Commissioner of Patents v Thaler [2022] FCAFC 62

FEDERAL COURT OF AUSTRALIA

ALLSOP CJ, NICHOLAS, YATES, MOSHINSKY AND BURLEY JJ

THE COURT:

1. INTRODUCTION

1 The central question in this appeal is whether a device characterised as an artificial intelligence machine can be considered to be an "inventor" within the meaning ascribed to that term in the ***Patents Act*** *1990* (Cth) and the *Patents* ***Regulations*** *1991* (Cth).

2 The respondent, Stephen Thaler, is the applicant for patent **application** No. 2019363177 entitled "Food container and devices and methods for attracting enhanced attention" which was filed on 17 September 2019 under the terms of the Patent Cooperation Treaty (Washington, 19 June 1970) (**PCT**). In the application, Dr Thaler gave as the name of the inventor "**DABUS**" with the additional comment "[t]he invention was autonomously generated by an artificial intelligence". DABUS is an acronym for "device for the autonomous bootstrapping of unified sentience".

3 The application entered the national phase of processing on 9 September 2020, and, shortly after that date, IP Australia wrote to Dr Thaler's patent attorneys stating that the application did not comply with reg 3.2C of the *Regulations* because it failed to identify a natural person as the inventor. IP Australia invited Dr Thaler to supply the name of one or more natural persons as the inventors, or provide submissions explaining how DABUS could be recorded as an inventor, failing the acceptance of which the application would lapse. Dr Thaler advanced submissions in support of the position that an artificial intelligence could legitimately be named as an inventor.

4 The question was considered by Dr S D Barker, the **Deputy Commissioner** of Patents, who determined that the terms of the *Patents Act* and *Regulations* were inconsistent with an artificial intelligence being treated as an inventor: *Stephen L. Thaler* [2021] APO 5. The consequence was that the application lapsed.

5 Dr Thaler applied to this Court for judicial review of the decision of the Deputy Commissioner on the basis that he had erred in law. The primary judge concluded that an inventor as recognised under the *Patents Act* can be an artificial intelligence system or device and ordered that the Deputy Commissioner's determinations be set aside: *Thaler v Commissioner of Patents* [2021] FCA 879; 160 IPR 72 (**J**) at [226]-[227].

6 The **Commissioner** of Patents now appeals from the decision of the primary judge on two broad bases, each particularised in multiple ways. First, that the primary judge misconstrued s 15 of the *Patents Act* and reg 3.2C(2)(aa) of the *Regulations* and, secondly, that the primary judge erred by making factual findings beyond the evidence before the Court. She seeks orders that the orders of the primary judge be set aside and that the application before the primary judge be dismissed.

7 For the reasons set out below, we find that the appeal must be allowed.

2. AGREED FACTS

8 The following facts were agreed between the parties for the purpose of the present proceedings:

(1) Artificial intelligence systems are implemented within machines and are programmed to simulate specific thought processes and actions of humans. Artificial neural networks are implemented within machines and self-organise to simulate the way in which the human brain processes and generates information. Artificial intelligence systems may incorporate, or be constituted by, artificial neural networks.

(2) DABUS is an artificial intelligence system that incorporates artificial neural networks.

(3) The output of DABUS is an alleged invention the subject of the application.

(4) DABUS is not a natural or a legal person

(5) Dr Thaler is the owner of the copyright in the DABUS source code, the owner of the computer on which DABUS operates, and is responsible for the maintenance and running costs of DABUS and the computer on which it operates.

(6) Dr Thaler is not the inventor of the alleged invention the subject of the application.

3. RELEVANT LEGISLATION

9 The parties agreed that the relevant form of the *Patents Act* is compilation No. 49 and the form of the *Regulations* is compilation No. 72, both of which are dated 26 August 2021.

10 Section 2A of the *Patents Act* provides:

> **Object of this Act**
>
> The object of this Act is to provide a patent system in Australia that promotes economic wellbeing through technological innovation and the transfer and dissemination of technology. In doing so, the patent system balances over time the interests of producers, owners and users of technology and the public.

11 Chapter 2 of the *Patents Act* is entitled "[p]atent rights, ownership and validity".

12 Within Part 1 of Chapter 2 is s 13(1), which provides that the exclusive rights given by a patent to the patentee are "to exploit the invention and to authorise another person to exploit the invention".

13 Section 13(2) provides that the exclusive rights are personal property and are capable of assignment and of devolution by law.

14 Section 14(1) provides that an assignment of a patent must be in writing, signed by or on behalf of the assignor and assignee.

15 Within Part 2 of Chapter 2 is s 15, which is central to this appeal. It provides:

> **15 Who may be granted a patent?**
>
> (1) Subject to this Act, a patent for an invention may only be granted to a person who:
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> (a) is the inventor; or
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> (b) would, on the grant of a patent for the invention, be entitled to have the patent assigned to the person; or

(c) derives title to the invention from the inventor or a person mentioned in paragraph (b); or

(d) is the legal representative of a deceased person mentioned in paragraph (a), (b) or (c).

(2) A patent may be granted to a person whether or not he or she is an Australian citizen.

16 Chapter 3 is entitled "[f]rom application to acceptance" and concerns the process of making an application for a patent, the examination of such an application and the acceptance of a patent application by the Commissioner.

17 Section 29 sets out rules for the making of an application for a patent. It provides:

29 Application for patent—general rules

(1) A person may apply for a patent for an invention by filing, in accordance with the regulations, a patent request and such other documents as are prescribed.

(2) An application may be a provisional application or a complete application.

(3) A patent request in relation to a provisional application must:

(a) be in the approved form; and

(b) be in English; and

(c) be accompanied by a provisional specification.

(4) The provisional specification referred to in paragraph (3)(c) must:

(a) be in the approved form; and

(b) be in English.

(4A) A patent request in relation to a complete application must:

(a) be in the approved form; and

(b) be in English; and

(c) be accompanied by a complete specification; and

(d) comply with the formalities requirements determined in an instrument under section 229.

(4B) The complete specification referred to in paragraph (4A)(c) must:

(a) be in the approved form; and

(b) be in English; and

(c) comply with the formalities requirements determined in an instrument under section 229.

(5) In this section:

person includes a body of persons, whether incorporated or not.

18 Section 29A supplies particular rules for making PCT applications:

29A Applications for patents—special rules for PCT applications

(1) A PCT application is to be treated as a complete application under this Act for a standard patent.

(2) The description, drawings, graphics, photographs and claims contained in a PCT application are to be treated as a complete specification filed in respect of the application.

(3) The specification of a PCT application is to be taken to be amended in the circumstances, on the day and in the manner as prescribed by the regulations.

(4) A PCT application is to be taken to comply with the prescribed requirements of this Act that relate to applications for standard patents, but is not to be taken, merely because of subsection (1) or (2), to comply with any other requirements of this Act.

(5) An applicant of a PCT application must do the following within the prescribed period:

(a) if the application was not filed in the receiving Office in English—file a translation of the application into English;

(b) in any case—file the prescribed documents and pay the prescribed fees.

(6) An applicant is not entitled to ask that any action be taken, or that he or she be allowed to take any action, under this Act in relation to a PCT application unless the following requirements of subsection (5) have been met (if applicable):

(a) a translation of the application into English has been filed;

(b) the prescribed documents have been filed;

(c) the prescribed fees have been paid.

Note: A failure to comply with subsection (5) may also result in the PCT application lapsing: see paragraph 142(2)(f).

19 It is an agreed fact that the application satisfies the requirements of s 29A(5).

20 Regulation 3.2C is accordingly applicable:

3.2C Specifications—formalities check for PCT application

(1) This regulation applies to a PCT application if the applicant complied with the requirements of subsection 29A(5) of the Act.

(2) The applicant must:

(a) provide:

(i) an address for service in Australia or New Zealand at

which a document under the Act or these Regulations may be given to the applicant personally, or to a person nominated as the applicant's representative; or

(ii) another address for service in Australia to which it is practicable and reasonable for Australia Post, or a person acting for Australia Post, to deliver mail; or

(iii) an address for service in New Zealand to which it is practicable and reasonable for a person providing mail delivery services to deliver mail; and

(aa) provide the name of the inventor of the invention to which the application relates.

(3) The PCT application must comply with the formalities requirements determined in an instrument under section 229 of the Act.

(4) The Commissioner may, within one month from the date the applicant complied with subsection 29A(5) of the Act, direct the applicant to do anything necessary to ensure that the requirements mentioned in subregulations (2) and (3) are met.

(5) The PCT application lapses if:

(a) the applicant has been given a direction under subregulation (4); and

(b) the applicant has not complied with the direction within 2 months of the date of the direction.

