Essential Causation and the Metaphysics of Patent Law's Abstract-Ideas Exclusion

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Hogg v. Emerson (1848)

"this most
metaphysical
branch of
modern law"

Justice Woodbury

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What Metaphysics Can Tell Us About Patent Law

Ariel Simon (2009): Does it distort basic science?

- Law-of-nature exclusion characterizes science as discovery of "fundamental Truths"
- Pragmatists, Popper destabilize this category, making exclusion "arbitrary or analytically tenuous"

Science funding could serve in part to correct patent law's distortions

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What Metaphysics Can Tell Us About Patent Law

Dan Burk (2007): Is it sexist?

- Inventorship doctrine exhibits a "striking pattern of dualism"
- Focuses on mental act of conception; physical reduction to practice is largely irrelevant

This dualism "appears to reinforce socially established structures of hierarchy"

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What Metaphysics Can Tell Us About Law

Steven D. Smith (2006): Do we hold outdated conceptions of "the Law"?

"[L]aw's metaphysical commitments pervade and inform the ways that lawyers talk and argue and predict and that judges decide and justify."

***Law's Quandary*: Ontological inventory on contemporary law-talk**

"[I]f we say things that we cannot account for using the materials in our [ontological] inventories, we speak 'non-sense'…"

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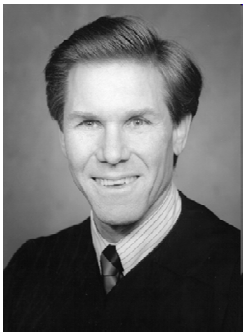
What Metaphysics Can Tell Us About Patent Law

Judge Rader (2008): What is an abstract idea?



"[A]n abstract claim would appear in a form that is not even susceptible to examination against prior art under the traditional tests for patentability."

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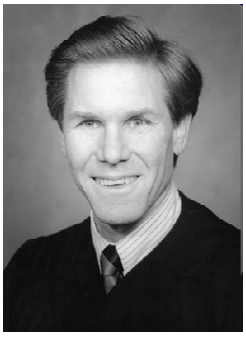

When do abstract claims cause tests for patentability to "speak 'non-sense'"?

Need: Ontological inventory on patent law-talk [pp. 1-16*]

*** Full draft on IPSC 2011 Web site**

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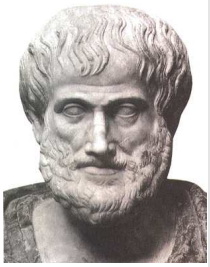
The Patent System's Ontological Inventory

Claim = Novel kind with essence
[pp. 16-27]

- **Claim language = Essential sortal**
- **Claim element = Essential property**

Embodiment = Particular [pp. 27-39]

- **Causal powers manifested in use**
- **May be inoperative due to variation, complexity**



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Compatible Metaphysical Worldviews

Scientific essentialism/
scientific realism/
argument from the best
explanation (Ellis)

Conserved-quantity account of
causation (Dowe/Salmon)

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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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Jeffrey Lefstin (2008): Not "syntactically sensible" to ask whether inventor "possessed" a class having infinite scope. [pp. 39-45]

WD requirement has definitional purpose

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ARIAD

Adequate description:

- Shows ontological possession of claimed kind
- Conveys *de dicto* commitment to claimed kind by picking out a well-defined class [pp. 50-54]

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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. [pp. 36-39]

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) [pp. 54-61]

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. [pp. 36-39]**

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

- **Implies essential causation requirement [pp. 63-66]**
  - **Kinematic property exclusion (Salmon/Dowe [pp. 67-76])**

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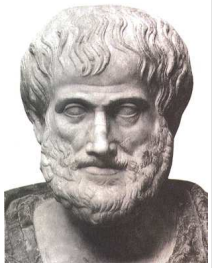
"Useful Art": at least one essential causal power Express/implied (via doctrine of equivalents)



Embodiment = Particular

Causal powers manifested in causal processes

May be inoperative due to variation, complexity

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Kinematics

The science of pure motion, which studies
the relative geometric displacements of points and links of a mechanism,
without regard to
forces that generate those displacements or
the physical embodiment that realizes them

$$F = ma$$
$$KE = \tfrac{1}{2}\, mv^2$$

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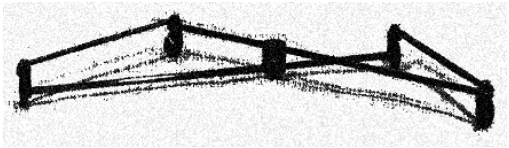
Kinematics as Empirical Geometry



Robert Yates
(1931)

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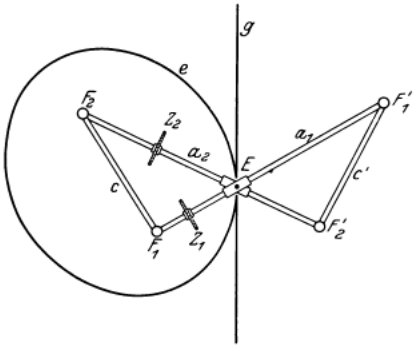
Kinematics as Empirical Geometry



