



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**11.09.2019 Bulletin 2019/37**

(51) Int Cl.:  
**A41H 3/00 (2006.01)**

(21) Application number: **18159909.3**

(22) Date of filing: **05.03.2018**

(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**  
Designated Extension States:  
**BA ME**  
Designated Validation States:  
**KH MA MD TN**

(72) Inventor: **MCFARLANE, James Brown**  
**Edinburgh, EH4 6GZ (GB)**

(74) Representative: **McDonough, Jonathan**  
**Hepworth Browne**  
**7 Wragley House**  
**Valley Road**  
**Hebden Bridge**  
**West Yorkshire HX7 7BN (GB)**

(71) Applicant: **Endura Limited**  
**Livingston**  
**Lothian EH54 8SF (GB)**

(54) **A METHOD OF DESIGNING A GARMENT AND A GARMENT DESIGNED BY SUCH A METHOD**

(57) A method of designing a garment, the garment comprising a plurality of adjacent panels, the method comprising the steps of

- (a) a client providing a template request to a server, the template request identifying the garment;
- (b) the server providing a plurality of two dimensional panel templates to the client, each panel template corresponding to a panel of the garment, each panel template comprising an outer face defined by a template edge;
- (c) the client adding a graphical element to the outer face of at least one of the panel templates and then returning the panel templates to the server;
- (d) the server connecting the panel templates together to form a three dimensional representation of the garment, and
- (e) the server returning the representation of the garment to the client.

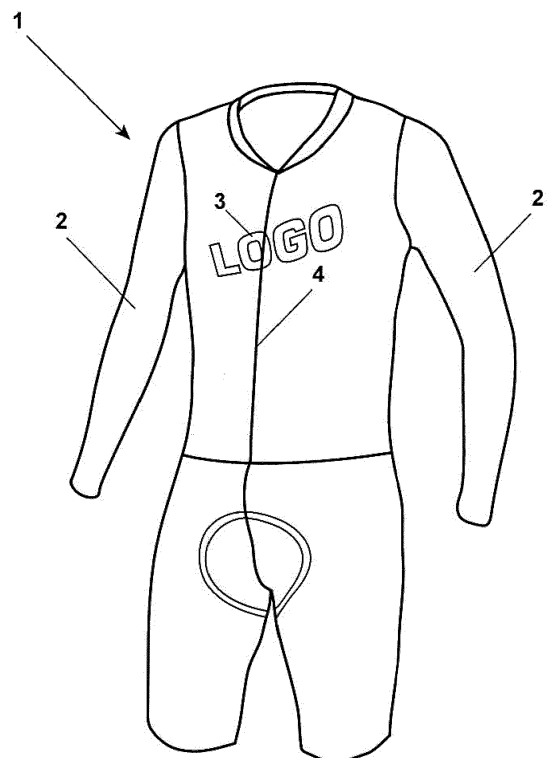


Figure 1

## Description

**[0001]** The present invention relates to a method of designing a garment. More particularly, but not exclusively, the present invention relates to a method of designing a garment, the garment comprising a plurality of adjacent panels, the method comprising the steps of a server providing a plurality of panel templates to a client, each panel template corresponding to a panel of the garment, the client adding a graphical element to at least one of the panel templates and returning the panel templates to the server, the server connecting the pattern templates together to produce a three dimensional representation of the garment and returning the representation to the client for review. In a further aspect the present invention relates to a garment designed by the method.

**[0002]** Garment and footwear manufactures often desire to provide customised garments or articles of footwear to a client's specifications. Manufacturers typically have two approaches to providing this service.

**[0003]** In the first approach the manufacturer provides a catalogue of components to the client, typically via a web interface. The client selects components from the catalogue which together make up the garment or article of footwear. Such an approach is convenient for the manufacturer but has at least two drawbacks. Firstly, the amount of customisation a client can create is relatively limited. The client can only choose from pre-defined components in the catalogue. Secondly, the client cannot apply their own graphical element to the footwear or garment. Again, the client can only select from pre-defined graphical elements on the components in the catalogue.

