(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
3 June 2011 (03.06.2011)

PCT

(10) International Publication Number
WO 2011/063709 A1

(51) International Patent Classification:
H01L 31/042 (2006.01)

(21) International Application Number:
PCT/CN2010/078376

(22) International Filing Date:
3 November 2010 (03.11.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
200910188449.4 27 November 2009 (27.11.2009) CN

(71) Applicant *(for all designated States except US)*: **BYD COMPANY LIMITED** [CN/CN]; No. 3001, Hengping Road, Pingshan, Longgang, Shenzhen, Guangdong 518118 (CN).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **FANG, Junxiang** [CN/CN]; No.3001, Hengping Road, Pingshan, Longgang, Shenzhen, Guangdong 518118 (CN). **LIU, Yunliang** [CN/CN]; No.3001, Hengping Road, Pingshan, Longgang, Shenzhen, Guangdong 518118 (CN). **LUO, Hui** [CN/CN]; No.3001, Hengping Road, Pingshan, Longgang, Shenzhen, Guangdong 518118 (CN). **WANG, Shengya** [CN/CN]; No.3001, Hengping Road, Pingshan, Longgang, Shenzhen, Guangdong 518118 (CN). **JIANG, Zhanfeng** [CN/CN]; No.3001, Hengping Road, Pingshan, Longgang, Shenzhen, Guangdong 518118 (CN). **HE, Long** [CN/CN]; No.3001, Hengping Road, Pingshan, Longgang, Shenzhen, Guangdong 518118 (CN).

(74) Agent: **TSINGYIHUA INTELLECTUAL PROPERTY LLC**; Room 301, Trade Building, Zhaolanyuan, Tsinghua University, Haidian, Beijing 100084 (CN).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(54) **Title**: BACKPLANE FOR SOLAR BATTERY AND SOLAR BATTERY COMPRISING THE SAME

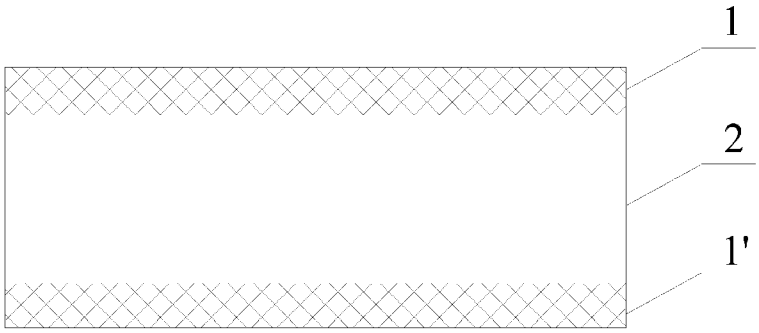

Fig. 1

(57) **Abstract**: A backplane for a solar battery and a solar battery comprising the same are provided. The backplane comprises a metal substrate (2), and an organic insulating layer (1) formed onto at least one surface of the metal substrate (2). The organic insulating layer (1) is made from a resin selected from a group consisting of phenolic resin, epoxy resin, amino resin, and combination thereof.

WO 2011/063709 A1

BACKPLANE FOR SOLAR BATTERY AND SOLAR BATTERY COMPRISING THE SAME

CROSS-REFERENCE TO RELATED APPLICATION

The present application claims priority to and benefits of Chinese Patent Application No. 200910188449.4, filed with the State Intellectual Property Office of the People's Republic of China (SIPO) on November 27, 2009, the entire content of which is hereby incorporated by reference.

FIELD

The present disclosure relates to a solar battery, more particularly to a backplane for a solar battery and a solar battery comprising the same.

BACKGROUND

Solar energy as a green energy is widely used. The solar battery usually has a laminated structure, which comprises a transparent cover plate, a solar cell plate, a gasket cement film, and a backplane. The backplane may enhance the mechanical strength and the sealing performance of the solar battery, so it is required that the materials of the backplane have the properties of high strength, high insulation, high aging resistance, high weatherability, and high corrosion resistance.

At present, a TPT plane is widely used, which was formed by binding and heat pressing the three films of polyvinyl fluoride / polyethylene terephthalate / polyvinyl fluoride (PVF/PET/PVF) in turn. However, TPT materials are expensive.

SUMMARY

The present disclosure is directed to solve at least one of the problems existing in the prior art. Accordingly, a backplane for a solar battery with low cost and high performance and a solar battery comprising the same are provided.

