

DABUS GAINS TERRITORY IN SOUTH AFRICA AND AUSTRALIA: REVISITING THE AI-INVENTORSHIP QUESTION

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ABSTRACT

This paper draws from and builds upon DO Oriakhogba ‘What If DABUS Came to Africa? Visiting AI Inventorship and Ownership of Patent from the Nigerian Perspective’ (2021) 42(2) *Business Law Review* 89. It reviews the recent granting of a patent by the Companies and Intellectual Property Commission (CIPC) to Dr Stephen Thaler in respect of the DABUS-generated invention in South Africa and the judgment of the Australian Federal Court (FCA) upholding AI-inventorship. The review, which is based on desk research, is conducted against a backdrop of statutory provisions and case law from both countries, the provisions of the Patent Cooperation Treaty (PCT) and relevant literature dealing with the inventorship question. The paper determines whether, without reform of the extant patent law and policy, recognition of artificial intelligence (AI) as an inventor does not undermine the foundational concept of human inventorship, and the central focus on human creation and agency for intellectual property protection in South Africa and Australia. In connection with this, the paper asks and examines the question of whether the CIPC patent grant and the FCA judgment can stand judicial scrutiny under the extant patent regimes in South Africa and Australia.

KEYWORDS: DABUS; Artificial Intelligence; Inventor; Patent; South Africa; Australia

1. INTRODUCTION

The South African Companies and Intellectual Property Commission (CIPC) accepted Dr Thaler’s Patent Cooperation Treaty (PCT)¹ application on 24 June 2021 for a patent in respect of inventions² generated by DABUS,³ an artificial intelligence (AI) ‘inventor’.⁴ In July 2021, the CIPC released a notice of issuance for the patent.⁵ As expected, the patent granted to Thaler by the CIPC in South Africa (SA) has been hailed as the first patent granted for an

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1 Patent Cooperation Treaty (PCT), 19 June 1970, 28 U.S.T. 7645, 1160 U.N.T.S. 231, reprinted in 9 I.L.M. 978 (1970). South Africa and Australia are member states of the PCT and became bound by it in 1999 and 1980, respectively. See https://www.wipo.int/pct/en/pct_contracting_states.html (accessed on 11 August 2021)

2 Thaler SL Food container and devices and methods for attracting enhanced attention. ZA2021/03242. 2021.

3 DABUS is an acronym for Device for the Autonomous Bootstrapping of Unified Sentience.

4 IPWatchdog ‘DABUS Gets Its First Patent in South Africa Under Formalities Examination’ (29 July 2021), available at <https://www.ipwatchdog.com/2021/07/29/dabus-gets-first-patent-south-africa-formalities-examination/id=136116/> (accessed on 11 August 2021).

5 CIPC *The South African Patent Journal* (28 July 2021) Part II, 54(7) *The South African Patent Journal* 255.

AI invention (DABUS patent).⁶ Hailing the grant as an ‘historic decision’ and ‘progressive and pro-science’,⁷ and calling for a broad reading of the provisions of the SA Patents Act (SAPA)⁸ on inventorship, Thaldar and Naidoo argued that it:

was the right legal decision, [which] aligned with [SA] public policy on AI more broadly. The [SA] government has published various policy documents relating to science, technology, and innovation in light of the Fourth Industrial Revolution (4IR). [...] The fact that [SA] has become the first jurisdiction in the world to allow AI inventorship [...] shows that the law – patent law in this case – can be dynamic and develop in step with cutting-edge science. AI innovation has the potential to improve the human condition.⁹

However, if subjected to critical assessment against the backdrop of the clear provisions of the SAPA and SAPR,¹⁰ would the patent granted by the CIPC stand a validity test under judicial scrutiny? Moreover, without an amendment of the extant patent legislation, has the grant not watered-down the foundational concept of human-inventorship that underpins the SAPA and SAPR and turned the principle of subjective rights and personhood,¹¹ especially in IP-related matters in SA,¹² on its head?

Nonetheless, the CIPC appears to find judicial support in the FCA judgment of 30 July 2021, per Beach J,¹³ which confirmed DABUS as an inventor under the Australian Patent Act (APA) and Regulations (APR).¹⁴ The judgment was based on an application for judicial review of an earlier ruling by the Australian Patent Office (APO) of 9 February 2021, per Barker, Deputy Commissioner of Patent (DCP),¹⁵ which held that the language of the APA and the APR made thereto are not consistent ‘with an application for a patent identifying an [AI] machine as an inventor’.¹⁶ Barker DCP’s ruling was based on a similar application for patent as that granted by the CIPC.¹⁷ Already, Beach J’s judgment is attracting mixed reactions¹⁸ for its broad extension of the principles of legal personality and inventorship to DABUS, the AI ‘inventor’, contrary to the High Court of Australia’s (HCA) traditional stance

6 IPwatchdog (n4).

7 DW Thaldar & M Naidoo ‘AI inventorship: The right decision?’ (4 August 2021) *OSF Preprints* 7, available at <https://osf.io/7uctg/> (accessed on 11 August 2021).

8 Patent Act No 57 of 1978 (SAPA).

9 Thaldar & Naidoo (n7) 7.

10 Patent Regulations 1978 (SAPR).

11 Generally, see LM du Plessis *An Introduction to Law* 3 ed (2009).

12 CB Neube & DO Oriakhogba ‘Monkey selfie and authorship in copyright law: The Nigerian and South African perspectives’ (2018) 21 *PER/PELJ*, available at <https://www.ajol.info/index.php/pelj/article/view/183358/172722> (accessed on 11 August 2021).

13 *Thaler v Commissioner of Patents* [2021] FCA 879.

14 Patent Act No. 83 of 1990 (APA); Patent Regulations 1991 (APR).

15 *Stephen L Thaler* [2021] APO.

16 *Stephen L Thaler* (n15) para 34.

17 Patent Application No. 2019363177, 17 September 2019; Food Container and Devices and Methods for Attracting Enhanced Attention.

18 J Taylor ‘I’m sorry Dave I’m afraid I invented that: Australian court finds AI systems can be recognised under patent law’ (30 July 2021) *The Guardian*, available at <https://www.theguardian.com/technology/2021/jul/30/im-sorry-dave-im-afraid-i-invented-that-australian-court-finds-ai-systems-can-be-recognised-under-patent-law> (accessed on 11 August 2021).

on the need for human creation and agency for the conferral of IP rights,¹⁹ and the effect the judgment will have on the Australian patent system. Indeed, on 3 August 2021, IP Australia, an agency of the country's Department of Industry, Innovation and Science, announced its decision to appeal the judgment of the Federal Court.²⁰ However, the opinions expressed here are not aimed at pre-empting the outcome of the appeal.

Drawing from, and building on, this author's earlier work, which examined decisions from the United States of America (US), the United Kingdom (UK) and the European Patent Office (EPO) on similar patent application,²¹ this paper examines the DABUS patent granted by the CIPC and Beach J's judgment against the backdrop of the provisions of the SAPA and SAPR, as well as the APA and APR, to determine whether the respective legal regimes indeed support AI inventorship. Relevant provisions of the Patent Cooperation Treaty (PCT) and case law are also relied on. To this end, the paper is divided into five parts, with the introduction as the first. The second part of the paper briefly discusses the development of the DABUS case in the US, UK and the EPO. The third part of this paper focuses on the SA context, while the fourth part discusses the Australian case. Concluding remarks are presented in the fifth part of the paper.

