

# IES's UIEs for Generating LACs for Arguing that a CI Satisfies SPL

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**Abstract**—The paper outlines the User Interface Entities of an Innovation Expert System which enables its users to generate the Legal Argument Chains determined by the FSTP-Test, as required for testing a claimed - classical as well as emerging - technology invention under the Substantive Patent Law of any National Patent System. In particular, under the 4 §§ 101/102/103/112 of 35 USC and its interpretations provided by the Supreme Court's *KSR/Bilski/Mayo* decisions. Such Legal Argument Chains, in real-time-mode, are helpful in arguing (e.g., in a patent court's hearing) about a claimed invention's inventive concepts making it satisfying Substantive Patent Law, i.e. patent-eligible and patentable). The Innovation Expert System and its functionalities presented here are worldwide unique. They are being implemented as a prototype in a major R&D project.

**Keywords**-User Interface Entities; FSTP-Test; SPL; Inventive Concept.

## I. INTRODUCTION

The US Supreme Court's *Mayo* decision [1][18][19] requires describing a claimed invention (CI) by its "inventive concepts, inCs" if it deals with emerging technology subject matter and hence is "model-based" – and thus stimulated Advanced IT [2] research on decision making in testing such CIs under Substantive Patent Law (SPL), also holding if describing the CI needs no model [11][18][19][25][36][45][72][79].

Some examples of such models are: The "ISO/OSI" model of telecommunications, "molecular bonding forces" models of nano-technology, "RNA/DNA" models of genetics, "Natural Language" models of Advanced IT – some standardized, all implicitly used by SPL precedents without being aware of this. The philosophical synonym of the term model is "paradigm", the scientific one "reference system", e.g., "coordinate system". Using a model often enables de-scribing a CI precisely on top of it, though it itself is not understood precisely – as practiced with mathematics' "axioms/theorems/proofs", with physics' "laws of nature", and here with SPL's "claimed inventions". The here claimed invention is applicable to all model-based CIs.

Previous studies [10][18][19][25][46][47] proved that "A CI satisfies SPL iff it passes the "FSTP-Test" (Facts Screening/ Transforming/ Presenting)". Thus, the FSTP-Test may (semi-) automatically deliver all different "Legal Argument Chains, LACs" showing a CI satisfies SPL. This greatly facilitates every patent practitioner's decision making as to testing a CI under SPL, in particular if it is model-based. SPL reasoning is always of finite first order logic (FFOL).

While Section I gave the background of the paper's topic, Section II introduces IES, UIEs and LACs, Section III

talks about the LACs generated during the testing of a given CI, Section IV draws some conclusions about the scope of the CI of [59] and discusses the need for scientizing the reasoning about model-based CIs, and Section V will close by showing that this way of generating LACs ( $\alpha$  -  $\zeta$ ) is patentable/patent-eligible, i.e., specifically something completely new.

## II. THE IES, ITS UIES AND LACS

A system based on a CI's alias TT.0's (Technical Teaching) PTR<sup>SPL</sup>-DS (Pair of technical Teaching over a prior art Reference Set - Data Structure) [6][7] – which stores all SPL-relevant functional and non-functional properties of this CI – is called an "Innovation Expert System, IES", iff it has a "User Interface Entity, UIE" enabling its user(s) to access of this CI all (legally non-redundant) Legal Argument Chains (LACs) showing its satisfying SPL. An IES leverages on its PTR-DS embodying, by all results of its CI's FSTP-Test, all "Arguable Subtests, ASTs" – these being the blueprints of all LACs of this CI. Automatic LACs generation according to this invention is not limited to CIs' tests under SPL.

The UIE of an IES is made-up from UIE.Ys,  $Y=1,2,\dots$ , any one comprising a knowledge representation "KR-UIE.Y", a human interaction "HI-UIE.Y", and an interaction control "IC-UIE.Y" entity, in config-/real-time-mode used separately resp. synchronously. An IES or a user of it invokes between them an "interaction". In config-mode, an interaction serves for generating or modifying of a UIE.Y by a user at least 1 of its just quoted 3 components. In real-time mode, an interaction serves for invoking, controlled by its IC-UIE.Y, the presentation of a HI-UIE.Y. In both modes, this interaction uses its KR-UIE.Y, which in turn uses the knowledge stored by PTR-DS [11][25]. A UIE.Y may be subdivided into (potentially nested) "UIE.Y Steps"; invoking a UIE.Y causes at least executing one of them partially.