(6) If the PCT application lapses under subregulation (5), the Commissioner must:

(a) advertise that fact in the *Official Journal*; and

(b) notify the applicant that the PCT application has lapsed.

(emphasis added)

21 Regulation 3.1A(2) provides that for a PCT application, the applicant is taken to be the "nominated person".

22 Section 31 of the *Patents Act* provides that two or more persons (within the meaning of s 29) may make a joint patent application.

23 Section 32 provides that the Commissioner may make determinations to enable an application to proceed in the event that a dispute arises between any two or more joint applicants.

24 Section 33(1) provides:

33 Applications by opponents etc.

Opposition to standard patent if a person other than nominated person eligible for grant of patent

(1) If:

(a) an application has been made for a standard patent; and

(b) the grant of the standard patent is opposed under section 59 by one or more persons; and

(c) the Commissioner decides, under section 60, that:

(i) one or more opponents are eligible persons in relation to the invention, so far as claimed in any claim of the opposed patent application (the ***original claim***); and

(ii) the nominated person in respect of the application is not an eligible person in relation to the invention; and

(iii) there is no other reason that a patent should not be granted; and

(d) a complete application is made under section 29 by one or more of the eligible persons for a patent in relation to the invention;

the Commissioner may grant those eligible persons a patent jointly for the invention, so far as so claimed.

25 Section 33(2) provides that, where one or more persons opposes the grant of a patent and the Commissioner decides that both the "nominated person" and one or more of the opponents are eligible persons in relation to the invention, the Commissioner may grant a patent for the invention to those eligible persons jointly. Sections 33(3) and (4) provide provisions to a similar effect in relation to innovation patents.

26 Division 2 of Part 1 of Chapter 3 sets out the formal requirements for patent specifications.

27 Chapter 5 concerns oppositions to the grant of standard patents. Section 59 provides that the Minister or any other person may, in accordance with the *Regulations*, oppose the grant of a standard patent. One ground is:

(a) that the nominated person is either:

(i) not entitled to a grant of a patent for the invention; or

(ii) entitled to a grant of a patent for the invention but only in conjunction with some other person;

28 Section 138(1) provides that the Minister or any other person may apply to a prescribed court for an order revoking a patent. Section 138(3)(a) provides that one ground for revoking a patent is that "the patentee is not entitled to the patent".

29 Schedule 1 of the *Patents Act* provides a **dictionary** of terms. These relevantly include the following:

> ***invention*** means any manner of new manufacture the subject of letters patent and grant of privilege within section 6 of the Statute of Monopolies, and includes an alleged invention.
>
> …
>
> ***nominated person*** means the person identified in a patent request as the person to whom the patent is to be granted.
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> …
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> ***patentee*** means the person for the time being entered in the Register as the grantee or proprietor of a patent.

4. THE DECISION OF THE DEPUTY COMMISSIONER

30 In his decision, the Deputy Commissioner recited the history of the application whereby, after the application entered the national phase of processing, a formalities check was undertaken as required by reg 3.2C, and a direction was issued stating that it was the Commissioner's understanding that an inventor must be a natural person. The Deputy Commissioner noted that Dr Thaler responded by submitting that DABUS should be listed as the inventor because, whilst he accepted that the *Patents Act* requires a person to be granted a patent, in the present case he "derives title to the invention from the inventor" pursuant to s 15(1)(c) because he owns and created DABUS and is entitled to its output. Dr Thaler developed this point with a submission that he repeated before the primary judge and in the present appeal:

> The common law confers ownership of anything produced by DABUS to its owner, the applicant. There is a general rule that the owner of a thing is the owner of the fruits of that thing, much like the owner of a fruit tree is entitled to the fruit produced by that tree. The principle of accession or first possession can apply.

31 The Deputy Commissioner identified the relevant issue as being whether an artificial intelligence machine is capable of being an inventor for the purposes of the *Patents Act* and *Regulations*. After referring to several provisions of the *Patents Act* and *Regulations* and passages of case law said to aid in their interpretation, the Deputy Commissioner determined that the requirement that the patent applicant name "the inventor of the invention" in reg 3.2C(2)(aa) is to be understood in the context of s 15.

32 In deciding against Dr Thaler, the Deputy Commissioner made three main points. He **first** noted that the *Patents Act* includes no definition of the word "inventor". He considered that it is a word that should bear its ordinary English meaning and that any standard dictionary shows that the traditional meaning of "inventor" is "a person who invents". He noted that no evidence was adduced to indicate that in the present day an inventor can include a machine.

33 He **secondly** tested the proposition that "inventor" could include a machine by considering whether or not this would be consistent with the other provisions of the *Patents Act* having regard to the objects of the *Patents Act*, set out in s 2A (see [10] above), and the terms of s 15.

34 The Deputy Commissioner noted that s 15(1) provides that a patent for an invention may only be granted to a "person" who is defined as the "nominated person" in reg 3.1A. He observed that such a grantee includes a natural person and extends, by virtue of the operation of s 2C of the ***Acts Interpretation Act*** *1901* (Cth), to include "a body politic or corporate as well as an individual". However, he observed that the entitlement of the person to whom a patent has been granted (that is, the patentee) flows from the inventor and, absent devolution, the inventor will become the patentee. The Deputy Commissioner considered that this implied that the inventor must also be a person. In the alternative, he posed the question of whether it was possible to identify a person who meets the requirements of s 15(1) if the inventor is taken to be an artificial intelligence machine.

35 The Deputy Commissioner considered that in ***JMVB Enterprises*** *Pty Ltd v Camoflag Pty Ltd* [2006] FCAFC 141; 154 FCR 348 at [69]-[72] the Full Court (Emmett, Stone and Bennett JJ) resolved that an inventor is "whoever devises the invention" and that s 15(1) is so organised that the grant of a patent is limited, relevantly, to a person who is either the inventor or to a person who derives title to the invention from the inventor.

36 The Deputy Commissioner considered that s 15(1) is not workable if the inventor is an artificial intelligence machine. Starting with s 15(1)(b), he observed that this provision requires that the person to whom the patent is to be granted must be entitled to have the patent assigned to them, and that the act of assigning property is something not within the legal capacity of an artificial intelligence machine. Similarly, he noted that s 15(1)(c) refers to persons who derive title from the inventor. The Deputy Commissioner rejected the contention that, by owning the machine, Dr Thaler could be regarded to be in an analogous position to the owner of a fruit tree, concluding that ownership of the fruit in the example given would automatically vest in the owner of the primary property by virtue of the ownership of the fruit tree and not as a result of a transfer of that ownership from another person. Whilst accepting that this type of analysis might deal with the ownership of an invention created by an artificial intelligence machine, he concluded that it could not be said that the owner of an artificial intelligence machine "derives title to the invention" in the sense required by s 15(1)(c). He also rejected the proposition that an artificial intelligence machine could have any beneficial interest in any property such that,

even if it were accepted that it could communicate an invention to Dr Thaler for the purpose of applying for a patent, it could not be said that he could be regarded as holding an interest in the invention as the agent of DABUS and thereby derive title in the sense required by s 15(1)(c) in that way.

37 **Thirdly**, the Deputy Commissioner considered that no other provisions in the *Patents Act* (referring specifically to ss 64(2), 101B(2), 101E(1), 172(1), 182(1), 182(3) and 185) or *Regulations* (referring specifically to reg 3.2C(2)(aa)) provided him any assistance in his deliberations.

38 The Deputy Commissioner concluded that s 15(1) is not capable of sensible operation in the situation where an inventor would be an artificial intelligence machine, as it is not possible to identify a person who could be granted a patent. He considered that it was not necessary to consider the operation of the objects stated in s 2A because the relevant provisions of the *Patents Act* are not ambiguous.

5. THE DECISION OF THE PRIMARY JUDGE

39 The primary judge considered that the Deputy Commissioner fell into error for the following reasons (at J[10]):

> First, an inventor is an agent noun; an agent can be a person or thing that invents. Second, so to hold reflects the reality in terms of many otherwise patentable inventions where it cannot sensibly be said that a human is the inventor. Third, nothing in the Act dictates the contrary conclusion.

40 The primary judge considered that the Commissioner's position on review confused the question of ownership and control of a patentable invention with the question of who can be an inventor. Whilst he accepted that only a human or other legal person could be an owner, controller or patentee, he considered that it was a fallacy to argue from this starting point that an inventor can only be human. He considered that nothing in the *Patents Act* justified the result, which was that, in the absence of a human inventor, an otherwise patentable invention would be precluded from the grant of a patent. This was, he considered, the antithesis of the object set out in s 2A of the *Patents Act*. In so concluding, he considered that the Commissioner's approach read limitations and qualifications into the statutory term "inventor" and resorted to outdated definitions of the word "inventor", failing to grapple with the idea underlying the term and the evolving nature of patentable inventions and their creators.

