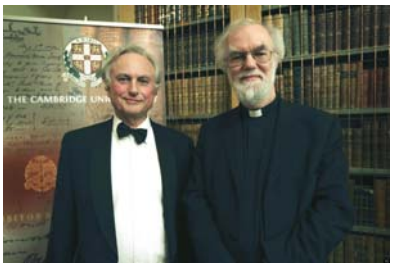
Only One is Ontologically Committed to "God"



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The Patent System and Ontological Commitment

- The patent system is engaged in an ontological project.
- Patent systems examine claims and award rights in ways that incur ontological commitments to types defined by claim language
- Criteria of ontological commitment/warrant?

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Promiscuous Ontological Commitment

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§ 112 and Ontological Commitment

- Filing: Demand for admission into the patent system's ontology of "useful Arts"
- Written description: Conveys ontological commitment
- Enablement: Warrants ontological commitment

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Kind-Level Predicates

- Can be true of a kind but not of individuals
  - "The passenger pigeon became extinct"
- Generally incompatible with indefinite articles
  - No: "A lion is widespread"
- Exception: Novel kinds
  - "Fred invented *a* pumpkin-crusher"
  - (But: "Bell invented *the* telephone")

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Scientific Realism

USPTO does not require:

a working model (unless factual reasons would lead a PHOSITA to question operability)

a correct account of theory of operation (unless necessary to convince a PHOSITA of asserted utility)

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Causal Powers of Embodiments

"It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted…."

— Diamond v. Diehr

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Types of Ontological Commitment

de dicto committed to the existence of (possible) objects of the kind

de re committed to certain particulars of the kind

Filing of adequate disclosure = warranted *de dicto* commitment to claim as a kind [pp. 45-50]

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The Written Description Requirement

Ariad (Fed. Cir. 2010) (en banc): "[T]he test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date."

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The Written Description Requirement

Ariad (Fed. Cir. 2010) (en banc): "[T]he test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date."

Jeffrey Lefstin (2008): Not "syntactically sensible" to ask whether inventor "possessed" a class having infinite scope.

WD requirement has definitional purpose

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The Written Description Requirement

Ariad (Fed. Cir. 2010) (en banc): "[T]he test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date."

Adequate description:

- Shows ontological possession of claimed kind
- Conveys *de dicto* commitment to claimed kind by picking out a well-defined class

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The Enablement Requirement

Argument from the best explanation:

- If the world behaves as if an unobserved entity *E* exists, then the best explanation of this fact is that *E* really does exist.

Enabling disclosure:

- Provides warrant for *de dicto* ontological commitment to claimed kind
- Furnishes theoretical or factual support (in addition to knowledge in the art) to justify reliance on argument from the best explanation, given unobserved embodiment(s)

Esab

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The Enablement Requirement

Argument from the best explanation:

- If the world behaves as if an unobserved entity *E* exists, then the best explanation of this fact is that *E* really does exist.

Ellis: Scope of ontological warrant is limited to kinds of entities involved in causal processes

- Implies essential causation requirement
  - Kinematic property exclusion (Salmon/Dowe)

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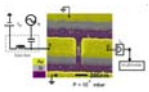
Machines that do math

Past

Present



Future

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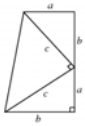
Pythagorean Theorem is not patentable



$$A_{\text{trapezoid}} = \frac{1}{2}\sum[\text{bases}]\cdot[\text{altitude}] = \frac{1}{2}(a+b)(a+b) = \frac{1}{2}ab+\frac{1}{2}ab+\frac{1}{2}c^2.$$

$$\frac{1}{2}(a^2+2ab+b^2) = ab+\frac{1}{2}c^2 \quad a^2+2ab+b^2 = 2ab+c^2 \quad a^2+b^2=c^2.$$

Flook: Not patentable even if further limited by "a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques"

Followed by *Bilski*, *State Street Bank*

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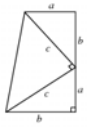
Pythagorean Theorem is not patentable



$$A_{\text{trapezoid}} = \frac{1}{2}\sum[\text{bases}]\cdot[\text{altitude}] = \frac{1}{2}(a+b)(a+b) = \frac{1}{2}ab+\frac{1}{2}ab+\frac{1}{2}c^2.$$

$$\frac{1}{2}(a^2+2ab+b^2) = ab+\frac{1}{2}c^2 \quad a^2+2ab+b^2 = 2ab+c^2 \quad a^2+b^2=c^2.$$

In re Bergy: "well established" as unpatentable: "principles, laws of nature, mental processes, intellectual concepts, ideas, natural phenomena, mathematical formulae, methods of calculation, fundamental truths, original causes, motives, the Pythagorean theorem, and the computer-implementable claims of Benson and Tabbot."

