만 한다. 예를 들어, 단일형으로 설명되어 있는 각 구성 요소는 분산되어 실시될 수도 있으며, 마찬가지로 분산된 것으로 설명되어 있는 구성 요소들도 결합된 형태로 실시될 수 있다.

[0065] 본원의 범위는 상기 상세한 설명보다는 후술하는 특허청구범위에 의하여 나타내어지며, 특허청구범위의 의미 및 범위 그리고 그 균등 개념으로부터 도출되는 모든 변경 또는 변형된 형태가 본원의 범위에 포함되는 것으로 해석되어야 한다.

부호의 설명

[0066] 10, 400: 에어백 가스주입장치

110: 에어백 내피

111: 종 방향 대응 팽창부

112: 횡 방향 대응 팽창부

210: 에어백 외피

211: 지퍼부

212: 수납부

220: 에어백 벨트

221: 벨크로

410: 센서부

420: 격발부

421: 트리거 유닛

422: 구동력 제공유닛

423: 탄성 부재

430: 인플레이터

431: 이동경로

432: 공이

433: 공이 지지부재

434: 연결부

435: 주입구

440: 카트리지

441: 커버

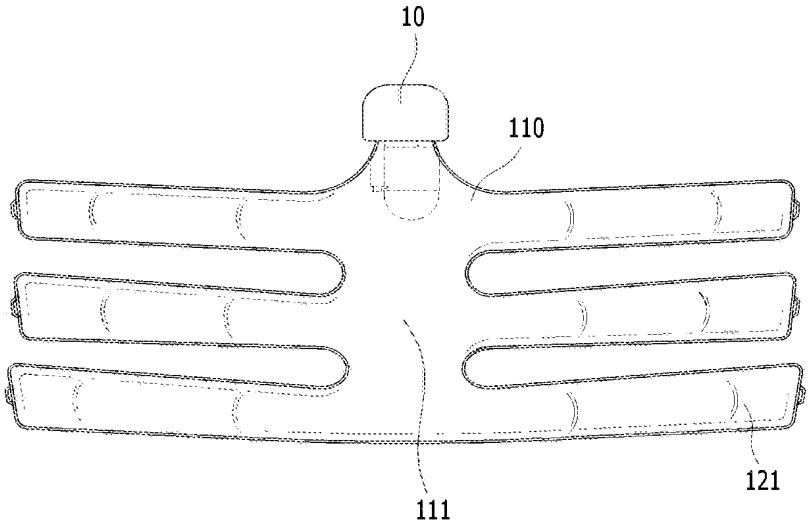
450: 구체

460: 보호 하우징

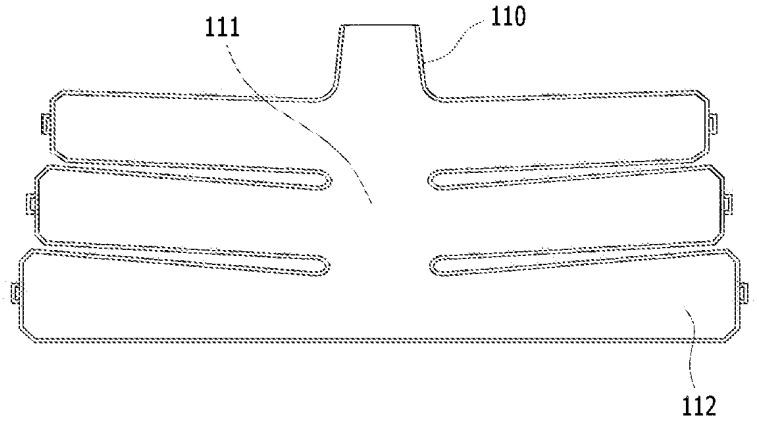
ALPINESTARS
Ex. 1002 - Page 313

도면

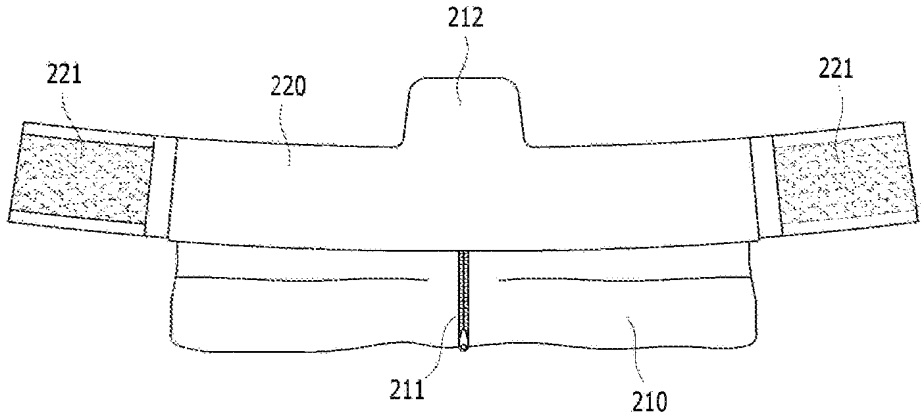
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도면1b

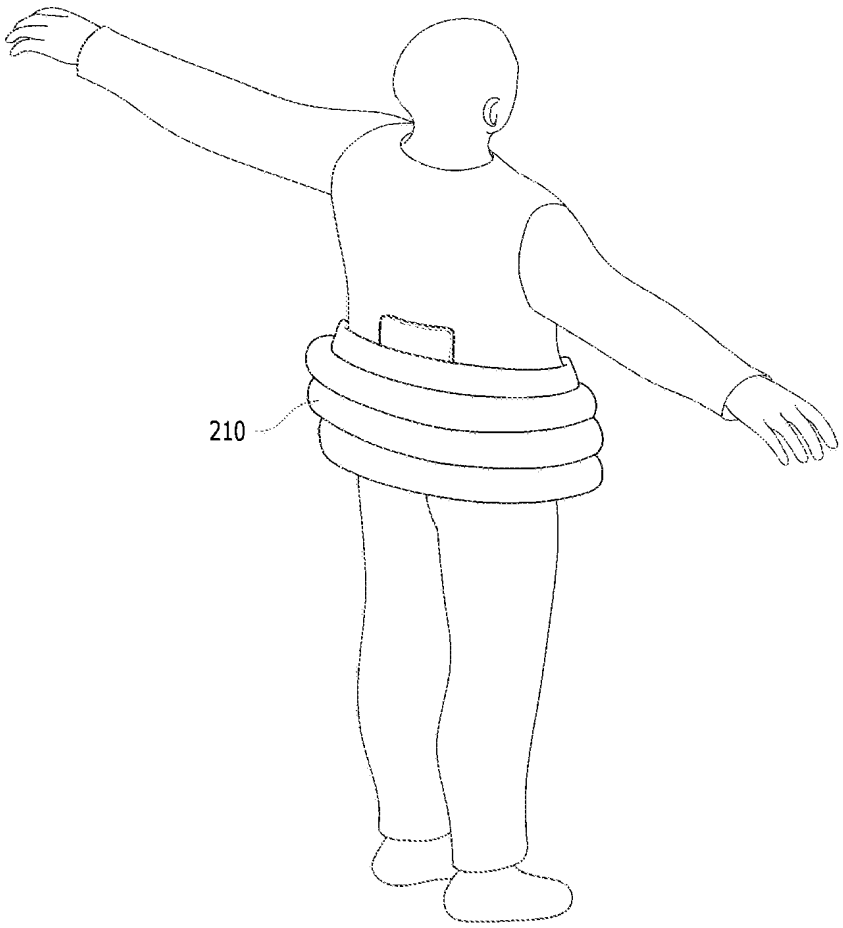


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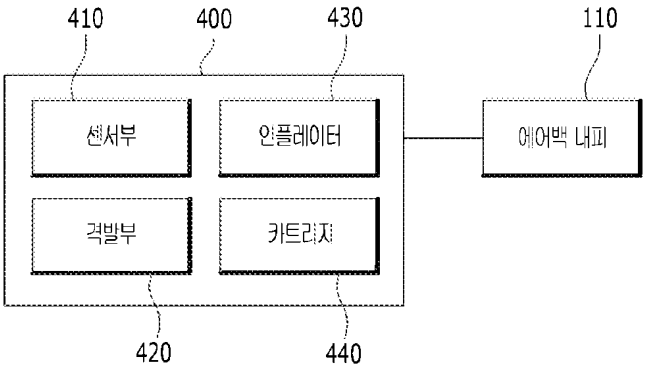


ALPINESTARS
Ex. 1002 - Page 314

도면3

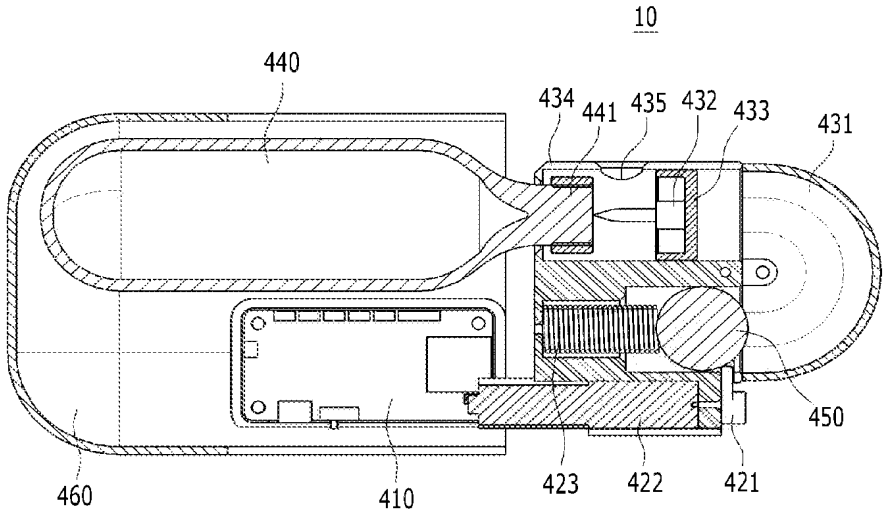


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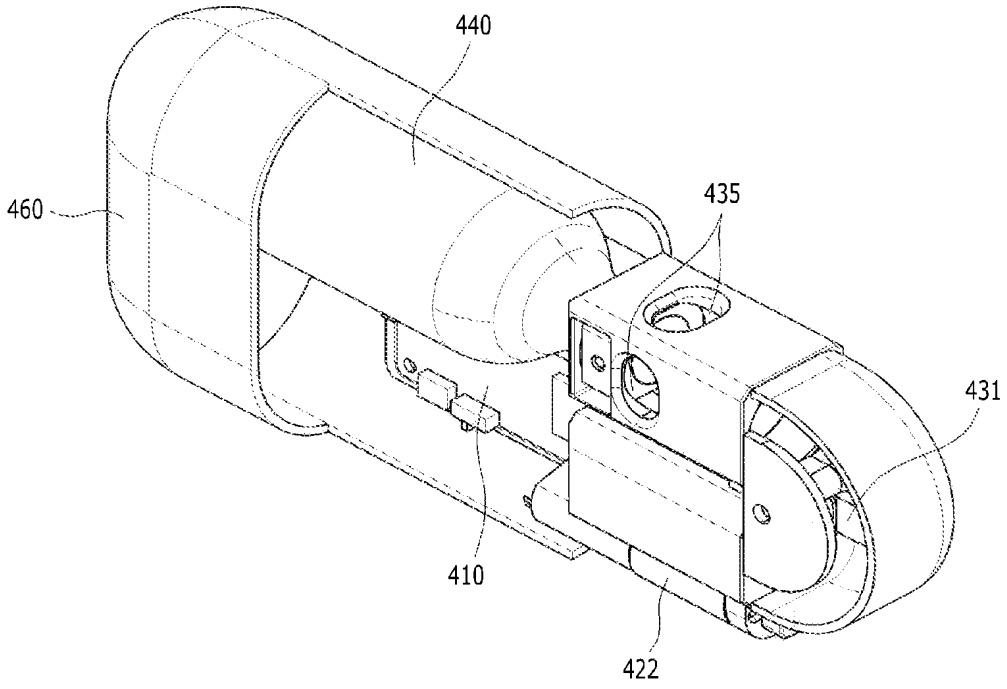


ALPINESTARS
Ex. 1002 - Page 315

도면5

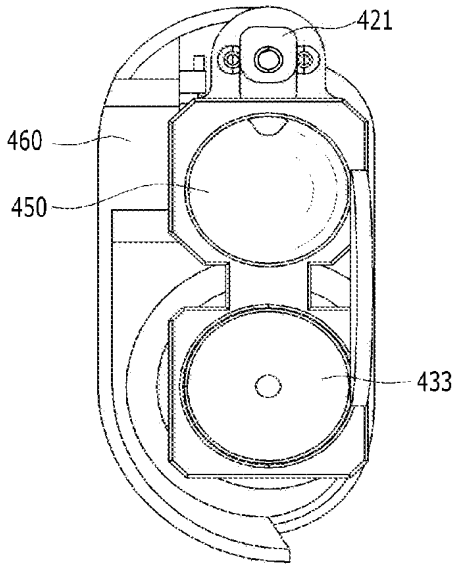


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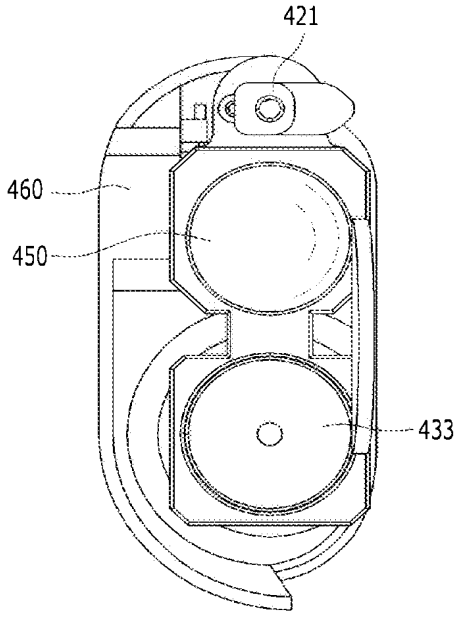


ALPINESTARS
Ex. 1002 - Page 316

도면7a



도면7b



ALPINESTARS
Ex. 1002 - Page 317

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Lino DAINESE	Confirmation No.: *To Be Assigned*
Applicant: D-AIR LAB S.R.L.	Art Unit: *To Be Assigned*
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Title: **PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE**

Authorization to Treat a Reply as Incorporating an Extension of Time Under 37 C.F.R. § 1.136(a)(3)

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Commissioner:

The U.S. Patent and Trademark Office is hereby authorized to treat any concurrent or future reply that requires a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. The U.S. Patent and Trademark Office is hereby authorized to charge all required extension of time fees to our Deposit Account No. 19-0036, if such fees are not otherwise provided for in such reply.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

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Espacenet

CN109998200A Application method of intelligent caring waist belt

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Inventors: SONG LONGHAI

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Application method of intelligent caring waist belt

Abstract

The invention relates to the technical field of wearable intelligent devices, and in particular discloses an application method of an intelligent caring waist belt. The intelligent caring waist belt comprises a waist belt body, a shell, an air bag, an air cylinder and a controller, wherein the waist belt body is arranged at the upper end of the outer surface of the shell in a penetrating manner, the controller is arranged on the shell, the upper end of the air bag is connected with the shell, buckles are arranged on the two sides of the lower part of the air bag, an air inlet is arranged at the upper end of the air bag, and the air cylinder is inserted in the air inlet. The application method comprises the following steps of fixing the waist belt body to the waist of a wearer; folding theair bag to the position, near the waist, of the wearer in a manner of winding from bottom to top; buckling the buckles on the two sides around the wearer; and enabling a controller to control the aircylinder to be opened for carrying out air inflation on the air bag, so that the air bag is downwards unfolded. For the application method of the intelligent caring waist belt provided by the invention, the air bag in the waist belt is unfolded downwards after being inflated for surrounding the lower part of the wearer, and thus the protecting effect on the wearer is improved.

ALPINESTARS
Ex. 1002 - Page 319

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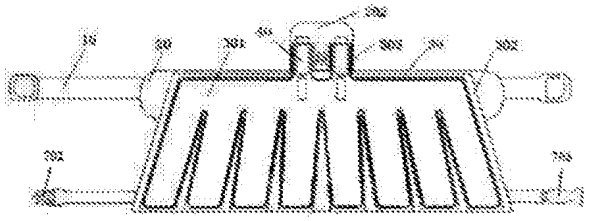
权利要求书1页 说明书5页 附图3页

(54)发明名称

一种智能呵护腰带的应用方法

(57)摘要

本发明涉及可穿戴智能设备技术领域，具体公开了一种智能呵护腰带的应用方法。智能呵护腰带包括腰带本体、外壳、气囊、气瓶和控制器，腰带本体穿设在外壳的外表面的上端，控制器设置在外壳上，气囊的上端与外壳连接，气囊的下部两侧设置有卡扣，气囊的上端设置有进气口，气瓶插接在进气口中，应用方法包括：将腰带本体固定在佩戴者的腰部；将气囊沿下至上卷绕折叠至佩戴者的腰部附近位置；将两侧的卡扣环绕佩戴者扣合；控制器控制气瓶开启以向气囊中充气，使气囊向下展开。本发明提供的智能呵护腰带的应用方法，能够保证腰带中的气囊在充气后向下展开包围佩戴者下身，提高对佩戴者的保护效果。



CN 109998200 A

1.一种智能呵护腰带的应用方法，其特征在于，所述智能呵护腰带包括腰带本体、外壳、气囊、气瓶和控制器，所述腰带本体穿设在所述外壳的外表面的上端，所述控制器设置在所述外壳上，所述气囊的上端与所述外壳连接，所述气囊的下部两侧设置有卡扣，所述气囊的上端设置有进气口，所述气瓶插接在所述进气口中，所述应用方法包括：

将所述腰带本体固定在佩戴者的腰部；

将所述气囊沿下至上卷绕折叠至所述佩戴者的腰部附近位置；

将两侧的所述卡扣环绕所述佩戴者扣合；

所述控制器控制所述气瓶开启以向所述气囊中充气，使所述气囊向下展开。

2.根据权利要求1所述的应用方法，其特征在于，所述卡扣内设置有启动启动开关，所述智能呵护腰带上设置有电源，所述电源与所述启动开关及所述控制器电连接；

所述应用方法包括：

当所述卡扣扣合时，所述启动开关启动所述电源。

3.根据权利要求2所述的应用方法，其特征在于，所述卡扣包括公扣和母扣，所述气囊的下部的一侧设置有所述公扣，另一侧设置有所述母扣，所述母扣内设置有启动芯片，所述启动开关设置在所述启动芯片上，所述启动芯片分别与所述控制器及所述电源电连接，所述公扣上设置有启动所述启动开关的压杆。

4.根据权利要求2所述的应用方法，其特征在于，所述应用方法还包括：

当所述启动开关启动所述电源后，所述控制器所在电路启动，所述控制器对所述佩戴者的状态进行持续监测。

5.根据权利要求4所述的应用方法，其特征在于，所述应用方法还包括：

当所述控制器检测到所述佩戴者摔倒时，所述控制器控制所述气瓶开启以向所述气囊中充气。

6.根据权利要求1所述的应用方法，其特征在于，所述外壳包括收纳气囊的气囊袋和收纳气瓶的气瓶袋，所述气瓶袋固定在所述气囊袋的上方且两者连通，所述气囊的上端固定在所述气囊袋的内部，所述应用方法还包括：

在将所述气囊由下至上卷绕折叠后，将所述气囊放入所述气囊袋中，且使所述气囊两侧的所述卡扣伸出所述气囊袋外部；

密封所述气瓶袋及所述气囊袋。

7.根据权利要求6所述的应用方法，其特征在于，所述气囊沿横向对称设置有至少一对褶皱。

8.根据权利要求6所述的应用方法，其特征在于，所述气囊的上端与所述气囊通过拉链、魔术贴、纽扣或子母扣可拆卸连接。

9.根据权利要求1所述的应用方法，其特征在于，所述气囊包括内胆，所述内胆包括多个并排设置的内胆爪，且所述内胆爪在所述内胆的上端连通，所述内胆上端设置有所述进气口，所述气瓶插在所述进气口内。

10.根据权利要求9所述的应用方法，其特征在于，所述气囊还包括外层，所述外层为袋状结构，所述内胆位于所述外层内部，且所述内胆的边缘与所述外层固定。

ALPINESTARS
Ex. 1002 - Page 321

一种智能呵护腰带的应用方法

技术领域

[0001] 本发明涉及可穿戴智能设备技术领域，具体涉及一种智能呵护腰带的应用方法。

背景技术

[0002] 在常见的智能可穿戴设备中，其技术方向往往是偏向于运动监测、身体指标检测以及提醒功能，如常见的计步、心率检测、来电提醒等，功能上往往更趋向于年轻的健康人群。近年来随着我国老年人比例不断加大，独自在家的老人、小孩往往处于无人照管的状态，尤其是老年人由于机体功能的减退，易发生跌倒、突发心血管等意外事件，由于未能得到及时救治而增加治疗难度与猝死的发生率。老年人行走于坑洼或湿滑场面，更易跌倒，严重影响了老年人的身体健康和独立生活能力，并造成了老年人心理上的压力和恐惧。跌倒往往会对老年人的身体带来巨大的损害，有时造成的后果对老年人来说甚至是致命的。老年人跌倒时，往往是髋股部首先着地，由于该部位缺少软组织缓冲，这样就会使髋股部直接触地受力，从而容易发生髋股骨发生骨折，而目前市面上却没有能够为这类人群在跌倒过程中提供下半身全面保护措施的智能装置。

发明内容

[0003] 本发明的目的在于提供一种智能呵护腰带的应用方法，能够全面保护人体，尤其对人体下半身进行有效保护。

[0004] 为实现上述目的，本发明采用下述技术方案：

[0005] 一种智能呵护腰带的应用方法，所述智能呵护腰带包括腰带本体、外壳、气囊、气瓶和控制器，所述腰带本体穿设在所述外壳的外表面的上端，所述控制器设置在所述外壳上，所述气囊的上端与所述外壳连接，所述气囊的下部两侧设置有卡扣，所述气囊的上端设置有进气口，所述气瓶插接在所述进气口中，所述应用方法包括：

[0006] 将所述腰带本体固定在佩戴者的腰部；

[0007] 将所述气囊沿下至上卷绕折叠至所述佩戴者的腰部附近位置；

[0008] 将两侧的所述卡扣环绕所述佩戴者扣合；

[0009] 所述控制器控制所述气瓶开启以向所述气囊中充气，使所述气囊向下展开。

[0010] 进一步地，所述卡扣内设置有启动启动开关，所述智能呵护腰带上设置有电源，所述电源与所述启动开关及所述控制器电连接；

[0011] 所述应用方法包括：

[0012] 当所述卡扣扣合时，所述启动开关启动所述电源。

[0013] 进一步地，所述卡扣包括公扣和母扣，所述气囊的下部的一侧设置有所述公扣，另一侧设置有所述母扣，所述母扣内设置有启动芯片，所述启动开关设置在所述启动芯片上，所述启动芯片分别与所述控制器及所述电源电连接，所述公扣上设置有启动所述启动开关的压杆。

[0014] 进一步地，所述应用方法还包括：

ALPINESTARS
Ex. 1002 - Page 322

[0015] 当所述启动开关启动所述电源后，所述控制器所在电路启动，所述控制器对所述佩戴者的状态进行持续监测。

[0016] 进一步地，所述应用方法还包括：

[0017] 当所述控制器检测到所述佩戴者摔倒时，所述控制器控制所述气瓶开启以向所述气囊中充气。

[0018] 进一步地，所述外壳包括收纳气囊的气囊袋和收纳气瓶的气瓶袋，所述气瓶袋固定在所述气囊袋的上方且两者连通，所述气囊的上端固定在所述气囊袋的内部，所述应用方法还包括：

[0019] 在将所述气囊由下至上卷绕折叠后，将所述气囊放入所述气囊袋中，且使所述气囊两侧的所述卡扣伸出所述气囊袋外部；

[0020] 密封所述气瓶袋及所述气囊袋。

[0021] 进一步地，所述气囊沿横向对称设置有至少一对褶皱。

[0022] 进一步地，所述气囊的上端与所述气囊通过拉链、魔术贴、纽扣或子母扣可拆卸连接。

[0023] 进一步地，所述气囊包括内胆，所述内胆包括多个并排设置的内胆爪，且所述内胆爪在所述内胆的上端连通，所述内胆上端设置有所述进气口，所述气瓶插在所述进气口内。

[0024] 进一步地，所述气囊还包括外层，所述外层为袋状结构，所述内胆位于所述外层内部，且所述内胆的边缘与所述外层固定。

[0025] 本发明的有益效果在于：

[0026] 本发明提供的智能呵护腰带的应用方法，通过在气囊的下部两侧设置卡扣，在智能呵护腰带使用时，将卡扣环绕佩戴者腰部附近位置卡合，可以保证气囊充气后能够向下展开，而非向人体两侧展开，有效地使气囊包围人体下半身，提高对佩戴者的保护效果。

附图说明

[0027] 图1是本发明收纳时结构示意图；

[0028] 图2是本发明工作时结构示意图；

[0029] 图3是本发明实施例一气瓶结构示意图；

[0030] 图4是本发明实施例二卡扣结构示意图；

[0031] 图5是本发明实施例三气瓶结构示意图；

[0032] 图6是本发明实施例四气瓶安装结构示意图；

[0033] 图7是本发明实施例五外壳内部结构示意图。

具体实施方式

[0034] 下面结合附图和实施例对本发明作进一步的详细说明。可以理解的是，此处所描述的具体实施例仅仅用于解释本发明，而非对本发明的限定。另外还需要说明的是，为了便于描述，附图中仅示出了与本发明相关的部分而非全部结构。

[0035] 在本发明的描述中，除非另有明确的规定和限定，术语“相连”、“连接”、“固定”应做广义理解，例如，可以是固定连接，也可以是可拆卸连接，或成一体；可以是机械连接，也可以是电连接；可以是直接相连，也可以通过中间媒介间接相连，可以是两个元件内部的连

ALPINESTARS
Ex. 1002 - Page 323

通或两个元件的相互作用关系。对于本领域的普通技术人员而言，可以具体情况理解上述术语在本发明中的具体含义。

[0036] 在本发明中，除非另有明确的规定和限定，第一特征在第二特征之“上”或之“下”可以包括第一和第二特征直接接触，也可以包括第一和第二特征不是直接接触而是通过它们之间的另外的特征接触。而且，第一特征在第二特征“之上”、“上方”和“上面”包括第一特征在第二特征正上方和斜上方，或仅仅表示第一特征水平高度高于第二特征。第一特征在第二特征“之下”、“下方”和“下面”包括第一特征在第二特征正下方和斜下方，或仅仅表示第一特征水平高度小于第二特征。

[0037] 在本实施例的描述中，术语“上”、“下”、“右”、等方位或位置关系为基于附图所示的方位或位置关系，仅是为了便于描述和简化操作，而不是指示或暗示所指的装置或元件必须具有特定的方位、以特定的方位构造和操作，因此不能理解为对本发明的限制。此外，术语“第一”、“第二”仅仅用于在描述上加以区分，并没有特殊的含义。

[0038] 如图1所示，本发明一种智能呵护腰带整体结构示意图，包括腰带本体10、外壳20和气囊30，所述腰带本体10穿设在所述外壳20的外表面，腰带本体10与外壳20活动连接，腰带本体10能够更换，如果用户平时不使用腰带，则可以使用智能腰带自带的腰带本体10，若用户有自身惯用的腰带本体10，则可以使用自己的腰带本体10替换产品自带的腰带本体10，满足不用用户的使用需求，所述外壳20包括收纳气囊30的气囊袋201及收纳气瓶40的气瓶袋202，所述气瓶袋202固定在所述气囊袋201的中间上方且两者连通，将气瓶袋202设置在气囊袋201中间上方，一方面外观美观，另一方面为使用者背部提供支撑，所述外壳20设置有腰带本体10的一面内部设置有控制器50和电池60，即控制器50位于贴近人体的一侧，对于人体状态的检测更加准确，所述外壳20封闭，防止用户随意拆卸，对智能腰带的功能造成损害，本实施例中通过拉锁对外壳20进行封闭，方便智能腰带的组装，所述外壳20下方设置有撕裂线，保证气囊30充气后能够快速冲破外壳20。

[0039] 如图2所示，为本发明气囊30结构示意图，所述气囊30包括内胆301和外层302，所述内胆301的边缘通过热合密封，保证内胆301充气后的密封性，所述外层302为袋状结构，增加气囊30的强度，保证人体摔倒时与地面发生摩擦不会损毁气囊30以至于气囊30漏气达不到保护的效果，所述内胆301边缘与所述外层302固定，保证充气后鼓胀的内胆301均匀分布在人体周围，所述气囊30沿横向对称设置有至少一对褶皱，保证充气后气囊30展开时不会向内挤压人体，确保穿戴的舒适，所述内胆301为多爪结构，使得气囊30充气后气囊30下部的展开范围更大，增大气囊30的保护范围，所述内胆爪3011的上部连通，所述内胆301顶部设有进气口303，方便对整体气囊30充气，所述气瓶40插在所述进气口303内，气瓶40与气囊30直接连通，保证充气速度快，所述外层302的下部两侧连接有卡扣70，气囊30下端部向人体两侧展开不能有效保护人体体侧，扣合的卡扣70保证气囊30始终围成一圈，包围人体下半身，增加对人体的保护范围，所述卡扣70内设置有启动开关701，卡扣70扣合时智能腰带启动工作，此种设置方法，一方面，通过卡扣70扣合启动电源开关，防止穿戴智能腰带时忘记按压启动按钮，提高智能腰带的使用效率，另一方面，将启动开关701设置在卡扣70上使得腰带本体10可以更换，不会因为开关设置在腰带本体10上导致仅能使用产品固带的腰带本体10，从而满足不同用户的使用需求，所述气囊30卷绕折叠收纳在气囊袋201内且与所述气囊袋201可拆卸连接，方便组装，本实施例中，所述气囊30与所述气囊袋201通过拉链、

ALPINESTARS
Ex. 1002 - Page 324

魔术贴、纽扣或子母扣连接，组装简单，所述卡扣70伸出所述气囊袋201，方便在穿戴时进行扣合。

[0040] 如图3所述，为本发明充气结构示意图，为保证气瓶40能够快速安全的开启，所述气瓶40的瓶口套设有第一点爆器组件401，点爆头402位于所述第一点爆器组件401内，所述点爆头402靠近所述气瓶40的瓶口，使得点爆头402爆破时产生的冲击波瞬间作用在瓶口，快速打开气瓶40，所述第一点爆器组件401侧壁设有连通所述瓶口和外部空间的通气孔403，气瓶40冲破后，气瓶40内气体从通气孔403冲出进入气囊30内，气囊30鼓胀冲破外壳20，快速延展打开，保护人体。

[0041] 如图4所示，所述卡扣70包括公扣703和母扣702，所述母扣702内设置有启动芯片704，所述启动开关701设置在所述启动芯片704上，启动芯片704与控制器50和电源连接，所述公扣703设有启动所述启动开关701的压杆705，通过压杆705控制开关开启，控制器50电路连通，开始持续监测人体所述状态，随时准备开启气囊30，在本发明的实施例中，所述启动开关701为接近开关，由于接近开关突出所述启动芯片704表面，为保证公扣703能够和接近开关相配合，所述压杆705端部设有与所述接近开关配合的凹部706，当公扣703与母扣702扣合时，所述凹部706与接近开关配合，启动电源电路，进一步的，为了保证卡扣70扣合时公扣703的压杆705不会顶压到接近开关侧边，所述凹部706前端为C型倒角，保证压杆705平滑插入启动芯片704的下方。

[0042] 如图5所示，在本发明另一个实施例中，所述通气孔403沿所述第一点爆器组件401的轴向设置在其侧壁，通气孔403为直通孔，方便在第一点爆器组件401内加工，所述瓶口还套设有第二点爆器组件404，所述第二点爆器组件404包围所述第一点爆器组件401，所述通气孔403连通所述第二点爆器组件404内部空间，气体冲出气瓶40后经第一次拐弯进入通气孔403，从通气孔403流出后由于第二点爆器组件404的阻挡再次拐弯朝向瓶口外部的方向冲出，两次变向，保证瓶口爆破时产生的碎屑被充分过滤，进一步的，所述第二点爆器组件404与所述第一点爆器组件401相互抵接，使得第一点爆器组件401的位置被限位，第一点爆器组件401不会因为长时间与外部接触产生松动，所述第一点爆器组件401外还套设有第三点爆器组件405，使得第一点爆器组件401被完全包围，外部组件无法接触到第一点爆器组件401，进一步保证第一点爆器组件401位置的稳定，点爆控制芯片406位于所述第三点爆器组件405内，点爆头402与点爆控制芯片406距离近，信号传输快，加快气瓶40打开的效率，所述第三点爆器组件405插入所述内胆301内部，使得气瓶袋202与气囊袋201连接稳定，气瓶袋202不会由于其内的气瓶40较重而发生晃动。

[0043] 如图6所示，所述进气口303设置有两个，所述气瓶40竖直插入所述进气口303，气流向气囊30下部冲出，气流的冲击力辅助气囊30快速冲破外壳20并迅速充满气体，所述控制器50和电池60设置在所述气瓶40之间，方便设置且能充分利用空间，为使气瓶40在人体摔倒时不会对人体造成二次伤害，所述气瓶40、控制器50和电池60均设置在减震垫80内，所述减震垫80形状与气瓶袋202相适配。

[0044] 如图7所示，在本发明另一个实施例中，所述气瓶袋202正下方的气囊袋201侧边设有收纳袋90，所述控制器50和电池60设置在所述收纳袋90内，气囊袋201位置更加稳定，不会由于自身的原因产生晃动，且更贴近人体，对人体状态的判断更精准。

[0045] 注意，上述仅为本发明的较佳实施例及所运用技术原理。本领域技术人员会理解，

ALPINESTARS
Ex. 1002 - Page 325

本发明不限于这里所述的特定实施例，对本领域技术人员来说能够进行各种明显的变化、重新调整和替代而不会脱离本发明的保护范围。因此，虽然通过以上实施例对本发明进行了较为详细的说明，但是本发明不仅仅限于以上实施例，在不脱离本发明构思的情况下，还可以包括更多其他等效实施例，而本发明的范围由所附的权利要求范围决定。

