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Inventorship guidance for AI-assisted inventions

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Background for guidance

Thaler v. Vidal

- Federal Circuit upheld the USPTO's decisions to deny two petitions seeking to name an AI system as an inventor.
- Decision hinged on the interpretation of the definition of "inventor" in 35 U.S.C. 100(f) "the individual or, if a joint invention, the individuals collectively who invented or discovered the subject matter of the invention."
- Court concluded that an inventor must be a natural person.
- Court further explained that it was **not** confronted with "the question of whether inventions made by human beings with the assistance of AI are eligible for patent protection."

Thaler v. Vidal, 43 F.4th 1207 (Fed. Cir. 2022)

Executive Order

- Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence (EO 14110)
  - *The USPTO Director shall "within 120 days of the date of this order, publish guidance to USPTO patent examiners and applicants addressing inventorship and the use of AI, including generative AI, in the inventive process, including illustrative examples in which AI systems play different roles in inventive processes and how, in each example, inventorship issues ought to be analyzed"*

Inventorship guidance for AI-assisted inventions

Inventorship guidance for AI-assisted inventions

- USPTO issued inventorship guidance for AI-assisted inventions and Request for comments on February 13, 2024 (89 FR 10043)
- Key takeaways
  - AI assisted inventions are not categorically unpatentable for improper inventorship
  - Focus of inventorship analysis on human contributions, specifically - significant contribution (*Pannu* factors)
  - Five guiding principles to inform application of *Pannu* factors
  - Guidance applies to utility, plant, and design patents & applications
  - Potential impact to other areas of patent practice
  - Two examples illustrating application of guidance

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AI-assisted inventions are not categorically unpatentable

- Patent applications and patents for AI-assisted inventions must name the natural person(s) who *significantly contributed* to the invention as the inventor or joint inventors (i.e., meeting the *Pannu* factors).
  - Use of an AI system (or other advanced tools) by a natural person(s) does not preclude that natural person(s) from qualifying as the inventor (or joint inventors) if the natural person(s) significantly contributed to the claimed invention.
- Applications and patents must not list any entity that is not a natural person as the inventor or joint inventor, even if an AI system may have been instrumental in the creation of the claimed invention.

Significant contribution

- Each named inventor must contribute in some significant manner to the invention. That is, each named inventor must satisfy the *three Pannu factors*:
  - contribute in some significant manner to the conception or reduction to practice of the invention,
  - make a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention, and
  - do more than merely explain to the real inventors well-known concepts and/or the current state of the art.

  Failure to meet any one of these factors precludes that person from being named the inventor or joint inventor.
- Things to remember
  - Focus of Pannu factors analysis is on the natural person(s) contributions
  - Joint inventors may apply for a patent jointly even though each did not make the same type or amount of contribution or each did not make a contribution to the subject matter of every claim of the patent.

The *Pannu* factors and guiding principles

The Pannu factors

- The first *Pannu* factor - conception: Each named inventor must contribute in some significant manner to the conception (or reduction to practice) of the claimed invention
  - Each named inventor must have significantly contributed to the "definite and permanent idea of the complete and operative invention as it is thereafter applied in practice."
  - Conception analysis focuses on the natural person(s) contributions
  - Reduction to practice of an invention conceived by another is not enough to constitute inventorship
    - Reference to "reduction to practice" in the first Pannu factor is simply an acknowledgement of the doctrine of simultaneous conception and reduction to practice, which is sometimes pertinent in unpredictable arts.

Pannu factors (cont.)

- The second Pannu factor – quality of contributions: Each named inventor must make a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention
  - For example, providing routine or expected inputs to an AI system could be an exercise of normal skill expected of one skilled in the art that is considered insignificant in quality.
- The third Pannu factor – mere explanation of the state of the art: An inventor must do more than merely explain to the real inventors well-known concepts and/or the current state of the art.
  - For example, experts whom the inventor consulted to discuss current state of the art, but who themselves were not involved in the invention creation process would likely not satisfy this factor. See e.g., Fina Oil and Chemical Co. v. Ewen, 123 F.3d 1466, 1473 (Fed. Cir. 1997) (citing Hess v. Advanced Cardiovascular Sys., Inc., 106 F.3d 976, 981 (Fed.Cir.1997)).

