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(54) Title: A STERILIZATION APPARATUS FOR STERILIZING A WEB OF PACKAGING MATERIAL AND A STERILIZATION METHOD

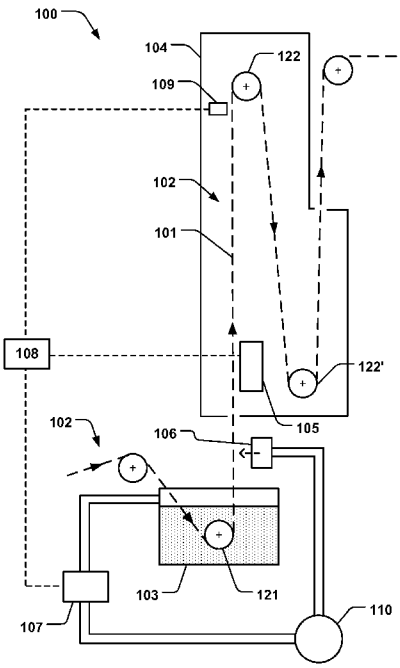

Fig. 1

(57) Abstract: A sterilization apparatus for sterilizing a web of packaging material being conveyed along a path thereof, in an upstream- to a downstream direction, is disclosed. The sterilization apparatus comprises a sterilizing module in which a sterilizing agent is applied to the web, a sterilization chamber through which the web is fed when conveyed downstream of the sterilizing module, a heating unit configured to heat the web in a heating medium when fed through the sterilization chamber, and a pressurized gas outlet arranged upstream of the heating unit and downstream of the sterilizing module, wherein the pressurized gas is configured to expel a pressurized gas, having a lower temperature than said heating medium, towards the web. A method of sterilizing a web of packaging material and a related packaging machine are also disclosed.

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[Continued on next page]

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

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/068401

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61L2/04 A61L2/18 B65B55/10 B65B55/06
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)
A61L B65B

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

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

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 874 668 B1 (TETRA LAVAL HOLDINGS & FINANCE [CH]) 19 April 2017 (2017-04-19) paragraphs: [0010-0011], [0014-0017], [0019-0020], [0022], [0025], [0029], [0031] figure: 1 -----	1-5, 11-13, 15,16
X	WO 2015/090720 A1 (TETRA LAVAL HOLDINGS & FINANCE [CH]) 25 June 2015 (2015-06-25) page 3: line 19-33; figure: 1 -----	1

☐ 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 another 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	Date of mailing of the international search report
11 September 2018	18/01/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Nania, Manuela

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2018/068401

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.:
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:

see additional sheet

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 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.:

2-5, 12, 13(completely); 1, 11, 15, 16(partially)

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 2-5, 12, 13(completely); 1, 11, 15, 16(partially)

   sterilising a web of packaging material with a sterilising agent, further employing a heating unit and a pressurised gas outlet whose temperature is regulated according to the temperature of the web

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2. claims: 6-10, 14(completely); 1, 11, 15, 16(partially)

   sterilising a web of packaging material with a sterilising agent, further providing an aseptic chamber with multiple pressurised gas outlets to remove the residues of sterilising agent from the web

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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