A LAC.Z,  $Z=1, 2, \dots$ , is presented by executing at least 1 partial UIE.Y in real-time-mode. An AST.X,  $X=1, 2, \dots$ , is accessed by at least 1 KR-UIE.Y, each translated into at least 1 LAC.Z. An AST.X may be used in at least 1 "logics presentation", tied to at least 1 HI-UIE.Y by its own IC-UIE.Y, as customized by an IES user in config-mode – between which a user may toggle by invoking these IC-UIE.Ys, i.e., in config-mode of the IES, any AST is (semi-) automatically transformable into its 1 or more LAC.Zs, being AST's in various logics presentations translated into multimedia presentations by UIE.Ys – as needed by a judge, examiner, lawyer or an inventor. In real-time-mode, a user may toggle between these UIE.Ys of an AST.X for highlighting its aspects by the LAC.Zs into which AST.X is translated.

### III. ON GENERATING ALL LACs FOR A CI'S TEST UNDER ANY FFOLLIN [A][B]

This paper leverages on scientific insights achieved in the FSTP project and the reference list. They showed how all ASTs – all being non-isomorphic – of a CI/TT.0 tested under SPL, may semi-automatically be transformed, using an IES in config-mode, into their peer LACs, which in the real-time-mode of the IES then may be automatically invoked. The role of the FFOLLIN is explained after **(a)-ζ)** below.

For conveying the working of the IES in config-mode, the below bullet points specify technical features of an IES enabling a user of it to configure alias calibrate alias customize it according to the needs of its user(s) in its real-time-mode. Thereby one or several users may use the IES simultaneously in config- and/or real-time-mode, thus directly or indirectly communicating with each other. The understanding of the working of the IES in real-time-mode immediately follows from its config-mode understanding. They add such features sometimes redundantly, as explained already above and/or by these publications.

These bullet points thus also disclose the scope of the CI of the patent application this paper is based on.

- According to Schindler et al. [25], a CI satisfies SPL iff it passes the FSTP-Test. And: A CI passing FSTP test.m,  $2 \leq m \leq 10$  (on top of a subset S resp. S' of TT.0's finite set of all its BED-inCs (binary elementary disclosed inventive concept) passes all FSTP test.n,  $1 \leq n < m$ , on top of this set. The inverse of this implication evidently needs not to hold.
- The complete FSTP-Test is a program evaluating, for a CI under SPL test, the whole FFOL expression modeling the logics (see below) of and between the 11 concerns embodied by the 35 USC SPL over the mirror predicates of BED-inCs of this CI, the conjunctions of these BED-inCs' mirror predicates modeling the properties of the elements of the CI. Their peers in prior art TTs may or may not exist – as decided by an FSTP-Test user (and confirmed by the person of ordinary skill and creativity (posc) – forming the AN (anticipated non-anticipated) matrix [6][7][11][43][59].
- Any AST is a lexically and syntactically correct “**sentence**” alias FFOL term from within this whole FFOL expression. Hence, for any CI, there are only finitely many ASTs, and for any AST its semantic is evident (except the semantics of the above properties and the relations between them that the user/posc has input into the PTR-DS when generating it – here assumed to be correct).
- PTR dependent, only finitely many (usually few hundred) ASTs exist. All these ASTs are executable on top of these finitely many and PTR-dependent BED-inC subsets. All these ASTs, resp. their basic AST arguments (BASTAs) are the blueprints for all LACs. Other (legally non-redundant) LACs don't exist – though different presentations to IES users of any AST as different LACs may.
- Any UIE.Y for any AST.X (to be translated into a LAC.Z) may be generated in config-mode by an IES user by its invoking the “**UIE-stub**” provided by any IES implementation and delivering to it this UIE.Y, depending on the parameters of this invocation being a fresh UIE.Y or an existing and defined UIE.Y for checking or changing the result of preceding input, or the interworking between presenting several UIE.Y invocations of LAC.Z, or its interworking with other LAC.Z' presentations. Thereby any UIE.Y may be composed by the user of one or several sequential “UIE steps, UIESes”, whereby any UIES again may be composed by the user of one or several sequential such steps (nested UIE.Ys). Any UIE.Y and UIES.Y must be specified by the user – except automatic ones, depending on the particular IES implementation and/or configuration – as to the functionalities of their 3 resp. KR-/HI-/IC-UIE.Ys or KR-/HI-/IC-UIES.Ys.
- The just mentioned 3 components of any UIEs may vastly be generated automatically by the IES or interactively generated by a user guided by the IES – not elaborated here – and would basically be the same or similar, i.e. are principally stereotypical.
- Thereby the objective of the claimed invention presented here, is not limited to providing for a given CI only all LAC.Zs for justifying solely its classical claim construction – such LAC.Zs would only show that the CI has a chance to satisfy SPL – but to provide all LAC.Zs showing CI satisfies SPL.
- After automatically or semi-automatically/interactively having decomposed in config-mode, as deemed reasonable by an IES user, all the PTR-DS into all ASTs, any one potentially in a multitude of ASTs' logics, into peer LACs' multimedia representations and user interaction capabilities (as shown by the below steps **(a)-ζ)**), in real-time-mode these ASTs or LACs may be invoked automatically (e.g., by an acoustic word spotter of the IES), and/or (semi-) automatically by an IES user (see the below steps **(a)-ζ)**). Thereby its execution may comprise specific items for communicating with a user, e.g., about any kind of management issues. Pertinent ordinary skill knows, e.g., from IVR systems and their audio pattern spotting and matching functionalities how in principle to (semi-) automatically identify in real-time LACs to be instantly invoked, as the dialog just taking place generates an appropriate pattern. Here such LAC identification and invocation processes in real-time-mode may be substantially supported by the IES calibration providing resp. hints to these processes, e.g., leveraging on graphical and/or acoustic patterns embodied by a related multimedia thesaurus construction based on “AST patterns”.
- The complete **FSTP-Test** of a CI for its satisfying 35 USC SPL comprises the 10 FSTP test.o,  $1 \leq o \leq 10$ . It is executed for the “set  $\forall$  claim interpretations, Sol” of the CI, selected in **(b)** therein, i.e. all TT.0s

