

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ AU

PCT

DEMAND

CHAPTER II

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty.

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Identification of IPEA	Date of receipt of DEMAND
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Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION

Applicant's or agent's file reference 1273923	International application No. PCT/IB2022/061643
International filing date (day/month/year) 01/12/2022	(Earliest) Priority date (day/month/year) 01/12/2021
Title of invention A PROXIMITY STATUS OF EQUIPMENT	

Box No. II APPLICANT(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) Sandvik Mining and Construction Australia (Production/Supply) Pty Ltd Level 5 / 135 Coronation Drive Milton QLD 4064 Australia	E-mail address* attorney@pof.com.au
	Telephone No.
	Facsimile No.
	Applicant's registration No. with the Office

* **E-mail authorization:** Indicating an e-mail address above authorizes the International Bureau and the International Preliminary Examining Authority, if they provide such a service, to send notifications exclusively by e-mail to that address, unless the following box is marked:

☐ notifications are requested to be sent exclusively by postal mail.

State (that is, country) of nationality: AU	State (that is, country) of residence: AU
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Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality: State (that is, country) of residence:	
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☐ Further applicants are indicated on a continuation sheet.

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representative
 and ☐ has been appointed earlier and represents the applicant(s) also for international preliminary examination.
☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.
☒ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation.
The address must include postal code and name of country.)*

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* **E-mail authorization:** Indicating an e-mail address above authorizes the International Bureau and the International Preliminary Examining Authority, if they provide such a service, to send notifications exclusively by e-mail to that address, unless the following box is marked:

☐ notifications are requested to be sent exclusively by postal mail.

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION**Statement concerning amendments:***

1. The applicant wishes the international preliminary examination **to start on the basis of:**

the description ☒ as originally filed, or

☐ as amended under Article 34

the sequence listing (if any) ☐ as originally filed, or

☐ as amended under Article 34

the claims ☐ as originally filed, or

☐ as amended under Article 19, and/or

☒ as amended under Article 34

the drawings (if any) ☒ as originally filed, or

☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. ☐ Where the IPEA wishes to start the international preliminary examination at the same time as the international search in accordance with Rule 69.1(b), the applicant requests the IPEA **to postpone** the start of the international preliminary examination until the expiration of the applicable time limit under Rule 69.1(d).

4. ☐ The applicant expressly requests **to postpone** the start of the international preliminary examination until the expiration of the applicable time limit under Rule 54bis.1(a).

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed.

☐ which is the language of a translation furnished for the purposes of international search.

☐ which is the language of publication of the international application.

☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The filing of this demand constitutes the election of all Contracting States which are designated and are bound by Chapter II of the PCT.

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | | |
|---|---|--------------------------|--------|
| 1. translation of international application | : | | sheets |
| 2. amendments under Article 34 | : | 6 | sheets |
| 3. amended sequence listing under Article 34 | : | ☐ | |
| 4. letter accompanying the amendments under Article 34 (Rule 66.8) | : | 3 | sheets |
| 5. copy (or, where required, translation) of amendments under Article 19 | : | | sheets |
| 6. copy of the letter accompanying the amendments under Article 19 (Rules 46.5(b) and 53.9) | : | | sheets |
| 7. copy (or, where applicable, translation) of any statement under Article 19 (Rule 62.1(ii)) | : | | sheets |
| 8. other (<i>specify</i>) | : | | sheets |

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received not received

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The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. ☐ fee calculation sheet | 5. ☐ sequence listing for the purposes of international preliminary examination (Rule 13 <i>ter</i>) |
| 2. ☐ original separate power of attorney | 6. ☐ a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed |
| 3. ☐ original general power of attorney | 7. ☐ other (<i>specify</i>): _____ |
| 4. ☐ copy of general power of attorney; reference number, if any: _____ | |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

/Andrew Massie/

Name: PHILLIPS ORMONDE FITZPATRICK

Name of Signatory: Andrew Massie

Capacity: Principal

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1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.
☐ The applicant has been informed accordingly.
4. ☐ The date of receipt of the demand is WITHIN the time limit of 19 months from the priority date as extended by virtue of Rule 80.5.
5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rules 82 or 82*quater*.

6. ☐ The date of receipt of the demand is AFTER the expiration of the time limit under Rule 54*bis*.1(a) and item 7 or 8, below, does not apply.
7. ☐ The date of receipt of the demand is WITHIN the time limit under Rule 54*bis*.1(a) as extended by virtue of Rule 80.5.
8. ☐ Although the date of receipt of the demand is after the expiration of the time limit under Rule 54*bis*.1(a), the delay in arrival is EXCUSED pursuant to Rules 82 or 82*quater*.

