

Semiotic Impacts of the Supreme Court's *Mayo/Biosig/Alice* Decisions on Legally Analyzing Emerging Technology Claimed Inventions (ET CIs)

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I. THE CURRENT SEMIOTIC PROCESS IN PATENTING ET CIs

Semiotics, as “meaning-making” science, is currently the key issue in any Emerging Technology business, in particular in adjusting Substantive Patent Law (“SPL”) precedents about ET CIs such as to meet the needs of the community of ET inventors/R&D/investors/judges/managers/lawyers/licensees/licensors/examiners, It namely turned out that trying to protect ET CIs by classical SPL precedents – the since long established semantics of which simply is lacking notions capable of consistently cooperating with the new definitorial phenomenology of ET CIs¹ – led to an overall legal development felt by the ET economy to be that unpredictable/inconsistent/unreliable that investing into ET R&D is threatened to lose its business model.

Due to the increasing dependency of the society's wealth on the ET economy, the Supreme Court – constitutionally responsible and empowered to stop this disastrous trend – interfered, into the clash existing within the CAFC for many years about ET CIs, by its groundbreaking decision in favor of ET CIs in *Mayo*, which was preceded by its alike but first only indicative decisions in *KSR/Bilski*, but then succeeded and explicitly confirmed and elaborated on in its *Myriad/Biosig/Alice* decisions. In total, it thereby clearly outlined the way how to notionally refine SPL precedents such that the CAFC and District Courts would be enabled to consistently cooperate with this phenomenology of ET CIs in their SPL precedents on them. The Supreme Court thereby required – from these courts and the patent community as a whole^{2,a)} – to take SPL precedents on ET CIs to a higher level of development than the current one, which is notionally sufficiently powerful for deciding about CT CIs (“Classical Technology CIs”), but notionally by far too coarse for enabling consistently deciding on ET CIs.

The Supreme Court thus required that, in legally analyzing an ET CI, it is necessary to become aware of the definitorial peculiarities coming along with them. I.e.: It required developing new legal meanings enabling courts consistently qualifying ET CIs. To support the courts in meeting their so required awareness of the need of new adequate decisions, the Supreme Court put forward – in particular in its *Bilski/Mayo/Alice* decisions – terms it assumed would help the courts in this endeavor. These were in *Bilski/Mayo* especially the terms “inventive concept(s)” of an ET CI, and its new SPL

¹ as seen from an Advanced IT [4] point of view

properties of being a “natural phenomenon”, an “abstract idea”, and “preemptive” – confirmed in *Alice* by a detailed description of how patent-noneligible ET CI may be “transformed” by an inventive concept into a patent-eligible “application” of the former.

These new legal terms of the Supreme Court and its outline of their meanings put the patent-eligibility question of an ET CI – especially whether and why it meets the “usefulness” requirement stated by 35 USC §§ 112/101 – into a quite new light: While this “light of *Mayo*”, several times explicitly emphasized by the Supreme Court, clearly is indispensable for legally understanding the ET CI, it never before was heard of in 35 USC and/or in SPL precedents^{2.a)}. I.e.: The Supreme Court initiated by these *Bilski/Mayo/Alice* terms – for a person without AIT background indeed Delphic – a semiotical process in order to identify the hitherto unknown exact/precise³⁾ SPL meanings required for consistently and socially consensually deciding in SPL precedents about ET CIs^{2.b)}.

But, what the Supreme Court created by launching these new terms – it evidently invited by them the patent community to develop the needed refinement of SPL precedents for enabling it to such dealing with ET CIs, as Justice Breyer later confirmed by a powerful metaphor^{2.a)} – was an immediate uproar of this whole patent community about these terms. In spite of the massive clashes within the CAFC and between the CAFC and the Supreme Court and the huge vogue of wild discussions about these terms^{2.b)} – which clearly proved that the classical interpretation of 35 USC was too coarse for

^{2. a} JUSTICE BREYER: “*Different judges can have different interpretations. All you’re getting is mine, ok? I think it’s easy to say that Archimedes can’t just go to a boat builder and say, apply my idea. All right. Everybody agrees with that. But now we try to take that word “apply” and give content to it.*

And what I suspect, in my opinion, Mayo did and Bilski and the other cases, is to sketch an outer shell of the content, hoping that the experts, you and the other lawyers and the CAFC, could fill in a little better than we had done the content of that shell. So far you’re saying, well, this is close enough to Archimedes saying “apply it” that we needn’t go further.” [69]. Justice Breyer’s last sentence was pure irony: Evidently the term “apply it” must semiotically be clarified – there is no meaning yet for this “outer shell” alias term.

