IN THE U.S. COURT OF APPEALS FOR THE FEDERAL CIRCUIT

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Stephen Thaler, an individual

Plaintiff,

v.

ANDREW HIRSHFELD, Performing the Functions and Duties of the Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office and UNITED STATES PATENT AND TRADEMARK OFFICE

Defendant.

Case No. 21-2347

Hearing Date: _____

Time: _____ a.m.

[AMICUS CURIAE MEMORANDUM IN SUPPORT OF AFFIRMING THE (DENIED) MOTION FOR SUMMARY JUDGMENT BY DISTRICT COURT]

/s/ Mitch Apper

Mitchell Apper, *pro se*

Dated this 11th day of January, 2022

THE FOLLY OF ARTIFICIAL INTELLGENCE AS INVENTOR

A. INTEREST OF AMICUS CURIAE

This *amicus curiae* represents the thoughts and opinions of a lone registered patent practitioner (USPTO), engineer and inventor who has no interest, association or affiliation with DABUS, DABUS counsel, DABUS associates or the inventor of DABUS, Dr. Stephen Thaler. Nor does this *amicus* have any interest, association or affiliation with any of DABUS' competitors, their counsel, associates or affiliates. This *amicus* has no financial or any specific interest whatsoever in the outcome of the decision as to whether DABUS or any other invention is adjudicated to be its own inventor, or not. This *amicus*' sole interest in the DABUS case is in seeing the public, judiciary and legislatures of the United States as well as other jurisdictions, evaluate intellectual property law and policy related to artificial intelligence (AI) with integrity, rooted in accurate science and engineering.

B. ABSTRACT/THESIS

There is an awful lot of hype bandied about with respect to artificial intelligence.[1, 2] The plaintiff, Dr. Stephen Thaler, is capitalizing on marketing puffery, disinformation, propaganda and demagoguery to promote an agenda with the bogus narrative that DABUS is intelligent and should therefore be accorded status as an inventor.[3] The thesis of the plaintiff is something like: 1) DABUS generates an inventive product like that produced by a human inventor; 2) DABUS is an AI; 3) AIs are intelligent; 4) inventors are intelligent, therefore 5) DABUS should be regarded as an inventor just like a natural person. This syllogism is logically flawed and contains fatal category errors that render the conclusion false and unsound. One of these category errors is mischaracterizing AI's as themselves intelligent. A related and very confusing error is the failure by the plaintiff to distinguish between narrow AIs and AGIs. There is a gargantuan difference between an AI that performs an intelligent task as a so-called (narrow) AI and 'being intelligent'. A second category error is the failure to recognize the kinds of intelligence requisite for

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1 "Questioning the Hype About Artificial Intelligence", Erik Larson, The Atlantic, May 14, 2015 https://www.theatlantic.com/technology/archive/2015/05/the-humanists-paradox/391622/

2 "…*DABUS may be considered "sentient"* in that any chain-based concept launches a series of memories (i.e., affect chains) that sometimes terminate in critical recollections, thereby launching a tide of artificial molecules. It is these associated memory sequences, and the accompanying simulated neurotransmitter rush, that are *considered equivalent to subjective feelings in humans (i.e., sentience)*. In this way, *DABUS has an emotional appreciation for what it conceives*.", The Artificial Inventor Project (Stephen Thaler's website), see: https://artificialinventor.com/dabus/, retrieved on 14 November, 2021

3 "*The Myth of Artificial Intelligence*", Eric J. Larson, Belknap Press of Harvard University, Cambridge, Massachusetts, 2021. see especially chapter 6 'AI as Technological Kitsch'.

invention and conception and to falsely regard DABUS (or any other narrow AI) as possessing those intelligences. It is erroneous to characterize DABUS as intelligent because DABUS lacks any of the intelligence prerequisites for conception. A third category error is the failure to recognize the true inventor of the products of DABUS or any other AI. The true inventor of an AI's products and output is not the AI, but the inventor or inventors of the AI.