ALPINESTARS
Ex. 1002 - Page 326

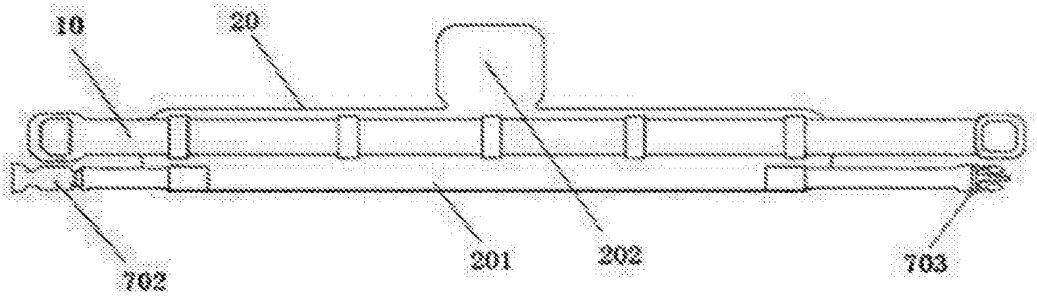


图1

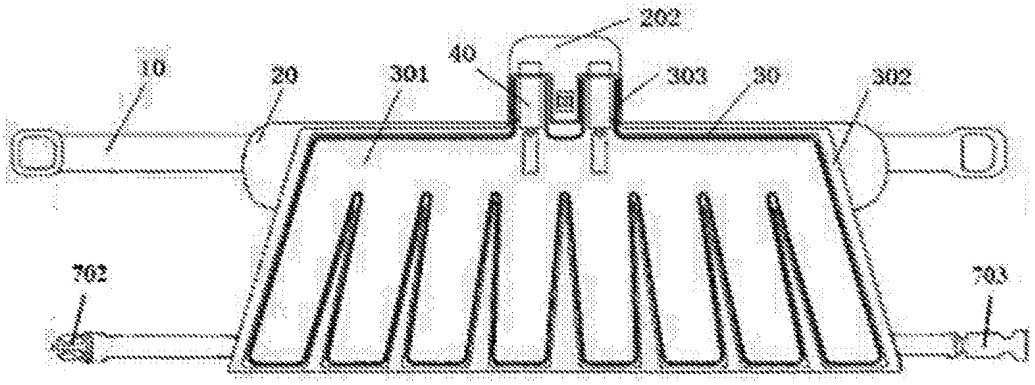


图2

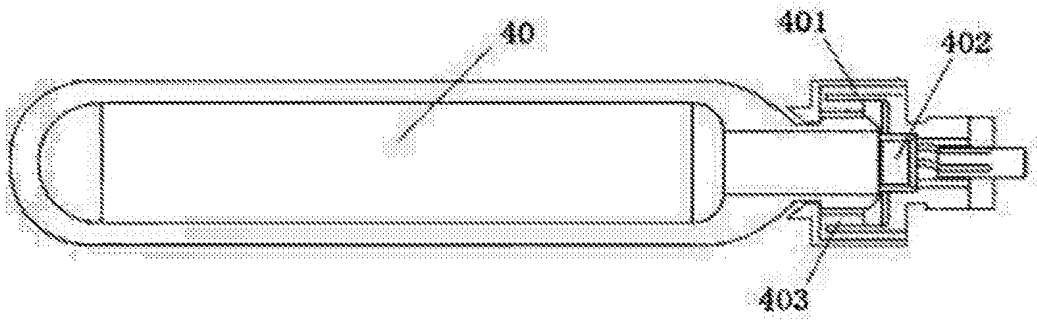


图3

ALPINESTARS
Ex. 1002 - Page 327

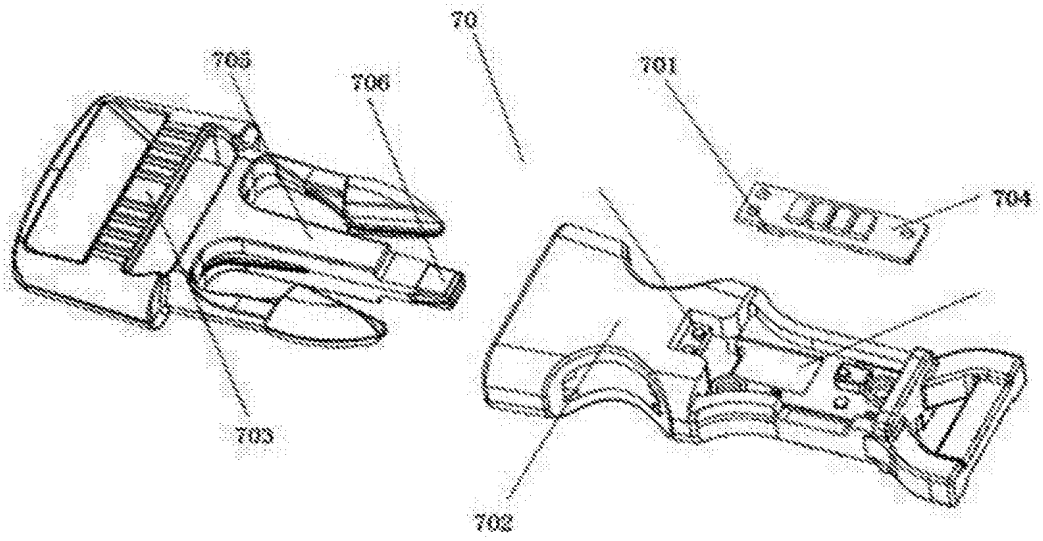


图4

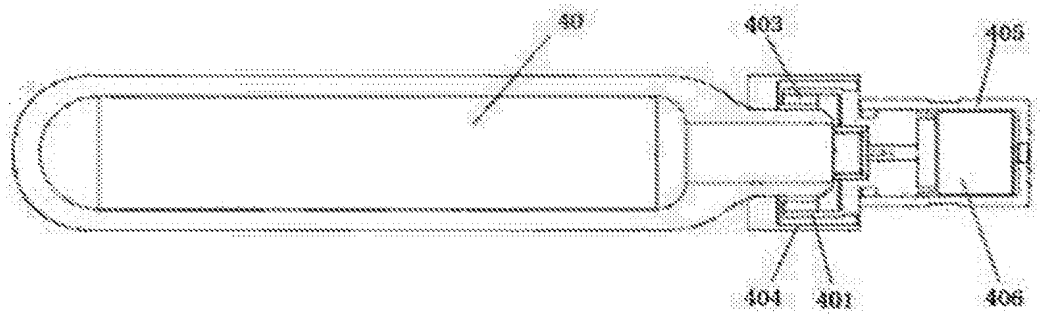


图5

ALPINESTARS
Ex. 1002 - Page 328

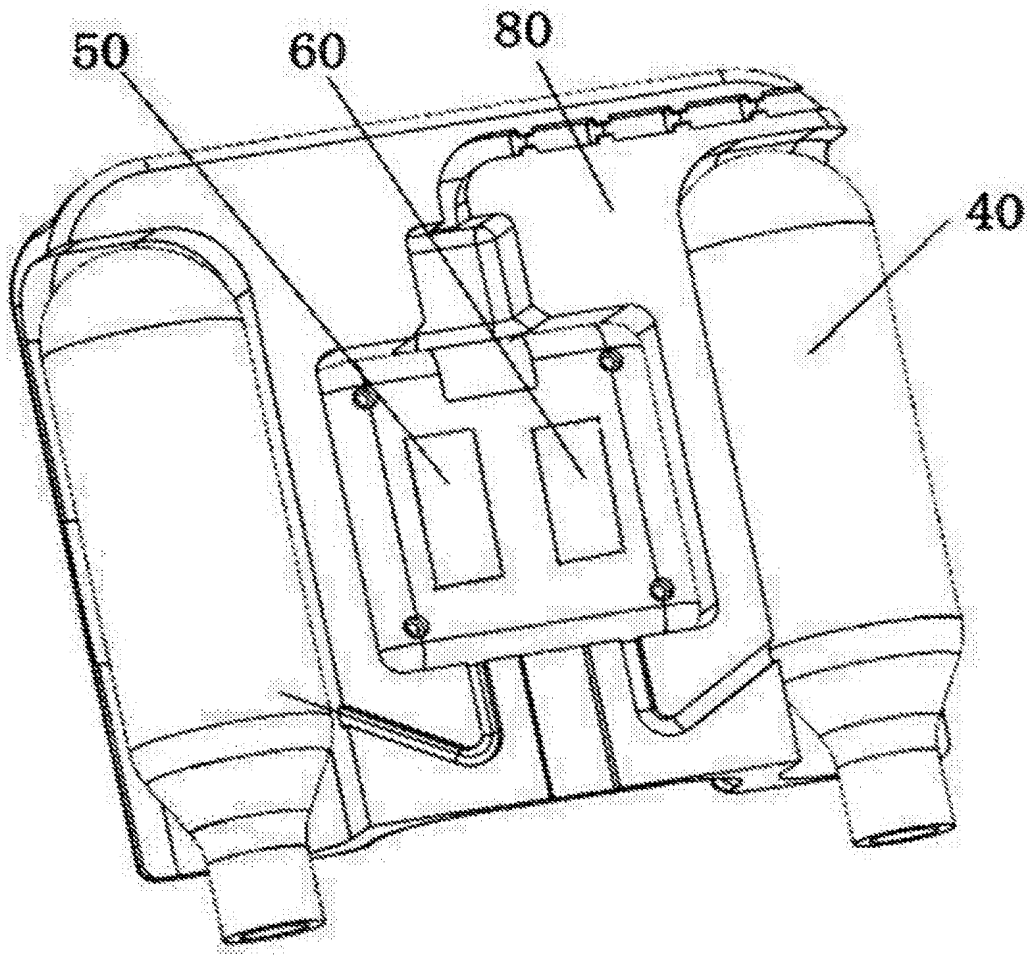


图6

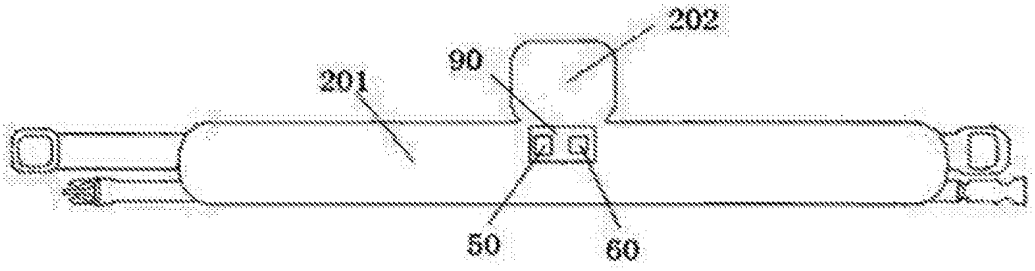


图7

ALPINESTARS
Ex. 1002 - Page 329

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(54) **PROTECTION DEVICE AND METHOD FOR MANUFACTURING SUCH A PROTECTION DEVICE**

SCHUTZVORRICHTUNG UND VERFAHREN ZUR HERSTELLUNG SOLCH EINER SCHUTZVORRICHTUNG

DISPOSITIF DE PROTECTION ET PROCÉDÉ DE FABRICATION D'UN TEL DISPOSITIF DE PROTECTION

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(56) References cited:
EP-A1- 0 994 207
DE-U1- 7 837 841
US-A- 5 945 359
US-A1- 2012 032 422
US-A1- 2012 055 201

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ALPINESTARS
Ex. 1002 - Page 330

Description

[0001] The present disclosure relates to a protection device, in jargon called airbag, for protecting a use. The protection device includes an inflatable element apt to protect from impacts and/or falling a passenger, a motor vehicle driver or similar user, during a sporting and/or working activity and/or any activity.

[0002] A known protection device, such as the one described in WO 2010/067288, includes an element apt to assume an active inflated condition and a rest deflated condition.

[0003] The inflatable element in particular is formed by a a first mesh and a second mesh.

[0004] The inflatable element further includes a first sheet or first wall and a second sheet or second wall fastened with one another along respective peripheral edges which cover and coat on an outer side, respectively, the first mesh and the second mesh. The known protection device, even if it is advantageous from several points of view, have some drawbacks which have been not yet overcome.

[0005] For example, a drawback lies in that the first mesh and the second mesh belong to a textile structure with great sizes and prefabricated, that is a structure, usually sold in rolls, wherein the two meshes are opposed and overlapped. In order to implement the protection device, the prefabricated structure is cut to length according to a drawing established in advance based upon the shape or form or airbag which one wants to obtain. Considering that the sack or inflatable element most times has particular shapes with creeks or curves to be apt to the various portions of the body of a user to be protected, if follows that, after the cut, often there is a high waste material which cannot be recovered.

[0006] Furthermore, another problem of the prefabricated structure is that the pulling threads have a preestablished length. In order to implement inflatable elements with different height, it is necessary to make available several textile structures with pulling threads having different lengths and to unite the textile structures. Such solution is an expensive solution and it requires several working phases for cutting and uniting/sewing the textile structures.

[0007] A technical problem underlying the present disclosure lies in making available a protection device for the protection of a user capable of overcoming said drawback and/or obtaining additional advantages and making available a garment including said device for the personal protection.

[0008] Such problem is solved by a protection device for the protection of a user, by a method for manufacturing a protection device and by a use according to the respective independent claims.

[0009] Secondary features of the subject of the present disclosure are defined in the respective depending claims.

[0010] The protection device according to the present disclosure characterizes in that, instead of using a prefabricated structure including two meshes, a tailored knitted body is used, based upon the shape of the inflatable element to be obtained. In other words, the protection device according to the present disclosure is implemented by means of a knitting.

[0011] Such knitting technique allows overcoming the drawback of a high material waste, since airbag portions are implemented by knitting and they belong to one single knitted body or body with three-dimensional mesh (according to the profile to be obtained) which then is not cut by a prefabricated roll.

[0012] In particular, the knitted body according to the present disclosure carries out a similar or same function of the first mesh and of the second mesh described in the above-mentioned International patent application, and it is knitted starting from a thread or tape which is knitted, according to a pre-established drawing so that there is no prefabricated material waste or that such waste is reduced to the minimum.

[0013] Within the present disclosure, under the term "thread" an elongated and thin body is meant, with flexible consistency made of a material suitable for a knitting. It can even be a tape or band which can be knitted by means of a machine for knitting or knitting machine. Alternatively to the thread, even a filament can be used, comprising a plurality of threads or fibres wound on themselves, or a plurality of threads approached therebetween.

[0014] Under the expression "knitting" a working is meant allowing to obtain an in-series interlacement formed by threads, rings or small circles made of various material.

[0015] The mesh can be meant as a tissue or net having a determined mesh opening.

[0016] More in particular, according to the present disclosure, it is a knitted body having, contrary to the above-mentioned International patent application, closed structure on at least four sides or walls, wherein, practically said structure has at least a partially tubular shape and defines an inner area or inner chamber. Then, it can be a knitted body defining an inner area or inner chamber, wherein the knitted body includes at least a first knitted face, that is a first side or first portion or knitted wall, at least a second knitted face, that is a second side, or second portion or knitted wall, opposite to the first face; at least a third knitted face, that is a third side or third portion or knitted wall and continuously connected by knitting to the first face and the second face on one side of such two faces; at least a fourth knitted face, that is a fourth face or fourth portion or knitted wall and continuously connected by knitting to the first face and the second face on the other side of such two faces, wherein the fourth face is opposite to the third face.

[0017] In other words, it is a body comprising at least a mesh having tubular shape. The tubular structure under a collapsed condition has two opposite and overlapped portions, which result to be connected laterally in one

ALPINESTARS
Ex. 1002 - Page 331

single body without continuity solution by means of respective connecting side portions and which then do not need seams or other connecting method. In other words, contrary to the meshes of the above-mentioned International patent application, the two opposite portions, that is the first wall and the second wall of the knitted body are continuously connected by knitting (without continuity solution) thanks to the fact that the knitted body is a three-dimensional body, at least with tubular shape, worked all together. Furthermore, the inflatable element comprises a plurality of union threads arranged in the inner area and apt to connect at least the first portion/face and the second portion/face of the knitted body. The union threads are integrating portion of the knitted body and they act as tie rods and allow to limit a maximum expansion of the knitted body. In other words, each one of the union threads has a respective first end portion connected to the first side or wall of the worked body and a second end portion connected to the second side or wall of the knitted body. Even the union thread is to be meant as thread with any shape as defined above. The union threads then are knitted starting, too, from a thread or filament which is knitted together with the thread or filament forming the faces of the knitted body.

[0018] In other words, according to the present disclosure, the knitted body apart from the thread forming the faces of the knitted body also includes union threads having the function of tie rods, and which play the same function of the tie rod members described in the International patent application mentioned above. Even in this case the union threads are knitted with the knitted body, to form a single body therewith. The union threads are in the inner chamber and cross the latter. The union threads can be worked together with the knitted body in one single productive phase in a respective knitting machine.

[0019] The knitted body then is a so-called three-dimensional body, that is it extends at least in three directions and it is already equipped with the union threads at time of the knitting.

[0020] In other words, the union threads can be worked together with the knitted body in a knitting machine. To this purpose, at least one group of the union threads belongs to, or is made starting from, one single thread, or one single filament constituted by at least two threads, wherein the single thread or the single filament is extended alternatively continuously by knitting between the first portion and the second portion of the knitted body.

[0021] Still more preferably, the single thread or the single filament is arranged in a zigzag manner or according to a sinusoidal pattern between the first portion and the second portion of the knitted body to cover or involve at least a region of the inflatable element. The zig-zag arrangement can be meant widely, in the sense that the union threads can be arranged so as to result with a diagonal arrangement between the first portion of the knitted body and the second portion of the knitted body, or the union threads are arranged substantially orthogonal between the first portion and the second portion.

[0022] According to an embodiment of the present disclosure, thanks to the fact that the union threads are united and worked together with the knitted body by means of the same knitting machine, it is possible to adjust or program, already in the productive phase, the length of the union threads depending upon the maximum width of the inflatable element which is wanted to be obtained.

[0023] In particular the inflatable element can comprise, in a first area, first union threads having a first length and, in a second area, second union threads having a second length, wherein the first length is different from the second length.

[0024] Similarly, according to an embodiment of the present disclosure, thanks to the fact that the union threads are united and worked together with the knitted body by means of the same knitting machine, it is possible to adjust or program, already in the productive phase, the density of the union threads, meant as number of threads per surface unit, depending upon the area of the inflatable element, for example in relation to the distance from a pressure gas generator. The inflatable element then can comprise, in a first area, for example in an area near to the gas generator, union threads distributed with a first density of threads and, in a second area, for example farer from the gas generator, union threads distributed with a second density of threads, wherein the first density of threads is different from the second density of threads, for example a greater density.

[0025] It can be noted that the above-described faces of the knitted body have mainly a supporting function for the union threads. It follows that the faces of the knitted body can be made of a different material than the material of the union threads and less resistant and less stiff of the union threads so as not to influence, or to influence to the minimum, on an overall complexity of the knitted body. The faces of the knitted body for example can be made of cotton or wool with a thread with determined title, that is yarns with very soft consistency and suitable for the insertion into a garment with a minimum impact on comfort. The union threads can be made of thread having high resistance to tensile strength. In an embodiment of the present disclosure the thread for implementing the knitted body is a 50 polyester thread, whereas the thread of the union thread is 75 polyester thread. Preferably, in an embodiment of the present disclosure, the knitted body is a body having bag-like structure, that is a structure closed on at least five sides, and having only one open area, or opening or accessing mouth to access an area inside the knitted body.

[0026] In other words, according to this last embodiment, the knitted body includes a fifth side or fifth portion/face or knitted wall, wherein the fifth side is connected continuously by knitting to the first side or first portion/face, the second side or second portion/face, the third side or third portion/face and the fourth side or fourth portion/face. Such bag-like structure having one single accessing opening has the advantage of allowing to access the inner area of the knitted body to position possible

ALPINESTARS
Ex. 1002 - Page 332

technical instruments or devices inside the same inflatable device, such as for example a pressure gas generator, sensors and/or electronics for managing the protection device. Should it not be necessary to arrange anything inside the inflatable element, the knitted body can even be a closed casing on all sides, like a balloon made of meshes and collapsed on itself to form two main layers overlapped and united therebetween on the whole periphery in single body. In other words, according to this last embodiment, the knitted body includes a sixth side or sixth portion/face or knitted wall and continuously connected by knitting to the first side or first portion, the second side or second portion/face, the third side or third portion/face and the fourth side or fourth portion, wherein the sixth side or sixth portion/face is substantially opposite to the fifth side or fifth portion/face.

[0027] It is to be meant that thanks to the fact that the knitted body is worked with a knitting machine, even the possibility of weaving or knitting electric cables for inner sensors, for example pressure sensors, or for the connection with the managing electronics, should it be inserted inside the knitted body, can be provided.

[0028] In order to retain an inflating fluid in the inner chamber of the knitted body, several alternative solutions may be provided.

[0029] For example, the mesh can be worked so closely that the mesh openings of said knitted body are at least partially closed to retain at least temporarily an inflating fluid in said inflatable element.

[0030] Alternatively the meshes can be welded therebetween after knitting to form a barrier for the inflating fluid.

[0031] It is to be meant that the knitted body should not be necessarily implemented so as to be impermeable in absolute way to the inflating fluid, but it is sufficient that the knitted body can remain under inflated condition for a sufficient period of time during the impact.

[0032] The mesh openings can be also closed and covered by means of a covering layer or a cover sheet apt to cover an outer surface of said knitted body. The covering layer can be made of any suitable material, such as for example a resin which is spread on an outer surface of the knitted body.

[0033] Alternatively or in combination with the previous embodiments, the knitted body can be further comprised or included inside an outer covering casing which can be made of a material impermeable to a gas under pressure or, generally, a material capable to resist to determined gas pressures.

[0034] In an embodiment of the present disclosure, the outer cover is implemented like the one described in the above-mentioned International application and formed by a first wall or first sheet and a second wall or second sheet connected therebetween along a periphery, for example by means of gluing.

[0035] A method for manufacturing a knitted body as the one described above, for example, provides using a so-called machine for a three-dimensional knitting and known to a person skilled in the art. Preferably it is a knitting machine having two needle beds or including a first needle bed and a second needle bed. It follows that according to the latter embodiment the above-mentioned first side, or first portion or knitted wall is a side of the knitted body worked on a first needle bed of a knitting machine having two needle beds and said second side, or second portion or knitted wall is a side of the knitted body worked on a second needle bed of said knitting machine.

[0036] Preferably, it is a rectilinear knitting machine which is capable of knitting in three dimensions and preferably even of uniting the mesh by means of a thread passing transversally inside the dimensional structure and connecting walls or areas of the knitted body, to form the above-mentioned union threads.

[0037] In other words, according to an embodiment of the present disclosure, the knitted body can be implemented automatically and with very quick productive time by means of rectilinear knitting machines known in the field of the machines intended to implement garments of three-dimensional type, for example the rectilinear knitting machines intended to implement meshes in one single body, such as for example gloves or socks.

[0038] For example a rectilinear knitting machine includes at least two needle beds and it is capable of transferring the meshes of a knitted tissue between the needle beds. Such machine can be configured to perform a step of knitting the mesh on a first needle bed, a step of knitting the mesh on a second needle bed and a step of performing the knitting on a needle bed and on the other needle bed so that the tissue knitted on the first needle bed and the tissue knitted on the second needle bed are connected to each other by means of the union yarn.

[0039] In practice, the knitted body is implemented by working alternatively by means of a first thread guide a first thread on the needles of the first needle bed (to form a mesh ranking) and on the needles of the second needle bed (to form the remaining mesh ranking), so as to obtain a complete mesh turn, and then, after some complete mesh turns, the above-mentioned substantially tubular shape, or shape like a tubular mantle, of the knitted body. The rectilinear knitting machine may include a second thread guide which brings the second thread (intended to form the plurality of the union threads) alternatively between the first needle bed and the second needle bed to connect the union thread between the two opposite portions of the knitted body.

[0040] The rectilinear knitting machine can be programmed so as to control the length of the union thread and then to adjust the maximum height which the inflatable element can reach under inflated condition.

[0041] The fact of using a knitting machine for manufacturing a knitted body with the union threads allows calibrating according to needs the threads thereof the knitted body is made. In particular the tubular mantle and the possible additional side walls of the knitted body can be made of a soft and light material, as above anticipated,

ALPINESTARS
Ex. 1002 - Page 333

so as to reduce to the minimum the impact on an overall weight and to optimize the comfort of the personal protection device. The union threads can be made of a material with higher resistance to tensile strength.

[0042] Furthermore, the machine for knitting can be programmed to vary the length and density of the union threads based upon the portion of the protection device wherein they are. In other words, the protection device can include portions intended to protect different areas of a user's body or intended to protect as many parts or portions of a body. It follows that the protection device portions can require a different configuration in terms of overall height or stiffness of protection device under inflated condition. Such material variety and differentiation, length of the union threads or density of the union threads, and/or number of mesh threads can be controlled by means of suitable configuration of the machine for the rectilinear knitting and the variation can be even punctual between a mesh stitch and an adjacent mesh stitch.

[0043] For example at side areas (for example near the above-mentioned third face and/or of the above-mentioned fourth face) or folding areas of the knitted body, the union threads can have a lower overall length than the one of the remaining union threads, so as not to leave dead and not inflated areas when the inflatable element is put in tension.

[0044] In case to further modulate the bag's stiffness the insertion of stiff portions inside or outside the knitted body can be provided.

[0045] With reference to the cover, as said the cover coating the knitted body can be implemented according to a technique known in the field and capable of coping with quick inflations of the inflatable element, in very quick time in the order of milliseconds, and still more in particular between 10 and 500 milliseconds, preferably between 10 and 200 milliseconds, still more preferably to obtain overpressures (with respect to the atmospherical pressure) comprised between 0.5 and 3 bar.

[0046] To this regard, in an embodiment, the personal protection device includes means for activating and means for inflating the inflatable element, that is one or more sensors capable of detecting the unexpected event, and valves capable of connecting the inner chamber of the inflatable element with a source of inflating fluid. The source of inflating fluid preferably comprises a generator of cold gas, such as for example helium, that is a container wherein the gas is kept at a high pressure.

[0047] It is to be noted that the knitting technique according to the present disclosure can be used for manufacturing a garment which, in a single body, includes the inflatable element. In fact, the machine for knitting can be used for manufacturing a garment (even in one single tissue layer), and programmed for creating in a determined garment area a double layer of tissue with union threads corresponding to the above-mentioned knitted body with tubular shape. The area of the double layer made of tissue can be coated with a cover apt to retain an inflating fluid. Cover sheets or layers can be placed on both sides and closed peripherally around the double layer by providing suitable openings in the tissue layer allowing a mutual gluing of the two covering layers or sheets.

[0048] Alternatively, the inflatable element is included in a garment or sub-garment, for example received in a pocket of the garment or the sub-garment.

[0049] Still alternatively, the inflatable element coincides with the garment or with the sub-garment, that is the garment or the sub-garment is implemented as a knitted body and with union threads, and equipped with activating and inflating means.

[0050] Other advantages, features and use modes of the subject of the present disclosure will result evident from the following detailed description of some preferred embodiments thereof, given by way of example and not for limitative purposes. It is however evident that each embodiment can have one or more of the above-enlisted advantages; in each case it is not requested that each embodiment has simultaneously all enlisted advantages.

[0051] The figures of the enclosed drawings will be referred to, wherein:

- figure 1 shows a top view of a protection device rested on a plane and manufactured according to the present disclosure;
- figure 2 shows a section view according to the line II-II of figure 1;
- figure 3 shows a detail III of figure 2;
- figure 4 shows a detail IV of figure 2;
- figure 5 shows a top view of a knitted body according to the present disclosure;
- figure 6 shows a view of a step for manufacturing a protection device according to the present disclosure wherein a knitted body is associated to a cover.

[0052] By referring to the enclosed figures, with the reference number 1 a protection device according to the present disclosure is designated in agreement with a specific and exemplifying embodiment.

[0053] In particular, the protection device 1 comprises an inflatable element 2 apt to assume substantially a first rest condition or deflated condition, and a second active condition or inflated condition. The modes for inflating the inflatable element 2 will be described hereinafter in the description.

[0054] The protection device 1 comprises a knitted body 3 having in the example a closed structure, that is it is a substantially casing-like shaped body, that is a three-dimensional structure at least with tubular shape, and preferably mainly closed on five sides or on all sides and defining an inner area or chamber 4.

[0055] In the illustrated embodiment the knitted body 3 is a substantially bag-like shaped body having one single opening 6 allowing the access to the inner area 4.

[0056] The knitted body 3 then, when laid on a plane and pressed in such extended position, includes two opposite portions/faces or walls 3a, 3b and at least three

ALPINESTARS
Ex. 1002 - Page 334

side portions/faces 3c, 3d, only two thereof can be seen in figures 2 and 4 extending without continuity solution between the two opposite portions 3a, 3b. Thanks to the tubular shape, and still better thanks to the shape like closed bag or casing, the knitted body 3 has the advantage of being closed laterally on at least two sides (at the side portions 3c, 3d) and not requesting a seam at least on said two sides, as for example described in the above-mentioned International patent application.

[0057] In the example illustrated in the drawings, the inflatable element 2 has a shape with two side wings 8, 9 for covering the shoulders of a user, a central portion shaped substantially like a "C" 10 and a spinal portion 11, intended to protect the spine of the user. The knitted body 3 has a shape re-using and following the shape of the inflatable element 2 and it is implemented in one single body according to said shape to define a single inner area 4.

[0058] In figure 5 and in figure 6, the knitted body 3, in schematic way, show a substantially rectangular shape in order to show how this is coated and covered by means of a cover. It is to be meant, as said, that the knitted body 3 can have or show a shape corresponding to that of the inflatable element 2 to be obtained.

[0059] In the illustrated embodiment, the spinal portion 11 can have said access opening 6 to allow positioning inside the inner area 4 a gas generator under pressure 12. Practically, the gas under pressure is introduced starting from the spinal portion 11. The knitted body 3 further includes a plurality of union threads 5 or pulling threads distributed in the inner chamber 4 and firmly connected to respective portions 3a, 3b of the knitted body 3, in particular to surface portions of the same.

[0060] The union thread 5 is an element or entity having the function of keeping united or constrained or fixed, being tensioned to tensile strength, two or more portions of the knitted body 3, at least when the latter is under inflated condition. It is noted that in the illustrated embodiment the plurality of union threads 5 is obtained starting from or belongs to one single thread, or one single filament constituted by at least two threads, wherein the single thread or the single filament is extended alternatively continuously by knitting between the first portion 3a and the second portion 3b of the knitted body 3. The thread thereof the union threads are made is a different thread or filament from that thereof the faces of the knitted body are made.

[0061] Still more in particular, the single thread or the single filament is arranged in a zigzag manner or according to a sinusoidal pattern between the first portion 3a and the second portion 3b of the knitted body 3 to cover or occupy a region of the inflatable element 2.

[0062] The union threads 5 are suitably sized so that, when the inflatable element 2 is under rest condition, preferably they are not subjected to tension and they are collapsed in the inner chamber 4, whereas when the inflatable element 2 is under inflated condition they are subjected to tension. The threads can be arranged so as to connect opposite portions 3a, 3b of the knitted body 3 or they can be arranged diagonally so as to connect not opposite portions of the knitted body 3.

[0063] The threads are distributed closely for example with a density of at least a pulling element each cm^2 of surface of the inner chamber 4, still more preferably, still by way of example, with density comprised between 1 and 15 threads each cm^2 of surface of the inflatable element 2, preferably between 4 and 6 threads each cm^2. The distribution of the threads can be varied according to the protection device area wherein the threads are. The union threads 5 for example can be made of polyester or polyamide, with thickness comprised between about 500 and about 1000 decitex (length unit of a continuous thread or a yarn). Each thread 5 can include a beam of continuous fibres without twist which outgo from a single point of a respective mesh of the knitted body 3.

[0064] In an embodiment of the present disclosure, the yarns used to implement the union threads 5 are yarns of different type with respect to those used for implementing the casing-like body and the above-mentioned portions 3a, 3b, 3c, 3d. In particular the union threads are made of a material having greater resistance to tensile strength than the threads of the casing-like body. The threads of the casing-like body can be made of a softer material, so as to obtain an inflatable element which is soft as much as possible and has a light and flexible consistence which is of total comfort for a user wearing it.

[0065] The threads of the knitted body 3 can be made of a material variable and differentiated even based upon the area of the protection device wherein they are and upon the area of the body of a user to be protected, for example the union threads 5 have a shorter length in a region of the inflatable element adjacent to the third portion/face 3c and/or the fourth portion/face 3d with respect to a central area of the inflatable element far from the third portion/face 3c and/or the fourth portion/face 3d.

[0066] The knitted body 3 and the union threads 5 can be implemented with a machine for knitting, or rectilinear knitting machine of known type which includes two needle beds, that is two rows of needles intended to the working of the knitted body. A knitting machine of known type is a machine for gloves as the one with code SWG0991N by Shima Seiki.

[0067] The two needle beds have a field of needles having an extension or length corresponding to a shape size, such as for example width or shape length, of the inflatable element to be obtained, corresponding to one of the two portions 3a or 3b comprised between the portions 3c and 3d for example. The machine is equipped with a first thread guide supporting a first thread intended to form the knitted body 3 and a second thread guide carrying a second thread intended to form the union threads 5.

[0068] The machine can be programmed so as to implement the knitted body 3 by means of the first thread guide which works alternatively the thread on the first needle bed of needles and on the second needle bed of

ALPINESTARS
Ex. 1002 - Page 335

needles.

[0069] The machine can be programmed so as to unite two opposite areas 3a, 3b of the mesh by means of the second thread carried by the second thread guide, to form the union threads 5. For example the machine can be programmed to work some mesh ranks, so as to form some complete mesh turns, and subsequently to unite by means of the second thread guide, and then the second thread, determined needles of the first needle bed with determined needles of the second needle bed. Subsequently, some mesh turns are worked again to repeat then the knitting with the second thread forming the union threads.

[0070] In order to define a specific length of the union thread, it is possible to unite the meshes by means of diagonal union threads. In this case the second thread guide will interlace the union thread with determined needles of the first needle bed and of the second needle bed so that the union threads are arranged diagonally between the needles of a first needle bed and the needles of a second needle bed. Alternatively, the mesh can be worked with a "needle-discarding" technique wherein, for each needle bed one provides using some needles as "operating" needles intended for knitting and then involved by the working of the meshes of the knitted body, and other "not operating" free needles, not involved by the knitting. Such kept-free "not operating" needles allow receiving temporarily the union thread. Practically, the union thread is "parked" momentarily on the "not operating" needle when it is worked between the first needle bed and the second needle bed. In particular, the union thread is knitted on an "operating" needle of the first needle bed intended for the working of the meshes, then it is "parked" on a "not operating" needle of the same first needle bed and subsequently it is worked on an "operating" needle of the second needle bed. In this way, by programming the distance between the first "operating" needle of the first needle bed, the not operating needle of the first needle bed and the "operating" needle of the second needle bed, it is possible establishing in advance the length of the union threads 5 when the knitted body is removed from the knitting machine.

[0071] It is to be meant that a person skilled in the use of the rectilinear knitting machines can be able to program the machine in the most optimum way to obtain the wished result.

[0072] Additional information about the working of a knitted body by means of union threads can be traced in the Italian patent application TO-2013-A-472, which describes the implementation of knitted bodies equipped with union threads.