^{.b} The patent community never managed to use the generic term “ET CI”, but considered the patent-eligibility question of a “computer implemented invention, CII” to be different from the ones with “software”, “molecular medicine” and broadly practiced the misunderstanding that there is “patent-eligible subject matter” and “patent-noneligible subject matter”! By its *Alice* decision the Supreme Court here established clarity the subject matter per se does not fall into these two “patent-(non)eligibility” categories, but that these are distinct from each other as outlined in the opinion.

³ “Exact” shall reemphasize that these definitions of new SPL meanings seamlessly fit into the *Mayo/Alice* framework, which the Supreme Court explicitly put forward, repeatedly, as being required to be applied in SPL testing an ET CI. “Precise” shall reemphasize that these definitions of new SPL meanings take, by their enabling the quantification of an ET CI’s SPL testing to a level of development, prior to this semiotic process just unthinkable (as briefly mentioned by the legend to FIG 1, explained in detail by [e.g. 175]).

One could start arguing that none of this Supreme Court decision requires the degree of preciseness as required here, i.e. for scientification of SPL precedents about ET CIs. But this would evidently mean nothing else but forgetting about striving for consistency in such precedents – i.e. failing to meet the social requirement the Supreme Court clearly described in *Mayo* to be unconditionally met by its accordingly refined interpretation of 35 USC SPL. I.e.: The original metaphysical meanings of the above new SPL terms were the unavoidable first steps, performed by the Supreme Court, to their precise definitions by **D.0-D.14** – which even proved to unfold by their amenability to scientification potentials practically extremely important and amazingly useful (whereby non-rationalized metaphysical meanings of terms should not count in SPL precedents, i.e. not exist there, otherwise any invention were non-novel/obvious).

cooperating with the new problems of SPL brought-up by ET CIs – all the patent crowd simply refused an adequate discussion of this semiotic challenge raised by the Supreme Court. Instead, this whole community instantly massively blamed the Supreme Court of incompetence as to patenting know-how, at least as to its patent-eligibility question – and this attitude still is in the air. Prominent panels at large pertinent conferences still discuss, whether this Supreme Court engagement indicates “The end of the pro-patent era” [196] – for not to quote really aggressive comments on the above line of Supreme Court decisions, e.g. [82,129,144,169,...].

But, as recognized by AIT from the outset [1], the contrary is true: By these decisions, the Supreme Court just refined the interpretation of 35 USC such that it caters the new social as well as definitorial phenomenological needs coming along with ET CIs. Looking at them semiotically: ■) Academia pretty early recognized this semiotic process launched by the Supreme Court [113]. ■) A panel of the CAFC (which in part still struggles with *Alice*, e.g. in *Myriad* [163]) by its *DDR* decision showed: It fully appreciates these new terms’ new SPL meanings, too [168]. ■) The USPTO launched these terms’/notions’ exemplary implementation into its everyday examination business by its “Interim Eligibility Guidance (IEG)” (though its huge examiners body disables the USPTO from approving them *uno sono* [194]). ■) AIT finally tops these statements of appreciation for this Supreme Court initiative, by semiotics to find a firm legal fundament for SPL precedents about ET CIs – frequently objected – by showing that this legal fundament is extremely amenable to scientification [194]. I.e.: This semiotic process even gave birth to a new exact science on top of elementary axiomized mathematics and below physics: To what here is called “Patent Technology”, or better to the point “Mathematical Innovation Science” [182].

This research on the currently ongoing semiotic process in SPL – induced by the Supreme Court – in the end even proved that all its new terms’ new meanings are precisely/mathematically definable [194] and thus take SPL precedents on ET CIs to a much higher level of development than the today’s very shaky/incomplete one. On this much higher level of understanding the principal definitorial phenomenology of ET CIs, not only SPL precedents on them is improved dramatically, but also – and this is even much more important – inventing/designing/specifying/drafting/marketing/licensing/... ET CIs and developing a cutting edge “Innovation Expert System (IES)” for professionally dealing with ET CIs in IPR business: It takes IPR business from manufacturers’ thinking to post-industrial quality and efficiency [136,184].

The remainder of this paper will present and elaborate on this semiotic process. This should in particular facilitate becoming aware of its indispensable existence in any discipline of thinking. Even colleagues from famous law schools, though acknowledging that “pushing back the frontiers to the unknown” is the controlling principle in any research, never had heard of “semiotics” before [172-180] and hence always talk about language or linguistic problems when addressing the current difficulties of the patent community with the above new SPL terms, which inherently bars also them from understanding this process^{2.b)}, discussed in this paper.

Thus, what follows should facilitate grasping that a resolution of the new definitorial legal problems raised by ET CIs is unachievable without making new legal meanings and denoting them by new legal terms, i.e. without new legal notions – as indeed being generated by the currently ongoing semiotic process.