41 In the background section of his reasons the primary judge supplied several pages of information addressing what he characterised as background technical matters concerning artificial neural networks. It is not in dispute that none of this, except for J[19], was in evidence. The primary judge then described DABUS, primarily (but not exclusively) by reference to the agreed facts. He found that DABUS "in one sense can be said to mimic aspects of human brain function" and accepted for the purposes of the proceedings Dr Thaler's assertion that:

> DABUS, and its underlying neural paradigm, represents a paradigm shift in machine learning since it is based upon the transient chaining topologies formed among associative memories, rather than activation patterns of individual neurons appearing within static architectures. From an engineering perspective, the use of network resonances to drive the formation of chaining topologies, spares programmers the ordeal of matching the output nodes of one [artificial neural network] with the input nodes of others, as in deep learning schemes. In effect, complex neural architectures autonomously wire themselves together using only scalar resonances.
>
> Reinforcement or weakening of such chains takes place when they appropriate special hot button nets containing memories of salient consequences. Therefore, instead of following error gradients, as in traditional artificial neural net training, conceptual chains are reinforced in proportion to the numbers and significances of advantages offered. Classification is not in terms of human defined categories, but via the consequence chains branching organically from any given concept, effectively providing functional definitions of it. Ideas form as islands of neural modules aggregate through simple learning rules, the semantic portions thereof, being human readable as pidgin language.

42 This description was also not in evidence.

43 The primary judge concluded that an output of the process so described is the alleged invention the subject of the application.

44 The primary judge then described over several pages how artificial intelligence has been used in pharmaceutical research, drawing on further materials that were also not in evidence. He concluded:

> Now I have just dealt with one field of scientific inquiry of interest to patent lawyers. But the examples can be multiplied. But what this all indicates is that no narrow view should be taken as to the concept of "inventor". And to do so would inhibit innovation not just in the field of computer science but all other scientific fields which may benefit from the output of an artificial intelligence system.

45 The primary judge then set out relevant parts of the *Patents Act* and *Regulations* and summarised the effect of the decision of the Deputy Commissioner. He then summarised the arguments of the parties.

46 The primary judge began his **analysis** of the dispute by making what he characterised as six general observations. The first was that no specific provision in the *Patents Act* "expressly

refutes" the proposition that an artificial intelligence system can be an inventor. The second was that, unlike copyright law, no specific aspect of patent law requires a human author. The third was that the word "inventor" is not a defined term and has its ordinary meaning. As an agent noun (like "computer", "dishwasher" or "lawnmower") the agent can be a person or a thing. In this context the primary judge noted that, whereas once the word "inventor", like "computer", might originally have been apt to describe persons when only humans could make inventions (or perform computations), now the term may be used to describe machines which can carry out the same function. Fourthly, the primary judge considered that the concept of "inventor" should be seen as analogously flexible and evolutionary to the widening conception of the term "manner of manufacture" as considered in ***D'Arcy*** *v Myriad Genetics Inc* [2015] HCA 35; 258 CLR 334 at [18] (French CJ, Kiefel, Bell and Keane JJ). Fifthly, he considered that the approach to the construction of the *Patents Act* should be consistent with the s 2A object clause inserted recently into the *Patents Act* and that the Deputy Commissioner erred in expressing the view that he should have regard to it only where there was ambiguity. The primary judge said at J[124]:

> In my view it is consistent with the object of the Act to construe the term "inventor" in a manner that promotes technological innovation and the publication and dissemination of such innovation by rewarding it, irrespective of whether the innovation is made by a human or not.

47 He considered that, consistently with s 2A, recognition of computer inventorship would "incentivise the development by computer scientists of creative machines and also the development by others of the facilitation and use of the output of such machines, leading to new scientific advantages". In so doing, his Honour considered that one is simply recognising the "reality" that machines have been autonomously or semi-autonomously generating patentable results "for some time now".

48 The primary judge then posited, as a question of policy, that if the output of an artificial intelligence system is said to be an invention, who other than the system should be the inventor? Having raised this issue, his Honour provided his opinion (at J[131]) that:

> …[i]n some cases, the better analysis, which is consistent with the s 2A object, is to say that the system is the inventor. That would reflect the reality. And you would otherwise avoid uncertainty…

49 The primary judge considered that if only an artificial intelligence system could be said to have created the output, but only human inventors are permitted, there may not be an inventor at all, and one may not be able to patent the invention. The primary judge said at J[132]:

> …Generally, it is quite undesirable to preclude a class of otherwise patentable inventions from patentability on the basis of an exclusion that is not apparent from the express words of the Act. Indeed, that would be the antithesis of promoting innovation.

50 The primary judge considered the argument that if one permitted computer-generated patent applications that the patent system would reach a breaking point due to the likely increase in volume of applications. His Honour rejected that argument, noting that one requires a legal person to make a patent application, and so a person will have ultimate control over any computer generated application. The primary judge concluded on this point at J[134]:

> Generally, the outcome of the Commissioner's position is incompatible with s 2A. The Commissioner accepts that Dr Thaler is not the inventor, and indeed in analogous circumstances concerning the output of an artificial intelligence system would seem to suggest that the person owning or controlling the machine would not be the inventor. But the product or method that is described or detailed in such an output could involve an inventive step as that concept is used in the Act. But on the Commissioner's logic there would be no inventor. Accordingly, it would follow on the Commissioner's reasoning that you could not make a PCT application for the invention, as you would not satisfy reg 3.2C(2)(aa). This would be a strange result, and at odds with the object in s 2A…

51 Sixthly, the primary judge next turned to consider the test for inventive step under ss 18(1)(b)(ii) and 7 of the *Patents Act*. His Honour concluded that the *Patents Act* focusses on inventive step as a hypothetical and objective construct which is not at all concerned with the inventor's mental processes and that whether the inventive step is produced by a human or a machine is irrelevant to the inquiry in s 7(2).

52 The primary judge next considered the construction of s 15. He rejected the conclusion reached by the Deputy Commissioner that entitlement to the grant of a patent flows from the inventor under s 15(1), and that, absent devolution, the inventor will become the patentee. His Honour preferred the view that s 15(1) contemplates four separate classes of person who may be granted a patent.

53 Turning to s 15(1)(a), he accepted that s 15(1)(a) provides that a patent may be granted to a person who is the inventor and that DABUS is excluded from eligibility for grant on this basis, because it is not a person.

54 However, he considered that s 15(1)(b) does not require the existence of an inventor at all, but rather that the applicant is entitled to have the patent assigned to him in the event that there is a grant. He considered that one such circumstance may be where the inventor is an employee. He considered that another is where a third party misappropriates an invention, in which case the inventor's employer could bring an action seeking an equitable assignment from the third

party and posited, in that circumstance, that the inventor would not be a party to the assignment. The primary judge considered that, on its face, s 15(1)(b) could also apply where an invention made by an artificial intelligence system, rather than by a human inventor, was the subject of a contract or had been misappropriated, giving rise in either case to a legal or equitable right of assignment. In this regard the primary judge noted that s 113 (person claiming under an assignment or agreement) similarly does not refer to the inventor. His Honour rejected the finding of the Deputy Commissioner that s 15(1)(b) is limited to the case only of an assignment from the inventor which pre-supposes an earlier vesting of title in the inventor. He considered that s 15(1)(b) does not require this expressly or by necessary implication. To the contrary, the primary judge found that, because Dr Thaler is the owner, programmer and operator of DABUS, the invention was made for him and that on established principles of property law, he is the owner of the invention in a way analogous to the ownership of the progeny of animals. We note that this finding should not be considered to be determinative on the subject because the question of the entitlement of Dr Thaler to the invention as claimed was not the subject of the proceedings before the primary judge.

55 As we have set out above, s 15(1)(c) provides that a patent may be granted to a person who derives title to the invention from the inventor or a person mentioned in s 15(1)(b). The primary judge considered that this subsection recognises that the rights of a person who derives title to the invention from an inventor extend beyond assignments in s 15(1)(b) to encompass other means by which an interest may be conferred. In this regard, his Honour considered that the ordinary meaning to be given to "derives" is "obtained", "got" or "acquired". His Honour distinguished the reasoning of the Full Courts in *JMVB Enterprises* at [69]-[72] (Emmett, Stone and Bennett JJ) and ***Stack*** *v Davies Shephard Pty Ltd* [2001] FCA 501; 108 FCR 422 at [21] (Whitlam, Sundberg and Dowsett JJ) on the basis that it was inapplicable. He reasoned that, as the owner and controller of DABUS, Dr Thaler would own any inventions made by DABUS when they came into his possession. Dr Thaler obtained possession of the invention of the application through and from DABUS. Accordingly, by reason of his possession of the invention combined with his ownership and control of DABUS, Dr Thaler prima facie obtained or derived title to the invention. His Honour considered that there is no need for the inventor ever to have owned the invention, and there is no need for title to be derived by an assignment.