[0073] It is further to be noted that the rectilinear knitting machine can further be programmed to vary the length of the union thread according to the area of the inflatable element to be implemented. For example, in an area of the knitted body 3 intended to be placed at the peripheral areas or areas 3c, 3d of the inflatable element 2, the union threads 5 can have a length which reduces gradually up to the minimum, in order to guarantee a tension of the union threads 5 even at the peripheral areas when the inflatable element 2 is inflated.

[0074] Furthermore, the rectilinear knitting machine can further be programmed to vary the mesh opening, for example by modifying the programming of the discarded needle, or when a closer mesh is required by using a double thread for implementing the mesh.

[0075] An important aspect deriving from the fact that the knitted body 3 is obtained in a single working step lies in the fact that it is not necessary to provide peripheral seams in the meshes as on the contrary it was provided in the above-mentioned International patent application.

[0076] The knitted body can be further coated and covered by a cover.

[0077] The cover can include two walls 15, 16 or sheets made of a sheet of soft and gas-tight material, for example of polyamide or polyurethane, which are opposite one with respect to the other one, and fastened peripherally along respective peripheral edges 20, 21.

[0078] The walls 15, 16 can be like those described in the above-mentioned International patent application and they can be made of a laminate, which is usually used as a garment lining and including a layer of fabric, in the example nylon 100% (representing about 65% in weight of the laminate) and a layer of glue, in the example a film of glue (representing about 35% in weight of the laminate), for example polyurethane glue, distributed onto the layer of fabric, by means of roller spreading.

[0079] The knitted body 3 is firmly fastened to the surface of the respective wall 15, 16, by means of a film of glue (not visible in the figures). In case of using the above-mentioned laminate, the film of glue is arranged in contact with the layer of glue of the laminate.

[0080] The just described protection device is implemented in the following way according to an embodiment.

[0081] The knitted body 3 is arranged under extended condition, so that the two opposite portions 3a, 3b are collapsed one onto the other one. The knitted body 3 in such configuration is arranged between two walls 15, 16 and fastened adhering to a respective wall 15, 16, for example by means of glue.

[0082] Subsequently, respective opposite peripheral edges 20, 21 of the walls 15 and 16 are overlapped one onto the other one along the periphery.

[0083] From the above-mentioned description it comes out that the two walls 15 are 16 substantially are two opposite elements or sheets of the inflatable element 2, fastened along the respective peripheral edges 20 and 21. In any case there is nothing to prevent the two walls 15 and 16 from being opposite portions of one single book-like folded sheet, and then having peripheral edges extended along a portion of the periphery and closed by means of sealing tape.

[0084] To implement the inflation of the inflatable element 2, in case of unforeseen fall and/or slide and/or impact by a user or a vehicle whereon he/she proceeds, the protection device 1 according to the present invention

ALPINESTARS
Ex. 1002 - Page 336

is apt to cooperate with suitable activation means operatively connected to inflation means, thereof in figures by purely way of illustration a compressed cold gas cylinder 12 is illustrated, connected by means of a duct or cannula to an intercept valve, fastened to the inflatable element 2, which allows inserting an inflating fluid into the inflatable element 2.

[0085] The gas cylinder 12, as above indicated, can be also included inside the inflatable element 2.

[0086] Alternatively, such inflating means can include gas generators of pyrotechnic type or hybrid type or other types known to the state of art.

[0087] Said inflating means is controlled by a control unit based upon the detection of the status of the vehicle/driver system; for example said control unit can implement a system for predicting the fall allowing to timely identify the fall event and a reliable prediction thereof by means of accelerometric sensors integral to the vehicle (or the driver) and a unit for processing the signals produced by the sensors themselves.

[0088] Alternatively, the device according to the present disclosure can also be applied by using an activation cable connected to a vehicle guided by a user, which cable controls the inflation of the inflatable element 2 after the removal of the user from the vehicle, for example, after a fall or an unforeseen impact.

[0089] In any case, the above-mentioned activating and inflating means can be integrated in the protection device 1 according to the present invention or placed outside the same.

[0090] It is to be also noted that the activation modes, even if they are an aspect of particular relevance for an effective operation of the device, will not be further described with greater detail as they are methods mainly already known to the person skilled in the art of the protection of a subject from unforeseen impacts. The knitted body 3 can include even electric threads which can be knitted together with the knitted body for the connection of inner/outer sensors and/or managing electronics or valves or other electric devices.

[0091] It is further to be noted that the protection device can be included in a garment, or it can be integrating portion of a garment. In fact, there is nothing to prevent that, thanks to the programming potential of a rectilinear knitting machine, from implementing in one single producing step a knitted body together with a garment, that is that the knitted body is integrated in one single body with the garment, or even coincides with the garment. In fact for example the knitted body can have a vest-like or jacket-like shape and, for example, worked with a mesh density so as to allow an adequate fluid-tightness of the inflating gas.

[0092] In order to make the knitted body impermeable or at least with temporary fluid-tightness, the implementation of a localized cover of the knitted body, or the implementation of a closer mesh at the knitted body, can be provided.

[0093] Two covering layers can be provided on opposite sides of the knitted body, and such covering layers can be united by means of suitable openings provided around the knitted body.

[0094] The subject of the present disclosure has been sofar described with reference to preferred embodiments. It is to be meant that other embodiments belonging to the same inventive core may exist, all within the protection scope of the herebelow enclosed claims.

Claims

1. A protection device (1) for the protection of a user, said protection device comprising an inflatable element (2) apt to assume an active inflated condition and a rest deflated condition and wherein said inflatable element (2) includes a knitted body having a closed structure on at least four sides or walls and having at least a partially tubular shape to define an inner area or inner chamber (4), wherein the knitted body (3) includes a plurality of union threads (5) occupying at least partially the inner area (4) and apt to connect two faces or walls (3a, 3b) of the knitted body (3).

2. The protection device (1) according to claim 1, wherein the union threads (5) cross the inner chamber (4) and they are elements knitted with the faces of the knitted body, said union threads being sized so that, when said inflatable element (2) is under the rest deflated condition, said union threads (5) are under a not tensioned condition and collapsed in said inner chamber (3), whereas when said inflatable element (2) is under the active inflated condition, said union threads (5) are subjected to tensile strength, and/or wherein the union threads (5) are joined with the knitted body (3) by knitting.

3. The protection device (1) according to claim 1 or 2, wherein at least a group of said union threads (5) are part of a thread, or of a filament constituted by at least two threads, wherein the thread or filament is continuously extended alternately into the faces of the knitted body.

4. The protection device (1) according to claim 3, wherein the knitted body comprises at least a first face or knitted wall (3a); at least a second face or knitted wall (3b), opposite to the first face (3a); at least a third face or knitted wall (3c) and continuously connected by knitting to the first face (3a) and to the second face (3b); at least a fourth face or knitted wall (3d) and continuously connected by knitting to the first face (3a) and the second face (3b), wherein the fourth face (3d) is opposite to the third face (3c), and wherein the thread or filament extends alternatively, it is arranged in a zigzag manner or according to a sinusoidal pattern, between the first face (3a) and

ALPINESTARS
Ex. 1002 - Page 337

the second face (3b) of the knitted body (3) to occupy at least a region of the inner chamber (4) of the inflatable element (2).

5. The protection device (1) according to claim 4, wherein the union threads (5) have a shorter length in a region of the inflatable element adjacent to the third face (3c) and/or to the fourth face (3d) with respect to a central area of the inflatable element far from the third face (3c) and/or the fourth face (3d).

6. The protection device (1) according to anyone of the previous claims, wherein the union threads (5) are made of a different material than the walls or faces of the knitted body (3) and/or wherein the walls or faces of the knitted body (3) is made of a softer material and/or a less resistant to tensile strength material than a material of the union threads (5).

7. The protection device (1) according to anyone of the previous claims, wherein the inflatable element comprises, in a first area, first union threads (5) having a first length and, in a second area, second union threads (5) having a second length, wherein the first length is different from the second length, and/or wherein the inflatable element comprises, in a first area, union threads (5) distributed with a first density of threads and, in a second area, union threads (5) distributed with a second density of threads, wherein the first density of threads is different from the second density of threads.

8. The protection device (1) according to anyone of the previous claims, wherein the knitted body (3) is a closed body on at least five faces or walls to define a bag comprising at least an access opening (6) to access said inner area (4).

9. The protection device (1) according to anyone of the previous claims, wherein the knitted body (3) is a closed body on all sides to define a closed casing.

10. The protection device (1) according to anyone of the previous claims, wherein at least a first face or knitted wall (3a) is, or corresponds to, a side of the knitted body (3) worked on a first needle bed of a knitting machine having two needle beds and a second wall or knitted face (3b) is, or corresponds to, a side of the knitted body (3) worked on a second needle bed of said knitting machine.

11. The protection device (1) according to anyone of the previous claims, wherein the mesh openings of said knitted body (3) are at least partially closed or covered to retain at least temporarily an inflating fluid in said inflatable element (2), and/or wherein said inflatable element (2) includes a covering layer or a cover sheet (4) apt to cover an outer surface of said knitted body (3).

12. The protection device (1) according to anyone of the previous claims, said protection device being apt to assume said active inflated condition in the event of an unforeseen impact.

13. A garment including, or integrally incorporating, a protection device (1) according to anyone of the previous claims, or garment coincident with a protection device (1) according to anyone of the previous claims.

14. A method for making a protection device (1) for the protection of a user, comprising the steps of
knitting at least a first thread to obtain a knitted body having a closed structure on at least four faces or walls, and having at least a partially tubular shape, to define an inner area or inner chamber (4) wherein said knitted body (3) is intended to be inflated and
knitting at least a second thread so that the second thread is interlaced or interwoven or knitted with the first thread of the faces of the knitted body and wherein the second thread extends alternatively in the chamber between the faces or portions of the knitted body so that a first region of the second thread is knitted with a first face of the knitted body and a second region of the second thread is worked with a second face of the knitted body (3) to define a plurality of union threads (5) crossing the inner chamber (4) and each having a first end portion connected to the first face of the worked body (3) and a second end portion connected to the second face of the knitted body (3).

15. The method according to claim 14, wherein the first thread and the second thread are knitted by means of the same knitting machine.

16. The method according to claim 15, wherein the knitting machine is a rectilinear knitting machine.

17. The method according to claim 15 or 16, wherein the method provides to work the second thread so as to adjust the length of the union threads according to the region of the inflatable element.

18. The method according to anyone of the previous claims 15 to 17, wherein the knitting machine includes at least two needle beds and it is configured to perform a step of knitting the mesh on a first needle bed via the first thread carried by a first thread guide, a step of knitting the mesh on a second needle bed through the first thread carried by the first thread guide, and a step of performing the knitting on one needle bed and on the other needle bed via the second thread carried by a second thread guide so that the knitted body on the first needle bed and the knit-

ALPINESTARS
Ex. 1002 - Page 338

ted body on the second needle bed are connected to each other by the second thread.

19. The method according to anyone of the previous claims 14 to 18, wherein the first thread is made of a different material than the second thread.

20. The method according to anyone of the previous claims 14 to 19, wherein the method provides to work the first thread so as to form a closed body on at least five faces or walls to define a bag comprising at least an access opening (6) to access said inner area (4).

21. The method according to anyone of the previous claims 14 to 20, wherein the method provides to work the first thread so as to form a closed body on all sides to define a closed casing.

22. The method according to anyone of the previous claims 14 to 21, wherein the method provides to close at least partially the mesh openings of said knitted body (3) for holding at least temporarily in the inner chamber (4) an inflating fluid and/or wherein the method provides to cover or to coat an outer surface of said knitted body (3).

23. A use of a rectilinear knitting machine for manufacturing a protection device airbag (1) having an inner chamber (4), wherein said rectilinear knitting machine is configured to work a first thread for manufacturing a body with casing and a second thread for manufacturing union threads crossing the inner chamber (4), wherein the protection device airbag (1) is the protection device according to anyone of the previous claims 1 to 12, or a device obtained by means of the method according to anyone of claims 14 to 22.

Patentansprüche

1. Schutzvorrichtung (1) zum Schutz eines Benutzers, wobei die Schutzvorrichtung ein aufblasbares Element (2) aufweist, das einen aktiven aufgeblasenen Zustand und einen nicht aufgeblasenen Ruhezustand annehmen kann, und wobei das aufblasbare Element (2) einen gewirkten Körper enthält, der eine geschlossene Struktur an mindestens vier Seiten oder Wänden und mindestens eine teilweise röhrenförmige Form aufweist, um einen inneren Bereich oder eine innere Kammer (4) zu definieren, wobei der gewirkte Körper (3) eine Vielzahl von Verbindungsfäden (5) aufweist, die zumindest teilweise den inneren Bereich (4) okkupieren und dazu geeignet sind, zwei Flächen oder Wände (3a, 3b) des gewirkten Körpers (3) zu verbinden.

2. Schutzvorrichtung (1) gemäß Anspruch 1, wobei die Verbindungsfäden (5) die innere Kammer (4) kreuzen und Elemente sind, die mit den Flächen des gewirkten Körpers gewirkt sind, wobei die Verbindungsfäden so bemessen sind, dass, wenn das aufblasbare Element (2) sich im nicht aufgeblasenen Ruhezustand befindet, die Verbindungsfäden (5) in einem nicht gespannten Zustand und in das innere der Kammer (3) kollabiert sind, während, wenn sich das aufblasbare Element (2) im aktiven aufgeblasenen Zustand befindet , die Verbindungsfäden (5) einer Zugkraft unterworfen werden, und/oder wobei die Verbindungsfäden (5) durch Wirken mit dem gewirkten Körper (3) verbunden sind.

3. Schutzvorrichtung (1) gemäß Anspruch 1 oder 2, wobei mindestens eine Gruppe der Verbindungsfäden (5) Teil eines Fadens oder eines Filaments ist, der oder das aus mindestens zwei Fäden besteht, wobei der Faden oder das Filament kontinuierlich abwechselnd in die Flächen des gewirkten Körpers verlängert ist.

4. Schutzvorrichtung (1) gemäß Anspruch 3, wobei der gewirkte Körper umfasst: Mindestens eine erste Fläche oder gewirkte Wand (3a); mindestens eine zweite Fläche oder gewirkte Wand (3b), die der ersten Fläche (3a) gegenüberliegt; mindestens eine dritte Fläche oder gewirkte Wand (3c), die durch Wirken kontinuierlich mit der ersten Fläche (3a) und der zweiten Fläche (3b) verbunden ist; mindestens eine vierte Fläche oder geistwirkte Wand (3d) die kontinuierlich durch Wirken mit der ersten Fläche (3a) und der zweiten Fläche (3b) verbunden ist, wobei die vierte Fläche (3d) der dritten Fläche (3c) gegenüberliegt, und worin sich der Faden oder das Filament abwechselnd erstreckt, er oder es zickzackförmig oder sinusförmig zwischen der ersten Fläche (3a) und der zweiten Fläche (3b) des Gewirkkörpers (3) angeordnet ist, um mindestens einen Bereich des innere Kammer (4) des aufblasbaren Elements (2) zu okkupieren.

5. Schutzvorrichtung (1) gemäß Anspruch 4, wobei die Verbindungsfäden (5) in einem Bereich des aufblasbaren Elements benachbart zu der dritten Fläche (3c) und / oder zu der vierten Fläche (3d) eine kürzere Länge aufweisen in Bezug auf einen mittigen Bereich des aufblasbaren Elements, der von der dritten Fläche (3c) und / oder der vierten Fläche (3d) beabstandet ist.

6. Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche, wobei die Verbindungsfäden (5) aus einem anderen Material hergestellt sind als die Wände oder Flächen des gewirkten Körpers (3) und / oder wobei die Wände oder Flächen der Gewirke der Körper (3) aus einem weicheren Material und /

ALPINESTARS
Ex. 1002 - Page 339

oder einem weniger reißfesten Material als ein Material der Verbindungsfäden (5).

7. Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche, wobei das aufblasbare Element aufweist: In einem ersten Bereich erste Verbindungsfäden (5) mit einer ersten Länge und in einem zweiten Bereich zweite Verbindungsfäden (5) mit einer zweite Länge, wobei sich die erste Länge von der zweiten Länge unterscheidet, und/oder wobei das aufblasbare Element aufweist: In einem ersten Bereich Verbindungsfäden (5), die mit einer ersten Fadendichte verteilt sind und in einem zweiten Bereich Verbindungsfäden (5), die mit Fadendichte verteilt sind, wobei sich die erste Fadendichte von der zweiten Fadendichte unterscheidet.

8. Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche, wobei der gewirkte Körper (3) an mindestens fünf Seiten oder Wänden ein geschlossener Körper ist, um einen Beutel zu definieren, der mindestens eine Zugangsöffnung (6) zum Zugang zu dem inneren Bereich (4) aufweist.

9. Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche, wobei der gewirkte Körper (3) auf allen Seiten ein geschlossener Körper ist, um ein geschlossenes Gehäuse zu definieren.

10. Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche, wobei mindestens eine erste Seite oder gewirkte Wand (3a) eine Seite des gewirkten Körpers (3) ist oder ihr entspricht, die an einem ersten Nadelbett einer Wirkmaschine mit zwei Nadelbetten gearbeitet wurde, und eine zweite Seite oder gewirkte Wand (3b) eine Seite des gewirkten Körpers (3) ist oder ihr entspricht, die an einem zweiten Nadelbett der Wirkmaschine gearbeitet wurde.

11. Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche, wobei die Maschenöffnungen des gewirkten Körpers (3) zumindest teilweise geschlossen oder bedeckt sind, um zumindest vorübergehend ein Aufblasfluid in dem aufblasbaren Element (2) zurückzuhalten, und/oder wobei das aufblasbare Element (2) eine bedeckende Schicht oder eine Deckschicht (4) aufweist, die geeignet ist, eine äußere Oberfläche des gewirkten Körpers (3) zu bedecken.

12. Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche, wobei die Schutzvorrichtung geeignet ist, den aktiven aufgeblasenen Zustand im Falle eines unvorhergesehenen Aufpralls anzunehmen.

13. Kleidungsstück, welches eine Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche oder ein Kleidungsstück, das mit einer Schutzvorrichtung (1) gemäß einem der vorhergehenden Ansprüche übereinstimmt umfasst oder ganzheitlich mit sich vereint.

14. Verfahren zum Herstellen einer Schutzvorrichtung (1) zum Schutz eines Benutzers, umfassend die Schritte:

Wirken mindestens eines ersten Fadens, um einen gewirkten Körper mit einer geschlossenen Struktur auf mindestens vier Seiten oder Wänden zu erhalten, und der zumindest eine teilweise röhrenartige Form aufweist, um einen inneren Bereich oder eine innere Kammer (4) zu definieren, wobei der gewirkte Körper (3) zum Aufblasen vorgesehen ist, und

Wirken mindestens eines zweiten Fadens, so dass der zweite Faden mit dem ersten Faden der Seiten des gewirkten Körpers verflochten oder verwoben oder verwirkt ist und wobei der zweite Faden sich abwechselnd in der Kammer zwischen den Seiten oder Abschnitten des Gewirkkörpers erstreckt, so dass ein erster Bereich des zweiten Fadens mit einer ersten Seite des Gewirkkörpers gewirkt ist und ein zweiter Bereich des zweiten Fadens mit einer zweiten Seite des gewirkten Körpers (3) bearbeitet ist, um mehrere Verbindungsfäden (5) zu definieren, welche die innere Kammer (4) kreuzen und jeweils einen ersten Endabschnitt aufweisen, der mit der ersten Seite des bearbeiteten Körpers (3) verbunden ist und einen zweiten Endabschnitt aufweisen, der mit der zweiten Seite des gewirkten Körpers (3) verbunden ist.

15. Verfahren gemäß Anspruch 14, wobei der erste Faden und der zweite Faden mittels derselben Wirkmaschine gewirkt werden.

16. Verfahren gemäß Anspruch 15, wobei die Wirkmaschine eine geradlinige Wirkmaschine ist.

17. Verfahren gemäß Anspruch 15 oder 16, wobei das Verfahren vorsieht, den zweiten Faden so zu bearbeiten, dass die Länge der Verbindungsfäden entsprechend dem Bereich des aufblasbaren Elements angepasst wird.

18. Verfahren gemäß einem der vorhergehenden Ansprüche 15 bis 17, wobei die Wirkmaschine mindestens zwei Nadelbetten umfasst und konfiguriert ist, um auszuführen: Einen Schritt des Wirkens des Netzes auf einem ersten Nadelbett mittels des von einem ersten Fadenführer getragenen ersten Fadens, einen Schritt des Wirkens des Netzes auf einem zweiten Nadelbett mittels des von dem ersten Fadenführer getragenen ersten Faden und einen

ALPINESTARS
Ex. 1002 - Page 340

Schritt des Wirkens auf dem einen Nadelbett und auf dem anderen Nadelbett mittels des von einem zweiten Fadenführer getragenen zweiten Fadens, so, dass der gewirkte Körper auf dem ersten Nadelbett und der gewirkte Körper auf dem zweiten Nadelbett durch den zweiten Faden miteinander verbunden sind.

19. Verfahren gemäß einem der vorhergehenden Ansprüche von 14 bis 18, wobei der erste Faden aus einem anderen Material als der zweite Faden hergestellt ist.

20. Verfahren gemäß einem der vorhergehenden Ansprüche 14 bis 19, wobei das Verfahren vorsieht, den ersten Faden so zu bearbeiten, dass ein geschlossener Körper auf mindestens fünf Seiten oder Wänden gebildet wird, um einen Beutel zu definieren, der mindestens eine Zugangsöffnung (6) zum Zugang des inneren Bereichs umfasst.

21. Verfahren gemäß einem der vorhergehenden Ansprüche 14 bis 20, wobei das Verfahren vorsieht, den ersten Faden so zu bearbeiten, dass auf allen Seiten ein geschlossener Körper gebildet wird, um ein geschlossenes Gehäuse zu definieren.

22. Verfahren gemäß einem der vorhergehenden Ansprüche 14 bis 21, wobei das Verfahren vorsieht, die Maschenöffnungen des gewirkten Körpers (3) zumindest teilweise zu schließen, um zumindest vorübergehend ein Aufblasfluid in der inneren Kammer (4) zu halten, und/oder wobei das Verfahren vorsieht, eine äußere Oberfläche des gewirkten Körpers (3) zu bedecken oder zu beschichten.

23. Verwendung einer geradlinigen Wirkmaschine zum Herstellen eines Schutzvorrichtungs-Airbags (1) mit einer inneren Kammer (4), wobei die geradlinige Wirkmaschine ausgebildet ist zum Bearbeiten eines ersten Fadens zum Herstellen eines Körpers mit Hülle und eines zweiten Fadens zum Herstellen von Verbindungsfäden, welche die inneren Kammer (4) durchqueren, wobei der Schutzvorrichtungsairbag (1) die Schutzvorrichtung gemäß einem der vorhergehenden Ansprüche 1 bis 12 oder eine Vorrichtung ist, die mittels des Verfahrens gemäß einem der Ansprüche 14 bis 22 erhalten wurde.

Revendications

1. Dispositif de protection (1) pour la protection d'un utilisateur, ledit dispositif de protection comprenant un élément gonflable (2) pouvant assumer une condition gonflée active et une condition dégonflée au repos et dans lequel ledit élément gonflable (2) comprend un corps tricoté ayant une structure fermée sur au moins quatre côtés ou parois et ayant au moins une forme en partie tubulaire pour définir une aire interne ou une chambre interne (4), dans lequel le corps tricoté (3) comprend une pluralité de fils d'union (5) occupant au moins en partie l'aire interne (4) et pouvant relier deux faces ou parois (3a, 3b) du corps tricoté (3).

2. Dispositif de protection (1) selon la revendication 1, dans lequel les fils d'union (5) traversent la chambre interne (4) et sont des éléments tricotés avec les faces du corps tricoté, lesdits fils d'union étant dimensionnés de telle sorte que, quand ledit élément gonflable (2) est dans la condition dégonflée au repos, lesdits fils d'union (5) sont sous une condition non tendue et affaissés dans ladite chambre interne (3), alors que quand ledit élément gonflable (2) est dans la condition gonflée active, lesdits fils d'union (5) sont soumis à une résistance au déchirement, et / ou dans lequel les fils d'union (5) sont joints au corps tricoté (3) par tricotage.

3. Dispositif de protection (1) selon la revendication 1 ou 2, dans lequel au moins un groupe desdits fils d'union (5) forment partie d'un fil, ou d'un filament constitué par au moins deux fils, dans lequel le fil ou filament est étendu en continu en alternance dans les faces du corps tricoté.

4. Dispositif de protection (1) selon la revendication 3, dans lequel le corps tricoté comprend au moins une première face ou paroi tricotée (3a) ; au moins une deuxième face ou paroi tricoté (3b), opposée à la première face (3a) ; au moins une troisième face ou paroi tricotée (3c) et reliée en continu par tricotage à la première face (3a) et à la deuxième face (3b) ; au moins une quatrième face ou paroi tricotée (3d) et reliée en continu par tricotage à la première face (3a) et à la deuxième face (3b), dans lequel la quatrième face (3d) est opposée à la troisième face (3c) et dans lequel le fil ou filament s'étendant en alternance est agencé de manière en zig-zag ou selon un motif sinusoïdal entre la première face (3a) et la deuxième face (3b) du corps tricoté (3) pour occuper au moins une région de la chambre interne (4) de l'élément gonflable (2).

5. Dispositif de protection selon la revendication 4, dans lequel les fils d'union (5) ont une longueur plus courte dans une région de l'élément gonflable adjacente à la troisième face (3c) et / ou à la quatrième face (3d) par rapport à une aire centrale de l'élément gonflable loin de la troisième face (3c) et / ou de la quatrième face (3d).

6. Dispositif de protection (1) selon l'une quelconque des revendications précédentes, dans lequel les fils d'union (5) sont réalisés à partir d'un matériau diffé-

ALPINESTARS
Ex. 1002 - Page 341

rent de celui des parois ou faces dudit corps tricoté (3) et / ou dans lequel les parois ou faces du corps tricoté (3) sont réalisées à partir d'un matériau plus doux et / ou d'un matériau moins résistant à une résistance au déchirement qu'un matériau des fils d'union (5).

7. Dispositif de protection (1) selon l'une quelconque des revendications précédentes, dans lequel l'élément gonflable comprend, dans une première aire, des premiers fils d'union (5) ayant une première longueur et, dans une seconde aire, des seconds fils d'union (5) ayant une seconde longueur, dans lequel la première longueur est différente de la seconde longueur, et / ou dans lequel l'élément gonflable comprend, dans une première aire, des fils d'union (5) répartis avec une première densité de fils et, dans une seconde aire, des fils d'union (5) répartis avec une seconde densité de fils, dans lequel la première densité de fils est différente de la seconde densité de fils.

8. Dispositif de protection (1) selon l'une quelconque des revendications précédentes, dans lequel le corps tricoté (3) est un corps fermé sur au moins cinq faces ou parois pour définir un sac comprenant au moins une ouverture d'accès (6) pour accéder à ladite aire interne (4).

9. Dispositif de protection (1) selon l'une quelconque des revendications précédentes, dans lequel le corps tricoté (3) est un corps fermé sur tous les côtés pour définir une enveloppe fermée.

10. Dispositif de protection (1) selon l'une quelconque des revendications précédentes, dans lequel au moins une première face ou paroi tricotée (3a) est, ou correspond à, un côté du corps tricoté (3) travaillé sur un premier fonture d'un métier à tricot ayant deux fontures et une seconde paroi ou face tricotée (3b) est, ou correspond à, un côté du corps tricoté (3) travaillé sur un second fonture dudit métier à tricot.

11. Dispositif de protection (1) selon l'une quelconque des revendications précédentes, dans lequel les ouvertures de mailles dudit corps tricoté (3) sont au moins en partie fermées ou couvertes pour retenir au moins temporairement un liquide de gonflage dans ledit élément gonflable (2) et / ou dans lequel ledit élément gonflable (2) comprend une couche de couverture ou une couche de recouvrement (4) pouvant recouvrir une surface externe dudit corps tricoté (3).

12. Dispositif de protection (1) selon l'une quelconque des revendications précédentes, ledit dispositif de protection pouvant assumer ladite condition gonflée active en cas d'impact imprévu.

13. Vêtement comprenant, ou incorporant d'un seul tenant, un dispositif de protection (1) selon l'une quelconque des revendications précédentes ou vêtement coïncidant avec un dispositif de protection (1) selon l'une quelconque des revendications.

14. Procédé de fabrication d'un dispositif de protection (1) pour la protection d'un utilisateur, comprenant les étapes consistant à :

tricoter au moins un premier fil pour obtenir un corps tricoté ayant une structure fermée sur au moins quatre faces ou parois, et ayant au moins en partie une forme tubulaire, pour définir une aire interne ou chambre interne (4) dans lequel ledit corps tricoté (3) est destiné à être gonflé, et tricoter au moins un second fil de sorte que le second fil soit entrelacé ou enchevêtré ou tricoté avec le premier fil des faces du corps tricoté et dans lequel le second fil s'étend en alternance dans la chambre entre les faces ou parties du corps tricoté de telle sorte qu'une première région du premier fil est tricotée avec une première face du corps tricoté et une seconde région du second fil est travaillée avec une seconde face du corps tricoté (3) pour définir une pluralité de fils d'union (5) traversant la chambre (4) et ayant chacun une première partie d'extrémité reliée à la première face du corps travaillé (3) et une seconde partie d'extrémité reliée à la seconde face du corps tricoté (3).

15. Procédé selon la revendication 14, dans lequel le premier fil et le second fil sont tricotés à l'aide du même métier de tricotage.

16. Procédé selon la revendication 15, dans lequel le métier de tricotage est un métier de tricotage rectiligne.

17. Procédé selon la revendication 15 ou 16, dans lequel le procédé prévoit de travailler le second fil de façon à régler la longueur des fils d'union selon la région de l'élément gonflable.

18. Procédé selon l'une quelconque des revendications précédentes 15 à 17, dans lequel le métier de tricotage comprend au moins deux fontures et est configuré pour exécuter une étape consistant à tricoter la maille sur un premier fonture par l'intermédiaire du premier fil porté par un premier guide-fil, une étape consistant à tricoter la maille sur un deuxième fonture par l'intermédiaire du premier fil porté par le premier guide-fil et une étape consistant à exécuter le tricotage sur un fonture et sur l'autre fonture par l'intermédiaire du second fil porté par un second guide-fil de sorte que le corps tricoté sur le premier fonture et le corps tricoté sur le second fonture soient

ALPINESTARS
Ex. 1002 - Page 342

reliés l'un à l'autre par le second fil.

19. Procédé selon l'une quelconque des revendications précédentes 14 à 18, dans lequel le premier fil est réalisé à partir d'un matériau différent du second fil.

20. Procédé selon l'une quelconque des revendications précédentes 14 à 19, dans lequel le procédé prévoit de travailler le premier fil de façon à former un corps fermé sur au moins cinq faces ou parois pour définir un sac comprenant au moins une ouverture d'accès (6) pour accéder à ladite aire interne (4).

21. Procédé selon l'une quelconque des revendications précédentes 14 à 20, dans lequel le procédé prévoit de travailler le premier fil de façon à former un corps fermé sur tous les côtés pour définir une enveloppe fermée.

22. Procédé selon l'une quelconque des revendications précédentes 14 à 21, dans lequel le procédé fait en sorte de fermer au moins en partie les ouvertures de maille dudit corps tricoté (3) pour maintenir au moins temporairement dans la chambre interne (4) un liquide de gonflage et / ou dans lequel le procédé fournit la couverture ou le revêtement d'une surface externe dudit corps tricoté (3).

23. Utilisation d'un métier rectiligne de tricot pour fabriquer un coussin gonflable de dispositif de protection (1) ayant une chambre interne (4), dans lequel ledit métier rectiligne de tricot est configuré pour travailler un premier fil en vue de fabriquer un corps avec une enveloppe et un second fil pour fabriquer des fils d'union traversant la chambre interne (4), dans lequel le coussin gonflable de dispositif de protection (1) est le dispositif de protection selon l'une quelconque des revendications précédentes 1 à 12 ou un dispositif obtenu à l'aide du procédé selon l'une quelconque des revendications 14 à 22.

