

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
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 CHINA TRUER IP

PCT

WRITTEN OPINION OF THE
 INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing <i>(day/month/year)</i> 13 December 2017	
Applicant's or agent's file reference 17P200015JYC	FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/CN2017/076952	International filing date <i>(day/month/year)</i> 16 March 2017
Priority date <i>(day/month/year)</i> 10 March 2017	
International Patent Classification (IPC) or both national classification and IPC C09J 183/04(2006.01)i; C09J 165/04(2006.01)i; C09J 5/00(2006.01)i	
Applicant Hong Kong Applied Science and Technology Research Institute Company Limited	

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 43bis.1(a)(i) with regard to novelty, inventive step and 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 66.1bis(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/ STATE INTELLECTUAL PROPERTY OFFICE OF THE P.R.CHINA China 6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088	Date of completion of this opinion 06 December 2017	Authorized officer JIANG,Haiyan
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WRITTEN OPINION OF THE
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International application No.

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Box No. I Basis of the 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:

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

1. Statement

Novelty (N)	Claims	<u>1-19</u>	YES
	Claims	<u>None</u>	NO
Inventive step (IS)	Claims	<u>None</u>	YES
	Claims	<u>1-19</u>	NO
Industrial applicability (IA)	Claims	<u>1-19</u>	YES
	Claims	<u>None</u>	NO

2. Citations and explanations :

[1] Reference is made to the following document:

[2] D1:US 2012/094101A1

[3] 1. Novelty

[4] D1 discloses a method for forming a functional chemical layer on the surface of the substrate, the adhesion of the silicone coating layer to the substrate can be improved by using functionalized polymers which comprise at least one end or side functionalized block or graft copolymer with groups capable of reacting with a silicone or groups. It comprises

[5] moiety that is reactive or compatible with the silicone coating, the reactive moiety contains vinylic, silane hydride, or vinyl silane end or side groups which can react with silicone coatings (the first compound), the compatible moiety is preferably a polysiloxane which can improve the adhesion of the silicon layer by mixing and physical bonding (the second compound). The functional chemical layer is formed by using a steam application beam. The moiety comprising hydrophilic groups is typically compatible with the hydrophilic substrate, for example, O- or N-atoms are hydrophilic (see description, paragraphs [0021]-[0025], [0027]- [0028]).

[6] D1 does not disclose at least the units of second compound interspersed among/with the

[7] units of the first compound, therefore, claims 1, 9, 17 are novel in the sense of PCT Article 33 (2).

[8] Dependent claims 2-8 refer directly to claim 1, dependent claims 10-16 refer directly or indirectly to claim 9, dependent claims 18-19 refer directly to claim 17, therefore, dependent claims 2-18, 10-16, 18-19 are novel in the sense of PCT Article 33 (2).

[9] 2. Inventive step

[10] D1 is considered to be the closest prior art document to the present invention. Claims 1, 9, 17 differ from D1 in that: D1 does not disclose the units of second compound interspersed

[11] among/with the units of the first compound. However, the compatible moiety such as polysiloxane is not chemically reactive to the reactive moiety, therefore, it would have been obvious for a person skilled in the art to adjust the proportion of the compatible moiety and reactive moiety, and make sure that units of second compound can be interspersed

[12] among/with the units of the first compound. Therefore, claims 1, 9, 17 do not involve an inventive step in the sense of PCT Article 33(3).

[13] Regarding claims 2, 6, 8, 14, 19: D1 discloses the first units of the first compound and the

[14] second units of the second compound are chemically bonded with surface

[15] functional groups of the substrate, and silicone coating is formed from polymerization

[16] of monomers, and the functional chemical layer is monolayer (see paragraphs [0021]-[0022], [0025], [0027]- [0028]).

[17] Regarding claims 3-5, 7, 12-13: It would have been easy for a person skilled in the art to select the volume ratio and the molecular size of the first compound and the second

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citations and explanations supporting such statement**

- [18] compound that fall within the presently claimed amount, and it would have been easy for a person skilled in the art to select the specific first compound or second compound on the base of the above disclosure, absent evidence of unexpected or surprising results.
- [19] Regarding claims 10-11, 15-16: D1 discloses the functional chemicals are water dispersible or water emulsifiable (see paragraph [0011]). Therefore, it would have been easy for a person skilled in the art to dissolve the compounds in a solvent, and select the solvent such as alcohol and water and proper ratio of them. D1 discloses the functional chemical layer is formed by using a steam application beam (see paragraph [0023]), and solution immersion is also an ordinary method of surface treatment, therefore, it would have been obvious for a person skilled in the art to select proper method for surface treatment and the adhesion of the silicone coating layer to the substrate.
- [20] Regarding claim 18: It would have been obvious for a person skilled in the art to select the thickness of intermediate layer, absent evidence of unexpected or surprising results. Therefore, claims 2-8, 10-16, 18-19 do not involve an inventive step in the sense of PCT Article 33(3).
- [21] 3. Industrial applicability
- [22] Claims 1-19 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be used in surface treatment for a substrate.