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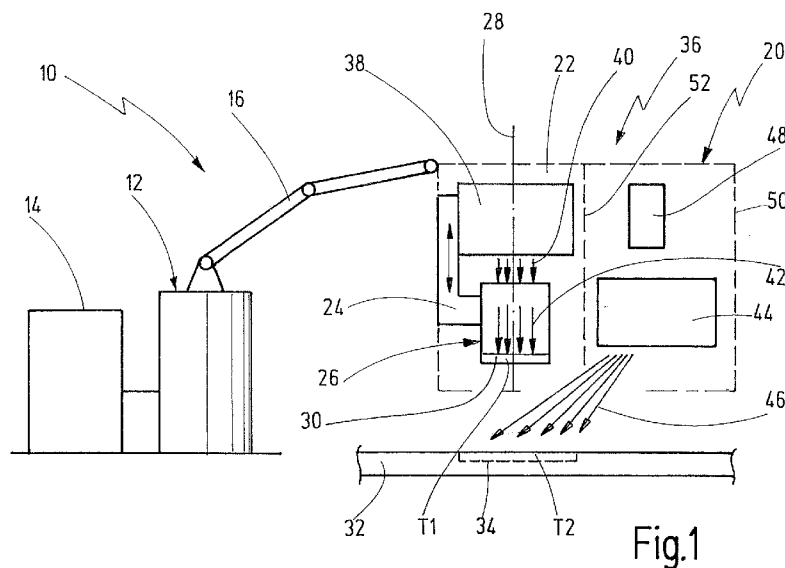
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kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
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DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
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KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
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GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: JOINING METHOD, JOINING APPLIANCE AND FASTENING ELEMENT



(57) Abstract: The invention relates to a method for joining a fastening element (26) on to a surface portion (34) of a component (32), the fastening element (26) having an adhesion face (109), on to which there is applied an adhesive (30) that is thermally meltable and thermally settable, comprising the steps of - pre-heating the adhesive (30) to a first temperature (T1), in order to activate the adhesive; - pre-heating the surface portion (34) to a second temperature (T2); and - placing the adhesion face (109) on to the surface portion (34); the adhesive (30) undergoing main heating, to a third temperature (T3), after the adhesion face (109) has been placed on to the surface portion (34), in order to set the adhesive and thereby permanently fasten the fastening element (26) to the component (32).

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26 May 2011

- *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))*

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2010/062268

A. CLASSIFICATION OF SUBJECT MATTER

INV. C09J5/06 B23P19/00 B29C65/02 F16B11/00
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)

C09J B23P B29C F16B

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)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 81/03028 A1 (GRACE W R LTD AU [AU]) 29 October 1981 (1981-10-29) abstract page 7, line 1 - line 9 page 11, line 9 - page 13, line 19; claims 1,11-14	1-10
X	----- WO 2008/020036 A1 (TESA AG [DE]; KEITE-TELGENBUESCHER KLAUS [DE]; ENGELDINGER HANS KARL [DE]) 21 February 2008 (2008-02-21) line 23 - page 20, line 27; claim 16; figures 2,3; example 5	1-15
Y	----- US 5 414 247 A (GEITHMAN GLENN A [US] ET AL) 9 May 1995 (1995-05-09) column 6, line 65 - column 7, line 19; figures 1-3,7A ----- -/-	1-15

☒ 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 document but published on or after the international filing date

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"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.

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Date of the actual completion of the international search

5 April 2011

Date of mailing of the international search report

13/04/2011

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2010/062268

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 196 38 521 A1 (RAYMOND A & CIE [FR]) 26 March 1998 (1998-03-26) column 1, line 20 - line 38 column 3, line 63 - column 4, line 37; figures -----	1-15
X	US 2007/114227 A1 (STUMPF MICHAEL [DE] ET AL) 24 May 2007 (2007-05-24) paragraphs [0025], [0031]; claims 11-16; figures -----	16
A	EP 1 902 903 A1 (HEBIC [BE]) 26 March 2008 (2008-03-26) paragraphs [0035], [0041]; figures -----	1-15
X	EP 0 902 903 A1 (HEBIC [BE]) 26 March 2008 (2008-03-26) paragraphs [0035], [0041]; figures -----	16
X	EP 0 902 199 A1 (M ET G S S A R L [FR]) PARALUX SAS [FR] 17 March 1999 (1999-03-17) paragraph [0032]; figures -----	16
X	US 4 636 124 A (GUGLE JAMES E [US] ET AL) 13 January 1987 (1987-01-13) column 1, line 66 - column 2, line 48; figures -----	16
A	US 4 139 408 A (KOBETSKY ROBERT G) 13 February 1979 (1979-02-13) column 2, line 36 - column 3, line 40; figures -----	1-16
A	US 4 048 458 A (ZIRK SR ROBERT LOUIS) 13 September 1977 (1977-09-13) column 2, line 58 - column 4, line 28; figures -----	1-15
A	DE 22 33 412 A1 (TRI INNOVATIONS AB) 24 January 1974 (1974-01-24) the whole document -----	1-15
A	EP 0 823 312 A1 (MINNESOTA MINING & MFG [US]) 11 February 1998 (1998-02-11) page 3, line 11 - line 16; figures -----	1-15
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A	WO 01/51579 A1 (RAYMOND A & CIE [FR]; BREMONT MICHEL [FR]; LEROUX YANNICK [FR]; SCHULL) 19 July 2001 (2001-07-19) cited in the application claims; figures -----	1-16
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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2010/062268

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 10 2004 012786 A1 (NEWFREY LLC [US]) 29 September 2005 (2005-09-29) cited in the application claims; figures	1-16
A	----- US 2007/295698 A1 (HENGEL JAMES F [US] ET AL) 27 December 2007 (2007-12-27) paragraph [0028]; figure 3 -----	16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2010/062268

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.:

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-10

Method for joining a fastening element onto a surface portion of a component,

- a) the fastening element having an adhesion face, onto which there is applied an adhesive that is thermally meltable and thermally settable, comprising the steps of
- b) pre-heating the adhesive to a first temperature (T1), in order to melt the adhesive;
- c) pre-heating the surface portion to a second temperature (T2); and
- d) placing the adhesion face onto the surface portion;
- e) the adhesive undergoing main heating, to a third temperature (T3), after the adhesion face has been placed onto the surface portion, in order to set the adhesive and thereby permanently fasten the fastening element to the component.

2. claims: 11-15

Joining appliance for joining a fastening element onto a surface portion of a component, the fastening element having

- a) an adhesion face, onto which there is applied an adhesive that is thermally meltable and thermally settable, comprising

- b) a holding device for holding a fastening element, the holding device being designed to be moved along a joining axis;
- c) at least one heating device, which is designed to heat the adhesive and the surface portion; and
- d) a control device, the control device being designed so to control the at least one heating device that the adhesive is first pre-heated, the holding device is then moved onto the component, in order to place the fastening element onto the surface portion, and the at least one heating device is finally so controlled that the adhesive between the fastening element and the surface portion is heated for the purpose of setting this adhesive.

3. claim: 16

Fastening element, the fastening element having

- a) a shank portion and
- b) having a flange portion, which adjoins the shank portion and has a larger cross-sectional area than the shank portion,
- c) the flange portion having, on the side that is opposite the shank portion and/or on the side that faces towards the shank portion, an adhesion face, onto which there is applied an adhesive that is thermally meltable and thermally

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

settable,
d) at least one spacing protuberance being realized on the
adhesion face.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2010/062268

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International application No

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