# PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

**PCT**

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

| | |
|---|---|
| Date of mailing *(day/month/year)* | 26.05.2015 |
| Applicant's or agent's file reference: S1783 | **FOR FURTHER ACTION** See paragraph 2 below |

| International application No. | International filing date *(day/month/year)* | Priority date *(day/month/year)* |
|---|---|---|
| PCT/JP2015/055764 | 27.02.2015 | 04.03.2014 |

International Patent Classification (IPC) or both national classification and IPC

C09J133/04(2006.01)i, C09J4/02(2006.01)i, C09J7/00(2006.01)i, C09J11/04(2006.01)i, C09J11/06(2006.01)i, C09J163/00(2006.01)i, C09J163/10(2006.01)i, H01L21/60(2006.01)i

Applicant

SEKISUI CHEMICAL CO., LTD.

1. This opinion contains indications relating to the following items:

| | | |
|---|---|---|
| ☒ | Box No. I | Basis of the opinion |
| ☐ | 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 Rule 43*bis*.1(a)(i) 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 |

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

| Name and mailing address of the ISA/JP | Date of completion of this opinion | Authorized officer |
|---|---|---|
| Facsimile No. | | Telephone No. |

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2015/055764

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ 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 (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2015/055764

**Box No. V** **Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Claims | 1-8 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | | YES |
| | Claims | 1-8 | NO |
| Industrial applicability (IA) | Claims | 1-8 | YES |
| | Claims | | NO |

2. Citations and explanations:

Document 1: JP 2012-041540 A (SONY CHEMICAL & INFORMATION DEVICE CORP.) 01 March 2012

Document 2: JP 2013-028726 A (SEKISUI CHEMICAL CO., LTD.) 07 February 2013

Document 3: JP 2009-173796 A (LINTEC CORP.) 06 August 2009

a) The invention as is claims 1 to 2 and 5 to 8 does not involve an inventive step in the light of document 1 cited in the ISR. The invention as in claims 3 to 4 does not involve an inventive step in the light of documents 1 and 2 the cited in the ISR.
(Claims 1 to 2, 6 to 7)

Document 1 discloses a circuit connection material (corresponding to adhesive for mounting an electronic component), and the circuit connection material contains a radical polymerizable resin, a thermal radical polymerization initiator, a reactive acrylic polymer having a (meth)acryloyl on a side chain (double bond equivalent 1 meq/g), and a silane coupling agent having a (meth)acryloyl group (see claims, example 4, and

elsewhere). It is also indicated that a polyfunctional (meth)acrylate compound having three or more functional groups may be used as the radical polymerizable resin (see paragraphs [0019], [0022] and [0023]).

Based on these descriptions, a person skilled in the art could easily produce a suitable circuit connection material.

The effects of the invention as in the claims of the present application will be discussed at this point. The specification of the present application indicates that a predetermined effect is obtained by using a predetermined adhesive when a flip chip is mounted by soldering. However, there is no description regarding mounting by soldering in the claims of the present application, and said effect is not an effect of the invention as in the claims of the present application. Also, the invention as in the claims of the present application is not considered to have a special prominent effect in comparison with document 1, even with consideration given to other descriptions in the specification of the present application.

(Claims 3 to 4)

Document 2 discloses a circuit connection material, wherein a curable compound and a curing agent therefor are used in order to increase conduction reliability between electrodes, the curable compound having an epoxy group and a (meth)acryloyl group (see paragraphs [0032] and [0033], and elsewhere).

Adding a curable compound and a curing agent therefor could be carried out, as appropriate, in accordance with the desires of a person skilled in the art in the invention as in document 1.

**Box No. V** **Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

(Claim 5)

Document 1, paragraph [0043] indicates that filler may be added, and therefore, actually adding a filler could be carried out, as appropriate, in accordance with the desires of a person skilled in the art.

(Claim 8)

Document 1, paragraph [0058] indicates use in flip chip mounting.

b) The invention as in claims 1 and 3 to 7 does not involve an inventive step in the light of document 3 cited in the ISR.

Document 3 discloses an adhesive for die bonding (corresponding to adhesive for mounting an electronic component), and the adhesive for bonding contains an acrylic polymer having an unsaturated hydrocarbon, an epoxy-based thermosetting resin having an unsaturated hydrocarbon group and curing agent therefor, a photoinitiator, a coupling agent, an inorganic filler, and an energy-ray polymerizable compound (acrylate compound having six functional groups) (see claims, example 7, and elsewhere). It is also indicated that the acrylic polymer having an unsaturated hydrocarbon group is obtained by polymerizing a (meth)acrylic acid monomer in a ratio of 10 to 2,000 parts by weight with respect to 100 parts by weight of a constituent unit derived from a functional group-containing monomer, and thereafter reacting 3-100 eq. of an unsaturated-group containing compound with respect to 100 eq. of the functional-group-containing monomer (see paragraphs [0027], [0032]). It is furthermore indicated that a silane coupling agent having a (meth)acryloyl group may be used as the silane

coupling agent (see paragraph [0063]).

Based on these descriptions, a person skilled in the art could easily produce a suitable adhesive for die bonding. Also, in similar manner to the discussion in a) above, the effect of the invention as in the claims of the present application is not considered to be a special prominent effect in comparison with document 3.