2. BACKGROUND

The story of DABUS is not new. The legal issues raised by DABUS and AI, generally, within the context of intellectual property (IP) law have formed the focus of ongoing academic engagement and policy discourse.²² DABUS is at the centre of an artificial intelligence project (AIP), the objective of which is to obtain '[IP] rights for inventions generated by an AI without a traditional human inventor'.²³ To achieve its objectives, the promoters of the AIP have already filed patent applications under the World Intellectual Property Organization's (WIPO) PCT system, and are currently pursuing national patent grants in some of the PCT system's member states. The applications, which are in respect of a fractal container (food container) and a neural flame (flashlight) claimed to have been invented by DABUS, are pending in countries such as Brazil, New Zealand, Saudi Arabia, Republic of Korea, Switzerland, Japan, Israel, India, Taiwan, Canada and China.²⁴ A key element in these applications is the naming of DABUS as the inventor and the claim that Dr Thaler, the owner of DABUS, acquired his rights to the invention from

19 *IceTV Pty Limited v Nine Network Australia Pty Limited* [2009] HCA 14.

20 IP Australia 'Commissioner to appeal court decision allowing artificial intelligence to be an inventor' (30 August 2021), available at <https://www.ipaustralia.gov.au/about-us/news-and-community/news/commissioner-appeal-court-decision-allowing-artificial-intelligence> (accessed on 16 October 2021).

21 DO Oriakhogba 'What if DABUS came to Africa? Visiting AI inventorship and ownership of patent from the Nigerian perspective' (2021) 42(2) *Business Law Review* 89.

22 Generally, see Oriakhogba (n21) 2.

23 See <https://artificialinventor.com/> (accessed on 11 August 2021).

24 See <https://artificialinventor.com/patent-applications/> (accessed on 11 August 2021).

DABUS in situations that could be likened to the common law principle of accession (owner-owned relationship), among others.²⁵

The applications before the US Patent and Trademark Office (USPTO) and the European Patent Office (EPO) lapsed because of the failure of the applicant to furnish the particulars of a human inventor for the inventions and the refusal of those IP offices to accept DABUS as an inventor under their respective patent laws and regulations.²⁶ The application to the United Kingdom Intellectual Property Office (UKIPO) was deemed withdrawn since the applicants failed to stipulate a human inventor as required by the UK Patent Act.²⁷ Dr Thaler's application for judicial review brought before the US District Court of the Eastern District of Virginia against the USPTO ruling was recently rejected.²⁸ Rejecting Dr Thaler's contentions, while concurring with the USPTO that the plain language of the US Patent Act only admits of natural persons as inventors, Brinkema (District Judge) concluded that:

[Thaler's] policy arguments do not override the overwhelming evidence that [the US Congress] intended to limit the definition of "inventors" to natural persons. As technology evolves there may come a time when [AI] reaches a level of sophistication such that it might satisfy accepted meanings of inventorship. But that time has not yet arrived, and, if it does, it will be up to Congress to decide how, if at all, it wants to expand the scope of patent law.²⁹

The UKIPO ruling was also confirmed by a judgment of a UK High Court.³⁰ Thaler appealed against this judgment to the UK Court of Appeal.³¹ A detailed examination of the Court of Appeal's judgment is beyond the scope of this paper; suffice to note that the appeal was dismissed by a majority judgment of 2 to 1, and that all three Justices (Arnold LJ, Laing LJ and Birss LJ) concurred that the UK Patent Act envisages only human inventors. In the words of Birss LJ,

Within the meaning of the 1977 Act the "inventor" is the person who actually devised the invention. That conclusion is arrived at without any need to examine the policy arguments raised by both parties. Machines are not persons. The fact that machines can now create inventions, which is what Dr Thaler says happened in this case, would not mean that machines are inventors within the meaning of the Act. Assuming the machine is the entity which actually created these inventions, it has no right to be mentioned as the inventor [...].³²

25 For instance, see *Stephen L Thaler* (n15) para 2.

26 *EPO Grounds for Refusal: In Re EP 18 275 163.6*, 27 Jan. 2020 (fractal container), available at <https://register.epo.org/application?documentId=E4B63SD62191498&number=EP18275163> (accessed on 11 August 2021); *EPO Grounds for Refusal: In Re EP 18 275 174.3*, 27 Jan. 2020 (neural flame), available at <https://register.epo.org/application?documentId=E4B63OBI2076498&number=EP18275174> (accessed 11 August 2021); *USPTO Decision on Petition In Re Application No. 16/525,350* (fractal container), 22 Apr. 2020, available at https://www.uspto.gov/sites/default/files/documents/16524350_22apr2020.pdf (accessed 11 August 2021).

27 *UKIPO Decision Not to Grant: In Re GB1816909.4/GB1818161.0*, BL O/741/19, 4 Dec. 2019 (fractal container and neural flame), available at <https://www.ipo.gov.uk/p-challenge-decisionresults/o74119.pdf> (accessed 11 August 2021).

28 *Thaler v Hirshfeld*, Case 1:20-cv-00903-LMB-TCB, 2 September 2021.

29 *Thaler v Hirshfeld* (n28) 8.

30 *Stephen L Thaler v. The Comptroller-General of Patent, Designs and Trademarks* [2020] EWHC 2412 (Pat).

31 *Thaler v Comptroller General of Patents Trade Marks and Designs* [2021] EWCA Civ 1374.

32 *Thaler* (n31) paras 54 and 55.

Similarly, the EPO rulings were confirmed by the EPO Boards of Appeal (BOA) on 21 June 2021.³³ Confirming the EPO's rulings, the BOA noted that:

[...] allowing the applicant to designate an entity without legal capacity as inventor would be going beyond the wording of the applicable rule. [...] A decision dismissing the appeal and based on the above reasoning does not mean that under the [European Patent Convention] an application is to be rejected where the applicant refuses to indicate a natural person as the inventor because in his opinion the invention was made without any causal human contribution. [...] Such a decision would mean only that the applicant, while remaining free to explain in the specification of the patent application how a claimed technical teaching was made, would have no right to indicate a machine as the inventor in the form to be submitted [...].³⁴

Drawing on the EPO and UK judgments, Stankova argued that 'human inventorship is a necessary condition for the existence of an invention and inventive step, with the result that only products of human inventorship merit European patents'.³⁵ Reviewing the judgments, excluding the EPO BOA communication, the US District Court's and UK Court of Appeal's rulings, this author earlier predicted that in view of :

the broad similarity between the statutory provisions applied by the EPO, USPTO and UKIPO, including the [UK High Court], and those contained in sections 2, 3 and 4 of the [Nigerian Patent Act], the Nigerian [like other African countries] patent office will not reach a different conclusion were it to consider the DABUS patent application. The reason is simple. AI [...] does not have a mind of its own and still needs human support to function. AI is not a natural person as envisaged under the statutory provisions on inventorship and ownership. AI lacks both legal and fictitious legal personality. AI is a thing capable of being owned. AI cannot own property and cannot transfer this either by contract or the operation of law.³⁶

Interestingly, and contrary to this author's prediction,³⁷ and as noted in part 1 above, the CIPC recently granted the DABUS patent and the Australia Federal Court has overturned a refusal by the APO to recognise DABUS as an inventor under the APA and APR. The following discussion examines the validity of the actions of the CIPC and the Australian Federal Court in light of the provisions of the SA and Australian patent legal frameworks, respectively.

3. SOUTH AFRICA: THE CIPC'S PATENT GRANT IN RESPECT OF THE DABUS-GENERATED INVENTIONS

Is the patent granted by the CIPC, based on the application indicating AI (DABUS) as the inventor, supported by the SAPA and SAPR? Put differently,

33 *Communication of the Board of Appeal pursuant to Article 15(1) of the Rules of Procedure of the Board of Appeals*, Appeal No. J0008/20-3.1.01 (21 June 2021), available at <https://register.epo.org/application?number=EP18275163&tab=doclist> (accessed 11 August 2021); *Communication of the Board of Appeal pursuant to Article 15(1) of the Rules of Procedure of the Board of Appeals*, Appeal No. J0009/20-3.1.01 (21 June 2021), available at <https://register.epo.org/application?number=EP18275174&tab=doclist> (accessed 11 August 2021).

