

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: SHINSEGI PATENT LAW FIRM 3th Floor, Yoong-jun Bldg., 829-6 Yeoksam-dong, Gangnam-ku Seoul 135-936 Republic of Korea

Date of mailing (day/month/year) 18 APRIL 2007 (18.04.2007)

Applicant's or agent's file reference LBM130-07	FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/KR2007/000206	International filing date (day/month/year) 11 JANUARY 2007 (11.01.2007)	Priority date(day/month/year) 13 FEBRUARY 2006 (13.02.2006)
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International Patent Classification (IPC) or both national classification and IPC <i>B41M 1/00(2006.01)i, G03G 5/00(2006.01)i, C09D 11/00(2006.01)i</i>
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Applicant EXAX INC. et al

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 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

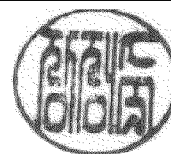
2. **FURTHER ACTION**

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 66.1bis(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.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Date of completion of this opinion 18 APRIL 2007 (18.04.2007)	Authorized officer JANG, Jung Suk Telephone No.017)416-2281
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**WRITTEN OPINION OF THE
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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 43bis.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. type of material
 - a sequence listing
 - table(s) related to the sequence listing
 - b. format of material
 - on paper
 - in electronic form
 - c. time of filing/furnishing
 - contained in the international application as filed.
 - filed together with the international application in electronic form.
 - furnished 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 and/or table relating thereto 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 or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2 - 13, 14 (part), 15, 16, 19, 20	YES
	Claims	1, 14 (part), 17, 18	NO
Inventive step (IS)	Claims	2 - 13, 14 (part), 15, 16, 19, 20	YES
	Claims	1, 14 (part), 17, 18	NO
Industrial applicability (IA)	Claims	1 - 20	YES
	Claims	None	NO

2. Citations and explanations :

1. Reference is made to the following documents:

D1: JP 63-278983 A (Toyota Autom. Loom. Works Ltd.) 16 November 1988
 D2: JP 05-311103 A (Tanaka Anaka Kikinzoku Kogyo KK.) 22 November 1993
 D3: JP 13-207088 A (Matsushita Electric Ind. Co., Ltd.) 31 July 2001

D1 discloses an organometallic ink which can give a pattern formation solution of an increased metal content which is useful for the circuit pattern formation of hybrid IC and retains a viscosity suitable for a liquid crystal injector of an ink jet system. The organometallic ink of D1 was obtained by mixing a metal tertiary carboxylate, e.g. silver neodecanoate, with an organic solvent comprising an aromatic hydrocarbon and an agent for preventing volatilization of a solvent.

D2 discloses a printing ink for silver conductor circuit comprising a resin component, a silver component (preferably metallic silver powder singly dispersed and having 0.1-0.5µm particle diameter), a flux component, and a solvent.

D3 discloses a silver ink which can be used as an electrode material for electronic parts. The silver ink of D3 is obtained by mixing at least one of a solvent, a metallic powder, a ceramic powder, glass powder, an organometallic compound, and a resin with a silver soap.

2. Novelty and Inventive Step

2 - 1. Claim 1

The subject matter of claim 1 relates to a silver organo-sol ink of solution type for forming electrically conductive pattern comprising:

(A1) silver C0 to C16 aliphatic carboxylate saturated or unsaturated, linear or branched, unsubstituted or substituted with amino, nitro and/or hydroxy group(s) having 1 to 3 carboxyl groups,
 or (A2) silver aromatic carboxylate defined as Formula 1;
 and (B) organic solvent.

The organometallic ink of D1 comprises (A1) a metal tertiary carboxylate, e.g. silver neodecanoate, and (B) an organic solvent (abstract, example 1). The printing ink of D2 (Continued on Supplemental Sheet.)

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Box No. VI Certain documents cited

1. Certain published documents (Rule 43bis.1 and 70.10)

<u>Application No. Patent No.</u>	<u>Publication date (day/month/year)</u>	<u>Filing date (day/month/year)</u>	<u>Priority date (valid claim) (day/month/year)</u>
P, X KR 10-0587402 B1	30 / 05 / 2006	11 / 10 / 2005	
P, X KR 10-0587404 B1	30 / 05 / 2006	02 / 09 / 2005	

Document KR 10-0587402 B1, filed on 11/10/2005, published on 30/05/2006 does not constitute prior art with the meaning of Rule 64.1(b) PCT, but appears to disclose all the features of claims 1-16.

Document KR 10-0587404 B1, filed on 02/09/2005, published on 30/05/2006 does not constitute prior art with the meaning of Rule 64.1(b) PCT, but appears to disclose all the features of claims 1-4, 14, and 17-20.

