

## SEARCH RECORD

**Title of invention:** ELECTRICAL TOMOGRAPHY FOR VERTICAL PROFILING

**Application No:** PCT/FI2017/050628

**Priority application No:**

- No priorities -

**Minimum documentation searched (classification system followed by classification):**

**IPC:** G01N, G01R, G01V

**CPC:** G01N, G01R, G01V

**others:**

**Documentation searched other than minimum (FI,SE,NO,DK):**

IPC: G01N27/07, G01N27/22, G01N33/28, G01R27/22

**Electronic data bases consulted during the the novelty search:**

EPODOC, EPO-Internal full-text databases, Full-text translation databases from Asian languages, WPIAP, PRH-Internal, XP3GPP, XPAIP, XPESP, XPETSI, XPI3E, XPIEE, XPIETF, XPIOP, XPIPCOM, XPJPEG, XPMISC, XPOAC, XPRD, XPTK, COMPDX, INSPEC, TDB, NPL

**Language(s) in which the search was carried out:**

English

**Examiners consulted:**

Verifying examiner Tomi Koskinen

Date	Examiner
07.02.2018	Ville Möttönen

**The listing of the search history:**

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? ..FI $ABS2
? /IN/PA ROCSOLE
** SS 5: Results 34
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** SS 6: Results 2.246
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** SS 7: Results 3.725.502
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IMPEDANCE W TOMOGRAPH+), EIT, (ELECTRIC+ W RESIST+ W TOMOGRAPH+), ERT)
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** SS 7: Results 3
? AND 6, VERTICAL+
** SS 8: Results 3
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** SS 15: Results 3.976
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** SS 3: Results 223
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** SS 19: Results 248
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? \*1 AND DK/PN {Filtered DK documents}  
\*\* SS 22: Results 20  
? \*2 AND NO/PN {Filtered NO documents}  
\*\* SS 23: Results 1  
? \*3 AND FI/PN {Filtered FI documents}  
\*\* SS 24: Results 0  
? XFull Fulltext Non Patent Literature Search:  
Mode Direct (Non Patent Literature Search)  
English query: 'and (or LAAKKONEN, lehkoinen, mononen, voutilainen, ROCSOLE), (or tank+, vessel+, container+), (or probe, electrode);'  
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''  
English limit: None  
English results: 437  
? XFull Fulltext Non Patent Literature Search:  
Mode Direct (Non Patent Literature Search)  
English query: 'and (or LAAKKONEN, lehkoinen, mononen, voutilainen, ROCSOLE), (or tank+, vessel+, container+), (or probe, electrode+), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+), (or oil, moisture, water, liquid);'  
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''  
English limit: None  
English results: 174  
? XFull Fulltext Non Patent Literature Search:  
Mode Direct (Non Patent Literature Search)  
English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+)) p (or probe, electrode+), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+), (or oil, moisture, water, liquid);'  
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''  
English limit: None  
English results: 2602  
? XFull Fulltext Non Patent Literature Search:  
Mode Direct (Non Patent Literature Search)  
English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+)) p probe) p electrode+), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+), (or oil, moisture, water, liquid);'  
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''  
English limit: None  
English results: 631  
? XFull Fulltext Non Patent Literature Search:  
Mode Direct (Non Patent Literature Search)  
English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+)) p probe) p electrode+), (or height, (measurement w level)), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+), (or oil, moisture, water, liquid);'  
English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''  
English limit: None  
English results: 271  
? XFull Fulltext Non Patent Literature Search:

Mode Direct (Non Patent Literature Search)

English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+)) p probe) p electrode+), (or height, (measurement w level)), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+), (or oil, moisture, water, liquid), interface+, surface+;'

English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''

English limit: None

English results: 151

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Mode Direct (Non Patent Literature Search)

English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+)) p probe) p electrode+), (or height, (measurement w level)), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+), (or oil, moisture, water, liquid), interface+, surface+, vertical+, (or rope+, cable+, anchor+);'

English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''

English limit: None

English results: 44

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Mode Direct (Non Patent Literature Search)

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English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''

English limit: None

English results: 1

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Mode Direct (Non Patent Literature Search)

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English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''

English limit: None

English results: 2

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English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+)) p (probe 4w ((or within, inside, closed) 4w (or tank, volume, container, vessel)))) p electrode+), (or height, (measurement w level)), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+), (or oil, moisture, water, liquid), vertical+;'

English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''

English limit: None

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English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+)) p (probe 4w ((or within, inside, closed) 4w (or tank, volume, container, vessel)))) p electrode+), (or height, (measurement w level)), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+), (or oil, moisture, water, liquid);'