34 Appeal No. J0008/20-3.1.01 para 4; Appeal No. J0009/20-3.1.01 para 4.

35 E Stankova 'Human inventorship in European patent law' (2021) 80(2) *Cambridge Law Journal* 338.

36 Oriakhogba (n21) 99.

37 *Ibid.*

can the patent withstand a validity challenge under the SAPA? In resolving this question, which has not yet been judicially considered within the SA context, it should be noted that the DABUS patent granted by the CIPC was based on a PCT application that is primarily governed by ss 43A to 43F of the SAPA.

3.1 Examination of patent in South Africa

To interrogate the above question, it is relevant to keep in mind that, generally, the SAPA obligates the Registrar of Patent to ‘examine in the prescribed manner every application for a patent and every complete specification accompanying such application or lodged at the patent office in pursuance of such application’, and to accept such application if it complies with the requirements of the Act.³⁸ However, the reality is that SA operates a depository patent system and only conducts formal, as opposed to substantive, examination of patent applications. Substantive examination:

entails an analysis of the patent application for technical quality, adequate disclosure, unity of claims, and whether the prior art signifies that the claimed invention is new and involves an inventive step. Such examination also seeks to establish the potential industrial applicability of a patent application.³⁹

In summary, substantive examination will help to reveal whether the application meets the requirements of newness, non-obviousness and applicability or usefulness in trade, industrial or agricultural practices as enshrined in s 25(1) of the SAPA.⁴⁰ On the other hand, formal examination involves checking to confirm that the application conforms to documentation, financial and administrative requirements;⁴¹ that the inventor and applicant are qualified persons under the requisite law;⁴² and that the invention is not designated as excluded subject matter, such as computer programs.⁴³

38 SAPA, s 34.

39 L Ndlovu ‘Why South Africa should introduce patent searches and substantive examination to improve access to essential medicines’ (2015) 6 *WIPO-WTO Colloquium Papers* 73–74, available at https://www.wto.org/english/tratop_e/trips_e/colloquium_papers_e/2015/chapter_9_2015_e.pdf (accessed on 11 August 2021).

40 *Ascendis Animal Health Pty Ltd v Merck Sharpe Dohme Corporation & Ors.* [2019] ZACC 41. The case has been extensively reviewed elsewhere. See B Shoji & YA Vawda ‘Quo vadis patent litigation: *Ascendis Animal Health (Pty) Limited v Merck Sharpe Dohme Corporation* 2020 1 SA 327 (CC) – In search of the bigger picture on patent validity’ (2021) 24 *PER/PELJ*, available at <https://perjournal.co.za/article/view/8021/11983> (accessed on 11 August 2021); CI Okorie ‘The Constitutional Court of South Africa provides guidance on patent prosecution policy in South Africa’ (2020) 120 *Intellectual Property Forum* 101; CI Okorie ‘South Africa’s constitutional court rules on whether patent validity can be used as both a sword (revocation action) and a shield (infringement action) in patent proceedings’ (14 January 2020) *The IPKat*, available at <https://ipkitten.blogspot.com/2020/01/south-africas-constitutional-court.html> (accessed on 11 August 2021).

41 For instance, see s 30 of SAPA and regs 22, 40–43 of the SAPR.

42 For instance, see s 27(1) of SAPA.

43 For instance, see s 25(2) and (3) of SAPA.

In practice, however, the CIPC's formal examination is limited as it focuses mainly on documentation, financial (fees) and administrative issues as prescribed in s 30 of the SAPA and regs 22 and 40–43 of the SAPR. As such, the CIPC would grant a patent once the application satisfies the requirements.⁴⁴ The effect of this is that questions relating to whether the invention is designated as excluded subject matter under s 25(2) and (3), and whether the inventor and applicant are qualified under s 27(1) are usually ignored at the formal examination stage in South Africa; thus, making them matters for the Commissioner of Patent⁴⁵ to consider as grounds for the revocation of a patent where such claims in respect of the patent are made under s 60 of the SAPA.

Furthermore, s 27(1) recognises an inventor or 'any other person acquiring from *him*'⁴⁶ or both the inventor and such other person as those qualified to apply for patent in South Africa. When considering questions of qualification of patent applicants, this provision should be read with s 30(4), which stipulates that 'any person other than the inventor making or joining in an application for a patent shall in the prescribed manner furnish such proof of his title or authority to apply for a patent as may be prescribed'. At the moment, the application form P1 contained in Schedule 2 of the SAPR prescribes an assignment (item 5 on the list of accompanying documents) as proof of the title or authority of such a person. This irrefutably implies, contrary to what Thaldar and Naidoo think,⁴⁷ that the SAPA and SAPR contemplate only legal subjects (persons in this context) as inventors since only legal subjects can validly assign rights. Sections 25(2) and (3) and 27(1) will be revisited later in part 3.2 below.

3.2 PCT application in South Africa

Recall that the DABUS patent was based on a PCT application. Thus, a proper investigation of the issue stated in the opening paragraph of part 3 above will require an engagement with the provisions of the SAPA on PCT applications read with stipulations in the PCT itself. In this connection, it should be borne in mind that the PCT does not make stipulations relating to excluded subject matter; neither does it provide for inventor and applicant qualification nor does it govern granting of patents. These are matters to be determined according to the national regimes of the member states, or the regulations of the relevant regional IP office designated in the application. The PCT mainly provides a global centralised preliminary search and formal examination, also

44 TAC, MSF & RIS 'Why South Africa should examine pharmaceutical patents: how legislative reform could boost the affordability and accessibility of medicines for South Africans' (January 2013), available at https://msfaccess.org/sites/default/files/MSF_assets/Access/Docs/Access_Brief_SAPharmapatents_ENG_2013_final.pdf (accessed on 11 August 2021)

45 The Commissioner of Patents is the judicial officer recognised under s 8 of SAPA.

46 Italics added.

47 According to Thaldar and Naidoo, 'the Patent Act requires that the applicant provides proof of title or authority, but does not limit it to assignment by the inventor, hence leaving open the possibility of title based on ownership of the AI inventor' (n7) 6.

enabling applicants under it to claim international priority from the date of the application.

That being said, s 43B of the SAPA deems PCT applications designating SA to be applications lodged at the patent office under the Act. For this purpose, the patent office is defined to be ‘the receiving office in respect of’ a PCT application made by an SA resident or national; ‘the designated office’ in respect of a PCT application designating SA as such; or ‘the elected office’, if the PCT application designating SA chooses SA for ‘purposes of an international preliminary examination under Chapter II of the’ PCT.⁴⁸ Acting as designated or elected office, the patent office is empowered to begin processing of the national phase of a PCT application before the expiration of 19, or not later than 30, months from the priority date, as the case may be, where the applicant has paid the prescribed national fees.⁴⁹

Importantly, the patent office is required to apply the provisions of the PCT, its regulations and administrative instructions and other provisions of the SAPA when considering PCT applications.⁵⁰ Interestingly, however, s 43F(2) makes provision for the PCT, its regulations and administrative instructions to prevail over those of the SAPA in case of any conflict.⁵¹ In this connection, s 43F(3) contains a list of provisions of the SAPA that are excluded from being applied when processing PCT applications. In particular, s 30(1), among others, prescribing the form of application under the SAPA, is excluded. For PCT applications, the descriptions, claims, drawings and abstracts prescribed under art 3(2) of the PCT are deemed to be a complete specification under the SAPA.⁵² Sections 25(2) and (3), 27(1) and 30(4) are not excluded.