ALPINESTARS
Ex. 1002 - Page 343

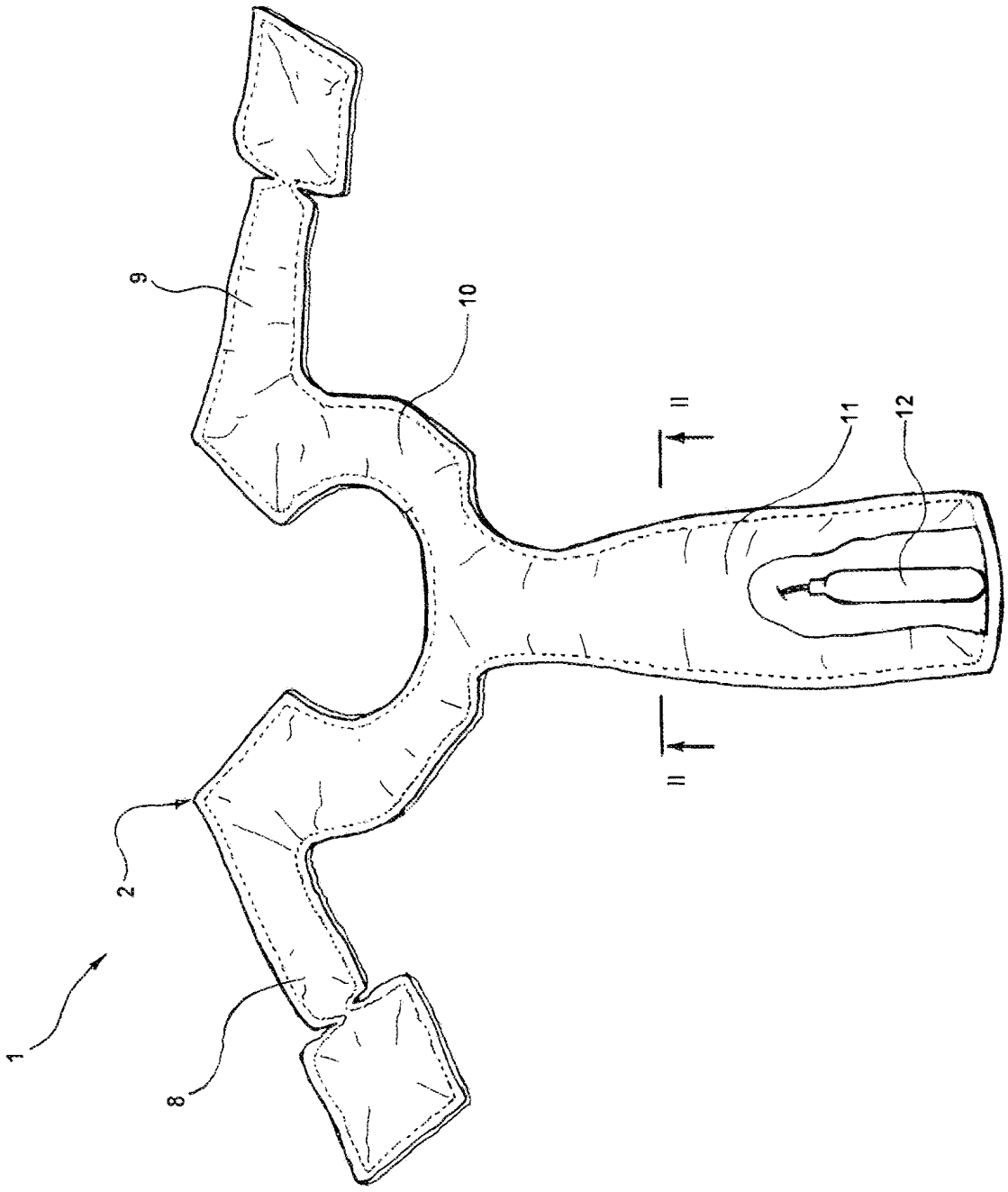


FIG.1

ALPINESTARS
Ex. 1002 - Page 344

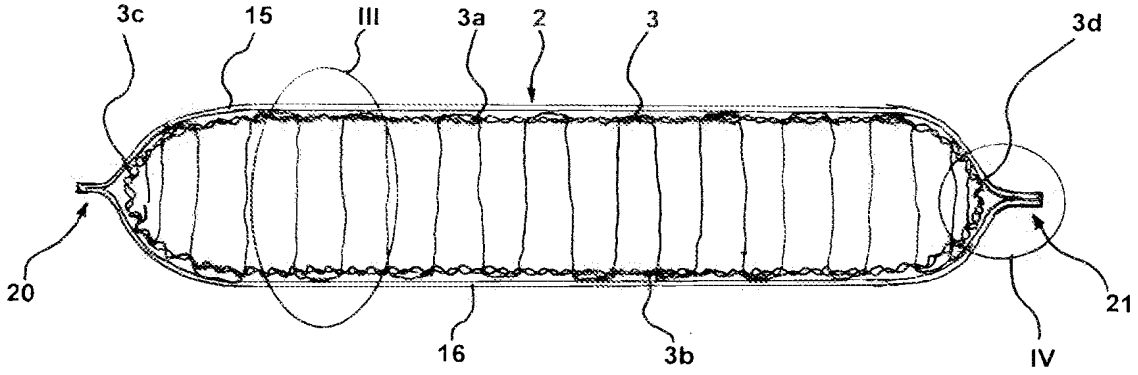


FIG.2

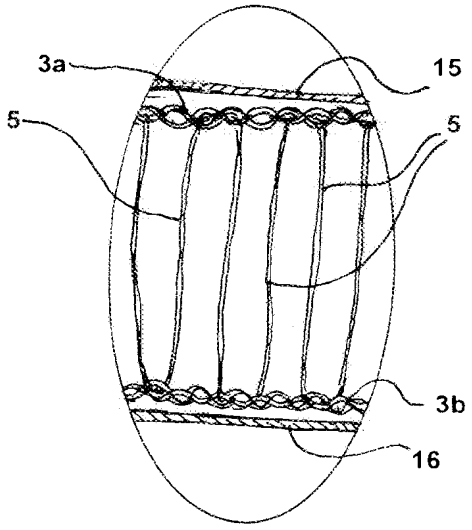


FIG.3

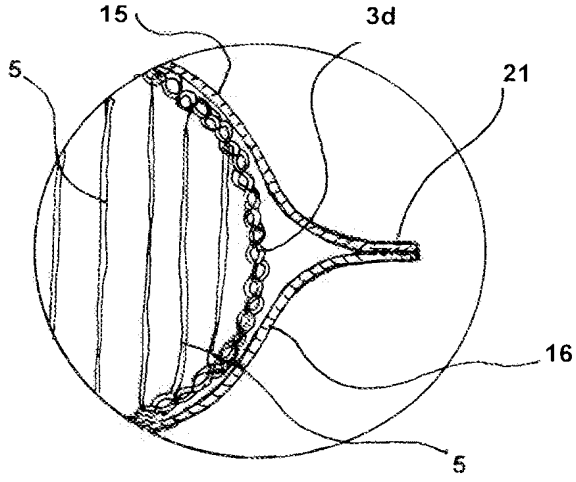


FIG.4

ALPINESTARS
Ex. 1002 - Page 345

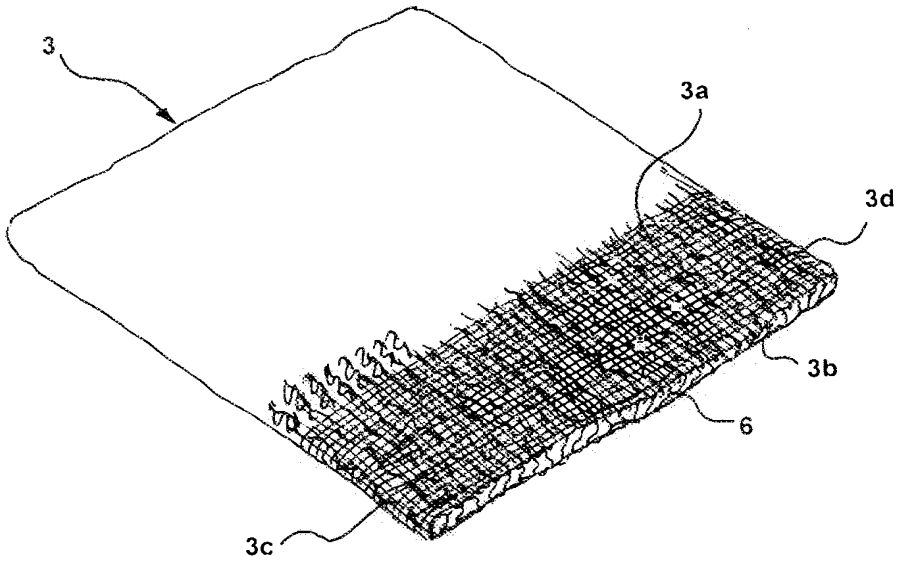


FIG.5

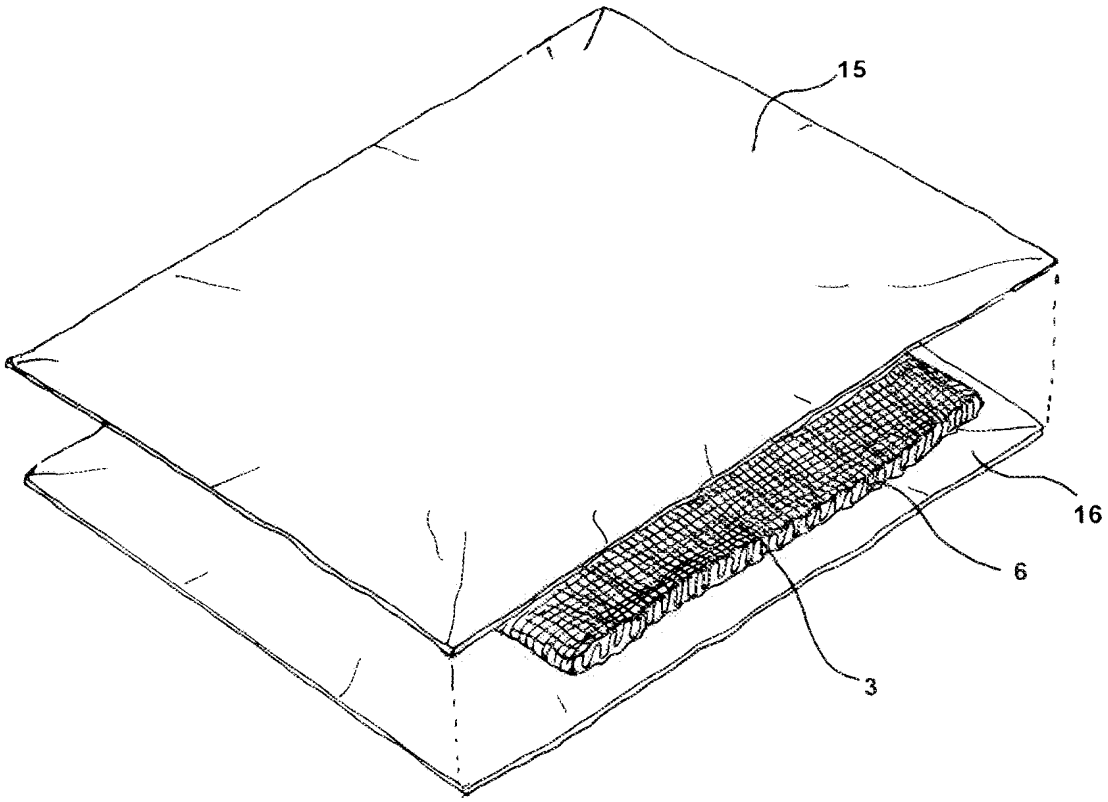


FIG.6

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Ex. 1002 - Page 346

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2010067288 A **[0002]**
- IT TO20130472 A **[0072]**

ALPINESTARS
Ex. 1002 - Page 347

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TBD
	Application Number	
Title of Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Lino		DAINESE	

Residence Information (Select One) US Residency ● Non US Residency Active US Military Service

City	Vicenza	Country of Residence i	IT

Mailing Address of Inventor:

Address 1	c/o D-Air Lab S.r.l.		
Address 2	Via dell'Economia 64/C		
City	Vicenza	**State/Province**	
Postal Code	36100	**Country** i	IT

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	26111		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE		
Attorney Docket Number	TBD	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TBD
	Application Number	
Title of Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	26111		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	a 371 of international	PCT/IB2020/061689	2020-12-09

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TBD
	Application Number	
Title of Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
102019000023958	IT	2019-12-13	

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
102019000023961	IT	2019-12-13	

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
102019000023964	IT	2019-12-13	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TBD
	Application Number	
Title of Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TBD
	Application Number	
Title of Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor

● Person to whom the inventor is obligated to assign. | Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	D-AIR LAB S.R.L.		
Mailing Address Information For Applicant:			
Address 1	Via dell'Economia 64/C		
Address 2			
City	Vicenza	**State/Province**	
Country	IT	Postal Code	36100
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TBD
	Application Number	
Title of Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	D-AIR LAB S.R.L.

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	Via dell'Economia 64/C		
Address 2			
City	Vicenza	**State/Province**	
Country i	IT	Postal Code	36100
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Paul A. Calvo/			Date (YYYY-MM-DD)	2022-06-13
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	TBD
	Application Number	
Title of Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE	

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

As the below named inventor, I hereby declare that:

This declaration is directed to:

- ☐ The attached application, or
- ☒ United States application or PCT international application number PCT/IB2020/061689 filed on 9 December 2020.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Lino DAINESE Date (Optional): 13.06.2022

Signature: / /

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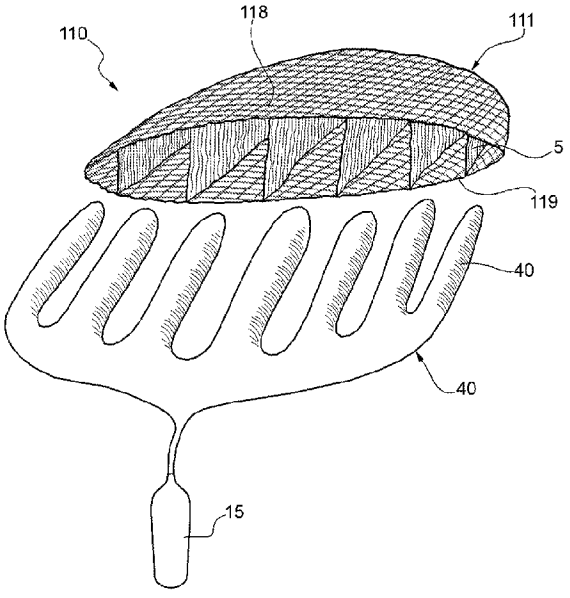


FIG.1

(57) Abstract: The present disclosure relates to a protective device (10, 110) for the protection of a user. The protective device (10) comprises a mesh structure (11, 111) comprising a first mesh portion (18, 118) and a second mesh portion (19, 119) and a plurality of tie elements (5), wherein said first mesh portion (18, 118) and said second mesh portion (19, 119) are opposite one another and are connected one another by the plurality of tie elements (5); wherein the first mesh portion, the second mesh portion and the tie elements define one or more inner housings of the mesh structure (11, 111). The protective device (10, 110) includes a casing body (40, 42, 43) disposed in one or more of said inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in the one or more inner housings of the mesh structure (11, 111).

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PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

DESCRIPTION

The present disclosure generally refers to a protective device for protecting a user. It is preferably a wearable protective device. The protective device includes an inflatable element which, in an inflated condition, is configured to protect a passenger, motor vehicle rider or similar user from impacts and/or falls, during a sporting and/or working activity and/or any other activity.

A known protective device is for example the one described in the European patent EP3291697B1. Such a device includes an inflatable element apt to assume an active inflated condition and a deflated rest condition. The inflatable element includes a body made of mesh, that is, made by knitting. Said mesh body is a closed, or at least tubular, structure defining an inner region, or area, or chamber. This inner chamber is occupied at least partially by a plurality of joining threads connecting opposite portions of the mesh body to each other. The fact of making a single mesh body has the advantage of containing manufacturing waste and minimizing production times; in fact joining threads and meshes can be machined with a single knitting machine. The joining threads are part of a single thread connected to opposite portions of the mesh body. In particular, the thread passes alternately and continuously between a first portion and a second portion of the mesh body.

The inflatable element also includes waterproofing walls arranged externally that allow to contain the inflation fluid for a certain period of time. The walls are, for example, a first sheet, or first wall, and a second sheet, or second wall, fixed to each other along their respective perimetric edges. Said first and second sheet cover and line the mesh body on an external side or surface.

An inflatable element thus made, while being very advantageous from many points of view, nevertheless has the disadvantage of not always allowing adequate transpiration in a garment where it is integrated or inserted. In particular, the inflatable element in a deflated condition can create a sort of bag around the user's body that does not allow adequate passage of ventilation air. To overcome this problem, it has been proposed to fold the inflatable element in a deflated condition and make it expand and occupy a more extended position in the inflated condition so that when the inflatable element is at rest and not in use there are minimal areas with little transpiration. Even this solution, while advantageous from many points of view, has some drawbacks, as it is not always possible to place the inflatable

element in a deflated position and in any case a control of the expansion of the inflatable element is required at the time of inflation.

A technical problem underlying the present disclosure resides in providing a protective device for the protection of a user capable of overcoming the drawbacks of the known art and allowing greater transpiration and/or to achieve further advantages, and to provide a garment including said personal protective device.

This problem is solved by a protective device for the protection of a user, by a protective garment or accessory for a garment, and by a production method for manufacturing a protective device according to the respective independent claims.

Secondary characteristics of the object of this disclosure are defined in the respective dependent claims.

A protective device according to the present disclosure for the protection of a user comprises a mesh structure including a first mesh portion and a second mesh portion, wherein the first mesh portion and the second mesh portion are opposed one another and connected one another by a plurality of tie elements to define one or more housings. Furthermore, the inflatable element comprises at least one inflatable casing body housed in the inner area, therefore in said one or more housings, between the first mesh portion and the second mesh portion. The inflatable casing body is preferably a simple mono-layer structure, similar to a balloon. More particularly, and preferably the casing body is a flexible, preferably mono-layer, extensible body made of elastic material.

In the deflated condition, the casing body occupies a space smaller than the space available in the respective housing, so as to determine a free region. In this way, the free region, which is actually defined by the mesh structure, allows transpiration when the protective device is used.

In other words, the casing body occupies a first region of the housing in a deflated condition and a second region of the housing in an inflated condition. The first region is apt to house the inflatable element in a deflated condition and the region which lacks or is free of the inflatable element in a deflated condition. The second region receives the inflatable element in the inflated condition and is open towards the first region to house the casing body, in an inflation step from the deflated condition to the deflated condition. In fact, by inflating the casing body expands as much as possible in the housing until it occupies all the available space, and until it is blocked by the mesh structure and the tie elements that essentially "bridle it".

In other words, the aforementioned technical problem can be solved by means of a mesh structure which houses inside thereof a casing body which is intended to be

inflated to also inflate the mesh structure, and to make the mesh structure an inflatable structure. The mesh structure contains the inflation of the casing body. The casing body in the deflated condition does not form any additional layer for the protective device in the second region. The second region houses the casing body only in the inflated condition and is open towards the first region to receive the inflatable element, for example in an inflation phase from the deflated condition to the inflated condition.

The protective device can therefore be housed in a portion of the garment. This portion is to be understood as a garment portion that dresses a part of the body, such as the bust (neck region, chest region, shoulder joint region, back and arms). The portion of the garment is made according to a predefined textile technology apt to give certain characteristics to the garment, such as transpiration, or having ventilation openings. It follows that, once housed in the garment, the second region of the protective device allows to ensure the garment transpiration and ventilation.

The protective device preferably further includes a gas source connected to the inflatable casing body for inflating the inflatable casing body between a first deflated condition and a second inflated condition.

The inflatable casing body is therefore a flexible body, which in an inflated condition keeps this condition at least once for a determined period. Preferably it is a body impermeable to the inflation gas. In this case, a vent valve is provided to deflate the casing body. The casing body is preferably a tubular body or including tubular portions, preferably having high expansion capacities.

The housings are preferably channel-shaped to favour the insertion of the casing body.

As anticipated above, in the deflated condition the casing body can occupy a minimum space between the mesh portions, and therefore allow maximum ventilation of the item of clothing or garment. A body made of a preferably very elastic and expandable material, and which can ensure gas tightness for at least a certain time can be used as a casing body. It is, for example, a membrane or film in latex, polyurethane, polypropylene, polyester, polyamide. Inflation occurs at the moment of impact or when it is needed.

When the inflatable casing body is inflated it preferably occupies all or almost all of the housing where it is housed until the tie elements are tensioned. The maximum tension of the tie elements determines the maximum possible distance between the first mesh portion and the second mesh portion. It is thus obtained a protective device wherein the mesh portions and the casing body define an inflatable element, that is to say an element which is configured to assume at least an active inflated

configuration and a rest deflated configuration.

The mesh portions represent an external side of the inflatable element and the inflatable casing body represent an inner side of the inflatable element. There are therefore advantageously no external walls which can stiffen the inflatable component too much. Possibly there may be reinforcing layers, possibly of minimal dimensions.

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. Therefore, by appropriately shaping the structure or body including the two mesh portions with the tie elements and possibly providing different lengths for the tie elements according to their location in the chamber itself, it is possible to determine a priori the shape assumed by the inflatable element in an inflated condition (both in terms of distance between the two meshes, and in terms of the perimetric shape of the two mesh portions).

It can be a structure that can be more easily customized for a user, with a wide variety in terms of resistance, flexibility, colours, types of threads and yarns etc ...

Also with the term tie element is meant 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.

The tie elements can alternatively be threads, or pieces of fabric, or ribbons, in other words they can be dividing walls connecting mesh portions of the mesh structure. Said dividing walls can also be tensioned. The tie elements can be arranged in such a way that a first group of tie elements is arranged in a crossing or oblique condition with respect to a second group of tie elements.

The tie elements can also be made as stitches or topstitching.

It follows that mesh portions (including shuttle weaving or needled materials (non-woven fabric) with seam construction can be provided. The first deflated condition of the casing body corresponds to the rest deflated condition of the inflatable element and the second inflated condition of the casing body corresponds to the active inflated condition of the inflatable element. It follows that the first mesh portion and the second mesh portion, together with the tie elements, act as a cage or frame for the containment the inflation of the inflatable casing body. The casing body actually

coats from inside the mesh textile structure, at the time of inflation, while it is slack in the deflated condition.

In other words, it should be noted that a condition of at least partial tension of the tie elements corresponds to the active inflated configuration of the inflatable element, and a condition of at least partial loosening, and generally a slack condition, of the tie elements and the mesh structure corresponds to the rest deflated configuration of the inflatable element. The casing body or the casing bodies are therefore arranged with clearance in the inner area of the mesh structure in a deflated condition.

In this way, preferably, when the casing body is tensioned, the whole inflatable element is tensioned. In this way, by appropriately calibrating the shape of the housings, the shape of the casing body, the length of the tie elements, the configuration of the mesh portions, the final shape of the inflatable element can be calculated a priori.

In the inflated condition, the casing body at least partially lines the first mesh portion and the second mesh portion, in contact.

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.

In addition, thanks to the shape control, the inflatable element can be easily coupled to other devices or protective elements independent of the inflatable element, and having a shape conjugated to that of the inflatable element in the inflated condition.

A further advantage lies in the fact that the tie elements ensure a limited expansion of the inflatable element in an inflated condition in order to obtain a reduced bulk, and in particular a limited thickness, and at the same time ensuring adequate protection for a user.

As it is in fact an inflatable device, this solution is particularly advantageous.

This reduced size allows, in the event of accidental inflation of the inflatable element, less discomfort and risk for a user while driving a vehicle. In other words, a contained expansion of the inflatable element does not affect the control of a vehicle by the user, and therefore does not represent a risk of accident.

Another advantage lies in the fact that by controlling the shape of the inflatable element it is possible to control (and in particular contain) also a quantity of gas necessary for inflating the inflatable element.

According to a preferred aspect of the present disclosure, in order to have a structure as flat as possible, the housings are placed side by side one another, so

that portions of the casing body are side by side one another in the mesh structure, or a plurality of casing bodies are side by side one another. In other words, the mesh structure is a single structure including a plurality of housings placed side by side one another. In order to obtain these housings side by side, the mesh structure has inner separating walls or septa, suitably arranged so as to create a plurality of housings.

The inner partitions or walls can be parallel to one another in such a way as to obtain a plurality of housings or channels parallel to each other within the mesh structure.

Preferably, the mesh structure includes a plurality of channels side by side, and a casing body for each channel. The channel has the function of the housing according to this disclosure. The casing body has preferably a tubular shape. It follows that once the casing body has been arranged in the respective channel/ housing, each channel has a first region occupied by the casing body, and a second region free and intended to house the casing body in an inflated condition. 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.

In order to make the channels, for example, the tie elements are arranged between said first mesh portion and said second mesh portion aligned in a plurality of rows of tie elements to define a plurality of side-by-side housings. Preferably, each row of tie elements of the plurality of rows of tie elements comprises a plurality of tie elements. The casing body is shaped in such a way as to be arranged in a respective housing between the rows of tie elements.

According to a preferred aspect of the present disclosure, in the condition of at least partial tension, the tie elements extend along a direction of development substantially perpendicular to the direction of extension of the rows of tie elements. According to another preferred aspect of the present disclosure, in the condition of at least partial tension, the tie elements belonging to the same row of tie elements are arranged substantially parallel to each other.

According to a preferred aspect of the present disclosure, the inflatable casing body is hand-shaped or comb-shaped to thus have a plurality of portions arranged between the tie elements.

In an operative embodiment, the casing body is shaped as a tubular or duct body inserted, for example, in a serpentine way between the tie elements, or in a tree shape.

In a further embodiment, a plurality of inflatable casing bodies is provided, each

housed between a mesh portion and the opposite mesh portion.

The first mesh portion and the second mesh portion actually define a layer of the inflatable element within which the inflatable casing body is arranged. In an embodiment of the present disclosure, the inflatable element comprises at least a third mesh portion overlapping the first mesh portion and the second mesh portion, to define a second layer of the inflatable element. It is possible arranging portions of the casing body alternately between the two layers in order to control the final shape of the inflatable element in a targeted manner, without occupying too much space between the meshes, and thus ensuring ventilation.

It can therefore be observed that the inflatable element according to the present disclosure lends itself to a high modularity and adaptation to the constructional needs of the protective device.

Further advantages, features and methods of use of the object of the present disclosure will become evident from the following detailed description of the embodiments thereof, presented by way of non-limiting example. It is however evident that each embodiment can present one or more of the advantages listed above; however, each embodiment is not required to simultaneously present all the listed advantages.

Reference will be made to the figures of the accompanying drawings, wherein:

Figure 1 shows a partially sectional schematic view of a protective device according to an embodiment of the present disclosure;

Figure 1A shows a schematic view of a protective device according to an embodiment of the present disclosure;

Figure 2 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in an inflated condition;

Figure 3 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in the inflated condition according to a further embodiment;

Figure 4 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in a deflated condition;

Figure 5 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in a deflated condition according to a further embodiment;

Figure 6 shows a partially sectional schematic view of a protective device according to an embodiment of the present disclosure;

Figure 7 shows a view of a garment including a personal protective device;

Figure 8 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in the inflated condition according to a further embodiment;

Figure 9 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in the inflated condition according to a further embodiment;

Figure 10 shows a schematic view of an enclosure for a device according to the present disclosure.

With reference to the attached figures 1-10, the reference number 10, 100 indicates a personal protective device according to the present disclosure in accordance with respective embodiments of the present disclosure. It is preferably a wearable protective device.

The embodiments differ mainly in the textile mesh structure 11, 111 described as will be described below. For identical components having the same structure, the two protective devices keep identical reference numbers.

The personal protective device 10, 110 comprises an inflatable element 12, 112 which is able to substantially assume a first rest condition or deflated condition, and a second active condition or inflated condition. The inflation methods will be described later in the description.

In an embodiment of the present disclosure, the inflatable element 12, 112 can be shaped like a jacket and is apt to surround an upper area or bust of the user's body. Nothing prevents from making the inflatable element 12 according to any shape.

The inflatable element 12, 112 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.

The mesh textile structure 11 can be made according to the technology described in the patent application PCT/IB2009/055512 and in the patent application PCT/IT2009/000547, incorporated herein by reference in their entirety in the present disclosure, or the mesh textile structure 111 can be made according to the technology described in the patent application WO2016178143A1, or in the patent application WO2017163196A1, incorporated herein by reference in their entirety in the present disclosure. In other words, it is preferably a mesh textile structure with threads, formed by meshes and tie elements as described in these patent applications. The most significant difference with respect to these patent applications lies in the fact that the inflatable element here described does not have the same external gas containment walls described in the aforementioned patent applications.

More particularly, according to the technology, for example, of the patent application PCT/IB2009/055512, the mesh structure 11 comprises a first mesh portion 18 and a second mesh portion 19 joined along the perimeter. According to the technology of patent application WO2016178143A1, the mesh structure 111 comprises a first

mesh portion 118 and a second mesh portion 119 which are part of a mesh casing body made in a single body. What is relevant for the present patent application is the fact that the first mesh portion 118, 18 and the second mesh portion 19, 119 are opposite each other and are connected to each other by a plurality of tie elements 5.

Preferably, the tie elements 5 are arranged between said first mesh portion 18 and said second mesh portion 19 aligned in a plurality of rows 24 of tie elements 5. The arrangement in rows 24 allows better regulation of the thread arrangement and further control of the expansion of the inflatable element, as well as forming a plurality of side-by-side housings. Therefore, in the mesh structure 11 there are 111 housings in the shape of channels.

To control even better the expansion of the inflatable element, in active condition, when the inflatable element 2 is in the inflated condition, the tie threads 5 are parallel to each other in the respective row 24 and substantially orthogonal to the direction of the row. The threads are preferably shorter in the edge region, i.e. they decrease in length as they approach the edge region.

According to an aspect of the present disclosure, 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. According to the embodiment of Figure 1, the inflatable casing body 40 has a hand or comb shape and includes a plurality of portions 40a of the inflatable casing body 40 inserted between the rows of tie elements 5. According to the embodiment of Figure 6 the inflatable casing body 42 has a tubular shape and is inserted in a serpentine way between the tie elements. In the embodiment of Figure 10, the casing body has the shape of a tree, that is, it has lateral branches and is also inserted between the channels of a mesh structure 11, 111.

The casing body 40, 42, 43 is in a deflated condition during a rest situation of the inflatable element 2, 102 and occupies the smallest possible space thus allowing the passage of air between the mesh portions 18, 19, 118, 119. At the moment of inflation, the casing body 40, 42, 43 inflates until the tie elements and the mesh portions are tensioned, and thus obtain a maximum tension of the inflatable element. The mesh textile structure 11, 111 actually acts as a containment cage for the casing body 40, 42, 43 in the inflated condition.

It is to be understood that the casing body 40, 42, 43 and the tie elements 5 can be selected and arranged in a suitable way to allow the insertion of the inflatable casing body 40, 42, 43 and the achievement of a desired final shape.

The fact of providing an inflatable casing body 40, 42, 43 with a plurality of portions 40a which are side by side between rows of tie elements 5 allows to obtain a substantially flat final configuration of the inflatable element due to the fact that the various portions 40a in inflated condition are forced to stay side by side, blocked by the mesh portions 18, 118, 19, 119.

In an alternative embodiment such as that of figure 8, a third mesh portion 120 overlapped the first mesh portion 118 and the second mesh portion 119 is provided. This third mesh portion 120 allows to make a second layer of inflatable element and therefore make available a plurality of housings for the inflatable casing body 40, 42, 43, and allow an even greater variability of arrangement of the inflatable casing body or of its portions within the mesh textile structure 11, 111.

The present disclosure also relates to a protective garment 50 comprising a protective device 10, 110 as defined above. The protective device 10, 110 can be housed in a garment pocket.

It follows that the garment pocket forms a cover for the protective device 10, 110. For example, the pocket can be made between a covering outer layer of the garment and an inner layer or lining. Alternatively again, the protective device can be simply fixed underneath the covering outer layer, without a real pocket.

The covering layer, in use, is substantially placed over the personal protective device. The covering layer can also be understood as a multilayer structure.

In this case, the garment includes a covering outer layer, which can also be a multilayer structure. The outer layer of the garment can advantageously be made of a breathable material, or include holes or ventilation openings. In other words, and in general, the garment can be made of breathable material and/or material that allows the passage of air through it, that is, that allows ventilation, for example it is a perforated material or has one or more ventilation openings. In other words, the garment preferably has one or more parts made of material suitable for allowing transpiration and/or ventilation. The main advantage of the fact that the casing body in a deflated condition occupies only a part of the mesh structure lies exactly in the fact that the presence of the inflatable element does not affect the characteristics of transpiration and ventilation of the garment.

In this way, when the inflatable element is in an inactive condition, and in fact not used, the casing body forms an additional layer in the garment in a confined way, only in a restricted region of the garment. In the remaining part of the garment (second region of the mesh structure), the casing body does not form an additional layer. It follows that the garment can preserve its own peculiarities and technical characteristics determined by the combination of layers chosen to make the

garment, and they can be, as mentioned, suitable for ventilation or transpiration. Such layers include, for example, the lining and the covering surface of the protective device.

The present disclosure also relates to a method for making a protective device 10, 110 for the protection of a user.

The method includes the steps of:

- provide an inflatable element 12, 112 configured to assume an active inflated configuration and a rest deflated configuration, wherein said inflatable element 12 comprises a first mesh portion 18 and a second mesh portion 19, 119 opposite the first mesh portion 18, 119 to define at least one inner housing;
- connecting said first mesh portion 18 to said second mesh portion 19 with a plurality of tie elements 5 so as to define one or more inner housings;
- arrange in the inner housing a casing body 40, 42, 43 and preferably connect the casing body 40, 42, 43 to a gas source to inflate the casing body in an inflated condition.

Preferably in the deflated condition, the casing body 40, 42, 43 occupies a first space or first region, and wherein in said deflated condition a second region or second space of said at least one housing is devoid of said casing body, and in wherein in said inflated condition the casing body expands and occupies the second region or second space.

Preferably, the step of connecting the first mesh portion 18 to the second mesh portion 19 with the plurality of tie elements 5 is carried out by arranging the tie elements 5 aligned in a plurality of rows 24 of tie elements, wherein each row 24 of elements tie elements 5 comprises a plurality of tie element elements 5 and the casing body is arranged between the rows 24.

Actually, the casing body covers the mesh structure 11, 111 from within, without requiring external waterproofing walls.

In relation to inflation, in order to inflate the casing body 40, 42, 43, in the event of a fall and/or slip and/or unexpected impact by a user or a vehicle on which he/she is travelling, the protective device 10, 110 is apt to cooperate with suitable activation means (not shown) operatively connected for example to the gas source 15, such as a can of compressed cold gas, such as for example helium. The can can be provided with a respective shut-off valve (not shown).

Alternatively, the inflation fluid source can comprise gas generators of the pyrotechnic or hybrid type or of other types known to the state of the art.

The opening of the shut-off valve of each inflation can is preferably controlled by a control unit according to the detection of the status of the vehicle/driver system; for

example, said control unit can implement a fall prediction system that allows a timely identification of the fall event and a reliable prediction of this by means of accelerometric sensors integral with the vehicle (or driver) and a processing unit of the signals produced by the same sensors.

Alternatively, the device according to the present disclosure can also find application using an activation cable connected to a vehicle driven by a user, which cable controls the inflation of the inflatable element following the distancing of the user from the vehicle, for example, following a fall or an unexpected impact. The use of the cable is particularly used in the horse riding sector.

In any case, the aforementioned activation and inflation means can be integrated into the protective device according to the present invention or located outside the same.

It should also be noted that the activation methods, while being an aspect of particular importance for an effective operation of the device, will not be further described in greater detail, being methods essentially already known to a person skilled in the art of protection of an individual from unexpected impacts.

The object of the present disclosure has so far been described with reference to the embodiments thereof. It is to be understood that there may be other embodiments which relate to the same inventive nucleus, all falling within the scope of protection of the claims provided below.

CLAIMS

1. Protective device (10, 110) for the protection of a user, said protective device (10) comprising a mesh structure (11, 111) comprising a first mesh portion (18, 118) and a second mesh portion (19, 119) and a plurality of tie elements (5), wherein said first mesh portion (18, 118) and said second mesh portion (19, 119) are opposite one another and are connected one another by the plurality of tie elements (5); wherein the first mesh portion, the second mesh portion and the tie elements define one or more inner housings of the mesh structure (11, 111);

wherein the protective device (10, 110) includes a casing body (40, 42, 43) arranged at least in an inner housing of said one or more inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in the at least one inner housing of the mesh structure (11, 111), and wherein in said deflated condition, the casing body (40, 42, 43) occupies a first space or first region, and wherein in said deflated condition a second region or second space of said at least one housing lacks a casing body, and wherein in said inflated condition the casing body occupies the second region or second space.

2. Protective device (10, 110) according to claim 1, wherein in the inflated condition said casing body is configured to line from the inside, at least partially in contact, the mesh structure (11, 111) and/or that said mesh structure is an external structure of the protective device (10, 110).

3. Protective device according to claim 1 or 2, wherein in said inflated condition the casing body completely occupies the second region or second space and the first region or first space of the housing.

4. Protective device (10, 110) according to any one of the preceding claims, wherein the deflated condition of the casing body corresponds to a slack and loose condition of the mesh structure (11, 111) and of the tie elements (5), and wherein to the inflated condition of the casing body corresponds an at least partially tensioned condition of the tie elements (5) and of the first mesh portion (18, 118) and the second mesh portion (19, 119).

