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Automatic Derivation of Argument Chains Legally Defending Patenting Inventions - II

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Abstract: This paper presents a fundamental function of an "**Innovation Expert System, IES**". An IES enables automatically generating/customizing all "**legal argument chains, LACs**" of interest in an emerging technology claimed invention's test under "**Substantive Patent Law, SPL**", e.g. 35 USC §§ 112/101/102/103, in Europe EPC §§ 52-56, 69.
It leverages on the US Supreme Court's recent SPL precedents and hence on the new terms/notions required by its *Mayo* decision to be used in such an SPL test, namely "**inventive concepts**, **in-Cs**" for describing the increments of usefulness of the claimed invention under test, and "**nonpreemptiveness**" for verifying its well-founded/definedness.
Any LAC presents an "**arguable subtest, AST**" of the SPL test - legally being proven correct mathematically, technically being subject to the posc's confirmation - and vice versa. The fundamental function of an IES explained here is its capability of automatically generating all ASTs, which enables deriving all LACs from them.

Keywords: Legal argument chain; Substantive Patent Law; inventive concept; nonpreemptivity; arguable subtest; Argumentation for legal reasoning; New application areas; Hybrid argumentation-based models.

1 Introduction

This paper focuses on introducing a fundamental functionality of an **"Innovation Expert System, IES"** for invoking and then automatically generating, in its realtime-mode, a customizable LAC (Schindler 2014j, Schindler 2014k) legally proven correct mathematically and technically confirmed correct by the person of ordinary skill and creativity, **"posc"** – customizable in its multimedia and/or (logical/legal) detailedness presentation controllable by a user of the IES – that may be, at any point in time, of actual interest in a claimed invention's test whether it satisfies **"Substantive Patent Law, SPL"**, e.g. USC §§ 112/101/102/103, in Europe EPC §§ 52-56, 69 (Schindler 2013a, Schindler 2013b, Schindler 2012a, Schindler 2013c, Schulze 2014, Schindler 2013d, Schindler 2013e, Schindler 2013f, Correa 2010, Klunker 2010, USPTO/MPEP 2010, Schindler 2014a, Daily & Kieff 2013). I.e.: Preceding an invocation of a LAC in one of its presentations, the latter must be defined in the IES's config-mode by its user.

First the terms/notions used by this paper are introduced.

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Upfront: This paper is based on the terms/notions, which the US Supreme Court's *Mayo* decision requires to be used in SPL testing a claimed invention, especially if it deals with emerging technology (Schinder 2013a, Schindler 2013d, Schindler 2014b, Schindler 2013g, USPTO 2012, O'Malley 2013, Schindler 2013h, Schindler 2013i, Schindler 2013j, Schindler 2013k, Boolos & Burgess & Jeffrey 2007, Bench-Capon & Coenen 1992, Fuchs & Schwitter 1996, Paschke 2013, Schindler 2014c, Schindler 2014d, Schindler 2014e, Schindler 2014f, Schindler 2014g) and hence is "model" based: The invention's **"inventive concepts, in-Cs"** describing its usefulness increments making it up, and its being **"nonpreemptive"** asserting it is well-founded/defined.

Both these new terms/notions in SPL precedents are indispensable if this claimed invention deals with emerging technology, as only they enable dealing with their increased scientification and hence getting "model-based". I.e., by its *Mayo* decision the US Supreme Court increased the height of the level of development of SPL precedents by refining it such that it meets the needs of emerging technologies, in the US and worldwide. This paper leverages on that higher scientific level of legally dealing with innovations enforced by the US Supreme Court into US SPL precedents.

Models are e.g.: 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 is "reference system", e.g. "coordinate system". Using a model/paradigm often enables describing inventions alias new knowledge precisely, though it itself is not understood or defined precisely – as practiced with mathematics' "axioms/theorems/proofs" and physics' "laws of nature", here with SPL's "claimed inventions".