To this end, Section II starts by presenting the results of this semiotic process. These are a fundamental theorem – summarizing how much this process has increased the refined legal understanding of ET CIs – and 14 definitions of (almost completely) new legal meanings in mathematical notation, hence very cryptic yet in detail explained in [194]. Their semiotic analysis in a list of 1+14 bullet points, terminating Section II, will show that these new SPL notions are indeed full of hitherto unknown or only vaguely felt intricacies^{2.9)}, unavoidable due to the definitorial peculiarities of ET CIs. But, these intricacies are semi-automatically controllable by the IES and its FSTP-Test. And painstakingly clarifying these intricacies is extremely awarding as enabling a hitherto unachievable degree of trustworthiness in patents, as outlined in [166,184] and summarized by the above fundamental theorem. The FSTP-Test – it enables these 14 definitions, i.e. provides the scientification of SPL precedents about ET CIs – is shown, in principle and in detail by FIGs 1 and 2 immediately following these definitions, details briefly outlined by the FIGs’ resp. legends,

Justifying that these 14 FSTP-Test based definitions actually do exactly and precisely mirror the Supreme Court’s understanding of these new terms’ meanings³⁾, is omitted here [182] – in favor of sketching, by these 14 bullet points, the very sophisticated semiotic process bearing the making of these many SPL meanings at issue, here, and absolutely crucial for the hundreds of billions of dollars yearly spent in ET R&D.

II. THE PRECISE NEW SPL NOTIONS MADE BY THIS SEMIOTIC PROCESS

Up-front a word of clarification concerning the term “inventive concept”, key to the *Mayo/Alice* framework. Its meaning is a dramatic simplification of the “concept” notion today in common use in KR, DL, ... [4], in database modeling since the 70s, and in detail explained as to its “invention” dedication earlier. I.e., here its intuitive understanding suffices, as used within the *Mayo/Alice* framework – see the below point “D.0 •”.

THEOREM: *Any non-pathologic ET-CI may be upgraded – by using the FSTP-Test – to unassailable patent-eligibility & patentability & nonobviousness, i.e. to be legally absolutely robust. Depending on the creativity effort invested in what parts and to what extent, the scope(ET-CI) would thereby controllably shrink resp. grow.*

D.1: $S^R ::= \{\forall s^{Rv}\} ::= \{\forall \langle s^{Rv1} \in TS(s^1), \dots, s^{RvK} \in TS(s^K) \rangle\}$ is called “**TT0-REALIZATION SET**” iff TT0 passes the FSTP-Test $\wedge \forall s^{Rv}$ TT0’s specification discloses a “**s^{Rv}-embodiment, TT0^{s^{Rv}}**”.

D.2 “SCOPE(TT0)”: S^R is called “**scope(TT0)**” resp. “**scope(CI)**”.

D.3 “TT0’ = TT0”: A TT0’ is called to be “**equal, ‘=’**” to TT0 iff $S^{R'} = S^R$.

D.4 “TT0’ \in SCOPE(TT0)”: A TT0’ is called to “**belong to scope(TT0)**” iff $S^{R'} \subseteq S^R$.

D.5 “TT0’ VIOLATES TT0” A TT0’ \notin SCOPE(TT0) is called to “**violate**” TT0 iff $S^{R'} \cap S^R \neq \Phi$.

D.6 “TT0 IS DEFINITE”: A TT0 is called “**definite**” iff it passes the FSTP-Test.

D.7: Induced by *Mayo* let, for a TT0’s CI-element, the term “**improvement-prone, ip**” denote a new “property **category**” for its inC(s), modeled as its(their) “ip-inC(s)”. Compared to such an inC, its new ip-inC property is: It is already ‘visible’ that it will “improve” in its domain and/or its TS, no matter whether predictably in time or not.

D.8: For an $s \in S$ and an s^o let denote ■) the relation “**s^o > s**” iff $\text{domain}(s) = \text{domain}(s^o) \wedge TS(s^o) \setminus TS(s) \neq \Phi$, and ■) the meaning of “**s=ip**” to be that “s is an ip-inC”.

D.9: “**PREEMPTIVITY**” by *Bilski*: TT0 is called “**preemptive**” iff $\exists \text{TT0}' \neq \text{TT0}$ passing the FSTP-Test: $\text{scope}(\text{TT0}') \cap \text{scope}(\text{TT0}) \neq \Phi \wedge \exists k \in [1, K]: (s^k > s^k) \vee (s^k = \text{ip})$.

D.10: “**ABSTRACT IDEA**” by *Bilski*: TT0 is called an “**abstract idea**” iff $\exists \text{TT0}' \neq \text{TT0}$ passing the FSTP-Test: $\text{scope}(\text{TT0}') \cap \text{scope}(\text{TT0}) \neq \Phi \wedge \exists k \in [1, K] \exists k': (s^k > s^k) \wedge (s^k = \text{ip})$.

