

The *Mayo/Alice* Notion of “Inventive Concept” Enables: Seeing Today’s “Preemptivity Gap”,
The Scientification of Substantive Patent Law (“SPL”), and Thus Precisely Defining
The Separation Line Between Patent-Eligibility and -Noneligibility of ET CIs

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I. THE TWO PURPOSES OF AND A SURVEY ABOUT THIS PAPER

The first purpose of this paper is to clarify, in Section II, the key aspects of the notion¹⁾ ‘inventive concept’ of the Supreme Court’s *Mayo/Alice* framework for SPL precedents about ET CIs (“Emerging Technology Claimed Inventions”). Using this notion when testing ET CIs under SPL enables recognizing ●) the ‘preemptivity gap’ (tightly related to PTO’s ‘Interim Eligibility Guidance, IEG’ [157]), ●) its overcoming – via SPL’s scientification – by the *Mayo/Alice* implied separation line of an ET CI’s patent-eligibility from its -noneligibility, and ●) the philosophy P for leveraging on this insight when drafting ET CIs’ specifications – greatly complementing the IEG.

But, the patent community still holds this notion of ‘inventive concept’ as mysterious: *Mayo/Alice* namely left its details open – as it was known since long [2], how precisely to model any real-world issue (here: an invention) by its issue specific concepts (here: its inventive concepts). Thus, Section II briefly outlines the 5 here key aspects of this notion of ‘inventive concept’ of the *Mayo/Alice* framework, key especially for precisely modeling ET CIs: They all are invisible/intangible/fictional and thus embody serious new SPL problems not existing with classic technology (“CT”) CIs – why a CT CI’s SPL test can get along without its testing by its inventive concepts.

This paper’s second and main purpose is presented by Sections III/IV: The philosophy, P, for drafting SPL protected patents with “application tied preemptive” ET CIs – i.e. drafting ET CIs’ specifications such that they are *Mayo/Alice* protected, hence ‘SPL proof’, while owing an application tied preemptivity as indispensable for investors. This P, enabled by SPL having undergone its scientification, including declaratively precisely defining the line between patent-eligible/-noneligible ET CIs, so finally overcoming operationally, too, for any ET CI its preemptivity gap. Thus, P eliminates any concern, *Mayo/Alice* allegedly reduced incentives to invest into R&D for costly ET CIs by granting SPL protection only to totally nonpreemptive ET CIs – false allegations, as *Mayo/Alice* clearly approve that SPL tolerates for ET CIs some preemptivity! Thus, the true question is: How much and what kind of preemptivity.

Next week – after the AIPLA meeting in San Francisco – a follow-up paper will relate this paper’s both results to a pending Petition for Cert, recent CAFC decisions, the IEG, a scientific paper complementary to this one as informally further reaching [204-207,156,157], and to contributions of this upcoming AIPLA meeting.

II. KEY ASPECTS OF THE *Mayo/Alice* INVENTIVE CONCEPT

Up-front a notice is in place: Starting from the rational of 35 USC SPL as interpreted by the Supreme Court by *Mayo/Alice*, this Section II very briefly recapitulates by 5 subsections some key insights into the basic being of inventive concepts (scattered on FSTP papers, see the Reference List) – then for the patent community a new notion¹. I.e.: In spite of its redundancy, it does not introduce this new notion.

1) The basic *Mayo* semiotics², also the notion of inventive concept, was here presented in [5-7] and explicitly confirmed by *Alice* [150,151] – though using a coarser terminology than that of the FSTP-Project, as *Alice* nowhere tried itself to become precise about the *Mayo/Alice* framework³. But, the Supreme Court clearly implicitly and even explicitly³ invited the patent community to achieve this.

Here, one or several inCs of a CI exist – as properties alias predicates of their resp. CI-elements – on the “binary abstract disclosed, BAD” level of notional resolution as well as the “binary elementary disclosed, BED” such level, any BAD-inC of this CI being one or a conjunction of several of its BED-inCs – this BAD-inC predicate mirroring the truth set TS of the conjunction of the resp. BED-inC predicates’ truth sets, TS(BED-inCs), here being the decisive modelling tool.

2) In the US the use of the notion inventive concept in a patent of a CI is not new. New is solely that *Mayo/Alice* use this notion for indicating how to refine it as needed for catering ET CIs by SPL protection. Yet, this notion simply had come out of fashion. Instead the misbelief into a persuasive simplification became popular: Namely that the important notion of a “patent’s claim“ interpretation

¹ A “term” is an arbitrarily complex “identifier” alias “name” alias “element of an alphabet”. A pair <“term”, its “meaning”> is called the term’s “notion”. A term’s meaning is called its “semantics” – if it is further restricted in an application specific sense, its “pragmatics”, application-wise refining its semantics.

The meaning-making for terms is called “semiotics” – be its semantics-making or pragmatics-making. The notion of semiotics – and its derivatives, such as semiotical and semiotic – may be used as a substantive in singular or plural, or as adverb, or as adjectives, in present/past/future, ..., no grammatical alias syntactical limitation exists, just as for the notion “meaning-making”.

² The notion¹⁾ “semiotics in SPL” is here understood – other than in sessions at events dealing with highly individualized aspects of law, including somewhat esoteric semiotics in law [191] – to mean an exact science achievable due to its SPL limitation, i.e. ignoring any procedural patent law issue.

Philosophically, so understood SPL semiotics is located on top of Analytic Philosophy, within Mathematics, and below Physics. In the US Wikipedia, semiotics is outlined as AIT [2] focused on linguistic “**meaning-making**” in any area of pragmatics whatsoever, e.g. in SPL precedents on ET CIs.

SPL semiotics may be seen as the unnoticed giant not only in the evolvement of SPL precedents on ET CIs, but in most innovations: While R&D investments are indispensable for creating them, sufficient such investments may be raised only by anticipating them semiotically, especially also in SPL.

This understanding is brought to the point by Justice Breyer’s “Archimedes metaphor”³⁾. Interpreted historically, it invites to scientifying the linguistic *Mayo/Alice* framework’s SPL semiotics (located on top of classical SPL semantics/pragmatics) – just as his metaphor’s “boat building” semiotics²⁾ became scientized, resulting in powerful naval architecture technologies. The same happens here with the “*KSR/Bilski/Mayo/Myriad/Biosig/Alice*” semiotics.

³ JUSTICE BREYER [69]: “*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 boats’ 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.”

The last sentence’s criticism clarifies the point: The term “apply it” does need an appropriate refinement of Archimedes’ water displacement semiotics being the “**outer shell**” of a new boat building semantics – but hitherto there was nothing alike developed by the patent community and filled into this “outer shell”, here being the set of new notions that the Supreme Court introduced by its line of unanimous decisions in *KSR/Bilski/Mayo/Myriad/Biosig/Alice*.

were basically reducible to “its claim’s wording” interpretation. By the late second half of the 20th century, the even less reasonable notion of “Broadest Reasonable Interpretation” of a claim became broadly accepted, thus sharpening the misbelief that the meaning of a patent’s claimed invention – i.e. of the CI to be SPL protected by this patent – is derivable from claim’s wording, of this CI.

As a matter of fact, proceeding the other way around is logically and linguistically absolutely indispensable: The meaning of this claim’s wording can dependably be derived only from the – to be up-front determined – claimed invention, CI, that the patent asserts, i.e. from the invention the patent’s specification discloses.

Thereby the increments of this CI – disclosed by the patent’s specification, in total making-up this invention – are called this invention’s “inventive concepts”.

A CI’s inventive concepts hence need not even be quoted by a claim’s wording, if the specification implicitly or explicitly discloses the CI and this wording does mean it.

Many courts repeatedly committed this BRI nonsense, including some CAFC panels. The Supreme Court’s semiotics of an ET CI’s inventive concept(s) fortunately now terminated it [208].

- 3) The Supreme Court’s *Mayo* notion of “inventive concept”, just outlined, is much simpler than that of the AIT “concept” [2], since ever serving for general purpose recursively aggregating compound concepts from more elementary (= “atomic”) ones. Yet, both kinds of concepts serve the same basic purpose – namely precisely describing either how new compound concepts are aggregated from elementary ones or how given compound concepts are to be disaggregated into new elementary ones – though of opposite “polarities”. inCs serve the latter purpose: for disaggregating given compound concepts into elementary new, i.e. inventive ones.