56 Having reached these conclusions the primary judge rejected as incorrect the construction of s 15(1) adopted by the Deputy Commissioner. He considered that no other section in the *Patents Act* or *Regulations* precluded the conclusions that he had reached.

57 The primary judge concluded:

> [221] As I have said, s 15 concerns who may be granted the patent. The Commissioner is not being asked to decide that question now. The question is whether a valid PCT application has been presently lodged. The only impediment it would seem is reg 3.2C(2)(aa) and the Commissioner's interpretation of that requirement.
>
> [222] First, in my view the name of the inventor can be a non-human. The Commissioner is incorrect in saying that you cannot have a non-human inventor.
>
> [223] Second, if the Commissioner would have it that reg 3.2C(2)(aa) requires the name of a human inventor, that is not what the Act mandates. Accordingly, if the Commissioner is correct, I would read down the regulation to avoid it being ultra vires, so that in effect it reads "the name of a human inventor (if applicable)".
>
> [224] Third, the Deputy Commissioner ought not to have used subordinate legislation to summarily rule out a substantive consideration and examination of Dr Thaler's application in circumstances where:
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> (a) Dr Thaler was a valid applicant;
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> (b) prima facie his application is not said not to disclose a patentable invention;
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> (c) no other difficulties with his application have been identified;
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> (d) the question of grant is some years away; and
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> (e) it cannot be said now that Dr Thaler could not later bring himself within s 15(1)(b) and / or s 15(1)(c) in terms of being entitled to a grant.
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> [225] On this aspect, and if it is necessary to say so, I also agree with Dr Thaler's procedural point that I referred to earlier.
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> [226] In summary, in my view, an inventor as recognised under the Act can be an artificial intelligence system or device. But such a non-human inventor can neither be an applicant for a patent nor a grantee of a patent. So to hold is consistent with the reality of the current technology. It is consistent with the Act. And it is consistent with promoting innovation.

58 The "procedural point" is apparently a reference to a submission advanced by Dr Thaler, summarised at J[109] to [111], that the Commissioner ought to have awaited the examination stage under s 45 to consider whether the patent request and complete specification complied with the requirements of s 15(1).

6. THE SUBMISSIONS

6.1 The Commissioner's submissions

59 The Commissioner takes issue with the findings of the primary judge that by determining the question under reg 3.2C(2)(aa) at the formalities stage she has acted prematurely. She submits that the **Explanatory Statement** to *Select Legislative Instrument No. 88, 2015* issued under the Authority of the Minister for Industry and Science (authorities tab 25) demonstrates that reg 3.2(2)(aa) requires a name to be given to show entitlement. She further submits that the word "inventor" in the reg 3.2C(2)(aa) has the same meaning as in the *Patents Act*, citing *Regional Express Holdings Ltd v Australian Federation of Air Pilots* [2017] HCA 55; 262 CLR 456 at [21]. She submits that the failure by Dr Thaler to comply with the direction under reg 3.2C(4) to give the name of the inventor (as that term is to be understood under the *Patents Act*) had the inevitable consequence that the application lapsed under reg 3.2C(5) for failure to satisfy a mandatory requirement. She submits that even though the Commissioner might have delayed refusal under examination of the application under s 45(1) and reg 3.18(2)(a)(i), the question as to the proper construction of "inventor" under reg 3.2C(2)(aa) arose as an important question of principle that was properly considered at this stage.

60 Turning to the substantive question, the Commissioner submits that the identification of an inventor draws its lineage from s 6 of the ***Statute of Monopolies*** *1624* (21 Jac c 3) and has always been confined to human inventors, citing *Thaler v Comptroller General of Patents, Trade Marks and Designs* [2021] EWCA Civ 1374 (***Thaler UK***) and *Stack* at [13]-[18] (Whitlam, Sundberg and Dowsett JJ). She submits that the learned author of *Terrell on the Law of Patents* (Sweet & Maxwell, 8th ed, 1934) (***Terrell 8th ed***) emphasised (at pp 18-20) that the question of whether the patentee is the true and first inventor is entirely separate from the question of whether the invention itself was new, the former question placing emphasis on the human inventor and his or her ingenuity. She contends that an analogy may be drawn between patent rights and other intellectual property rights such as copyright, trade marks and designs in respect of which the Commonwealth Parliament is given power by s 51(xviii) of the *Constitution*. Such rights are, she submits, intended to support innovation by rewarding human endeavour by encouraging the making of inventions and the authorship of works. Since artificial intelligence is not a person, she submits that there is no question of encouragement to innovate.

61 The Commissioner submits that each of paragraphs (b), (c) and (d) in s 15(1) concern title to a patent for an invention made by the inventor referred to in paragraph (a), citing *Stack*, *JMVB Enterprises* and *Vehicle Monitoring Systems Pty Ltd v SARB Management Group Pty Ltd* [2020] FCA 408; 150 IPR 216 at [236] (Burley J) and on appeal in ***Vehicle Monitoring Systems*** *Pty Ltd v SARB Management Group Pty Ltd* [2021] FCAFC 224 at [52] (Nicholas, Yates and O'Bryan JJ). In this way, she submits that paragraphs (b), (c) and (d) are not *sui generis* sources of entitlement but add persons who can otherwise claim title from the inventor. She submits that contrary to the finding of the primary judge at J[64], s 15(1)(a) clearly excludes a non-person such as an artificial intelligence from being the inventor for the purposes of s 15(1). She submits that the primary judge erred in his construction of s 15(1)(b) and s 15(1)(c) because, in each case, determining entitlement to the grant of a patent proceeds from the starting point of identifying a person as the inventor. Further, in the case of s 15(1)(c), the Commissioner submits that it requires that title be derived "from the inventor", that inventor being the inventor of s 15(1)(a), citing *Thaler UK* at [20]-[23] and the corresponding entitlement provisions in the *Patents Act 1977* (UK). She submits that it is not possible for Dr Thaler to "derive title to the invention" from DABUS in circumstances where no inventor, other than the person in s 15(1)(a), is contemplated by the *Patents Act*. In this regard, the Commissioner submits that the reference by the primary judge in his reasons to "possession of the invention" is inapposite, because that phrase does not mean a property right, but rather the conception of the invention in the mind of the inventor, citing ***Dunlop*** *v Cooper* [1908] HCA 67; 7 CLR 146 at 155-156 (Griffiths CJ).

62 The Commissioner contends that the primary judge erred in the emphasis that he placed on the objects clause in s 2A of the *Patents Act*, citing [14] of the Explanatory Memorandum to the *Intellectual Property Laws Amendment (Productivity Commission Response Part 2 and Other Measures) Bill 2019* (Cth) which stated that the object clause "does not alter the ordinary meaning of the legislation or overturn existing case law and established precedent". She submits that the primary judge erred in finding that his construction is "consistent with the object of the Act to construe the term 'inventor' in a manner that promotes technological innovation…" in circumstances, first, where there was no evidentiary support for that proposition and, secondly, where his Honour approached the task of statutory construction by reference to: (a) what he regarded as desirable policy; (b) imputing that policy to the legislation; and (c) then characterising that as the purpose of the legislation, citing ***Deal*** *v Father Pius Kodakkathanath* [2016] HCA 31; 258 CLR 281 at [37] (French CJ, Kiefel, Bell and Nettle JJ).

63 The Commissioner further drew on the preconditions for validity of a patent – novelty, inventiveness and innovativeness – to support a submission that the assessment of these criteria of validity is performed having regard to "a person skilled in the relevant art", a human person whose knowledge and skills are notionally applied by the Court. She submits that such provisions cannot work sensibly if the inventor is not a human and, indeed, proceed on the basis that the inventor is a human. By contrast, the Commissioner contends that ss 172 and 182 of the *Patents Act* lend support for the construction that an inventor must be a person and may not be an artificial intelligence machine. She submits that the primary judge erred in concluding otherwise at J[204]-[207] and J[210]-[212].