of this CI – a CI may enable several interpretations, if disclosed by its patent’s (application’s) specification [72][79]. The term/notion “technical teaching 0, TT.0” [6][7][11] then stands for one of them [72][79], i.e., the TT.0s are the elements of the CI’s “set of interpretations, Sol”.

- Note that there is a variety of execution sequences of the FSTP-Test for any one of these TT.0s: While the initialization sequence of the 10 FSTP test.o’s must be that of their natural number indexes, they may be executed exhaustively or overlapping – i.e., for the latter case holds:  $\forall$  FSTP test.n check of this CI only those of its inCs already confirmed by the FSTP test.m  $\forall$  m < n.
- Advanced IT knows that the input and commands provided by an IES user to the IES just as the latter’s output to an IES user must have, for being understandable by both, some before given – here a priori defined by the IES – alphabet (vocabulary) and syntax and semantics and pragmatics or these must be determined during the execution of the claimed invention’s FSTP-Test by the IES under rules given a priori by the IES and under the control by an IES user.
- The term/notion “legal argument chain, LAC” stands for what is commonly understood by any posc with knowledge of the SPL. Its broad meaning is not limited in any other way. The index “Z” identifies a particular LAC.Z, more precisely: an instantiation Z of the “type LAC” (in terms of programming languages). The same applies for the types/instantiations “AST”/“AST.X”, “UIE”/“UIE.Y”, ...
- The above UIE-stub provided by an IES on top of a PTR-DS – representing a CI’s TT.0 to be tested for satisfying SPL - is available to an IES user all the time (unless locked by a user). As said above already: By means of the UIE-stub an IES user may define a broad range of UIE instantiations for configuring the UIE between an IES user and the IES for customizing the CI’s SPL test for the IES user: Such as to facilitate for it using the functionality provided by the IES for this test.
- Whether a UIE.Y is to be generated/integrated/modified or executed is determined by the mode the IES is in at UIE.Y invocation time – whereby this mode may be set by an IES user (e.g., the one performing this invocation or another one) or by the IES and/or at whatsoever time of the existence of this UIE.Y and of the function execution being invoked. Thereby conflicts may occur and must be resolved by the implementation of the IES, either automatically or interactively with an IES user.
- Any invocation may refer to only a step within a UIE instantiation.
- The content of a human interaction, i.e. its semantics, is currently transparent to the IES unless it is automatically derived by the IES from the AST at issue, potentially occurring for very simple ASTs.

