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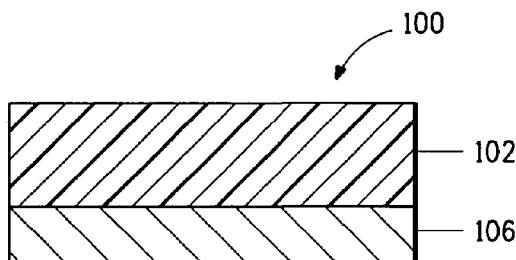
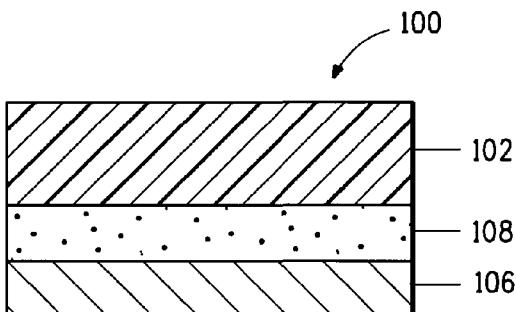
(30) Priority Data:
11/488,200 17 July 2006 (17.07.2006) US(71) Applicant (for all designated States except US): **E. I. DU PONT DE NEMOURS AND COMPANY** [US/US], 1007 Market Street, Wilmington, Delaware 19898 (US)

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(75) Inventors/Applicants (for US only): **BAILEY, Richard, Kevin** [US/US], 108 Burning Bush Drive, Newark,

(54) Title: THIN FILM TRANSISTOR COMPRISING NOVEL CONDUCTOR AND DIELECTRIC COMPOSITIONS

(57) Abstract: The invention relates to thin film transistors comprising novel dielectric layers and novel electrodes comprising metal compositions that can be provided by a dry thermal transfer process

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(81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FT, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY,

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(88) **Date of publication of the international search report:**

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/016119

A. CLASSIFICATION OF SUBJECT MATTER
INV. H01L51/10

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)

HOIL

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)

EPO-Internal , INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| A | WO 03/052841 A (AVECIA LTD [GB]; LEEMING STEPHEN WILLIAM [GB]; MOHIALDIN-KHAFFAF SOAD) 26 June 2003 (2003-06-26) cited in the application page 5, lines 25-27; figure 1 | 1 |
| X | US 2006/124922 A1 (KIM SEONG HYUN [KR] ET AL) 15 June 2006 (2006-06-15) paragraphs [0003], [0017] - [0019], [0022]; claims 1-3,6 | 1-5 |
| A | STEJSKAL J. ET AL.: "Polyani line. Preparation of a conducting polymer" PURE AND APPLIED CHEMISTRY, vol. 74, no. 5, 2002, pages 857-867, XP002474132 page 865, lines 19,20 | 1 |

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
- 'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- 'O' document referring to an oral disclosure, use, exhibition or other means
- 'P' document published prior to the international filing date but later than the priority date claimed

- 'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- '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.
- '&' document member of the same patent family

Date of the actual completion of the international search

27 March 2008

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11/07/2008

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Beierlein, Udo

INTERNATIONAL SEARCH REPORTInternational application No
PCT/US2007/016119**C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No |
|----------|---|----------------------|
| Y | EP 1 434 281 A (KONICA MINOLTA HOLDINGS INC [JP]) 30 June 2004 (2004-06-30) paragraphs [0060], [0065], [0073] - [0075], [0083]; figure 1 ----- | 1-5 |
| Y | US 2006/081840 A1 (MORI TOSHIKATA [JP] ET AL) 20 April 2006 (2006-04-20) paragraphs [0164] - [0169], [0173] ----- | 1-5 |

RJRTH INFORMATION CONTINUED FROM PCT/ASA/ 210

Continuation of Box II. 2

Claims Nos.: 41-45

Claims 41, 43 and 45 relate to a thin film transistor which has a given desired property, namely an on/off ratio of 10⁵ or greater or a mobility of 0.5 cm²/Vs or greater. Claims 42 and 44 relate to a thin film transistor array which has the desired property of a yield of functional transistors of 98% or greater.

These claims attempt to define the subject-matter in terms of the result to be achieved, e.g. that the thin film transistor which has an on/off ratio of 10⁵ or greater. This merely states the underlying problem of achieving a high on/off ratio without providing the technical features necessary for achieving this result.

Hence, claims 41-45 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. Non-compliance with the substantive provisions is such that a meaningful search of the subject-matter of claims 41-45 could not be carried out.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2)PCT declaration be overcome.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/016119

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.: **41-45** 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:
see FURTHER INFORMATION sheet PCT/ISA/210

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 allsearchable 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.:

1-5

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: 1-5

covering a TFT wherein the gate electrode, the source and drain electrodes or all of the electrodes comprise a metal composition comprising metal particles and a polymer, solving the problem of providing a solution processable electrode material.

2. claims: 6,7,16-40

covering a TFT wherein the dielectric layer comprises a dielectric polymer, solving the problem of fabricating a TFT having a high resistivity dielectric layer.

3. claims: 8-14

describing a TFT comprising a certain organic semiconducting material, solving the problem of providing a cheap organic semiconductor.

4. claim: 15

covering a TFT on a substrate, solving the problem of providing a suitable support for an electronic device.'

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/016119

| Patent document cited in search report | Publication date | Patent family member(s) | | | Publication date |
|--|------------------|-------------------------|----|------------|------------------|
| WO 03052841 | A 26-06-2003 | AU 2002343058 | A1 | 30-06-2003 | |
| | | CA 2469912 | A1 | 26-06-2003 | |
| | | EP 1459392 | A1 | 22-09-2004 | |
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| US 2006124922 | A1 15-06-2006 | KR 20060064987 | A | 14-06-2006 | |
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| US 2006081840 | A1 20-04-2006 | GB 2419464 | A | 26-04-2006 | |