D.11: Induced by *Alice*, let for an ip-TT0 the term “**transformation-warranting, tw**” denote another **category** of its ip-CI-element/s’ properties, modeled by “tw-inC/s” tying its ip-inC/s into a user-application, so transforming this ip-TT0 into patent-eligibility.

D.12 “PATENT-ELIGIBLE” by *Alice*: An ip-TT0 is called “**patent-eligible**” iff $\exists \{k^*\} \subseteq [1, K] : \bigwedge^{k \in [1, K]} \text{BED-crC0k} \gg \bigwedge^{k \in [1, K] \setminus \{k^*\}} \text{BED-crC0k}$, whereby the “ \gg ” has the meaning “ $\{k^*\}$ transforms the latter conjunction into a user-application”.

D.13: For an ip/tw-CI, let “**scope(ip/tw-CI)**” be the modification of the S^R of the original CI as it results from the modifications of the domains and TSeS of this original CI’s inCs, first by its ip-inCs, making this ip-CI preemptive, and then by its tw-inCs, making this **ip/tw-CI** a nonpreemptive user-application.

D.14: Let the meaning of the relation “**substantially more than, \gg** ” between an ip/tw-CI and its ip-CI be: “The ip/tw-CI’s tw-inC(s) eliminate the preemptivity created by its ip-inC(s) by modifying their domains and/or TSeS such that any ip-inC is defined only for and this ip-CI is transformed into a user-application ip/tw-CI of its tw/ip-inC(s)”.

First, FIG 1 provides an outline of the philosophy carrying the FSTP-Test, shown and discussed by FIG 2.

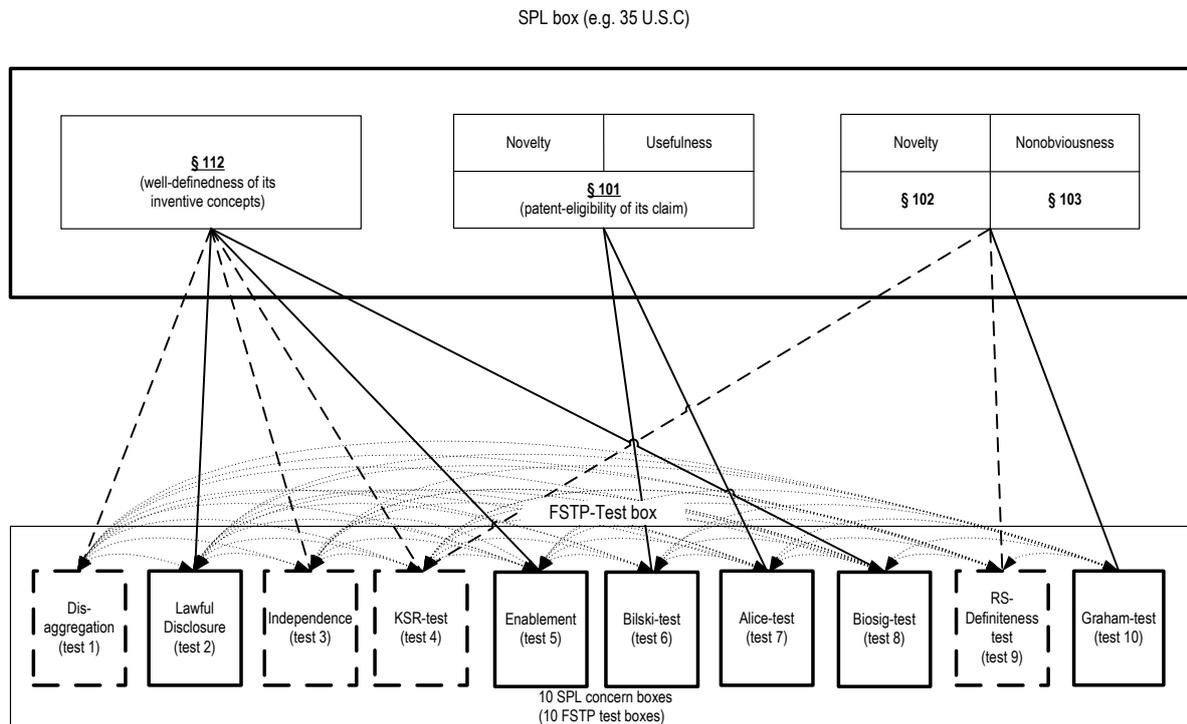


FIG 1

Bold lines show the classical claim construction’s test.i’s, dashed ones what *Mayo/Biosig/Alice* additionally require (refined claim construction). “←” show a “use hierarchy” among testi’s. “→” expand it to testi’s total dependency.