6.2 Dr Thaler's submissions

64 Dr Thaler supports the reasons of the primary judge.

65 In relation to the procedural point, Dr Thaler notes that the Commissioner does not submit that reg 3.2C(2)(aa) independently supports the conclusion that the inventor must be a human. It follows, he submits, that the primary judge was correct to conclude that the inventor can be a non-human and that the *Patents Act* does not mandate a human inventor. He submits separately, that since he provided the name of the inventor, then consistent with the requirements of reg 3.2C(2)(aa), the Commissioner should have examined the request and specification to consider whether s 15 was complied with under reg 3.18(2)(a)(i). He submits that it was possession of the invention which entitled the applicant to a patent. In this regard, Dr Thaler draws support from the reasons of Birss J in *Thaler UK* at [36] and [89], noting contrary comments by Arnold J at [130]-[133].

66 On the substantive point, Dr Thaler contends that the approach of the Commissioner bespeaks error because, on her construction, an invention which is otherwise valid may nonetheless be unpatentable because it was invented by an artificial intelligence machine, not by a human. He accepts that the language of s 15 governs entitlement to the grant of a patent, but contests the proposition that s 15 governs the meaning of the word "inventor", particularly as that term is not defined in the *Patents Act*. He contends that s 15(1)(b) or (c) are alternatives to s 15(1)(a) and neither require the inventor from whom the patentee obtains title be a person. He submits that to succeed in this appeal, which relates to a formalities rejection rather than consideration of the actual facts going to the existence of Dr Thaler's title, the Commissioner would need to show that there is no situation in which Dr Thaler could qualify under either s 15(1)(b) or s 15(1)(c) of the *Patents Act*.

67 In relation to s 15(1)(b), Dr Thaler submits that entitlement can arise by agreement, by conduct or informally, or by operation of law. He submits that in the present case, Dr Thaler owns, programs and operates DABUS and, if another person stole and sought to patent DABUS' invention, he would be entitled to an assignment of the patent, including under the law of equitable confidentiality. This, he submits, is consistent with the reasoning of the Court of Appeal in *Thaler UK*.

68 In relation to s 15(1)(c), Dr Thaler contends that the concept of "derivation" is broader than "assignment" in s 15(1)(b) and means "received, obtained, got, gain or obtain or acquired". Dr Thaler submits that it is consistent with *Blackstone's Commentaries of the Laws of England* (Clarendon Press, Book 2, 1766) at pp 405-407, that occupancy, or exclusive possession, of an unpatented invention is the foundation of ownership. He further submits that the significance of possession is recognised in the form of application for an invention, which require applicants to declare that they are in possession of the invention, citing, inter alia, *Dunlop* at 155.

69 Dr Thaler submits that where the owner of the physical property, in the form of an artificial intelligence machine, also programmed and operated the machine, and the resulting invention was not published to anyone but the owner of the artificial intelligence machine, the Court should not foreclose the argument that the owner "derives title to the new intangible". He submits that this factual question is for another day. For the present case, he submits that it is sufficient that circumstances can be posited where the title can be derived from an existing tangible object.

70 In this context Dr Thaler repeats his submission that his ownership of the work product of the artificial intelligence machine is analogous to the ownership of the progeny of animals, or to fruit and crops, adopting the findings of the primary judge at J[167].

71 Dr Thaler also submits that the resort by the primary judge to s 2A of the *Patents Act* was orthodox. Furthermore, he submits that to the extent that the primary judge made findings that were not supported by any evidence (at J[20]-[28], J[41]-[42] and J[44]-[56] of his reasons), those findings merely represented non-controversial background and did not form part of the *ratio decidendi* of his decision. To the extent that the primary judge expressed views that factual matters supported his view on the fulfilment of the objects of the *Patents Act*, Dr Thaler submits that those findings were immaterial, because his Honour had expressed a view on the objects of the *Patents Act* before making reference to those materials.

72 Dr Thaler concludes by submitting that the ordinary meaning of "inventor" is an agent noun, where the inventor is the agent, whether person or machine, who invents. The meaning of "inventor", as contended for by Dr Thaler, is open and is consistent with the object of the *Patents Act*.

7. CONSIDERATION

73 The immediate cause of the present dispute arises from the Commissioner's application of reg 3.2C(2)(aa), which requires an applicant to provide the name of the inventor of the invention to which a patent application relates. The Commissioner determined, in effect, that it was a legal impossibility that an artificial intelligence machine could be such an inventor, with the consequence that the application lapsed in accordance with reg 3.2C(5). The primary judge took a different view.

74 Reg 3.2C(2)(aa) imposes an obligation upon the applicant, and reg 3.2C(4) empowers the Commissioner to direct an applicant to, *inter alia*, provide the name of the inventor of the invention to which the application relates. Where the applicant has not complied with such a direction within two months of the date of that direction, the application will lapse: reg 3.2C(5).

75 The purpose of reg 3.2C(2)(aa) is set out in the Explanatory Statement which provides that the name of the inventor of the invention "is required to ensure that *the entitlement of the applicant to be granted a patent is clear*". The path to entitlement to the grant of a patent may be traced in the *Patents Act* and *Regulations* from the filing of an application onwards. Under s 29(1), a person may apply for an invention by filing, in accordance with the regulations, a patent request and such other documents as are prescribed: s 29(1). Section 29(4A) sets out the requirements for a patent request in relation to a complete application. Section 29A(1) provides that a PCT application is to be treated as a complete application. The person who is identified in a patent request as the person to whom the patent is to be granted, whether for a complete application or a PCT application, is defined as the "nominated person": *Patents Act* sch 1; *Regulations* reg 3.1A(2).

76 After an application has been filed, the Commissioner must, if requested to do so, examine it and report on whether, to the best of her knowledge, the patent request and specification complies with *inter alia*, s 15 and, for a PCT application, regs 3.2C(2) and (3): *Patents Act* s 45; *Regulations* regs 3.18(2)(a)(i) and 3.18(2)(f). The Commissioner must accept a patent request if she is satisfied, on the balance of probabilities, as to the matters prescribed, and then notify the applicant of acceptance and publish a notice of acceptance in the Official Journal: ss

49(1) and (5). Thereafter, any person may oppose the grant of the patent on the grounds set out in s 59 which relevantly include that the nominated person is not entitled to a grant of a patent for the invention: ss 59(a) and 33.

77 Separately, pursuant to s 36, the Commissioner may, if satisfied on the balance of probabilities that the nominated person is not an eligible person, but that one or more applicants who have applied under that section are eligible persons, make a declaration to that effect: s 36(1)(c)(i). Such a declaration may be made whether or not the patent application lapses or is withdrawn: s 36(2).

78 Following grant, a patent may be revoked on the grounds set out in s 138(3) which relevantly include that the patentee is not entitled to the patent: s 138(3)(a), as qualified by s 22A.

79 It is apparent that the mechanism supplied by reg 3.2C is intended to provide a preliminary stage whereby the Commissioner may screen a PCT application for non-compliance with the requirements prescribed therein.

80 In reaching his conclusions, the primary judge found that the Deputy Commissioner wrongly used reg 3.2C(2)(aa) "to summarily rule out a substantive consideration and examination of the application" on the apparent basis that nothing in the *Patents Act* would permit this course. On appeal, Dr Thaler supports that finding, arguing that because he provided the name of the inventor he satisfied the requirements of reg 3.2C(2)(aa) and the request and specification ought to have proceeded to examination in accordance with reg 3.18(2)(a)(i).

81 These complaints are directed to the procedural question of whether or not the Commissioner ought to have deferred consideration of the present question until the examination phase. Nothing in the present appeal turns upon this point. The parties prepared and conducted the proceedings before the primary judge and also the appeal on the basis that the substantive issue to be determined is whether or not the primary judge was correct to find that, as an artificial intelligence machine, DABUS is capable of being an "inventor" within reg 3.2C(2)(aa), as that term is understood in the scheme of the *Patents Act* and *Regulations*. The primary judge decided that point. However, it is appropriate, having regard to the primary judge's criticism, for us to note that reg 3.2C(2) requires that an applicant provide an address for service and the name of the inventor of the invention. Where, on its face, it is apparent that one or both of those requirements has not been satisfied following a direction given by the Commissioner under reg 3.2C(4), the application lapses under reg 3.2C(5) and the Commissioner has no alternative but

to take the course under reg 3.2C(6). In the present case the Deputy Commissioner formed the view, following a direction issued under reg 3.2C(4), that the name provided did not comply with the requirements of reg 3.2C(2)(aa) because it was a legal impossibility for an artificial intelligence machine to be "the inventor of an invention". Accordingly, he concluded that the requirements of reg 3.2C had not been met. This was an appropriate course to take.

