



(51) International Patent Classification:

D06M 10/06 (2006.01) *D06M 11/83* (2006.01)
A41D 31/06 (2019.01) *B32B 15/14* (2006.01)

(21) International Application Number:

PCT/US2019/059672

(22) International Filing Date:

04 November 2019 (04.11.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/755,116 02 November 2018 (02.11.2018) US

(71) Applicant: **THE NORTH FACE APPAREL CORP.**
[US/US]; 200 Hanby Building, 3411 Silverside Road,
Wilmington, Delaware 19810 (US).

(72) Inventors: **LAU, Cindy Y.**; 200 Hanby Building, 3411
Silverside Road, Wilmington, Delaware 19810 (US). **LY,
John**; 200 Hanby Building, 3411 Silverside Road, Wilm-
ington, Delaware 19810 (US). **MAYER, Kirk Michael**;
200 Hanby Building, 3411 Silverside Road, Wilmington,
Delaware 19810 (US). **AGHANOURI, Abolfazl**; 200 Han-
by Building, 3411 Silverside Road, Wilmington, Delaware
19810 (US).

(74) Agent: **RIESEN, Michael J.**; Smith, Gambrell & Russell,
LLP, Promenade, Suite 3100, 1230 Peachtree Street, N.E.,
Atlanta, Georgia 30309-3592 (US).

(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, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
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.

(84) Designated States (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

(54) Title: METALLIZED FABRIC THAT ENHANCES THERMAL INSULATION

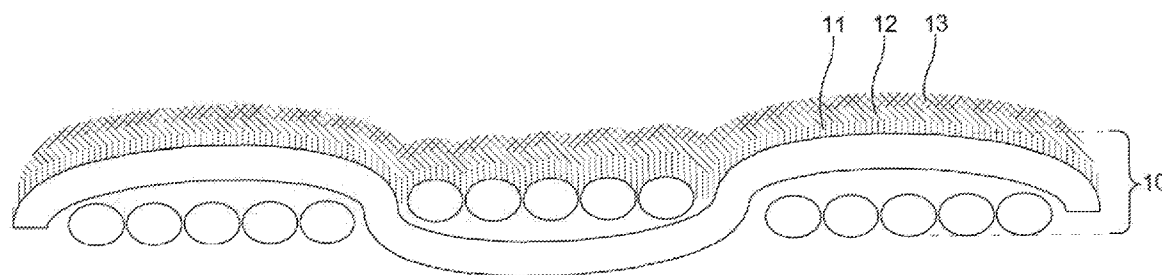


FIG. 1

(57) Abstract: Disclosed is a textile comprising a woven fabric and a layer of a low emissivity material disposed on the woven fabric, wherein the layer of low emissivity material is vapor deposited. The woven fabric has a yarn size of no greater than 30D and a weight no greater than 55 gsm. At least one coating layer vapor may be deposited adjacent the low emissivity layer. The woven fabric may comprise one or more of a nylon or a polyester. The textile may exhibit an increase in insulation ability of at least 10% compared to a substantially similar woven fabric in the absence of the low emissivity layer when tested together with a fibrous sheet insulation and another untreated woven fabric in accordance with ASTM-F1868 Part A.



Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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))*

(88) Date of publication of the international search report:

23 July 2020 (23.07.2020)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/059672

A. CLASSIFICATION OF SUBJECT MATTER

INV. D06M10/06 A41D31/06 D06M11/83 B32B15/14
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)

D06M A44C A41D B32B

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)

EP0-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	JP 2010 037681 A (TOYOCO SPECIALTIES TRADING CO) 18 February 2010 (2010-02-18) paragraphs [0015] - [0018], [0036]; figures 1-5; examples 1-4 -----	1-15
X	US 2014/356574 A1 (CONOLLY BRIAN JOHN [AU] ET AL) 4 December 2014 (2014-12-04) paragraph [0049]; claims 19, 31, 36, 55; figures -----	1-15
A	WO 2013/025827 A1 (DU PONT [US]; REBOUILLAT SERGE [FR] ET AL.) 21 February 2013 (2013-02-21) the whole document -----	1-15
X,P	US 2019/017785 A1 (MORAG ELAD [IL] ET AL) 17 January 2019 (2019-01-17) paragraph [0071] -----	1



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

27 March 2020

Date of mailing of the international search report

30/06/2020

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Barathe, Rainier

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/059672

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-15

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2019/059672

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2010037681 A	18-02-2010	JP 5285993 B2 JP 2010037681 A	11-09-2013 18-02-2010
US 2014356574 A1	04-12-2014	GB 2517042 A GB 2529938 A US 2014356574 A1 US 2019099984 A1	11-02-2015 09-03-2016 04-12-2014 04-04-2019
WO 2013025827 A1	21-02-2013	CN 104159734 A EP 2744649 A1 JP 6140159 B2 JP 2014529519 A US 2015053086 A1 US 2017266609 A1 WO 2013025827 A1	19-11-2014 25-06-2014 31-05-2017 13-11-2014 26-02-2015 21-09-2017 21-02-2013
US 2019017785 A1	17-01-2019	NONE	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-15

A textile comprising:

- a woven fabric comprising one or more of a nylon or a polyester, wherein the woven fabric has a yarn size of no greater than 30D and a weight no greater than 55 gsm;
 - a layer of a low emissivity material disposed on the woven fabric, wherein the layer of low emissivity material is vapor deposited; and
 - at least one coating layer vapor deposited adjacent the low emissivity layer,
- wherein the textile exhibits an increase in insulation ability of at least 10% compared to a substantially similar woven fabric in the absence of the low emissivity layer when tested together with a fibrous sheet insulation and another untreated woven fabric in accordance with ASTM-F1868 Part A.

2. claims: 16, 17

A composite fabric comprising:

- a first fabric layer, wherein the first fabric layer comprises a woven fabric or a knit fabric, and wherein the first fabric layer has an air permeability of from about 30 cubic feet per minute (CFM) to about 100 CFM when tested in accordance with ASTM D737;
- a plurality of insulating baffle structures disposed adjacent the first fabric layer, each of the plurality of insulating baffle structures comprising a fabric shell defining a cavity and an insulating material located within the cavity, wherein the fabric shell is downproof, having an air permeability of from 0.5 CFM to about 8 CFM when tested in accordance with ASTM D737; and
- a low emissivity layer disposed on a surface of the fabric shell, wherein the low emissivity layer is disposed via a vapor deposition process, and wherein the low emissivity layer increases the insulation of the composite fabric compared to a substantially similar composite fabric in the absence of the low emissivity layer when measured in accordance with ASTM-F1868 Part A.