Legend to FIG 1:

- The SPL_box, on top, shows the 4 Sections of 35 USC SPL, the requirements of which – they encode the society’s concerns about granting temporary monopolies on innovations immediately after their creation for providing an incentive for publishing and marketing them quickly – must be met by the ET CI under SPL test.
- The FSTP-Test_box, at the bottom, shows these 10 concerns of the society as to SPL: These concerns are encoded by the 4 SPL Sections as their requirement statements – which hence must be met alias satisfied by the ET CI under SPL test.
- The bold lines show what is tested by the classical claim construction for an ET CI.
- The dashed lines show what indispensably must additionally be tested for an ET CI for its preciseness and completeness in its refined claim construction – due to an ET CI’s invisibility/intangibility/fictionality.
- All tests must be executed for any “Generative Set, GS(ET CI)” of inventive concepts generating this ET CI – of which only a finite number of versions exist, as the problem is of “Finite First Order Logic, FFOL” (see FIG.2).
- Here is assumed, for simplicity and w.l.o.g., that just 1 GS exists, i.e. just 1 interpretation of the ET CI under FSTP-Test. Even for a single GS alias “Technical Teaching 0, TT0” – for brevity often called just “S” – there may be several “Realization Sets, S^R” of this single TT0 for the FSTP-Test (see D.1 above) [45]. S^R exists only if its TT0’ has passed the FSTP-Test. If |S^R|>1, no s^{Rv} alone may decide TT0’s passing the FSTP-Test.
- If this ET CI had several S/interpretations, only one or none TT0 may satisfy SPL.
- If an ET CI passes the FSTP-Test, it is legally absolutely robust. And: If it is allegedly infringed by or infringing an ET CI*, this is easily, exactly, and non-deniably determinable. **THESE ARE TWO INSIGHTS UNIMAGINABLE pre-*Mayo/Alice* !! THE SEMIOTIC PROCESS AS TO SPL PRECEDENTS FOR ET CIs, LAUNCHED BY THE SUPREME COURT, WAS SCIENTIFICALLY EXTREMELY FERTILE!!**

At a first glance, the below FSTP-Test seems tough, but at a second one it is easy to grasp.

The **FSTP^{FFOLLIN}-Test** is a computer implemented method – defining also a system – for testing

- under a given Finite First Order Logic Legal Invention Norm, **FFOLLIN**, a given Claimed Invention, **CI^{FFOLLIN}**, which has a given interpretation **TT0^{FFOLLIN}**, represented by its Generative Set of **TT0^{FFOLLIN}, S^{FFOLLIN}**,
- **TT0^{FFOLLIN}** – defined by **S^{BADFFOLLIN} ::= {BAD-crC0n^{FFOLLIN} | 1 ≤ n ≤ N} ∧**

$$\wedge S^{FFOLLIN} ::= \{BED-crC0kn^{FFOLLIN} | 1 \le n \le N : BAD-crC0n^{FFOLLIN} = \wedge_{1 \le k \le K^n} BED-crC0kn^{FFOLLIN}\},$$

whether this **FFOLLIN** is satisfied by **TT0^{FFOLLIN}** alias **S^{FFOLLIN}**,

- whereby **FFOLLIN** is defined to comprise a conjunction of 10 given **FSTP^{FFOLLIN}-test.o** of **TT0^{FFOLLIN}** alias **S^{FFOLLIN}**, i.e. $\wedge_{1 \le o \le 10} \text{FSTP}^{\text{FFOLLIN}}\text{-test.o}$ – for brevity in the sequel the index “**FFOLLIN**” being omitted, any **FSTP-test.o** abbr. by just “**o**”, $1 \le o \le 10$, and for $6 \le o \le 10$ the stereotypic “over model and posc” omitted – whereby the claimed invention for any **TT0** prompts the CI’s user to input to it

- the given information **■** \forall **TT0**-elements **X0n** of **TT0**, $1 \le n \le N$, $\wedge \forall$ binary abstract and elementary disclosed creative concepts of all **X0n**, **BAD-crC0n** resp. **BED-crC0n** **■** for $|RS| > 0$ also \forall **TTi**-(**dummy**-)elements **Xin** peer to **X0n**, $1 \le i \le |RS|$ $\wedge 1 \le n \le N$, $\wedge \forall$ binary abstract and elementary disclosed (**dummy**-)creative concepts, **crCin**, of all (**dummy**-)elements **Xin**, called **BAD-crCin** resp. **BED-crCin**, as well as **■** \forall below justifications, by stepwise prompting,

i.e., for testing the **S** input to it as follows:

- 1) (a) **S^{BAD} ::= {BAD-crC0n | 1 ≤ n ≤ N}**, **S ::= {BED-crC0kn | 1 ≤ n ≤ N : BAD-crC0n = $\wedge_{1 \le k \le K^n}$ BED-crC0kn}**;
 (b) **justo^{1 \le n \le N}**: **BAD-crC0n** is **definite**;
 (c) **justo^{1 \le n \le N \wedge 1 \le k \le K^n}**: **BED-crC0kn** is **definite** $\wedge \forall$ patent-noneligible **BED-crC0kn*** are identified;
 (d) **justo^{1 \le n \le N} S^{BADUS}**: **BAD-crC0n = $\wedge_{1 \le k \le K^n}$ BED-crC0kn**;
- 2) **justo^{1 \le n \le N} S^{BADUS}**: **s ∈ S ∧ BAD-crC0n ∈ S^{BAD}** are **lawfully disclosed**;
- 3) **justo^{1 \le n \le N} S^{BADUS}**: **Independence-test passed** **S** is well-defined & independent over model;
- 4) **justo^{1 \le n \le N} S^{BADUS}**: **KSR-test passed** **S** is well-defined over posc;
- 5) **justo^{1 \le n \le N} S^{BADUS}**: **TT0’s implementation by S is enablingly/lawfully disclosed**;
- 6) **justo^{1 \le n \le N} S^{BADUS}**: **Bilski-test passed** **TT0** is non-preemptive;
- 7) **justo^{1 \le n \le N} S^{BADUS}**: **Alice-test passed** **TT0** is patent-eligible;
- 8) **justo^{1 \le n \le N} S^{BADUS}**: **Biosig-test passed** **TT0** is definite;
- 9) **justo^{1 \le n \le N} S^{BADUS}**: **RS-Definiteness-test passed** **RS** is well-defined over **TT0**;
- 10) **justo^{1 \le n \le N} S^{BADUS}**: **Graham-test passed** **TT0** is patentable.

FIG 2:

The **FSTP^{FFOLLIN}-Test**, the passing of which is necessary and sufficient for a CI’s **TT0** satisfying **SPL**

Legend to FIG 2:

- The **FSTP-Test** comprises the 10 **FSTP-testi**’s, in total checking a **CI** for its satisfying **SPL**. This is the case iff **CI** meets all 10 concerns legally encoded by **SPL**, i.e. by 35 USC §§ 101/102/103/112 – as outlined by **FIG 1**.
- It prompts the user to input, for this **CI** from **doc0**, first its elements **X0n** and their modeled compound inventive concepts **BAD-X0n** and as many elementary inventive concepts **BED-crC0nk** as it is able to identify, $1 \le n \le N$, $1 \le k \le K^n$, which defines **CI**’s **S** (see **FIG 1**) – whereby the user also identifies all **BAD-X0n*** and **BED-crC0k*** subject to a patent-eligibility exemption.
- The **FSTP-test1** is the *Mayo* test, though refined – as often required for being applicable and meaningful, as explained in [6,7] – by disaggregating **TT0**’s **BAD-inCs** into equivalent logical conjunctions of **BED-inCs**.
- The other **FSTP-testi**, $i > 1$, not named by Supreme Court decisions are not yet noticed by **SPL** precedents, though indispensable for exactly analyzing **ET CIs**.
- **KSR-test4** is only indicative – its definition impacts on the **Graham-test10**.
- **RS-Definiteness-test9** must in principle take for any prior art document./**TTi**, if there is any, peer steps to those taken for **doc0/TT0** in test1. Practically, this may vastly be simplified [6,7].
- The **FSTP-Test** is the logically indispensable and hence canonical procedure for acquiring and evaluating all technically and legally relevant information, based on user input, about a **CI**.
- The **FSTP-Test** evidently is not an algorithm/program but an algorithm/program “scheme” – it comprises any operational implementation of a necessary & sufficient *Mayo/Alice* test.

The following bullet point list **D.1-D.14** explicitly shows that of all of 14 exact and precise³⁾ definitions of SPL meanings – except the first two ones, which may be seen as having existed in specific cases prior to *Mayo/Alice* – none was exactly and/or precisely pre-existing thereto, but their exactness and preciseness resulted from the semiotic process of Section I.

D.0 • Moreover, this **D.0** shows that the key *Mayo* notion of “**inventive concept**” also represents a broadly unnoticed semiotic SPL effect, although it clearly comes to bearing in the CAFC’s much discussed *DDR* decision.

This by *Mayo* also semiotically defined new SPL notion of “inventive concept” means the Supreme Court has broken with the nonsense irrationally believed in over decades: That a CI may be described completely by its claim’s wording. I.e., *Mayo/Alice* clearly acknowledge that parts of a CI’s definition may be disclosed, in its patent (application) specification, also outside of its claim’s wording⁴⁾ – as evidently practiced/confirmed by the CAFC’s *DDR* decision.

Once this new key notion of the refined claim interpretation [182] is understood, it also becomes evident that a CI’s inventive concept(s) is(are) the incremental legal/technical building block(s) of the total creativity embodied by the CI – as outlined by *Alice* [160]. In so far, the above identified semiotic process directed towards defining an ET CI’s refined claim interpretation, as launched by the Supreme Court, does not only strive for increasing the scrutiny in applying the classical interpretation!