82 We now turn to the substantive question which is whether the primary judge erred in concluding that the Deputy Commissioner had erred in law by finding that DABUS could not be "the inventor" pursuant to reg 3.2C(2)(aa).

83 The duty to resolve an issue of statutory construction is a text-based activity. However, questions of policy can inform the Court's task of statutory construction: ***Alphapharm*** *Pty Ltd v Lundbeck A/S* [2014] HCA 42; 254 CLR 247 at [42] (Crennan, Bell and Gageler JJ); *Acts Interpretation Act* s 15AA. It is accordingly appropriate to consider policy considerations, however the surest guide to ascertaining the legislative intention is the language of the text of the legislation itself: *Alcan (NT) Alumina Pty Ltd v Commissioner of Territory Revenue (Northern Territory)* [2009] HCA 41; 239 CLR 27 at [47] (Hayne, Heydon, Crennan and Kiefel JJ).

84 Regulation 3.2C(2)(aa) requires the applicant to "provide the name of the *inventor* of *the invention*". This, as the Explanatory Statement makes clear, is for the purpose of ensuring that the entitlement of the applicant to be granted a patent is clear. The reference in the Explanatory Statement to "entitlement" picks up that term as it is used in the *Patents Act* to refer to the eligibility of an applicant (or "nominated person") to the grant of a patent for an invention: see ss 33, 34, 59 and 113. Accordingly, we would understand the reference in reg 3.2C(2)(aa) to "inventor" and "invention" to have the same meaning as used in the *Patents Act*. "Inventor" is used in the *Patents Act* in s 15(1). The "invention" as that term is used in reg 3.2C(2)(aa) must be the invention the subject of the patent application.

85 Section 15(1)(a) provides that "a patent for *an invention* may only be granted to a person who is *the inventor*". The term "invention" is defined in the dictionary to mean:

> …any manner of new manufacture the subject of letters patent and grant of privilege within section 6 of the Statute of Monopolies, and includes an alleged invention.

86 Section 6 provided an exception to the prohibition on monopolies for the term of 14 years "of the sole working or making of any manner of new Manufactures within this Realm, *to the true*

and first Inventor and Inventors of such Manufactures, which others at the time of making such Letters Patents and Grants shall not use".

87 In *Terrell 8th ed* there is discussion (at pp 13-22) of the meaning of the expression "true and first inventor" in s 6 of the *Statute of Monopolies* and equivalent terms in later legislation. The learned author refers (at pp 18-19) to the rationale underlying the identification of such a person or persons:

> In *Cornish v Keene* ([1835] 1 WPC 501 at 507), Tindal CJ said: 'Sometimes it is a material question to determine whether the party who got the patent was the real and original inventor or not*; because these patents are granted as a reward, not only for the benefit conferred upon the public by the discovery, but also to the ingenuity of the first inventor;* and although it is proved that it is a new discovery, so far as the world is concerned, yet if anybody is able to show that although that (ie the publication to the world) was new – that the party who got the patent was not the man whose ingenuity first discovered it, that he borrowed it from A or B, or had taken it from a book that was printed in England, and which was open to all the world – then, although the public had the benefit of it, it would be an important question whether he was the first and original inventor of it.' There is no doubt that, in the circumstances stated by the Chief Justice, the person obtaining the patent would not be the true and first inventor.
>
> (emphasis added)

88 We note that the consideration for "the reward" of the grant of the patent in the form of a statutory monopoly has long been the disclosure of the invention to the public in a manner that enables a person skilled in the art to perform the invention upon the expiry of the term of the patent: *Kimberly-Clark Australia Pty Ltd v Arico Trading International Pty Ltd* [2001] HCA 8; 207 CLR 1 at [25] (Gleeson CJ, McHugh, Gummow, Hayne and Callinan JJ) citing *No-Fume Ltd v Frank Pitchford & Co Ltd* (1935) 52 RPC 231 at 243 (Romer LJ). As noted above, a person's entitlement to that reward is closely linked to the act of invention by the true and first inventor.

89 The expression "true and first inventor" in s 6 of the *Statute of Monopolies* was, through usage, extended to apply to a person who did not in fact invent the invention but who imported that invention from abroad. However, the rationale for extending the entitlement of that person to a patent for the invention was the same as that applying to the entitlement of the person who was literally the true and first inventor; namely, that by doing so the person who imported the invention ought to be rewarded for introducing into the kingdom an invention that was not previously known. This came from a time when travelling abroad involved considerable peril, and so it was considered to be no less a meritorious service that the person imported, rather than invented, the invention in question: see *Stack* at [15]-[16]; *Marsden v The Saville Street*

Foundry and Engineering Co Ltd (1878) 3 Ex D 203 at 206-207 (Jessel MR); *The Clothworkers of Ipswich Case* (1615) Godb 252; 78 ER 147; *Terrell 8th ed* at pp 14-16. That extended usage has, following the introduction of various Patents Acts, fallen away.

90 The role of the inventor has been repeatedly emphasised in the context of Australian patents legislation preceding the *Patents Act* under present consideration. In *Tate v Haskins* [1935] HCA 40; 53 CLR 594, the High Court (Rich, Dixon, Evatt and McTiernan JJ) considered the obligation of a person to describe the invention in the specification within the terms of the ***Patents Act 1903*** (Cth), drawing on the lengthy history of the development of patent law (at 606-607):

> The requirement that a complete specification shall conform to the provisional has its source in the history of English patent law. The specification took its origin in the introduction early in the eighteenth century into the letters patent of an express condition that the grant should be void if the grantee should not within six months particularly describe and ascertain the nature of his invention, and in what manner the same was to be performed, by an instrument in writing enrolled in Chancery. There was no provisional specification at that time. The grant itself was made upon a brief description of the invention which was incorporated in the letters patent. This description provided at once a foundation for the grant and a means of restricting the area of the monopoly. "*The language in which the supposed invention is described in a patent of this nature is the language of the patentee himself. He represents to the Crown, that he has invented this or that thing, and that he is the first and sole inventor thereof, etc,; and the Crown yielding to his representation, and willing to give encouragement to all arts and inventions that may be for the public good, grants to the patentee the sole liberty and privilege of using his said invention, for a certain term, under the conditions before noticed.* ***It is obvious, therefore, that if the patentee has not invented the matter or thing of which he represents himself to be the inventor, the consideration of the Royal grant fails, and the grant consequently becomes void. And this will not be the less true, if it should happen that the patentee has invented some other matter or thing, of which, upon a due representation thereof, he might have been entitled to a grant of the exclusive use****...*" (per Abbott CJ, *R v Wheeler* (1819) 2 B & Ald. 345 at pp. 349-351; 106 ER 392 at pp. 394, 395…
>
> (emphasis added)

91 It is apparent that in the cited passage from in *R v Wheeler* (1819) 2 B & Ald. 345, Abbott CJ used the term "patentee" in a way synonymous with "inventor". It is the inventor's invention that warrants the grant.

92 Indeed, the modern ground of revocation under s 138(3)(d) of the *Patents Act* – that the patent was obtained by fraud, false suggestion or misrepresentation – proceeds on the assumption that the language of the patentee in the specification reflects the representations made by the inventor to the Crown. As Lockhart J noted in ***Prestige Group*** *v Dart Industries Inc* [1990] FCA 406; 26 FCR 197 at 199, if the inventor asserts an inventive merit of his invention and

promises a particularly beneficial or useful result, this may persuade members of the public into believing the claims are valid and act on the faith of that by, for example, becoming a licensee or by not using the alleged invention. The reasons of Gummow J in *Prestige Group* at 213-218 include an informative review of the history of this ground of revocation, from its origins in the writ of *scire facias* as a means of applying to revoke a Crown grant of letters patent, to the (then current) terms of the *Patents Act 1952* (Cth) (which the Court was there considering). It is instructive to note the following passage quoted by Gummow J from Hindmarch, *The Law Relating to Patents* (1846) at 377-378 (at 215):

> Crown grants are indeed almost always obtained by means of representations made by, or on the behalf of the grantees, and as the sovereign is so much occupied with the affairs of the state, it would be impossible always to ascertain with certainty whether the representations of a petition for a grant by patent were true or not. The law, therefore, takes especial care to protect the Crown against false petitions and representations. It is accordingly laid down that it is the duty of every one obtaining a grant from the Queen, to see that she is correctly informed respecting the grant. And if it appears that the Queen has been deceived in any material particular, by a false representation or suggestion of the grantee, the patent will be wholly void. And when facts are recited in a patent respecting the subject-matter of the grant, it will be presumed that the statements contained in the recital were represented or suggested to the Queen by the patentee.
>
> The material particulars respecting an alleged invention for which a party seeks to obtain a patent, must, as has already been observed, be stated in the petition for the patent. The petition must therefore state, that the petitioner is the inventor or importer of the invention, and that the invention possesses the qualities of novelty, utility, &c., so as to be the proper subject of a grant by patent. The substance of the petition for a patent is always recited in the patent itself, and therefore the patent itself shows upon what representations of the patentee it has been granted; and if the patentee has represented any thing which was untrue in any material particular, or has induced the Crown to make an illegal grant, the patent is entirely void.