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A claim covering all structural uses of the Pythagorean Theorem

1. An apparatus for measuring angles, comprising:
   a first leg member having a first end and a second end separated by a first distance *a*;
   a second leg member having a first end and a second end separated by a second distance *b*, the first end of said second leg member being attached to the first end of said first leg member; and
   a hypotenuse member having a first end and a second end separated by a third distance $\sqrt{a^2+b^2}$, the first end of said hypotenuse member being attached to the second end of said first leg member and the second end of said hypotenuse member being attached to the second end of said second leg member,
   whereby said first leg member and said second leg member form a right angle.

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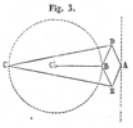
Peaucellier's Theorem

M. Peaucellier, *Note sur une question de géométrie de compas*, 12 NOUVELLES ANNALES DE MATHÉMATIQUES (2D SER.) 71, 74 (1873)

fixe C′, auquel on reliera le point B, le lien C′B étant d'une longueur égale à la distance CC′ des centres fixes.
Ce qui précède constitue une solution rigoureuse du problème posé par Watt; elle est assez simple pour pouvoir être employée avec avantage dans certaines machines à longue course. M. Mannheim, en 1867, en a fait

Fig. 3.



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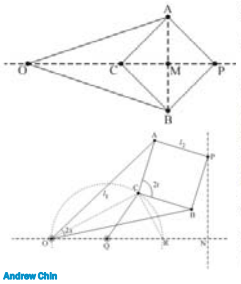
Peaucellier's Theorem



Given: $OA = OB = l_1$, $AP = BP = AC = BC = l_2$, and $\cos^{-1}(s) = \frac{l_2}{l_1}$. Then: $OM^2 + AM^2 = l_1^2$, $PM^2 + AM^2 = l_2^2$ (Pythagorean Theorem); thus $OC \cdot OP = (OM - PM)(OM + PM) = l_1^2 - l_2^2$ is a constant. Fix O, Q so that $OQ = QC$; i.e., C moves on a circle centered at Q. Then $\angle OCR = 90°$. Drop perpendicular $\overline{PN}$ from P to $\overline{OQ}$; then $\Delta OCR \sim \Delta ONP$ and $ON = \frac{OC \cdot OP}{OR} = \frac{k^2}{2OQ}$ is a constant; i.e., N is stationary. Thus P moves on a straight line perpendicular to $\overline{OQ}$.

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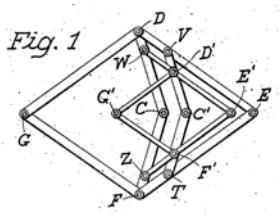
U.S. Patent 1,190,215 (issued 1916)

1. A constant product linkage comprising a large Peaucellier cell and a similar smaller Peaucellier cell, and connections to keep their corresponding angles equal.



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Kinematic Property Product Claims

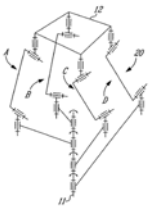
1. A manipulator for receiving and displacing an object, comprising:

a base;

a moving portion, adapted to receive the object;

four articulated support legs each extending between the moving portion and the base for supporting the moving portion, each of the articulated support legs being connected to the base by a first R-joint with axes of the first R-joints being parallel to one another, and with sequentially second, third, fourth and fifth R-joints connecting the first R-joints to the moving portion, with axes of the fifth R-joints not all being coplanar, the articulated support legs being topologically equivalent to one another with respect to the first, second, third, fourth and fifth R-joints, the articulated support legs being arranged with respect to one another between the base and the moving portion so as to restrict movement of the moving portion to three translational degrees of freedom and one rotational degree of freedom; and

four angular actuators being each operatively connected to a different one of the R-joints for controlling the movement of the moving portion in any one of the three translational degrees of freedom and the one rotational degree of freedom.



U.S. Patent 6,997,669 (issued 2006)

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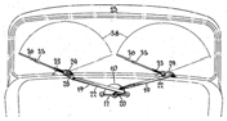
Linkages and patents



Flash of Genius (2008)

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Machine

A device consisting of fixed and moving parts that modifies mechanical energy and transmits it in a more useful form.

American Heritage Dictionary (4th ed. 2000)

Patent machines, not kinematics!

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Future Work [pp. 87-91]

- The essential causation requirement also may imply:
  - An economic utility requirement (Fisher, Walras, Pareto: energy = utility)
  - A semiotic printed matter exclusion: Collins (2010)
- Inventorship and mental causation (*cf.* Burk)
- Law-of-nature exclusion and today's physics (*cf.* Simon)
- Role of enablement in linguistic essentialism (Kaminsky [n.155])
- Further roles for claim construction, DOE/PHE

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