Mayo / Alice – The Supreme Court's Requirement Statement as to Semiotics in Substantive Patent Law ("SPL") & Emerging Technology Claimed Inventions ("ET CI"s)

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I. RECENT SPL RESULTS ACHIEVED BY MATHEMATICAL SEMIOTICS AND KNOWLEDGE REPRESENTATION

The patent law community should be familiar, in principle at least, with what is reported here, as expected and guided to by the Supreme Court[1.a)]: By its *Mayo/Alice* decisions, it semiotically[1.b)] expanded SPL by a series of new SPL terms/meanings and required their use in testing ET CIs for satisfying SPL – for adjusting SPL precedents to the needs of ET CIs, caused by their invisibility/intangibility/fictionality, their R&D being extremely expensive, and their exclusive/unique potential to preserve the society's wealth.

[171,175,194] already partially achieved this ET CI semiotics driven scientification of SPL: By first defining the meanings of the established SPL terms by their absolutely unquestionable mathematical representation (using solely "Finite First Order Logic, "FFOL" and basics of Set Theory). Hitherto, these established SPL terms' meanings have never anywhere been precisely defined, i.e. rationalized – instead, the patent community since ever simply (and erroneously) assumed to precisely and completely understand them. Thus, the PTO, the District Courts, and even the CAFC interpreted them inconsistently (as proven e.g. by the multiple clashes in the CAFC). The *Mayo*-based FSTP-Test of FIGs 1-2[2.a)] enabled this rationalization, first time – and the hitherto unknown mathematical definitions of the established SPL key terms' meanings, see D.1-D.6 in FIG 0[2.a)]. **This scientized the pre-*Mayo/Alice* SPL.**

The Definitions D.7-D.12 in FIG 0 then deal with the much more complex new terms' meanings semiotically introduced into SPL by *Mayo/Alice* – yet still in natural language syntax/semantics. This invites sloppiness, here excluded by providing for them mathematical definitions, too – as shown by FIG 3. **This hence scientizes also the post-*Mayo/Alice* SPL**[1.c)].

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[1] **.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 [of a law of bouts' water displacement]. *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 clarifies the point: The term "apply it" needs an appropriate boat builder meaning – but there is no such appropriate boat builder meaning yet for this *"outer shell"* alias term.

.b Semiotics in SPL is here understood – other than in meetings dealing with various highly individualized aspects of law, including a somewhat esoteric understanding of semiotics in law [191] – as an exact science achievable due to its evident subject matter limitations, philosophically located on top of Analytic Philosophy anyway, outlined in US Wikipedia belonging to AIT [2], and as focused on "meaning-making" in SPL, i.e. ignoring any procedural law issue. This "semiotics in SPL" understanding is brought to the point by Justice Breyer in his just quoted "Archimedes metaphor": Interpreted historically, it invites the scientification of the *Mayo/Alice* framework's SPL semiotics – just as the then "boat building" semiotics became scientized, resulting in powerful naval architecture technologies.

.c While the principal meaning's of these mathematical representations are pretty easy to grasp, too, proving that they do indeed exclude any sloppiness, i.e. are "well defined" – comprising their axiomatic foundation – requires intriguing mathematical elaborations, left to [64,74,91,199], as here superfluous [182].

D.1: $S^R ::= \{\forall s^{Rv}\} ::= \{\forall <s^{Rv1} \epsilon TS(s^1),..,s^{RvK} \epsilon TS(s^K)>\}$ is called "**TT0-REALIZATION SET**"[4.a)2.b)].

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' ϵ SCOPE(TT0)**": A TT0' is called to "**belong to scope(TT0)**" iff $S'^R \subseteq S^R$. D.5

"**TT0' VIOLATES TT0**": A TT0'∉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 an inC per se, its new additional property to be an ip-inC 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: "**PREEMPTIVITY**" (*Bilski*): TT0 is called "**preemptive**" iff [2.c)] ∃TT0'≠TT0
passing the FSTP-Test: $scope(TT0') \cap scope(TT0) \neq \Phi \wedge \exists k \epsilon [1,K]: (s'^k > s^k) \vee (s^k = ip)$.