2. Non-written disclosures (Rule 43bis.1 and 70.9)

<u>Kind of non-written disclosure</u>	<u>Date of non-written disclosure (day/month/year)</u>	<u>Date of written disclosure referring to non-written disclosure (day/month/year)</u>
_____	_____	_____

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Concerning the constituents of silver organo-sol ink with respect to [20], [25] and [26] of description, claim 1 and claim 17, the scope of carbon numbers in silver aliphatic carboxylate is unclear since aliphatic carboxylate cannot be embodied in case of C0 or C1. [PCT Article 5 and 6]

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of :

BOX V

contains (A1) metallic silver powder, e.g. silver 2-ethyl hexanoate or silver neodecanoate ([0010]) and (B) an organic solvent like xylene, toluene, and butanol ([0007]). The silver ink of D3 also comprises (A1) silver C2 to C22 aliphatic carboxylate and (B) an organic solvent (claims, [0011]).

As the silver ink comprising (A1) silver aliphatic carboxylate and (B) organic solvent is disclosed in D1 to D3, the silver organo-sol ink of claim 1 of the present invention is anticipated by D1 to D3. Thus the subject matter of claim 1 is neither novel nor inventive under PCT Article 33(2) and (3).

2 - 2. Claims 2 to 13

Claim 2, which is dependent on claim 1, defines (B) organic solvent of claim 1 as (B1) a reactive organic solvent which can form chelate or complex with silver and (B2) polar or nonpolar organic solvent for control of viscosity.

The subject matter of claim 2 differs from the disclosure of D1 to D3 mainly in the organic solvent used in the silver ink. There is no suggestion in any of the documents D1 to D3, either alone or in combination, which would lead to the combination of organic solvent (B1 + B2) as disclosed in claim 2. Also, the organic solvent of claim 2 would not be obvious to a person skilled in the art. Thus the subject matter of claim 2 is considered to be novel and inventive under PCT Article 33(2) and 33(3).

Claims 3 to 13 are dependent on claim 2, and consequently, the subject matter of claims 3 to 13 is also novel and inventive under PCT Article 33(2) and (3).

2 - 3. Claim 14

Claim 14 relates to silver organo-sol ink of solution type according to any one of claim 1 to claim 13, wherein said silver organo-sol ink is used for electrically conductive patterns by inkjet-printing .

D1 discloses a silver ink comprising (A1) silver neodecanoate and (B) an organic solvent which can be used for the circuit pattern formation of hybrid IC and retains a viscosity suitable for a liquid crystal injector of an ink jet system .

As D1 discloses the silver ink comprising (A1) silver aliphatic carboxylate and (B) organic solvent which can be used in ink jet system, the subject matter of claim 14 is anticipated by D1 in case of using silver organo-sol ink of solution type according to claim 1. Thus the subject matter of claim 14, in case of using the silver organo-sol ink of solution type according to claim 1, is neither novel nor inventive. [PCT Article 33(2) and (3)]

However, in case of using the silver organo-sol ink of solution type according to any one of claim 2 to claim 13, none of the prior documents D1 to D3 teaches or fairly suggests the combination of organic solvent B1 and B2 as disclosed in claims 2 to 13.

(Continued on the Next Supplemental Sheet)

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of :

BOX V.

Also, the organic solvent of claims 2 to claim 13 would not be obvious to a person skilled in the art. Therefore the subject matter of claim 14, in case of using the silver organo-sol ink of solution type according to any one of claim 2 to 13, is novel and inventive under PCT Article 33(2) and (3).

2 - 4 Claims 15 and 16

Claims 15 and 16, which are dependent on claim 14, define the compositional range of (A2) silver aromatic carboxylate. None of the prior documents D1 to D3 discloses (A2) silver aromatic carboxylate. Also, it is not obvious to a person skilled in the art to use the silver aromatic carboxylate (A2) of Formula 1 in an etching solution. Thus the subject matter of claims 15 and 16 is considered to be novel and inventive under PCT Article 33(2) and (3).

2 - 5 Claims 17 and 18

Claims 17 and 18, which are dependent on claim 1, define (A1) silver aliphatic carboxylate as silver C0 to C8 aliphatic carboxylate saturated or unsaturated, linear or branched, unsubstituted or substituted with amino, nitro and/or hydroxy group(s).

D2 discloses the printing ink containing (A1) silver 2-ethyl hexanoate ([0010]) with (B) an organic solvent like xylene, toluene, and butanol ([0007]). The silver ink of D3 also comprises (A1) silver C2 to C22 aliphatic carboxylate and (B) an organic solvent (claims, [0011]).

As the silver ink comprising (A1) silver aliphatic carboxylate and (B) organic solvent is disclosed in both D2 and D3, the silver organo-sol ink of claims 17 and 18 of the present invention is anticipated by both D2 and D3. Thus the subject matter of claims 17 and 18 is neither novel nor inventive under PCT Article 33(2) and (3).

2 - 6 Claims 19-20

Claims 19 and 20, which are dependent on claim 18, define the compositional range of (A1) silver aliphatic carboxylate, (B1) a reactive organic solvent, and (B2) polar or nonpolar organic solvent.

None of the prior documents D1 to D3 discloses the combination of B1 and B2 for the organic solvent. Also, the combination of organic solvents B1 and B2 would not be obvious to a person skilled in the art. Thus the subject matter of claims 19 and 20 is considered to be novel and inventive under PCT Article 33(2) and (3).

3. Industrial Applicability

The subject matter of claims 1 to 20 appears to be industrially applicable under PCT Article 33(4).