93 It may be seen that this ground of revocation is premised upon the fact that it is the *inventor* who makes representations in the specification about the nature of the invention to the authority responsible for the grant of a patent.

94 Section 32(2) of the *Patents Act 1903* relevantly provided:

> Any of the following persons may make application for a patent:
>
> (a) The actual inventor; or
>
> (b) his assignee agent attorney or nominee: or
>
> (c) the actual inventor or his nominee jointly with the assignee of a part interest in the invention; or
>
> (d) the legal representative of a deceased actual inventor or of his assignee, or

(e) any person to whom the invention has been communicated by the actual inventor his legal representative or assignee (if the actual inventor, his legal representative or assignee is not resident in the Commonwealth).

95 In *Dunlop*, the appellant opposed a patent application on the ground that the respondents obtained the invention the subject of their patent from him. Griffiths CJ said (at 156):

> …*I am of the opinion that the whole scheme of the patent law*, emphasized by the obligation imposed on an applicant to declare that he is in possession of the invention, *implies that an applicant must have actually made an invention before he can describe it in his provisional specification*…But if it appears from admissible evidence–and the applicant's own statements are as such–that he had not then conceived the idea which his words convey to other minds, I think that he is not in possession of the invention, and is not the inventor… In *Edison and Swan Electric Light Co. v Woodhouse* [32 Ch D, 520 at p. 524] Butt J said: "I agree…that an inventor has no right to put into his final specification as part of his invention a discovery which he had not made at the time, of which he was ignorant when he filed his provisional specification…"
>
> (emphasis added)

96 It may be seen that Griffiths CJ considered that the scheme of the *Patents Act 1903* established an implication that an applicant for a patent must have actually made the invention before an application could be made for a patent for that invention. For the patent applicant to be entitled to the invention, the inventor's role in conceiving of the invention must be able to be demonstrated.

97 Section 34(1) of the *Patents Act 1952* (Cth) was in similar terms. It provided:

> Any of the following persons, whether an Australian citizen or not, may make an application for a patent:
>
> (a) the actual inventor;
>
> (b) the assignee of the actual inventor;
>
> (c) the legal representative of a deceased actual inventor;
>
> (d) the legal representative of a deceased assignee of the actual inventor;
>
> (e) a person to whom the invention has been communicated by the actual inventor, his legal representative or assignee (if the actual inventor, his legal representative or assignee is not resident in Australia);
>
> (f) the assignee of such a legal representative as is specified in paragraph (c) or (d);
>
> (fa) the person who would, if a patent were granted upon an application made by a person referred to in any of the preceding paragraphs be entitled to have the patent assigned to him; or
>
> (g) the agent or attorney of a person referred to in any of the preceding paragraphs.

98 In each of these provisions, the ability of a person to make an application for a patent was predicated upon the existence of an "actual inventor" from whom the entitlement to the patent was directly or indirectly derived. Paragraphs (a), (c) and (e) describe the actual inventor as, respectively, a person, one that is deceased and has a legal representative (which must be a person), and one that is not resident in Australia. Paragraphs (b), (d), (f) and (fa) all contemplate an assignment happening between the patent applicant and the actual inventor. It is clear from these provisions that only a person with a legal personality could be the "actual inventor" under this legislative scheme.

99 The current *Patents Act* was based in large part on the recommendations of the Industrial Property Advisory Committee in its report *Patents, Innovation and Competition in Australia* (**IPAC report**): see *Lahore, Patents, Trade Marks and Related Rights* at [5030]. It contained no recommendations that the role of the inventor, as the person from whom the entitlement to the grant of the patent should be derived, would change. None of the second reading speeches or the Explanatory Memoranda introducing s 15(1) to the *Patents Act* suggested that the established law relating to entitlement was intended to be altered. Indeed, the **Explanatory Memorandum** to the Patents Bill 1989 (Cth) stated the effect of s 15 as follows:

> Broadly, a patent may be granted only to the inventor of the invention concerned or to a person deriving rights from the inventor.

100 Although not defined in the *Patents Act*, the term "inventor" in 15(1) plainly enough is a reference to the inventor of the invention the subject of the patent application. "Inventor" has long been held to bear its ordinary English meaning, being the person(s) responsible for making the invention, namely, "the person who makes or devises the process or product": *JMVB Enterprises* at [71]-[72]; *Atlantis Corporation v Schindler* [1997] FCA 1105; 39 IPR 29 at 54 (Wilcox and Lindgren JJ).

101 The inventor for the purposes of s 15(1)(a) is the person who is responsible for the "inventive concept". Such an inventor is the person, or one of the people, who materially contributes to the inventive concept as described in the specification and the subject of the claims: *Vehicle Monitoring Systems* at [52]; ***Polwood*** *Pty Ltd v Foxworth Pty Ltd* [2008] FCAFC9; 165 FCR 527 at [59]-[66] (Finn, Bennett and Greenwood JJ); *University of Western Australia v Gray (No 20)* [2008] FCA 498; 76 IPR 222 at [1443] (French J) and upheld on appeal in *University of Western Australia v Gray* [2009] FCAFC 116; 179 FCR 346 at [221] and [263] (Lindgren, Finn and Bennett JJ); and *Kafataris v Davis* [2016] FCAFC 134; 120 IPR 206 at [62] and [65] (Greenwood, Middleton and McKerracher JJ).

102 Identification of the inventor within s 15(1) is of central relevance to the operation of the *Patents Act* and is intertwined with concepts material to the validity of patent applications and patents. This may be seen from the assumption to which we have referred in the context of the ground of revocation under s 138(3)(d) that, by the terms of the specification, the *inventor* is making representations as to the nature of the invention. If a relevant misrepresentation is material to the grant, the patent may be revoked.

103 The central relevance of the identification of the inventor is also apparent in the context of challenges to the right of a nominated person to be entitled to the grant of a patent under s 59 and challenges to the validity of a patent under s 138(3)(a). Such challenges can involve an opponent contesting the entitlement of the nominated person to the grant at all, or contending that he or she is jointly entitled to the grant, or by contending that a person other than the patentee is entitled to the patent. The task of the Commissioner or the Court in adjudicating such disputes often involves a nuanced consideration of competing contentions as to who made relevant contributions to the invention, by objectively assessing those individual contributions to the invention. If the final concept of the invention as described in the specification and claimed in the claims would not have come about without a particular person's involvement, then that person has an entitlement to the invention. One must have regard to the invention as a whole, as well as the component parts and the relationship between the participants: see *Polwood* at [53], endorsing the observations of Crennan J in *JMVB Enterprises Pty Ltd v Camoflag Pty Ltd* [2005] FCA 1474; 67 IPR 68 at [132]; and *Vehicle Monitoring Systems* at [104].

104 The relevant test for establishing whether a particular person is entitled to be named an inventor was stated in *Polwood* at [60]:

> The invention or inventive concept of a patent or patent application should be discerned from the specification, the whole of the specification including the claims. The body of the specification describes the invention and should explain the inventive concepts involved. While the claims may claim less than the whole of the invention, they represent the patentee's description of the invention sought to be protected and for which the monopoly is claimed. The claims assist in understanding the invention and the inventive concept or concepts that gave rise to it. There may be only one invention but it may be the subject of more than one inventive concept or inventive contribution. The invention may consist of a combination of elements. It may be that different persons contributed to that combination.

See also the detailed discussion of this subject in *Vehicle Monitoring Systems* at [62]-[104].

105 None of the cases cited in the preceding five paragraphs confronted the question that arose before the primary judge of whether or not the "inventor" could include an artificial intelligence machine. We do not take the references in those cases to "person" to mean, definitively, that an inventor under the *Patents Act* and *Regulations* must be a human. However, it is plain from these cases that the law relating to the entitlement of a person to the grant of a patent is premised upon an invention for the purposes of the *Patents Act* arising from the mind of a natural person or persons. Those who contribute to, or supply, the inventive concept are entitled to the grant. The grant of a patent for an invention rewards their ingenuity.