D.9: "**ABSTRACT IDEA**" (*Bilski*): TT0 is called an "**abstract idea**" iff ∃TT0'≠TT0
passing the FSTP-Test: $scope(TT0') \cap scope(TT0) \neq \Phi \wedge \exists k \epsilon [1,K] \not\ni k': (s'^k > s^k) \wedge (s^{k'} = ip)$.

D.10: "**PATENT-ELIGIBLE**" (*Alice*): An ip-TT0 is called "**patent-eligible**" iff $\exists \{k^*\} \subset [1,K]$: $\wedge^{\forall k \epsilon [1,K]}$BED-crC0k≫$\wedge^{\forall k \epsilon [1,K] \setminus \{k^*\}}$BED-crC0k, whereby the "≫" has the meaning "{k*} transforms the latter conjunction into a user-application".

D.11: Induced by *Alice,* let for an ip-TT0 the term "**transformation-prone, tp**" denote another **category** of its ip-CI-element/s' new properties, modeled by "tp-inC(s)", "tying its ip-inC(s) into a user-application", so transforming this ip-TT0 into patent-eligibility[2.d)].

D.12: Let the meaning of the relation "**substantially more than, ≫**" between an ip/tp-CI and its ip-CI be: "The ip/tp-CI's tp-inC(s) eliminate the preemptivity created by its ip-inC(s) by modifying their DOMs and/or TSes such that any ip-inC is defined only for and this tp-inC, transforming this ip-CI into a user-application tp/ip-CI of its tp/ip-inC(s)".

FIG 0
The New SPL Informal Notions the Supreme Court Made for Semiotically Elevating ET CIs to Patent-Eligibility

Legend to FIG 0:

- *Mayo* axiomatically introduced – by its *Mayo*-AD[2.a)] – into SPL the new meaning "inventive concept, inC"[2.b)], potentially of category "ip-inC" or its subcategory "tp/ip-inC", see FIG 3.
- Yellow mark-ups show, what in FIG 3 is axiomized and mathematized – i.e. scientized – SPL.
- D.1-6 are already mathematized, using "**natural language glue**", as usual in Mathematics[3)].
- D.8-10 and D.12 are fully mathematized, once the yellow sections in D.7 and D.11 are.
- Yet, the Supreme Court nowhere tells, what exactly within an ip-CI – a "downstream application comprising an ip-inC, hence per se patent-noneligible as preemptive" [194[6)]] – "transforms" it into a (user) application of this ip-CI, being patent-eligible by *Alice* as non-preemptive [194[6)]], though not using the qualifier 'user'[3)].
- Instead, *Alice* explicates, what *Mayo* had already hinted at: This transformation is performed by "*combining*" CI's elements, i.e. it comprises its one/several transforming element(s). The in *Alice* allegedly missing item/s thus is/are this/these one/several transforming element/s, thus modeling the *Mayo/Alice* framework by a subcategory of ip-inCs/elements – (potentially) warranting ip-CI's transformation into patent-eligibility, i.e. neutralizing its preemptivity.
- FIG 3 shows in detail that *Mayo/Alice* induced mathematical D.1/7/11 axioms, enabling scientifically defining ■) for the first time "all classic SPL notions", ■) 3 in SPL hitherto unknown new semantics –"inventive concept, inC"/"ip-inC"/"tp-inC"[2.e)] – and ■) the then unavoidable new legal notions: "preemptivity"/"abstract idea"/"user-/downstream application".