**[0004]** In an alternative approach, particularly in the field of garment manufacture, the garment manufacturer provides a web interface that allows a client to apply graphical elements such as logos, images or patterns onto a 3D visual representation of the garment to create an overall visual impression of what a client wishes to communicate as their design. This is a very useful tool to communicate graphical concepts and give a general sense of how the garment should look when manufactured. However, because the graphical elements have been applied to the 3D representation they are not received by the garment company in an accurate 2D form that allows the files to be used directly for printing the panels of fabric that the garment is comprised of. Additionally, graphical elements that are positioned to continuously pass across seams from one panel to another are not adjusted to make allowances for angles and seam allowances that are necessary for manufacture.

**[0005]** As such, the manufacturer often has to spend time adjusting the graphical elements on the garment panels so that the graphical elements on the final garment run continuously from one panel to the next. This can be time consuming and expensive for the manufacturer. Further, adjusting the graphical elements on two dimensional panels so that they run smoothly from one panel to the

next in the three dimensional final garment is a skilled operation. Even a skilled manufacturer may have difficulty achieving this at the first attempt. This further increases the cost of manufacture.

**[0006]** Accordingly, in a first aspect, the present invention provides a method of designing a garment, the garment comprising a plurality of adjacent panels, the method comprising the steps of

(a) a client providing a template request to a server, the template request identifying the garment;

(b) the server providing a plurality of two dimensional panel templates to the client, each panel template corresponding to a panel of the garment, each panel template comprising an outer face defined by a template edge;

(c) the client adding a graphical element to the outer face of at least one of the panel templates and then returning the panel templates to the server;

(d) the server connecting the panel templates together to form a three dimensional representation of the garment, and

(e) the server returning the representation of the garment to the client.

**[0007]** The method according to the invention enables a client to add graphical elements to panel templates and then view an accurate representation of the final garment constructed from the panel templates. If the graphical elements are not positioned correctly on the outer surface of the garment, for example the graphical elements do not run continuously from one panel to the next, the client can adjust the graphical elements on the panel templates until he or she is happy with the appearance of the garment. The manufacturer can then manufacture the panels from the panel templates and connect them together to produce the final garment. The manufacturer does not need to adjust the graphical elements on the panel templates so reducing the cost of manufacture of the garment.

**[0008]** Preferably the method further comprises the step of the client reviewing the representation of the garment, amending the graphical element on at least one of the panel templates and resubmitting the panel templates to the server, the server reconnecting the panel templates together and returning a new representation of the garment to the client.

**[0009]** Preferably the method further comprises the step of manufacturing a garment from the panel templates.

**[0010]** Preferably the template request identifies the garment by garment model.

**[0011]** Additionally or alternatively the template request identifies the garment by garment size.

**[0012]** Preferably each panel template comprises a guide line on its outer face spaced apart from the template edge, the guide line surrounding a graphics area, the client adding the graphical element to the graphics area.

**[0013]** Preferably the guide line is substantially parallel to the template edge.

**[0014]** Preferably the server connects the panel templates together such that the guide lines of adjacent panel templates abut.

**[0015]** Preferably for at least two adjacent panel templates the client adds graphical elements to the panel templates which extend at least as far as the guide line so that when the panel templates are connected together the graphical elements extend continuously from one panel to the next on the representation of the garment.

**[0016]** Preferably the panels together make up the entirety of the surface of the garment.

**[0017]** Alternatively the panels together make up a portion of the surface of the garment.

**[0018]** Preferably the garment is a garment for cycling, preferably a body suit, cycle jersey or cycle shorts

**[0019]** Alternatively the garment is a garment for other sports or a general fashion garment.

**[0020]** Preferably each panel template comprises a cut line on its outer face, the cut line being arranged between the guide line and template edge and surrounding the graphics area.

**[0021]** In a further aspect of the invention there is provided a garment designed by the method of any one of claims 1 to 13.

**[0022]** The present invention will now be described by way of example only and not in any limitative sense with reference to the accompanying drawings in which

Figure 1 shows a garment comprising a plurality of adjacent garment panels;

Figure 2 shows the first steps of a method according to the invention;

Figure 3 shows a panel template in plan view; and,

Figure 4 shows further steps of a method according to the invention

**[0023]** Shown in figure 1 in perspective view is a garment 1 which comprises a plurality of adjacent garment panels 2. Two panels 2 are adjacent if they share a common edge. The garment 1 is a body suit for cycling and together the garment panels 2 make up the entirety of the outer surface of the garment 1.