Section 43F of the SAPA appears to draw inspiration from the provisions of art 27 of the PCT, in terms of which ‘no national law shall require compliance with requirements relating to the form or contents of [PCT applications] different from or additional to those which are provided for in [the PCT] and the Regulations’. An uncritical application of this provision along with s 43F(2) and (3) of the SAPA would lead one to conclude that a PCT application must be accepted and granted in SA without any assessment by the CIPC, especially since the SA patent system is merely depository and the CIPC only conducts limited formal examinations. Such an approach is not supported by s 34 of the SAPA, which empowers the Registrar of Patent to conduct an examination of patent applications, which have not been excluded by s 43F(3), and cannot be said to be in conflict with the PCT. In addition, the approach does not find support in the PCT itself, which creates exceptions to the provisions of art 27(1).

48 Section 43C of the SAPA.

49 Sections 43D and 43E(1) of the SAPA.

50 Section 43F(1) of the SAPA.

51 Section 43F(2) of the SAPA.

52 Section 43F(3)(e)(i) of the SAPA.

Indeed, the PCT enables member states to subject PCT applications to further formal, as well as substantive, examination, among others.⁵³ The PCT does not limit the freedom of member states to legislate on patentable inventions or conditions for patentability, among others.⁵⁴ In this regard, the provisions of s 25 of the SAPA cannot be said to be in conflict with the PCT. For a proper perspective, s 25(2) and (3) of the SAPA excludes, among others, computer programs; schemes, rules or methods for performing a mental act; playing a game; or doing business from the list of allowable patentable subject matter. The CIPC believes that the section does not exclude a computer program from patentability if it forms ‘part of a technical solution, i.e. when it is used to operate a specific device or machine such as a winder, a crane or parking management’.⁵⁵ However, it has been rightly argued that ‘there is nothing in the [SAPA] which would suggest that a programme for a computer which has a technical effect [and a computer-implemented invention] would be an invention for the purposes of the Act’.⁵⁶ From its definition in the literature,⁵⁷ one can safely surmise that AI is a computer program or, at best, a network or connection of advanced computer programs and its innovative outputs are computer-generated inventions. Viewed this way, it is logical to argue that both DABUS and the inventions for which the CIPC granted the patent to Thaler (to the extent that they are AI or computer-generated inventions) are, and should be regarded as, excluded subject matters under s 25(2) and (3) of the SAPA. However, this is not to say that a fractal container and flashing light (the inventions in this case) are computer programs. Indeed, by their nature, fractal containers and flashing lights are inventions that would ordinarily be regarded as patentable subject matter under s 25(2) and (3) of the SAPA if they were otherwise human-generated.

That being said, the PCT does not preclude member states from making provisions defining the qualifications of inventors and applicants for purpose of patent applications. Accordingly, art 27(3) of the PCT provides that ‘where the applicant, for the purposes of any designated State, is not qualified according to the national law of that State to file a national application because he is not the inventor, the international application may be rejected by the designated Office’. Although this provision regulates the qualification of applicants, its application at the national level will require determining the qualification of inventors, especially within the context of AI-generated inventions, such as in the DABUS case. This is so because the qualification of the applicant is undoubtedly linked to, and hinged on, the status and legal capacity of the inventor. In this connection, the provisions of s 27(1) of the SAPA, which does

53 Article 27(2) to (8) of the PCT.

54 Article 27(5) and (6) of the PCT.

55 See <http://www.cipc.co.za/index.php/trade-marks-patents-designs-copyright/patents/> (accessed on 11 August 2021).

56 P Lombard ‘Patentability of a programme for a computer and computer-implemented inventions: A South African perspective’ (3 May 2021), available at <https://www.golegal.co.za/patentability-programme-computer/> (accessed on 11 August 2021).

57 Generally, see Oriakhogba (n21) where the definitions are discussed.

not in any way conflict with the PCT or its regulations and administrative instruction, is important.

Section 27(1) provides that '[a]n application for a patent in respect of an invention may be made by the inventor or by any other person acquiring from *him* the right to apply or by both such inventor and such other person'.⁵⁸ Although the term 'inventor' is mentioned in the above provision and in most parts of the SAPA, it is not defined therein. The PCT also does not define the term. However, it provides in art 4(1)(v) that a request should contain:

the name and other prescription concerning the inventor where the national law of at least one of the designated states requires these indications to be furnished at the time of filing the national application. Otherwise, the said indications may be furnished either in the request or in separate notices addressed to each designated Office whose national law requires the furnishing of the said indications but allows that they be furnished at a time later than that of the filing of a national application.

Interestingly, the SAPA does not require furnishing of the name and other information of the inventor in the application. Even so, schedule 2 of the Regulations, read with s 30(4) of the Act, requires applicants who are not themselves the inventors to accompany their application with assignments as proof of their title or authority to apply for the patent. In line with s 27, one can safely argue that such assignments are to be obtained from the inventors, whose name and other relevant data such as address would customarily be contained in the assignments. As already stated above, such assignments can only be valid in law if executed by human inventors. This is so because, although not defined under s 27(1) of the SAPA, the use of the pronoun 'him' points to the fact that only human inventors can be accommodated in the extant patent regime. Indeed, s 6(a) of the SA Interpretation Act⁵⁹ stipulates that '[i]n every law, unless the contrary intention appears — words importing the masculine gender include females'. In other words, the use of 'him', as in s 27(1) includes 'her', but not 'it' (AI). Thus, the DABUS patent can validly be challenged on the grounds that it contravenes s 27(1), since there is no inventor known in terms of the SAPA, the fact that it is a PCT application notwithstanding.

3.3 Consequences of the DABUS patent grant

Thaldar and Naidoo canvassed for a purposive approach to, and broader – as against a literal interpretation of, s 27(1) to include AI on the grounds that such an approach aligns with the government's policy stance on the promotion of 'science, technology, and innovation in light of the fourth industrial revolution (4IR)'.⁶⁰ For this position, the authors relied on the judgment of the FCA mentioned in parts 1 and 2 above. This judgment is reviewed in part 4 below.

⁵⁸ Italics added.

⁵⁹ Interpretation Act No 33 of 1957 (South Africa).

⁶⁰ Thaldar & Naidoo (n7) 7.

For now, it is important to keep in mind that a purposive interpretation of statutes must be objective, not subjective. Purposive interpretation does not permit construing of statute in a manner that gives meaning to words and phrases outside the context of the legislation being interpreted. Additionally, a purposive or objective approach to statutory interpretation does not jettison the need to find the ordinary meaning of a phrase within the context of the enactment. As Wallis JA put it:

Interpretation is the process of attributing meaning to the words used in a document, be it legislation, some other statutory instrument, or contract, having regard to the context provided by reading the particular provision or provisions in the light of the document as a whole and the circumstances attendant upon its coming into existence. Whatever the nature of the document, consideration must be given to the language used in the light of the ordinary rules of grammar and syntax; the context in which the provision appears; the apparent purpose to which it is directed and the material known to those responsible for its production. [...]. The process is objective not subjective. A sensible meaning is to be preferred to one that leads to insensible or unbusinesslike results or undermines the apparent purpose of the document. Judges must be alert to, and guard against, the temptation to substitute what they regard as reasonable, sensible or businesslike for the words actually used. To do so in regard to a statute or statutory instrument is to cross the divide between interpretation and legislation.⁶¹