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[2] **.a** The FIGs 0-2 are replica from [194,198], whereby some changes were made in FIG 0 by rearranging "Mathematical Definitions, MDs" into the ftn [2.b),e)], for here focussing on "Axiomatic Definitions, ADs" and "Legal Definitions, LDs", as elaborated on in FIG 3.
By the "use-hierarchy" [194[2.b)]] between these definitions holds: Post-*Mayo/Alice*-LDs use *Mayo/Alice*-ADs and pre-*Mayo/Alice*-LDs (and by them required *Mayo/Alice*-MDs resp. pre-*Mayo/Alice*-MDs, both not at issue here).
.b Its meaning is a dramatic simplification of the "concept" notion today in common use in KR, DL, … [2], in database modeling since the 70s, and in detail explained as to its "invention" dedication earlier. I.e., here its intuitive understanding vastly suffices, as used within the *Mayo/Alice* framework – see the point "D.0 ●" in [194].
.c Two such MDs are: ∀s∈S and an s^o let denote the meaning of the relation ■) "s^o>s" iff $domain(s)=domain(s^o) \wedge TS(s^o) \setminus TS(s) \neq \Phi$, and ■) "s=ip ∨ tp/ip" iff "s is an ip-inC ∨ tp/ip-inC ". Wordings of ADs/LDs are here also slightly changed for clarity[4.a)].
.d For a tp/ip-CI, let "**scope(tp/ip-CI)**" be, of the original CI, the modification of its S^R resulting from modifying its DOMs and/or TSes, first by its ip-inCs, assessing ip-CI is preemptive, and then by its tp-inCs, potentially assessing this tp/ip-**CI** is a non-preemptive user-application – whereby the original CI may be preemptive or not.
.e – necessary for consistent and predictable SPL precedents on ET CIs, just as sufficient, as far as currently recognizable.