The usefulness of the CI disclosed in the patent application this paper is based on – i.e. of the IES resp. of the method controlling it – is to be seen in the HI-UIEs’ capability of (semi-)automatic instant information presentations by one or several different LACs about any AST of a CI’s TT.0 under, e.g., SPL test to an IES user, in response to the latter’s invocation of some detail of the PTR-DS or its FSTP-Test representing this TT.0 resp. this detail.

The invention of the patent application this paper is based on has been invented, in particular, for thus enabling the IES to present automatically or interactively a LAC in response to a question being asked, as if this response were provided by a human being of total knowledge about the TT.0 being SPL tested.

To this end, this response must be represented by the IES – by having the person speaking and showing what it graphically uses for support of its presentation, both in reality or on a screen, anyway all media used in synchrony, what would be the normal cases in real-time mode use of the IES – as it were presented without the support by the IES. For achieving this, the IES enables a user first to acoustically and/or graphically input fragments of the arguments it later intends to present in its personalized fashion, then to combine these fragments into what it considers to be a complete legal argument chain, and finally to invoke the automatic reproduction of this argument. Responding this way to a listener/viewer of this LAC – to a question it or somebody else had input to the claimed invention before as a query – then would appear to the listener/viewer as a personal and potentially multimedia announcement/information of a smart IMR system (interactive multimedia response). This “user personalization” of the behavior of the above claimed invention’s IMR subsystem would comprise that an IES user and the IES may cooperate in jointly presenting a complex LAC by alternatively speaking or reacting on interposed questions by answering them immediately – whereby such prompt reactions may be configured, also by IC-UIE.Ys, to be interventions and/or accompanying illustrations, always under an IES user control.

For achieving this result, the IES would execute many steps of such a whole process automatically or interactively, as outlined in  $\alpha$ )- $\zeta$ ) below, e.g., when directly or indirectly (i.e., on IES request) invoked by an IES user, the IES may basically:

- $\alpha$ ) recognize by/for which “high level user interaction” – due to the FFOL nature of the problem only finitely many such user interactions are required by an IES – this invocation occurred, then
- $\beta$ ) derive, for this interaction, which technical items and/or legal items from the FSTP-DS it needs,
- $\gamma$ ) determine, by which “basic AST arguments, BASTAs” (see below) they are covered – due to the FFOL nature of the problem, i.e. of the FSTP-Test, there is only a finite number of BASTs (basic ASTSs) for any TT.0, the respective TT.0 independent BASTAs would be provided by the IES, and the TT.0 dependent BASTAs would be input by an IES user into the IES under the latter’s guidance being controlled by the PTR-DS prior to using the IES as outlined by  $\alpha$ )- $\zeta$ ) – then

- δ) compile from these BASTAs some “sequence of BASTA, SoBASTA” – due to the FFOL nature of the problem any sequence is correct, yet second thoughts being useful – a single complete sequence of “low level answers” to these questions, and have a KR-UIE instantiation represent this SoBASTA,
- ε) translate this low level SoBASTA into one or several specific – but logically equivalent to each other and to the SoBASTA – sequences of future (if working in config-mode) or actual (if working in real-time-mode) multimedia outputs on what I/O devices, and have the same number of HI-UIE instantiations represent these future/actual outputs, whereby each such instantiation provides, potentially supported by the KR-UIE alias SoBASTA, a specific basis for one or several sequences of high-level user interactions invoked above but executed under the control of ζ), and finally,
- ζ) determine, for any HI-UIE instantiation of ε), when in the future (if working in config-mode) or actually (if working in real-time-mode) on what event how to output on what I/O devices which part of this or another one of these HI-UIE instantiations of ε), and have for this HI-UIE instantiation its specific IC-UIE instantiation represent these future/actual interaction controls – thus linking, to commands of IES users, not only parts of HI-UIE instantiations of ε) but also what any latter part needs for its execution from a KR-UIE.

