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(54) Laminar structure providing adaptive thermal insulation

(57) The invention relates to a laminar structure (10) providing adaptive thermal insulation, comprising a first layer (22), a second layer (24), at least one cavity (16) provided in between the first layer (22) and the second layer (24), a gas generating agent (18) having an unactivated configuration and an activated configuration, the gas generating agent (18) being adapted to change from the unactivated configuration to the activated configuration, such as to increase a gas pressure inside the cavity (16), in response to an increase in temperature in the cavity (16), the first layer (22), the second layer (24) and the cavity (16) being arranged such that a distance (D) between the first layer (22) and the second layer (24) increases in response to the increase in gas pressure inside the cavity (16), the laminar structure (10) being configured to reversibly change, in response to an increase in temperature, the distance (D) between the first layer (22) and the second layer (24), from a first distance (D0) in the unactivated configuration of the gas generating agent (18) to a second distance (D1) in the activated configuration of the gas generating agent (18), and/or, in response to a decrease in temperature, from the second distance (D1) in the activated configuration of the gas generating agent (18) to the first distance (D0) in the unactivated configuration of the gas generating agent (18).

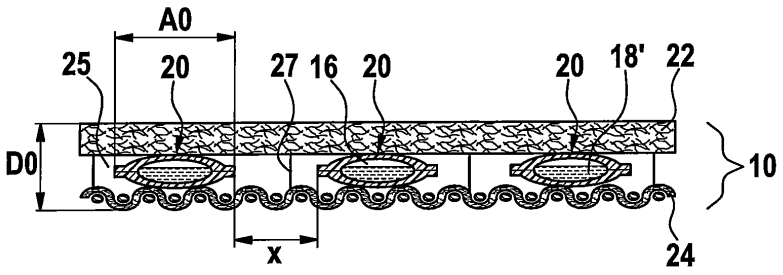

Fig. 6a

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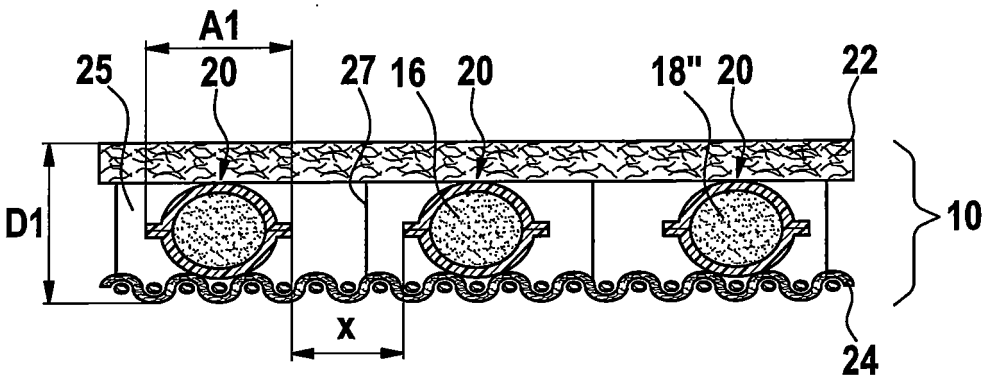

Fig. 6b

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EUROPEAN SEARCH REPORT

Application Number
EP 12 15 2886

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 Y	EP 1 579 830 A1 (M. KRAISS) 28 September 2005 (2005-09-28) * paragraphs [0013], [0015], [0016] *	1-14 15	INV. A41D31/00 A62B17/00
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A,D	WO 2009/025892 A2 (HIGHER DIMENSION MATERIALS INC.) 26 February 2009 (2009-02-26) * paragraphs [0011], [0018], [0020], [0023], [0030] - [0033] *	1,7,11, 15	
A	US 2005/050619 A1 (C. DUNN) 10 March 2005 (2005-03-10) * paragraphs [0014] - [0020] *	1,15	

TECHNICAL FIELDS SEARCHED (IPC)

A41D
A61F
A62B
B32B
F16L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 September 2012	Goodall, Colin

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

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 12 15 2886

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-13, 15

Laminar structure providing adaptive thermal insulation and a fabric comprising the laminar structure

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2. claim: 14

Envelope enclosing at least one cavity

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 15 2886

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
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04-09-2012

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