According to an aspect of the present disclosure, a backplane for a solar battery is provided. The backplane comprises a metal substrate, and an organic insulating layer formed onto at least one surface of the metal substrate. The organic insulating layer is made from a resin selected from a group consisting of phenolic resin, epoxy resin, amino resin, and combinations thereof.

According to another aspect of the present disclosure, a solar battery comprises: a transparent cover plate, a first gasket cement film, a solar cell plate, a second gasket cement film, and a backplane. The transparent cover plate, the first gasket cement film,

the solar cell plate, the second gasket cement film, and the backplane are superposed together in turn. The backplane comprises a metal substrate and an organic insulating layer formed onto at least one surface of the metal substrate. The organic insulating layer is made from a resin selected from a group consisting of phenolic resin, epoxy resin, amino resin, and combinations thereof.

The backplanes according to the embodiments of the present disclosure may have better performances, such as better insulating performance, lower water vapor transmittance and better heat dissipation property, thus effectively protecting the solar cell plate and extending the service life of the solar battery. Furthermore, the cost of the backplane according to the embodiments of the present disclosure was lower than that of the TPT backplane by more than about 40%.

Additional aspects and advantages of the embodiments of the present disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects and advantages of the disclosure will become apparent and more readily appreciated from the following descriptions taken in conjunction with the drawings in which:

Fig. 1 shows a laminated structure of the backplane according to an embodiment of the present disclosure; and

Fig. 2 shows a laminated structure of the backplane according to another embodiment of the present disclosure.

DETAILED DESCRIPTION

Reference will be made in detail to embodiments of the present disclosure. The embodiments described herein with reference to the accompany drawings are explanatory and illustrative, which are used to generally understand the present disclosure. The embodiments shall not be construed to limit the present disclosure. The same or similar elements and the elements having same or similar functions are denoted by like reference numerals throughout the descriptions.

As shown in Fig. 1, a backplane for a solar battery comprises a metal substrate 2 and an organic insulating layer 1 formed onto at least one surface of the metal substrate 2, for example, an upper surface of the metal substrate 2. The organic insulating layer 1 is coated onto the at least one surface of the metal substrate 2 by electrophoresis. The

organic insulating layer is made from a resin selected from a group consisting of phenolic resin, epoxy resin, amino resin, and combinations thereof.

As shown in Fig. 1, in one embodiment, two organic insulating layers 1, 1' are formed on the upper and lower surfaces of the metal substrate 2 respectively.

In some embodiments, the two organic insulating layers 1, 1' may be made from an identical material or different materials.

Because the two organic insulating layers 1, 1' are in different environments, they are particularly made from different materials. The organic insulating layer 1 exposed to the air is made from a resin with better water resistance and better weatherability. The organic insulating layer 1' on the lower surface of the metal substrate 2 is made from a resin, which has good insulating performance and has better adhesive force with a gasket cement film.

In some embodiments, the organic insulating layer 1 is formed by electrophoresis. In one embodiment, an electrophoretic liquid comprises a resin, and the metal substrate is connected with an electrode. Under an external electric field, the particles of the resin suspended in the electrophoretic liquid may be directionally migrated and deposited onto the surface of the metal substrate to form the organic insulating layer.

In some embodiments, the metal substrate may be selected from a group consisting of a stainless steel plate, an iron plate, a copper plate, an aluminum plate, and combinations thereof. In some embodiments, the metal substrate may have a thickness of about 0.1 mm to about 1.5 mm, particularly about 0.4 mm to about 0.8 mm.

The backplane comprising the metal substrate 2 may have high mechanic strength, good heat dissipation property and low water vapor transmittance. The organic insulating layer has good adhesive force with the gasket cement film of the solar battery, and prevents the metal substrate from contacting with the air, thus preventing the oxidation of the metal substrate and enhancing the insulating performance between the solar cell plate and the metal substrate.

The phenolic resin may be a polymer formed by the polycondensation of phenols and aldehydes in the presence of acid or base catalysts. In some embodiments, the phenolic resin is selected from a group consisting of phenol-formaldehyde resin, phenylamine modified phenolic resin, nitrile butadiene rubber modified phenolic resin, and combinations thereof.

The epoxy resin may be an organic macromolecular compound having two or more epoxy groups. In some embodiments, the epoxy resin is selected from a group consisting of bisphenol A epoxy resin, novolac epoxy resin, propanetriol epoxy resin, polyurethane modified epoxy resin, and combinations thereof.