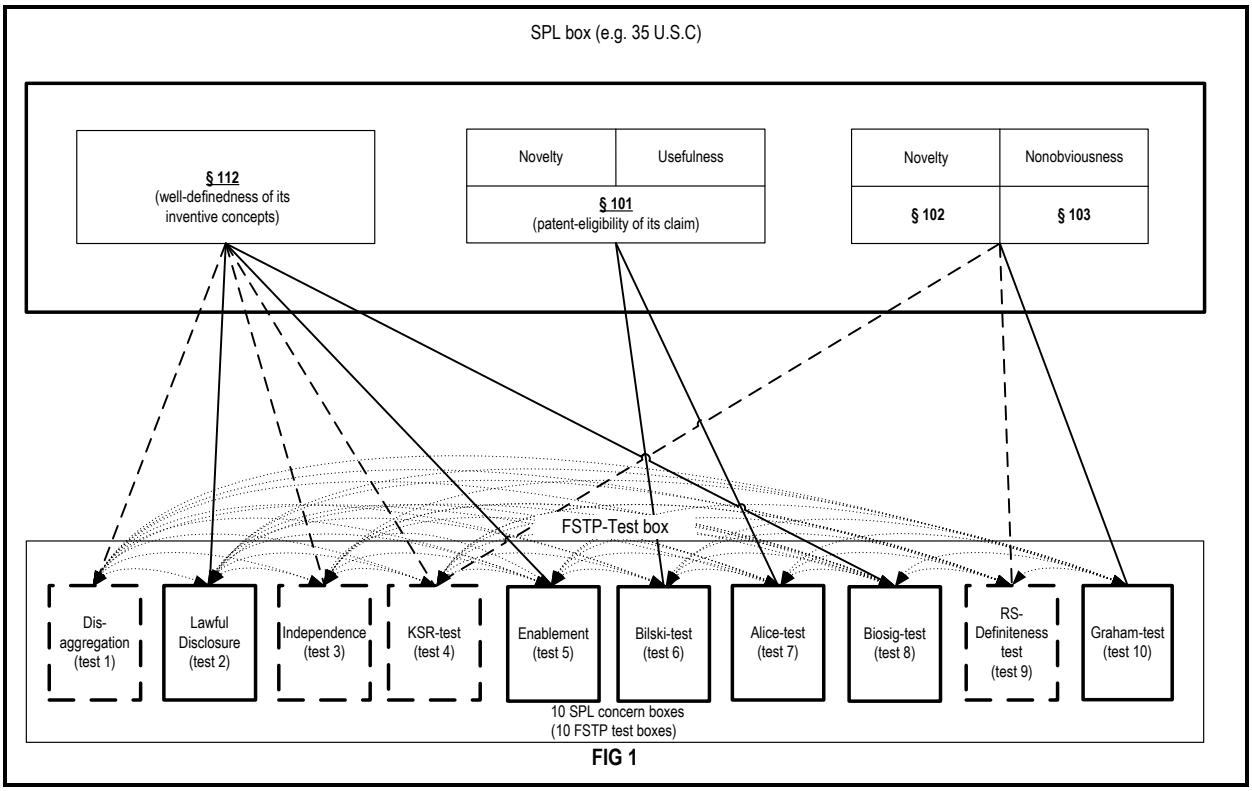

FIG 1

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" of testi's, → expand it to total dependency. FIG 1 provides an outline of the philosophy carrying the FSTP-Test, shown and discussed by FIG 2.

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 monopoles 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.
- ■) An ET CI passing the FSTP-Test is legally absolutely robust. ■) Its alleged infringement by or infringing an ET CI* 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!!

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} ∧
  ∧ S^{FFOLLIN} ::= {BED-crC0kn^{FFOLLIN} | 1≤n≤N : BAD-crC0n^{FFOLLIN}=∧$^{1≤kn≤Kn}$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. ∧$^{1≤o≤10}$FSTP^{FFOLLIN}-test.o – for brevity in the sequel the index **"FFOLLIN"** being omitted, any FSTP-test.o abbr. by just "o)", 1≤o≤10, and for 6≤o≤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 ■) ∀TT0-elements X0n of TT0, 1≤n≤N, ∧ ∀ binary abstract and elementary disclosed creative concepts of all X0n, BAD-crC0n resp. BED-crC0n ■) for |RS|>0 also ∀TTi-(dummy-)elements Xin peer to X0n, 1≤i≤I=|RS| ∧1≤n≤N, ∧ ∀ binary abstract and elementary disclosed (dummy-)creative concepts, crCin, of all (dummy-)elements Xin, called BAD-crCin resp. BED-crCin, as well as ■) ∀ 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=∧$^{1≤kn≤Kn}$BED-crC0kn};
   (b) justof$^{∀1≤n≤N}$: BAD-crC0n is **definite**,
   (c) justof$^{∀1≤n≤N∧∀1≤kn≤Kn}$: BED-crC0kn is **definite** ∧ ∀ patent-noneligible BED-crC0kn* are identified;
   (d) justof$^{∀∈SBAD∪S}$: BAD-crC0n = ∧$^{1≤kn≤Kn}$BED-crC0kn;
2) justof$^{∀∈SBAD∪S}$: s∈S ∧ BAD-crC0n∈S^{BAD} are **lawfully disclosed**;
3) justof$^{∀∈SBAD∪S}$: **Independence-test passed** S is well-defined&independent over model;
4) justof$^{∀∈SBAD∪S}$: ***KSR*-test passed** S is well-defined over posc;
5) justof$^{∀∈SBAD∪S}$: **TT0's implementation by S is enablingly/lawfully disclosed**;
6) justof$^{∀∈SBAD∪S}$: ***Bilski*-test passed** TT0 is non-preemptive;
7) justof$^{∀∈SBAD∪S}$: ***Alice*-test passed** TT0 is patent-eligible;
8) justof$^{∀∈SBAD∪S}$: ***Biosig*-test passed** TT0 is definite;
9) justof$^{∀∈SBAD∪S}$: **RS-Definiteness-test passed** RS is well-defined over TT0;
10) justof$^{∀∈SBAD∪S}$: ***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
At a first glance, the below FSTP-Test seems tough, but at a second one it is easy to grasp.

