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C01B 21/20 (2006.01)

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Declarations under Rule 4.17:

[Continued on next page]

(54) Title: GENERATION OF STERILANT GASSES AND USES THEREOF

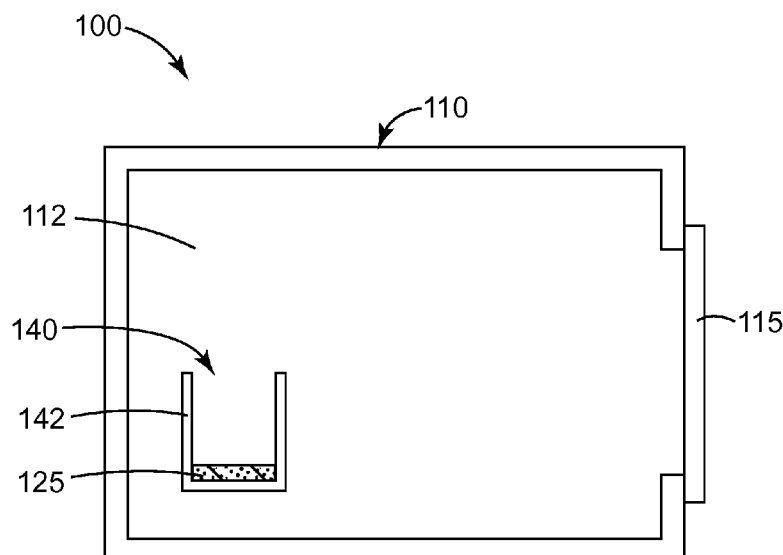


Fig. 1

(57) Abstract: The disclosure provides processes and systems for sterilizing an object using a sterilant gas. In some embodiments, the sterilant gas is produced by the thermal decomposition of a salt. Compositions to generate sterilant gasses are also disclosed.



- 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))
- 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))

(88) Date of publication of the international search report:

19 May 2011

Published:

- with international search report (Art. 21(3))

A. CLASSIFICATION OF SUBJECT MATTER*A61L 2/20(2006.01)i, B01J 7/00(2006.01)i, C01B 21/20(2006.01)i, A61L 101/02(2006.01)n, A61L 101/06(2006.01)n*

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)

A61L 2/20; C01G 45/02

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2007-0014686 A1 (ERNST ARNOLD et al.) 18 January 2007 See the abstract; the paragraphs 16-18, 21, 25, 57, 60, 61, 105; claims 1-10, 27, 32, 64-73; and Fig.1.	1-4, 10-13, 27-34 , 48-50, 52
Y	Malecki, A., et al., Formation of N2O during thermal decomposition of d-metal hydrates nitrates, Thermochimica Acta 446 (2006), pp.113-116 See the abstract and the equation(1) on page 113.	1-4, 10-13, 27-34
Y	Mihit, M., et al., Applied Surface Science 252 (2006), pp.2389-2395 See the right column on page 2389.	48-50, 52
A	US 2737445 (Nossen, E.S.) Mar.6, 1956 See the equation (1); and col.2, lines 25-40.	1-4, 10-13, 27-34 , 48-50, 52
A	US 4141963 A1 (MILLER; RALPH) 27 February 1979 See the abstract and the equation(col.3, line 6).	1-4, 10-13, 27-34 , 48-50, 52
A	Stern, K.H., High Temperature Properties and Decomposition of Inorganic Salts Part 3. Nitrates and Nitrites, J.Phys.Chem.Ref.Data, Vo.1, No.3, 1972 See right col.(p.755), the right col.(Copper, p.757), left col.(Manganese, p.761), the right col.(Zn, p.770).	1-4, 10-13, 27-34 , 48-50, 52



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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Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/040152**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, 16, 21, 23, 26, 36, 39, 42, 46
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, 16, 21, 23, 26, 36, 39, 42, 46 are unclear because they are dependent claims referring to dependent claims which are not drafted in accordance with the second and third sentence of Rule 6.4(a).
3. ☒ Claims Nos.: 5-7, 9, 14, 15, 17-20, 22, 24, 25, 35, 37, 38, 40, 41, 43-45, 47, 51
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:

This ISA found multiple inventions as follows:

Group I, claims 1-47, drawn to a process for producing a sterilant gas by decomposition of thermolabile salt by heating, a composition and a sterilizing system thereof.

Group II, claims 48-52, drawn to a process and a system for sterilizing an object by a sterilant gas generated by the reaction of an oxidizable metal with an acid.

The same special technical feature between the groups I and II is a process and a system for sterilizing an object by a sterilant gas. However, this special technical feature is disclosed in US 2007/0014686 A1 (Jan.18, 2007). And there is no technical relationship left over the prior art between the groups I and II leaving the said groups without a single general inventive concept. Hence, there is a lack of unity "a posteriori".(PCT Rules 13.1 and 13.2)

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.

PCT/US2010/040152

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