

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

|                                                                                                                              |                                                                                     |                                                                         |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Applicant's or agent's file reference<br>P101166WO01                                                                         | <b>FOR FURTHER ACTION</b>                                                           | See item 4 below                                                        |
| International application No.<br>PCT/EP2022/050807                                                                           | International filing date ( <i>day/month/year</i> )<br>14 January 2022 (14.01.2022) | Priority date ( <i>day/month/year</i> )<br>15 January 2021 (15.01.2021) |
| International Patent Classification (IPC) or national classification and IPC<br>See relevant information in Form PCT/ISA/237 |                                                                                     |                                                                         |
| Applicant<br>TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)                                                                          |                                                                                     |                                                                         |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                  |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
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| 1.                                  | This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 <i>bis</i> . I(a).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                  |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| 2.                                  | This REPORT consists of a total of 8 sheets, including this cover sheet.<br><br>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                  |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| 3.                                  | <p>This report contains indications relating to the following items:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 80%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> | <input checked="" type="checkbox"/>                                                                                                                              | Box No. I | Basis of the report | <input type="checkbox"/> | Box No. II | Priority | <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | <input type="checkbox"/> | Box No. IV | Lack of unity of invention | <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement | <input checked="" type="checkbox"/> | Box No. VI | Certain documents cited | <input checked="" type="checkbox"/> | Box No. VII | Certain defects in the international application | <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application |
| <input checked="" type="checkbox"/> | Box No. I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Basis of the report                                                                                                                                              |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input type="checkbox"/>            | Box No. II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Priority                                                                                                                                                         |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input type="checkbox"/>            | Box No. III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability                                                                 |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input type="checkbox"/>            | Box No. IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Lack of unity of invention                                                                                                                                       |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Reasoned statement under Article 35(2) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. VI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Certain documents cited                                                                                                                                          |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. VII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Certain defects in the international application                                                                                                                 |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. VIII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Certain observations on the international application                                                                                                            |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| 4.                                  | The International Bureau will communicate this report to designated Offices in accordance with Rules 44 <i>bis</i> .3(c) and 93 <i>bis</i> .1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44 <i>bis</i> .2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                  |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                  |                                     |            |                         |                                     |             |                                                  |                                     |              |                                                       |

|                                                                                               |                                                                                                                            |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|                                                                                               | Date of issuance of this report<br>04 July 2023 (04.07.2023)                                                               |
| The International Bureau of WIPO<br>34, chemin des Colombettes<br>1211 Geneva 20, Switzerland | Authorized officer<br><br><div style="text-align: center; font-weight: bold;">Nora Lindner</div> e-mail pct.team5@wipo.int |

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:

see form PCT/ISA/220

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

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

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/EP2022/050807

International filing date (day/month/year)  
14.01.2022

Priority date (day/month/year)  
15.01.2021

International Patent Classification (IPC) or both national classification and IPC  
INV. H04W68/02

Applicant  
TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)

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 and 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 usually 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.

Name and mailing address of the ISA:



European Patent Office  
P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040  
Fax: +31 70 340 - 3016

Date of completion of  
this opinion

see form  
PCT/ISA/210

Authorized Officer

García, Montse

Telephone No. +31 70 340-0



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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of:
  - ☒ the international application in the language in which it was filed.
  - ☐ 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)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
  - a. ☐ forming part of the international application as filed:
    - ☐ in the form of an Annex C/ST.25 text file.
    - ☐ on paper or in the form of an image file.
  - b. ☐ furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
  - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
    - ☐ in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
    - ☐ on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

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**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**

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1. Statement

|                               |             |             |
|-------------------------------|-------------|-------------|
| Novelty (N)                   | Yes: Claims | <u>1-38</u> |
|                               | No: Claims  |             |
| Inventive step (IS)           | Yes: Claims | <u>1-38</u> |
|                               | No: Claims  |             |
| Industrial applicability (IA) | Yes: Claims | <u>1-38</u> |
|                               | No: Claims  |             |

2. Citations and explanations

see separate sheet

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**Box No. VI Certain documents cited**

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1. Certain published documents (Rules 43bis.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43bis.1 and 70.9)

see form 210

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

see separate sheet

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

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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:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement.

