



(11) **EP 4 358 399 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
17.07.2024 Bulletin 2024/29

(51) International Patent Classification (IPC):
H02S 30/10^(2014.01)

(43) Date of publication A2:
24.04.2024 Bulletin 2024/17

(52) Cooperative Patent Classification (CPC):
H02S 30/10; Y02E 10/50

(21) Application number: **24162250.5**

(22) Date of filing: **03.11.2020**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **30.09.2020 CN 202011061500**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
22198520.3 / 4 131 773
20205561.2 / 3 979 491

(71) Applicants:
• **JINKO SOLAR CO., LTD.**
Shangrao, Jiangxi 334100 (CN)
• **ZHEJIANG JINKO SOLAR CO., LTD.**
Haining, Zhejiang (CN)

(72) Inventors:
• **GONG, Xinxin**
Shangrao, Jiangxi (CN)
• **GUO, Zhiqiu**
Shangrao, Jiangxi (CN)
• **LIU, Junhui**
Shangrao, Jiangxi (CN)
• **ZHANG, Zehui**
Shangrao, Jiangxi (CN)

(74) Representative: **Balder IP Law, S.L.**
Paseo de la Castellana 93
5ª planta
28046 Madrid (ES)

(54) **PHOTOVOLTAIC FRAME, PHOTOVOLTAIC MODULE AND METHOD FOR MANUFACTURING PHOTOVOLTAIC FRAME**

(57) The embodiments of the present disclosure relate to the field of photovoltaic module technology, and disclose a photovoltaic frame, a photovoltaic module and a method for manufacturing the photovoltaic frame. The photovoltaic frame comprises: a top support portion, a bottom support portion and a transverse edge portion. The top support portion and the transverse edge portion enclose a holding slot, and the top support portion has a bearing surface facing the holding slot. The bottom support portion is arranged opposite to the top support portion, and the transverse edge portion is located at one side of the top support portion away from the bottom support portion. The photovoltaic frame is molded by a carbon steel sheet material after processing.

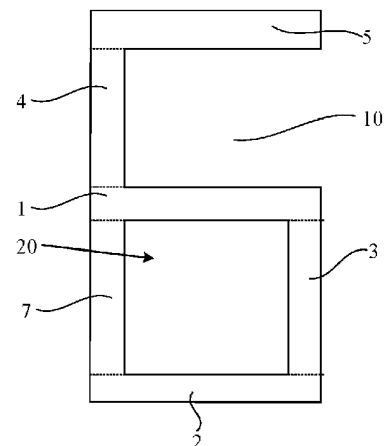


FIG. 1



EUROPEAN SEARCH REPORT

Application Number
EP 24 16 2250

5

10

15

20

25

30

35

40

45

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 206 697 500 U (WUXI INFINITY NEW ENERGY CO LTD) 1 December 2017 (2017-12-01) * figures 1-4 *	1,4-12	INV. H02S30/10
X	WO 2014/050078 A1 (SANYO ELECTRIC CO [JP]) 3 April 2014 (2014-04-03) * abstract; figures 1-4 *	1-3	
X	CN 211 209 641 U (HANWHA SOLARONE QIDONG CO LTD) 7 August 2020 (2020-08-07) * abstract; figures 1-3 *	1	
X	CN 207 994 980 U (JIANGYIN NANFANG NEW ENERGY TECH CO LTD) 19 October 2018 (2018-10-19) * abstract; figure 1 *	1	
X	CN 111 669 110 A (XIAN LONGI GREEN ENERGY ARCHITECTURE TECH CO LTD) 15 September 2020 (2020-09-15) * abstract; figures 3-12 *	1	
X	CN 208 272 919 U (TRINASOLAR CO LTD; TRINA SOLAR CHANGZHOU TECH CO LTD) 21 December 2018 (2018-12-21) * abstract; figures 1-8 * * section "Utility model content" *	1,4	
A	CN 208 572 012 U (SUZHOU XIECHUANG NEW ENERGY TECH CO LTD ET AL.) 1 March 2019 (2019-03-01) * abstract; figures 1-9 * * Description of the frame in carbon steel *	1	TECHNICAL FIELDS SEARCHED (IPC) H02S

