

**PATENT COOPERATION TREATY**

**TRANSLATION**

From the  
INTERNATIONAL SEARCHING AUTHORITY

**PCT**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year) **see form PCT/ISA/210**

Applicant's or agent's file reference <b>SL/ALST 11</b>		<b>FOR FURTHER ACTION</b> See paragraph 2 below
International application No. <b>PCT/FR2010/051350</b>	International filing date (day/month/year) <b>29.06.2010</b>	Priority date (day/month/year) <b>29.06.2009</b>
International Patent Classification (IPC) or both national classification and IPC <b>C02F1/42, F22B37/00, C02F103/02</b>		
Applicant <b>ALSTOM TECHNOLOGY LTD</b>		

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP	Date of completion of this opinion	Authorized officer
Facsimile No.		Telephone No.

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Box No. I	Basis of this opinion
1.	<p>With regard to the <b>language</b>, this opinion has been established on the basis of:</p> <p><input checked="" type="checkbox"/> the international application in the language in which it was filed</p> <p><input type="checkbox"/> a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).</p>
2.	<p><input type="checkbox"/> This opinion has been established taking into account the <b>rectification of an obvious mistake</b> authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))</p>
3.	<p>With regard to any <b>nucleotide and/or amino acid sequence</b> disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:</p> <p>a. type of material</p> <p><input type="checkbox"/> a sequence listing</p> <p><input type="checkbox"/> table(s) related to the sequence listing</p> <p>b. format of material</p> <p><input type="checkbox"/> on paper</p> <p><input type="checkbox"/> in electronic form</p> <p>c. time of filing/furnishing</p> <p><input type="checkbox"/> contained in the international application as filed</p> <p><input type="checkbox"/> filed together with the international application in electronic form</p> <p><input type="checkbox"/> furnished subsequently to this Authority for the purposes of search</p>
4.	<p><input type="checkbox"/> In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.</p>
5.	<p>Additional comments:</p>

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

the entire international application

claims Nos. 1-11

because:

the said international application, or the said claims Nos. \_\_\_\_\_ relate to the following subject matter which does not require an international search (*specify*):

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 1-11 are so unclear that no meaningful opinion could be formed (*specify*):

**See Supplemental Box**

the claims, or said claims Nos. \_\_\_\_\_ are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

no international search report has been established for said claims Nos. \_\_\_\_\_

a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13ter.1(a) or (b).

a meaningful opinion could not be formed without the tables related to the sequence listings; the applicant did not, within the prescribed time limit, furnish such tables in electronic form complying with the technical requirements provided for in Annex C-bis of the Administrative Instructions, and such tables were not available to the International Searching Authority in a form and manner acceptable to it.

the tables related to the nucleotide and/or amino acid sequence listing, if in electronic form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

See Supplemental Box for further details.

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<b>Box No. V</b>	<b>Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</b>
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1. Statement			
Novelty (N)	Claims	12, 13	YES
	Claims	_____	NO
Inventive step (IS)	Claims	_____	YES
	Claims	12, 13	NO
Industrial applicability (IA)	Claims	12, 13	YES
	Claims	_____	NO

2. Citations and explanations:
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2 Reference is made to the following documents (the references between parentheses relate to said documents):

D1 US 4 532 045 A (LITTMANN ROBERT J [US]) 30 July 1985

D2 FR 2 009 659 A5 (MANNESMANN AG) 6 February 1970

D3 FR 1 294 144 A (COMMISSARIAT ENERGIE ATOMIQUE; GRENOBLOISE ETUDE APPL) 26 May 1962

D4 US 3 056 651 A (MCILHENNY WILLIAM F ET AL) 2 October 1962

D5 US 3 976 541 A (STITELER FRED ZWALD ET AL) 24 August 1976

3 The present application does not meet the requirements of PCT Article 33(1) since the subject matter of claims 12 and 13 does not involve an inventive step (PCT Article 33(3)).

3.1 Document D1, which is considered to be the prior art closest to the subject matter of independent process claim 12, describes a process for treating the make-up water for a cooling circuit comprising the following steps [Figure 1; column 9, lines 5-30]:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- a tank [reference 4 in Figure 1; column 9, lines 20-21] is provided that contains capturing means suitable for fixing the calcium ions present in the make-up water [see column 4, in particular lines 16-18 and 62-64];

- the make-up water is fed into the tank [column 9, lines 14-16]; and

- the laden capturing means are regenerated [column 9, lines 24-26].

3.2 Therefore, the subject matter of claim 12 differs from this known water treatment process in that:

(i) the make-up water is fed continuously;

(ii) the feed flow rate of the make-up water into the tank is greater than about 1 m<sup>3</sup>/s; and

(iii) the regeneration system comprises a transfer circuit and a regeneration column into which the capturing means are fed and then regenerated before being reinjected into the tank.

3.3 The process of claim 12 has various advantages, as described on page 7, line 30 to page 9, line 31 of the description of the present application. For example, it enables the make-up water to be fed continuously at a very high flow rate.

3.4 The problem addressed by the present invention can therefore be considered that of how to improve the cooling circuit described in document D1, in particular in such a way that the make-up water can be fed continuously at a flow rate greater than

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1 m<sup>3</sup>/s.