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≤n≤N, 1≤k≤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 meaningful, see [6,7] – by disaggregating TT0's BAD-inCs into equivalent logical conjunctions of BED-inCs.
- Also 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 – i.e. consistent SPL precedents on them. KSR-test4 is only indicative – its definition impacts on the Graham-test10 – and both of them avoid the logical glitches tolerated by their classical versions.
- RS-Definiteness-test9 must in principle take for any prior art document.i/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 most flexible procedure for acquiring and evaluating all technically and legally relevant information, based on user input, about a CI. I.e.: The FSTP-Test evidently is not an algorithm/program but an algorithm/program "scheme" – as it comprises any operational implementation of a necessary & sufficient *Mayo/Alice* test.
- Papers in preparation will show that the FSTP-Test also can be used for improving as to an ET CI, the creativity of its inventor (as indicated by the final conclusion in the legend of FIG1 [137]), as well as in a legal way a "soft-scope (ET CI)", potentially much larger than "scope (ET CI)" [202].

II. TWO ADVANTAGES OF SCIENTIZING ALL SPL NOTIONS

This first advantage is to show: There is no chance to understand all the intricacies of SPL applied to ET CIs (i.e. implied by the *Mayo/Alice* framework) without getting familiar with the scientific fundament the Supreme Court's interpretations of SPL rests on[4.a)] – otherwise uncertainties occur. Even the excellent IEG project run by the USPTO and its dozens of exemplary interpretations of this framework provide just starters' know-how about SPL applied to ET CIs: The most recent event covering this know-how transfer problem ahead [201], just as all the other qualification initiatives recently launched by the USPTO [e.g. 183-195], unintentionally but univocally confirmed this problem[3.a)]. Though: Help is coming up [182] – even reaching much further than just facilitating this know-how transfer [e.g. 198].

This second advantage is to complete the partial SPL scientification of FIG 0 by providing the axiomized mathematical definitions[3.b)] of also those *Mayo/Alice* notions it left informal and to present them by FIG 3 – i.e. "'preemptivity"/"abstract idea"/"substantially more than" and the 3 mathematized axioms indispensable to this end. While this rigor never has been heard before as to SPL precedents on ET CIs, this scientification is yet easily grasped once is understood: The Supreme Court itself[1)] indeed eventually had to put forward these new meanings. Namely, deciding by SPL on ET CIs on the basis of the established meanings only – i.e. without refining them for meeting the ET CIs' robustness/predictability requirements – evidently got courts into serious confusions, as massively encountered by the CAFC. By contrast, using these fully scientized semiotic meanings in SPL tests of ET CIs, even induced and enabled developing totally unexpected and extremely strong results, such as:

> ***THEOREM:*** ***"Any non-pathologic ET CI may be upgraded, by the FSTP-Test, to become legally absolutely robust. Depending on the creativity effort invested, the scope(ET CI) would thereby controllably shrink or grow".***

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[3] **.a** The intricacies explained here are not Mathematics caused, i.e. no academic frills. For ET CIs these booby traps really exist! Only an exact Patent Technology is capable of providing the dependable way on which they are avoided, i.e. leading to consistent SPL precedents on ET CIs. Refusing to accept this level of refined thinking puts the whole SPL into jeopardy.

.b Any axiom in Mathematics performs, for a part of the non-rational context of some mathematical context, the former's transformation into this context's rationality, i.e. is „rationality-making" in this mathematical context, i.e. need not be a semiotic instrument as it may not yet be "meaning-making" (meaning as understood in linguistics and semiotics). In Physics, its axioms gravity and time immediately perform meaning-making – here an AD may serve both purposes, as in Maths[4.c)].

Riemann discovered a today famous kind of mathematical axioms dealing with Euclid's parallelism problem: May two parallel straight lines cut each other? Known to exist for 2000+ years, during all that time parallels were assumed to stretch on a plane in a 3-dimensional space as known since ever – establishing the known mathematical context of this problem. A part of the non-rational in this context then is: May this plane be embedded in a then totally unknown as benched space, or the space spanned by this plane internally benched in a totally unknown way? During all these 2000+ years, both questions would have addressed metaphysics, i.e. the irrational (Actually, in both cases parallels may cut).