D.1 • At a first glance the notion of a TT0’s “**realization set**” seems to be the analogon to a dynamic physical system’s “state space”. While this is not quite wrong, it yet misses the point that a TT0 in many cases does not show the kind of dynamicity shown by such physical systems – though, a tricky similarity does exist to Physics.

D.2 • As with **D.1**, one could understand also the legal notion “**scope(TT0)**” to be the size of the alleged state space, whereby here the analogy seem to be even more striking – except that this size has absolutely no legal connotation, whatsoever.

D.3 • Hitherto, there was no indication of the existence, in SPL precedents, of this exact notion of “**equivalence**” alias “**equality**” of two TT0s alias technical teachings, whereas this new SPL term and meaning is an absolute necessity for achieving consistency in SPL precedents, in particular when dealing with ET CIs.

D.4 • Hitherto, as in **D.3**, there was no indication of the existence, in SPL precedents, of this exact notion of “**TT0’ is \in scope(TT0)**”, whereas this new SPL term and meaning is an absolute necessity for achieving consistency in SPL precedents, in particular when dealing with ET CIs.

⁴ For any complex CI – in that e.g. the objective it achieves needs some explanation, i.e. its “inventive concept achieving its transformation into a patent-eligible application” (by *Alice*) – this even is unavoidable for keeping the claim’s wording as clear as SPL requires. This is the case in *DDR*, where the claim’s wording does not even mention its ET CI’s such “inventive concept”.

Note that by introducing the notion of “inventive concept” into claim interpretation, *Mayo* implicitly but definitively bars using the nonsense notion of “Broadest Reasonable Interpretation, BRI” of a claim – as still referred to in the current draft of the USPTO’s [163] – as it later also *Biosig* explicitly banned from being used in SPL precedents and accordingly the CAFC proceeded by *DDR* [160].

D.5 • Hitherto, as in **D.3-D.4**, there was no indication of the existence, in SPL precedents, of this exact notion of “**TT0’ violates scope(TT0)**”/“**TT0’ infringes scope(TT0)**”/ “**TT0’ violates TT0**”, whereas this new SPL term and meaning is an absolute necessity for achieving consistency in SPL precedents, in particular when dealing with ET CIs.

D.6 • Hitherto, as in **D.3-D.5**, there was no indication of the existence, in SPL precedents, of an operational and finite algorithm like the FSTP-Test, the passing of which by a CI is necessary and sufficient for its “satisfying SPL”⁵ – implying its definiteness – whereas this new SPL term and meaning “**SPL satisfaction**” test⁵ alias “passing the FSTP-Test” is evidently an absolute necessity for achieving consistency in SPL precedents, in particular when dealing with ET CIs. Otherwise there namely is no common interpretation basis enabling talking of consistency of whatsoever.

Yet, as clearly legally required by the Supreme Court primarily in its *Mayo/Alice* decisions, for arriving at such a CI SPL evaluation system, like the FSTP-Test, consistent over all CIs, in particular also over ET CIs, the interpretation of 35 USC §§ 101/102/103/112 requires a refined claim interpretation and claim construction [160]. Thereby this refinement is unachievable by only increasing the preciseness of notions now mathematically defined in **D.1-D.4**. But, the Supreme Court hinted at indispensable new legal notions, then only vaguely haunted and hence semiotically not clarified yet³).

In total: The FSTP-Test is based on these by now semiotically clarified new SPL notions of these hitherto metaphysical legal notions hinted at by the Supreme Court – turning out to be amenable to the rigorous rationalization/scientification in **D.7-D.14**.⁹

D.7 • Hitherto, as in **D.3-D.14**, there was no indication of the existence, in SPL precedents, of the new SPL meaning of a BAD- and/or BED-inC being “**improvement-prone**” as exactly/precisely³ modelling^{2.a)} uniformly – as *Alice* requires – the new SPL meanings “natural phenomenon” and “abstract idea” of a variety of categories by ip-inCs, all such categories being preemptivity generating, whereas this new SPL meaning is by *Bilski/Mayo/Alice* a logically absolute necessity for achieving legal consistency in SPL precedents, in particular when dealing with ET CIs [194].⁷

D.8 • Hitherto, as in **D.3-D.14**, there was no indication of the existence, in SPL precedents, of the new SPL meanings of an inC alias $s \in S$ and an s^o to be related to each other by “**s^o>s**” and/or “**s=ip**”, whereas this new SPL meaning is by *Bilski/Mayo/Alice* a logically absolute necessity for achieving legal consistency in SPL precedents, in particular when dealing with ET CIs [194].