Moreover, the patent system does not serve patent applicants alone. Indeed, it is meant to serve the public interest, as gleaned from the whole context of the SAPA, which is to ensure that only valid, viable and useful patents are granted. This justifies the provision of s 34 of the SAPA, which empowers the Patent Registrar to conduct an examination of patent applications in South Africa, and which was not excluded by s 43F(3) in respect of PCT applications. Unfortunately, s 34 has so far not been fully implemented in South Africa, with the effect that the public interest is not protected. Lamenting the gaps in the approach to patent examination by the CIPC and its effect on the public interest, the SA Constitutional Court recently stated that:

[...] we must not lose sight of the fact that testing the validity of patents is in the public interest because patents create artificial monopolies. Currently, South Africa completely relies on private parties to regulate this artificial monopoly system because the government does not examine a patent's validity upon registration.⁶²

Furthermore, if the approach to interpreting s 27(1) suggested by Thaldar and Naidoo is adopted, it could, echoing Summerfield:

have numerous consequences, both foreseeable and unforeseeable. Allowing patents for inventions churned out by tireless machines with virtually unlimited capacity, without the further exercise of any human ingenuity, judgment, or intellectual effort, may simply incentivise large corporations to build 'patent thicket generators' that could only serve to stifle, rather than encourage, innovation overall.⁶³

61 *Natal Joint Municipal Pension Fund v Endumeni Municipality* 2012 4 SA 593 (SCA) para 18. Generally, see K Perumalsamy 'The life and times of textualism in South Africa' (2019) 22 *PER/PELJ*, available at <http://www.saflii.org/za/journals/PER/2019/65.pdf> (accessed on 11 August 2021).

62 *Ascendis* (n40) para 100

63 Dr Mark Summerfield reported in Taylor (n18)

The above consequences will not serve the public interest in the context of a developing country, such as SA, with issues of social and economic inequalities to be addressed. Such consequences are certainly not what the government's policies on science, technology, innovation and IP are formulated to achieve. The SA Intellectual Property Policy (IP Policy), for instance, is formulated to, among other reasons, 'consider the development dynamics of South Africa and improve how IP supports small institutions and vulnerable individuals in society, including in the domain of public health';⁶⁴ and 'nurture and promote a culture of innovation, by enabling creators and inventors to reach their full potential and contribute towards improving the competitiveness of our industries'.⁶⁵ In this vein, the IP Policy seeks to advance 'a balanced and coordinated approach to IP that regulates IPRs in line with the SA Constitution';⁶⁶ and 'introduce key policy reforms that account for the development dynamics of South Africa',⁶⁷ among other goals.

In essence, viewed from a constitutional prism, the country's IP Policy is formulated to cater to the social and economic wellbeing of people and not machines or AI that can still be regarded as mere tools in creative and innovative processes.⁶⁸ The rights safeguarded by, as well as the obligations defined in, the Constitution are for legal subjects, not objects. Specifically, patent and other forms of IP are regarded as property under s 25(1) of the Constitution,⁶⁹ which prohibits unjustifiable deprivation and expropriation of such property without compensation to the owners. Thus, any limitation to and, in this context, expansion of the scope of patent must be in line with the Constitution.⁷⁰

Moreover, unless SA patent law is amended to accommodate, or new rules developed to cater for the peculiarities of, AI 'inventors' (such as DABUS), granting a patent on an application that names AI as the inventor will result in the dismantling of the human inventorship foundation, which is linked to the concepts of personhood and subjective rights on which the extant patent regime is hinged. The concepts of personhood and subjective rights have been discussed extensively elsewhere.⁷¹ However, Thaldar and Naidoo do not agree with this contention. The authors believe that there are moral and economic justifications to extend personhood to AI because of the possibility that AI could attain consciousness as humans in the future, and the likelihood of conferring rights and duties on AI.⁷² What is certain, nonetheless, is that at the moment AI is a tool deployed in the inventive process. Beach J, in the

64 DTI 'Intellectual Property Policy of the Republic of South Africa Phase I' (2018) 4, available at https://www.gov.za/sites/default/files/gcis_document/201808/ippolicy2018-phasei.pdf (accessed on 11 August 2021).

65 Ibid.

66 Ibid.

67 Ibid.

68 Beach J refers to them as 'semi-autonomous' in *Thaler v Commissioner of Patents* (n13) para 18

69 Constitution of the Republic of South Africa 1996.

70 M du Bois 'The appropriate scope of property rights in patents' (2018) 6 *SAIPLJ* 67–91.

71 Du Plessis (n11).

72 Thaldar & Naidoo (n7) 6.

Australian judgment relied on by Thaldar and Naidoo (discussed in part 4 below), agreed with this contention when he refers to AI as semi-autonomous and described how it has been deployed in pharmaceutical research and innovation.⁷³ In addition, AI has not attained the status foreseen by Thaldar and Naidoo and there is no consensus among scholars on the possibility of AI evolving to that level just yet.⁷⁴

To be fair, Thaldar and Naidoo conceded that the possibility of AI attaining personhood is not ‘implied by allowing AI inventorship. To the extent that one views inventiveness as a human characteristic, AI now has this human characteristic [...] That, however, does not imply that AI is fully human or is legally viewed as a person. Rather, it means that AI is a *special species of legal object that has the ability to invent*.’⁷⁵ Thaldar and Naidoo appear to miss the point that being a legal subject does not involve the enjoyment of rights and benefits only. It also involves enduring certain duties, liabilities and responsibilities. One cannot pick and choose between rights and duties as a legal subject. Moreover, possessing ‘the ability to invent’ is no justification for conferring rights and duties (inventorship) on AI, which has been already argued are mere tools in the inventive process. The challenges of recognising AI inventorship under the patent system was aptly captured by Visser in the following passage:

[...] would there be any meaningful benefits in recognising AI as inventor beyond those provided by allowing AI-created inventions to be patentable? The final issue raises the question of who should be held responsible for actions taken by AI – the end user, the developer, or AI itself – as well as the related question of how to access liability. The view that patent infringement by humans or AI should be deterred is likely not controversial. Moreover, failing to hold “someone” liable for patent infringement by AI will likely encourage using AI for infringement. But more discussions on how to handle patent infringements by AI are required, such as on who should be held liable and on how liability should be assessed. The answers must promote the patent law system’s main objectives, as well as maximise the social, economic and ethical benefits.⁷⁶

The FCA, on which Thaldar and Naidoo heavily and uncritically relied, attempted to answer the above questions within the Australian context. The next part of this paper engages the FCA judgment against the backdrop of the patent regime and relevant case law in Australia, to determine whether it would survive an appellate review. Nonetheless, the CIPC DABUS patent grant may trigger legislative and policy conversations on the impact of AI on IP in general, and particularly the patent system in SA. This appears to be the only legacy of the grant that may endure.

73 *Thaler v Commissioner of Patents* (n13) paras 19–57.

74 Generally, see Oriakhogba (n21).

75 Thaldar & Naidoo (n7) 6.

76 C Visser ‘The Fourth Industrial Revolution: A changing landscape for intellectual property’ 12–13, Unpublished keynote address at the Industry 4.0 and Intellectual Property Colloquium, 24 Oct. 2019 (on file with author). The colloquium is reported at <http://www.ipchair.uct.ac.za/news/fair-use-ai-author-and-inventor-take-centre-stage-industry-4-0-and-intellectual-property> (accessed on 11 August 2021).