DABUS is not intelligent in any way shape or form. Neither DABUS nor any other narrow AI computer program should be regarded as or accorded legal recognition as an inventor because narrow AIs do not conceive and conception is the cornerstone for determining inventorship. The DABUS computer program hasn't invented anything and is not capable of invention. The products of the DABUS computer program are the result of design, architecture and programming by a natural person - the actual inventor of DABUS' products.

technical issues undergirding legal determination

It is acknowledged that when legal cases can be determined based on simple reasoning or precedent, that course should be followed. True that questions of patent law do follow classical legal methods, but some are rooted in technology and science and the case before this Court is an example of such a case. The question now before this Court is not merely whether an AI is a person, but whether, given the current state-of-the-art, can a computer or an AI be rightly regarded as an inventor from the perspective of whether the AI is *technically capable* of invention? If the AI is not technically capable of invention, it is wholly inappropriate to regard the AI as an inventor even if the formal issues were not blocking such consideration. The previous court ruled correctly in this matter and requests this Court to affirm that ruling and in

addition requests this Court to strengthen that affirmance by finding that the plaintiff has failed to show that DABUS is conscious, intelligent, has a mind, can form concepts or is capable of conception or invention. Answering these questions should inform this Court's decision: 1) Is the definition of conception as used in the MPEP and in the associated case law, correct? 2) Is conception a just prerequisite for allowing a patent? 3) Are any of today's AIs/computers capable of conception? 4) Did DABUS conceive with respect to the '350 and '532 patent applications?

C. TECHNICAL ISSUES UNDERGIRDING LEGAL DETERMINATION

It is acknowledged that when legal cases can be determined based on simple reasoning or precedent, that course should be followed. True that questions of patent law do follow classical legal methods, but some are rooted in technology and science and the case before this Court is an example of such a case. The question now before this Court is not merely whether an AI is a person, but whether, given the current state-of-the-art, can a computer or an AI be rightly regarded as an inventor from the perspective of whether the AI is *technically capable* of invention? If the AI is not technically capable of invention, it is wholly inappropriate to regard the AI as an inventor even if the formal issues were not blocking such consideration. The previous court ruled correctly in this matter and requests this Court to affirm that ruling and in addition requests this Court to strengthen that affirmance by finding that the plaintiff has failed to show that DABUS is conscious, intelligent, has a mind, can form concepts or is capable of conception or invention. Answering these questions should inform this Court's decision: 1) Is the definition of conception as used in the MPEP and in the associated case law, correct? 2) Is

conception a just prerequisite for allowing a patent? 3) Are any of today's AIs/computers capable of conception? 4) Did DABUS conceive with respect to the '350 and '532 patent applications?

D. NARROW AI VERSUS ARTIFICIAL GENERAL INTELLIGENCE (AGI)

The term 'AI' can and does have a range of meanings as it is used by workers in the field, and in everyday conversation by the public, media, and by those who work in intellectual property law. Sometimes, however these meanings become conflated, especially by persons who lack a technical understanding of AI and machine learning technology. AI can be used in two senses: (1) narrow AI or as (2) a general AI; these are two entirely different systems. It is not possible to have a meaningful and informed discussion about public policy, AI and intellectual property law without distinguishing between these two very different kinds of artificial intelligence.

In practice, any application that uses a neural network for pattern recognition, regression or clustering analysis is characterized as using AI. **As strange and paradoxical as it might sound, none of today's artificial intelligences are intelligent, rather they possess the capability of producing results and products – in very narrow domains - that appear intelligent.**[4] [5]

'Artificial Intelligence' was a slogan created by John McCarthy in 1956 at the Dartmouth

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[4] "MIT AGI: Building Machines that See, Learn, and Think Like People", MIT course # 6.S099: Artificial General Intelligence, lecture by Professor Josh Tenenbaum, Lex Fridman and Josh Tennenbaum, Lex Fridman podcast, February 8, 2018, see at approximately 2:20 into the lecture https://www.youtube.com/watch?v=7ROelYvo8f0