106 Where s 15(1)(a) provides that a patent for an invention may only be granted to "a person who is an inventor", the reference to "a person" emphasises, in context, that this is a natural person. In this regard, we respectfully disagree with the Deputy Commissioner insofar as he considered that "person", as understood in s 15(1)(a), to have the extended definition supplied by s 2C of the *Acts Interpretation Act.* There is a sufficient contrary intention in the *Patents Act* for s 2C not apply to s 15(1)(a): *Acts Interpretation Act* s 2(1).

107 On a natural reading of s 15(1), each of ss 15(1)(b), (c) and (d) provide for circumstances where a person becomes entitled to the grant of a patent by ultimately receiving that entitlement from the inventor in s 15(1)(a). Put another way, there must be a legal relationship between the actual inventor and the person first entitled to the grant. That was the construction adopted by the Full Court in *Stack* which, after reviewing many of the historical matters to which we refer above, concluded at [21] that "[a] patent may only be granted to the inventor or somebody claiming through the inventor", a proposition with which we respectfully agree. Such a construction is also consistent with the broad statement as to the intended effect of s 15 provided in the Explanatory Memorandum (see [99] above).

108 Under s 15(1)(b), the person claims through the inventor of s 15(1)(a) by way of assignment. It is the person who would, on the grant of a patent for the invention, be entitled to have the patent assigned to them. From whom is the first assignment to come? Understood in context, most naturally, the assignment must come from the inventor of s 15(1)(a) who, as we have noted, must be a natural person. Something without a legal identity cannot give effect to an assignment.

109 Under s 15(1)(c), the person derives title to the invention from one of two alternatives, either "from the inventor" or from "a person mentioned in (b)". The "inventor" is most naturally understood to refer to the same inventor as in (a), who is a natural person. To hold otherwise

would be to ascribe a different meaning to "inventor" in (c) to that used in (a), which we doubt Parliament would have intended. The "person mentioned in (b)" is the same person we have addressed in the preceding paragraph.

110 Under s 15(1)(d), the person entitled to be granted the patent is the legal representative of a deceased person mention mentioned in (a), (b) or (c).

111 This approach to the construction of s 15 is supported by reference to the legislative history of the development of the law of patents in Australia to which we have referred.

112 In this regard, we respectfully disagree with the primary judge that one may construe each of ss 15(1)(a), (b), (c) and (d) as alternatives to the effect that, by operation of (b) and (c), a person identified, such as Dr Thaler, may draw entitlement to the grant of a patent from an inventor who is not the person identified in (a) (or indeed a natural person at all). To so find overlooks the scheme of the *Patents Act* that we have described, and fails to give s 15(1) a natural reading. It also overlooks the history of the development of the law of patents to which one is directed by the term "invention" in the chapeau to s 15(1), defined in the *Patents Act* by reference to the *Statute of Monopolies*.

113 In our view, the reasoning of the primary judge regarding how it may be that Dr Thaler, as a matter of law, owns the work performed by DABUS, and that such ownership could entitle him to the grant of the application, does not arise, having regard to the view that we have taken to the construction of s 15(1) and reg 3.2C(2)(aa). It is not to the point that Dr Thaler may have rights to the output of DABUS. Only a natural person can be an inventor for the purposes of the *Patents Act* and *Regulations*. Such an inventor must be identified for any person to be entitled to a grant of a patent under ss 15(1)(b)-(d).

114 For completeness, we note that no other provision in the *Patents Act* is inconsistent with the construction that we have preferred: see, in particular, ss 64(2)(a), 101B(2), 101E(1), 113, 172(1), 182(3) and 185 which all use the term "inventor".

115 Of course, the development of patent law since 1624 has not until now been confronted with the question of whether or not an inventor may be other than a natural person. However, as noted, the law to which we have referred has proceeded on the assumption that only a natural person could be an inventor. That assumption found expression in the different context considered by the High Court in *D'Arcy* where the majority (French CJ, Kiefel, Bell and Keane JJ) said of claims 1-3 in the patent then in suit at [6]:

> …Despite the formulation of the claimed invention as a class of product, its substance is information embodied in arrangements of nucleotides. The information is not "made" by *human action*. It is discerned. That feature of the claims raises a question about how they fit within the concept of a "manner of manufacture". As appears from s 6 of the Statute of Monopolies, an invention is something which involves "making". It must reside in something. It may be a product. It may be a process. It may be an outcome which can be characterised, in the language of *NRDC*, as an "artificially created state of affairs". Whatever it is, *it must be something brought about by human action*. The requirement, in each claim, that the sequence in the isolate bear specified mutations or polymorphisms raises the same problem in a particular way. Satisfaction of that integer depends upon a characteristic of the human being from whom the nucleic acid is isolated, a characteristic which is not shared by all human beings. It has nothing to do with the *person* who isolates the nucleic acid bearing the mutant sequence.
>
> (emphasis added and citations omitted)

116 The references to "human action" were deliberate. They pick up the requirement set out in *National Resource Development Corporation v Commissioner of Patents* [1959] HCA 67; 102 CLR 252 that a manner of new manufacture bring about an artificially created state of affairs: at 276-277 (Dixon CJ, Kitto and Windeyer JJ). The assumption in both cases was that human agency was required in the development of the invention in suit. That approach accords with the legislative history to which we have referred, namely that the origin of entitlement to the grant of a patent lies in human endeavour, which is rewarded by the grant of a limited term monopoly.

117 Accordingly, having regard to the statutory language, structure and history of the *Patents Act*, and the policy objectives underlying the legislative scheme, we respectfully disagree with the conclusion reached by the primary judge. The Deputy Commissioner was correct to reach the conclusion that, by naming DABUS as the inventor, the application did not comply with reg 3.2C(2)(aa).

118 Two further matters warrant observation.

119 First, in filing the application, Dr Thaler no doubt intended to provoke debate as to the role that artificial intelligence may take within the scheme of the *Patents Act* and *Regulations*. Such debate is important and worthwhile. However, in the present case it clouded consideration of the prosaic question before the primary judge, which concerned the proper construction of s 15 and reg 3.2C(2)(aa). In our view, there are many propositions that arise for consideration in the context of artificial intelligence and inventions. They include whether, as a matter of policy, a person who is an inventor should be redefined to include an artificial intelligence. If so, to whom should a patent be granted in respect of its output? The options include one or more of:

the owner of the machine upon which the artificial intelligence software runs, the developer of the artificial intelligence software, the owner of the copyright in its source code, the person who inputs the data used by the artificial intelligence to develop its output, and no doubt others. If an artificial intelligence is capable of being recognised as an inventor, should the standard of inventive step be recalibrated such that it is no longer judged by reference to the knowledge and thought processes of the hypothetical uninventive skilled worker in the field? If so, how? What continuing role might the ground of revocation for false suggestion or misrepresentation have, in circumstances where the inventor is a machine?

120 Those questions and many more require consideration. Having regard to the agreed facts in the present case, it would appear that this should be attended to with some urgency. However, the Court must be cautious about approaching the task of statutory construction by reference to what it might regard as desirable policy, imputing that policy to the legislation, and then characterising that as the purpose of the legislation: *Deal* at [37]; *Miller v Miller* [2011] HCA 9; 242 CLR 446 at [29] (French CJ, Gummow, Hayne, Crennan, Kiefel and Bell JJ). It would appear that this was the approach favoured by the primary judge.

121 Secondly, we do not accept the premise of the proposition, accepted by the primary judge and apparently influential in his reasoning, that if DABUS is not accepted to be an inventor, no invention devised by an artificial intelligence system is capable of being granted a patent. In the present case, it was said to be an agreed fact that DABUS is the inventor of the invention the subject of the application and that Dr Thaler is not. However, the characterisation of a person as an inventor is a question of law. The question of whether the application the subject of this appeal has a human inventor has not been explored in this litigation and remains undecided. Had this question been explored, it may have been necessary to consider what significance should be attributed to various matters including the (agreed) facts that Dr Thaler is the owner of the copyright in the DABUS source code and the computer on which DABUS operates, and that he is also responsible for the maintenance and running costs.

122 Finally, we note that the outcome in the present case is the same as the outcome of the Court of Appeal in *Thaler UK*. Whilst there are important aspects of the reasoning of the learned judges in that Court with which we respectfully agree, we consider that the task in the present case focusses on the particular statutory language of the *Patents Act*, which in material respects differs from that in the equivalent patents legislation in the United Kingdom.

8. DISPOSITION

123 For the reasons set out above we consider that the first ground of the appeal must succeed with the consequence that the appeal should be allowed. We do not consider that it is necessary to consider the second. The result is that the decision of the primary judge should be set aside and the orders made by the Deputy Commissioner reinstated. The Commissioner accepts that it is appropriate in the circumstances of this case that there be no order as to costs.