Thus, by contrast to AIT concepts, inCs support a court’s decision making about a TT0 proceeds inversely. Thereby, compound and elementary inventive concepts model of a TT0 all its compound resp. elementary properties, also seen as compound resp. elementary increments of TT0’s total inventivity.

Thereby, both kinds of concepts are indispensable for ascertaining that a TT0’s total inventivity is lawfully/correctly/completely/... disclosed, definite, useful and patent-eligible, not obvious over prior art, as required by 35 USC SPL (see FIG 1), as modeled by the FSTP-Test of FIG 2. This assertion is evidently often logically impossible with TT0’s compound alias BAD-inCs, only, i.e. possible only after these are disaggregated into their BED-inCs (as modeled by FSTP-Test1).

4) The total set of BED-inCs of a TT0, called S(TT0) or just S – see the FSTP-Test modeled by FIG 2 – is another key issue. If the question for TT0's patent-eligibility arises and hence the *Alice* test in the FSTP-Test must be applied, S comprises at least one inC modelling a patent-noneligible natural phenomenon or abstract idea (as which a TT0 itself being an abstract idea may always be remodeled) [197].

The “ip-category” of CI's inCs then is the nonempty subset of S of all “improvement prone inCs, ip-inCs” as well as the single “transformation prone inC, tp-inC” – see AD.3/4 in FIG 0. The ip-inCs uniformly model TT0's natural phenomena and/or abstract ideas, while tp-inC serves for modeling this subset's impact on TT0's preemptivity alias patent-eligibility – both explained in detail in Section III.

5) Finally, the *Mayo/Alice* notion of inventive concept(s) of an ET CI, resp. of its here single TT0, implies the 4 following quite principle advantages:

-) It enables and requires adding scrutiny to a TT0's claim interpretation, by the patentee as well as the examiner or judge, for becoming capable of using TT0's inCs in its test under SPL – namely by screening all of TT0's specification for ET CI's inCs, not just the wording of the ET CI, and disaggregating them as explained in 1)-3), and verifying that the so determined S completely makes-up the total inventivity of this CI.
-) This additional scrutiny – of clearly identifying and describing inventive concept(s) of the TT0 according to the *Mayo/Alice* framework, for TT0's test under SPL – evidently massively hampers applying for trivial patents right from its outset, as the inventor then encounters the difficulty to convincingly present its trivial invention as inventivity deserving patentability, i.e. not to make itself ridiculous before the whole patent community by its patent application publication and before the PTO's examiner and eventually a court, if it nevertheless tries to persuade them to recognize then not identifiable nonobvious inventive increments of its TT0 as in total representing a nonobvious inventivity.
-) It takes SPL precedents about ET CIs to a much higher level of rationality than pre-*Mayo/Alice* possible, namely to the level of testing an ET CI under SPL in a scientific and hence unquestionable way – a practical advantage, which Section III explains only partially, namely exactly this SPL scientification: It enforces consistent and predictable SPL precedents on ET CIs, especially as to the unquestionable separation line, for today and tomorrow, of patent-eligible from noneligible ones.
-) It enables building technology, such as the Innovation Expert System [198], rapidly changing large parts of all today's patent and future innovation businesses, due to dramatically increasing the productivity available therein.

Section III will start by summarizing the result of scientifying the SPL, based on the preceding key aspects focused discussions of the notion of inventive concept, on which its *Mayo/Alice* framework rests, as the Supreme Court repeatedly indicated. This SPL scientification – i.e. the mathematical definition of all SPL notions – enables recognizing many logical interrelations between them. This enforces into this *Mayo/Alice* framework a rigorous rationality, hitherto totally unknown in SPL (just as in any other part of any law). The FSTP-Project, founded for leveraging on this phenomenon [5-7], recognized a range of practically very important such interrelations existing between these refined SPL notions (see the Reference list).

This SPL scientification/mathematification firstly enables testing consistently and predictably all kinds of ET CIs for their satisfying SPL – hitherto impossible, as shown by the recent years' clashes in the CAFC. Secondly, it enabled already developing a method for drafting legally absolutely unassailable patents on ET CIs. And thirdly, it enabled designing the philosophy for closing the hitherto existing – though made visible only by the notion of inventive concept – above described preemptivity alias patent-eligibility gap in ET CIs' post-*Mayo/Alice* SPL precedents. Without this SPL scientification this philosophy, summarized by FIG 3, would have been hard to discover and is definitively not precisely describable – as evidenced by Section III.

Finally, 3 remarks are in place as to the many new notions in Section III: **1.)** For brevity, it will not go into all the details the FSTP papers provide about them. This self-contained and complete presentation of the SPL scientification will be found in [182], later this year. **2.)** The exact and precise⁴⁾ understanding of these notional details is indispensable for assessing the absolute integrity of the *Mayo/Alice* framework – i.e. for excluding there are neither further gaps its notions leave open nor contradictions between them within it, as these would presently go undetected but later emerge by surprise in a legal conflict, thus inevitably causing inconsistencies in ET CIs' precedents, again – requiring that these notions' definitions (provided by FIG 0) are performed also purely mathematically [142]. **3.)** Yet, the following basic and coarse meanings in natural language representation, underlying these mathematical definitions, may already intuitively be grasped, just because of their natural language representation, though not in all subtleties, i.e. not quite correctly (see **2.**)). Such natural language elaborations are inevitable in any such effort and are used here for performing the indispensable semiotic refinements of the pre-*Mayo/Alice* SPL notions/meanings/pragmatics, as these proved insufficient for consistently and predictably testing ET CIs under SPL.

III. SOME IMPACTS OF THE *Mayo/Alice* INVENTIVE CONCEPTS

Written in more detail, this headline would state: The *Mayo/Alice* notion of inventive concept firstly enabled the SPL scientification, following from it the precise declarative definition of the line, which separates patent-eligible from -noneligible ET CIs – in principle prescribed by *Mayo/Alice* – which in turn, secondly, led to P, a philosophy to be obeyed when drafting the specification of an ET CI for overcoming, for any ET CI, its preemptivity gap, i.e. deciding its patent-(non)eligibility problem.

Accordingly, Section III starts by summarizing in FIG 0 the SPL scientification, implying declaratively defining the line between patent-eligible and -noneligible ET CIs (FIGs 1 and 2 show the fundament of this scientification, all originally presented earlier [171,194,197]). Then FIG 3 defines the philosophy, P, derived from this separation line’s declarative definition, which – if pursued in drafting an ET CI’s specification – overcomes its preemptivity gap, thus solving its above problem.

The meanings of FIG 0’s definitions (AD.1-4 stand for “Axiomatic Definitions” and LD.1-13 for “Legal Definitions”), for clarity, have fully mathematical representations, i.e. their right sides are purely mathematical expressions – thus leveraging on the fact that the rational of semiotics alias meaning-making evidently does not predetermine the syntax it uses and its resp. semantical/pragmatical¹⁾²⁾ units.

I.e.: Rationality leaves flexibility in parsing into ADs the mental fundament of the total semiotics¹⁾ of the *Mayo/Alice* framework for SPL providing a complete set of