The amino resin may be a resin formed by the polycondensation of an amino compound and formaldehyde. In some embodiments, the amino resin is selected from a group consisting of phenyl glycidyl ether amino resin, urea formaldehyde resin, melamine formaldehyde resin, and combinations thereof.

In some embodiments, the organic insulating layer may have a thickness of about 10 μm to about 100 μm.

In some embodiments, a coating layer 3 is formed onto the at least one surface of the metal substrate 2, thus being disposed between the metal substrate 2 and the organic insulating layer 1. In other embodiments, as shown in Fig. 2, two coating layers 3,3' are formed onto the upper and lower surfaces of the metal substrate 2 respectively. In some embodiments, the coating layer is selected from a zinc coating layer, a nickel coating layer, or a tin coating layer.

In some embodiments, the coating layer may have a thickness of about 2 μm to about 50 μm.

In the harsh environment, even if small amounts of water vapor gets through the organic insulating layer to the metal substrate, the coating layer may prevent the metal substrate from being corroded.

The organic insulating layer formed by electrophoresis may have excellent performance. First, the organic insulating layer may have good adhesive force with the metal substrate, and consequently may not drop even if the organic insulating layer is used for a long time. Next, the organic insulating layer may have a uniform, flat and smooth surface, and may have good compactability, thus effectively preventing the penetration of the water vapor and enhancing the corrosion resistance of the organic insulating layer. Furthermore, the organic insulating layer may have high hardness and good impact resistance, thus effectively protecting the metal substrate and improving the service life of the backplane for the solar battery.

Because of using the metal substrate and the electrophoresis process, the backplane for the solar battery according to an embodiment of the present disclosure may have lower cost, compared with a conventional backplane for a solar battery.

A solar battery comprises: a transparent cover plate, a first gasket cement film, a solar cell plate, a second gasket cement film, and a backplane. The transparent cover plate, the first gasket cement film, the solar cell plate, the second gasket cement film, and the backplane are superposed together in turn. The backplane comprises a metal substrate and an organic insulating layer formed onto at least one surface of the metal substrate. The organic insulating layer is made from a resin selected from a group consisting of phenolic resin, epoxy resin, amino resin, and combinations thereof.

In some embodiments, the transparent cover plate may be made from glass, and the first and second gasket cement films may be made from ethylene vinyl acetate copolymer (EVA) respectively.

Hereinafter, the present disclosure will be described in details with reference to the following embodiments.

EMBODIMENT 1

A stainless steel plate having two zinc coating layers on both surfaces thereof was used to form a backplane. The stainless steel plate had a thickness of about 0.5 mm. Each coating layer had a thickness of about 15 μm.

A propanetriol epoxy resin layer with a thickness of about 30 μm was coated on one surface of the stainless steel plate by electrophoresis, and a polyurethane modified epoxy resin layer with a thickness of about 35 μm was coated on the other surface of the stainless steel plate by electrophoresis.

The backplane A1 was obtained.

EMBODIMENT 2

An aluminum plate with a thickness of about 0.7 mm was used to form a backplane.

A polyurethane modified epoxy resin layer with a thickness of about 40 μm was coated on one surface of the aluminum plate by electrophoresis, and a melamine formaldehyde resin layer with a thickness of about 30 μm was coated on the other surface of the aluminum plate by electrophoresis.

The backplane A2 was obtained.

EMBODIMENT 3

A stainless steel plate having two zinc coating layers onto both surfaces thereof was used to form a backplane. The stainless steel plate had a thickness of about 0.5 mm. Each coating layer had a thickness of about 15 μm.

A polyurethane modified epoxy resin layer with a thickness of about 30 μm was coated on each surface of the stainless steel plate by electrophoresis.

The backplane A3 was obtained.

EMBODIMENT 4

A stainless steel plate having two zinc coating layers onto both surfaces thereof was used to form a backplane. The stainless steel plate had a thickness of about 0.3 mm. Each coating layer had a thickness of about 10 μm.

A nitrile butadiene rubber modified phenolic resin layer with a thickness of about 25 μm was coated on one surface of the stainless steel plate by electrophoresis, and a polyurethane modified epoxy resin layer with a thickness of about 35 μm was coated on the other surface of the stainless steel plate by electrophoresis.