English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEP XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''

English limit: None

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English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPMTCEA TXPMTCEU TXPMTTEA TXPMTTEB TXPMTTEC TXPMTTEU TXPMTTEU TXPMTTEW TXPMTTEY TXPMTJEA TXPMTJEB TXPMTJEU TXPMTJEY TXPMTKEA TXPMTKEB TXPMTKEU TXPMTKEY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPW0EA TXPW0TEA WPIAP EPODOC'

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German query: ''

German cluster: ''

German limit: None

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French query: ''

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French results: 0

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English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+)) p (probe 4w ((or within, inside, closed) 4w (or tank, volume, container, vessel)))) p electrode+), (or height, (measurement w level)), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+);'

English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPMTCEA TXPMTCEU TXPMTTEA TXPMTTEB TXPMTTEC TXPMTTEU TXPMTTEU TXPMTTEW TXPMTTEY TXPMTJEA TXPMTJEB TXPMTJEU TXPMTJEY TXPMTKEA TXPMTKEB TXPMTKEU TXPMTKEY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPW0EA TXPW0TEA WPIAP EPODOC'

English limit: None

English results: 0

German query: ''

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German limit: None

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French cluster: ''

French limit: None

French results: 0

? XFull Fulltext Patent Search:

Mode Direct (Patent Search)

English query: 'and (((or (electrical w tomograph+), (electrical w capacitance w

tomograph+), ECT, (electrical w impedance w tomograph+), EIT, (electrical w resistance w tomograph+), ERT) p (or tank+, vessel+, container+) p (probe 4w ((or within, inside, closed) 4w (or tank, volume, container, vessel)))) p electrode+), (or admittivity, permittivity, conductivity, impedance, capacitance, tomograph+);'

English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPMTCEA TXPMTCEU TXPMTEA TXPMTEB TXPMTTEC TXPMTTEE TXPMTET TXPMTTEU TXPMTTEW TXPMTTEY TXPMTJEA TXPMTJEB TXPMTJEU TXPMTJEY TXPMTKEA TXPMTKEB TXPMTKEU TXPMTKEY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPW0EA TXPW0TEA WPIAP EPODOC'

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G01N33/2847/LOW  
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English query: 'and (or (electric+ 2w tomograph+), (electric+ w capacit+ w tomograph+), ECT, (electric+ w impedance w tomograph+), EIT, (electric+ w resist+ w tomograph+), ERT), ((or tank+, vessel+, container+, reservoir+, cistern+) 5d (or probe, electrode+)), (or height+, level+, vertical+);'

English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPMTCEA TXPMTCEU TXPMTEA TXPMTEB TXPMTTEC TXPMTTEE TXPMTET TXPMTTEU TXPMTTEW TXPMTTEY TXPMTJEA TXPMTJEB TXPMTJEU TXPMTJEY TXPMTKEA TXPMTKEB TXPMTKEU TXPMTKEY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPW0EA TXPW0TEA WPIAP EPODOC'

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English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA

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ECT, (electric+ w impedance w tomograph+), EIT, (electric+ w resist+ w tomograph+), ERT),  
((vertical+ 5d (or mov+, shift+, transfer+)) 5d (or probe, electrode+));'  
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE  
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? XFull Create Set Patent Search:  
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8663 documents selected in the XFull set (Patent Search)  
English query: 'and (or (electric+ 2w tomograph+), (electric+ w capacit+ w tomograph+),  
ECT, (electric+ w impedance w tomograph+), EIT, (electric+ w resist+ w tomograph+), ERT),  
(vertical+ 3d profile+);'  
English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE  
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German limit: 0  
German results: 0  
French query: ''  
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French limit: 0  
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? XFull Create Set Patent Search:  
Set was not Amended.  
? XFull Fulltext Patent Search:





ECT, (electric+ w impedance w tomograph+), EIT, (electric+ w resist+ w tomograph+), ERT),  
(((or probe+, element+, electrode+) 5d (or contaminat+, (foreign w matter), impurity,  
pollutant, dirt)) 5d (or interface, surface)), (or tank+, vessel+, container+, reservoir+,  
cistern+), (or vertical+, profile+, height+, level+);'

English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE  
TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA  
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TXPMTKEU TXPMTKEY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPW0EA TXPW0TEA WPIAP EPODOC'

English limit: None

English results: 22

German query: ''

German cluster: ''

German limit: None

German results: 0

French query: ''

French cluster: ''

French limit: None

French results: 0

? XFull Create Set Patent Search:

EPODOC SS 1 Results: 78816 /CCI/CUI G01N22/04/LOW

G01N27/02/LOW

G01N27/22/LOW

G01N27/60/LOW

G01N33/26/LOW

G01R27/00/LOW

G01V3/18/LOW

EPODOC SS 2 Results: 164802 /IC G01N22/04/LOW

G01N27/02/LOW

G01N27/22/LOW

G01N27/60/LOW

G01N33/26/LOW

G01R27/00/LOW

G01V3/18/LOW

180070 selected documents in the XFull set.