AD.1: A TTO’s “ generative set, S ” represents ⁴⁾ :		TTO’s FSTP-Test passes on $S^{leC} \wedge \exists ip-s^k \in S ::= \{ \forall crCs \text{ of } \in S^{leC} \}$.
AD.2: A TTO’s “ scope (TTO) ” is defined to be ⁴⁾ :		$SR ::= \{ \forall s^{Rv} \in SD \} ::= \{ \forall < s^{Rv1} \in TS(s^1), \dots, s^{Rvk} \in TS(s^k) \}$.
LD.1: A TTO is called “ definite ”	iff	$S^R = TTO$.
LD.2: A TTO* is called to be “ equal, ‘=’ ” to TTO	iff	$S^{*R} = S^R$.
LD.3: A TTO* is called to “ belong to scope(TTO) ”, i.e.	iff	$S^{*R} \subseteq S^R$.
LD.4: A TTO* \notin scope(TTO) is called “ violating ” TTO	iff	$S^{*R} \cap S^R \neq \Phi$.
AD.3: A TTO has an “ improvement prone $s^{ip} \in S$ ” means:		$TS(s^{ip}) \subset +TS(s^{ip})$.
AD.4: A TTO has the “ transformation prone $s^{tp} \in S$ ” means:	$\forall s^k \in \underline{s}^{tp}$:	$TS(s^k) = \mp TS(s^k)$.
LD.5: A TTO comprises an “ abstract idea ”	iff $\exists \mp TS^{SD}(s^k)$:	$TS(s^k) \subset \mp TS^{SD}(s^k)$.
LD.6: A TTO comprises a “ natural phenomenon ”	iff $\exists \mp TS^{SD}(s^k)$:	$TS(s^k) \subset \mp TS^{SD}(s^k)$.
LD.7: A TTO is called “ nonpreemptive ”	iff $\nexists ip-s^k$.	
LD.8: A ATT0 is called “(unlimited) preemptive ”	iff $\exists ip-s^k \wedge (\nexists A_{stp} \vee (A_{stp} \wedge AS = \Phi)) \vee Q_{pmgp}(ATT0) = 0$.	
LD.9: A ATT0 is called “(application) tied preemptive ”	iff $\exists ip-s^k \wedge (\exists A_{stp} \wedge (A_{stp} \wedge AS \neq \Phi)) \wedge Q_{pmgp}(ATT0) \geq 1$.	
LD.10: A ATT0 is called “ patent-eligible /-noneligible ”	iff ATT0 = non \vee tied preemptive / ATT0 = preemptive.	
LD.11: A ATT0 has an “ inventive (Alice) concept in^{AC} ” means:	$\exists in^{AC} ::= \prod \forall s^k \in A_{stp} (A_{sk}) : A_{stp} \geq 1$.	
LD.12: A ATT0 is called “ substantially more than ” Φ TTO	iff	$ A_{stp} \geq 1$.
LD.13: A ATT0 (being patent-eligible) is called “ patentable ”	iff	$RS = \Phi Q_{pmgp}(ATT0) \geq 1$.

FIG 0:

The Scientification of the Substantive Patent Law, i.e. of its pre- and post-*Mayo/Alice* Notions.

These notions’ preciseness enables precisely defining the separation line between patent-eligible and -noneligible ET CIs, thus enables drafting not only nonpreemptive legally unassailable ET CIs, but even such ET CIs of customizable limited preemptivity, too, here called (e.g. application) ‘tied preemptivity’. This scientification is configurable for further adapting, as socially adequate, the ties on ET CIs’ preemptivity imposed here. The so adequate preemptivity is to be defined by courts, e.g. subject area specifically [204].

exact mental building blocks for it. Here, this *Mayo/Alice* framework is construed by the 13 LDs of FIG 0, which are based on its 4 such non-uniquely prescribed ADs, i.e. neither these components are not unique nor their mathematical representations. Yet, the post-*Mayo/Alice* semiotics as a whole, defined by these 13 LDs – using pre-/post-*Mayo/Alice* terms¹⁾ – is ex- and implicitly – uniquely prescribed by *Mayo/Alice*.

This ‘the preemptivity gap overcoming’ philosophy P suggested by this paper’s FIG 3, is directly derived from FIG 0. Hence, it precisely and clearly draws the separation line of unlimited preemptive ET CIs (patent-noneligible by FIG 0) from nonpreemptive and application tied preemptive ET CIs (patent-eligible by FIG 0). This often asked-for bright separation line – implicitly defined in principle already by *Mayo/Alice* – evidently smoothens SPL precedents on ET CIs quite significantly.

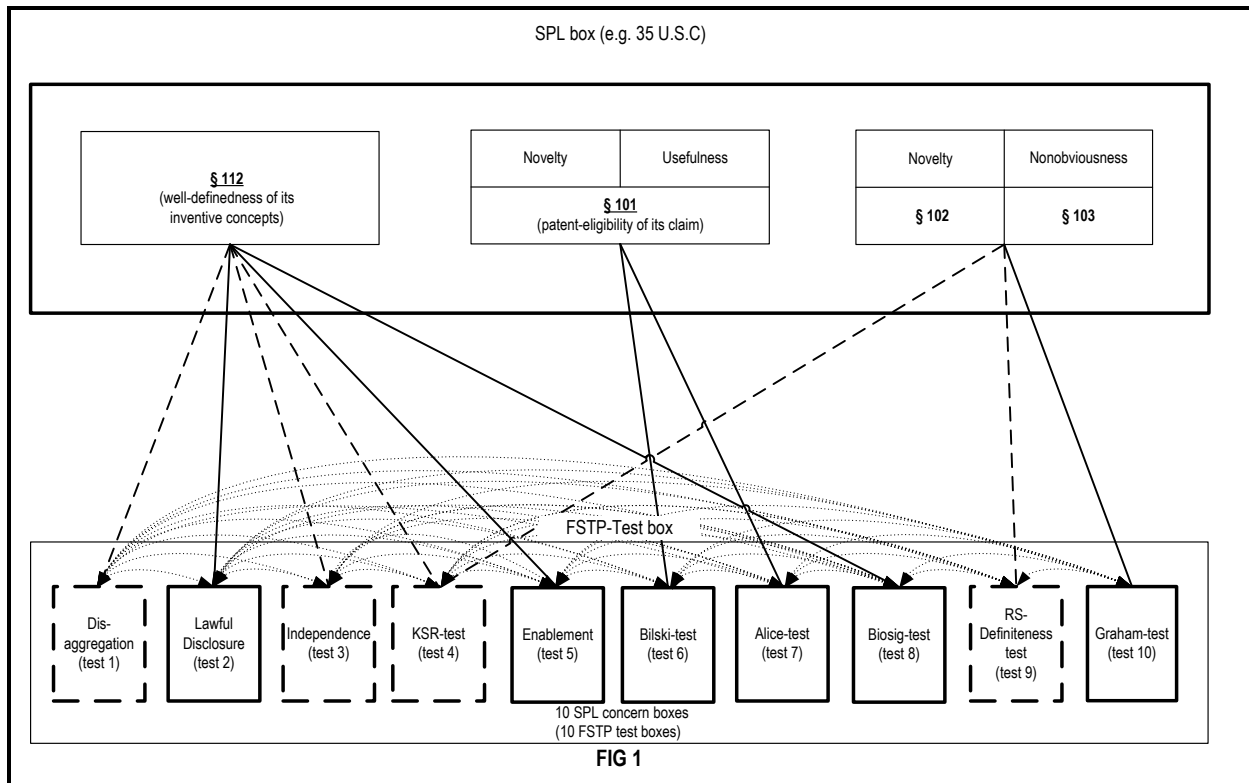
Yet, at a first glance, the mathematical definitions of the *Mayo/Alice* notions¹⁾ in FIG 0 seem incomprehensible – though, eventually, they will turn out for any patent professional as a matter of course, as FIG 0 evidences at a closer look.

In spite of these two strong indicators of rationality in this SPL semiotics and of FIG 0 evidently modelling inCs’ foreseeable evolvments in most ET CIs (in a very abstract style), today grasping these new SPL notions exactly and precisely⁴⁾ is far from trivial. The primary reason is the hitherto very broad but disastrous discussion about *Mayo/Alice*, which directs everybody’s attention away from innovative creativity in interpreting these two Supreme Court opinions – which by most “legal only” persons are felt really Delphic (and also by the author felt to be very demanding, in spite having the right background). Nevertheless, as using these new SPL notions is undoubtedly/unmistakably required by the Supreme Court, it is a must to immediately get seriously acquainted with the *Mayo/Alice* messages. This holds especially, as also by pure logics these new *Mayo/Alice* notions inevitably are needed for expanding the pre-*Mayo/Alice* pragmatics¹⁾ – incapable of consistent/predictable SPL precedents on ET CIs, thus putting their SPL protection into jeopardy – such as to enable it to dealing with ET CIs in a rational and hence consistent and predictable way.

⁴ “Exact” shall reemphasize that these definitions of new SPL meanings seamlessly represent the *Mayo/Alice* framework, which the Supreme Court explicitly put forward, repeatedly as being required to be applied in SPL testing ET CIs. “Precise” shall reemphasize that these definitions of new SPL meanings don’t stay within the semantics of pre-*Mayo/Alice* SPL semantics, but take an ET CI’s SPL testing – by their enabling the quantification of the latter (as briefly mentioned by the legend to FIG 1, explained in detail by [e.g. 175]) – to a level of development and hence scrutiny, prior to this semiotic process just unthinkable by logical reasons – which also imply that both notions are meaningful only when dealing with ET CIs which passed the FSTP-Test.