5. Protective device (10, 110) according to any one of the preceding claims, wherein the tie elements define a plurality of housings between the first mesh portion (18, 118) and the second mesh portion (19, 119) and the casing body (40, 42, 43) comprises a plurality of portions (40a) each arranged in a corresponding housing of said housings.

6. Protective device (10, 110) according to any one of the preceding claims, wherein the housings have the shape of channels and are arranged side by side one another and each one intended to house a corresponding casing body or casing body

portion, and wherein in inflated condition, the casing bodies are inflated against each other so as to form a planar structure.

7. Protective device (10, 110) according to any one of the preceding claims, wherein the casing body (40, 42, 43) has a hand or comb or tree shape, or has tubular shape arranged in a serpentine way.

8. Protective device (10, 110) according to any one of the preceding claims, wherein the tie elements (5) are arranged between said first mesh portion (18, 118) and said second mesh portion (19, 119) aligned in a plurality of rows (24) of tie elements (5).

9. Protective device (10) according to claim 6, wherein each row (24) of tie elements (5) of the plurality of rows of tie elements (5) comprises a plurality of tie elements (5) wherein in a condition of at least partial tension, the tie elements (5) belonging to the same row (24) of tie elements (5) are arranged substantially parallel to each other.

10. Protective device (10, 110) according to any one of the preceding claims, wherein an inflated condition of the casing body corresponds to an inflated condition of protection of the inflatable element, and a deflated condition corresponds to a rest condition of the inflatable element, and wherein in said deflated condition the second region of said at least one housing is apt to allow a passage of air between the first mesh portion and the second mesh portion passing through the second region of said at least one housing.

11. Protective device (10, 110) according to any one of the preceding claims, comprising a gas source (15) or inflation source connected to the inflatable casing body.

12. Device according to any one of claims 1 to 11, wherein said device is a wearable device or use of said device according to any one of claims 1 to 11 on a user.

13. Protective garment (50) or clothing accessory comprising a protective device (10) according to any of the preceding claims.

14. Protective garment (50) according to claim 12, wherein said protective garment (50) 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 housings.

15. Method for making a protective device (10) for the protection of a user, said method comprising the steps of:

- provide a mesh structure (11, 111) comprising a first mesh portion (18, 118) and a second mesh portion (19, 119), opposite the first mesh portion (18, 118), and a plurality of tie elements (5) connecting the first mesh portion (18, 118) and the second mesh portion (19, 119), wherein said first mesh portion (18,

118) and said second mesh portion (19, 119) and the plurality of tie elements (5) define one or more housings in the mesh structure (11, 111);

- arranging a casing body (40, 42, 43) in at least one of said housings to form with the mesh structure (11, 111) an inflatable element (12, 112);

- inflate the casing body (40, 42, 43) from a first deflated operating condition to a second inflated operating condition, wherein in said deflated condition, the casing body (40, 42, 43) occupies a first space or region, and wherein in said deflated condition a second region or second space of said at least one housing lacks said casing body, and wherein in said inflated condition the casing body expands and occupies the second region or second space.

16. Method according to the preceding claim, wherein the casing body is inflated until the tie elements (5) and the mesh structure (11, 111) are tensioned and/or until the casing body is at least partially adhered to the first mesh portion (18, 118) and the second mesh portion (19, 119).

17. Method according to claim 15 or 16, wherein the tie elements (5) are arranged to form a plurality of side-by-side housings and wherein portions of the casing body or a plurality of casing bodies are arranged side by side one another, and wherein in said inflated condition portions of casing body or a plurality of casing bodies push against each other to form a planar structure.

18. Method according to any one of the preceding claims 15 to 17, the casing body is inflated until the mesh structure is tensioned and the mesh structure (11, 111) bridles and prevents a further expansion of the casing body.

19. Method according to any one of claims 15 to 18, wherein in said deflated condition the second region of said at least one housing allows an air passage between the first mesh portion and the second mesh portion passing through the second region.