4. AUSTRALIA: THE APO AND FEDERAL COURT ON DABUS THE AI 'INVENTOR'

4.1 The APO's ruling

Upon entering the national phase of processing under s 29A of the APA, the APO checked the PCT application to ascertain its compliance with the formal requirements in reg 3.2C of the APR. Specifically, reg 3.2C(2)(aa) requires that an applicant for a patent must 'provide the name of the inventor of the invention to which the application related'. Based on this provision, the APO issued a directive indicating that the inventor must be human in order to comply with the regulations.⁷⁷

In their response, the applicant stated that 'DABUS can and should be listed as the inventor' under the regulations. In any case, argued the applicant, neither the APA nor the APR contains any definition of the term 'inventor'.⁷⁸ The applicant concluded that the APA 'only requires a person to be granted the patent. The applicant "derives title to the invention from the inventor" under ss. 15(1)(c). The applicant owns and created DABUS and is entitled to the output produced by DABUS'.⁷⁹ In support of this position, the applicant contended that 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.⁸⁰

After noting that DABUS is not a person in law (human, body corporate or body politic), the APO, through Barker DCP, formulated the issue for consideration as to 'whether an [AI] machine is capable of being an inventor for the purpose of the [APA] and Regulations'. Before determining the issue, Barker correctly noted that the question whether the AI is the actual inventor is not a matter to be determined at the formality stage.⁸¹ Also, he noted that the APA and APR do not define the term 'inventor'.⁸² To find the meaning of inventor, Barker DCP adopted the literal approach to interpretation of the APA and APR and noted that words are to be interpreted according to their current meaning and not be limited to their meaning at the point the legislation was enacted. Barker, however, insisted that the meaning of inventor 'can move with time provided such meaning is not inconsistent with other parts' of the APA.⁸³ Concerning AI inventorship, he stated that at the time the APA:

came into operation [...] there would have been no doubt that inventors were natural persons, and machines were tools that could be used by inventors. However, it is now well known that machines can do far more than this, and it is reasonable to argue that [AI] might be capable

77 *Stephen L Thaler* (n15) para 1.

78 *Ibid.*

79 *Ibid.*

80 *Stephen L Thaler* (n15) para 2.

81 *Stephen L Thaler* (n15) para 4.

82 *Stephen L Thaler* (n15) paras 9–11.

83 *Stephen L Thaler* (n15) paras 6–8.

of being inventors. I have no evidence whether the ordinary meaning of “inventor”, assessed at the present day, can include a machine. But if this were the ordinary meaning would this be consistent with the other provisions of the [APA]?⁸⁴

To resolve the foregoing question, Barker DCP took note of s 2A of the APA,⁸⁵ which indicates that the object of the APA 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’. Section 2A is meant to assist Australian courts in the interpretation of the APA in situations where its words and phrases are ‘uncertain or ambiguous’.⁸⁶ Accordingly, Barker DCP did not apply s 2A since he believed that the relevant provisions of the APA were not ambiguous or uncertain in relation to whether AI could be considered an inventor under the APA.⁸⁷

Instead, he focused mainly on s 15(1) of the APA, which he rightly believes solves the question of the meaning of inventor in reg 3.2C(2)(aa) when read in the light of Australian case law. Section 15(1) of the APA provides:

- Subject to this Act, a patent for an invention may only be granted to a person who:
- a. is the inventor; or
 - b. would, on 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 deceased person mentioned in paragraph (a), (b), or (c).

Before proceeding to consider the implications of s 15(1) on the AI inventorship question, Barker DCP cited and relied on a decision of the Full Court⁸⁸ of the FCA (FCAFC) in the case of *JMVB Enterprises Pty Ltd v Comoflag Pty Ltd* (*JMVB*),⁸⁹ wherein the meaning of inventor in s 15(1) was stated as follows:

The language of s 15(1) evinces a clear intention on the part of the Parliament to limit the grant of a patent, relevantly, to a *person* who is the inventor or to a *person* who derives title to the invention from the inventor. There is no warrant for reading the word inventor as meaning anything different from the person who is responsible for making the invention, namely the person who makes or devises the process or product. The word bears its ordinary English meaning [...]. Inventor in s 15(1)(a) refers to the person who makes or devises the invention wherever the invention may be made.⁹⁰

84 *Stephen L Thaler* (n15) para 12.

85 Section 2A was introduced into the APA by para 1 in Part 1 of Schedule 1 to the Intellectual Property Laws Amendment (Productivity Commission Response Part 2 and Other Measures) Act 2020.

86 The Explanatory Memorandum to the Intellectual Property Laws Amendment (Productivity Commission Response Part 2 and Other Measures) Bill 2019 11, available at https://parlinfo.aph.gov.au/parlInfo/download/legislation/ems/s1216_ems_2d30b94a-4f04-46e8-bbe4-4be1e39bad05/upload_pdf/712877em.pdf (accessed on 11 August 2021).

87 *Stephen L Thaler* (n15) para 16.

88 The Full Court exercises appellate jurisdiction over the judgment of a single judge of the FCA.

89 *JMVB Enterprises Pty Ltd v Comoflag Pty Ltd* [2006] FCAFC 141.

90 *JMVB* (n89) paras 71–72 (italics added).

Flowing from the foregoing, Barker DCP concluded that AI, which is not a person in law, cannot be an inventor under s 15(1)(a).⁹¹ As such, stated Barker DCP, AI does not have the capacity to assign a patent (property) to its owner under s 15(1)(b).⁹² Furthermore, Barker DCP turned to s 15(1)(c) and noted that a person can derive title to an invention in two principal ways: by assignment and by communication. Barker DCP finds support for this position in the historical analysis of s 15(1) undertaken by the FCAFC in the *JMVB* case. According to the FCAFC:

[t]he predecessor of s 15(1) [APA] was s 34(1) of the Patents Act 1952 (Cth) (“the 1952 Act”). By s 34(1), both the actual inventor and a person to whom the invention has been *communicated* by the actual inventor were authorised to make an application for a patent. Similarly, the *assignee* of the actual inventor could make an application for a patent. Thus, a clear distinction was drawn between the actual inventor, on the one hand, and a person who took an *assignment* from the actual inventor or a person to whom the invention was *communicated* by an actual inventor, on the other hand. [...] Section 15(1) of the Act is, in a sense, a simplification of s 34(1) of the 1952 Act. Section 15(1) contemplates grant of a patent to a person who would, on the grant of a patent for the invention, be entitled to have the patent assigned to the person. [...] However, the distinction between the assignee of the actual inventor and a person to whom the invention has been communicated by the actual inventor, which was made in s 34(1) of the 1952 Act, is not to be found in s 15(1). *Those concepts have been amalgamated into the provision in s 15(1)(c), whereby a patent may be granted to a person who derives title to the invention from the inventor or a person who would, on the grant of a patent for the invention, be entitled to have the patent assigned to that person.*⁹³

Accordingly, as held Barker DCP, AI cannot assign inventions because it lacks legal personality. Further, Barker DCP noted that under Australian law,⁹⁴ communication of invention does not involve legal transfer of the patent as communicatees simply hold the patent in trust for the communicators who have beneficial interest in the patent.⁹⁵ He then noted that, although there is the possibility that AI can communicate inventions given the current evolution of technology, AI cannot have beneficial interest in property since it is not a person in law.⁹⁶ To that extent, he failed, and rightly so, to ‘see how the owner of [AI] can be regarded as the communicator of an [AI]’.⁹⁷

Reacting to the applicant’s contention that, by virtue of the principle of accession, he automatically derives title to the invention since he owns the AI, Barker DCP reasoned that –

[w]hile the principle of accession (or possession) might well deal with the ownership of an invention created by [AI], it does not do so by conceptually moving title “from” the [AI] to the owner [...]. It follows that the principle of accession (or possession) does not provide a means to identify a person who can be granted a patent that is consistent with section 15(1)(c).⁹⁸

91 *Stephen L Thaler* (n15) para 20.

92 *Stephen L Thaler* (n15) para 26.

93 *JMVB* (n89) paras 69–70.

94 *H’s Application* [1956] RPC 197.

95 *Stephen L Thaler* (n15) para 27.

96 *Stephen L Thaler* (n15) para 28.

97 *Stephen L Thaler* (n15) para 29.