How far the FSTP-Test actually uses of the inCsES also the lCs or just the crCs will be implementation/configuration depending, irrelevant here.

One could start arguing that none of this Supreme Court decision requires the degree of preciseness/scrutiny 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 originally pretty metaphysical meanings of the above new SPL terms were the unavoidable first steps, performed by the Supreme Court, to their precise definitions by FIG 0 – 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 be used in SPL precedents on ET CIs, i.e. not exist therein, as otherwise by their use any ET CI may be proven to be whatsoever, e.g. preemptive or non-novel/obvious).



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 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, SR” of this single TT0 for the FSTP-Test (see **AD.2** above) [45].
- 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 unassailable. ■) 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 $S^{BADFFOLLIN} ::= \{BAD-crC0n^{FFOLLIN} | 1 \leq n \leq N\} \wedge$
 $\wedge S^{FFOLLIN} ::= \{BED-crC0kn^{FFOLLIN} | 1 \leq n \leq N : BAD-crC0n^{FFOLLIN} = \wedge^{1 \leq kn \leq Kn} BED-crC0kn^{FFOLLIN}\}$,

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. $\wedge^{1 \leq o \leq 10} FSTP^{FFOLLIN-test.o}$ – for brevity in the sequel the index “FFOLLIN” being omitted, any FSTP-test.o abbr. by just “o”, $1 \leq o \leq 10$, and for $6 \leq o \leq 10$ 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, $1 \leq n \leq N$, $\wedge \forall$ binary abstract and elementary disclosed creative concepts of all X0n, BAD-crC0n resp. BED-crC0kn ■) for $|RS| > 0$ also $\forall TTI$ -(dummy)-elements Xin peer to X0n, $1 \leq |i| = |RS| \wedge 1 \leq n \leq N$, $\wedge \forall$ binary abstract and elementary disclosed (dummy)-creative concepts, crCin, of all (dummy)-elements Xin, called BAD-crCin resp. BED-crCikn, as well as ■) \forall below justifications, by stepwise prompting, i.e., for testing the S input to it as follows:

- 1) (a) $S^{BAD} ::= \{BAD-crC0n | \forall 1 \leq n \leq N\}$, $S ::= \{BED-crC0kn | 1 \leq n \leq N : BAD-crC0n = \wedge^{1 \leq kn \leq Kn} BED-crC0kn\}$;
 (b) $justof^{\forall 1 \leq n \leq N}$: BAD-crC0n is **definite**;
 (c) $justof^{\forall 1 \leq n \leq N \wedge \forall 1 \leq kn \leq Kn}$: BED-crC0kn is **definite** $\wedge \forall$ patent-noneligible BED-crC0kn* are identified;
 (d) $justof^{\forall S^{BADUS}}$: $BAD-crC0n = \wedge^{1 \leq kn \leq Kn} BED-crC0kn$;
- 2) $justof^{\forall S^{BADUS}}$: $s \in S \wedge BAD-crC0n \in S^{BAD}$ are **lawfully disclosed**;
- 3) $justof^{\forall S^{BADUS}}$: **Independence-test passed** S is well-defined & independent over model;
- 4) $justof^{\forall S^{BADUS}}$: **KSR-test passed** S is well-defined over posc;
- 5) $justof^{\forall S^{BADUS}}$: **TT0’s implementation by S is enablingly/lawfully disclosed**;
- 6) $justof^{\forall S^{BADUS}}$: **Bilski-test passed** TT0 is non-preemptive;
- 7) $justof^{\forall S^{BADUS}}$: **Alice-test passed** TT0 is patent-eligible;
- 8) $justof^{\forall S^{BADUS}}$: **Biosig-test passed** TT0 is definite;
- 9) $justof^{\forall S^{BADUS}}$: **RS-Definiteness-test passed** RS is well-defined over TT0;
- 10) $justof^{\forall S^{BADUS}}$: **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
At a first glance, the above 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-crC0kn as it is able to identify, $1 \leq n \leq N$, $1 \leq kn \leq Kn$, which defines CI’s S – 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./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].

To begin with: For understanding only intuitively FIG 0 and the following elaborations on the SPL notion “(application) **tied preemptivity**” introduced by this paper for overcoming the preemptivity gap the Supreme Court left open in *Mayo/Alice* – shown in FIG 0 by LD.12, being declarative, only, not procedural – a whole series of mathematical definitions and other abbreviations is needed. Though, only for simplifying these definitions’ representations in FIG 0, i.e. not affecting the new semantics/pragmatics established by the *Mayo/Alice* semiotics. These definitions/abbreviations are provided/explained after the following two introductory paragraphs.

The vast majority of the patent community is not yet aware of this notion of “**preemptivity gap**” any TT0 encounters in post-*Mayo/Alice* SPL precedents, as hitherto it has not been addressed at the pertinent events (see the FSTP Reference List). A TT0’s preemptivity gap denotes the fact that it is not known, up to what “extent of preemptivity” it still is patent-eligible. All that *Mayo/Alice* states are the extremes: A TT0 is patent-eligible resp. -noneligible if it is nonpreemptive resp. of ‘socially unacceptable high preemptivity’⁵), as they both emphasize. Thus, hitherto it seemed legally totally unclear, what limitations of TT0’s preemptivity would make it patent-eligible – while FIG 0 shows that this is not true: *Mayo/Alice* implicitly clearly provides the answer, here represented mathematically by LD.11/12 of FIG 0.

But, this crowd didn’t notice this implied subtlety of *Mayo/Alice* and instead focused on the allegedly “missing link” in the Supreme Court’s *Mayo/Alice* interpretation of 35 USC SPL – namely a line separating ET CIs of some limited preemptivity (needed by investors and carried by social consensus) from totally unlimited preemptive ET CIs (socially intolerable by several very good reasons). This allegedly missing link is substantially contributing to this crowd’s evidently still prevailing feeling of uneasiness about the whole SPL framework [206]. Thus, overcoming this preemptivity gap by the notion of ‘(application) **tied preemptivity**’ this paper introduces – and clarifying the other alleged obscurities of the *Mayo/Alice* notions, as performed by FIG 0, just as showing the other massive legal and technical advantages of the so demonized and instead rationalized *Mayo/Alice* framework – is crucial for accelerating this framework’s total acceptance by the patent community. Sooner or later this will take place anyway, due to this framework’s absolute necessity caused by sophisticated ET CIs and its support by its clean scientific foundation, shown here.

⁵ [5] proved that for the posc and over given prior art, TT0’s semantic height is an invariant, Q^{plcs} , over \forall isomorphic interpretations (“TT0s”) of a nonpathological CI. Whether this invariance statement also holds for Q^{pmgp} (pmgp reduced to the preemptivity of the TT0s as defined by FIG 0) – and hence also to these TT0s’ patent-eligibility – is not clarified yet. Though, the author assumes this is true (for an accordingly limited set of applications \underline{A}).

The below list of primarily purely mathematical definitions and other abbreviations – all directed towards the philosophy P suggested – is shown in a catalog like style, not yet in that of a textbook on cutting edge SPL Technique [182]. It provides only some overview about the subject area dealt with, rushes through all notational issues of FIG 0 and outlines their interrelations, but skips their intricacies.

For exposing and emphasizing the clarity and the notional systematic, which the SPL semiotics by *Mayo/Alice* embodies, FIG 0 is increasing the mathematical rigor of its representation – compared to that of these new SPL notions by FIG 3 of [197]: While the latter still was primarily natural language based and therefore less exact and precise⁴⁾ – i.e. there tolerated some vagueness unavoidably causing frictions in later everyday use – the preceding FIG 0 has no longer such deficiencies.

