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(71) Applicant: **HOLTEC INTERNATIONAL** [US/US]; 1 Holtec Boulevard, Camden, New Jersey 08104 (US).

(72) Inventors: **SINGH, Krishna P.**; 490 Mariner Road, Jupiter, Florida 33477 (US). **GOSWAMI, Dharendra Yogi**; 17952 Cachet Isle Dr., Tampa, Florida 33647 (US). **RAMPALL, Indresh**; 353 Tuvira Ln, Cherry Hill, New Jersey 08003 (US).

(74) Agent: **SPANITZ, Frank J.** et al.; 1800 JFK Boulevard, Suite 1010, Philadelphia, Pennsylvania 19103 (US).

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(54) Title: SOLAR POWER GENERATION SYSTEM

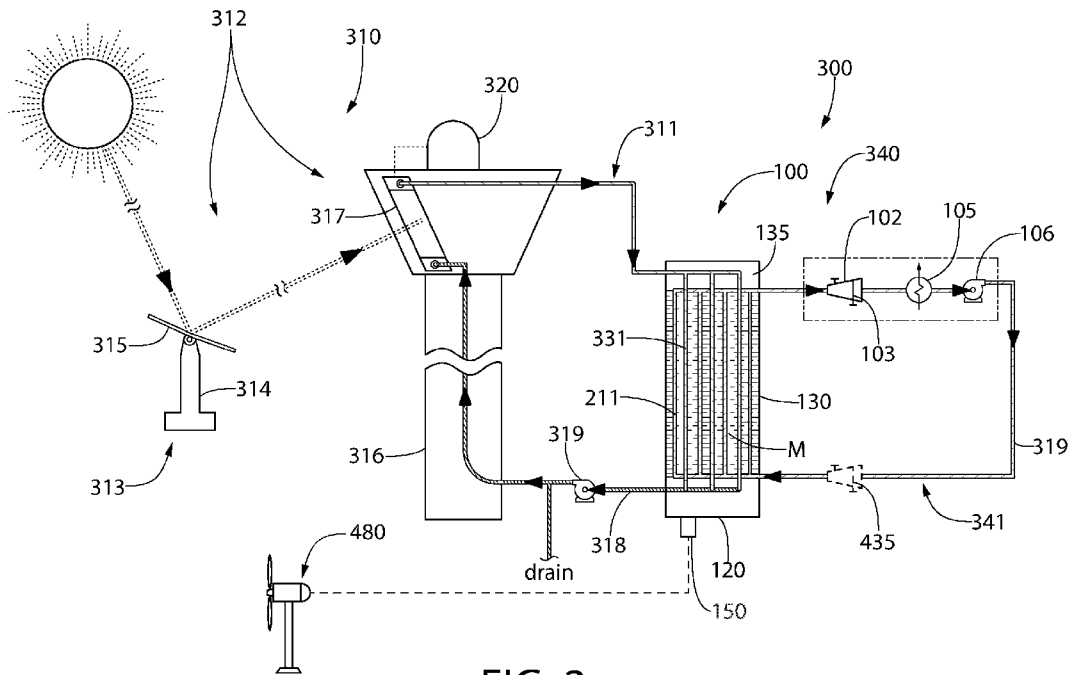


FIG. 2

(57) Abstract: A solar power generation system includes a thermal energy storage vessel containing a thermal mass composition operable to store thermal energy, solar energy collection system, and power generation system. The collection system comprises a first closed flow loop including a solar collector which absorbs solar energy and heats a first working fluid. The heated first working fluid recirculates through a first closed flow loop through and heats the thermal mass composition. The generation system comprises a second closed flow loop including a turbine-generator. The second closed flow loop recirculates a second working fluid through the thermal mass composition to absorb thermal energy and heat the second working fluid which flows to the turbine and the generator produces electricity. The second working fluid may be water/steam or a compressible gas. The thermal mass composition comprises a mixture of a phase change material such as salt and a metallic material.



MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA,
NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO,
RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS,
ZA, ZM, ZW.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2024/032921

A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. F24S 10/20; F24S 10/30; F24S 10/50; F24S 10/70; F24S 20/20; F24S 20/25; F24S 23/70; F24S 23/71 (2024.01)

ADD.

CPC - INV. F24S 10/20; F24S 10/30; F24S 10/50; F24S 10/70; F24S 20/20; F24S 20/25; F24S 23/10; F24S 23/70

ADD.

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)
See Search History document

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

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2011/0114079 A1 (HECKENDORN) 19 May 2011; Fig. 1; Fig. 2A; FIG. 2B; paragraph 0043; paragraph 0044; paragraph 0045	1-7, 16, 17, 23-28, 34-37
Y	US 4,624,242 A (MCCALL) 25 November 1986; Fig. 1; Fig. 3; Fig. 5; Fig. 12; Fig. 18; column 5, lines 16-18; column 5, lines 20-25; column 6, lines 4-6; column 7, lines 66-68; column 8, lines 1-4	1-7, 16, 17, 23-28, 34-37
Y --- A	US 2013/0298964 A1 (NUNEZ BOOTELLO ET AL.) 14 November 2013; Fig. 4; paragraph 0056; paragraph 0156	34 --- 1-7, 16, 17, 23-28, 34-37
Y --- A	US 6,400,896 B1 (LONGARDNER) 04 June 2002; Figs. 2-5; column 6, lines 27-33	35 --- 1-7, 16, 17, 23-28, 34, 36, 37
Y --- A	US 4,004,573 A (FRIELING ET AL.) 25 January 1977; Fig. 1; column 6, lines 14-18	36 --- 1-7, 16, 17, 23-28, 34, 35, 37
Y --- A	US 1,109,923 A (HILLER) 08 September 1914; Fig.; pg. 1, lines 100-105	37 ---

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	“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
“D” document cited by the applicant in the international application	“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
“E” earlier application or patent but published on or after the international filing date	“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
“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)	“&” document member of the same patent family
“O” document referring to an oral disclosure, use, exhibition or other means	
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Date of the actual completion of the international search

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Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-8300

Authorized officer

Shane Thomas

Telephone No. PCT Helpdesk: 571-272-4300

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2024/032921

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.:
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:

- 3. Claims Nos.: 8-15,18-22,29-33
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:

- 1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
- 2. As all searchable claims could be searched without effort justifying 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.:

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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2024/032921

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
		1-7, 16, 17, 23-28, 34-36