[1] Reference is made to the following documents:

- D1       ERICSSON: "Discussion on potential paging enhancements for UE power savings",  
3GPP DRAFT; R1-2009200, 3RD GENERATION PARTNERSHIP  
PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES  
LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE  
,  
vol. RAN WG1, no. e-Meeting; 20201026 - 20201113 24 October 2020  
(2020-10-24), XP051946891,  
Retrieved from the Internet:  
URL:[https://ftp.3gpp.org/tsg\\_ran/WG1\\_RL1/TSGR1\\_103-e/Docs/  
R1-2009200.zip](https://ftp.3gpp.org/tsg_ran/WG1_RL1/TSGR1_103-e/Docs/R1-2009200.zip) R1-2009200 Discussion on potential paging enhancements  
for UE power savings.docx  
[retrieved on 2020-10-24]
- D2       QUALCOMM INCORPORATED: "Paging enhancements for idle/inactive  
UE power saving",  
3GPP DRAFT; R1-2104682, 3RD GENERATION PARTNERSHIP  
PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES  
LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE  
,  
vol. RAN WG1, no. e-Meeting; 20210510 - 20210527 12 May 2021  
(2021-05-12), XP052010933,  
Retrieved from the Internet:  
URL:[https://ftp.3gpp.org/tsg\\_ran/WG1\\_RL1/TSGR1\\_105-e/Docs/  
R1-2104682.zip](https://ftp.3gpp.org/tsg_ran/WG1_RL1/TSGR1_105-e/Docs/R1-2104682.zip) R1-2104682 Paging enhancements for idle inactive UE  
power saving.docx  
[retrieved on 2021-05-12]
- D3       ERICSSON: "Summary of [AT116-e][046][ePowSav] Paging Early  
Indication",  
3GPP DRAFT; R2-2111562, 3RD GENERATION PARTNERSHIP  
PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES  
LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE

,  
vol. RAN WG2, no. eMeeting; 20211101 - 20211112 16 November 2021  
(2021-11-16), XP052077503,  
Retrieved from the Internet:  
URL:https://ftp.3gpp.org/tsg\_ran/WG2\_RL2/TSGR2\_116-e/Docs/  
R2-2111562.zip R2-2111562 Summary of [AT116-e][046][ePowSav]  
Paging Early Indication.docx  
[retrieved on 2021-11-16]

[2] D1 is regarded as being the prior art closest to the subject-matter of claim 1, and discloses ( see for example page 2 figure 1)

A method by a wireless device comprising:  
receiving, from the network node, the PEI; and based on the mapping of the PEI to ~~the plurality of paging occasions, monitoring (1206) a shared channel during the plurality of~~  
~~paging occasions~~ a paging occasion monitor a shared channel during the paging occasion.

[3] The subject-matter of claim 1 therefore differs from this known D1 in that the PEI is mapped to a plurality of paging occasions instead to a one to one mapping:

(1 PEI ---> 1 PO)

[4] The problem to be solved by the present invention may be regarded as how to reduce the overhead and power consumption for the network (gNB) in idle mode.

[5] The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) because starting from D1 and trying to solve the problem of reducing the network overhead and power consumption in idle mode, the person skilled in the art would not have been hinted to the solution proposed in claim 1.

PEI transmission is an additional cost for the NW/gNB in idle mode, in terms of resources not available for data transmission, and due to the need to wake up from sleep states to perform additional transmissions. There may also be cases where the NW regularly needs to go active only to transmit PEI. In the prior art the PEI is considered as a one-to-one mapping, i.e., one PEI per PO. This, in turn, means the NW has to send one additional signal in idle mode for each PO, leading to a large NW overhead and power consumption. The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) because starting from D1 and trying to solve this problem the person skilled in the art

would not have been hinted to the solution proposed in claim 1.

[6] The above analysis equally applies to independent claims 14, 35 and 36. which are related to the same subject-matter as claim 1.

[7] The dependent claims 2-13 and 15-34 meet therefore as well the requirements of the PCT with respect to novelty and inventive step.

#### **Re Item VI**

Documents D2 and D3 are PX documents. The priority of the application has been accordingly checked and is valid.

#### **Re Item VII**

Certain defects in the international application

[8.1]The independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

[8.2]Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 is not mentioned in the description, nor is this document identified therein.

#### **Re Item VIII**

Certain observations on the international application

[9.1]The vague and imprecise statement "spirit" in the description in last paragraph implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in a lack of clarity of the claims (Article 6 PCT) when the description is used to interpret the claims. This statement should therefore be amended to remove this inconsistency.

9.2 Although claims 35 and 37 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in

respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

The same reasoning applies to corresponding claims 36 and 38.

In order to overcome these objections claims 37 and 38 should be deleted.