[5] "*The Myth of Artificial Intelligence*", Erik J. Larson, Bellknap Press of Harvard University, 2021, page 59 and 'Part 2 – The Problem of Inference'.

conference to describe advanced computing. 'AI' is a misnomer; real intelligence comes from the mind of a human. Today, AI is clever software engineering, period. Scientists and engineers imagine that one day with further technical progress these narrow systems might advance and coalesce to exhibit some of the properties of general intelligence – but these are predictions and science fiction, not reality.[6] Examples of some of narrow AI applications include recommendation engines by Netflix, Spotify, YouTube or other media delivery services to serve up the entertainment that a consumer will most enjoy or for delivering marketing recommendations by companies like Amazon for their customers. Other narrow AI applications include mail sorting that deciphers handwritten zip codes to sort and route mail, facial recognition, image labeling used by tech companies to label images in their databases – and many other applications that we have come to accept as part of our daily culture, commerce and lives. Still other AIs are on the cutting edge of R&D and have garnered widespread recognition. The technology engine behind all of these generally includes some sort of machine learning multi-layered neural network. These technologies are used in pattern recognition, particularly activities which human beings employ all the time but whose algorithms can't be explicitly articulated. *Some of the characteristics of narrow AIs are*:

- They are capable of performing one or a few pattern recognition tasks, often as well as, or better than a natural person, sometimes even a highly skilled natural person,

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6 "Ray Kurzweil (USA) at Ci2019 – The Future of Intelligence, Artificial and Natural", Ray Kurzweil, CinnovationGlobal, November 4, 2019, https://www.youtube.com/watch?v=Kd17c5m4kdM

- They are usually limited to one or a few, narrow domains,
- They implement learning,
- As of January, 2021, there are many, many implementations, worldwide.

All current AIs right now, are designed by natural persons and their performance is a result of the programming that is architected into them by an engineer. At some point in time (in the future?) , if they are able to operate without a natural person as designer, that might hint at artificial intelligence sufficient to characterize the AIs as inventive. We are not there now, nor are we on the verge of that capability.

In contrast to narrow AIs, there is a type of AI characterized as artificial general intelligence or AGI. There is no AGI right now nor has there has ever been any AGI. An AGI is an AI that can perform intelligently like a human being in a general manner across a variety of domains. In short, an AGI is the kind of computer portrayed in the movie '*2001 A Space Odyssey'* depicted as HAL, in the movie "Her", as depicted in the Star Trek '*Next Generation'* series as Lieutenant Commander Data, or as Ava in *Ex Machina*, in which humans interact with machines and operating systems that are *conscious, sentient, driven and self-aware.*

Some of the characteristics of an AGI are:

- It is the holy grail of artificial intelligence and probably incorporates and integrates many tribes of AI such as learning using the connectionist model, logical/symbolic representations, one shot/few shot, transfer learning, blending of supervised, unsupervised, reinforcement learning, and advanced search.
- Exhibits intelligence across many domains,

- An AGI can perform at or close to the full range of many kinds of human intelligence (see: *infra* in the heading '*Pre-requisite Markers of Intelligence Essential for Conception'*. An AGI can perform many types of intelligent tasks.
- As of January, 2022, there exist no implementations of an AGI. One prediction is that AGI will begin to emerge as soon as 2030-2050, but no one really knows. Many technical obstacles must be overcome before anything resembling an AGI is implemented.

This case, in many ways, pivots on the question of whether an AI is capable of conception and boils down to whether or not an AI possesses the requisite intelligence to conceive. No credible person would assert that a regular computer program or an unintelligent complex piece of machinery should be regarded as an inventor. Here, the plaintiff's sole basis for asserting inventorship is that their AI possesses intelligence, can achieve the equivalent of conception and invention. "Intelligence cannot be measured by how well a machine performs a single task, or even several tasks. Instead, intelligence is determined by how a machine learns and stores knowledge about the world. We are intelligent not because we can do one thing particularly well, but because we can learn to do practically anything. The extreme flexibility of human intelligence requires many attributes such as the ability to learn continuously, to learn through movement, to learn many different models and to use general purpose reference frames for storing knowledge and generating goal oriented behaviors."[7]

E. CONCEPTION REQUIRES CONSCIOUSNESS AND INTELLIGENCE

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[7] 'Why There is No I in AI', in "*A Thousand Brains*", Jeff Hawkins, page 134, Basic Books, NY, March, 2021.

