

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
30 November 2017 (30.11.2017)

WIPO | PCT

(10) International Publication Number
WO 2017/201588 A8

(51) International Patent Classification:
E04B 2/96 (2006.01)

(21) International Application Number:
PCT/BE2017/000026

(22) International Filing Date:
02 May 2017 (02.05.2017)

(25) Filing Language: Dutch

(26) Publication Language: English

(30) Priority Data:
2016/5377 24 May 2016 (24.05.2016) BE

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(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, 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: CURTAIN WALL

(57) Abstract: Curtain wall (1) comprising one or more mullion profiles (5) and one or more transom profiles (14), wherein the one or more mullion profiles (5) extend vertically, the one or more transom profiles (14) are attached horizontal between two mullion profiles (5), wherein a barrier (28, 29) for water is provided on the fixing points of the transom profiles (14) to the mullion profiles (5), wherein the barrier (28, 29) is adapted to divert this water to a said transom profile (4), wherein the transom profiles is adapted to drain this water to the outside of the curtain wall (1).

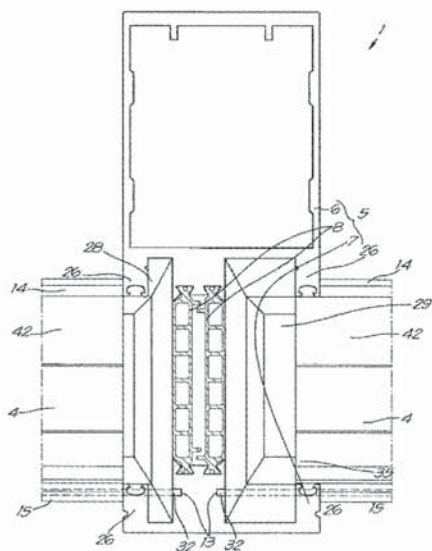


Fig. 3

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *of inventorship (Rule 4.17(iv))*

Published:

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

(48) Date of publication of this corrected version:

13 December 2018 (13.12.2018)

(15) Information about Correction:

see Notice of 13 December 2018 (13.12.2018)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 42401-WO-U	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/BE2017/000026	International filing date (<i>day/month/year</i>) 02.05.2017	Priority date (<i>day/month/year</i>) 24.05.2016	
International Patent Classification (IPC) or national classification and IPC INV. E04B2/96			
Applicant Claeys, Stephanie Catharina R.			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (<i>sent to the applicant and to the International Bureau</i>) a total of <u>5</u> sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).			
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ 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 Article 35(2) with regard to novelty, inventive step or 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			
Date of submission of the demand 04.01.2018		Date of completion of this report 31.08.2018	
Name and mailing address of the international preliminary examining authority:  European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016		Authorized officer Galanti, Flavio Telephone No. +31 70 340-2026 	

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/BE2017/000026

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ 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 (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-30 as originally filed

Claims, Numbers

1-25 as originally filed

Drawings, Sheets

1/13-13/13 as originally filed

- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/BE2017/000026

6. ☒ With regard to top-up searches (Rules 66.1 *ter* and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 22.08.2018 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
 - ☐ Additional relevant documents have been discovered during the top-up search.
 - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded".

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	<u>1-7, 10, 13, 20</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-8, 10-25</u>
Industrial applicability (IA)	Yes: Claims	
	No: Claims	<u>1-25</u>

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

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 not cited in the international search report.
 - D3 EP 0 435 748 A1 (ALCAN ALUMINIUM FRANCE [FR])
3 July 1991 (1991-07-03)
 - D4 EP 0 050 838 A1 (ELTREVA AG [CH]) 5 May 1982 (1982-05-05)
- 2 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new.
 - 2.1 D3 discloses (see in particular column 4, line 20 - column 5, line 38; figures 1-6) a curtain wall comprising of one or more mullion profiles (1) and one or more transom profiles (2) and panels (7) that fit with their edges into the mullion profiles (1) and into the transom profiles (2), wherein the one or more mullion profiles (1) extend vertically and are provided with an undercut groove (4, 5) with a fixed width access opening on two opposite sides, which grooves (4, 5) form a rabbet in which the side edge of a said panel (7) is fitted, wherein the one or more transom profiles (2) extend horizontally between two mullion profiles (1) and are fitted with their ends in the aforementioned grooves (4, 5) of these two mullion profiles, wherein a sealing piece (pièce souple d'étanchéité 11) is provided on these ends of the transom profiles (2), forming a barrier for water, wherein the barrier is adapted to divert this water to a said transom profile (2) and wherein the transom profiles (2) are adapted to drain this water to the outside of the curtain wall.
 - 2.2 A similar curtain wall is known from D4 (page 13, paragraph 1 - page 17, paragraph 1; figures 1-7).
 - 2.3 Therefore all the features of claim 1 are known from D3 and D4.

- 3 Dependent claims 1-8, 10-25 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step.
- 3.1 The additional features of claims 2-7, 10, 13, 20 all appear to be known from D3 and D4.
- 3.2 In claims 8, 11, 12, 14-19, 21-25 slight constructional changes in the curtain wall are suggested which come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can be readily contemplated in advance. Consequently, the subject-matter of these claims lacks an inventive step.
- 4 The combination of the features of dependent claims 1, 6 and 9 is neither known from, nor rendered obvious by, the available prior art.
- In D3 the sealing piece 11, partially encloses the central rib 3 of transom profile 2. Parts 25-28 of the sealing piece 11, on the other hand, fit inside the transom profile 2. Therefore, it would not be obvious to adapt the sealing piece 11 in such a way that it is dimensioned to fully enclose an end of the transom profile 2. Furthermore, part of the sealing piece would then be visible.
- Adapting the sealing piece 22 in D4 to fully enclose the end of the transom profile (7, 8, 10) would not appear necessary, since not all of the end of transom profile (7, 8, 10) abuts or is contact with the mullion profile (5, 6, 9).