98 *Stephen L Thaler* (n15) para 30.

This is logical because the mere ownership of AI, and by implication the invention ‘devised’ by it, cannot technically be regarded as deriving title under s 15(1)(c) in view of the historical analysis in *JMVB*, which shows that such derivation can only occur via assignment or communication. Finally, Barker DCP held, without difficulty, that an AI ‘inventor’ cannot be accommodated under s 15(1)(d), which relates to ‘legal representatives of deceased person’.⁹⁹ As shown in the next part of this paper, Beach J of the FCA disagreed with Barker DCP’s position and ordered a reconsideration of the PCT application. But can Beach J’s judgment survive an appeal?

4.2 The FCA’s ruling

In determining the application for judicial review of Barker DCP’s ruling, the FCA, through Beach J, noted that the question of inventorship arose because reg 3.2C(2)(aa) requires the name of the inventor to be stated in a PCT application. Beach J then framed the issue for determination as ‘whether an “inventor” for the purpose of the [APA] and the Regulations can be an [AI] system?’¹⁰⁰

Resolving the above issue, Beach J rejected Barker DCP’s position (already discussed above) on AI inventorship under the APA and APR, and held that Barker DCP’s thinking implies that AI ‘can invent something that satisfies all of the requirements of patentability in terms of novelty, inventiveness and utility, but such an invention will be unpatentable because the [APA] requires a human inventor’.¹⁰¹ Beach J further held that Barker DCP’s reasoning ‘confuses the question of ownership and control of a patentable invention including who can be a patentee, on the one hand, with the question of who can be an inventor, on the other hand’.¹⁰² Also, according to Beach J, Barker DCP’s reliance on reg 3.2C(2)(aa), ‘a procedural requirement in a subordinate instrument’, overrides the object clause in s 2A of the APA since it would prevent the application for a patent that had no human inventor.¹⁰³ In effect, according to Beach J, Barker DCP acted against the object clause in s 2A by ‘persisting with the notion that [AI] systems cannot be inventors’.¹⁰⁴ Finally on this point, Beach J was of the view that, in relying on the dictionary meaning of the term ‘inventor’, Barker DCP held on to the ‘old millennium usage’ of the word and failed to recognise the ‘evolving nature of patentable inventions and their creators’.¹⁰⁵

Reading through Barker DCP’s ruling over again, alongside the above reasoning of Beach J, it is difficult to understand how Beach J came to the above conclusions. For one, Barker DCP was very clear that he was not interested in, and in fact did not dive into, the issue of whether or not the AI (DABUS in

99 *Stephen L Thaler* (n15) para 31.

100 *Thaler v Commissioner* (n13) para 6.

101 *Thaler v Commissioner* (n13) para 7.

102 *Thaler v Commissioner* (n13) para 12.

103 *Thaler v Commissioner* (n13) para 13.

104 *Thaler v Commissioner* (n13) para 15.

105 *Ibid.*

this case) was the actual inventor of the invention in question. According to him, ‘at the formalities stage it is not necessary to consider whether the named entity is an actual inventor’.¹⁰⁶ The question he had to resolve was whether the provisions of the APA and APR are consistent with identifying or naming AI as an inventor in a patent application. In addition, Barker DCP did not venture into the question of patentability of the invention in question since this is a matter for the substantive examination stage. Furthermore, Barker DCP echoed the clear purpose which s 2A is meant to serve, as stated in the explanatory memorandum of the Bill that introduced this section to the APA. Barker DCP then, rightly, refused to rely on s 2A since the meaning of inventor could be drawn from provisions of s 15(1) and case law from the FCAFC, as illustrated in 4.1 above. It follows, therefore, that Beach J’s position was merely meant to set the tone for his overly broad ‘legislative’ construction of the term ‘inventor’ under the APA and APR.

To support his position further, Beach J spent a substantial part of his judgment expounding on the ‘artificial neural network’ technique through which AI is said to invent, which could be likened to the workings of the human brain. Beach J’s lecture also showed the steps involved in the inventive process that the artificial neural network represents. However, he preferred to refer to DABUS as a semi-autonomous machine, and its inventions as autonomously generated through artificial neural networks.¹⁰⁷ Even so, Beach J presented DABUS as acting independently when he noted that:

DABUS could be described as self-organising as a cumulative result of algorithms collaboratively generating complexity. DABUS generates novel patterns of information rather than simply associating patterns. Further, it is capable of adapting to new scenarios without additional human input. Further, the [AI’s] software is self-assembling. So, it is not just a human generated software program that then generates a spectrum of possible solutions to a problem combined with a filtering algorithm to optimise the outcome.¹⁰⁸

Despite the foregoing, Beach J showed further that ‘no narrow view should be taken as to the concept of “inventor”’.¹⁰⁹ He demonstrated this by devoting another aspect of his lecture to expound on how AI had been deployed in pharmaceutical research leading to scientific breakthroughs, discoveries and ground-breaking innovative products, providing examples.¹¹⁰ Thus, indirectly conceding that, at this stage of its evolution, AI could at best still be regarded as a tool in the innovative process. Indeed, apart from the very apparent inconsistencies in Beach J’s position about the status of AI in terms of whether it is semi-autonomous, independent or merely a tool, his lecture on artificial neural networks does not bear any relevance to the simple issue flowing from Barker DCP’s ruling discussed in part 4.1 above. If at all, the lecture would

106 *Stephen L Thaler* (n15) para 4.

107 *Thaler v Commissioner* (n13) paras 18–43.

108 *Thaler v Commissioner* (n13) para 41.

109 *Thaler v Commissioner* (n13) para 56.

110 *Thaler v Commissioner* (n13) paras 44–56.

be important at the substantive examination stage, where questions about whether or not the invention is patentable are resolved.

Returning to the issue raised by the application for judicial review, Beach J observed that the APA and APR neither define inventor, nor expressly excluded the possibility that AI can be an inventor. Moreover, according to Beach J, ‘there is no specific aspect of patent law, unlike copyright law involving the requirements for a human author or existence of moral rights, that would derive a construction of the [APA] as excluding non-human inventors’.¹¹¹ Furthermore, Beach J reasoned that the term inventor is an agent noun, which could be a person or thing, and that the suffix ‘or’ and ‘er’ describes the agent that undertakes the act referred to. Thus, argued Beach J, if AI is the inventing agent, then it could be described as an inventor.¹¹² But do the APA and APR support the identification of AI as the inventor in a patent application?

Beach J believed that a flexible and evolutionary conception of inventor under the extant patent regime that includes AI as such is more in tune with the current technological reality and more aligned to the object clause in s 2A of the APA.¹¹³ According to Beach J, this approach would avoid any uncertainty that would arise if a human must be named the inventor of an AI-generated invention. Put differently, simply naming the AI would avoid questions such as who between the programmer, the owner of the AI, the person who provided the data, the operator or the trainer should be named as the inventor.¹¹⁴ Beach J also believed that the approach he adopted is consistent with s 2A since it would incentivise ‘the development of computer scientists of creative machines, and also the development by others of the facilitation and use of the output of such machine, leading to new scientific advantages’.¹¹⁵

Beach J’s understanding of the object clause in s 2A is narrow because of its emphasis on the incentivisation goal, while ignoring the public interest objectives of ensuring that only patents that satisfy both the formal and substantive requirements of the APA are granted. Only a broad view of s 2A can ensure that the ‘patent system balances overtime the interests of producers, owners and users of technology and the public’.¹¹⁶ Nonetheless, it is important to inquire why Beach J opted to place the incentive on the owner of the patent in respect of an AI-generated invention, since the AI ‘inventor’ can be identified under the APA and APR, as he believed. Is Beach J not indirectly confirming that the concept of inventorship under the extant patent regime in Australia is human-centred? This question is germane since it is understood that inventorship under the current patent regime confers a bundle of rights on the inventor, including the right to apply for a patent over an invention, to assign and communicate the invention and to derive incentives from the invention through assignment of the title to the invention. Inventorship also

111 *Thaler v Commissioner* (n13) para 118–119.