There is considerable case law guiding our interpretation of what it means to conceive.[8] Here are three bullet points from this case law.

1. *CONCEPTION REQUIRES HAVING A MIND*

Townsend v. Smith teaches that "the complete performance of the mental part of the inventive act" is conception and "the formation in the mind of the inventor of a definite and permanent idea of the complete operative invention as it is thereafter to be applied in practice" constitutes 'conception'.[9] These words communicate that the conceiver of the invention must possess a mind. MPEP §2138.04 I reads "conception must be done in the mind of the inventor". None of today's AIs possess anything remotely resembling a mind, nor is there is a definition of 'mind' that resembles that which is described in any narrow AI.

2. *CONCEPTION REQUIRES THE MIND TO FORM IDEAS*

As a judicial test, "an exercise of the inventive faculty" has long been regarded as an absolute prerequisite to patentability.[10] *Bosies v. Benedict* teaches that "the inventor must form a definite and permanent idea of the complete and operable invention to establish conception[11]. *Hybritech Inc. v. Monoclonal Antibodies Inc.* teaches that "(Conception is the "formation in the mind of

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8 MPEP 2138.04

9 *Townsend v. Smith,* 36 F.2d 292,295, 4 USPQ 269, 271 (CCPA 1929)

10 Dann v. Johnston, 425 U.S. 219, 225 (1976)
see: "*Invention as the Absolute Prerequisite to Patentability*", Dennis Crouch, November 9, 2021, PatentlyO

11 *Bosies v. Benedict,* 27 F.3d539, 543, 30 USPQ2d 1862, 1865 (Fed. Cir. 1994)

the inventor, of a definite and permanent idea of the complete and operative invention,[12] as it is hereafter to be applied in practice."), and *Townsend v. Smith* ruled that a conceiver of the invention must generate the idea of the invention.[13] It may be that narrow AIs can be said to perform sometimes amazing computational feats, but they do not model, represent or process definite and permanent ideas. Narrow AIs do not understand anything that they are doing within the broad meaning of 'understanding' and neither their functionality nor their structure, model or represent thoughts or ideas. Narrow AIs don't implement anything like thoughts or ideas because their computational performance is an implementation of complex structures whose parameters have been set using clever training techniques such as gradient descent, backpropagation and the use of objective (cost) functions. The execution of these narrow AI functions, in inference, is not thinking or cognition but rather the execution of a computer circuit that has been defined by a human inventor.

3. *THE INVENTOR MUST THEMSELVES BE IN POSSESSION OF THE INVENTIVE CONCEPT*

Narrow AIs are not themselves in possession of any inventive concept at the time of invention, and thus do not conceive. *Gunter v. Stream* teaches that "It is settled that in establishing conception a party must show possession of every feature recited in the count, and that every limitation of the count must have been known to the inventor at the time of the alleged

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[12] *Hybritech Inc. v.Monoclonal Antibodies Inc.,* 802 F. 2d 1367, 1376,231 USPQ 81, 87 (Fed. Cir. 1986)

[13] *Townsend v. Smith,* 36 F.2d 292,295, 4 USPQ 269, 271 (CCPA 1929)

conception.[14, 15] Conception must be proved by corroborating evidence." If an AI is to be regarded as an inventor, that means that the AI itself must prove by corroborating evidence that it was in possession of every feature in the count (claim) and known to itself at the time of the invention.[16] None of today's (narrow) AIs can do this.