**[0024]** As can be seen, the garment 1 has a graphical element 3 on its outer surface which extends across two of the garment panels 2. In this case the graphical element 3 is a logo. Other common graphical elements are repeating patterns and also non-repeating patterns such as images. The logo 3 extends continuously from one panel 2 to the next. If the seam 4 between two adjacent

panels 2 did not run through the logo 3 it would appear that the logo 3 was one continuous logo.

**[0025]** Methods of producing such garments 1 are known. In one such method the garment manufacturer provides a web interface which displays the 3D representation of the garment 1. A customer can add graphical elements 3 to the representation of the garment 1 as desired. The 'marked up' representation of the garment 1 is then returned to the manufacturer. As has been explained above, the garment manufacturer cannot use this marked up representation of the garment 1 to directly manufacture the garment 1. Instead, the garment manufacturer must prepare two dimensional panels 2 having graphical elements 3 thereon. These panels 2, when joined together, produce a three dimensional garment 1 which appears the same as the marked up representation of the garment 1 provided by the customer.

**[0026]** This is a skilled process. One must allow for the distortion of the graphical element 3 as each panel 2 is deformed from two dimensions to three dimensions to make up the garment 1. Further, in a real garment, panels 2 are not connected edge to edge. Instead, a small portion around the edge of each panel 2 is used to form a seam 4 with an adjacent panel 2. If the graphical element 3 is added to this portion then it is lost into the seam 4 so resulting in a discontinuity in the graphical elements 3 on the outer face of the garment 1 as one passes from one panel 2 to the next.

**[0027]** Shown in figure 2 in schematic form are the first steps of an embodiment of a method according to the invention. The client typically visits a web interface 5 provided by the garment manufacturer. The web interface 5 lists garments 1 along with a list of available sizes for each garment 1. The client selects a garment model and size for that garment model, The client then sends a template request 6 via the web interface 5 to a server 7 of the garment manufacturer. The template request 6 includes information relating to the garment model and size.

**[0028]** On receiving this request 6 the server 7 returns a plurality of panel templates 8 to the client corresponding to the chosen model and size of garment 1. Each panel template 8 corresponds to a panel 2 of the chosen garment 1. The panel templates 8 are typically provided as electronic CAD files such as an SVG file, an adobe Illustrator ® file, Adobe Photoshop ® Ofite or similar and are two dimensional representations of the panels 2.

**[0029]** A typical example of a panel template 8 is shown in figure 3. The panel template 8 comprises an outer face 9 which is defined by a template edge 10. Arranged on the outer face 9 is a guide line 11 which is spaced apart from the template edge 10 and substantially parallel thereto. Additionally, between the guide line 11 and template edge 10 there is a cut line 12 which represents the shape of the cut panel of fabric that will be used for the garment panel 2 corresponding to the panel template 8 and which is also substantially parallel to the template edge 10. The portion of the panel template 8 between

the guide line 11 and the cut line 12 represents the portion of the panel 2 which is lost to the seam 4 when the garment 2 is manufactured. The guide line 11 provides a visual indication to the client as to the area on the panel template 8 outside of which any provided graphical elements 3 will be lost. The area inside the guide line 11 is the graphics area 13. Any graphical element 3 provided on the graphics area 13 will be visible in the final garment 1. The area between the cut line 12 and the template edge 10 is used to help position the garment panels 2 accurately during the manufacturing process and is generally referred to as the 'bleed allowance'.

**[0030]** In a next step the client adds graphical elements 3 to the outer faces 9 of the panel templates 8 as required. The amended panel templates 8 are then returned to the server 7 as shown in figure 4. When the server 7 receives the panel templates 8 it connects the panel templates 8 together to produce an accurate three dimensional representation 14 of the garment 1. When connecting the panel templates 8 together the server 7 arranges the panel templates 8 such that the guide line 11 of each panel template 8 abuts the guide lines 11 of its adjacent one or more panel templates 8 so hiding the portion of the panel templates 8 outside the guide lines 11 from view. If the graphical element 3 on one panel template 8 extends to the guide line 11 and the graphical element 3 on the adjacent panel template 8 also extends to its guide line 11 then in the representation 14 of the garment 1 the graphical elements 3 will appear to extend continuously from the first panel template 8 to the second panel template 8 across the join between the two panel templates 8.