Some comments on the steps α)-ζ) and, in particular, on this CI’s philosophy may be helpful:

- Any step requires some interactive input from or control by an IES user or executes fully automatic.
- These steps differ when invoked in different modes, e.g., **i)** in explorative/calibrating/config-mode, **ii)** in reply-testing-mode, **iii)** in “one-way”-reply-mode, **iv)** in “two-way”- alias “interactive”-reply-mode, **v)** in some “consolidation”-reply mode, etc.
- The BASTAs (= basic AST arguments) in step γ) represent a complete (usually, neither not unique, nor non-redundant) finite set of basic building blocks into which the whole FSTP-Test may be decomposed. In any BASTA, the term “basic” has the meaning that it deals with only a single factual alias “technical” and/or legal question as to one of the 10 FSTP test.o (which enables dealing, e.g., with the finitely many such details or evaluations or relations of some kinds of inCs or the FSTP test.o at issue), and the term “argument” indicates that the BASTAs are translated into the basic building blocks also of the LACs.
- While an embodiment of the CI of the patent application this paper is based on working with the steps α)-ζ) uses the functionality specified for the CI in a pretty sophisticated manner, for the person of post its implementation would nevertheless be straightforward realizable. This holds even more for the CI’s simpler embodiments, always achievable by appropriately limiting the I/O flexibility of such embodiments.

- In addition to the steps α)-ζ), an embodiment of the above claimed invention may provide “prototypes” of all user interactions and modes it provides, as well as macros for the stereotypically recurring parts when invoking them, such as repeating some passage in other words or particularly slowly, or skipping momentarily boring details, or prompting a user to continue, or asking for confirmation the understanding of the just said, or ... .
- LACs may also be presented by their default configurations coming with user interactions specific for models of application areas. These prototype interactions are fine for inputting/defining/configuring specific UIE instantiations by a user for its personalization of the IES and/or its LACs for adapting them to the specificities of the actual PTR-DS under test; but, normally, these prototypes' functioning is not yet what an IES user ideally would like to use.
- This paper nowhere uses peculiarities of an SPL [A] or its FSTP-Test, i.e., SPLs are too narrow for specifying it. The next paragraphs shall clarify this and thus determine the scope of the CI of [59].

Speaking in terms of programming languages: SPL, “**Substantive Copyright Law, SCL**”, ..., may be seen as a range of “directive” type declarations, the defining commonality of which is their being a “**finite FOL legal norm, FFOLLN**”. Hence, any such directive type declaration may be called FFOLLN and is defined by a finite set of conjunctively to be met requirements by any instantiation of this directive type, i.e., by any subject matter satisfying it.

Here, any instantiation of a FFOLLN would occur by means of a subject matter being a CI of FFOL, thus by means of a finite set of BED<sup>SCL</sup>-inCs generative for this CI [72]. Hence, this instantiation – being a subject matter defined by this CI of this FFOLLN – is called “**finite FOL legal invention norm, FFOLLIN**”.

#### IV. CONCLUSION/DISCUSSION

Based on this understanding, one sees that the scope of the above CI indeed comprises any IES<sup>FFOLLIN</sup> – which is confirmed by a careful analysis of the claims claiming this CI. Thus, from the above programming language considerations and definitions follows (in generalization of the considerations in, e.g., [10][18][19][25] mathematically reconsidered by [76] and putting it in terms independent of programming language and legal jargon): The scope of the patent application this paper is based on comprises any equally powerful “**test of a creation necessary and sufficient for its meeting a given requirement, TC.NaS.MR**”.

Being “equally powerful” means: This CI (based on the patent application this paper is based on) enables building for any FFOLLIN an IES<sup>FFOLLIN</sup>, which by customization/configuration becomes that knowledgeable that, if asked a question about this TT.0<sup>FFOLLIN</sup>’s satisfying a requirement its FFOLLIN instantiation states, it may instantly respond by one or several correct and complete LACs, their presentations being controllable by an IES user (as detailed above).

This generalization evidently impacts also on the  $FSTP^{SPL}$ -Test determining the  $PTR^{SPL}$ -DS, implying that an  $FSTP^{TCNaSMR}$ -Test determines a  $PTR^{TCNaSMR}$ -DS. Writing just “ $FSTP^{FFOLLN}$ -Test” and “ $PTR^{FFOLLN}$ -DS” is less specific in notation, but implies the same. This generalization even may be expanded to the  $FFOLLN$ ’s dependency on non-finite parameters, e.g., time. I.e., the above discussed CI has a much broader application area – i.e. all  $FFOLxNs$  areas, “x” standing not only for “law” but also for any private “directive” – than the one repeatedly explicitly addressed above for exemplary purposes, namely 35 USC SPL.