4. THE CONCEIVER MUST BE ABLE TO EXPLAIN THE INVENTION

"Conception is established when the invention is made sufficiently clear to enable one skilled in the art to reduce it to practice without the exercise of extensive experimentation or the exercise of inventive skill." [17] Conception has also been defined as a disclosure of an invention which enables one skilled in the art to reduce the invention to a practical form without "exercise of the inventive faculty." [18]

The gist of this case law is that conception requires a conceiver to: 1) have a mind, 2) form ideas, 3) themselves – be in the possession of an inventive concept at the time of the invention, and 4) be able to corroborate invention and explain its inventive concepts. Having a mind indicates that there must a source of intelligence. This case law is expressing that the motive force of the

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14 *Gunter v. Stream,* 573 F.2d 77, 197 USPQ 482 (CCPA 1978).

15 see also, *Coleman v. Dines,* 754 F.2d 353,224 USPQ 857 (Fed. Cir. 1985)

16 Hybritech Inc. v.Monoclonal Antibodies Inc., 802 F. 2d 1367, 1376,231 USPQ 81, 87 (Fed. Cir. 1986)

17 Hiatt v. Ziegler, 179 USPQ 757, 763 (Bd. Pat. Inter.1973).

18 Gunter v. Stream, 573 F.2d 77, 197 USPQ 482 (CCPA1978).
see also Coleman v. Dines, 754 F.2d 353,224 USPQ 857 (Fed. Cir. 1985)

mental energy used in conception must, and a) possess the intelligence to independently generate an inventive concept, and b) generate the inventive concept themselves. Forming an idea and being in possession of an entire inventive concept at the time of invention are products of intelligence, so in order to determine whether or not any AI is capable of conception and thus invention, a determination as to whether the AI possesses the intelligence necessary for conception is necessary.

5. *THRESHOLD OF CONCEPTION FOR PATENTABILITY MUST BE SIGNIFICANTLY MORE*

There are additional elements necessary for conception as applied to patentable invention. A patentable conception must be novel and non-obviousness and must fulfill the conditions of eligibility by exhibiting unconventional technological solutions to technological problems and contributing technological improvements to the art or technology.[19, 20, 21] The new results of a

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[19] "Patent Eligibility: Advantages over Prior Art are Not Sufficient without Meaningful Technological Improvement", Dennis Crouch, PatentlyO, October 19, 2020 https://patentlyo.com/patent/2020/10/eligibility-technological-improvements.html

[20] "Alice Corporation Pty. Ltd. V. CLS Bank International, et al.", 573 U.S. 208, 134 S. Ct., 2347 (2014 https://www.supremecourt.gov/opinions/13pdf/13-298_7lh8.pdf

[21] 'Unconventional' refers in part to the Alice-Mayo framework analysis step 2B, MPEP 2106.05, "Subject Matter Eligibility", Examination Guidelines (see October, 2019 updated guidelines) https://www.uspto.gov/patents/laws/examination-policy/subject-matter-eligibility. also see: *Enfish, LLC v. Microsoft Corp.,* 822 F.3d. 1327, 1334, 118 USPQ2d 1684, 1688 (Fed.Cir. 2016), *Amdocs (Israel), Ltd. v. Openet Telecom, Inc.,* 841 F.3d 1288, 1316,120 USPQ2d 1527, 1549 (Fed. Cir. 2016), and
Ancora Technologies, Inc. v. HTC America, Inc., CAFC Appeal # 18-1404, November 16, 2018. see: http://www.cafc.uscourts.gov/node/24063

patentable concept should be unpredictable and unexpected pursuant to non-obviousness criterion of 35 USC §103. Conception constitutes a special case of intelligence. There are basic thresholds for patentability which necessitate not mere intelligence, but a degree of intelligence that is well beyond and of a substantially higher caliber than ordinary intelligence because a patentable inventive concept requires more than ordinary skill in the art.[22] So too, the conceiver of a patentable invention must be able to apply synthetic imagination, creativity and intelligence that is greater than found in a PHOSITA.