**[0031]** The three dimensional representation 14 of the garment 1 is then returned to the client for review. The client is able to rotate the three dimensional representation 14 of the garment 1 so it can be viewed from any angle. The client can also zoom in and out of the three dimensional representation 14 so that the graphical elements 3 and the join between adjacent panel templates 8 can be inspected in detail.

**[0032]** If the client is not satisfied with the appearance of the three dimensional representation 14 of the garment 1 then the client can amend the graphical elements 3 on the panel templates 8 as required and return them to the server 7. The server 7 again connects the panel templates 8 together and returns a three dimensional representation 14 to the client for review. This process is repeated until the client is happy with the three dimensional representation 14 of the garment 1.

**[0033]** Once the client is happy with the three dimensional representation 14 of the garment 1 the client confirms acceptance to the server 7. The garment manufacturer then takes the panel templates 8 and manufactures panels 2 from these templates 8, the graphical elements 3 on the panels 2 being identical to those on the panel templates 8. The manufacturer then connects the panels 2 together in the same way as the panel templates 8 were electronically connected together by the server 7, employing the portion of the panels 2 which correspond to

the portions of the panel templates 8 between the guide lines 11 and the cut lines 12 to make the seams 4. The resulting garment 1 therefore appears identical to the three dimensional representation 14 of the garment 1 provided to the client.

**[0034]** The method according to the invention has the advantage that the garment manufacturer does not need to amend the graphical elements 3 on the panel templates 8 in any way before manufacturing the panels 2. This considerably reduces the cost of manufacturing the garment 1. This means that small quantities and even individual garments 1 with unique designs are able to be offered at accessible cost. From the point of view of the client the method according to the invention has the advantage that the client can view a completely accurate 3D representation 14 of the garment 1 before ordering the garment 1. In known methods the client provides only an approximate representation of the garment to the manufacturer and must rely on the skill of the manufacturer to alter the graphical elements 3 on the panels 2 appropriately when manufacturing the panels 2 that make up the garment 1.

**[0035]** A further advantage of the invention is that the accurate 3D representation of the garment 1 returned by the server 7 to the client can be shared electronically via the Internet if desired using social media or other methods prior to or after manufacture of the physical garment.

**[0036]** In the above embodiment the adjacent panels 2 comprise the entirety of the outer surface of the garment 1. In an alternative embodiment the adjacent panels 2 comprise a portion of the outer surface of the garment 1.

**[0037]** In an alternative embodiment of the invention the client is able to provide a pattern on all of the outer face of each of the panel templates. Once the client has confirmed acceptance of the three dimensional representation of the garment the server adds an area around each of the panel templates (corresponding to the area between the guide line and the cut line in the above embodiment) which is used to connect the panels together.