- An IES<sup>FFOLLIN</sup> defined by some  $FFOLLIN$  creation alias “technical teaching.0,  $TT.0^{FFOLLIN}$ ”, – defined to be a CI the properties of the elements of which are precisely describable by conjunctions of the mirror-predicates of this  $TT.0$ ’s  $BED^{FFOLLIN}$ -inCs – is all-knowing (in the above described sense) as to  $TT.0^{FFOLLIN}$ ’s satisfying this  $FFOLLN$ , and is comprised in [59]. E.g.: An IES<sup>SPL</sup> defined by a  $CI^{SPL}$ ’s  $BED^{SPL}$ -inCs and the  $FSTP^{SPL}$ -Test is all knowing about  $CI^{SPL}$ ’s satisfying this SPL.
- This enables several very interesting conclusions showing the total unreasonableness of trying to reason about model-based CIs without scientizing this reasoning. Namely, that
  - for implementing an IES<sup>FFOLLN</sup> (as claimed in [59]) – the 35 USC SPL is just a specific  $FFOLLN$  – neither a concrete  $FFOLLN$  nor the  $FSTP^{FFOLLN}$ -Test is needed (i.e. it is sufficient to know that it is  $FFOL$ ) nor a  $CI^{FFOLLN}$ . By calibrating a so implemented “abstract” IES<sup>FFOLLN</sup> by a  $CI^{FFOLLIN}$ ’s  $PTR^{FFOLLIN}$ -DS (based on a concrete  $FFOLLN$ , concrete  $CI^{FFOLLIN}$ , and concrete  $FSTP^{FFOLLIN}$ -Test here needed for construing the  $PTR^{FFOLLIN}$ -DS) it becomes an IES<sup>FFOLLIN</sup> all-knowing about  $CI^{FFOLLIN}$ ’s satisfying  $FFOLLN$ .
  - for none of the application areas of the CI disclosed by the patent application this paper is based on (one of them being the “35 USC SPL area”) – all being “ $FFOLLN$  areas” – the  $FSTP^{FFOLLN}$ -Test can be defined without basing it on a  $FFOL$  CI, i.e., any  $FFOL$  CI from a  $FFOLLN$  area creates, by its  $FSTP^{FFOLLIN}$ -Test, its specific compound metric for any prior just as posteriori art over the posc underlying this  $FFOLLN$  area.
  - recognizing any CI creates its own metric was not really necessary with classical technology CIs – there intuition insinuates it always is the same (though not understood by anybody prior to  $FSTP$  technology) – for model-based emerging technology CIs no intuition exists, thus making indispensable the scientification of their tests for satisfying their  $FFOLLNs$ , whatsoever [79].
- The below quoted and underlined phrases used by [59] have the following meanings:
  - a) “On direct or indirect request by an IES user” says that this IES user may by itself invoke a function (= request its execution directly) or

else it may be prompted by the IES to invoke a function (= request its execution indirectly).

- b) “Several different LACs about any AST of a CI/TT.0” shall indicate that the existence of several LACs need not only be due to an IES user having defined several different multimedia presentations for a LAC, but may also be caused by the AST itself comprising different ways of reasoning, e.g., having different disclosures for an inC the AST deals with and/or having for a disclosure more than one legal justification.
- c) An answer provided by the IES to a query put by an IES user (as to at least one aspect of at least one inC of the CI at issue) is called “complete and concise” iff it addresses and comprises all relevant legal and technical information and presents this information such that it shows the CI meets all respective requirements stated by SPL – unlike information provided by the classical claim construction, as missing both these objectives.
- d) “A question raised by an IES user intentionally or not” says that the user may raise this question quite purposefully, i.e., targeted, or incidentally, i.e., by chance, e.g., in presenting an argument.
- e) The different “logics” of an AST denote the various kinds this AST may present some issue, e.g. justify why an inC is disclosed by the specification or why the inCs in a set are independent.
- f) “All ASTs for a given CI and its  $FFOLLIN$ ” says that any part of this CI’s  $FSTP^{FFOLLIN}$ -Test is covered by an AST, i.e. the CI’s complete  $FSTP^{FFOLLIN}$ -Test understood as a logical conjunction of basic logic statements is decomposed into sets of BASTs (see  $\gamma$ ) above).
- g) Two LACs are “non-redundant”, if the ASTs they represent share no BAST.