The backplane A4 was obtained.

EMBODIMENT 5

A stainless steel plate having two zinc coating layers onto both surfaces thereof was used to form a backplane. The stainless steel plate had a thickness of about 0.6 mm. Each coating layer had a thickness of about 8 μm.

A nitrile butadiene rubber modified phenolic resin layer with a thickness of about 20 μm was coated on one surface of the stainless steel plate by electrophoresis, and a polyurethane modified epoxy resin layer with a thickness of about 30 μm was coated on the other surface of the stainless steel plate by electrophoresis.

The backplane A5 was obtained.

EMBODIMENT 6

A copper plate having two zinc coating layers onto both surfaces thereof was used to form a backplane. The copper plate had a thickness of about 0.5 mm. Each coating layer had a thickness of about 16 μm.

A polyurethane modified epoxy resin layer with a thickness of about 42 μm was coated on one surface of the copper plate by electrophoresis, and a phenyl glycidyl ether amino resin layer with a thickness of about 20 μm was coated on the other surface of the copper plate by electrophoresis.

The backplane A6 was obtained.

REFERENCE 1

A TPT material was used to form a backplane, which was formed by binding and heat pressing the three films of polyvinyl fluoride / polyethylene terephthalate / polyvinyl fluoride (PVF/PET/PVF) in turn. Each PVF film had a thickness of about 25 μm. The PET film had a thickness of about 0.3 mm.

The backplane AC1 was obtained.

Test

(1) Insulating Performance

Using the UL1703 method, the backplanes A1-A6 and AC1 were tested at high voltage of 3000 V respectively. The results were shown in Table 1.

(2) Water Vapor Transmittance

The water vapor transmittances were tested for the backplanes A1-A6 and AC1 respectively according to the ASTM F-1249 standard using $CaCl_2$ moisture absorption method under the conditions of: a temperature of about 38℃ and a humidity of about 90% for about 24 h. The results were shown in Table 1.

(3) Heat Dissipation Property

The backplanes A1-A6 and AC1 were formed into solar batteries with a size of 300 mm×300 mm respectively. Two terminals of each solar battery were short circuited. The solar batteries were exposed to outdoor sunlight for about 2 h, and then the average temperature of each solar battery was tested by an infrared thermometer. The results were shown in Table 1.

Table 1

	Insulating Performance at 3000 V	Water Vapor Transmittance (g/m^3)	Heat dissipation Property (℃)
A1	no breakdown	0.050	55.0
A2	no breakdown	0.050	55.6
A3	no breakdown	0.054	54.8
A4	no breakdown	0.051	54.9
A5	no breakdown	0.052	55.2
AC1	no breakdown	2.850	56.5

(4) Cost

The cost of the backplane A1 is as follows: the metal substrate costs about 26 RMB/m^2, resin materials cost about 15 RMB/m^2, the manufacturing cost is about 12 RMB/m^2, and the total cost is about 53 RMB/m^2. The cost of the backplane AC1 is as follows: the TPT material cost about 95 RMB/m^2.

It may be seen from table 1 that, the backplanes according to the embodiments of the present disclosure may have better performances, such as better insulating performance, lower water vapor transmittance and better heat dissipation property, thus effectively protecting the solar cell plate and extending the service life of the solar battery. It may also be seen from table 1 that, after testing the heat dissipation property of the backplanes A1-A6 and AC1, the temperature of the backplanes A1-A6 are obviously lower than that of the backplane AC1, which indicates that the heat in the backplanes A1-A6 may be dissipated effectively. Therefore, the temperature of the solar battery may be lower, the efficiency of the solar battery may be enhanced, the high-temperature damages for the parts may be reduced, and the service life of the parts may be extended. Furthermore, the cost of the backplane according to the embodiments of the present disclosure was lower than that of the TPT backplane by more than about 40%.

Although explanatory embodiments have been shown and described, it will be apparent to those skilled in the art that variations and modifications of the present disclosure may be made without departing from the scope or spirit of the present disclosure. Therefore, it is to be understood that the present disclosure is not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and are not used for the purpose of limitation.

WHAT IS CLAIMED IS:

1. A backplane for a solar battery, comprising:

a metal substrate; and

an organic insulating layer formed onto at least one surface of the metal substrate;

wherein the organic insulating layer is made from a resin selected from a group consisting of phenolic resin, epoxy resin, amino resin, and combinations thereof.