This list comprises 10 points, with statements to be understood jointly:

- 1) As stated in Section II, FSTP papers from [5] on introduced a TT0's description by *Mayo* inCs, these inCs' descriptions, TT0's generative set S, its realization set $\mathbb{S}^{\mathbb{R}}$, an inC's abbreviation "s^k", its truth set TS(s^k), just as inCs' extensions for forming the "ip-category" of inCs with its single inC^{tp}.
- 2) Some further abbreviations resp. straightforward definitions used in FIG 0 are:
 - "ip-s^k and s^k=ip stand for: 's^k is an ip-inC'".
 - "SU for: 'set \forall by TT0 actually used SPL notional objects, e.g. \forall +TS(s^k)s'".
 - "SD for: 'set \forall by TT0's specification disclosed SPL notional objects, e.g. \forall +TS(s^k)s'".
 - "+s^k \geq s^k for: '+TS(s^k) \geq TS(s^k), with +TS(s^k) \in SD and TS(s^k) \in SU" – see e.g. **3)4)8)**.
 - "aTS^{SD}(s^k) and nTS^{SD}(s^k) for: 'abstract resp. natural pheno. TS^{SD}(s^k) \in SD'" – see FIG 0.
 - "A-independent-s^k for: 'in the AS of \langle TT0,A \rangle , s^k is not affected by A" – see **6)7)**.
 - "+TT0 for: ' \forall +TS(s^k) \in SD\SU' and also TT0** for: ' \forall TS**(s^k) \in SD\SU' – see FIG 3.
- 3) +TS(s^{ip}) in AD.3 models – subject to being disclosed ex- or implicitly for the posc by TT0's SD \supseteq SU – what the maximal cumulative potential growth is of TS(s^k) by both reasons ●) occurring after TT0's priority date (due to its generative set S comprising a natural phenomenon, see LD.6) and/or ●●) already at this date TT0's specification comprises an abstract idea (see LD.5, by the same reason). Thus, $\forall k \in [1, K]$ holds +TS(s^k) = aTS(s^k) \cup nTS(s^k), i.e. = TS(s^k) for any s^k \neq ip-s^k.
- 4) The extension $\mathbb{t}^{\mathbb{p}}$ TS(s^{tp}) within TS(s^{tp}) doesn't model the TT0 per se (as the TS(s^k)s do), but models identifying the potential tied preemptivity on $\forall s^k \in \underline{\mathbb{t}^{\mathbb{p}}} \subseteq \mathbb{t}^{\mathbb{p}}$ TS(s^{tp}) assumed to be disclosed by SD. Thus, in AD.4 the $\mathbb{t}^{\mathbb{p}}$ TS(s^k) models replacing \forall such original TS(s^k)s by their resp. +TS(s^k)s (see **3)**). I.e.: $\underline{\mathbb{t}^{\mathbb{p}}} \subseteq \mathbb{t}^{\mathbb{p}}$ identifies the subset of S of all s^ks are subject to this replacement – in 8) made depending on two SDs, + Δ SD \supseteq Δ SD, and then named + Δ SD $\underline{\mathbb{t}^{\mathbb{p}}} \supseteq \Delta$ SD $\underline{\mathbb{t}^{\mathbb{p}}}$.

- 5) The explanation, why the first definitions in FIG 0 don't carry the prefix "A", is that – unless its TT0 is a priori known to be patent-eligible as $\exists \text{ip-s}^k \in \text{S}$ – from *Alice* evidently follows, there is some arbitrary "**application, A**" integrated with TT0 such that the pair $\langle \text{TT0}, \text{A} \rangle$ is patent-eligible⁶). This implies:

The "with A integrated TT0" is described by its generative set AS of K inCs. I.e.: The pair $\langle \text{TT0}, \text{A} \rangle$ is modeled as a set $\{X_n \mid 1 \leq n \leq N\}$, whereby all here relevant elementary properties of all X_n are modeled by $\text{As}^k \in \text{AS}$, $1 \leq k \leq K$ [5-7].

For its notion "substantially more than" (LD.12), *Alice* evidently implicitly assumes the specific $\text{A} = \Phi$ comprising nothing integrated with TT0: $|\text{AS}| = |\Phi\text{S}|$.

Φ is used already in all pre-*Mayo/Alice* relevant definitions, i.e. in FIG 0 e.g. the first 6 lines. Thus, for not mixing-up the generic prefix A and the specific prefix Φ , this prefix is dropped wherever this risk exists. This is this explanation.

Finally, without loss of generality and ignoring index "k", holds $\Phi\text{S} \supseteq \text{S}(\text{TT0})$.

- 6) The definition of $\text{ATT0} ::= \langle \text{TT0}, \text{A} \rangle$ as "(application) **tied preemptive**" (in LD.9) is clearly required by *Alice* and implies that ATT0 is nonobvious⁷.
- 7) As *Alice* only outlined it, the impact exerted by A on a TT0's patent-eligibility needs some clarification – retrospectively, as underlying the notions in FIG 0.

Mayo/Alice, both clearly identified the application of an ET CI to be key to its legal preemptivity, thereby repeatedly stating that granting patents to preemptive ET CIs is fundamentally problematic. Yet, both also refrained from requiring granting patents only to totally nonpreemptive ET CIs. Along this line, this "preemptivity gap overcoming" philosophy is elaborating on this dilemma – as Section I by its end announced already. Therefore, the above elaborations refined this *Alice* notion of a TT0 being integrated with an application, thus transforming this pair into patent-eligibility without requiring its total nonpreemptivity.

One of the main insights indispensable here is: The post-*Mayo/Alice* SPL semiotics of the term "TT0 is integrated with an application A" amounts to "the pair $\langle \text{TT0}, \text{A} \rangle$ provides its service directly to a user". This excludes the alternative, being the SPL semiotics "this pair is a downstream entity", meaning that "this pair provides its service not directly to a user but to the entity invoking it integrated in this pair, whereby this pair may be located in a multitude of envi-

⁶ The term application A is generic in that A may comprise a single application – what is assumed in this paper, for simplicity – or several totally different ones, to which case everything said below is easily adaptable in a straightforward manner, just as to the improbability of $\underline{\text{A}}$'s inCs as those of TT0 [182].

⁷ If *Alice* had allowed ATT0 to be obvious (comprising its non-novelty), it would not have required ATT0 to be "substantially more than" whatsoever. As SPL is of FOL, the nonobviousness of ATT0 means: ●) ATT0 passes the FSTP-Test, implying ●) that an isolated patent-eligibility test of ATT0 is logical nonsense (as emphasized in all earlier FSTP papers, which explained the FSTP-Test of FIG 2).

ronments not identifiable at priority date of TT0". Patenting a TT0 integrated with a downstream A were unlimited preemptive, a priori making *Alice* obsolete.

Thus, the SPL semiotics of a fictive *Alice* like term (i.e. here construed to be evidently fully in line with *Alice* yet easy to explain) “ $\{k^*\}$ transforms TT0 into a patent-eligible user-application A being substantially more than TT0” clearly means – due to the *Mayo/Alice* SPL interpretation – “ $\{k^*\}$ ⁸) makes the pair $\langle TT0, A \rangle$ patent-eligible by: 1.) tying TT0’s unlimited preemptivity exclusively to the $s^k \in AS \setminus A_{\text{stp}}$, i.e. granting unlimited preemptivity to only A-dependent s^k s (hence the naming: “application tied unlimited preemptivity”) 2.) limiting the preemptivity for the $s^k \notin AS \setminus A_{\text{stp}}$ to the by DS disclosed maxima (see 3)4) above), i.e. granting to all other $s^k \in AS$ the resp. maximal ${}^+ATS(s^k)$, and 3.) assessing that for the pair’s inventive concept in^AC (see 9)) holds: $|\text{in}^AC| ::= Q_{\text{pmgp}}$ is ≥ 1 , i.e. by checking $\langle TT0, A \rangle$ is novel or at least nonobvious.”

While this interpretation of *Alice* in general is unquestionable – as fully in line with *Mayo* and no reasonable alternative interpretation exists, thus by common sense being compulsory – for any specific pair $\langle TT0, A \rangle$, all 3 of these requirements had to be met by the user/posc individually for this pair. Thereby the 3rd requirement is met if LD.12/13 applies to this pair. Namely: The Supreme Court explains in *Mayo* in terms of TT0’s patentability and in *Alice* by requiring this pair $\langle TT0, A \rangle$ to be ‘substantially more than’ the patent-noneligible TT0, i.e. to be nonobvious⁷⁾ – a requirement met, if for this pair holds $Q_{\text{pmgp}} \geq 1$ [5-7].