Re Item VII

Certain defects in the international application

- 1 The relevant background art disclosed in documents D3 and D4 is not mentioned in the description, nor are these documents identified therein.
- 2 The independent should be cast in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D3 or D4 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

International patent application No. PCT/BE2017/000026,
In the name of CLAEYS Stephanie Catharina R., CLAEYS
Laurens Leonard J. and CLAEYS Nausikaä Els P.

*Reply to the written opinion of the international
5 searching authority.*

We refer to the search report and written opinion dated November 24, 2017.

10 According to the examiner's opinion, claim 1 is not new
in view of each of the cited documents D1 (GB 2.143.558)
and D2 (DE 33.13.444).

15 We respectfully disagree with this opinion for the following reasons.

Concerning D1

20 Present claim 1 at least differs from the D1 with the following features:

- In D1 the mullions cannot be considered as mullion profiles in the sense of the present application. Indeed, the mullions are composed of three profiles of different lengths, in particular a profile 8 on the inside of the wall, a profile 16 on the outside of the wall, and an intermediate profile 12 which is interrupted in its longitudinal direction at its connection with the transoms. Said profiles 8, 16 and 12 are held together by means of screws which

are applied from the outside with inclusion of glass panels which are clamped between the profiles 12 and 16. The profile 12 being interrupted, one can hardly speak of a mullion profile as in the present application where the mullion profiles are uninterrupted at the connection with the transom profiles.

- 5
10 - The profiles 12 being interrupted in D1 at the location of the connection between mullions and transoms, and therefore the mullions in D1 do not have an undercut groove in which the side edges of the glass panels are fitted as is required according to present claim 1.
- 15 - The mullions in D1 are moreover not provided with an undercut groove on both sides with an access opening with a fixed width according to present claim 1. Indeed, in D1 the mullions are provided
20 with a groove which is interrupted at the level of the transoms and which moreover has a width which is not fixed, the opening of the groove being determined by the thickness of the glass panels and the seals which are clamped between the profiles 12
25 and 16.
- 30 - The transoms in D1 are composed of three profiles 10, 14 and 18 of different length and can therefore not be considered as profiles as in the meaning of present claim 1.

5 - The profiles 10 of the transoms in D1 are indeed also provided between the profiles 8 of the mullions and are also provided with a seal at their ends, but these ends are not fitted in a groove of the mullions.

10 - The profiles 14 of the transoms of D1 are not fitted in a undercut groove of the mullions and are also not provided with a seal at their ends.

Concerning D2

Present claim 1 at least differs from the D2 with the following features:

15 - The mullions 1 in D2 are composed of two profiles 2 and 4 that fit telescopically in each other with inclusion of the panels 32a which are clamped between said profiles 2 and 4. The width of the access opening for the panels in the mullions is not fixed as required according to claim 1 but depends on the thickness of the panels and seals clamped between the profiles 2 and 4.

25 - In D2 the material of the profiles 4 of the mullions is locally removed at the connection with the transoms 22, whereby in the so formed recess 8 a complex connexion peace 3 is welded, which connection peace is provided with a U-shaped holder 11 for a transom which is provided with a sealing layer 21 for the sealing between the transoms and the profiles 4 of the mullions.

30

Said sealing layer 21 only partially encloses an extremity of the transom at the inside face of the wall (page 9, lines 5 and 6) and therefore does not prevent that water that falls on the transoms 22 ends up in hollow mullions via the ventholes 18a and 18b like in a classic cascade system. Said sealing layer 21 therefore does not form a barrier for water to divert the water on the transoms to the outside of the wall.

In short, not all features of claim 1 are known from D1 or from D2.

It would also not be obvious for a person skilled in the art to adapt either of the solutions of D1 or D2 to incorporate the missing features of present claim 1, no incentive to do so being provided in either of said documents D1 or D2.

Therefore we believe that present claim 1 is new and inventive in view of D1 and D2.

Regarding the clarity objections in item 4 of the opinion, we have the following observations:

4.1 Claim 1 is not in the two part form, the prior art being so distant from the present invention that the two part form of claim 1 would not be in the interest of clarity.

4.2 With respect to the term "undercut groove", we do not agree with the examiner that said term suggests that the mullions and transoms are made of one piece, whereby the groove is formed by extrusion, milling or moulding.

5 The meaning of this term is perfectly clear for a person skilled in the art. Moreover, the examiner contradicts himself because with respect to claim 1 the examiner has recognised an undercut groove being known from D1 and D2 which however comprise composite mullions.

10

4.3 The present invention does not tend to solve only the problem mentioned on page 3, lines 19 to 29 as suggested by the examiner. Other problems and their solutions are also discussed in the present application,
15 in particular the problems mentioned in the description page 5. More specifically the present invention allows in to drain the water per row of panels and to avoid water being uncontrollably drained in cascade through the mullions over the complete height of the wall.

20

In view of the above, we respectfully request reconsideration of the present application.

25