F. PREREQUISITE MARKERS OF INTELLIGENCE ESSENTIAL FOR CONCEPTION

The process of invention and conception are functions of intelligence and are products of the mind and brain. Joseph Rossman in the "Psychology of the Inventor" cites several characteristics that are normally associated with either intelligence *per se* or as human personality traits as central qualities to invention: perseverance, originality, imagination, reasoning and intelligence, analysis and keen observation.[23] Here are some of the functionalities and characteristics of the human mind, none of which is endowed into or onto any artificial intelligence or DABUS[24]:

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[22] MPEP 2141.03

[23] *Motives of Inventors*' in "*The Psychology of the Inventor*" (p 40), Joseph Rossman, The Inventors Publishing Company, Washington, D.C., J W. Stowell Printing Co., Federalsburg, Maryland, 1931. https://babel.hathitrust.org/cgi/pt?id=mdp.39015066018188&view=2up&seq=6

[24] Some (narrow) AIs use deduction and logical programming – the basis for expert systems, which have fallen into disfavor because it is difficult or impossible to hard code into an expert system every single case. Modern learning and deep learning system are all inductive. There is no

1) Consciousness is prerequisite to intelligence because it is the prerequisite for independent agency, personal cognitive initiative, ambition, motivation to invent, curiosity, restlessness, dissatisfaction to improve something about the world, experience. Without consciousness, there is no intelligence. 2) Cause and effect. 3) Reasoning by analogy. 4) The ability to generalize knowledge and apply knowledge and lessons from one domain to another domain. 5) The ability to build mental models of the world. 6) The ability to learn anything. Narrow AIs can learn about only a single narrow domain, but intelligent beings can learn anything. 7) The ability to reason using symbols (symbolic reasoning), to apply logic to those symbols (deduction), pattern recognition (induction), hybrid deductive-inductive reasoning). 8) synthetic imagination (abductive reasoning), Currently some AIs can do deduction and some can do induction, but none can effectively do both or use abductive reasoning. 9) The ability to make non-statistical predictions about the world. 10) Commonsense knowledge and reasoning. 11) Accumulation facts of, and the ability to understand engineering, science, prior art. 12) The ability to form, store and process thoughts, ideas and concepts. 13) The ability to build models of the world which are layers of lower level ideas and concepts. 14) The ability to process contextual meaning for different kinds of knowledge. 15) The ability to process and communicate using spoken and written language including nuance. 16) Spatial reasoning. The

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abductive AI which can perform synthetic imagination and there is no AI that can combine induction together with symbolic reasoning

ability to reason in 3D and mentally switch back and forth between 2D and 3D. 17) Experiential understanding of time, past present, future. 18) Ability to understand and distinguish between of reality, dreams, fantasy, non-reality, alternative realities, or to engage in shared realities 19) Ability to learn anything and to do so with only one or a few examples or episodes. 20) Ability to coherently synthesize new composite ideas from constituent ideas and to . create new combinations. 21) Ability to synthesize and integrate some or all of these various capabilities and intelligences. 22) Ability to explain how to make and use an invention. 23) Ability to explain how and why the inventor has arrived at a conclusion. 24) Intelligent persons are capable of independently gathering information and appreciating problems. 25) Independent Resourcefulness – the ability, when faced with obstacles or on being stuck, to develop alternatives to goals to get 'unstuck'.

G. THE TRUE INVENTOR

Computers, AIs and machine learning systems are machines that execute exactly as instructed, and no more: they open and close logic gates according to their programs. The programmers and architects of the programs are the true inventors of the products of the AIs and who do all of the inventing for every AI and computer system. (Right now) natural persons are the only ones who recognize the problems, devise the solution architectures and code the AI or learning system to perform. The rightly regarded inventors are the natural persons who perform this mental effort not the computational machines themselves. In the case of the DABUS family of inventions, Dr. Stephen Thaler is that creative force, conceiver and inventor. To regard the machine itself as the creator or conceiver abolishes 'conception' from invention.