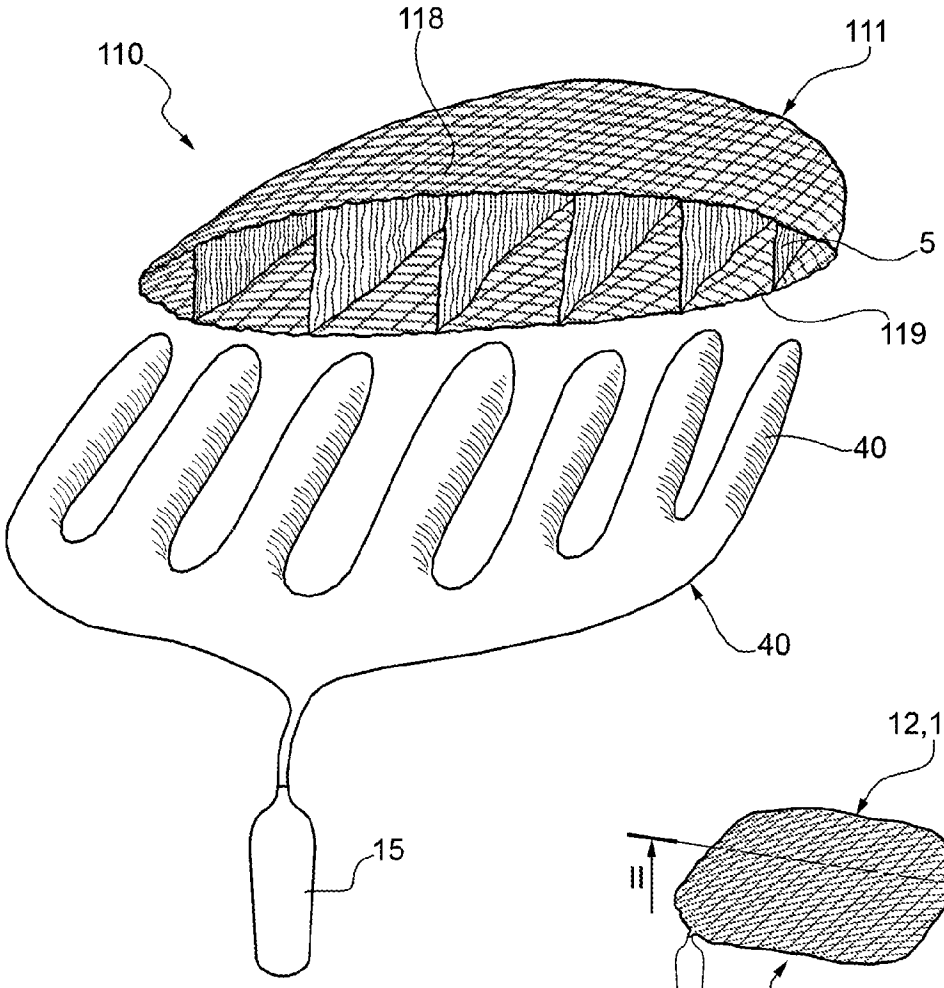


FIG.1

FIG.1A

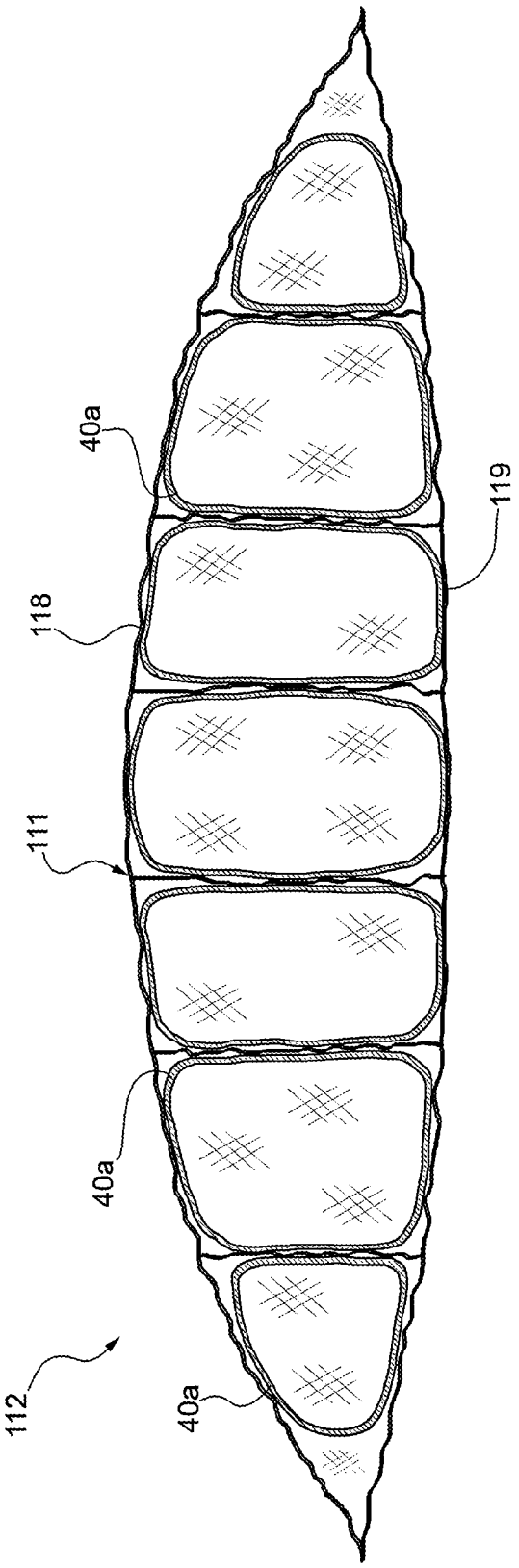


FIG.2

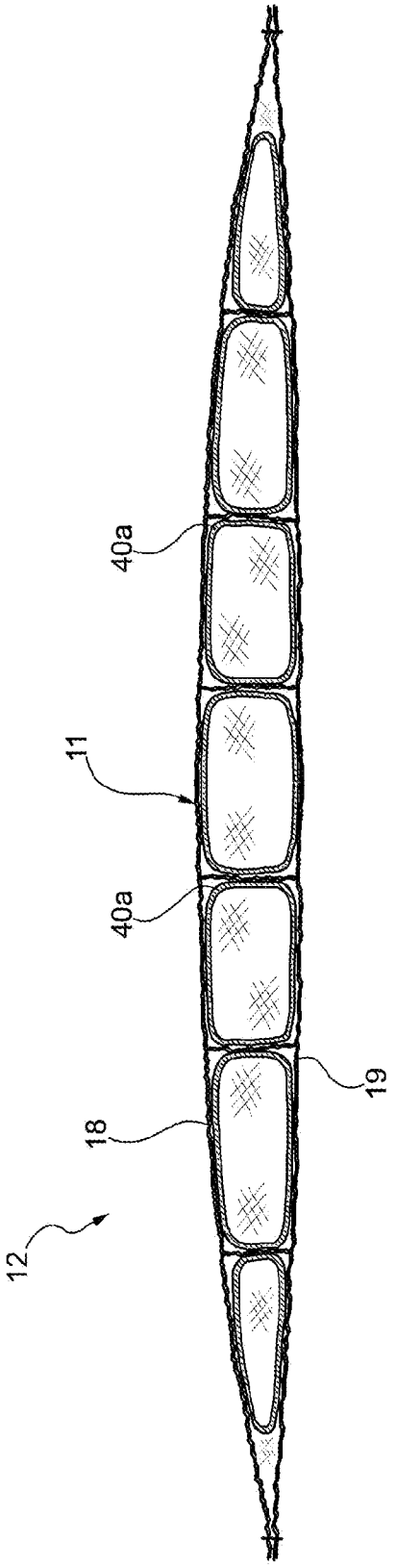


FIG.3

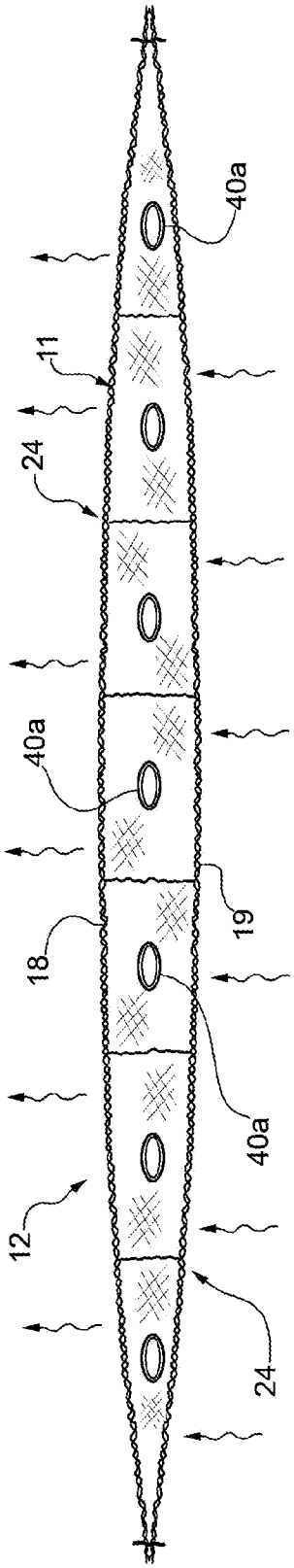


FIG.5

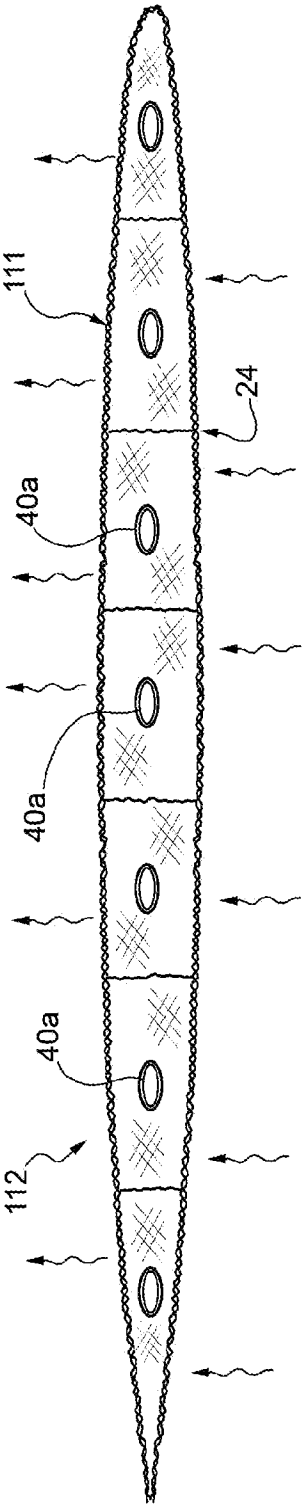


FIG.4

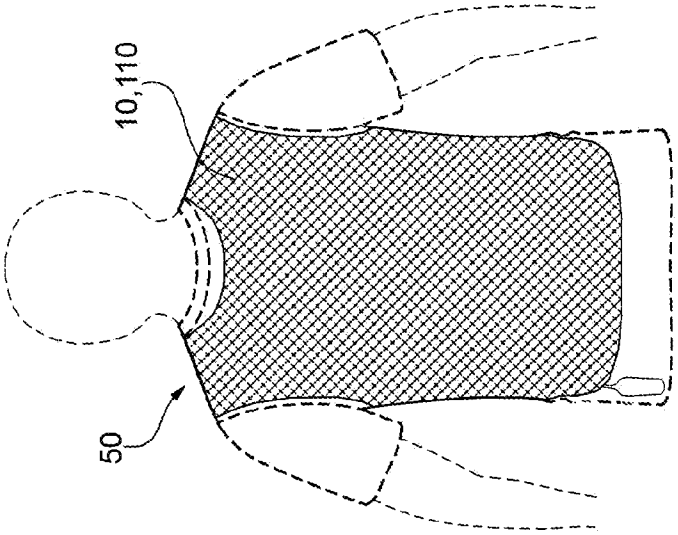


FIG.7

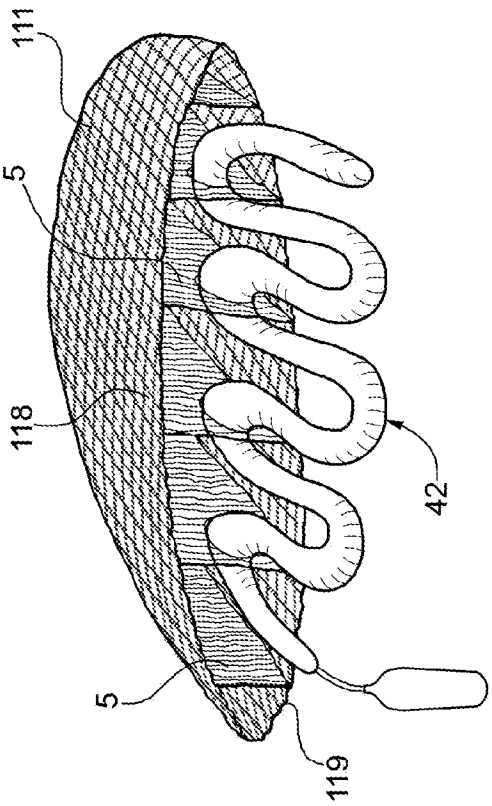


FIG.6

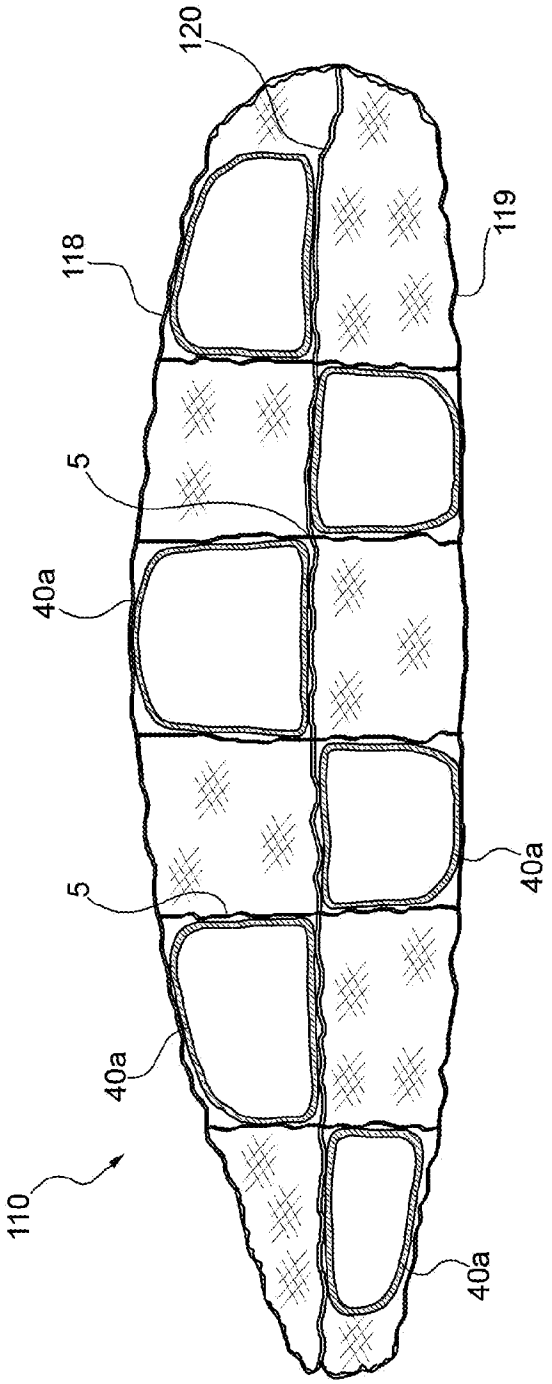


FIG.8

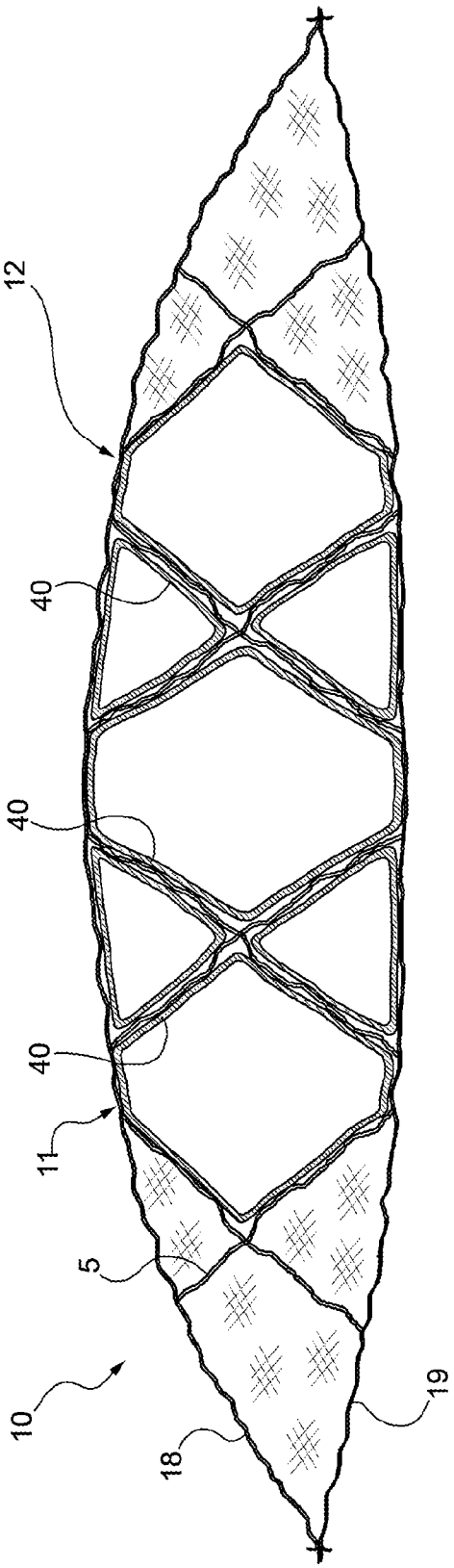


FIG.9

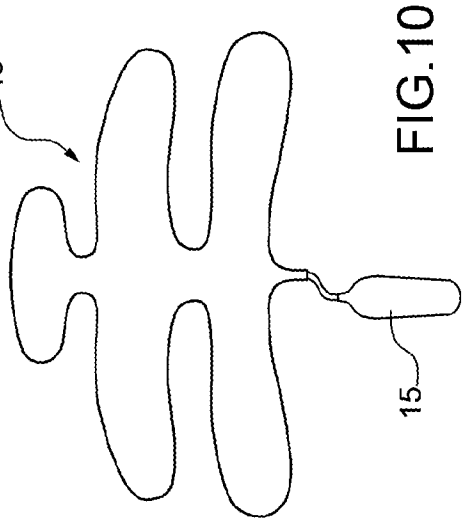


FIG.10

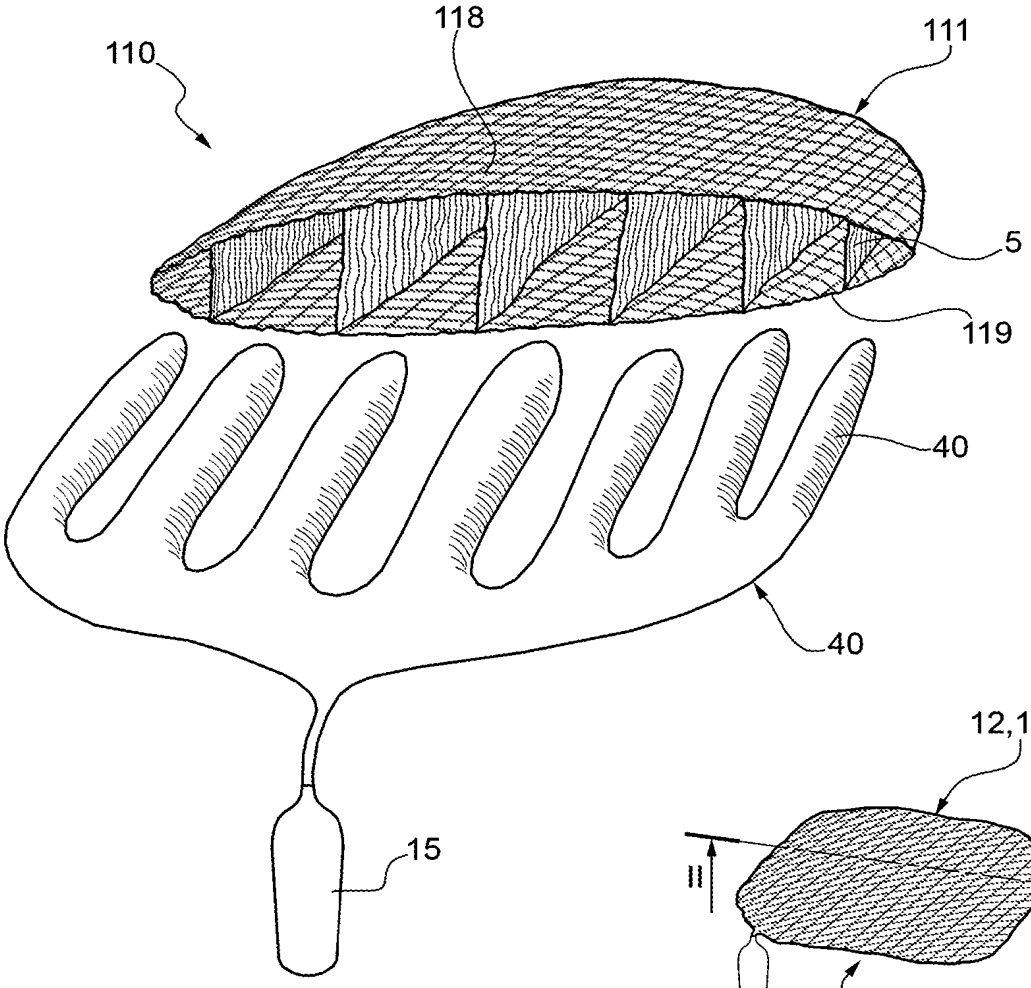


FIG.1

FIG.1A

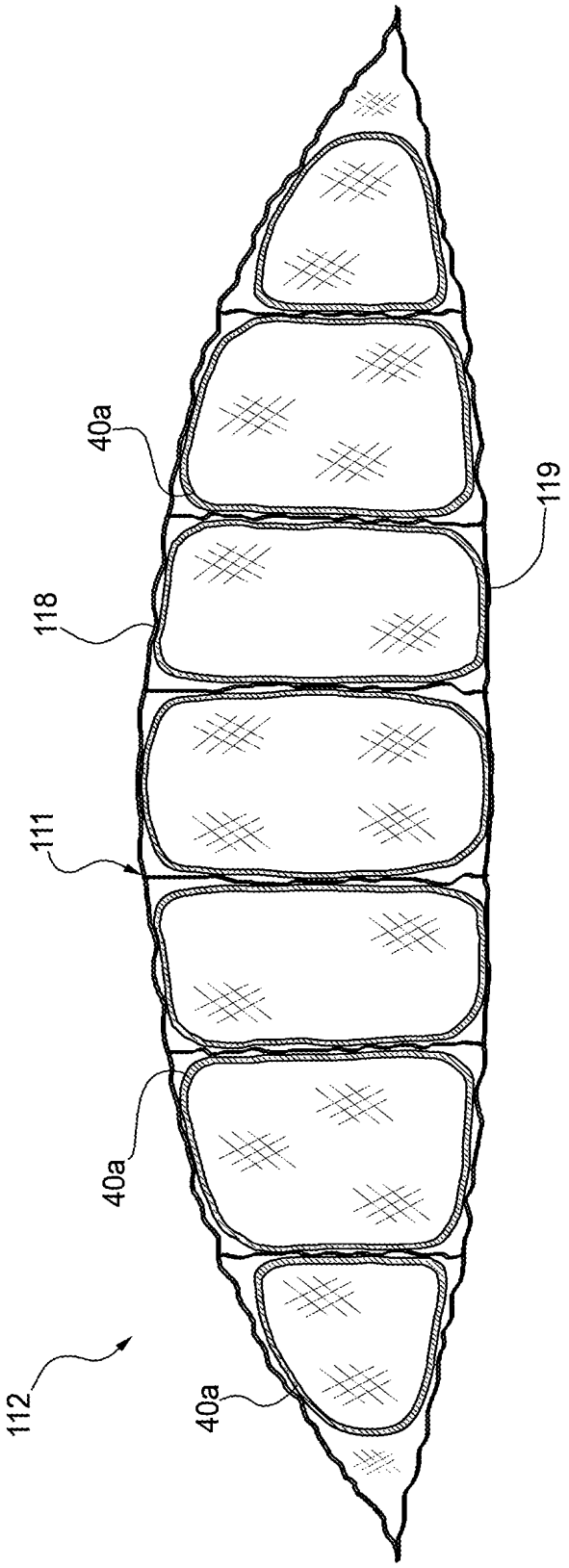


FIG.2

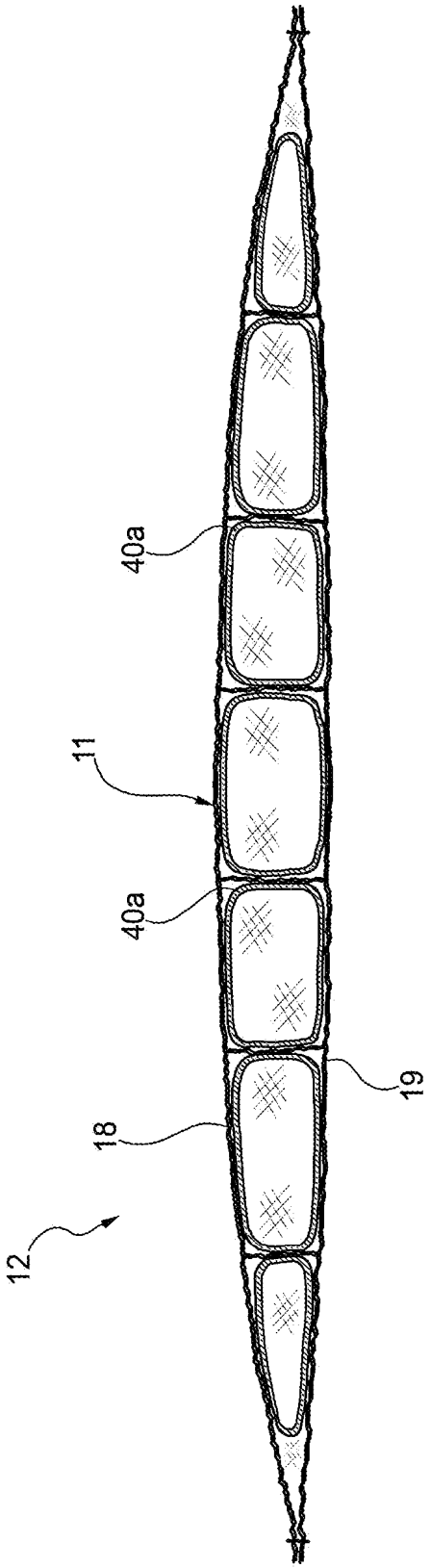


FIG.3

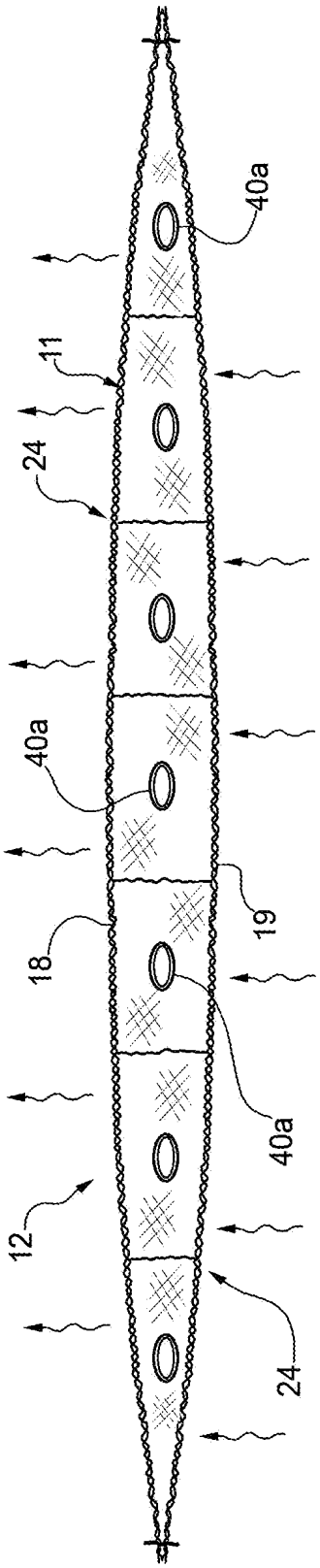


FIG.5

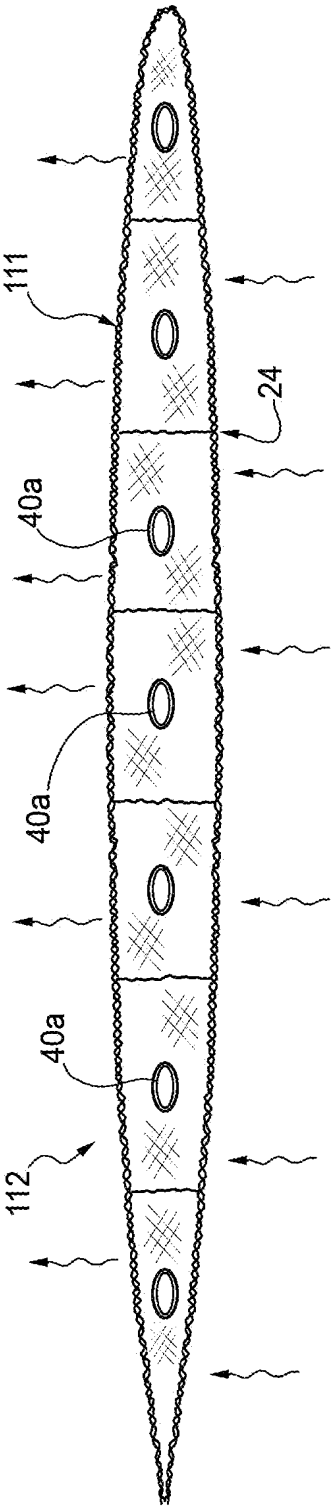


FIG.4

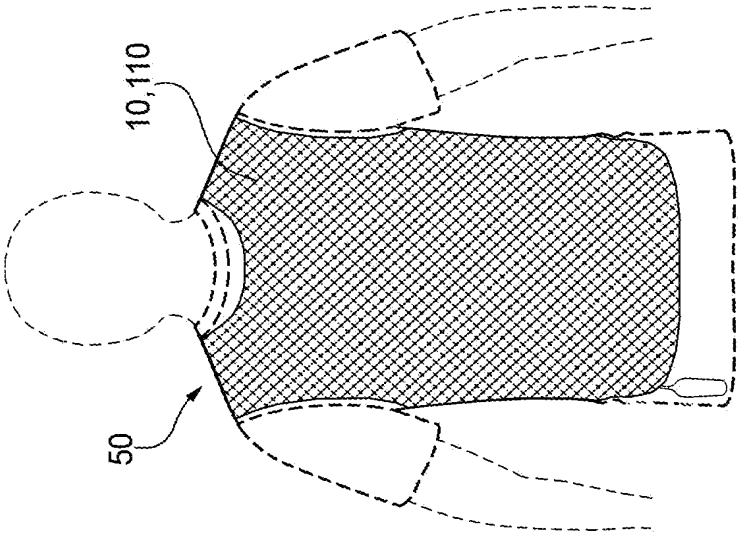


FIG.7

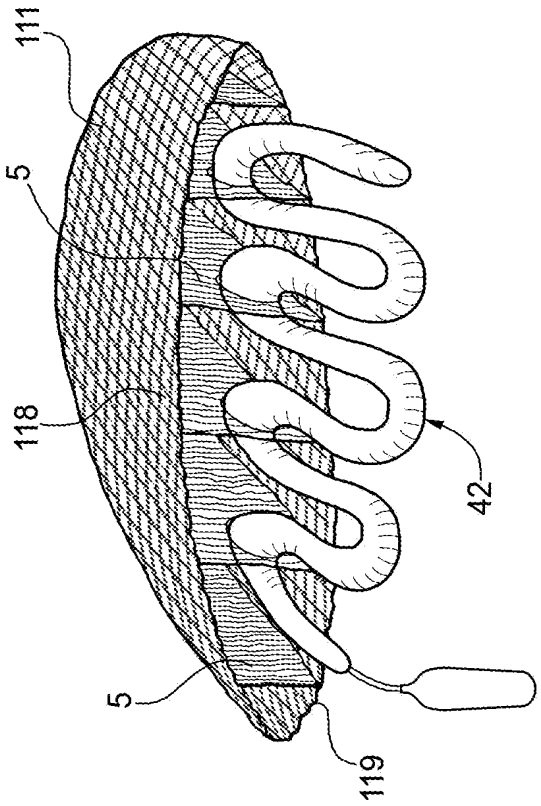


FIG.6

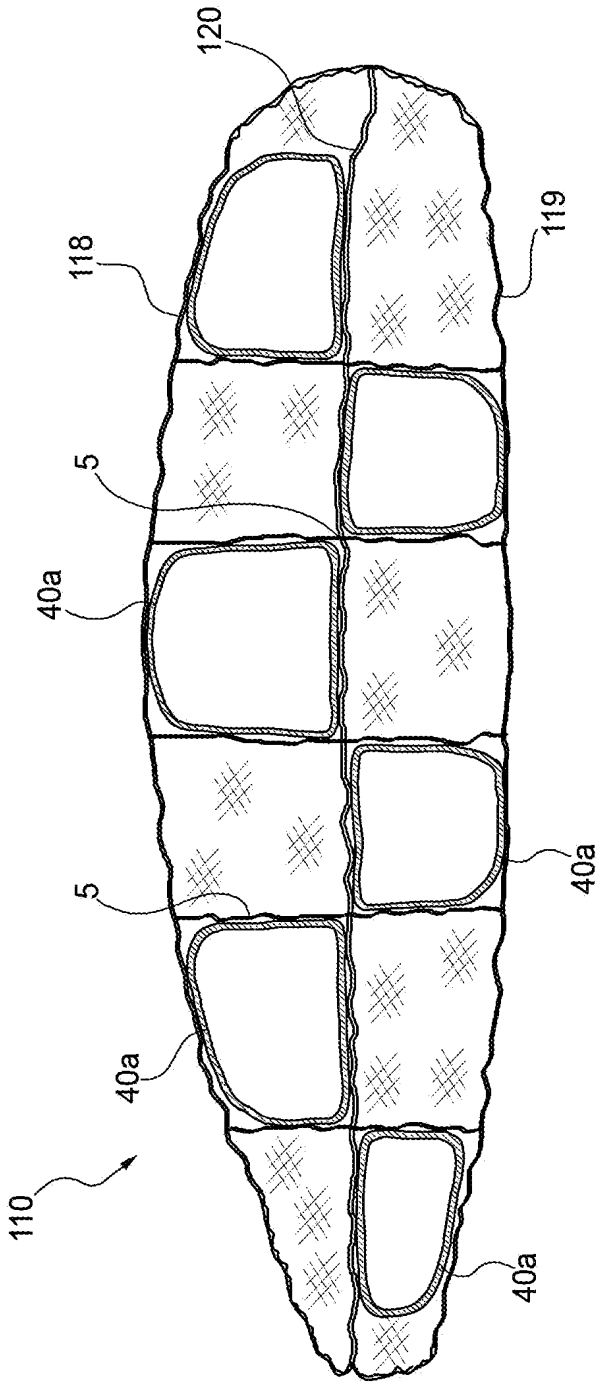


FIG.8

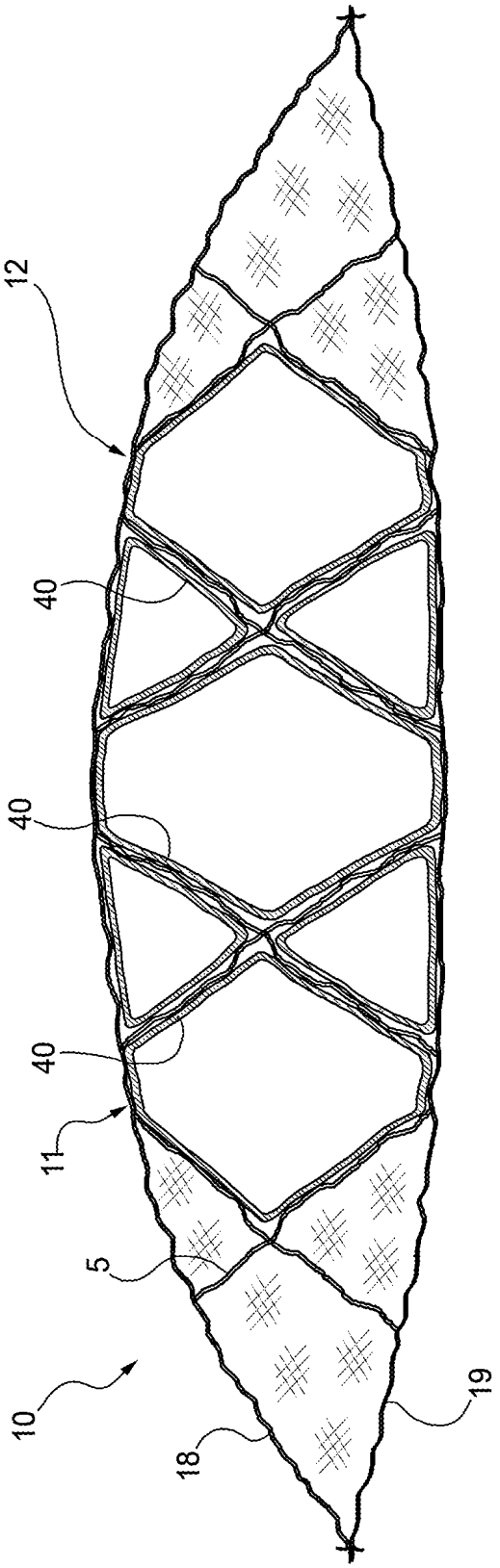


FIG.9

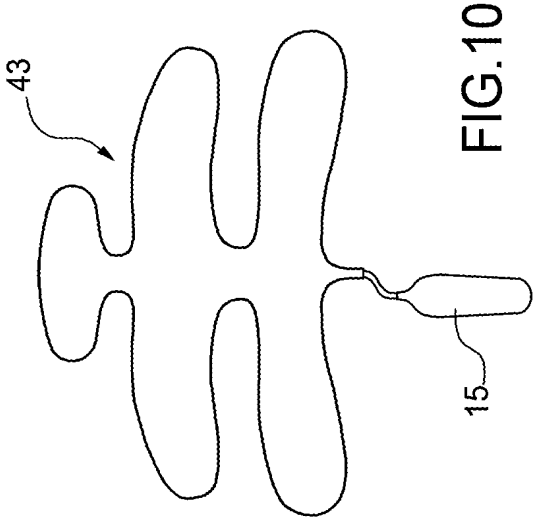


FIG.10

PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

DESCRIPTION

The present disclosure generally refers to a protective device for protecting a user. It is preferably a wearable protective device. The protective device includes an inflatable element which, in an inflated condition, is configured to protect a passenger, motor vehicle rider or similar user from impacts and/or falls, during a sporting and/or working activity and/or any other activity.

A known protective device is for example the one described in the European patent EP3291697B1. Such a device includes an inflatable element apt to assume an active inflated condition and a deflated rest condition. The inflatable element includes a body made of mesh, that is, made by knitting. Said mesh body is a closed, or at least tubular, structure defining an inner region, or area, or chamber. This inner chamber is occupied at least partially by a plurality of joining threads connecting opposite portions of the mesh body to each other. The fact of making a single mesh body has the advantage of containing manufacturing waste and minimizing production times; in fact joining threads and meshes can be machined with a single knitting machine. The joining threads are part of a single thread connected to opposite portions of the mesh body. In particular, the thread passes alternately and continuously between a first portion and a second portion of the mesh body.

The inflatable element also includes waterproofing walls arranged externally that allow to contain the inflation fluid for a certain period of time. The walls are, for example, a first sheet, or first wall, and a second sheet, or second wall, fixed to each other along their respective perimetric edges. Said first and second sheet cover and line the mesh body on an external side or surface.

An inflatable element thus made, while being very advantageous from many points of view, nevertheless has the disadvantage of not always allowing adequate transpiration in a garment where it is integrated or inserted. In particular, the inflatable element in a deflated condition can create a sort of bag around the user's body that does not allow adequate passage of ventilation air. To overcome this problem, it has been proposed to fold the inflatable element in a deflated condition and make it expand and occupy a more extended position in the inflated condition so that when the inflatable element is at rest and not in use there are minimal areas with little transpiration. Even this solution, while advantageous from many points of view, has some drawbacks, as it is not always possible to place the inflatable

element in a deflated position and in any case a control of the expansion of the inflatable element is required at the time of inflation.

A technical problem underlying the present disclosure resides in providing a protective device for the protection of a user capable of overcoming the drawbacks of the known art and allowing greater transpiration and/or to achieve further advantages, and to provide a garment including said personal protective device.

This problem is solved by a protective device for the protection of a user, by a protective garment or accessory for a garment, and by a production method for manufacturing a protective device according to the respective independent claims.

Secondary characteristics of the object of this disclosure are defined in the respective dependent claims.

A protective device according to the present disclosure for the protection of a user comprises a mesh structure including a first mesh portion and a second mesh portion, wherein the first mesh portion and the second mesh portion are opposed one another and connected one another by a plurality of tie elements to define one or more housings. Furthermore, the inflatable element comprises at least one inflatable casing body housed in the inner area, therefore in said one or more housings, between the first mesh portion and the second mesh portion. The inflatable casing body is preferably a simple mono-layer structure, similar to a balloon. More particularly, and preferably the casing body is a flexible, preferably mono-layer, extensible body made of elastic material.

In the deflated condition, the casing body occupies a space smaller than the space available in the respective housing, so as to determine a free region. In this way, the free region, which is actually defined by the mesh structure, allows transpiration when the protective device is used.

In other words, the casing body occupies a first region of the housing in a deflated condition and a second region of the housing in an inflated condition. The first region is apt to house the inflatable element in a deflated condition and the region which lacks or is free of the inflatable element in a deflated condition. The second region receives the inflatable element in the inflated condition and is open towards the first region to house the casing body, in an inflation step from the deflated condition to the deflated condition. In fact, by inflating the casing body expands as much as possible in the housing until it occupies all the available space, and until it is blocked by the mesh structure and the tie elements that essentially "bridle it".

In other words, the aforementioned technical problem can be solved by means of a mesh structure which houses inside thereof a casing body which is intended to be

inflated to also inflate the mesh structure, and to make the mesh structure an inflatable structure. The mesh structure contains the inflation of the casing body. The casing body in the deflated condition does not form any additional layer for the protective device in the second region. The second region houses the casing body only in the inflated condition and is open towards the first region to receive the inflatable element, for example in an inflation phase from the deflated condition to the inflated condition.

The protective device can therefore be housed in a portion of the garment. This portion is to be understood as a garment portion that dresses a part of the body, such as the bust (neck region, chest region, shoulder joint region, back and arms). The portion of the garment is made according to a predefined textile technology apt to give certain characteristics to the garment, such as transpiration, or having ventilation openings. It follows that, once housed in the garment, the second region of the protective device allows to ensure the garment transpiration and ventilation.

The protective device preferably further includes a gas source connected to the inflatable casing body for inflating the inflatable casing body between a first deflated condition and a second inflated condition.

The inflatable casing body is therefore a flexible body, which in an inflated condition keeps this condition at least once for a determined period. Preferably it is a body impermeable to the inflation gas. In this case, a vent valve is provided to deflate the casing body. The casing body is preferably a tubular body or including tubular portions, preferably having high expansion capacities.

The housings are preferably channel-shaped to favour the insertion of the casing body.

As anticipated above, in the deflated condition the casing body can occupy a minimum space between the mesh portions, and therefore allow maximum ventilation of the item of clothing or garment. A body made of a preferably very elastic and expandable material, and which can ensure gas tightness for at least a certain time can be used as a casing body. It is, for example, a membrane or film in latex, polyurethane, polypropylene, polyester, polyamide. Inflation occurs at the moment of impact or when it is needed.

When the inflatable casing body is inflated it preferably occupies all or almost all of the housing where it is housed until the tie elements are tensioned. The maximum tension of the tie elements determines the maximum possible distance between the first mesh portion and the second mesh portion. It is thus obtained a protective device wherein the mesh portions and the casing body define an inflatable element, that is to say an element which is configured to assume at least an active inflated

configuration and a rest deflated configuration.

The mesh portions represent an external side of the inflatable element and the inflatable casing body represent an inner side of the inflatable element. There are therefore advantageously no external walls which can stiffen the inflatable component too much. Possibly there may be reinforcing layers, possibly of minimal dimensions.

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. Therefore, by appropriately shaping the structure or body including the two mesh portions with the tie elements and possibly providing different lengths for the tie elements according to their location in the chamber itself, it is possible to determine a priori the shape assumed by the inflatable element in an inflated condition (both in terms of distance between the two meshes, and in terms of the perimetric shape of the two mesh portions).

It can be a structure that can be more easily customized for a user, with a wide variety in terms of resistance, flexibility, colours, types of threads and yarns etc ...

Also with the term tie element is meant 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.

The tie elements can alternatively be threads, or pieces of fabric, or ribbons, in other words they can be dividing walls connecting mesh portions of the mesh structure. Said dividing walls can also be tensioned. The tie elements can be arranged in such a way that a first group of tie elements is arranged in a crossing or oblique condition with respect to a second group of tie elements.

The tie elements can also be made as stitches or topstitching.

It follows that mesh portions (including shuttle weaving or needled materials (non-woven fabric) with seam construction can be provided. The first deflated condition of the casing body corresponds to the rest deflated condition of the inflatable element and the second inflated condition of the casing body corresponds to the active inflated condition of the inflatable element. It follows that the first mesh portion and the second mesh portion, together with the tie elements, act as a cage or frame for the containment the inflation of the inflatable casing body. The casing body actually

coats from inside the mesh textile structure, at the time of inflation, while it is slack in the deflated condition.

In other words, it should be noted that a condition of at least partial tension of the tie elements corresponds to the active inflated configuration of the inflatable element, and a condition of at least partial loosening, and generally a slack condition, of the tie elements and the mesh structure corresponds to the rest deflated configuration of the inflatable element. The casing body or the casing bodies are therefore arranged with clearance in the inner area of the mesh structure in a deflated condition.

In this way, preferably, when the casing body is tensioned, the whole inflatable element is tensioned. In this way, by appropriately calibrating the shape of the housings, the shape of the casing body, the length of the tie elements, the configuration of the mesh portions, the final shape of the inflatable element can be calculated a priori.

In the inflated condition, the casing body at least partially lines the first mesh portion and the second mesh portion, in contact.

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.

In addition, thanks to the shape control, the inflatable element can be easily coupled to other devices or protective elements independent of the inflatable element, and having a shape conjugated to that of the inflatable element in the inflated condition.

A further advantage lies in the fact that the tie elements ensure a limited expansion of the inflatable element in an inflated condition in order to obtain a reduced bulk, and in particular a limited thickness, and at the same time ensuring adequate protection for a user.

As it is in fact an inflatable device, this solution is particularly advantageous.

This reduced size allows, in the event of accidental inflation of the inflatable element, less discomfort and risk for a user while driving a vehicle. In other words, a contained expansion of the inflatable element does not affect the control of a vehicle by the user, and therefore does not represent a risk of accident.

Another advantage lies in the fact that by controlling the shape of the inflatable element it is possible to control (and in particular contain) also a quantity of gas necessary for inflating the inflatable element.

According to a preferred aspect of the present disclosure, in order to have a structure as flat as possible, the housings are placed side by side one another, so

that portions of the casing body are side by side one another in the mesh structure, or a plurality of casing bodies are side by side one another. In other words, the mesh structure is a single structure including a plurality of housings placed side by side one another. In order to obtain these housings side by side, the mesh structure has inner separating walls or septa, suitably arranged so as to create a plurality of housings.

The inner partitions or walls can be parallel to one another in such a way as to obtain a plurality of housings or channels parallel to each other within the mesh structure.

Preferably, the mesh structure includes a plurality of channels side by side, and a casing body for each channel. The channel has the function of the housing according to this disclosure. The casing body has preferably a tubular shape. It follows that once the casing body has been arranged in the respective channel/ housing, each channel has a first region occupied by the casing body, and a second region free and intended to house the casing body in an inflated condition. 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.

In order to make the channels, for example, the tie elements are arranged between said first mesh portion and said second mesh portion aligned in a plurality of rows of tie elements to define a plurality of side-by-side housings. Preferably, each row of tie elements of the plurality of rows of tie elements comprises a plurality of tie elements. The casing body is shaped in such a way as to be arranged in a respective housing between the rows of tie elements.

According to a preferred aspect of the present disclosure, in the condition of at least partial tension, the tie elements extend along a direction of development substantially perpendicular to the direction of extension of the rows of tie elements. According to another preferred aspect of the present disclosure, in the condition of at least partial tension, the tie elements belonging to the same row of tie elements are arranged substantially parallel to each other.

According to a preferred aspect of the present disclosure, the inflatable casing body is hand-shaped or comb-shaped to thus have a plurality of portions arranged between the tie elements.

In an operative embodiment, the casing body is shaped as a tubular or duct body inserted, for example, in a serpentine way between the tie elements, or in a tree shape.

In a further embodiment, a plurality of inflatable casing bodies is provided, each

housed between a mesh portion and the opposite mesh portion.

The first mesh portion and the second mesh portion actually define a layer of the inflatable element within which the inflatable casing body is arranged. In an embodiment of the present disclosure, the inflatable element comprises at least a third mesh portion overlapping the first mesh portion and the second mesh portion, to define a second layer of the inflatable element. It is possible arranging portions of the casing body alternately between the two layers in order to control the final shape of the inflatable element in a targeted manner, without occupying too much space between the meshes, and thus ensuring ventilation.

It can therefore be observed that the inflatable element according to the present disclosure lends itself to a high modularity and adaptation to the constructional needs of the protective device.

Further advantages, features and methods of use of the object of the present disclosure will become evident from the following detailed description of the embodiments thereof, presented by way of non-limiting example. It is however evident that each embodiment can present one or more of the advantages listed above; however, each embodiment is not required to simultaneously present all the listed advantages.

Reference will be made to the figures of the accompanying drawings, wherein:

Figure 1 shows a partially sectional schematic view of a protective device according to an embodiment of the present disclosure;

Figure 1A shows a schematic view of a protective device according to an embodiment of the present disclosure;

Figure 2 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in an inflated condition;

Figure 3 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in the inflated condition according to a further embodiment;

Figure 4 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in a deflated condition;

Figure 5 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in a deflated condition according to a further embodiment;

Figure 6 shows a partially sectional schematic view of a protective device according to an embodiment of the present disclosure;

Figure 7 shows a view of a garment including a personal protective device;

Figure 8 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in the inflated condition according to a further embodiment;

Figure 9 shows a schematic sectional view along the line II-II of the protective device of Figure 1A in the inflated condition according to a further embodiment;

Figure 10 shows a schematic view of an enclosure for a device according to the present disclosure.

With reference to the attached figures 1-10, the reference number 10, 100 indicates a personal protective device according to the present disclosure in accordance with respective embodiments of the present disclosure. It is preferably a wearable protective device.

The embodiments differ mainly in the textile mesh structure 11, 111 described as will be described below. For identical components having the same structure, the two protective devices keep identical reference numbers.

The personal protective device 10, 110 comprises an inflatable element 12, 112 which is able to substantially assume a first rest condition or deflated condition, and a second active condition or inflated condition. The inflation methods will be described later in the description.

In an embodiment of the present disclosure, the inflatable element 12, 112 can be shaped like a jacket and is apt to surround an upper area or bust of the user's body. Nothing prevents from making the inflatable element 12 according to any shape.

The inflatable element 12, 112 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.

The mesh textile structure 11 can be made according to the technology described in the patent application PCT/IB2009/055512 and in the patent application PCT/IT2009/000547, incorporated herein by reference in their entirety in the present disclosure, or the mesh textile structure 111 can be made according to the technology described in the patent application WO2016178143A1, or in the patent application WO2017163196A1, incorporated herein by reference in their entirety in the present disclosure. In other words, it is preferably a mesh textile structure with threads, formed by meshes and tie elements as described in these patent applications. The most significant difference with respect to these patent applications lies in the fact that the inflatable element here described does not have the same external gas containment walls described in the aforementioned patent applications.

More particularly, according to the technology, for example, of the patent application PCT/IB2009/055512, the mesh structure 11 comprises a first mesh portion 18 and a second mesh portion 19 joined along the perimeter. According to the technology of patent application WO2016178143A1, the mesh structure 111 comprises a first

mesh portion 118 and a second mesh portion 119 which are part of a mesh casing body made in a single body. What is relevant for the present patent application is the fact that the first mesh portion 118, 18 and the second mesh portion 19, 119 are opposite each other and are connected to each other by a plurality of tie elements 5.

Preferably, the tie elements 5 are arranged between said first mesh portion 18 and said second mesh portion 19 aligned in a plurality of rows 24 of tie elements 5. The arrangement in rows 24 allows better regulation of the thread arrangement and further control of the expansion of the inflatable element, as well as forming a plurality of side-by-side housings. Therefore, in the mesh structure 11 there are 111 housings in the shape of channels.

To control even better the expansion of the inflatable element, in active condition, when the inflatable element 2 is in the inflated condition, the tie threads 5 are parallel to each other in the respective row 24 and substantially orthogonal to the direction of the row. The threads are preferably shorter in the edge region, i.e. they decrease in length as they approach the edge region.

According to an aspect of the present disclosure, 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. According to the embodiment of Figure 1, the inflatable casing body 40 has a hand or comb shape and includes a plurality of portions 40a of the inflatable casing body 40 inserted between the rows of tie elements 5. According to the embodiment of Figure 6 the inflatable casing body 42 has a tubular shape and is inserted in a serpentine way between the tie elements. In the embodiment of Figure 10, the casing body has the shape of a tree, that is, it has lateral branches and is also inserted between the channels of a mesh structure 11, 111.

The casing body 40, 42, 43 is in a deflated condition during a rest situation of the inflatable element 2, 102 and occupies the smallest possible space thus allowing the passage of air between the mesh portions 18, 19, 118, 119. At the moment of inflation, the casing body 40, 42, 43 inflates until the tie elements and the mesh portions are tensioned, and thus obtain a maximum tension of the inflatable element. The mesh textile structure 11, 111 actually acts as a containment cage for the casing body 40, 42, 43 in the inflated condition.

It is to be understood that the casing body 40, 42, 43 and the tie elements 5 can be selected and arranged in a suitable way to allow the insertion of the inflatable casing body 40, 42, 43 and the achievement of a desired final shape.

The fact of providing an inflatable casing body 40, 42, 43 with a plurality of portions 40a which are side by side between rows of tie elements 5 allows to obtain a substantially flat final configuration of the inflatable element due to the fact that the various portions 40a in inflated condition are forced to stay side by side, blocked by the mesh portions 18, 118, 19, 119.

In an alternative embodiment such as that of figure 8, a third mesh portion 120 overlapped the first mesh portion 118 and the second mesh portion 119 is provided. This third mesh portion 120 allows to make a second layer of inflatable element and therefore make available a plurality of housings for the inflatable casing body 40, 42, 43, and allow an even greater variability of arrangement of the inflatable casing body or of its portions within the mesh textile structure 11, 111.

The present disclosure also relates to a protective garment 50 comprising a protective device 10, 110 as defined above. The protective device 10, 110 can be housed in a garment pocket.

It follows that the garment pocket forms a cover for the protective device 10, 110. For example, the pocket can be made between a covering outer layer of the garment and an inner layer or lining. Alternatively again, the protective device can be simply fixed underneath the covering outer layer, without a real pocket.

The covering layer, in use, is substantially placed over the personal protective device. The covering layer can also be understood as a multilayer structure.

In this case, the garment includes a covering outer layer, which can also be a multilayer structure. The outer layer of the garment can advantageously be made of a breathable material, or include holes or ventilation openings. In other words, and in general, the garment can be made of breathable material and/or material that allows the passage of air through it, that is, that allows ventilation, for example it is a perforated material or has one or more ventilation openings. In other words, the garment preferably has one or more parts made of material suitable for allowing transpiration and/or ventilation. The main advantage of the fact that the casing body in a deflated condition occupies only a part of the mesh structure lies exactly in the fact that the presence of the inflatable element does not affect the characteristics of transpiration and ventilation of the garment.

In this way, when the inflatable element is in an inactive condition, and in fact not used, the casing body forms an additional layer in the garment in a confined way, only in a restricted region of the garment. In the remaining part of the garment (second region of the mesh structure), the casing body does not form an additional layer. It follows that the garment can preserve its own peculiarities and technical characteristics determined by the combination of layers chosen to make the

garment, and they can be, as mentioned, suitable for ventilation or transpiration. Such layers include, for example, the lining and the covering surface of the protective device.

The present disclosure also relates to a method for making a protective device 10, 110 for the protection of a user.

The method includes the steps of:

- provide an inflatable element 12, 112 configured to assume an active inflated configuration and a rest deflated configuration, wherein said inflatable element 12 comprises a first mesh portion 18 and a second mesh portion 19, 119 opposite the first mesh portion 18, 119 to define at least one inner housing;
- connecting said first mesh portion 18 to said second mesh portion 19 with a plurality of tie elements 5 so as to define one or more inner housings;
- arrange in the inner housing a casing body 40, 42, 43 and preferably connect the casing body 40, 42, 43 to a gas source to inflate the casing body in an inflated condition.

Preferably in the deflated condition, the casing body 40, 42, 43 occupies a first space or first region, and wherein in said deflated condition a second region or second space of said at least one housing is devoid of said casing body, and in wherein in said inflated condition the casing body expands and occupies the second region or second space.

Preferably, the step of connecting the first mesh portion 18 to the second mesh portion 19 with the plurality of tie elements 5 is carried out by arranging the tie elements 5 aligned in a plurality of rows 24 of tie elements, wherein each row 24 of elements tie elements 5 comprises a plurality of tie element elements 5 and the casing body is arranged between the rows 24.

Actually, the casing body covers the mesh structure 11, 111 from within, without requiring external waterproofing walls.

In relation to inflation, in order to inflate the casing body 40, 42, 43, in the event of a fall and/or slip and/or unexpected impact by a user or a vehicle on which he/she is travelling, the protective device 10, 110 is apt to cooperate with suitable activation means (not shown) operatively connected for example to the gas source 15, such as a can of compressed cold gas, such as for example helium. The can can be provided with a respective shut-off valve (not shown).

Alternatively, the inflation fluid source can comprise gas generators of the pyrotechnic or hybrid type or of other types known to the state of the art.

The opening of the shut-off valve of each inflation can is preferably controlled by a control unit according to the detection of the status of the vehicle/driver system; for

example, said control unit can implement a fall prediction system that allows a timely identification of the fall event and a reliable prediction of this by means of accelerometric sensors integral with the vehicle (or driver) and a processing unit of the signals produced by the same sensors.

Alternatively, the device according to the present disclosure can also find application using an activation cable connected to a vehicle driven by a user, which cable controls the inflation of the inflatable element following the distancing of the user from the vehicle, for example, following a fall or an unexpected impact. The use of the cable is particularly used in the horse riding sector.

In any case, the aforementioned activation and inflation means can be integrated into the protective device according to the present invention or located outside the same.

It should also be noted that the activation methods, while being an aspect of particular importance for an effective operation of the device, will not be further described in greater detail, being methods essentially already known to a person skilled in the art of protection of an individual from unexpected impacts.

The object of the present disclosure has so far been described with reference to the embodiments thereof. It is to be understood that there may be other embodiments which relate to the same inventive nucleus, all falling within the scope of protection of the claims provided below.

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(54) **Title:** PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE

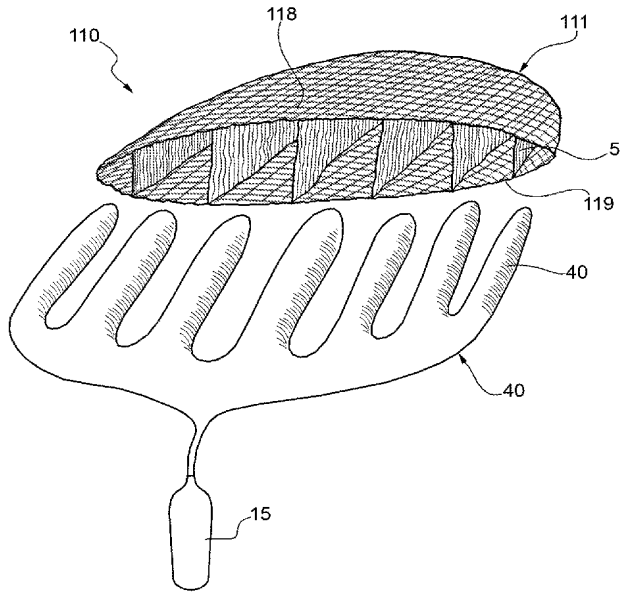


FIG.1

(57) **Abstract:** The present disclosure relates to a protective device (10, 110) for the protection of a user. The protective device (10) comprises a mesh structure (11, 111) comprising a first mesh portion (18, 118) and a second mesh portion (19, 119) and a plurality of tie elements (5), wherein said first mesh portion (18, 118) and said second mesh portion (19, 119) are opposite one another and are connected one another by the plurality of tie elements (5); wherein the first mesh portion, the second mesh portion and the tie elements define one or more inner housings of the mesh structure (11, 111). The protective device (10, 110) includes a casing body (40, 42, 43) disposed in one or more of said inner housings, wherein said casing body is configured to assume a deflated condition and an inflated condition in the one or more inner housings of the mesh structure (11, 111).

[continued on next page]

ALPINESTARS
Ex. 1002 - Page 400

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NOTE

DISPOSITIVO DI PROTEZIONE E METODO PER REALIZZARE TALE DISPOSITIVO DI PROTEZIONE

DESCRIZIONE

La presente divulgazione si riferisce in generale ad un dispositivo di protezione per una protezione di un utilizzatore a bordo di un veicolo. Il dispositivo di protezione include un elemento gonfiabile che, in condizione gonfiata, è configurato per proteggere da impatti un guidatore, un passeggero, un pilota di motoveicolo o un simile utilizzatore, durante la guida, per esempio da impatti contro il veicolo o porzioni del veicolo in caso di incidente.

La presente divulgazione riguarda altresì un veicolo includente tale dispositivo di protezione.

Un dispositivo di protezione noto è per esempio come quello descritto nel brevetto europeo EP2373524B1.

L'elemento gonfiabile include una struttura tessile a maglia e pareti impermeabilizzanti disposte esternamente che consentono di contenere il fluido di gonfiaggio per un determinato periodo di tempo. Le pareti sono, ad esempio, un primo foglio, o prima parete, ed un secondo foglio, o seconda parete, fissati l'uno con l'altro lungo rispettivi bordi perimetrali. Detto primo e secondo foglio ricoprono e rivestono su un lato esterno o superficie esterna rispettive maglie della struttura tessile a maglia.

Un elemento gonfiabile così realizzato, pur essendo molto vantaggioso sotto molti punti di vista, presenta tuttavia lo svantaggio di essere vincolati al materiale delle pareti esterne che deve garantire una adeguata tenuta, e pressione, e al tempo stesso consentire una adeguata distensione al momento del gonfiaggio, soprattutto quando si trova piegato in un vano del veicolo, o una adeguata traspirazione quando è integrato in un sedile. In particolare, l'elemento gonfiabile in condizione sgonfiata crea una sorta di sacchetto nel sedile che non consente un passaggio di aria adeguato. Inoltre le pareti esterne possono essere di una certa rigidità tale da impedire una adeguata distensione al momento del gonfiaggio.

Un problema tecnico alla base della presente divulgazione risiede nel mettere a disposizione un dispositivo di protezione in grado di superare gli inconvenienti della tecnica nota e che consenta una maggiore traspirazione e/o di conseguire ulteriori vantaggi, e di mettere a disposizione un veicolo includente detto dispositivo di protezione.

Tale problema viene risolto da un dispositivo di protezione per la protezione di un utilizzatore, da un veicolo e da un metodo produttivo per la realizzazione di un dispositivo di protezione secondo le rispettive rivendicazioni indipendenti.

Caratteristiche secondarie dell'oggetto della presente divulgazione sono definite nelle rispettive rivendicazioni dipendenti.

Un dispositivo di protezione secondo la presente divulgazione comprende una struttura a maglia includente una prima porzione a maglia ed una seconda porzione a maglia, in cui la prima porzione a maglia e la seconda porzione a maglia sono contrapposte tra loro e collegate tra loro con una pluralità di elementi tiranti a definire uno o più alloggiamenti. Inoltre, l'elemento gonfiabile comprende almeno un corpo ad involucro gonfiabile alloggiato nella zona interna, quindi in detto uno o più alloggiamenti, tra la prima porzione a maglia e la seconda porzione a maglia. Il dispositivo di protezione include preferibilmente ancora una sorgente di gas o sorgente di gonfiaggio collegata al corpo ad involucro gonfiabile per gonfiare il corpo ad involucro gonfiabile tra una prima condizione sgonfiata ed una seconda condizione gonfiata.

Il corpo ad involucro gonfiabile è pertanto un corpo flessibile, che in condizione gonfiata tiene tale condizione almeno un per determinato periodo. Preferibilmente si tratta di un corpo impermeabile al gas di gonfiaggio. In tal caso, per sgonfiare il corpo ad involucro è prevista una valvola di sfiato. Il corpo ad involucro è preferibilmente un corpo tubolare o includente porzioni tubolari, avente preferibilmente elevate capacità di espansione.

