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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

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

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(54) Title: PHOTOVOLTAIC PANEL-INTERFACED SOLAR-GREENHOUSE DISTILLATION SYSTEMS

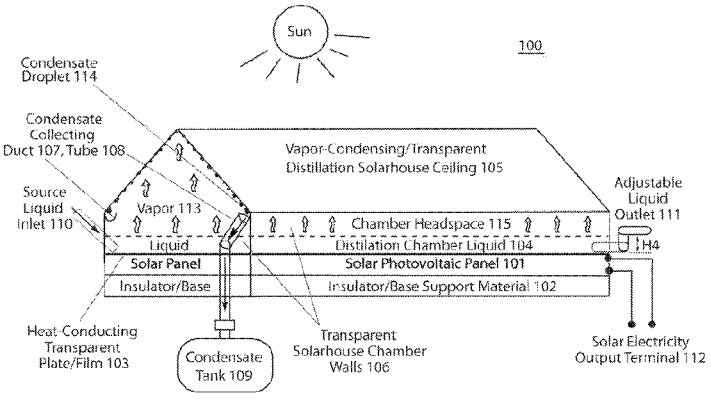


FIG. 1

(57) Abstract: A hybrid photovoltaic panel-interfaced solar-greenhouse distillation technology is provided that is capable of utilizing solar waste heat to perform liquid distillation while co-generating solar electricity. Solar waste heat co-generated at a photovoltaic panel is effectively utilized by in situ distillation liquid as an immediate heat sink in thermo contact with the photovoltaic panel front surface, thus providing beneficial cooling of the photovoltaic panel and co-making of distillation products while generating electricity with significant improvement on total-process solar energy utilization efficiency. Its enabled beneficial utilization of waste heat can provide a series of distillation-related products such as: freshwater, sea salts, distilled water, hot water, hot steam, saline/brine products, and brine photobiological cultures for production of advanced biofuels and bioproducts, in addition to solar electricity.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/065852

A. CLASSIFICATION OF SUBJECT MATTER

B01D 3/00(2006.01)i, F24J 2/00(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)

B01D 3/00; B01D 3/02; F24J 3/02; A01G 9/24; F24H 3/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: photovoltaic, panel, solar, greenhouse, liquid distillation, extraction, reforming, isomerization, synthesis

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4323052 A (STARK, VIRGIL) 06 April 1982 See abstract, column 12, line 58-column 13, line 44, column 14, line 54-column 15, line 8, claim 1	1-20
A	EP 0005103 A1 (COMMISSARIAT ENERGIE ATOMIQUE et al.) 31 October 1979 See abstract, figures 1-4, pages 1-15	1-20
A	US 4194949 A (STARK, VIRGIL) 25 March 1980 See abstract, column 21, lines 25-53, column 23, line 67-column 25, line 20, column 26, line 61-column 27, line 33, claim 1	1-20
A	US 2008/0131830 A1 (NIX, MARTIN E.) 05 June 2008 See abstract, paragraphs [0201], [0204]-[0205], [0214]-[0215], claim 1	1-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"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

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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