In other words: Adding one/several axiom/s to a mathematical space may be rationality-making for this mathematical context (e.g. enforcing the one or the other above answer), but need per se evidently not yet enable nonpreemptive meaning-making (as a mathematical space still may be inseparable). Though, adding axiom/s to a mathematical space may also model a user application enabling nonpreemptive meaning-making, too (e.g., a person on earth watching the color of light coming from an object in outer space, while the sun is crossing the way of light from this object to the earth, would observe a red-shift in this light as this interference is arising, due the sun's 'gravity impact on space' axiom, which thus evidently enables nonpreemptive meaning-making).

Thus, while for many ET CIs the distinction between their being user- or downstream-applications (of their invented usefulness they embody) indeed determines whether they represent nonpreemptive semiotic meaning-making, as suggested by *Alice*, this distinction need not always lead to this end – requiring further considerations, i.e. a refined *Alice* interpretation.

.c The post-*Mayo/Alice* higher semiotic SPL level is much more than just a higher abstraction level – as in System Design defined by hiding lower level known semantics and adding higher level a priori known semantics [156,182]. By contrast: The post-*Mayo/Alice* higher semiotic SPL level ■) defines, by mathematical axioms, hitherto totally unknown SPL semantics, and ■) mathematically derives, from them and a priori known SPL semantics, additional hitherto totally unknown SPL semantics. This applies to the Supreme Court's semiotic SPL level of notional development just as to any ET CI's such level.

AD.1: "TT0-REALIZATION SET":	"S^R::= $\{\forall s^{Rv}\}$::=$\{\forall <s^{Rv1}\epsilon TS(s^1),..,s^{RvK}\epsilon TS(s^K)>\}$"[4.a),b),c)].
LD.2: "SCOPE(TT0)":	S^R is called "**scope(TT0)**" resp. "**scope(CI)**".
LD.3: "TT0' = TT0":	A TT0' is called to be "**equal, '='**" to TT0 iff $S'^R=S^R$.
LD.4: "TT0' ϵ SCOPE(TT0)":	A TT0' is called to "**belong to scope(TT0)**" iff $S'^R\subseteq S^R$.
LD.5: "TT0' VIOLATES TT0":	A TT0'∉SCOPE(TT0) is called to "**violate**" TT0 iff $S'^R\cap S^R\neq\Phi$.
LD.6: "TT0 IS DEFINITE":	A TT0 is called to be "**definite**" iff it passes the FSTP-Test.
AD.7: "inC = ip-inC":	"An inC with its TS being too large resp. becoming larger"[4.b)]. This inC category is called "**improvement prone, ip-inC**".
LD.8: "PREEMPTIVITY":	A TT0 is called "**preemptive**" iff ∃TT0'≠TT0 passing the FSTP-Test: scope(TT0')∩scope(TT0)≠Φ ∧ ∃kϵ[1,K]: ($s'^k>s^k$) ∨ (s^k=ip).
LD.9: "ABSTRACT IDEA":	A TT0 is called an "**abstract idea**" iff ∃TT0'≠TT0 passing the FSTP-Test: scope(TT0')∩scope(TT0)≠Φ∧∃kϵ[1,K]≠k':($s'^k>s^k$)∧($s^{k'}$=ip).
LD.10: "PATENT-ELIGIBLITY":	A TT0 is called "**patent-eligible**" iff it is nonpreemptive.
AD.11: "ip-inC = tp/ip-inC"[4.b)]:	"A tp/ip-inC ties its inC into disclosed user-applications of CI". This ip-inC subcategory is called "**transformation-prone, tp**".
LD.12: "SUBSTAN. MORE, '≫'":	A TT0 is called "**substantially more than**" TT0' iff TT0::=$\wedge^{\forall k'\epsilon[1,K]}$BED-inC0k ∧ ($\forall k'\epsilon[1,K]$ holds: BED-inC0k=ip => BED-inC0k=tp/ip) ∧ ∧ ∃k'ϵ[1,K]: BED-inC0k'=ip ∧ (TT0'::=$\wedge^{\forall k'\epsilon[1,K]\neq k'}$BED-inC0k ∧ BED-inC0k'=ip).