#### V. THE IES’S UIE PATENT APPLICATION’S CI SATISFIES THE 35 USC’S SPL

Considering [11][25], the claimed invention in [59] satisfies the 35 USC §§ 101/102/103/112 as it passes all 10  $FSTP$  tests.o. It namely passes [C] the following tests:

- 1) The  $FSTP$ -Test prompts the user to input
  - <no “**multi-interpretable CI**” until [137]>
  - (a)  $\forall TT.i \wedge 0 \leq i \leq |RS| \wedge 1 \leq n \leq N = N(TT.0)$ :  
the pair  $(Xin, BAD-crCin)$ :
  - (b)  $\forall 1 \leq n \leq N$  justof:  $(X0n, BAD-crC0n)$  is **definite**;
  - (c)  $S ::= \{BED-crC0nk \mid 1 \leq k \leq K^n, 1 \leq n \leq N\}$ :  
 $BAD-crC0n = \bigwedge_{1 \leq k \leq K^n} BED-crC0nk$   $\wedge$   
 $K ::= \sum_{1 \leq n \leq N} K^n$ ;
  - (d)  $\forall 1 \leq k \leq K^n \wedge 1 \leq n \leq N$  justof:  $BED-crC0nk$  is **definite**;
- 2)  $\wedge \forall \epsilon \in S$  for justof: their **lawful disclosure**;
- 3)  $\wedge \forall \epsilon \in S$  for justof: their **definiteness** under § 112.6;
- 4)  $\wedge \forall \epsilon \in S$  for justof: their **joint enablement of TT.0**;
- 5)  $\wedge \forall \epsilon \in S$  for justof: their **joint independence**;

6)  $\wedge \forall c \in S$  for justof: their **joint KSR/posc-non-equivalence**

$\wedge$  define the BED\*-AN matrix by

$BED^*-inC_{ik} ::= N \quad \forall 1 \leq k \leq K^n \wedge 0 \leq i \leq I;$

$BED^*-inC_{0k} ::= A \quad \text{if } BED-inC_{0k} \in^{KSR} \text{posc};$

$BED^*-inC_{ik} ::= A \quad BED-inC_{ik} =^{KSR} BED-inC_{0k},$   
 $1 \leq i \leq I;$

7)  $\wedge$  for justof: by NAI0 [\*] S is **not an abstract idea only**;

<see iii> of [136]

8)  $\wedge$  for justof: S **contains a patent-eligible BED-crC0nk**

<see iii> of [136]

9)  $\wedge$  for justof: S **is a patent-eligible combination**;

<see iii> of [136]

10)  $\wedge$  for justof: by NANO [\*\*] S is **patentable** on  $S^{pat-el} \subseteq S$ .

<see iii> of [136]

Hence, as stated in [59], the there claimed invention satisfies 35 USC's SPL.

Finally, it is worthwhile noticing that this CI passes, by passing all 10 FSTP tests, even 16 tests – of which the classical claim construction only performs 6 ones, as explained by [25]. To put this insight into the *Mayo* context: If the classical claim construction were allegedly seen as an invention being that useful as to determine whether a claimed invention satisfies the US SPL or not, it would be – as seen by *Bilski/Mayo* – just an “abstract idea only” of a claim construction. Though, strangely enough, the classical claim construction never has been set out to be that useful. Indeed, it is more misleading than guiding to the complete and 35 USC conforming and by *Mayo* required claim construction [B][C].

## REFERENCES

[A] While today differences still exist between the “Substantive Patent Laws, SPLs” of the US and other regions/nations, e.g., the EU with the SPL of its EPC, these should disappear soon, as internationally harmonizing so understood SPLs is politically not too controversial and economically highly beneficial for all parties as then being “Highest Courts” proof – in the US totally, in the EU and many Industrial nations vastly. Similar processes occurred in the past, e.g., with the national accounting procedures of public companies, today harmonized by the worldwide IFRS (International Financial Reporting Standard). Here, the PatentHighwayProgram of several large PTOs may play a decisive role.