2. The backplane of claim 1, wherein the metal substrate is selected from a group consisting of a stainless steel plate, an iron plate, a copper plate, an aluminum plate, and combinations thereof.

3. The backplane of claim 1, wherein the metal substrate has a thickness of about 0.1 mm to about 1.5 mm.

4. The backplane of claim 1, wherein the phenolic resin is selected from a group consisting of phenol-formaldehyde resin, phenylamine modified phenolic resin, nitrile butadiene rubber modified phenolic resin, and combinations thereof.

5. The backplane of claim 1, wherein the epoxy resin is selected from a group consisting of bisphenol A epoxy resin, novolac epoxy resin, propanetriol epoxy resin, polyurethane modified epoxy resin, and combinations thereof.

6. The backplane of claim 1, wherein the amino resin is selected from a group consisting of phenyl glycidyl ether amino resin, urea formaldehyde resin, melamine formaldehyde resin, and combinations thereof.

7. The backplane of claim 1, wherein the organic insulating layer has a thickness of about 10 μm to about 100 μm.

8. The backplane of claim 1, wherein the organic insulating layer is coated onto the at least one surface of the metal substrate by electrophoresis.

9. The backplane of claim 1, comprising two organic insulating layers, wherein one insulating layer is formed onto a first surface of the metal substrate, and the other insulating layer is formed onto a second surface of the metal substrate.

10. The backplane of claim 9, wherein the two organic insulating layers are made from different materials.

11. The backplane of claim 1, wherein a coating layer is formed onto the at least one surface of the metal substrate and the insulating layer is formed onto the coating layer.

12. The backplane of claim 11, wherein the coating layer is selected from a group consisting of a zinc coating layer, a nickel coating layer, and a tin coating layer.

13. The backplane of claim 11, wherein the coating layer has a thickness of about 2 μm to about 50 μm.

14. A solar battery comprising:

a transparent cover plate;

a first gasket cement film;

a solar cell plate;

a second gasket cement film; and

a backplane;

wherein the transparent cover plate, the first gasket cement film, the solar cell plate, the second gasket cement film, and the backplane are superposed together in turn;

wherein the backplane comprises a metal substrate and an organic insulating layer formed onto at least one surface of the metal substrate; and

wherein the organic insulating layer is made from a resin selected from a group consisting of phenolic resin, epoxy resin, amino resin, and combinations thereof.

15. The solar battery of claim 14, wherein the transparent cover plate is made from glass; and the first and second gasket cement films are made from ethylene vinyl acetate copolymer respectively.