FIG 3
The Scientized *Mayo/Alice* SPL Notions Enable Objective Decisions on ET CIs' Patent-Eligibility

Legend to FIG 3:

- See[2.a)3.c)] for ADs, LDs, and the semiotic use hierarchy between them, indicated by line spacing.
- LD.2-6 are not independent of *Mayo/Bilski*, as [194] explains in detail – without the FSTP-Test, induced by *Mayo*, these 5 legal definitions don't exist, as S^R cannot be defined. I.e.: The classical, non-refined claim interpretation&construction is logically totally obscure, right from its outset[4.a)].
- For the axiomatic definitions AD.1/7/11 only "atomic semiotic meanings" are used, as told by Analytic Philosophy[1.b)]. This "atomicity requirement" is, just as "quantification", universal in scientizing a whatsoever knowledge area and has been encountered within FSTP-Technology already when disaggregating compound creative concepts into elementary ones, discussed earlier.
- All mathematical LDs, in FIG 3, are mathematical expressions right of their "if and only if"s.
- All mathematical ADs of a TT0's inCs[4.c)], ip-inCs, and tp/ip-inCs in AD.1/7/11 are unconditionally provided within the right side quotation marks. Thereby, AD.1 is already a mathematical expression defining its semiotic meaning, and AD.7/11 may be put as mathematical expressions, too:
  ■) for AD.7 by "$\exists$ip-inC ϵS => $\exists$TT0'≠TT0 : $t=o S'^R\cap S^R\neq\Phi \vee t>o S'^R\cap S^R\neq\Phi$" – making TT0 preemptive, and
  ■) for AD.11 by "if TT0 = user-application then ∀ ip-inC=tp else ∃ ip-inC≠tp"[2.c)4.c)].
- ADs' final sentences serve for naming, just as in LDs, not for their semiotics definitions by mathematical expressions (unlike natural language expressions evidently of unique meaning).
- The semiotic SPL meanings are "ip-inCs" and "tp/ip-inCs". The Supreme Court termed them "natural phenomenon"/"abstract idea"/"transforming into an application", i.e. closer to "natural language thinking" than to "mathematic semiotics thinking" here actually at issue – though in vain.

THIS COMPLETES THE SCIENTIFICATION OF SPL PRECEDENTS[4.e)]
– IT IS NOW FULLY AXIOMIZED & MATHEMATIZED, YET UNFOLDED ONLY PARTIALLY –

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[4] **.a** TT0 assumed to have passed the FSTP-Test ∧ $\forall s^{Rv}$ is an "**s^{Rv}-embodiment, TT0^{sRv}**"disclosed by TT0's specification. Note[2.c)] the importance of this notional restriction imposed on a TT0's S^R! [202] will show in detail: It is decisive for all the mathematical definitions provided here – i.e. all pre-/post-*Mayo/Alice* SPL notions – as briefly touched below[4.d)]. This notional restriction causes a first group of subtle intricacies coming along with SPL precedents on ET CIs, hinted at at the beginning of Section II [202].
.b More precisely: "… with its mirror predicates TS …".
.c as recognized by the "person of ordinary skill and creativity, posc", whose technical creativity is focused on and limited to FSTP-test1/4/9 – as required by the Supreme Court's *KSR* decision.
.d The mathematical definition of the semiotic meaning of the term "inC" has been provided earlier, just as a TT0's generative S. Here, instead, the mathematical AD.1 of the semiotic meaning of the term "TT0-realization set, S^R" derived from S is directly taken, i.e. the scope(TT0) – its prefix "$t=o$" or "$t>o$" denoting S^R's definition at the CI priority or a later point in time [202].
.e subject to change of its SPL interpretation by the Supreme Court – and trivially to fault fixing, if any should have occurred.

The FSTP-Project's Reference List

FSTP = Facts Screening/Transforming/Presenting (Version_of_05.05.2015*)

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[2] AIT, "Advanced Information Tech.", denotes cutting edge IT areas, e.g. Techs of Artificial Intelligence/ Knowledge Representation/Description Logic/Natural Language& Semantics &Semiotics/System Design/….

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