3.5 The process described in document D1 refers to high water flow rates [column 10, lines 39-49]. Modification of these flow rates so as to achieve flow rates greater than 1 m<sup>3</sup>/s does not in itself seem to require modifying the process described other than by increasing the size of the plant.

Moreover, systems for continuously regenerating ion exchange resins using a circulation circuit and a regeneration column, and allowing continuous feed of the water to be treated, are known in the prior art (see for example documents D2 to D5).

Although these documents do not specifically describe systems for treating volumes in excess of 1 m<sup>3</sup>/s or systems for treating the make-up water for cooling circuits, they do allow the treatment of large volumes of water (see for example the first two lines of document D3) for various industrial applications; they also clearly demonstrate the advantage that there is in using a system for the continuous regeneration of the ion exchange resins (see for example page 2, lines 5-11 of document D2).

3.6 Therefore, a person skilled in the art wishing to solve the stated problem would consider modifying the dimensions of the cooling circuit described in document D1 in such a way that it can treat volumes in excess of 1 m<sup>3</sup>/s, and he would also be aware that a continuous regeneration system involving a

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regeneration column and a circulation circuit is a solution allowing continuous inflow of the water to be treated. He would therefore consider incorporating such a system in the cooling circuit described in document D1 to solve the stated problem.

Therefore, the subject matter of claim 12 does not involve an inventive step.

3.7 Dependent claim 13 does not contain any features which, in combination with the features of claim 12 to which it refers, define subject matter which meets the requirements of inventive step, since the features of this claim are described in documents D1 to D5 or else represent minor variations or improvements regarding the systems and processes described in these documents.

**Box No. VIII**      **Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

4      The application fails to comply with the requirements of PCT Article 6 since claims 1, 2 and 5-12 are unclear.

4.1    Claim 1 and claims 2-11, which are dependent thereon, are unclear for all the reasons explained above in Box III and therefore do not meet the requirements of PCT Article 6.

4.2    Moreover, claims 1 and 12 are independent claims, which must relate to the essential features of the invention (see PCT Guidelines 5.15). In the present case, certain of the features of independent apparatus claim 1 have no counterpart in independent process claim 12, and vice versa. Thus, claim 12 makes no reference to the surface area for percolation, which is mentioned in claim 1, while claim 1 makes no reference to calcium ions, which are mentioned in claim 12. The different terminology employed for the circuit between the tank and the regeneration column, which is called the circulation circuit in claim 1, and called the transfer circuit in claim 12, also suggests that these two circuits perhaps have different features.

In conclusion, the essential features of the invention are not clearly defined and it follows that the subject matter of claims 1 and 12 is not clear (PCT Article 6).



Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box III

1 Device claims 1-11 are so unclear that it is not possible to establish an opinion regarding the novelty and inventive step for these claims. The reasons are as follows:

1.1 Claim 1 refers to a cooling circuit comprising a system for treating the make-up water for the cooling circuit. Since the make-up water treatment system is defined as part of the cooling circuit, it is not possible for the treated make-up water exiting the tank (lines 7-8 and 16-17 of claim 1), which forms part of the make-up water treatment system, to be injected into the cooling circuit since it is already in this circuit. This inconsistency casts doubt in such a way that it is not clear whether the water treatment system, which relates to a cooling circuit, forms part of the cooling circuit or not, and therefore whether it forms part of the desired field of protection or not.

1.2 Claim 1 is not clear since the term "surface area for percolation" has no recognized meaning. As a result, a person skilled in the art would not know if this surface area is the overall surface area of the treatment tank or if it is calculated as the sum of the surface areas of each of the resin beads present in the tank, or else if this is yet another surface area which could be defined otherwise, such as for example the "transverse surface area for

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percolation", which is defined in the description on page 8, lines 8-11. Since these various possibilities correspond to very different features, it follows that claim 1 is unclear.

1.3 In addition, the expression "the surface area for percolation possibly exceeding 250 m<sup>2</sup>" is unclear, since the feature introduced by this expression seems to be optional, thereby contributing to making claim 1 unclear.

1.4 Several features of claim 1 serve more to explain the operating mode of the device rather than clearly defining the device in terms of technical features. This is especially the case for the following features:

"a tank receiving make-up water";

"the make-up water exiting the tank being injected into the cooling circuit";

"the laden capturing means are regenerated and/or decontaminated... reinjected ...";

"the supply of make-up water operating continuously";

"the feed flow rate of the make-up water into the tank being greater than about 1 m<sup>3</sup>/s".

The corresponding restrictions of claim 1 are therefore not clearly apparent from this claim.

In particular, the references to the make-up water suggest that the make-up water itself forms part of the device and that the empty apparatus

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therefore does not form part of the desired field of protection. However, a water treatment apparatus is in general defined independently of the water that it is intended to treat.

Therefore, claim 1 lacks clarity.

1.5 The features of device claims 2 and 5-11 also relate to an embodiment of the device, instead of clearly defining this device in terms of technical features. The intended restrictions are therefore not clearly apparent from the claims.

1.6 As a consequence, it is not possible to issue an opinion as regards novelty and inventive step in respect of independent claim 1 and consequently claims 2-11 which are dependent thereon.