112 *Thaler v Commissioner* (n13) para 120.

113 *Thaler v Commissioner* (n13) paras 121–130.

114 *Thaler v Commissioner* (n13) para 131.

115 *Thaler v Commissioner* (n13) para 125.

116 Section 2A of the APA.

confers responsibilities on the inventor, such as the duty to avoid infringement of existing patents.¹¹⁷ Beach J concurs with this position. Amazingly, however, he concluded that the fact that the APA ‘stipulates rights or consequences for an inventor who is a person in some places does not logically entail that an inventor must be and can only be a person for all purposes’.¹¹⁸

Turning to s 15(1) of the APA, Beach J held that a fair reading of subsecs 1(b) and (c) must lead to the granting of a patent for an AI-generated invention.¹¹⁹ But this is not the issue that Barker DCP had to contend with. The issue he had to contend with has been stated repeatedly above. Suffice to note that, in construing s 15(1), Beach J was quick to distinguish the facts of *JMVB* from the DABUS case in order to escape being bound by the guidance in that case on the construction of ‘inventor’ under the APA.¹²⁰ He also noted that s 15(1) ought not to have been considered by Barker DCP since it deals with the granting of a patent,¹²¹ but failed to recognise the fact that the s is important in determining the qualification of an applicant, which must flow from the status and legal capacity of the inventor under the APA.

Interpreting s 15(1), Beach J refused to consider subsec (1)(d), which deals with inventors’ successors-in-title, for obvious reasons.¹²² Amazingly, he acknowledged that s 15(1)(a) refers to an inventor who is a person, but believed that the provision was not relevant in the DABUS case. Moreover, according to him, s 15(1)(a) shows that ‘the concept of a “person” is different to an “inventor”’. Thus, he believed that it would be fallacious to contend ‘from s 15(1)(a) that a non-human, indeed a non-person, cannot be an inventor’.¹²³

Arguing further that Thaler could possibly be granted a patent under s 15(1)(b) of the APA, Beach J devised four categories of situation that could fall within its ambit, to wit: (a) a chattel-owner relationship (the common law principle of accession); (b) an employer-employee relationship; (c) a person deriving title from the employer/owner; and (d) a person misappropriating the employer/owner title.¹²⁴ Ruling that Thaler could present himself in any of these categories, Beach J reasoned that the subsection ‘does not require the existence of an inventor at all: it requires no more than that the applicant is entitled to have a patent assigned to him, in the event that there is a grant’.¹²⁵ This is so because, according to Beach J, s 15(1)(b) is not limited to situations ‘only of an assignment from the inventor or pre-supposes an earlier vesting of title in the inventor’.¹²⁶

Concerning s 15(1)(c), Beach J interpreted the term ‘derive’ in its ordinary connotation to include ‘to receive or obtain from a source or origin, to get,

117 *Thaler v Commissioner* (n13) paras 201–212.

118 *Thaler v Commissioner* (n13) para 212.

119 *Thaler v Commissioner* (n13) para 200.

120 *Thaler v Commissioner* (n13) paras 181–187.

121 *Thaler v Commissioner* (n13) paras 156–157.

122 *Thaler v Commissioner* (n13) para 163.

123 *Thaler v Commissioner* (n13) para 160.

124 *Thaler v Commissioner* (n13) paras 166–176.

125 *Thaler v Commissioner* (n13) para 169.

126 *Thaler v Commissioner* (n13) para 175.

gain or obtain, and emanating or arising from'.¹²⁷ He then proceeded to rule that Thaler fell under the subsection since he could be said to have derived title to the invention from DABUS as its owner.¹²⁸ Agreeing with the applicant on the application of the common law principle of accession, Beach J reasoned that:

on the present material there is a prima facie basis for saying that Dr Thaler is a person who derives title from the inventor, DABUS, by reason of his possession of DABUS, his ownership of the copyright in DABUS' source code, and his ownership and possession of the computer on which it resides.¹²⁹

Through this reasoning, Beach J offers a simplistic answer to the nagging and complex question of who among the owner, the trainer, the computer programmer and the user of an AI can claim ownership of the invention. But does ownership of an invention by being in possession of the AI 'inventor' automatically qualify the AI as an inventor under the APA and APR? This question and the foregoing extensive review of Beach J's judgment expose its inherent contradictions and inconsistencies on the issue of inventorship under the APA and the APR. To further the broad definition of the concept of inventorship to include AI 'inventors', Beach J is seen in the foregoing review to strenuously distinguish established case law from higher courts, avoiding the construction of statutory provisions that contradict his position. Perhaps the inconsistencies, contradictions and avoidance in the ruling were deliberate attempts to create ambiguities and uncertainties in order to justify the heavy, but narrow, reliance on s 2A of the APA.

What is certain, however, is that Beach J's ruling flies in the face of the clear provisions of the APA and APR on the inventorship question, especially s 15(1) and reg 3.2C(2)(aa), and can be regarded as a judicial amendment of the APA and APR. Also, the judgment would undermine the established stance of the HCA on human creation and agency in IP matters.¹³⁰ Thus, it will be interesting to see how far the judgment will stand up to appellate reviews. Appeals against judgments of the FCA lie with the FCAFC and, from there, they go to the HCA (the final court). Nonetheless, like the CIPC DABUS grant in SA, the judgment may trigger much-needed policy and legislative intervention in Australia on AI and IP generally, or on the question of AI inventorship specifically.¹³¹

127 *Thaler v Commissioner* (n13) para 179.

128 *Thaler v Commissioner* (n13) para 177.

129 *Thaler v Commissioner* (n13) para 193.

130 For instance, see *IceTV* (n19).

131 Australia's Government Response to WIPO Draft Issues Paper on Intellectual Property Policy and Artificial Intelligence, available at https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/call_for_comments/pdf/ms_australia.pdf (accessed on 11 August 2021).

5. CONCLUSION

The CIPC, which administers the South African patent depository system, recently granted a patent to Thaler in respect of an AI-generated invention. The application, which originated from the PCT system, named DABUS (AI) as the inventor. Assessing CIPC's action against the backdrop of relevant provisions of the SAPA and SAPR, as well as the PCT application, it is believed it is unlikely that the DABUS patent will withstand a validity test if judicially scrutinised since it offends ss 25(2) and (3) and 27(1) of the SAPA, read with other relevant provisions. Moreover, it runs contrary to the human-centred stance of the SA patent regime.

In the case of Australia, the APO rightly declined to proceed with the patent application because it identified DABUS (AI) as the inventor against the clear provisions of the APA and APR. However, this ruling has been overturned by the FCA, which also ordered the APO to reconsider the application. The FCA took an overly broad and unnecessary approach to interpreting s 15(1) of the APA. In so doing, it made contradictory and inconsistent pronouncements on the AI-inventorship question; refusing to apply judicial precedence that contradicts its preconceived stance; avoiding other clear provisions of the APA that expose the errors in its reasoning; and, ultimately, taking a position that runs counter to the established stance of the HCA on human creation and agency as the centrepiece of IP in Australia.

The foregoing notwithstanding, CIPC's action and the FCA's ruling have the propensity to trigger conversations domestically in SA and in Australia, respectively, on the opportunities and challenges of AI to the IP landscape, in general, and the patent system, in particular. Such conversation may lead to law and policy reforms that may result in the accommodation of AI 'inventors' within the patent systems of both countries.