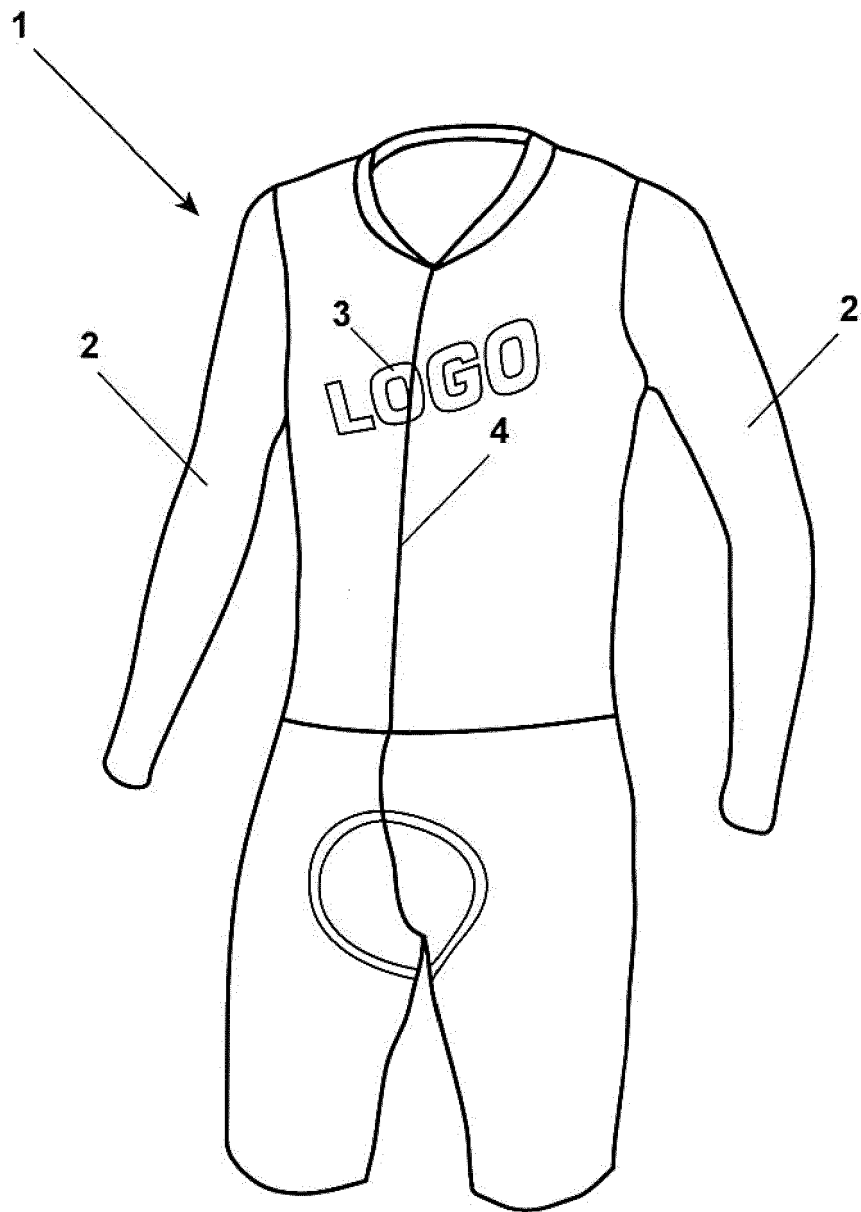
**[0038]** In an alternative embodiment of the invention the three dimensional representation 14 of the garment 1 returned by the server 7 to the client comprises a series of images of the three dimensional representation 14 of the garment 1 from different angles. This is useful for clients who do not have suitable software for manipulation of three dimensional models.

**[0039]** The invention has been described with reference to a body suit for cycling but is not so limited. The invention is applicable for any garment comprising a plurality of adjacent panels. In the field of cycling these could for example be cycling shorts or cycling shirts.

## Claims

1. A method of designing a garment, the garment comprising a plurality of adjacent panels, the method comprising the steps of

- (a) a client providing a template request to a server, the template request identifying the garment;
- (b) the server providing a plurality of two dimensional panel templates to the client, each panel template corresponding to a panel of the garment, each panel template comprising an outer face defined by a template edge;
- (c) the client adding a graphical element to the outer face of at least one of the panel templates and then returning the panel templates to the server;
- (d) the server connecting the panel templates together to form a three dimensional representation of the garment, and
- (e) the server returning the representation of the garment to the client.
2. A method as claimed in claim 1, further comprising the step of the client reviewing the representation of the garment, amending the graphical element on at least one of the panel templates and resubmitting the panel templates to the server, the server reconnecting the panel templates together and returning a new representation of the garment to the client.
3. A method as claimed in either of claims 1 or 2, further comprising the step of manufacturing a garment from the panel templates.
4. A method as claimed in any one of claims 1 to 3, wherein the template request identifies the garment by garment model.
5. A method as claimed in any one of claims 1 to 4, wherein the template request identifies the garment by garment size.
6. A method as claimed in any one of claims 1 to 5, wherein each panel template comprises a guide line on its outer face spaced apart from the template edge, the guide line surrounding a graphics area, the client adding the graphical element to the graphics area.
7. A method as claimed in claim 6, wherein the guide line is substantially parallel to the template edge.
8. A method as claimed in either of claims 6 or 7, wherein the server connects the panel templates together such that the guide lines of adjacent panel templates abut.
9. A method as claimed in claim 8, wherein for at least two adjacent panel templates the client adds graphical elements to the panel templates which extend at least as far as the guide line so that when the panel templates are connected together the graphical elements extend continuously from one panel to the next on the representation of the garment.
10. A method as claimed in any one of claims 1 to 9, wherein the panels together make up the entirety of the surface of the garment.
11. A method as claimed in any one of claims 1 to 9, wherein the panels together make up a portion of the surface of the garment.
12. A method as claimed in any one of claims 1 to 11, wherein the garment is a garment for cycling, preferably a body suit, cycle jersey or cycle shorts
13. A method as claimed in any one of claims 6 to 12, wherein each panel template comprises a cut line on its outer face, the cut line being arranged between the guide line and template edge and surrounding the graphics area.
14. A garment designed by the method of any one of claims 1 to 13.