Pannu factors – miscellaneous

- Application of *Pannu* factors to determine whether a natural person significantly contributed to an AI-assisted invention is made on a claim-by-claim and case-by-case basis
- When a single person uses an AI system to create an invention, that single person must make a significant contribution to every claim
- No requirement for a named joint inventor to contribute to every claim - a contribution to a single claim is sufficient; *but* each claim must have at least one natural person inventor
- Each inventor must make a significant contribution to the conception of the invention, and at least one inventor must have recognition and appreciation.

Guiding principles (Gp)

Gp1 A natural person's use of an AI system in creating an AI-assisted invention does not negate the person's contributions as an inventor.

Gp2 Merely recognizing a problem or having a general goal or research plan to pursue does not rise to the level of conception.

- A natural person who only presents a problem to an AI system may not be a proper inventor or joint inventor of an invention identified from the output of the AI system.
- However, a significant contribution could be shown in how the person constructs the prompt in view of a specific problem to elicit a particular solution from the AI system.

Gp3 Reducing an invention to practice alone is not a significant contribution that rises to the level of inventorship.

- A natural person who merely recognizes and appreciates the output of an AI system as an invention, particularly when the properties and utility of the output are apparent to those of ordinary skill, is not necessarily an inventor.
- However, a person who takes the output of an AI system and makes a significant contribution to the output to create an invention may be a proper inventor.

Guiding principles (cont.)

Gp4 A natural person who develops an essential building block from which the claimed invention is derived may be considered to have provided a significant contribution to the conception of the claimed invention even though the person was not present for or a participant in each activity that led to the conception of the claimed invention.

- In some situations, the natural person(s) who designs, builds, or trains an AI system in view of a specific problem to elicit a particular solution could be an inventor, where the designing, building, or training of the AI system is a significant contribution to the invention created with the AI system

Gp5 Maintaining "intellectual domination" over an AI system does not, on its own, make a person an inventor of any inventions created through the use of the AI system.

- A person simply owning or overseeing an AI system that is used in the creation of an invention, without providing a significant contribution to the conception of the invention, does not make that person an inventor.

Examples

Inventorship examples

- The USPTO also issued two examples to provide assistance on the application of this guidance
  - Transaxle for remote control car
  - Developing a therapeutic compound for treating cancer

Mechanical example- scenario 1

Facts

- Ruth and Morgan, engineers at the XYZ Toy Company prompt an AI system (Puerto5) to elicit a preliminary design for the transaxle for an RC car.
- The prompt states:
  - "Create an original design for a transaxle for a model car, including a schematic and description of the transaxle."
- The output from Puerto5, which Ruth and Morgan reviewed, includes a preliminary design for a transaxle that is comprised of a casing, a transmission that is removably mounted within the casing and secured by fasteners, and axle shafts that extend from the casing. The casing of the preliminary design consists of two elements that are separable along a vertical plane. Ruth and Morgan review the output and agree that the design should work in their RC car.

Claim 1 of the patent application drafted by XYZ Toy Company recites:

A transaxle comprising:
a casing;
a transmission;
said transmission separate from said casing and removably mounted within said casing;
axle shafts extending from said casing;
said casing being defined by two separable casing elements of said transaxle; and
a fastener on said transmission that removably mounts the transmission to one of said separable casing elements.

Are Ruth and Morgan proper joint inventors of the claimed invention?

Mechanical example – scenario 1

Ruth and Morgan's contribution	Analysis of the contribution
Recognized a problem (needing a transaxle)	GP2- Recognition of a problem does not rise to the level of conception
Prompted the AI system to solve the problem	Prompt is only a restatement of the problem, no inventive contribution in how the prompt is constructed
Reviewing the AI output	GP3 - Recognition and appreciation of an invention without a contribution to conception is not sufficient.