The present search report has been drawn up for all claims

3

50

Place of search Berlin	Date of completion of the search 4 June 2024	Examiner Favre, Pierre
----------------------------------	--	----------------------------------

55

EPO FORM 1503 03:82 (F04C01)

CATEGORY OF CITED DOCUMENTS
X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons
.....
& : member of the same patent family, corresponding document



EUROPEAN SEARCH REPORT

Application Number
EP 24 16 2250

5

DOCUMENTS CONSIDERED TO BE RELEVANT

10

15

20

25

30

35

40

45

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2019/000512 A1 (SUZHOU COOP&INNO GREEN ENERGY TECH CO LTD [CN]) 3 January 2019 (2019-01-03) * abstract; figures 1-8 * * example 3 *	1	
A	EA 016 066 B1 (ARCELORMITTAL STAINLESS AND NICKEL ALLOYS [FR]; SOLARTE [FR]) 30 January 2012 (2012-01-30) * abstract; figures 1-4 * * paragraph [0075] - paragraph [0081] *	1	
A	CN 104 158 480 B (HUNAN RED SOLAR NEW ENERGY SCIENCE AND TECHNOLOGY CO LTD) 14 September 2016 (2016-09-14) * abstract; figures 2-4 *	1	
A	US 2016/322525 A1 (WANG SHENCUN [CN] ET AL) 3 November 2016 (2016-11-03) * abstract; figures 3,4 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)

3

The present search report has been drawn up for all claims

50

Place of search Berlin	Date of completion of the search 4 June 2024	Examiner Favre, Pierre
----------------------------------	--	----------------------------------

55

EPO FORM 1503 03:82 (F04C01)

CATEGORY OF CITED DOCUMENTS
 X : particularly relevant if taken alone
 Y : particularly relevant if combined with another document of the same category
 A : technological background
 O : non-written disclosure
 P : intermediate document

T : theory or principle underlying the invention
 E : earlier patent document, but published on, or after the filing date
 D : document cited in the application
 L : document cited for other reasons

 & : member of the same patent family, corresponding document

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 24 16 2250

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

04 - 06 - 2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 206697500 U	01-12-2017	NONE	
WO 2014050078 A1	03-04-2014	JP WO2014050078 A1 WO 2014050078 A1	22-08-2016 03-04-2014
CN 211209641 U	07-08-2020	NONE	
CN 207994980 U	19-10-2018	NONE	
CN 111669110 A	15-09-2020	NONE	
CN 208272919 U	21-12-2018	NONE	
CN 208572012 U	01-03-2019	NONE	
WO 2019000512 A1	03-01-2019	CN 109150083 A WO 2019000512 A1	04-01-2019 03-01-2019
EA 016066 B1	30-01-2012	AT E538500 T1 AU 2008257305 A1 BR PI0809749 A2 CA 2684530 A1 CN 101711433 A DK 2143149 T3 EA 200970982 A1 EG 25391 A EP 2143149 A2 ES 2379033 T3 FR 2915345 A1 HR P20120076 T1 IL 201645 A JP 4892767 B2 JP 2010525564 A KR 20100021571 A MA 31322 B1 PL 2143149 T3 PT 2143149 E TN 2009000430 A1 US 2010154327 A1 US 2012324808 A1 WO 2008145898 A2 ZA 200907341 B	15-01-2012 04-12-2008 30-09-2014 04-12-2008 19-05-2010 20-02-2012 30-04-2010 25-12-2011 13-01-2010 20-04-2012 24-10-2008 29-02-2012 30-09-2013 07-03-2012 22-07-2010 25-02-2010 01-04-2010 31-05-2012 06-03-2012 31-03-2011 24-06-2010 27-12-2012 04-12-2008 28-07-2010
CN 104158480 B	14-09-2016	NONE	
US 2016322525 A1	03-11-2016	CN 203746873 U	30-07-2014

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 24 16 2250

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

04 - 06 - 2024

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
15			EP 3089220 A1	02 - 11 - 2016
			JP 6289643 B2	07 - 03 - 2018
			JP 2017501582 A	12 - 01 - 2017
			KR 20160090356 A	29 - 07 - 2016
			US 2016322525 A1	03 - 11 - 2016
			WO 2015096493 A1	02 - 07 - 2015
20	-----			
25				
30				
35				
40				
45				
50				
55				

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82