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(72) Inventors; and

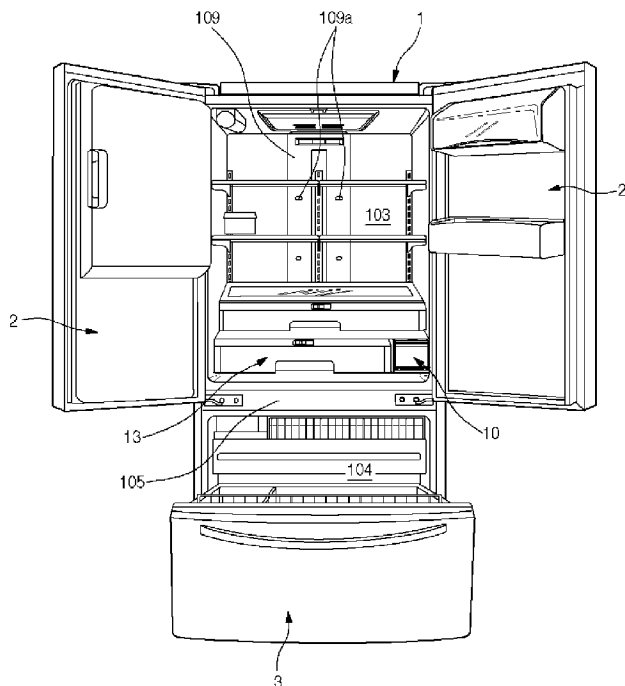
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[Continued on next page]

(54) Title: REFRIGERATOR AND COOLING APPARATUS

[Fig. 2]



(57) Abstract: Provided are a refrigerator and a cooling apparatus. The refrigerator includes a refrigerator body, a refrigerating compartment and a freezing compartment being configured to maintain operating temperatures that differ, with the freezing compartment having an operating temperature that is lower than an operating temperature of the refrigerating compartment, a cooling apparatus that is positioned in the refrigerating compartment and that is configured to cool liquid held by a container positioned in the cooling apparatus to a refrigerated temperature faster than the refrigerating compartment, the refrigerated temperature being higher than a freezing temperature, and a controller configured to detect a condition of the refrigerator and control operation of the cooling apparatus based on the detected condition of the refrigerator.



SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, ZA, ZM, ZW.

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- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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A. CLASSIFICATION OF SUBJECT MATTER***F25D 11/02(2006.01)i, F25D 29/00(2006.01)i, F25D 25/00(2006.01)i, F25D 19/00(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)

F25D 11/02; F25D 17/04; F25D 3/12; F25D 11/00; F25D 23/00

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: refrigerator, cooling, controller, door

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	KR 10-2005-0041036 A (LG ELECTRONICS INC.) 04 May 2005 See page 6, 7, and figures 1, 4.	1,22 2-6
A	KR 10-2000-0009208 A (SAMSUNG ELECTRONICS CO., LTD.) 15 February 2000 See abstract, figures 2, 5.	1-6,22
A	US 2007-0151284 A1 (JON FREESMEIER) 05 July 2007 See abstract, paragraphs [0024] - [0026], and figures 1, 4.	1-6,22
A	KR 20-2000-0000951 U (DAEWOO ELECTRONICS CORPORATION) 15 January 2000 See claims 1-2], and figures 1, 2.	1-6,22



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 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

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2011/005162**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.: 8, 11- 13,15 ,16
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:
Claims 8, 11- 13,15 ,16 are not to make meaningful search, because the claims refer multiple dependent claim.
3. ☒ Claims Nos.: 7, 9, 10, 14,17-21
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 an additional fee, this Authority did not invite payment of any additional fee.
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

Information on patent family members

International application No.

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KR 10-2005-0041036 A

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15.02.2000

None

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US 7343748 B2

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None