- 8) Moreover, from *Alice* evidently also follows: All would be the same if TT0 were integrated with an application B “equivalence set to A, $E_{\underline{A}}$ ” – defined by requiring that AS is the same $\forall B \in E_{\underline{A}}$, whereby these Bs else are insignificant. I.e., any A occurrence in FIG 0 or in the sequel could be replaced by $E_{\underline{A}}$ or $\forall B \in E_{\underline{A}}$.

The philosophy starts from $E_{\underline{A}}$ for 3 mental steps: ●) It reduces $E_{\underline{A}}$ to a $R_{\underline{A}}$, ●●) from $R_{\underline{A}}$ changes over to $R_{\underline{A}}SD$, and ●●●) thereafter expands $R_{\underline{A}}SD$ to ${}^+ASD$.

In detail: The philosophy firstly and secondly ●/●●) prohibits in $R_{\underline{A}}$ an application $B \in E_{\underline{A}}$ unless in $R_{\underline{A}}SD$ ($::= DS$ of $R_{\underline{A}}$) is explained that and why an integration of TT0 with B would be useful, too, and ought in principle be realizable like that of ${}^+TT0$ or like ex- or implicitly disclosed in $R_{\underline{A}}DS$, and finally in thirdly it ●●●) requires that $(R_{\underline{A}}SD \subseteq) {}^+ASD$ comprises a disclosures of at least one ${}^+TT0$ such that holds: ${}^+s^k \geq s^k \forall k \in [1, K]$, and ●/●●) for the integration of ${}^+TT0$ with $B \in R_{\underline{A}}$.

⁸ for $\{k^*\}$ see FIG 2

This shows: P requires, for a given TT0, nothing new from it, but more scrutiny as to its specification's +ASD and +ASD . Currently their relation to TT0's patent-eligibility is totally unclear. By contrast, *Alice* hints at it, and AIT enables precisely defining this relation as the philosophy P presented.

I.e.: If this additional scrutiny is not reflected by +ASD – by the respective drafting of a TT0's specification – the today's obscurity in SPL precedents as to its ET CI concerning these relations is preserved as to this TT0. Then, for this TT0, *Alice* normally must be seen as not applied as the Supreme Court required – if § 101 is within the *Mayo/Alice* framework understood to be as little limiting as only socially reasonable, what the author here assumes.

- 9) *Alice*'s (often compound) “**inventive concept, in^{AC}**” of the pair $\langle \text{TT0}, \text{A} \rangle$ is defined as $\text{in}^{\text{AC}} ::= \prod \forall \text{sk} \in \text{A}_{\text{stp}} (\text{A}_{\text{sk}}) ::= \prod \forall \text{sk} \in \text{A}_{\text{stp}} \text{TS}(\text{A}_{\text{sk}})$, with $|\text{in}^{\text{AC}}| ::= |\text{A}_{\text{stp}} \setminus \{\forall \text{ip-sk} \in \text{AS}\}| = \text{Qpmgp}$.
- 10) Closing this introductory list – see the end of Section III, below FIG 3, for a disclaimer as to its completeness – a remark is added not belonging to it, as from Analytic Philosophy. It explains the interplay between rationality/science (in the sense of Kant) and metaphysics/irrationalities as unavoidable in the arts. It also facilitates understanding, how actually has been achieved the here presented scientification of SPL and with it that of the above separation line in SPL between patent-eligibility and patent-noneligibility

Up-front, the distinction between the notional purposes represented by ADs versus those represented by LDs is recapitulated: Just as with the mathematical thinking of axioms (see below), ADs are used in FIG 0 for axiomatic meaning-making by means of – for legal thinking – irrationality based mental building blocks, while LDs are used for derivative meaning-making from ADs, which provides – to legal thinking – mental building blocks considered as embodying the rationalization of their metaphysical basis. I.e.: It is impossible to derive from pre-*Mayo/Alice* SPL semantics alone the new, hitherto unknown meaning made by an AD – i.e. without using any piece of hitherto metaphysics – but no new meaning-making LD must use any piece of metaphysics – as elaborated on next.

Any axiom in Mathematics performs, for a part of the nonrational 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 semiotic¹⁾ instrument as it is not yet “meaning-making” (meaning as understood in any language and semiotics [2]). In Physics, if gravity and time are

taken as two of its axioms to be added to its space context, these immediately perform meaning-making. In SPL semiotics, an AD may serve both purposes, as just outlined for Mathematics and elaborated on, next.

E.g., Riemann discovered a today famous kind of mathematical axioms, which deal with Euclid's parallelism problem, which asks: May two parallel straight lines cut each other? In the KR about this problem, existing 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 then known mathematical context of this problem. A part of the non-rational alias irrational/metaphysics in this context then is to ask: May this plane be embedded in a then totally unknown as warped space, or the space spanned by this plane be internally warped in a then totally unknown way? During all these 2000+ years, both questions for space warp 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 more rationality-making for this mathematical context (e.g. enforcing the one or the other above answer), but need per se not yet be meaning-making for a user using this mathematics (as a mathematical space per se still may be meaningless to it). Though, adding axiom/s to a mathematical space may also model a user application enabling meaning-making, too (An example is: 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 earth, would observe the light's red-shift as this interference is arising (due the impact of the gravity axiom on space curving it), which thus is already meaning-making, not just rationality-making.

These elaborations – on the only way of creating a logically absolutely flawless and consistent mathematical theory, namely to axiomize it – are of little interest to most mathematicians, if they know about the clean foundation of mathematical theories, at all: They often are interested, just as most Physicists and Engineers, in just using some Mathematics and its theorems, not in caring why/how its building blocks of their resp. rationalities and their applications came into existence and whether they correctly apply these theorems – if only the outcome seems reasonable. In face of this truth, it is nice to know that in scientizing SPL, we here proceed exactly as prescribed, since the early 20th century, for creating a resilient fundament for a mathematical theory – which here actually is created.

This normally justifies in principle the above practiced proceeding. I.e., AD.1-4 are axioms as impossible to construe from the pre-*Mayo* SPL notions the SPL semiotics that AD.1-4 define – independently of whether they per se imply new rationality in elementary set theory and/or FFOI, what none of them does. This holds, as the pre-*Mayo* SPL notions don't know anything from which could be derived the following: for AD.1 the new meaning of a CI's "inventive concept(s)", e.g. needed for precisely describing in a uniform way any invention, for AD.2 the new meaning of a CI's "realization set, S", e.g. needed for precisely describing in a uniform way the meaning of a whole series of pre- and/or post *Mayo/Alice* notions, for AD.3 for precisely describing in a uniform way the in SPL new meaning of a TT0 embodying a "natural phenomenon" or an "abstract idea", and for AD.4 for precisely describing in a uniform way the in SPL new meaning of a "patent-noneligibleTT0 being transformed into a patent-eligible application of TT0". By the same reasons holds that LD.1-13 are no ADs.

Coming to terms as to P now: After this list of primarily purely mathematical definitions, abbreviations, and considerations, this paper's philosophy of drafting patent specifications is presented by FIG 3 in terms of the new SPL semiotics defined by FIG 0. Thereby this presentation leverages on the identity of a CI's patent-eligibility and its being A tied (or non) preemptive – the latter guided and quickly computable by the Innovation Expert System (IES) designed and being prototyped in the FSTP-Project due to the power of today's computers, and also due to all SPL precedents' problems by the FSTP-Test being reduced to particularly simple FFOI. It should also be clear that the philosophy within the FSTP-Test is to be seen as the generic scheme of any *Alice* test alias FSTP-test.7 (see FIG 2), i.e. comprises any specific/concrete *Alice* test (i.e. technically: in terms of AIT is a "program scheme", just like the FSTP-Test itself).

Any presentation of P must evidently distinguish – for a given TT0 being questioned for its patent-eligibility/-noneligibility – between at least two situations in which it must be applied: When striving for SPL protection for this TT0 being drafted either from scratch (case **a**) or as a continuation of an already patented TT0*, which hence has been already proven to be tied (or non) preemptive (case **b**). Other cases, such as defending it in an invalidity attack on it, or asserting it in an infringement case, or evaluating it in a licensing deal, or ... are easily derived from these two cases **a**) and **b**) and hence skipped, here.