Pannu Factor Analysis

First *Pannu* factor – As shown in the table, none of Ruth and Morgan's contributions are considered a significant contribution to the conception of the claimed invention under the first *Pannu* factor.

The inventorship analysis fails at least the first *Pannu* factor. Therefore, Ruth and Morgan are not the proper joint inventors of claim 1.

Mechanical example – scenario 2

Facts

- Morgan, using the schematic created by Puerto5, builds the transaxle of claim 1 by:
  - Following the schematic exactly and not altering the design.
  - Selecting steel, a common material used in the RC car industry, to build transaxles.

Are Ruth and Morgan proper joint inventors of the claimed invention?

Claim 2 of the application reads:

The transaxle of claim 1, wherein the casing is constructed from steel.

Mechanical example – scenario 2

Ruth and Morgan's contribution	Morgan's contribution	Analysis of the contribution
Recognized a problem; Prompted the AI system to solve the problem; Reviewing the AI output		For the same reasons set forth in scenario 1, Ruth and Morgan's contributions to identifying a problem and prompting Puerto5 to solve that problem are not significant.
	Reduced the transaxle to practice	GP 3- Reducing an invention to practice alone is not a significant contribution that rises to inventorship
	Selected steel for the building the design	Selection of a well-known material is insignificant in quality when compared to the full scope of the claimed invention. (Second *Pannu* factor)

- Claim 2 depends from claim 1 and incorporates all the limitations from claim 1

<u>*Pannu* Factor Analysis</u>

First *Pannu* factor – As shown in the table, none of Ruth and Morgan's contributions are considered a significant contribution to the conception of the claimed invention under the first *Pannu* factor.

Second *Pannu* factor - As shown in the table, selection of a well-known material is an insignificant contribution, when compared to the invention as a whole.

The inventorship analysis fails at least the first and second *Pannu* factors. Therefore, Ruth and Morgan <u>are not</u> the proper joint inventors of claim 2.

Mechanical example – scenario 3

Facts

- Ruth and Morgan prompt Puerto5 to provide alternative transaxle designs
- Puerto5 outputs an alternative design with a casing separable along a horizontal (as opposed to vertical) plane
- Ruth and Morgan experiment with this alternative design and create a new different design
- Morgan further designs a clip fastener for the new design

Are Ruth and Morgan proper inventors of the new design recited in claim 3?

Claim 3 of the application reads:

A transaxle comprising:

an elongated casing;

a transmission;

said transmission being separate from said casing and removably mounted within the lower two thirds of said casing;

axle shafts extending from the lower two thirds of said casing;

said casing being defined by two separable casing elements wherein the separation of said casing elements is along a horizontal plane that is parallel to the axle shafts;

wherein said casing elements are separable at a location within the upper third of said casing; and

a clip fastener on said transmission that removably mounts the transmission to one of said separable casing elements.

Mechanical example – scenario 3

Ruth and Morgan's Contribution	Analysis of Contribution
Created the new design based upon a suggestion from the AI system including: • Elongated case • Specific placement of elements in cases • Specific location of separation in casing	GP 1 – a natural person's use of an AI system in creating an AI-assisted invention does not negate the person's contributions as an inventor
Clip fastener (Morgan)	Original design by a natural person and a significant element of the claimed invention

Pannu Factor Analysis

First *Pannu* Factor

- The new design and the clip fastener are significant contributions to the claimed invention.

Second *Pannu* Factor

- Ruth and Morgan's experimentation on the general idea resulted in a specific arrangement and the design of the clip fastener. These are integral elements of the claim invention.

Third *Pannu* Factor

- Contributions are not the result of explaining the current state of the art or well-known concepts.

Since the contributions of Ruth and Morgan satisfied all three *Pannu* factors, Ruth and Morgan are the proper inventors of claim 3.

Resources

- USPTO AI landing page
  - www.uspto.gov/initiatives/artificial-intelligence
- Inventorship RFC & examples
  - www.uspto.gov/initiatives/artificial-intelligence/artificial-intelligence-resources
- Manual of patent examining procedure
  - www.uspto.gov/web/offices/pac/mpep/index.html