⁵ Prior to the FSTP-Test, for a CI the notion of its “SPL satisfaction” test was unknown: No before existing CI tests – like e.g. the “Teaching/Suggestion/Motivation, TSM” test (testing the CI for obviousness over prior art) or the “Machine or Transformation, MoT” test (testing the CI for dealing with patent-noneligible subject matter) – was designed to test the CI wholistically for meeting all 4 SPL sections of 35 USC, as the FSTP-Test does, but they tried to test this CI just for one of these 4 sections. Any thus isolated test is logically flawed, right from its outset, as evidently follows from FIGs 1 and 2 and their legends.

⁶ Yet note: While in hindsight it is obvious that the above definitions of new SPL meanings must be specified precisely for enabling the FSTP-Test to deliver precisely, for a CI tested under it, whether it satisfies SPL or not, the preciseness provided by these definitions has been achieved only by means of the only intuitively defined FSTP-Test. I.e.: Only after having invented the FSTP-Test as a CI’s wholistic SPL satisfaction test it became intellectually evident that and how the above new SPL meanings – which the Supreme Court identified to be crucial for an ET CI’s test for SPL satisfiability – could be defined precisely/mathematically, in turn making the new and precise meaning “SPL satisfaction” test, holding for the FSTP-Test.

⁷ For simplicity, this and several more following definitions are not put into mathematical terms. Their mathematical notation – being straightforward but harder to decode than this one – will be provided by [191].

D.9 • Hitherto, as in **D.3-D.14**, there was no indication of the existence, in SPL precedents, of the exact new SPL meaning of a TT0's being "**preemptive**", whereas this exact/precise⁹⁾ new SPL meaning is by *Bilski/Mayo/Alice* a logically absolute necessity for achieving legal consistency in SPL precedents, especially dealing with ET CIs [194].

D.10 • Hitherto, as in **D.3-D.14**, there was no indication of the existence, in SPL precedents, of the exact new SPL meaning of a TT0's being an "**abstract idea**", whereas this precise new SPL meaning is by *Bilski/Mayo/Alice* a logically absolute necessity for achieving legal consistency in SPL precedents, in particular when dealing with ET CIs [194].

D.11 • Hitherto, as in **D.3-D.14**, there was no indication of the existence, in SPL precedents, of the exact new SPL meaning of a BAD- and/or BED-inC being "**transformation-warranting**" as precisely⁹⁾ modeling^{2.a)} uniformly – as *Alice* requires – transforming by a tw-inC TT0s of a variety of categories exempting them from patent-eligibility as generating preemptivity, into their patent-eligible "user-applications", whereas this precise new SPL meaning is by *Bilski/Mayo/Alice* a logically absolute necessity for achieving legal consistency in SPL precedents, in particular when dealing with ET CIs [194].

D.12 • Hitherto, as in **D.3-D.14**, there was no indication of the existence, in SPL precedents, of the exact new SPL meaning of a TT0's being "**patent-eligible**", while this precise new SPL meaning is by *Bilski/Mayo/Alice* a logically absolute necessity for achieving legal consistency in SPL precedents – politically/socially broadly accepted, i.e. not threatening the whole "National Patent System, NPS" to get into a limbo state – in particular when dealing with ET CIs [194].

D.13 • Hitherto, as in **D.3-D.14**, there was no indication of the existence, in SPL precedents, of the exact new SPL meaning of a "**scope(ip-/tw-TT0)**", while this precise new SPL meaning is by *Bilski/Mayo/Alice* a logically absolute necessity for achieving legal consistency in SPL precedents, in particular when dealing with ET CIs [194].

D.14 • Hitherto, as in **D.3-D.14**, there was no indication of the existence, in SPL precedents, of the exact new SPL meaning of a TT0's being "**substantially more than, >>**" the patent-noneligible conjunction of its building blocks reduced by TT0's inventive concept(s) alias tw-inC(s), whereas this precise new SPL meaning is by *Bilski/Mayo/Alice* a logically absolute necessity for achieving legal consistency in SPL precedents, in particular when dealing with ET CIs [194].

III. INNOVATION SCIENCE / TECHNOLOGY: THE FUTURE BATTLEGROUND OF THE LEGAL SEMIOTICS SCIENCE

This paper is concluded by stressing that the science of semiotics – in particular in the legislature of IPRs, especially for ET CIs – is a still sleeping giant just about awaking, as currently encountered by Substantive Patent Law and here explained. While namely the human ingenuity is fired by progress in ET R&D – e.g. in life sciences/technologies (Genetics, Pre-/Post-Natal Indicative/Operative Molecular Medicine, potentially backed by nano-technological methods/systems) – the respective inventions increasingly depend on an accelerated communication to the society of their pros and cons. This is achievable only by extensive semiotic support in creating the appropriate new meanings enabling the society to quickly become conscious about its risks and chances.

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