Gli alloggiamenti sono preferibilmente sagomati a canali, per favori inserimento del corpo ad involucro.

In condizione sgonfiata il corpo ad involucro può occupare un minimo spazio tra le porzioni a maglia, e quindi consentire una massima ventilazione. Come corpo ad involucro si può utilizzare un corpo in materiale preferibilmente molto elastico e espansibile, e che può garantire la tenuta al gas per almeno un certo tempo. Si tratta, per esempio, di una membrana o film in lattice, poliuretano, polipropilene, poliestere, poliammide. Il gonfiaggio avviene al momento dell'impatto o quando vi è necessità.

Quando il corpo a involucro gonfiabile viene gonfiato va preferibilmente a occupare tutto o quasi l'alloggiamento dove è alloggiato fino a portare in tensione gli elementi tiranti. La massima tensione degli elementi tiranti determina la massima distanza possibile tra la prima porzione a maglia e la seconda porzione a maglia. Si ottiene pertanto un dispositivo di protezione in cui le porzioni a maglia ed il corpo ad involucro definiscono un elemento gonfiabile, vale a dire un elemento che è configurato per assumere almeno una configurazione gonfiata attiva ed una configurazione sgonfiata di riposo.

Le porzioni a maglia rappresentano un lato esterno dell'elemento gonfiabile e il

corpo gonfiabile ad involucro rappresentano un lato interno dell'elemento gonfiabile. Non sono quindi vantaggiosamente presenti pareti esterni che possono irrigidire troppo il componente gonfiabile. Eventualmente possono essere presenti strati di rinforzo, eventualmente di minime dimensioni.

Il dispositivo di protezione, in una condizione gonfiata, è destinato ad interporsi tra un utilizzatore ed il veicolo, o una porzione del veicolo, in modo tale da assorbire l'energia dell'impatto tra l'utilizzatore ed il veicolo ed evitare per quanto possibile che, in caso di incidente, l'utilizzatore subisca lesioni in conseguenza di un impatto violento contro il veicolo o sue porzioni. Nella presente divulgazione, con "veicolo" si intende un qualsiasi mezzo di trasporto, anche per uso sportivo. A seconda dei casi, l'utilizzatore può ad esempio essere un motociclista, un pilota, un guidatore, un passeggero.

Con l'espressione struttura a maglia, o preferibilmente struttura tessile a maglia, o porzione a maglia si intende in senso lato una maglia vera e propria, oppure anche un tessuto, anche una rete, ciò che è importante è che sia una struttura forata o in grado di creare un telaio o gabbia tensionabile intorno al corpo ad involucro, e che fa passare aria o altro gas. Quindi la struttura a maglia è da ritenersi come una struttura a gabbia che intrappola e blocca o limita espansione del corpo ad involucro. Quindi, sagomando in modo opportuno la struttura o corpo includente le due porzioni a maglia con gli elementi tiranti ed eventualmente prevedendo lunghezze diverse per gli elementi tiranti a seconda della loro collocazione nella camera stessa, è possibile determinare a priori la forma assunta dall'elemento gonfiabile in condizione gonfiata (sia in termini di distanza tra le due maglie, sia in termini di sagoma perimetrale delle due porzioni a maglia).

Si può trattare anche di una struttura che può essere più facilmente personalizzata per un utilizzo, con ampia varietà in termini di resistenza, flessibilità, colori, tipologia di fili e filati etc...

Anche con il termine tirante si intende un elemento in senso lato, vale a dire un elemento che va in tensione tra le due porzioni a maglia quando il corpo ad involucro gonfiabile viene gonfiato. Il tirante potrebbe essere anche un punto di cucitura.

I tiranti possono essere alternativamente fili, oppure pezze in tessuto, oppure fettucce, in altre parole possono essere delle pareti divisorie che collegano porzioni a maglia della struttura a maglia. Anche dette pareti divisorie possono essere poste in tensione. I tiranti possono essere disposti in modo che un primo gruppo di tiranti è disposto ad incrocio o in condizione obliqua rispetto ad un secondo gruppo di tiranti.

Alla prima condizione sgonfiata del corpo ad involucro corrisponde la condizione

sgonfiata di riposo dell'elemento gonfiabile e la seconda condizione gonfiata del corpo ad involucro corrisponde alla condizione gonfiata attiva dell'elemento gonfiabile. Ne consegue che la prima porzione a maglia e la seconda porzione a maglia, unitamente ai tiranti, fungono da gabbia o telaio di tenuta del gonfiaggio del corpo ad involucro gonfiabile. Il corpo ad involucro di fatto fodera da dentro la struttura tessile a maglia, al momento del gonfiaggio, mentre è lasco in condizione sgonfiata.

In altre parole, è da notare che alla configurazione gonfiata attiva dell'elemento gonfiabile corrisponde una condizione di almeno parziale tensione degli elementi tiranti, e alla configurazione sgonfiata di riposo dell'elemento gonfiabile corrisponde una condizione di almeno parziale allentamento, e condizione lasca in genere, degli elementi tiranti e della struttura a maglia. Il corpo ad involucro o i corpi ad involucro sono disposti quindi con gioco nella zona interna della struttura a maglia in condizione sgonfiata.

In questo modo, preferibilmente, quando il corpo ad involucro va in tensione, tutto l'elemento gonfiabile va in tensione. In questo modo, calibrando opportunamente la forma degli alloggiamenti, la forma del corpo ad involucro, la lunghezza dei tiranti, la configurazione delle porzioni a maglia, si può calcolare a priori la forma finale dell'elemento gonfiabile.

In condizione gonfiata, il corpo ad involucro fodera almeno parzialmente la prima porzione a maglia e la seconda porzione a maglia, a contatto.

La prima porzione a maglia e la seconda porzione a maglia unitamente agli elementi tiranti determinano con il corpo ad involucro la forma finale dell'elemento gonfiabile. Per esempio l'elemento gonfiabile può raggiungere una forma finale generalmente piatta e piana. Tale forma finale è particolarmente utile per ottenere dispositivi di protezione con minimo ingombro, o dispositivi di protezione a tendina, oppure per creare barriere non ingombranti a fianco di sedile o intorno ad sedili per auto o seggiolini per bambini. Tale ridotto ingombro consente, in caso di gonfiaggio fortuito dell'elemento gonfiabile, un minore disagio e rischio per un utilizzatore mentre guida un veicolo. In altre parole, un'espansione limitata dell'elemento gonfiabile non pregiudica il controllo di un veicolo da parte dell'utilizzatore, e pertanto in caso di gonfiaggio fortuito non costituisce rischio di incidente. Il dispositivo di protezione per una motocicletta può essere disposto in un vano in prossimità del manubrio, ad esempio in un vano ricavato in una porzione di sommità del telaio o del serbatoio, e, quando gonfiato, il dispositivo di protezione si dispone in una regione davanti al motociclista utilizzatore, cioè sul manubrio, sul serbatoio e sul fanale anteriore.

Il dispositivo di protezione per un'automobile può essere disposto in un vano tra il

tetto e la parete laterale dell'abitacolo e, quando gonfiato, fuoriesce disponendosi sia in corrispondenza del tetto sia in corrispondenza del lato portiera.

Il dispositivo di protezione per un'automobile può essere disposto in un vano al di sotto del volante e/o del cruscotto; in condizione gonfiata, il dispositivo di protezione protegge le gambe e le ginocchia dell'utilizzatore (guidatore o passeggero) da un urto frontale contro la parte inferiore del cruscotto. I dispositivi di protezione per un'automobile possono disposti in rispettivi vani ricavati rispettivamente su un lato di un poggiatesta, su un lato dello schienale di un sedile e e su un lato della seduta del sedile. Preferibilmente, detti vani e i rispettivi dispositivi di protezione sono disposti su entrambi i lati del poggiatesta e del sedile.

In condizione gonfiata, i dispositivi di protezione fuoriescono dai rispettivi alloggiamenti e, grazie alla loro forma appiattita e controllata, si dispongono agevolmente ai lati dell'utilizzatore, rispettivamente in corrispondenza della testa, del tronco e delle gambe/ginocchia dell'utilizzatore, per una protezione dell'utilizzatore da urti laterali.

In sostanza, i dispositivi di protezione sono atti ad "avvolgere" l'utilizzatore su tutti i lati sui quali può verificarsi un urto. Un veicolo potrebbe essere fornito di solo alcuni di tali dispositivi, o potrebbe essere fornito di dispositivi di protezione aventi forme e/o posizioni differenti rispetto a quelle indicate.

Un ulteriore vantaggio risiede nel fatto che controllando la forma dell'elemento gonfiabile è possibile controllare (ed in particolare limitare) anche la quantità di gas o fluido necessaria per il gonfiaggio dell'elemento gonfiabile.

Secondo un aspetto preferito della presente divulgazione, al fine di avere una struttura più piatta possibile, gli alloggiamenti sono affiancati fra loro, in modo che porzioni di corpo ad involucro siano affiancate fra loro nella struttura a maglia, oppure una pluralità di corpi ad involucro sono affiancati fra loro. A tal fine, per esempio, gli elementi tiranti sono disposti tra detta prima porzione a maglia e detta seconda porzione a maglia allineati in una pluralità di file di elementi tiranti a definire una pluralità di alloggiamenti affiancati, vale a dire canali. Preferibilmente, ciascuna fila di elementi tiranti della pluralità di file di elementi tiranti comprende una pluralità di elementi tiranti. Il corpo ad involucro è sagomato in modo tale da essere disposto tra le file di tiranti.

Secondo un aspetto preferito della presente divulgazione, nella condizione di almeno parziale tensione, gli elementi tiranti si estendono lungo una direzione di sviluppo sostanzialmente perpendicolare alla direzione di estensione delle file di elementi tiranti. Secondo un altro aspetto preferito della presente divulgazione, nella

condizione di almeno parziale tensione, gli elementi tiranti appartenenti ad una stessa fila di elementi tiranti sono disposti sostanzialmente paralleli tra loro.

Secondo un aspetto preferito della presente divulgazione, il corpo ad involucro gonfiabile è sagomato a mano o a pettine per avere così una pluralità di porzioni disposte tra gli elementi tiranti.

In una forma di realizzazione operativa il corpo ad involucro è sagomato come un corpo tubolare o condotto inserito, per esempio, a serpentina tra gli elementi tiranti, oppure una forma a albero.

In una ulteriore forma di realizzazione, sono previsti una pluralità di corpi ad involucro gonfiabili ciascuno alloggiato tra una porzione a maglia e la contrapposta porzione a maglia.

La prima porzione a maglia e la seconda porzione a maglia definiscono di fatto uno strato dell'elemento gonfiabile all'interno del quale è predisposto il corpo ad involucro gonfiabile. In una forma di realizzazione della presente divulgazione, l'elemento gonfiabile comprende almeno una terza porzione a maglia sovrapposta alla prima porzione a maglia e alla seconda porzione a maglia, a definire un secondo strato dell'elemento gonfiabile. E' possibile prevedere di disporre porzioni di corpo ad involucro in modo alternato tra i due strati in modo da controllare in modo mirato la forma finale dell'elemento gonfiabile, senza occupare troppo posto tra le maglie, e quindi garantire la ventilazione.

Si può quindi osservare che l'elemento gonfiabile secondo la presente divulgazione si presta ad una elevata modularità e adattamento alle esigenze costruttive del dispositivo di protezione.

Altri vantaggi, caratteristiche e modalità di impiego dell'oggetto della presente divulgazione risulteranno evidenti dalla seguente descrizione dettagliata di alcune sue forme di realizzazione preferite, date a scopo esemplificativo e non limitativo. È comunque evidente come ciascuna forma di realizzazione possa presentare uno o più dei vantaggi sopra elencati; in ogni caso non è comunque richiesto che ciascuna forma di realizzazione presenti simultaneamente tutti i vantaggi elencati.

Verrà fatto riferimento alle figure dei disegni allegati, in cui:

La figura 1 mostra una vista schematica parzialmente in sezione di un dispositivo di protezione secondo una forma di realizzazione della presente divulgazione;

La figura 1A mostra una vista schematica di un dispositivo di protezione secondo una forma di realizzazione della presente divulgazione;

La figura 2 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione gonfiata;

La figura 3 mostra una vista schematica in sezione lungo la linea II-II del

dispositivo di protezione di figura 1A in condizione gonfiata secondo un'ulteriore forma di realizzazione;

La figura 4 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione sgonfiata;

La figura 5 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione sgonfiata secondo un'ulteriore forma di realizzazione;

La figura 6 mostra una vista schematica parzialmente in sezione di un dispositivo di protezione secondo una forma di realizzazione della presente divulgazione;

La figura 7 mostra un sedile per bambino includente un dispositivo di protezione secondo una forma di realizzazione della presente divulgazione;

La figura 7A mostra una vista parziale di un veicolo includente un dispositivo di protezione secondo una forma di realizzazione della presente divulgazione;

La figura 8 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione gonfiata secondo un'ulteriore forma di realizzazione;

La figura 9 mostra una vista schematica in sezione lungo la linea II-II del dispositivo di protezione di figura 1A in condizione gonfiata secondo un'ulteriore forma di realizzazione;

La figura 10 mostra una vista schematica di un involucro per un dispositivo secondo la presente divulgazione.

Con riferimento alle figure allegate 1-10, con il numero di riferimento 10, 100 viene indicato un dispositivo di protezione secondo la presente divulgazione in accordo a rispettive forme di realizzazione della presente divulgazione. Le forme di realizzazione si differenziano prevalentemente per la struttura tessile a maglia 11, 111 descritta come verrà descritto nel seguito. Per componenti identici e aventi la medesima struttura, i due dispositivi di protezione mantengono numeri di riferimento identici.

Il dispositivo di protezione 10, 110 comprende un elemento gonfiabile 12, 112 il quale è atto ad assumere sostanzialmente una prima condizione di riposo o condizione sgonfiata, ed una seconda condizione attiva o condizione gonfiata. Le modalità di gonfiaggio saranno descritte nel seguito della descrizione.

In una forma di realizzazione della presente divulgazione l'elemento gonfiabile 12, 112 può essere conformato a barriera per un sedile per bambini ed è atto a cingere una zona superiore o busto del corpo del bambino, oppure un elemento gonfiabile per il volante. Nulla vieta di realizzare l'elemento gonfiabile 12 secondo una

qualsiasi sagoma e applicazione in un veicolo.

L'elemento gonfiabile 12, 112 include una struttura tessile a maglia 11, 111, con una prima porzione a maglia 18,118, ed una seconda porzione a maglia 19, 119, in cui le due porzioni a maglia sono tra loro contrapposte.

La struttura tessile a maglia 11 può essere realizzata secondo la tecnologia descritta nella domanda di brevetto PCT/IB2009/055512 e nella domanda di brevetto PCT/IT2009/000547, qui incorporate per riferimento nella loro interezza nella presente divulgazione, oppure la struttura tessile a maglia 111 può essere realizzata secondo la tecnologia descritta nella domanda di brevetto WO2016178143A1, o nella domanda di brevetto WO2017163196A1, qui incorporate per riferimento nella loro interezza nella presente divulgazione. Vale a dire si tratta preferibilmente di una struttura tessile a maglia con fili, formata da maglie e fili tiranti come descritto in queste domande di brevetto. La differenza più significativa rispetto a tali domande di brevetto risiede nel fatto che l'elemento gonfiabile qui descritto non presenta le medesime pareti esterne di contenimento del gas descritte nelle suddette domande di brevetto.

Più in particolare secondo la tecnologia, per esempio, della domanda di brevetto PCT/IB2009/055512 la struttura a maglia 11 comprende una prima porzione a maglia 18 ed una seconda porzione a maglia 19 unite lungo il perimetro. Secondo la tecnologia della domanda di brevetto WO2016178143A1 la struttura a maglia 111 comprende una prima porzione a maglia 118 ed una seconda porzione a maglia 119 che sono parte di un corpo ad involucro a maglia lavorato in un corpo unico. Ciò che rileva per la presente domanda di brevetto è il fatto che la prima porzione a maglia 118, 18 e la seconda porzione a maglia 19, 119 sono contrapposte tra loro e sono collegate tra loro da una pluralità di elementi tiranti 5.

Preferibilmente, gli elementi tiranti 5 sono disposti tra detta prima porzione a maglia 18 e detta seconda porzione a maglia 19 allineati in una pluralità di file 24 di elementi tiranti 5. La disposizione in file 24 consente di regolare meglio la disposizione dei fili e controllare ulteriormente l'espansione dell'elemento gonfiabile, nonché formare una pluralità di alloggiamenti affiancati. Si hanno quindi nella struttura a maglia 11, 111 alloggiamenti conformati di fatto a canali.

Per controllare ancora meglio l'espansione dell'elemento gonfiabile, in condizione attiva, quando l'elemento gonfiabile 2 è in condizione gonfiata, i fili tiranti 5 sono paralleli fra loro nella rispettiva fila 24 e sostanzialmente ortogonali rispetto alla direzione della fila. I fili sono preferibilmente più corti nella zona di bordo, vale a dire diminuiscono in lunghezza mano a mano che si avvicinano verso la zona di bordo.

Secondo un aspetto della presente divulgazione, l'elemento gonfiabile 12, 112 comprende un corpo ad involucro gonfiabile 40, 42, 43 disposto in uno o più alloggiamenti tra la prima porzione a maglia 18, 118, e la seconda porzione a maglia 19, 119 e collegato ad una sorgente di gas 15, o sorgente di gonfiaggio. Secondo la forma di realizzazione di figura 1 il corpo ad involucro gonfiabile 40 ha una forma a mano o a pettine e include una pluralità di porzioni 40a di corpo ad involucro gonfiabile 40 inserite tra le file di tiranti 5. Secondo la forma di realizzazione di figura 6 il corpo ad involucro gonfiabile 42 ha una forma tubolare ed è inserito a serpentina tra i tiranti. Nella forma di realizzazione di figura 10, il corpo ad involucro ha forma di albero, ovvero presenta ramificazioni laterali ed è anch'esso inserito tra i canali di una struttura a maglia 11, 111.

Il corpo ad involucro 40, 42, 43 sta in condizione sgonfiata durante una situazione di riposo dell'elemento gonfiabile 2, 102 e occupa il minor spazio possibile consentendo quindi il passaggio di aria tra le porzioni a maglia 18, 19, 118, 119. Al momento del gonfiaggio, il corpo ad involucro 40, 42, 43 va a gonfiarsi fino a portare in tensione i tiranti e le porzioni a maglia, e quindi ottenere una tensione massima dell'elemento gonfiabile. La struttura tessile a maglia 11, 111 funge di fatto da gabbia di contenimento del corpo ad involucro 40, 42, 43 in condizione gonfiata.

E' da intendersi che il corpo ad involucro 40, 42, 43 e gli elementi tiranti 5 possono essere scelti e disposti in modo adeguato per consentire l'inserimento del corpo ad involucro gonfiabile 40, 42, 43 e il raggiungimento di una forma voluta finale.

Il fatto di prevedere un corpo ad involucro gonfiabile 40, 42, 43 con una pluralità di porzioni 40a che stanno affiancate tra file di elementi tiranti 5 consente di ottenere una configurazione finale sostanzialmente piatta dell'elemento gonfiabile dovuta al fatto che le varie porzioni 40a in condizione gonfiata sono forzate a stare una affianco all'altra, bloccate dalle porzioni a maglia 18, 118, 19, 119.

In una forma di realizzazione alternativa come quella di figura 8 si prevede la presenza di una terza porzione a maglia 120 sovrapposta alla prima porzione a maglia 118 e alla seconda porzione a maglia 119. Tale terza porzione a maglia 120 consente di realizzare un secondo strato di elemento gonfiabile e avere a disposizione pertanto una pluralità di alloggiamenti per il corpo ad involucro gonfiabile 40, 42, 43, e consentire una ancora maggiore variabilità di disposizione del corpo ad involucro gonfiabile o delle sue porzioni all'interno della struttura tessile a maglia 11, 111.

La presente divulgazione riguarda anche un veicolo 50 comprendente un dispositivo di protezione 10, 110 come sopra definito. Il dispositivo di protezione 10, 110 può essere alloggiato in un vano dell'autoveicolo 50 come visibile in figura 7A, oppure in

un sedile 52, per esempio il seggiolino per bambini, come mostrato in figura 7. Come detto si tratta di un dispositivo di protezione per auto, come un dispositivo di protezione che viene disposto in un volante o cosiddetto a tendina. Nulla vieta come detto che si tratti di un dispositivo di protezione per motoveicolo, per esempio disposto sul manubrio del motoveicolo, o in generale di un mezzo di trasporto, per esempio una bicicletta, uno sci o simile mezzo di trasporto.

La presente divulgazione riguarda anche un metodo per realizzare un dispositivo di protezione 10, 110 per la protezione di un utilizzatore su un veicolo o mezzo di trasporto.

Il metodo comprende le fasi di:

- fornire un elemento gonfiabile 12, 112 configurato per assumere una configurazione gonfiata attiva ed una configurazione sgonfiata di riposo, in cui detto elemento gonfiabile 12 comprende una prima porzione a maglia 18 ed una seconda porzione a maglia 19, 119 opposta alla prima porzione a maglia 18, 119 a definire almeno un alloggiamento interno;
- collegare detta prima porzione a maglia 18 a detta seconda porzione a maglia 19 con una pluralità di elementi tiranti 5 a definire uno o più alloggiamenti interni;
- disporre nell'uno o più alloggiamenti interni un corpo ad involucro 40, 42, 43 e preferibilmente collegare il corpo ad involucro 40, 42, 43 ad una sorgente di gas.

Preferibilmente, la fase di collegare la prima porzione a maglia 18 alla seconda porzione a maglia 19 con la pluralità di elementi tiranti 5 è effettuata disponendo gli elementi tiranti 5 allineati in una pluralità di file 24 di elementi tiranti, in cui ciascuna fila 24 di elementi tiranti 5 comprende una pluralità di elementi tiranti 5 e il corpo ad involucro viene disposto tra le file 24.

Di fatto il corpo ad involucro riveste da dentro la struttura a maglia 11, 111, senza richiedere pareti esterne impermeabilizzanti.

In relazione al gonfiaggio, per realizzare il gonfiaggio del corpo ad involucro 40, 42, 43, in caso di impatto imprevisto da parte del veicolo, il dispositivo di protezione 10, 110 è atto a cooperare con appositi mezzi di attivazione (non illustrati) collegati operativamente ad esempio alla sorgente di gas 15 o altra sorgente di gonfiaggio, come una bomboletta di gas freddo compresso, quale per esempio elio. La bomboletta può essere provvista di una rispettiva valvola di intercettazione (non mostrata).

Alternativamente, la sorgente di fluido di gonfiaggio può comprendere generatori di gas di tipo pirotecnico o di tipo ibrido o di altre tipologie note allo stato della tecnica.

L'apertura della valvola di intercettazione di ciascuna bomboletta di gonfiaggio è preferibilmente comandata da una centralina di controllo sulla base della rilevazione dello stato del sistema veicolo/pilota; ad esempio detta centralina di controllo può implementare un sistema di predizione dell'impatto che consenta un'identificazione tempestiva dell'evento impatto ed un'affidabile predizione di questa per mezzo di sensori accelerometrici solidali al veicolo ed un'unità di elaborazione dei segnali prodotti dai sensori stessi.

In ogni caso i suddetti mezzi di attivazione e gonfiaggio possono essere integrati nel veicolo secondo la presente divulgazione.

Si noti anche che le modalità di attivazione, pur essendo un aspetto di particolare rilevanza per un efficace funzionamento del dispositivo, non saranno ulteriormente descritte con maggiore dettaglio essendo metodi essenzialmente già noti ad un tecnico del settore della protezione di un individuo da impatti imprevisti.

L'oggetto della presente divulgazione è stato fin qui descritto con riferimento a sue forme di realizzazione. È da intendersi che possano esistere altre forme di realizzazione che afferiscono al medesimo nucleo inventivo, tutte rientranti nell'ambito di protezione delle rivendicazioni qui di seguito esposte.

RIVENDICAZIONI

1. Dispositivo di protezione (10, 110) per la protezione di un utilizzatore di un veicolo o di un mezzo di trasporto, detto dispositivo di protezione (10) essendo associato a, o una porzione di, il veicolo o mezzo di trasporto e comprendendo una struttura a maglia (11, 111) comprendente una prima porzione a maglia (18, 118) ed una seconda porzione a maglia (19, 119) ed una pluralità di tiranti (5), in cui detta prima porzione a maglia (18, 118) e detta seconda porzione a maglia (19, 119) sono contrapposte e sono collegate tra loro dalla pluralità di elementi tiranti (5); in cui la prima porzione a maglia, la seconda porzione a maglia e gli elementi tiranti definiscono uno o più alloggiamenti interni della struttura a maglia (11, 111);

in cui il dispositivo di protezione (10, 110) include un corpo ad involucro (40, 42, 43) disposto in uno o più di detti alloggiamenti interni, in cui detto corpo ad involucro è configurato per assumere una condizione sgonfiata ed una condizione gonfiata nell'uno o più alloggiamenti interni della struttura a maglia (11, 111).

2. Dispositivo di protezione (10, 110) secondo la rivendicazione 1, in cui detto corpo ad involucro è configurato per rivestire da dentro, almeno parzialmente a contatto, la struttura a maglia (11, 111) in condizione gonfiata e/o che detta struttura a maglia è una struttura esterna del dispositivo di protezione (10, 110).

3. Dispositivo di protezione secondo la rivendicazione 1 o 2, in cui il corpo ad involucro (40, 42, 43) occupa un primo spazio nella condizione sgonfiata atto a consentire un passaggio di aria tra le porzioni a maglia e occupa, in condizione gonfiata, un secondo spazio più ampio del primo spazio.

4. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui alla condizione sgonfiata del corpo ad involucro corrisponde una condizione lasca e rilassata della struttura a maglia (11, 111) ed in cui alla condizione gonfiata del corpo ad involucro corrisponde una condizione almeno parzialmente di tensione gli elementi tiranti (5) e della prima porzione a maglia (18, 118) e la seconda porzione a maglia (19, 119).

5. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui gli elementi tiranti definiscono una pluralità di alloggiamenti tra la prima porzione a maglia (18, 118) e la seconda porzione a maglia (19, 119) ed il corpo ad involucro (40, 42, 43) comprende una pluralità di porzioni (40a) disposte ciascuna in uno di detti alloggiamenti.

6. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui gli alloggiamenti sono tra loro affiancati e/o hanno forma di canali.

7. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui il corpo ad involucro (40, 42, 43) ha una forma a mano o a pettine, o ha una forma tubolare disposta a serpentina.
8. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui gli elementi tiranti (5) sono disposti tra detta prima porzione a maglia (18, 118) e detta seconda porzione a maglia (19, 119) allineati in una pluralità di file (24) di elementi tiranti (5).
9. Dispositivo di protezione (10) secondo la rivendicazione 6, in cui ciascuna fila (24) di elementi tiranti (5) della pluralità di file di elementi tiranti (5) comprende una pluralità di elementi tiranti (5) in cui in una condizione di almeno parziale tensione, gli elementi tiranti (5) appartenenti ad una stessa fila (24) di elementi tiranti (5) sono disposti sostanzialmente paralleli tra loro.
10. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, in cui una condizione gonfiata del corpo ad involucro corrisponde ad una condizione gonfiata di protezione dell'elemento gonfiabile, ed una condizione sgonfiata corrisponde ad una condizione di riposo dell'elemento gonfiabile.
11. Dispositivo di protezione (10, 110) secondo una qualsiasi delle rivendicazioni precedenti, comprendente una sorgente di gas (15) o sorgente di gondiaggio collegata al corpo a involucro gonfiabile.
12. Veicolo o mezzo di trasporto (50), o porzione di veicolo o di mezzo di trasporto, o sedile o porzione di sedile, comprendente un dispositivo di protezione (10) secondo una qualsiasi delle rivendicazioni precedenti.
13. Metodo per realizzare un dispositivo di protezione (10) per la protezione di un utilizzatore di un veicolo o di un mezzo di trasporto, detto metodo comprendendo le fasi di:
    - fornire una struttura a maglia (11, 111) comprendente una prima porzione a maglia (18, 118) ed una seconda porzione a maglia (19, 119), opposta alla prima porzione a maglia (18, 118), ed una pluralità di elementi tiranti (5), in cui detta prima porzione a maglia (18, 118) a detta seconda porzione a maglia (19, 119) e pluralità di elementi tiranti (5) definiscono uno o più alloggiamenti nella struttura a maglia (11, 111);
    - disporre un corpo ad involucro (40, 42, 43) in uno o più di detti alloggiamenti a formare con la struttura a maglia (11, 111) un elemento gonfiabile (12, 112);
    - gonfiare il corpo ad involucro (40, 42, 43) tra una prima condizione operativa sgonfiata ed una seconda condizione operativa gonfiata.

14. Metodo secondo la rivendicazione precedente, in cui il corpo ad involucro viene gonfiato fino a portare in tensione gli elementi tiranti e la struttura a maglia (11, 111) e/o fino a far aderire il corpo ad involucro almeno parzialmente alla prima porzione a maglia e la seconda porzione a maglia.

15. Metodo secondo la rivendicazione 13 o 14 in cui gli elementi tiranti sono organizzati in modo da formare una pluralità di alloggiamenti affiancati.

16. Metodo secondo una qualsiasi delle rivendicazioni precedenti da 13 a 15, in cui porzioni di corpo ad involucro sono disposte affiancate una a fianco dell'altra.

17. Metodo secondo una qualsiasi delle rivendicazioni precedenti da 13 a 15, il corpo ad involucro viene gonfiato fino a portare in tensione la struttura a maglia e la struttura a maglia (11, 111) imbriglia e blocca una ulteriore espansione del corpo ad involucro.

18. Uso di un dispositivo secondo una qualsiasi delle rivendicazioni da 1 a 12 per proteggere un utilizzatore durante un trasporto o movimento sul veicolo o su detto mezzo di trasporto.

RIASSUNTO

La presente divulgazione riguarda un dispositivo di protezione (10, 110) per la protezione di un utilizzatore. di un veicolo o di un mezzo di trasporto. Il dispositivo di protezione (10) è associato a, o una porzione di, il veicolo o mezzo di trasporto e comprende una struttura a maglia (11, 111) comprendente una prima porzione a maglia (18, 118) ed una seconda porzione a maglia (19, 119) ed una pluralità di tiranti (5). La prima porzione a maglia (18, 118) e la seconda porzione a maglia (19, 119) sono contrapposte e sono collegate tra loro dalla pluralità di elementi tiranti (5); in cui la prima porzione a maglia, la seconda porzione a maglia e gli elementi tiranti definiscono uno o più alloggiamenti interni della struttura a maglia (11, 111). Il dispositivo di protezione (10, 110) include un corpo ad involucro (40, 42, 43) disposto in uno o più di detti alloggiamenti interni. Il corpo ad involucro è configurato per assumere una condizione sgonfiata ed una condizione gonfiata nell'uno o più alloggiamenti interni della struttura a maglia (11, 111).