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Demand received from IPEA on:

CLAIMS

1. An apparatus associated with a work machine, the apparatus comprising at least one processor and at least one memory including computer program code, the at least one memory and the computer program code configured to with the at least one processor, cause the apparatus at least to:

receive information on an operational context of the work machine, the information comprising data describing operation of the work machine in a particular context;

detect at least one beacon signal provided by a beacon associated with equipment attachable to the work machine, the at least one beacon signal comprising a radio signal broadcasted by the beacon;

determine, based on the at least one beacon signal, a proximity status of the equipment, the proximity status relating to a proximity of the equipment to the work machine;

determine, based on the information on the operational context of the work machine, at least one criterion relating to the proximity status of the equipment; and

determine, in response to determining that the at least one criterion for the proximity status of the equipment is fulfilled, that the equipment is attached to the work machine.

2. The apparatus according to claim 1, wherein the at least one beacon signal comprises a Bluetooth low energy signal or a Zigbee signal.

3. The apparatus according to claim 1 or 2, wherein the at least one memory and the computer program code are configured to with the at least one processor, cause the apparatus to determine the proximity status based on a strength of the at least one beacon signal.

4. The apparatus according to any preceding claim, wherein information on the operational context comprises information provided by at least one of the following: a sensor, a transceiver, an imaging device or a clock.

5. The apparatus according to any preceding claim, wherein the operational context of the work machine comprises a distance travelled by the

work machine and the at least one criterion comprises a predetermined distance travelled by the work machine while the proximity status is maintained.

5 6. The apparatus according to any preceding claim, wherein the operational context of the work machine comprises a duration of operation by the work machine and the at least one criterion comprises a predetermined duration of operation by the work machine while the proximity status is maintained.

10 7. The apparatus according to any preceding claim, wherein the operational context of the work machine comprises a plurality of detected beacon signals by the work machine and the at least one criterion comprises a reduced number of detected beacon signals while the proximity status is maintained.

15 8. The apparatus according to any preceding claim, wherein the equipment attachable to the work machine comprises at least one of the following: a bucket, a breaking hammer, a rock drilling machine, a rock bolting machine, transmission, an engine, a pump, a battery, a head, a truck tub or differentials.

20 9. The apparatus according to any preceding claim, wherein the at least one beacon signal comprises identification data identifying the beacon.

25 10. The apparatus according to any preceding claim, wherein the apparatus comprises a control unit configured to control operations of the work machine.

 11. The apparatus according to any preceding claim, wherein the at least one memory and the computer program code are configured to with the at least one processor, cause the apparatus to listen for beacon signals continuously.

30 12. The apparatus according to any preceding claim, wherein the work machine comprises a load haul dump (LHD) machine, a breaker, a drilling rig, a rock bolter, or a dump truck.

35 13. A work machine comprising an apparatus according to any preceding claim.

14. A method comprising:

receiving information on an operational context of the work machine,
the information comprising data describing operation of the work machine in a
particular context;

5 detecting at least one beacon signal provided by a beacon associated
with equipment attachable to the work machine, the at least one beacon signal
comprising a radio signal broadcasted by the beacon;

determining, based on the at least one beacon signal, a proximity status
of the equipment, the proximity status relating to a proximity of the equipment to
10 the work machine;

determining, based on the operational context of the work machine, at
least one criterion for the proximity status of the equipment; and

determining, in response to determining that the at least one criterion
for the proximity status of the equipment is fulfilled, that the equipment is attached
15 to the work machine.

15. A computer program comprising instructions for causing an
apparatus to perform at least the following:

receiving information on an operational context of the work machine,
20 the information comprising data describing operation of the work machine in a
particular context;

detecting at least one beacon signal provided by a beacon associated
with equipment attachable to the work machine, the at least one beacon signal
comprising a radio signal broadcasted by the beacon;

25 determining, based on the at least one beacon signal, a proximity status
of the equipment, the proximity status relating to a proximity of the equipment to
the work machine;

determining, based on the operational context of the work machine, at
least one criterion for the proximity status of the equipment; and

30 determining, in response to determining that the at least one criterion
for the proximity status of the equipment is fulfilled, that the equipment is attached
to the work machine.