*Figure 1*

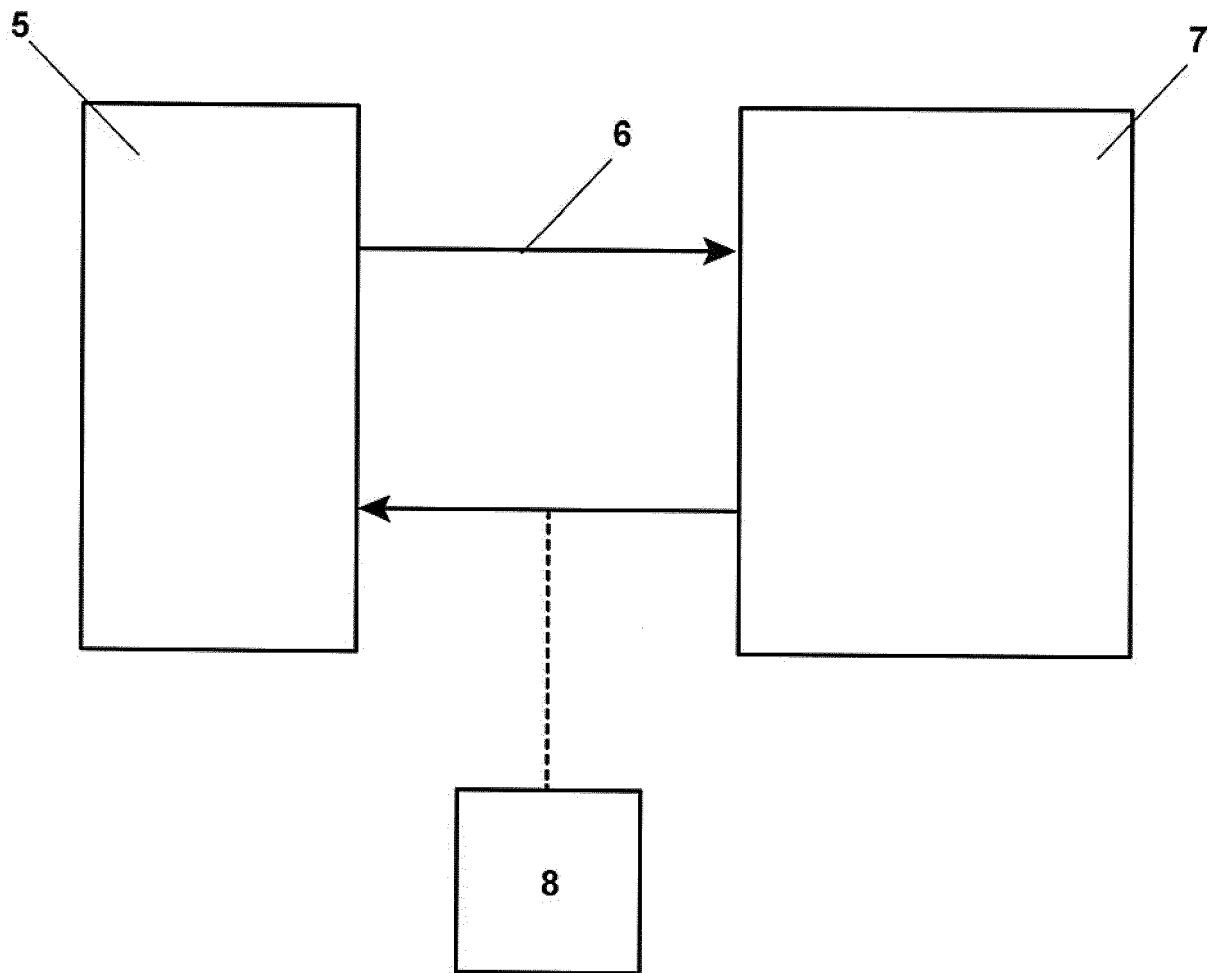
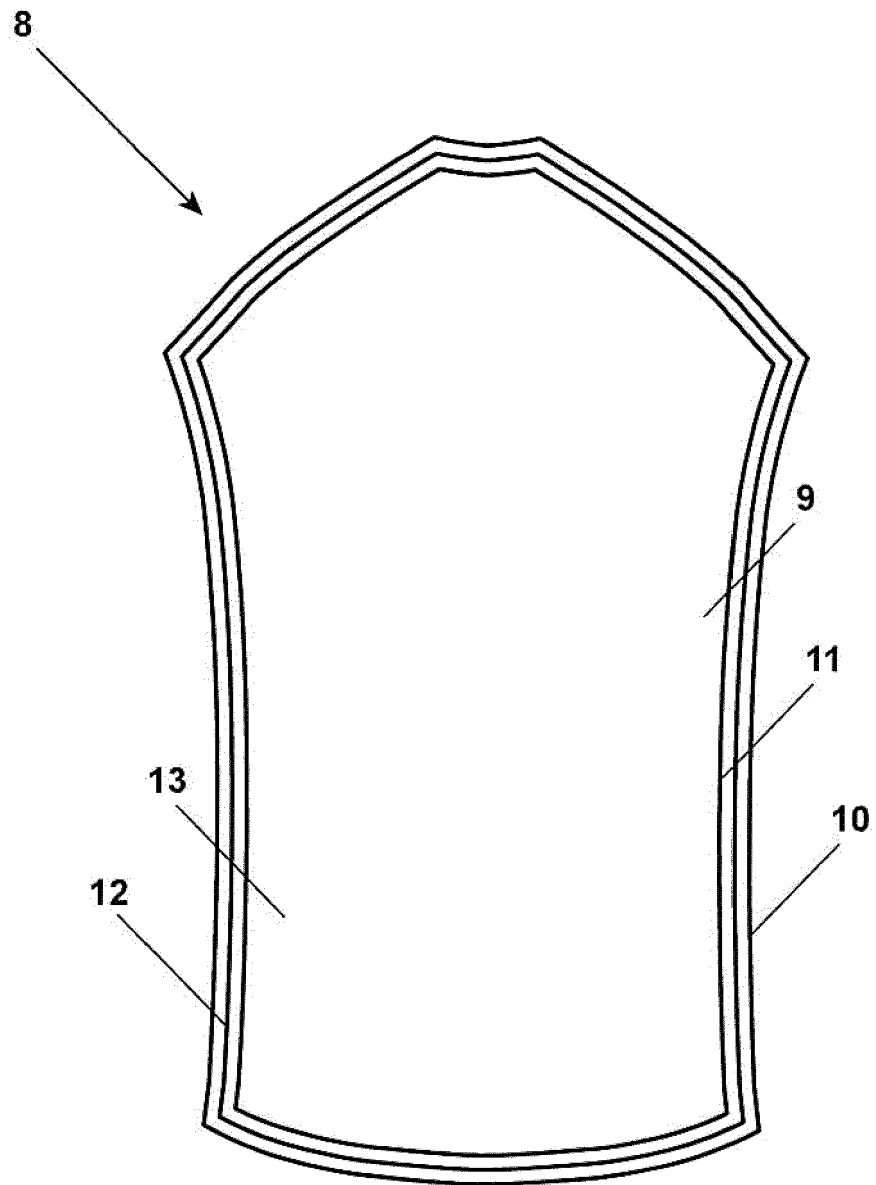
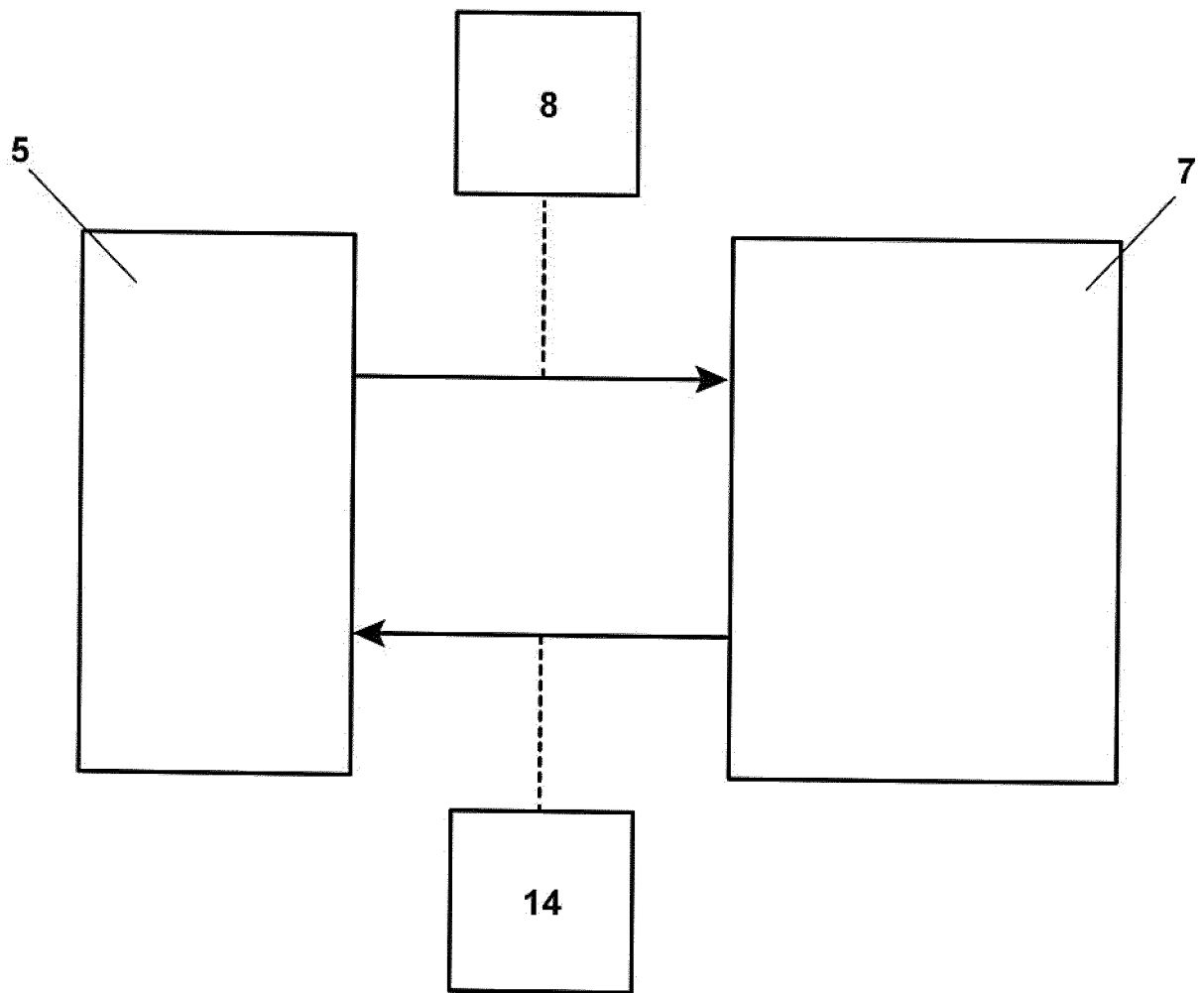


Figure 2



*Figure 3*





*Figure 4*



## EUROPEAN SEARCH REPORT

Application Number  
EP 18 15 9909

5

10

15

20

25

30

35

40

45

50

55

1

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 8 731 703 B1 (LEHRER MATTHEW [US] ET AL) 20 May 2014 (2014-05-20) * column 4, line 32 - line 45; figure 30 * -----	1-14	INV. A41H3/00
X	US 2005/177453 A1 (ANTON JOHN T [US] ET AL) 11 August 2005 (2005-08-11) * figure 3 * -----	14	
E	GB 2 556 333 A (ENDURA LTD [GB]) 30 May 2018 (2018-05-30) * the whole document * -----	1-14	
			TECHNICAL FIELDS SEARCHED (IPC)
			A41H A41D
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>6 August 2018</b>	Examiner <b>van Voorst, Frank</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 15 9909

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-08-2018

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 8731703	B1	20-05-2014	NONE
US 2005177453	A1	11-08-2005	NONE
GB 2556333	A	30-05-2018	NONE

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82