? XFull Fulltext Patent Search:

180070 documents selected in the XFull set (Patent Search)

English query: 'and (or electrical+, conduct+, impedance+, admittan+), (((or probe+,  
element+, electrode+) 5d (or contaminat+, (foreign w matter), impurity, pollutant, dirt))  
5d (or interface, surface)) 7d (or effect, impact, influence)), (or tank+, vessel+,  
container+, reservoir+, cistern+), (or vertical+, profile+, height+, level+);'

English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE  
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TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPMTCEA TXPMTCEU TXPMTEA TXPMTEB TXPMTEC TXPMTEE  
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English limit: 550435

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German query: ''

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G01N27/60/LOW

G01N33/26/LOW

G01R27/00/LOW

G01V3/18/LOW

NPL SS 3 Results: 4950 \*M1/LNKX {Incl alternative XP}

4950 selected documents in the XFull set.

? XFull Fulltext Non Patent Literature Search:

4950 documents selected in the XFull set (Non Patent Literature Search)

English query: 'and (or electrical+, conduct+, impedance+, admittan+), (((or probe+, element+, electrode+) 5d (or contaminat+, (foreign w matter), impurity, pollutant, dirt)) 5d (or interface, surface)) 7d (or effect, impact, influence)), (or tank+, vessel+, container+, reservoir+, cistern+), (or vertical+, profile+, height+, level+);'

English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''

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Mode Direct (Non Patent Literature Search)

English query: 'and (or electrical+, conduct+, impedance+, admittan+), (((or probe+, element+, electrode+) 5d (or contaminat+, (foreign w matter), impurity, pollutant, dirt)) 5d (or interface, surface)) 7d (or effect, impact, influence)), (or tank+, vessel+, container+, reservoir+, cistern+), (or vertical+, profile+, height+, level+);'

English cluster: 'XP3GPP XPAIP XPESP XPETSI XPI3E XPIEE XPIETF XPIOP XPIPCOM XPJPEG XPMISC XPOAC XPRD XPTK' 'COMPDX INSPEC TDB NPL' ''

English limit: None

English results: 11

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180070 documents selected in the XFull set (Patent Search)

English query: 'and (or electrical+, conduct+, impedance+, admittan+), (((or probe+, element+, electrode+) 7d (or contaminat+, (foreign w matter), impurity, pollutant, dirt)) 7d (or interface, surface)) 7d (or effect, impact, influence)), (or tank+, vessel+, container+, reservoir+, cistern+), (or vertical+, profile+, height+, level+);'

English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPMTCEA TXPMTCEU TXPMTEA TXPMTEB TXPMTEC TXPMTEE TXPMTET TXPMTIU TXPMTIUW TXPMTIY TXPMTJEA TXPMTJEB TXPMTJEU TXPMTJFY TXPMTKEA TXPMTKEB TXPMTKEU TXPMTKEY TXPUSE0A TXPUSE1A TXPUSEA TXPUSEB TXPW0EA TXPW0EA WPIAP EPODOC'

English limit: 550435

English results: 41

German query: ''

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French query: ''

French cluster: ''

French limit: 0

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English cluster: 'TCM TXPCNEA TXPCNEB TXPCNEC TXPCNEU TXPCNEY TXPEA TXPEB TXPEC TXPEE TXPEF TXPEH TXPEI TXPEP TXPEPEA TXPEPEB TXPES TXPEU TXPEY TXPJPEA TXPJPEB TXPJPOEA TXPJPOEB TXPKREA TXPKREB TXPKREU TXPKREY TXPMTCEA TXPMTCEU TXPMTEA TXPMTEB TXPMTEC TXPMTEE

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"WO2017203095"/PN

**SEARCH RECORD****Application No: PCT/FI2017/050628**

50 PN Documents found  
16 NPL Documents found  
including 31 restricted family members  
Input for Combi:  
"JP2013195343"/PN  
2 PN Documents found  
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**Other Information:**