[B] Due to their novelty, many details – also evident ones – were briefly explained in Section III of this paper. Such trivialities ought to be superfluous in a patent application. If a future patent application were supported by its PTR-DS – or even by an IES as discussed here – all such explanations, also trivial ones, would be presented to a user on its request in real-time, potentially in utmost controllable multimedia presentation.

[C] Performing the NANO test on the above CI determines its creative height to be  $\geq 5$  over posc, and there is no prior art or pragmatics which could reduce it. By [5][6] this CI's creative height is

- larger than 1, thus warranting its novelty (as by the posc there is no prior art document anticipating one of the 5 BID-inCs [59]), and as it is especially at least
- 5 or more, thus warranting its non-obviousness, due to the same reason.

[\*] The “Not Abstract Idea Only, NAI0” test prompts the user

1) for input&justof: the CI specification discloses a problem, P, to be solved by TT.0 of CI;

2) for input&justof: S alias TT.0 solves P;

3) for input&justof: P is not solved, if in S a BED-inC0k is relaxed (i.e. the truth set of a BED-inC0k is enlarged);

If 1)-3) apply, then  $\langle CI, S \rangle$  is “not an abstract idea only”.

[\*\*] The “Not Anticipated And Not Obvious, NANO” test checks of RS all its “anticipation combinations, ACs” as to S [5,6]:

1) It starts from the “anticipation/non-anticipation, AN” matrix of FSTP test.6, any one of the I+1 lines of which shows, by its K column entries, for  $i = 1, 2, \dots, I$ , which of the peer TT.0 entries is anticipated/non-anticipated by a former one, and for  $i=0$  is anticipated/non-anticipated by posc.

2) It automatically derives from the AN matrix the set of all {AC} with the minimal number,  $Q^{min}$ , of “N” entries.

[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 Technology”, denotes topical IT research areas, e.g., AI, KR, DL, NL, Semantics, ...

[5] S. Schindler: “Math. Model. Substantive Patent Law (SPL) Top-Down vs. Bottom-Up”, Yokohama, JURISIN 2013.

[6] S. Schindler: “FSTP” pat. appl.: “THE FSTP Expert System”, 2012.

[7] S. Schindler: “DS” pat. appl.: “An Innovation Expert System, IES, & Its Data Structure, PTR-DS”, 2013.

[10] SSBG's AB to CAFC in LBC, 2013.

[11] S. Schindler: “inC” pat. appl.: “Inventive Concepts Enabled Semi-Automatic Tests of Patents”, 2013.

[18] SSBG AB to the Supreme Court in CLS, 07.10.2013.

[19] SSBG AB to the Supreme Court in WildTangent, 23.09.2013.

[25] S. Schindler, A. Paschke, and S. Ramakrishna: “Formal Legal Reasoning that an Invention Satisfies SPL”, Bologna, JURIX-2013.

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[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”, 2014.

[45] SSBG's AB to the Supreme Court as to the CII Question, 28.01.2014.

[46] S. Schindler: “Autom. Deriv. of Leg. Arg. Chains (LACs) from Arguable Subtests (ASTs) of a Claimed Invention's Test for Satisfying SPL”, University of Warsaw, 24.05.2014.

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[59] S. Schindler: “UI” pat. appl.: “An IES Capable of Semi-Auto. Generating/Invoking All Legal Argument Chains (LACs) in the SPL Test of a Claimed Invention (CI), as Enabled by Its Inventive Concepts (inCs)”, 2014.

[72] .a) S. Schindler: “The Supreme Court's ‘SPL Initiative’: Scientizing Its SPL Interpretation Removes 3 Evergreen SPL Obscurities”, Press Release, 08.04.2014.

.b) S. Schindler: “The Supreme Court's ‘SPL Initiative’: Scientizing Its SPL Interpretation Removes 3 Evergreen SPL Obscurities – and Enables Automation in a CI's SPL Tests and Argument Chains”, Honolulu, IAM2014S, 18.07.14.

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[79] S. Schindler: “On the BRI-Schism in the US National Patent System (NPS) – A Challenge for the US Highest Courts”, 22.05.2014, submitted for publication

[136] S. Schindler: “High-Level Tutorial I to Claimed Inventions’ post-*Mayo* SPL Testing”, submitted for publication.

[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, and Stimulates/Inspires the Inventivity to/in CI’s Further Development”, in preparation.