David Hilbert
(1932)
[pp. 82-87]

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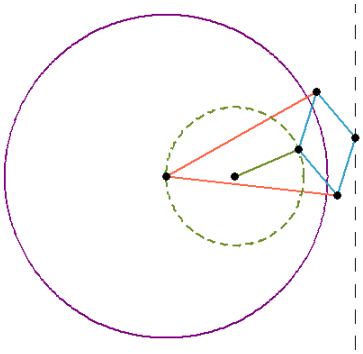
The Peaucellier Cell



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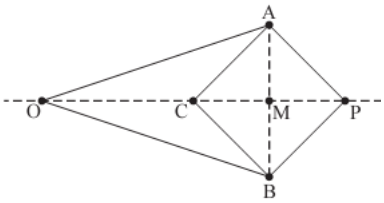
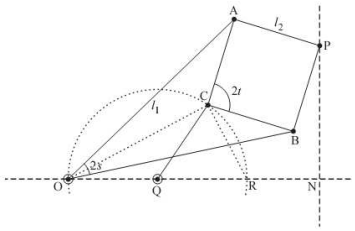
Peaucellier's Theorem





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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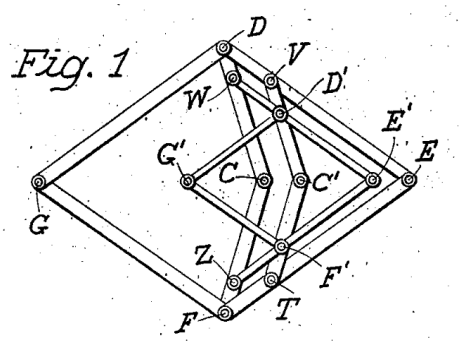
Kinematic Property Product Claims

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



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

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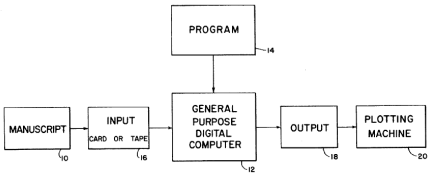
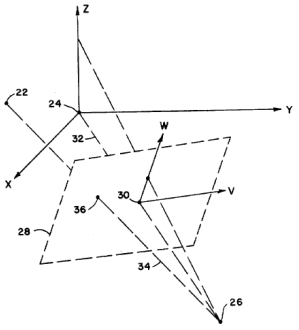
Kinematic Property Product Claims





U.S. Patent 3,519,997 (issued 1970)

In re Bernhardt, 417 F.2d 1395 (C.C.P.A. 1969) (holding machine claims not invalid as new uses under § 100(b))

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We claim:

1. A system for providing a drawing of an object comprising in combination: electronic digital computer means programmed to respond to applied signals (x_e, y_e, z_e) and a series of groups of signals (x_i, y_i, z_i) to provide a corresponding series of pairs of output signals (v_i, w_i) with the relationship between signals (x_i, y_i, z_i) and (x_e, y_e, z_e) to the signals (v_i, w_i) being defined as follows:

$$v_i = \frac{k(x_e^2+y_e^2+z_e^2)(-y_e x_i + x_e y_i)}{\sqrt{(x_e^2+y_e^2)}[(x_e^2+y_e^2+z_e^2)-(x_e x_i + y_e y_i + z_e z_i)]}$$

$$w_i = \frac{k\sqrt{(x_e^2+y_e^2+z_e^2)}}{\sqrt{(x_e^2+y_e^2)}}\left(\frac{-x_e z_e x_i - y_e z_e y_i + z_i(x_e^2+y_e^2)}{[(x_e^2+y_e^2+z_e^2)-(x_e x_i + y_e y_i + z_e z_i)]}\right)$$

where k is a selectable variable; signal means coupled with said computer means and providing said signals (x_i, y_i, z_i) and (x_e, y_e, z_e) thereto with said signals (x_i, y_i, z_i) representing the three dimensional co-ordinates of selected points on the object and with said signals (x_e, y_e, z_e) representing the three dimensional co-ordinates of the location of the observation point from which the object is seen; and planar plotting means coupled with said computer means and responsive to said signals (v_i, w_i) to make a drawing of the object.

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Kinematic Property Product Claims

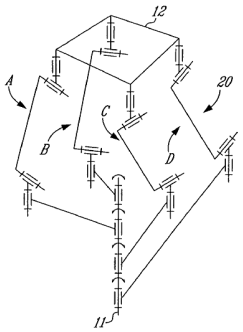
1. A manipulator for receiving and displacing an object, comprising:

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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Future Work [pp. 87-91]

- The essential causation requirement also implies:
  - 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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