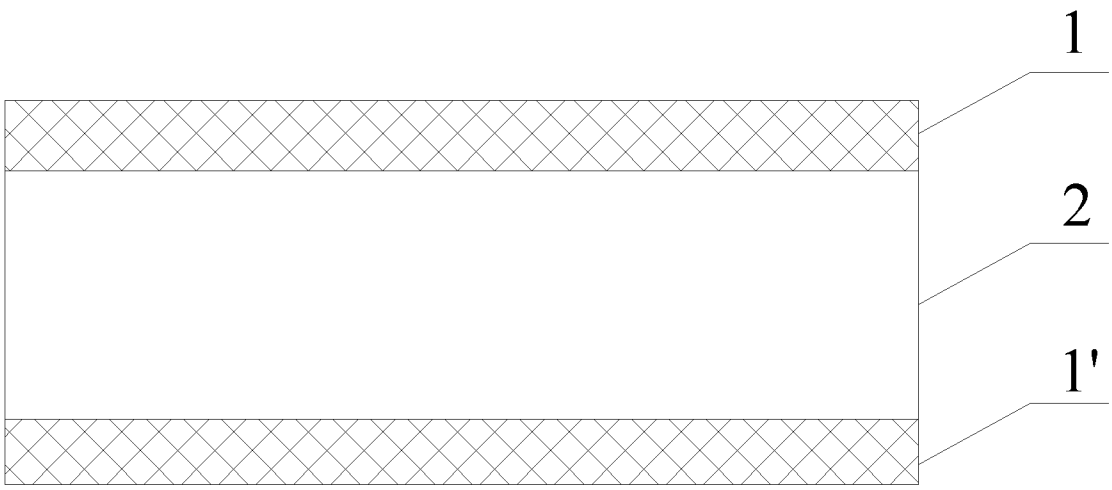

Fig. 1

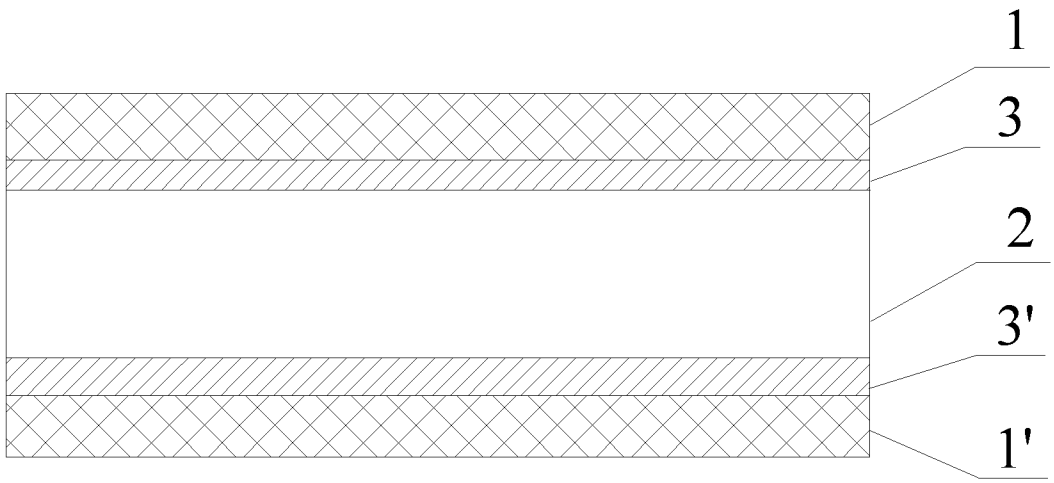

Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2010/078376

A. CLASSIFICATION OF SUBJECT MATTER

H01L 31/042（2006.01）i

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)

IPC:H01L31/, B32B

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 practicable, search terms used)
CPRS,CNTXT,CNKI,WPI,EPODOC: Backplane, back w plane, backsheet, back w sheet, metal, backside, back w cover, rear, resin, organic, solar, photovoltaic.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN101272903A (DAIKIN IND LTD) (JP) 24 Sep. 2008 (24.09.2008) see specification: line 7-line 22 of page 1, line 19-line 25 of page 2, line 22 of page 8, figs. 6-7	1-11,13-15
X	JP2002-134770A(TOPPAN PRINTING CO LTD)(JP) 10 May 2002 (10.05.2002) see specification: paragraphs [0010]-[0019], fig. 1	1-11,13-15
X	JP2008-53303A(MITSUBISHI JUKOGYO KK)(JP) 06 Mar. 2008 (06.03.2008) see specification: paragraphs [0025]-[0031], figs. 1-2	1-11,13-15
A	CN101542746A (DU PONT DE NEMOURS & CO E I) (US) 23 Sep. 2009 (23.09.2009) The whole document	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 application or patent 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	Date of mailing of the international search report
30 Jan. 2011 (30.01.2011)	**10 Feb. 2011 (10.02.2011)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer WANG, Xingyan Telephone No. (86-10)62411588

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2010/078376

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN101258611A (BP CORP NORTH AMERICA INC) (US) 03 Sep. 2008 (03.09.2008) The whole document	1-15
A	JP62-122181A (TOSHIBA KK) (JP) 03 Jun. 1987 (03.06.1987) The whole document	1-15

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2010/078376

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN101272903A	24.09.2008	WO2007010706A1	25.01.2007
		JP2007035694A	08.02.2007
		EP1938967A1	02.07.2008
		JP2010045376A	25.02.2010
JP2002-134770A	10.05.2002	NONE	
JP2008-53303A	06.03.2008	NONE	
CN101542746A	23.09.2009	US2008128018A1	05.06.2008
		WO2008070078A1	12.06.2008
		INDELNP200902900E	19.06.2009
		EP2097931A1	09.09.2009
		KR20090096487A	10.09.2009
		JP2010512027T	15.04.2010
CN101258611A	03.09.2008	US2007012352A1	18.01.2007
		WO2007011580A2	25.01.2007
		EP1905101A2	02.04.2008
		AU2006270366A1	25.01.2007
		INDELNP200800937E	27.06.2008
		KR20080041652A	13.05.2008
		JP2009502044T	22.01.2009
JP62-122181A	03.06.1987	NONE	