In both cases the philosophy is to establish, of a given pair ${}^A\text{TT0} ::= \langle \text{TT0}, A \rangle$, its patent-eligibility by its non/tied preemptivity, by drafting within its specification the sets SU and ${}^A\text{SD} \supseteq {}^R\text{ADS} \neq \emptyset$ such that they bar anybody from promisingly contending, at ${}^A\text{TT0}$'s application or post-grant time, that ${}^A\text{TT0}$ is preemptive by alleging:

In case α it would preempt⁶⁾

- some application $B \in \underline{A}$ as ${}^B\text{TT0} ::= \langle \text{TT0}, B \rangle \notin {}^R\text{ADS}$, and/or
- for an application $B \in \underline{A}$ some ${}^B\text{TT0} ::= \langle \text{TT0}, B \rangle \notin {}^A\text{ADS}$.⁹⁾

In case β it would preempt

- some application $B \in \underline{A}$ as ${}^B\text{TT0}^{**} ::= \langle \text{TT0}^{**}, B \rangle \notin {}^R\text{ADS}$, and/or
- for an application $B \in \underline{A}$ some ${}^B\text{TT0}^{**} ::= \langle \text{TT0}^{**}, B \rangle \notin {}^A\text{ADS}$.

FIG 3:

The “The Preemptivity/Patent-Eligibility Gap Overcoming” Philosophy, P, alias Test Suggested by this Paper

Legend to FIG 3:

- It is in line with *Mayo/Alice*, that a the question of TT0s' patent-eligibility arises as to their natural phenomena only in conjunction with their user applications (see above) they are integrated with, i.e. for such a TT0 the patent-eligibility question is undecidable unless it is integrated with a user application. As far as *Mayo/Alice* requires dealing with TT0s' potential abstract ideas the same way, this is achievable solely for ET CIs – as easily seen.
- It is in line with *Mayo/Alice*, too – though hitherto nowhere mentioned – that the notion of “being preempted (by a ${}^A\text{TT0}$ resp. its ${}^A\text{CI}$)” refers to ${}^A\text{TT0}$'s resp. its ${}^A\text{CIs}$, yet even more directly to applications they are integrated with.
- The above philosophy overcomes the preemptivity/patent-eligibility gap as then is defined the separation line implied by *Mayo/Alice*, which – if not determinable – is trouble-making, now avoided by their SPL meaning-making²⁾.
- Thereby note an intricacy (existing today already [207]) inevitably introduced by the posc: Evidently, ${}^R\text{ADS}$ and the more ${}^A\text{ADS}$ may comprise, for an appropriate ${}^A\text{TT0}$, an application $B : {}^B\text{TT0}$ resp. ${}^B\text{TT0}^{**}$ is unlimited preemptive, because the resp. pair has the $\text{in}^A\text{C}=0$, although $\text{in}^A\text{C}>1$ for another $B' \in {}^R\text{ADS}$ resp. ${}^A\text{ADS}$. While during drafting the specification of ${}^A\text{TT0}$ such B would not be put into ${}^R\text{ADS}/{}^A\text{ADS}$, there may \exists such a $B \in \text{posc} \wedge B$ obvious over ${}^A\text{ADS}$.
- Finally, ignoring in α) and β) the resp. second bullet points would result in a logically reasonable philosophy- but politically much less appealing than not ignoring them – both being possible by SPL but requiring consensus-making, as the USPTO should be capable of short term to establish, e.g. within its IEG its project.

Some aftermath: The intricacies of the *Mayo/Alice* semiotics explained here are not Mathematics caused or academic frills. In SPL semiotics, dealing with ET CIs, their booby traps really exist, quite practically – independently of their mathematical modeling (enabling preciseness). Only an exact SPL Technology is capable of leading to consistent SPL precedents on ET CIs. Refusing to accept this significantly higher level of scrutiny – in reasoning when testing an ET CI under SPL – puts by its disastrous consequences the whole patent system into jeopardy. This high degree of scrutiny hence is unavoidable for the refined claim interpretation&construction *Mayo/Alice* require, no matter that it indeed looks complicated – yet initially only.

Finally, one must not assume that the preceding points 1)-10) answered already all questions raised by the scientification of SPL and in particular by defining its separation line between patent-eligible and -noneligible ET CIs. As these questions address theoretical issues only, they today are not yet of interest for patent practitioners and therefore will be presented in later papers [142,182,208]. The practical pros & alleged cons of this philosophy P – as compared to leaving the preemptivity/patent-eligibility gap as it is – are elaborated on by Section IV.

⁹ Presently both occurrences take ${}^A\text{TT0}$ into preemptivity/patent-eligibility limbo, as no understanding exists of – not to speak of a consensus about – the by *Mayo/Alice* invited³⁾ notion of (an application) tied preemptivity of a TT0, which would make it patent-eligible.

IV. PROs AND CONs OF APPLICATION TIED PREEMPTIVE ET CIs.

Section III explained the philosophy, P, summarized by FIG 3, for overcoming the preemptivity/patent-eligibility gap for an ET CI made aware of by its inventive concepts and the scientification of SPL – simply by applying P when drafting this ET CI. The preceding elaborate discussion of P enables briefly summarizing the pros and the alleged con of this the “preemptivity gap overcoming” P.

There are 5 main pros: 1.) This P overcomes the preemptivity gap without requiring any change of 35 USC SPL or only contradicting SPL precedents. Quite the contrary: It is just an application of the suggestions implied by *Mayo/Alice*. Hence, the USPTO could practice it instantly – though blessing it legally would require respective SPL precedents, possibly changing or refining, anyway confirming P – and the patentees anyway, as it concerns just their patent drafting activity. 2.) To all the patent community P provides security, at least guidance, what in principle the Supreme Court implies by *Mayo/Alice* as to the preemptivity problem concerning granting patents to ET CIs. 3.) For inventors/patentees P cuts a very fair deal: The effort it requires, prior to priority time, for accruing the specific information outlined above into Δ SU and Δ ASD or $+\Delta$ ASD is by far overcompensated by the invitation to proceed this way, on which they enjoy the advantages just outlined – while not meeting this requirement does not later bar using any legal argument they could use hitherto. 4.) P evidently stimulates inventors/patentees to become creative as to future improved realizations and/or potential applications of their TT0s at issue already prior to the priority date and invite the public and investors to recognize their further potentials. 5.) Many other limitations added to a TT0 may be presented as an A meant by *Mayo/Alice*, thus P may support TT0 here equally.

An alleged but true alleged con does exist: Opponents of the grace period, i.e. primarily R&D managers of some very large European companies, would consider proceeding as P suggests not only to worsen this discrepancy in the international arena, in particular for the EPO being unacceptable, but also for the US patent system as factually making inventors frequently exceeding any grace period. The author – a representative of academia and hence strictly against any limitation of the grace period because of its empirically approved creativity reduction it causes [22] – does not consider it as con, this factual discrepancy between any limited grace period and P, as it removes the preemptivity alias patent-eligibility problem for ET CIs. Thus, this alleged con of P solely indicates that these opponents disregard the ET CIs' urgent needs, which the Supreme Court clearly identified in *Mayo/Alice*.

The FSTP-Project's Reference List

FSTP = Facts Screening/Transforming/Presenting (Version of 12.06.2015⁹)