(Figura 1)

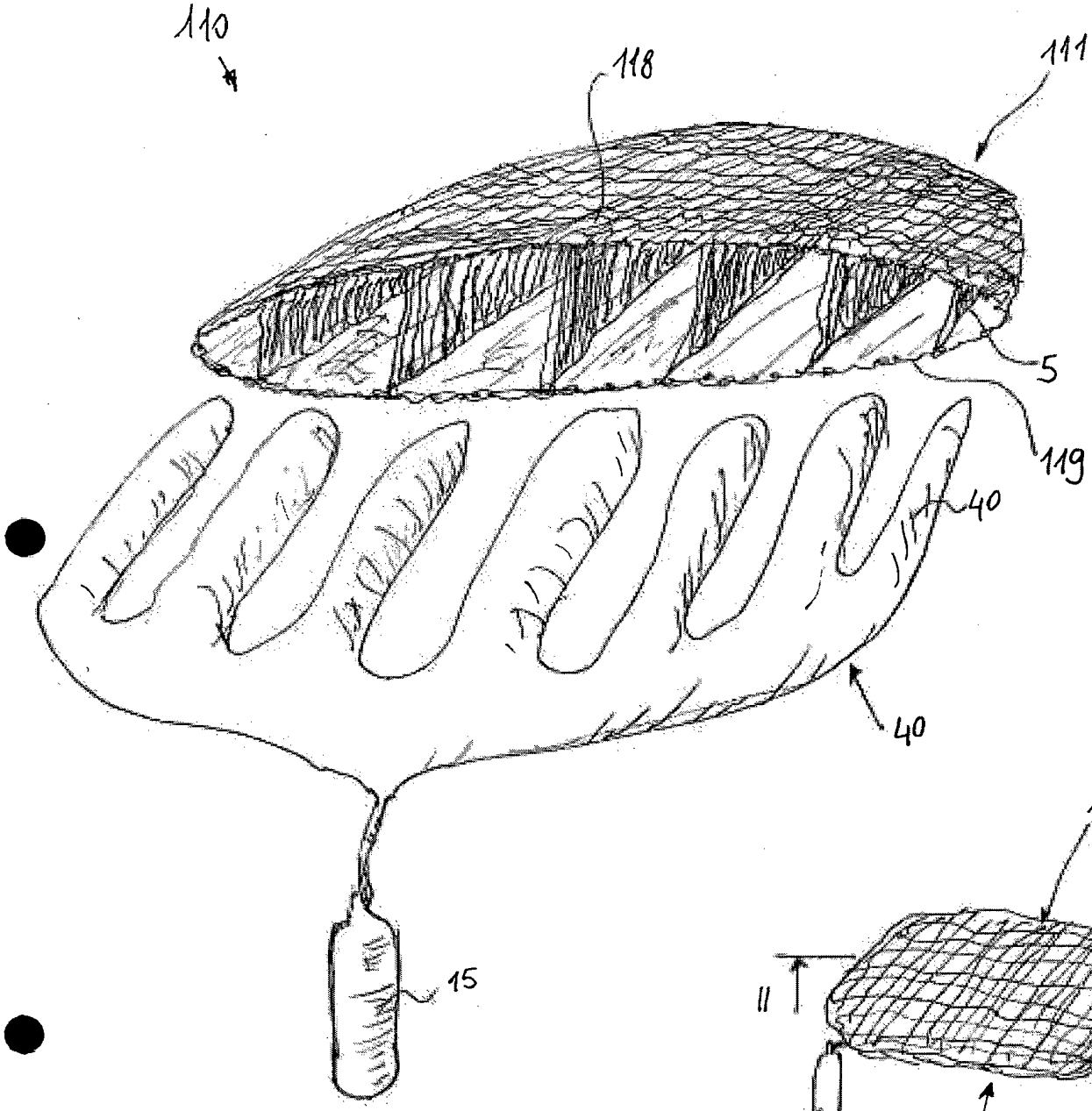


Fig. 1

Fig. 1A

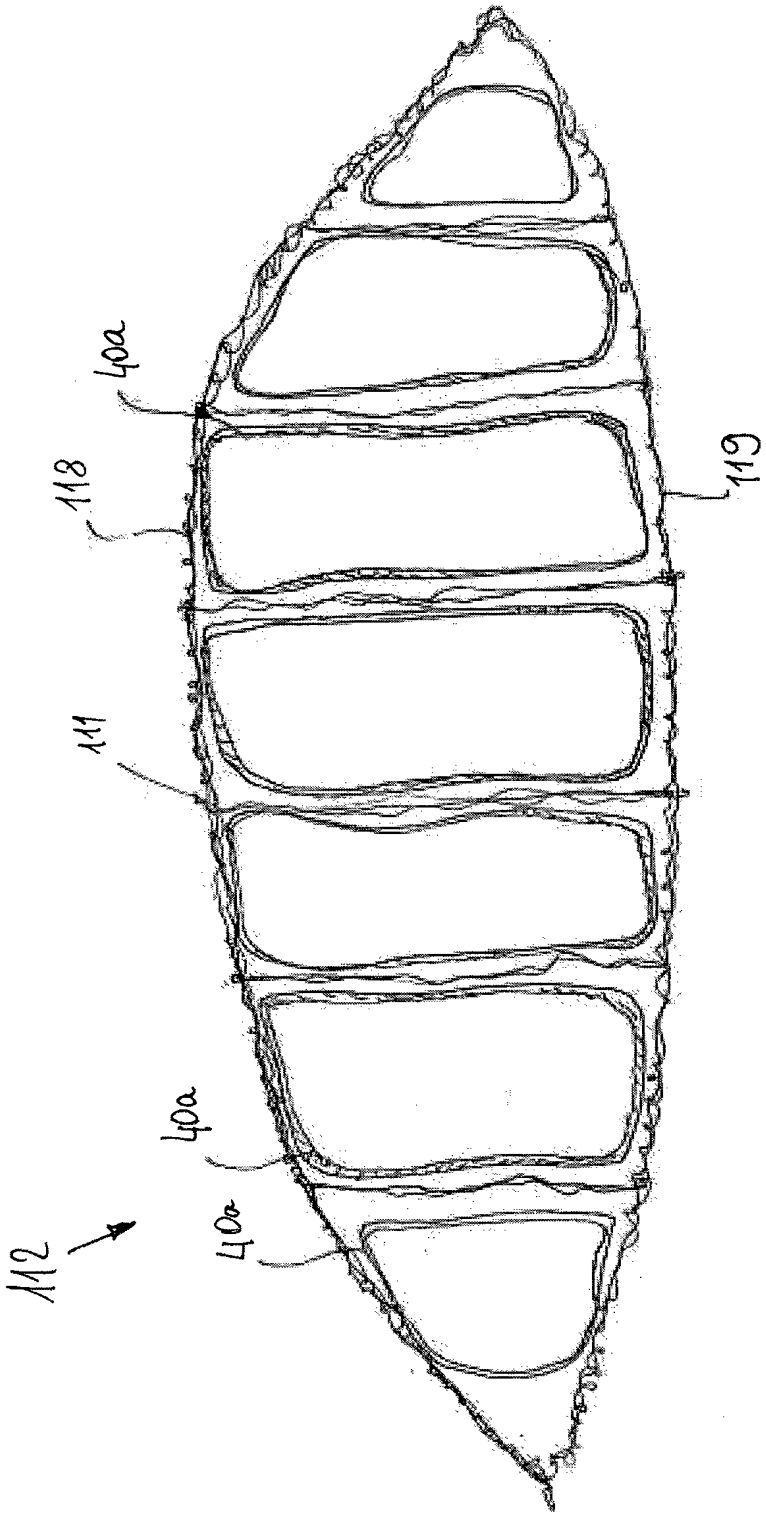


Fig. 2

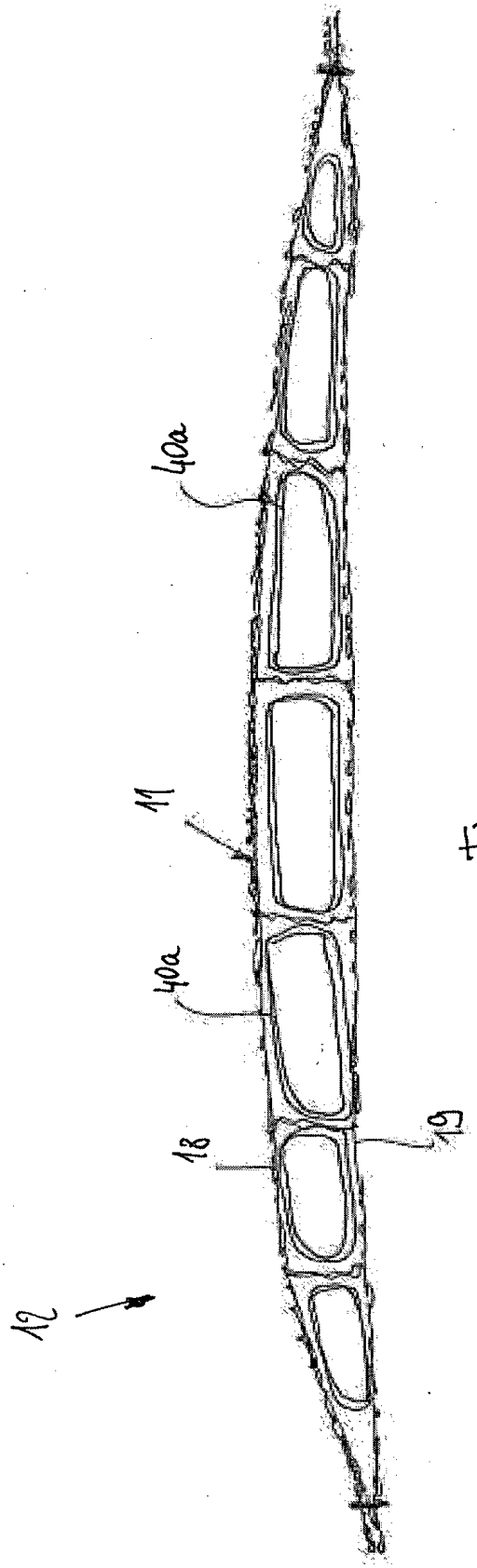


Fig. 3

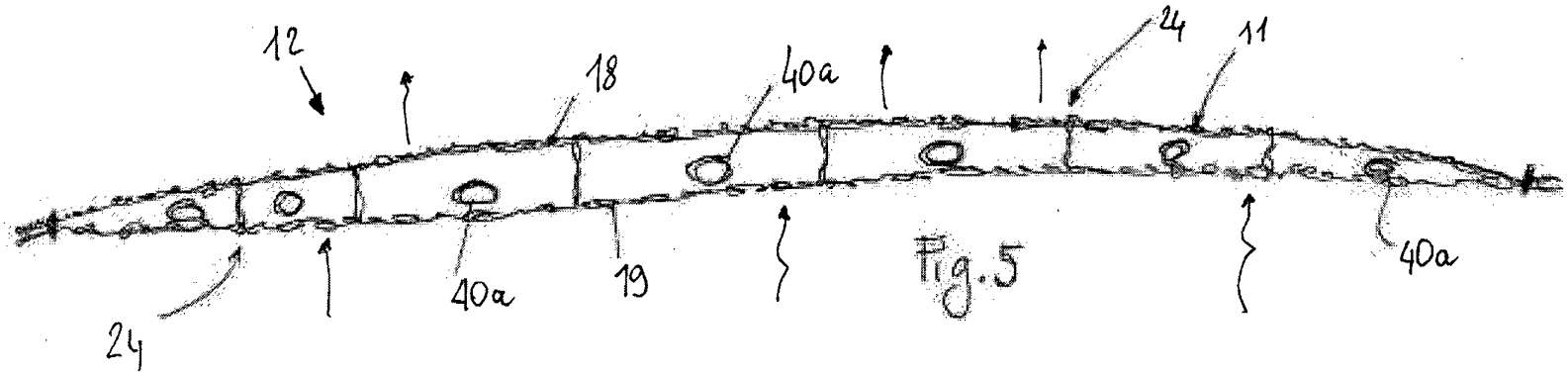


Fig.5

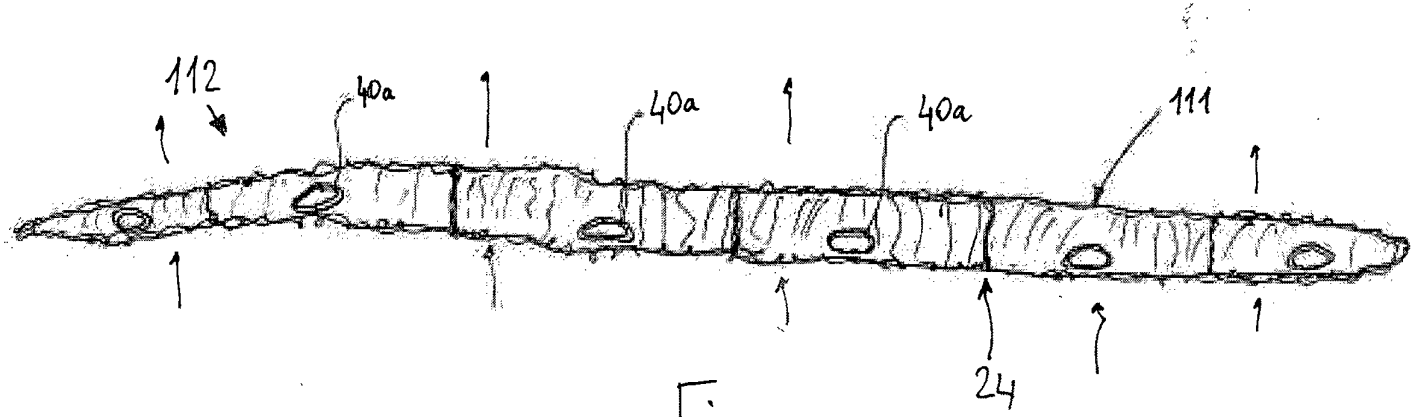


Fig.4

ALPINESTARS
Ex. 1002 - Page 427

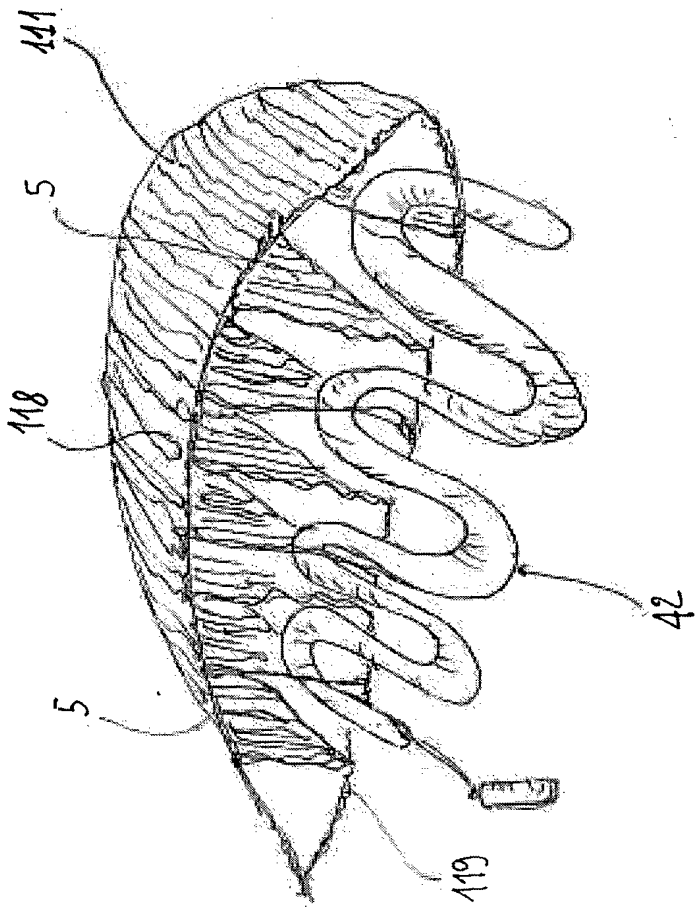


Fig. 6

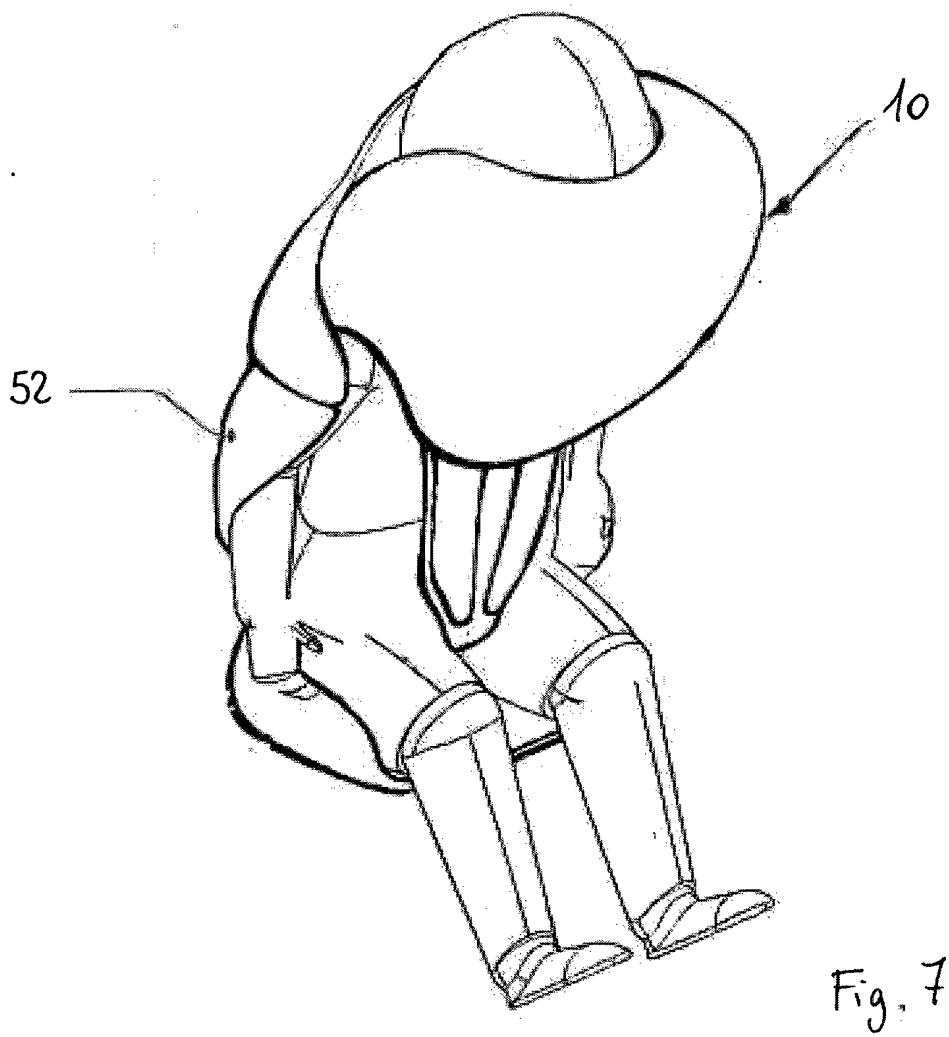


Fig. 7

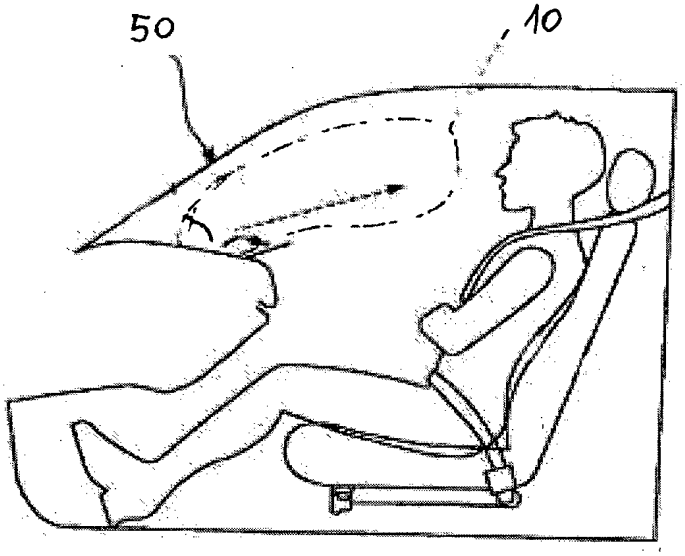


Fig. 7A

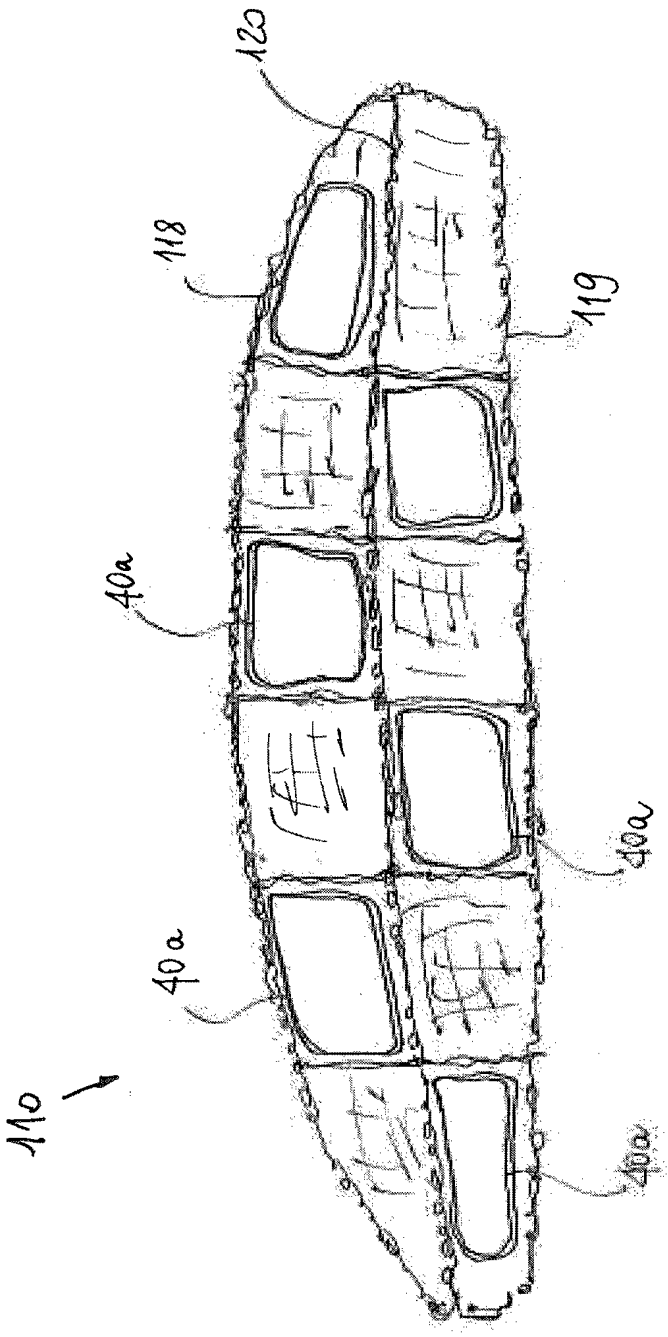


Fig. 8

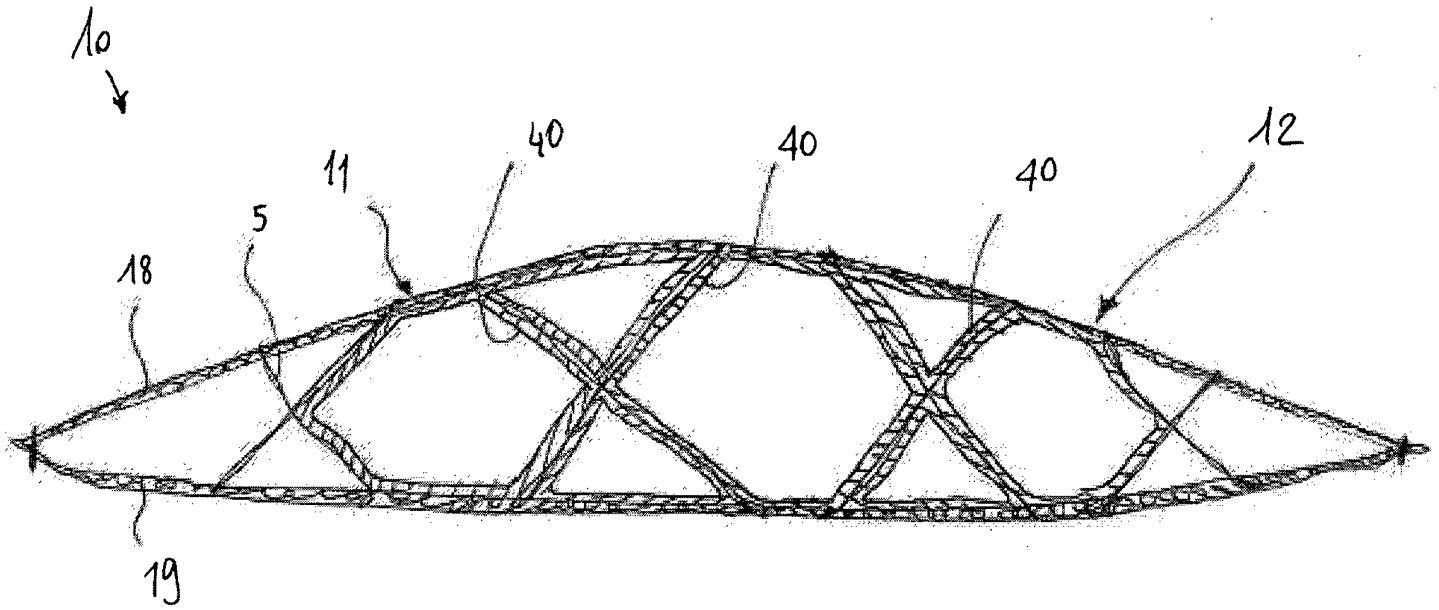


Fig. 9

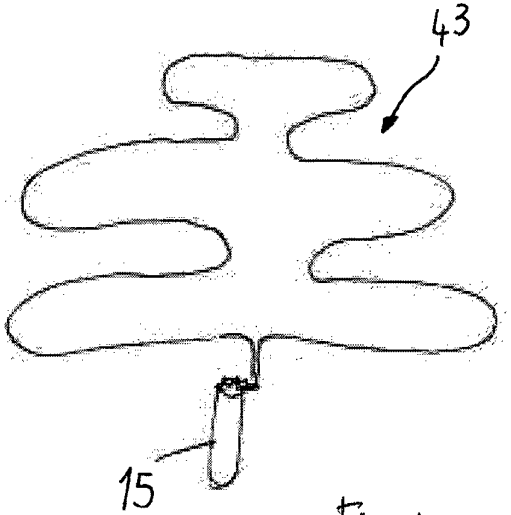


Fig. 10

ALPINESTARS
Ex. 1002 - Page 431

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International application number:		**PCT/IB2020/061689**
International filing date:		**09 December 2020 (09.12.2020)**
Document type:		**Certified copy of priority document**
Document details:	Country/Office:	**IT**
	Number:	**102019000023961**
	Filing date:	**13 December 2019 (13.12.2019)**
Date of receipt at the International Bureau:		**03 March 2021 (03.03.2021)**

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a),(b) or (b-*bis*)

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0	**For receiving Office use only**	
0-1	International Application No.	**PCT/IB2020/061689**
0-2	International Filing Date	**09 December 2020 (09.12.2020)**
0-3	Name of receiving Office and "PCT International Application"	**RO/IB**

0-4	**Form PCT/RO/101 PCT Request**	
0-4-1	Prepared Using	**ePCT-Filing Version 4.7.109 MT/FOP 20201118/1.1**
0-5	**Petition**	
	The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	**Receiving Office (specified by the applicant)**	**International Bureau of the World Intellectual Property Organization (RO/IB)**
0-7	**Applicant's or agent's file reference**	**BW158E**
I	**Title of Invention**	**~~PROTECTION DEVICE AND METHOD FOR MANUFACTURING SUCH PROTECTION DEVICE~~** ▲ PROTECTIVE DEVICE AND METHOD FOR MAKING SAID PROTECTIVE DEVICE ▲
II	**Applicant**	
II-1	This person is	**Applicant only**
II-2	Applicant for	**All designated States**
II-4	Name	**D-AIR LAB S.R.L.**
II-5	Address	**Via dell'Economia 64/C 36100 Vicenza Italy**
II-6	State of nationality	**IT**
II-7	State of residence	**IT**
III-1	**Applicant and/or inventor**	
III-1-1	This person is	**Inventor only**
III-1-3	Inventor for	**All designated States**
III-1-4	Name (LAST, First)	**DAINESE, Lino**
III-1-5	Address	**c/o D-Air Lab S.r.l. Via dell'Economia 64/C 36100 Vicenza Italy**

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IV-1	**Agent or common representative; or address for correspondence**	
	The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	**Agent**
IV-1-1	Name (LAST, First)	**MANFRIN, Marta**
IV-1-2	Address	**c/o SOCIETA' ITALIANA BREVETTI S.p.A. Stradone San Fermo, 21-sc. B 37121 Verona Italy**
IV-1-3	Telephone No.	**0039-45-8014990**
IV-1-4	Facsimile No.	**039-45-8033252**
IV-1-5	e-mail	**verona@sib.it**
IV-1-5(a)	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	**as advance copies followed by paper notifications**
IV-2	**Additional agent(s)**	**additional agent(s) with same address as first named agent**
IV-2-1	Name(s)	**DE BENEDETTI, Fabrizio; DE BENEDETTI, Jacopo; PAPA, Elisabetta; ROMANO, Giuseppe**
IV-3	**Additional agent(s)**	**Agent**
IV-3-1	Name (LAST, First)	**DE GIORGI, Michele**
IV-3-2	Address	**c/o SOCIETA' ITALIANA BREVETTI S.p.A. Stradone San Fermo, 21-sc. B 37121 Verona Italy**
IV-3-3	Telephone No.	**+39-045-8014990**
IV-3-4	Facsimile No.	**+39-045-8033252**
IV-3-5	e-mail	**verona@sib.it**
IV-3-5(a)	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	**as advance copies followed by paper notifications**
IV-3-6	Agent's registration No.	
V	**DESIGNATIONS**	
V-1	**The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.**	

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VI-1	**Priority claim of earlier national application**	
VI-1-1	Filing date	**13 December 2019 (13.12.2019)**
VI-1-2	Number	**102019000023958**
VI-1-3	Country or Member of WTO	**IT**
VI-2	**Priority claim of earlier national application**	
VI-2-1	Filing date	**13 December 2019 (13.12.2019)**
VI-2-2	Number	**102019000023961**
VI-2-3	Country or Member of WTO	**IT**
VI-3	**Priority claim of earlier national application**	
VI-3-1	Filing date	**13 December 2019 (13.12.2019)**
VI-3-2	Number	**102019000023964**
VI-3-3	Country or Member of WTO	**IT**
VI-4	**Incorporation by reference :**	
	where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a), or an element or part of the description, claims or drawings referred to in Rule 20.5bis(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.	
VII-1	**International Searching Authority Chosen**	**European Patent Office (EPO) (ISA/EP)**
VII-2	**Request to use results of earlier search; reference to that search**	
VII-2-1	Filing date	**13 December 2019 (13.12.2019)**
VII-2-2	Application Number	**102019000023958**
VII-2-3	Country (or regional Office)	**IT**
VII-2-5	Documents are available to the ISA in a form and a manner acceptable to it, and therefore do not need to be submitted by the applicant to the receiving Office, or to the ISA (Rules 12bis1.(c) and (d) and 12bis.2(b)):	**A copy of the results of the earlier search** **A copy of any document cited in the earlier search results**

VIII	**Declarations**	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	-	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	3	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	

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VIII-3-1	**Declaration: Entitlement to claim priority** Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	**In relation to this international application** **D-AIR LAB S.R.L.** **is entitled to claim priority of earlier application No. IT 102019000023958 by virtue of the following:**
VIII-3-1 (iv)		**an assignment from LD 72 S.R.L. to D-AIR LAB S.R.L., dated 02 November 2020 (02.11.2020)**

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VIII-3-2	**Declaration: Entitlement to claim priority** Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	**In relation to this international application** **D-AIR LAB S.R.L.** **is entitled to claim priority of earlier application No. IT 102019000023961 by virtue of the following:**
VIII-3-2 (iv)		**an assignment from LD 72 S.R.L. to D-AIR LAB S.R.L., dated 02 November 2020 (02.11.2020)**

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VIII-3-3	**Declaration: Entitlement to claim priority** Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	**In relation to this international application** **D-AIR LAB S.R.L.** **is entitled to claim priority of earlier application No. IT 102019000023964 by virtue of the following:**
VIII-3-3 (iv)		**an assignment from LD 72 S.R.L. to D-AIR LAB S.R.L., dated 02 November 2020 (02.11.2020)**

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IX	Check list	Number of sheets	Electronic file(s) attached
IX-1	Request (including declaration sheets)	**8**	✓
IX-2	Description	**13**	✓
IX-3	Claims	**4**	✓
IX-4	Abstract	**1**	✓
IX-5	Drawings	**7**	✓
IX-6a	Sequence listing part of the description (also to be used for the purposes of international search)	**-**	**-**
IX-7	TOTAL	**33**	
	Accompanying Items	Paper document(s) attached	Electronic file(s) attached
IX-8	Fee calculation sheet	**-**	✓
IX-19	Other	**Assignment**	✓
IX-19	Other	**Documents in pre-conversion format Statement (Section 706): This is a complete and accurate copy of the international application prior to its conversion into the electronic document format in which it is filed.**	✓
IX-20	**Figure of the drawings which should accompany the abstract**	**1**	
IX-21	**Language of filing of the international application**	**Italian**	
X-1	**Signature of applicant, agent or common representative**	**/Marta MANFRIN/**	
X-1-1	Name (LAST, First)	**MANFRIN, Marta**	
X-1-3	Capacity (if such capacity is not obvious from reading the request)	**Agent**	

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10-1	**Date of actual receipt of the purported international application**	**09 December 2020 (09.12.2020)**
10-2	**Drawings:**	
10-2-1	Received	
10-2-2	Not received	
10-3	**Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application**	
10-4	**Date of timely receipt of the required corrections under PCT Article 11(2)**	
10-5	**International Searching Authority**	**ISA/EP**
10-6	**Transmittal of search copy delayed until search fee is paid**	

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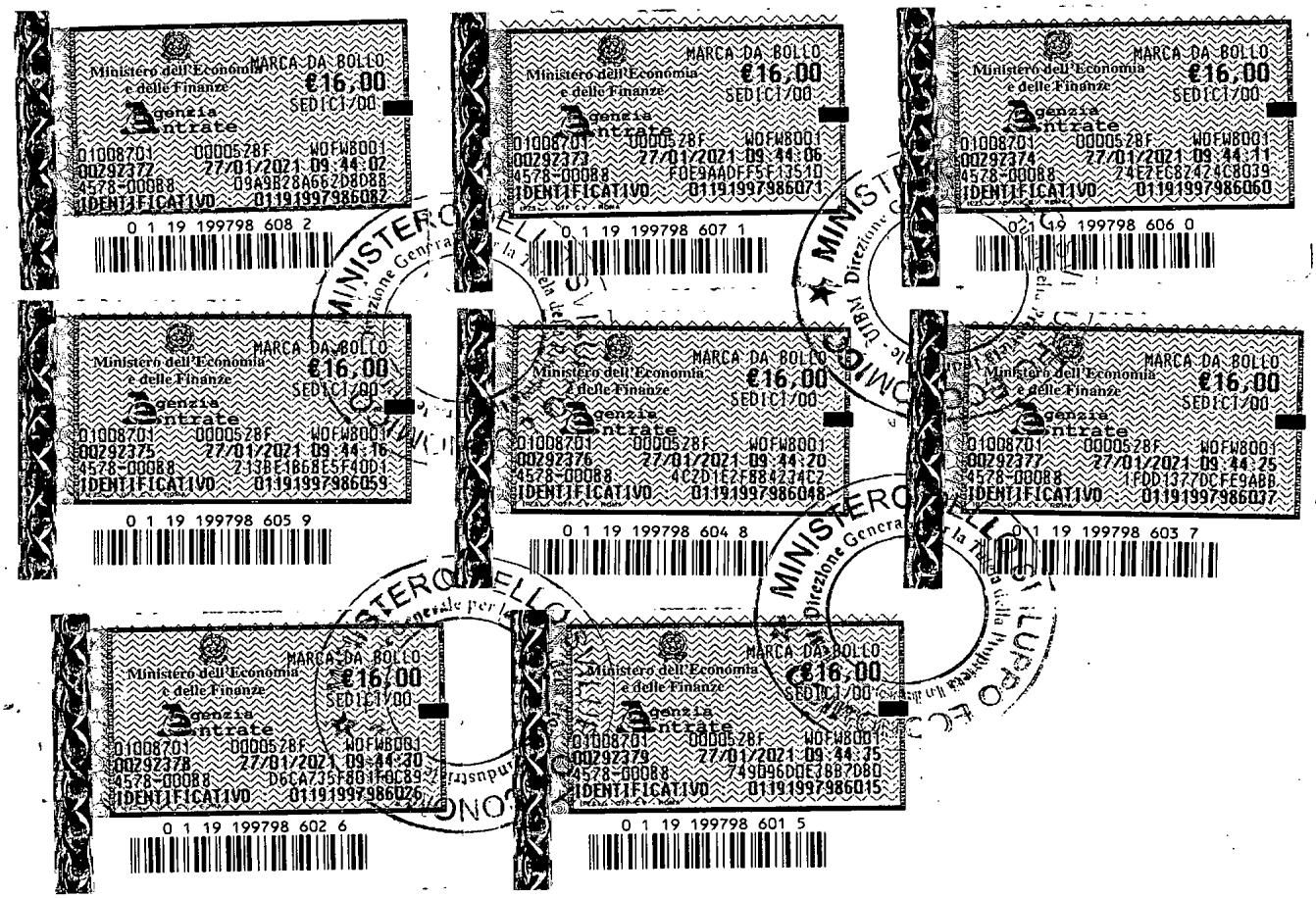
11-1	**Date of receipt of the record copy by the International Bureau**	

DB20/61689

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Direzione Generale Per la tutela della proprietà industriale
Ufficio Italiano Brevetti e Marchi – *Div. V*

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Direzione Generale per la Lotta alla Contraffazione
Ufficio Italiano Brevetti e Marchi

Attestato di deposito

di

Invenzione industriale

Numero di domanda: 102019000023964

Data di deposito: 13/12/2019

Ministero dello Sviluppo Economico

Ricevuta di presentazione

per

Brevetto per invenzione industriale

Domanda numero: 102019000023964

Data di presentazione: 13/12/2019