- [1] S. Schindler: "US Highest Courts' Patent Precedents in Mayo/Myriad/CLS/Ultramercial/LBC: 'Inventive Concepts' Accepted – 'Abstract Ideas' Next? Patenting Emerging Tech. Inventions Now without Intricacies".
- [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/...
- [5] S. Schindler: "Math. Model. Substant. Patent Law (SPL) Top-Down vs. Bottom-Up", Yokohama, JURISIN 2013¹.
- [6] S. Schindler, "**FSTP** pat. appl.", "THE FSTP EXPERT SYSTEM", 2012⁹.
- [7] S. Schindler, "**DS** pat. appl.", "AN INNOVATION EXPERT SYSTEM, IES, & ITS PTR-DS", 2013⁹.
- [11] S. Schindler, "**inC** pat. appl.", "inC ENABLED SEMI-AUTO. TESTS OF PATENTS", 2013⁹.
- [22] S. Schindler, "The View of an Inventor at the Grace Period", Kiev, 2013⁹.
- [26] SSBG AB to the Supreme Court in Bilski, 06.08.2009⁹.
- [32] S. Schindler, "A KR Based Innovation Expert System (IES) for US SPL Precedents", Phuket, ICIM-2014⁹.
- [33] S. Schindler, "Status Report about the FSTP Prototype", Hyderabad, GIPC-2014.
- [34] S. Schindler, "Status Report about the FSTP Prototype", Moscow, LESI, 2014.
- [35] S. Schindler, IPR-MEMO: "STL, SCL, and SPL – STL Tests seen as SCL Tests seen as SPL Tests", in prep.
- [36] S. Schindler, "Boon and Bane of Inventive Concepts and Refined Claim Construction in the Supreme Court's New Patent Precedents", Berkeley, IPSC, 08.08.2014⁹.
- [37] D.-M. Bey, C. Cotropia, "The Unreasonableness of the BRI Standard", AIPLA, 2009⁹.
- [38] Transcript of the Hearing in TELES vs. CISCO/USPTO, CAFC, 08.01.2014⁹.
- [39] Transcript of the en banc Hearing in CLS vs. ALICE, CAFC, 08.02.2013⁹.
- [40] SSBG's Brief to the CAFC in case '453⁹.
- [41] SSBG's Brief to the CAFC in case '902⁹.
- [42] SSBG's Amicus Brief to the CAFC in case CLS, 06.12.2012⁹.
- [43] S. Schindler, "**LAC** pat. appl.", "Semi-Automatic Generation/Customization of (All) Confirmative Legal Argument Chains (LACs) in a Claimed Invention's SPL Test, as Enabled by Its Inventive Concepts", 2014⁹.
- [44] R. Rader: "Patent on Life Sciences", Berlin, LESI, 2012.
- [45] SSBG's AB to the Supreme Court as to the CII Question, 28.01. 2014⁹.
- [46] S. Schindler: "Autom. Deriv. of Leg. Arg. Chains (LACs) from Arguable Subtests (ASTs) of a Claimed Invention's Test for Satisfying. SPL", U Warsaw, 24.05.2014⁹.
- [58] SSBG's Amicus Brief to the Supreme Court as to its (In)Definiteness Quest's, 03.03. 2014⁹.
- [59] S. Schindler, "**UI** pat. appl.", "An IES Capable of Semi-Auto. Generat./Invoking All Legal Argument Chains (LACs) in the SPL Test of a Claimed Invention (CI), as Enabled by Its Inventive Concepts (inCs)", 2014⁹.
- [60] S. Schindler: "Automatic Derivation of All Arg. Chains Legally Defending Patenting/Patented Inventions", ISPIM, Montreal, 6.10.2014, update⁹.
- [64] B. Wegner, S. Schindler: "A Mathematical Structure Modeling Inventions", Coimbra, CICM-2014⁹.
- [69] Transcript of the oral argument in Supreme Court, *Alice Corp. v. CLS Bank*, 31.03.2014⁹.
- [91] B. Wegner, S. Schindler: "A Mathematical KR Model for Refined Claim Construction II", subm. for publication.
- [119] www.zeit.de/2013/33/multiple-sklerose-medikament-tecfigera/seite-2/.
- [137] S. Schindler: "The Rationality of a Claimed Invention's (CI's) post-Mayo SPL Test – It Increases CI's Legal Quality and Professional Efficiency in CI's Use –lits Semiotics Inspiring the Inventivity to/in CI's Further Development", in prep.
- [142] B. Wegner, S. Schindler: "A Mathematical KR Model for Refined Claim Interpretation & Construction II", in prep...
- [150] S. Schindler: "Alice-Tests Enable "Quantifying" Their Inventive Concepts and thus Vastly Increase the Robustness" of ET Patents – A Tutorial about this Key to Increasing a Patent's Robustness – ", USPTO&GWU, 06.02.2015⁹, also ABSTRACT, see also [175]⁹.
- [151] S. Schindler: "Biosig, Refined by Alice, Vastly Increases the Robustness of Patents – A Tutorial about this Key to Increasing a Patent's Robustness", in prep."⁹.
- [156] CAFC Decision in *DDR*, 05.12. 2014⁹.
- [157] USPTO: "2014 Interim Guidance on Patent Subject Matter Eligibility & Examples: Abstract Ideas", 16.12.2014⁹.
- [161] S. Schindler: "The Innovation Expert System, IES: Philosophy & Functionality &, Mathematical Foundation – A Prototype Outl.", 7. GIPC, Mumbai, 16.01.2015⁹.
- [162] CAFC Decision in *CET*, 23.12.2014⁹.
- [163] S. Schindler: "The USSC's Mayo/Myriad/Alice Decisions: Their Overinterpret. vs. Oversimplification of ET CIs – Scientific. of SPL Prec. as to ET CIs in Action: The CAFC's Myriad & CET Decisions", USPTO, 07.01.2015⁹.
- [164] J. Schulze, D. Schoenberg, L. Hunger, S. Schindler: "Introduction to the IES User Interface of the FSTP-Test", 7. GIPC, Mumbai, 16.01.2015⁹.
- [165] "ALICE AND PATENT DOOMSDAY IN THE NEW YEAR", IPO, 06.01.2015⁹.
- [166] S. Schindler: "Today's Substantive Patent Law (SPL) Precedents and Its Perspectives, Driven by ET CIs", 7. GIPC, Mumbai, 15.01.2015⁹.
- [168] S. Schindler: "PTO's IEG Forum – Some Aftermath", publ. 10.02.2015⁹.
- [171] S. Schindler: "Semiotic Impacts of the Supreme Court's Mayo/Biosig/Alice Decisions on Legally Analyzing ET CIs", sub. f. pub.⁹.
- [175] S. Schindler: "A Patent's Robustness & 'Double Quantifying' Its Inventive Concept as Implied by *Mayo/Alice*", WIPIP, USPTO&GWU, 06.02.2015⁹.
- [182] S. Schindler: "Patent/Innovation Technology and Science", Textbook, in preparation.
- [183] S. Schindler: "The Mayo/Alice SPL Terms/Notions in FSTP-Technology & PTO Initiatives", USPTO, 16.03.2015⁹.
- [184] S. Schindler: "PTOs Efficiency Increase by the FSTP-Test, e.g. EPO and USPTO", LESI, Brussels, 10.04.2015⁹.
- [194] S. Schindler, B. Wegner, J. Schulze, D. Schoenberg: "post-Mayo/Biosig/Alice –The Precise Meanings of Their New SPL Terms", publ. 08.04.15⁹.
- [196] See the resp. prominent panel at the IPBCGlobal2015, San Francisco, 14-16.06.2015⁹.
- [197] S. Schindler: "*Mayo / Alice* – The Supreme Court's Requ. Statement as to Semiotics in SPL & ET CIs, USPTO, 06.05.2015⁹.
- [198] S. Schindler: "Patents' Abs. Robust. & the FSTP-Test – Semi-Automat. by the Innovation Expert System, IES", LESI 2015, Brussels, 18.04.2015⁹, and DBKDA 2015, Rome, 27.05.2015.
- [199] B. Wegner: "The FSTP Test – Its Mathematical Assessment of an ET CI's Practical and SPL Quality", LESI 2015, Brussels, 18.04.2015⁹, and DBKDA 2015, Rome, 27.05.2015.
- [200] D. Schoenberg: "The FSTP Test: A Software System for Assessing an ET CI's Practical and SPL Quality", LESI 2015, Brussels, 18.04.2015⁹, and DBKDA 2015, Rome, 27.05.2015.
- [201] Conclusions from the discussions during the "Patent Prosecution Session" at the AIPLA 2015 Meeting, LA., 31.04.2015.
- [202] S. Schindler: "The Notion of 'Inventive Concept', Fully Scientized SPL, and "Controlled Preemptive" ET CIs", this paper⁹.
- [204] J. Lefstin: "The Three Faces of Prometheus: A Post-Alice Jurisprudence of Abstraction", N.C.J.L.&TECH, July 2015⁹.
- [205] CAFC Decision in *BIO/SIG vs NAUTILUS*, 27.04.2015⁹.
- [206] US Sup. Court, Petition for Cert in *Ultramercial*, May 2015. .
- [207] K.-J. Meullis, report about a thus caused problem with a granted patent at the X. Senate of the German BGH.
- [208] S. Schindler: "The Current State of the Art in and Perspectives of SPL Precedents about ET CIs", to appear next week.

⁹) available at www.fstp-expert-system.com