On top of a model a "**claimed invention**" alias "**technical teaching, TT.0**" is considered and a "**reference set, RS**" for TT.0 – the elements of RS being prior art inventions similar to TT.0 – which together are denoted "**pair of TT.0 and RS, PTR**".

(Schindler 2013k) provides, for a PTR, 10 "**FSTP tests**" (see FIG 2) such that holds: TT.0 satisfies SPL iff it passes them all – mathematically proven (Schindler 2013j, Schindler 2013k). For a PTR, let "**PTR-DS**" denote a data structure storing all relevant functional and nonfunctional properties of PTR, the 10 FSTP tests, and all their executions' results on PTR.

For a PTR, let "**PTR-DS**" denote a data structure storing all relevant functional and nonfunctional properties of PTR, the FSTP-Test, and all its ASTs' results on PTR.

The shortness of these definitions evidences resp. insinuates correctly: What is presented here

- belongs to a series other papers – see e.g. the Reference List – of a major R&D project, namely the FSTP project, leveraging on and supporting Highest Courts' SPL precedents by Advanced IT (AIT, Brachmann & Levesque 2004, Baader 2010, Boolos & Burgess & Jeffrey 2007, Schindler 2014h, Schindler 2014i, Schindler 2012, Rader 2012). While this paper is self-contained, its terms/notions yet are hard to understand without their discussions in these other papers – hence the many cross references to these papers – though the basic ideas of this paper are vastly independent of the precise knowledge of this "context", and
- is not PTR/SPL dependent but can cope with relaxed paradigms. I.e., the "**PTR/SPL problem**" may be generalized to be of any "**First Order Logic Finite Legal Norm**,

FFLN" (Boolos & Burgess & Jeffrey 2007), as explained by the end of Section II. This FFLN property holds for many (probably all) inventions patented or applying for being patented. Other FFLNs, besides SPL, are "**Substantive Copyright Law**, **SCL**" and "**Substantive Trademark Law**, **STL**", with PTR^{STL}-DS ⊂ PTR^{SCL}-DS ⊂ PTR^{SPL}-DS (CAFC 2013a, Schindler 2014f).

As indicated above already and outlined below in more detail: From these 10 FSTP tests may be derived (semi-)automatically all meaningful "Legal Argument Chains, LACs". This enormously facilitates patent practitioners' decision making as to FFLN/SPL testing of claimed inventions.

A system based on a PTRFFLN-DS (Schindler 2013f) is an "Innovation Expert System ("IES")", if its "User Interface Entity, UIE" enables its user to access all in-C based "LACFFLNs" as to TT.0. While being calibrated, e.g. when its UIEs are defined by a user of the IES, the IES operates in "config-mode", while in its "realtime-mode" it instantly produces the LAC invoked by one of its users and outputs it under this or another user's acoustical/optical presentation and logics detailedness control. Both controls are in the sequel referred to by the term "presentation control".

A PTRFFLN-DS for a claimed invention embodies of the 10 FSTP tests, i.e. of the FSTP-Test, all "Arguable Subtests, ASTs", being the blueprints of all LACs: A LAC is just another presentation of an AST. The automatic generation of a - in general not unique - set of all ASTs for a PTR-DS is the main issue of this paper. It will be elaborated on in the next Section.

As shown by FIG 1, the UIE of an IES is made-up from UIE.Ys, Y=1,2,3,..., whereby any UIE.Y has 3 "Layer-UIE.Ys, L-UIE.Ys": Its knowledge representation "KR-UIE.Y", its human interaction "HI-UIE.Y", and its interaction control "IC-UIE.Y". In config-/realtime-mode of the IES the 3 L-UIE.Ys of an UIE.Y may be operated separately resp. only synchronously. As to their indices see below. I.e.: FFLN indices are often omitted from now on.

An IES or its user invokes an "Interaction" between them - in this exemplary layering of the 3 L-UIE.Ys in FIG 1, not excluding their alternative layerings or their coexistence - by a HI-UIE.Y of a LAC, this HI-UIE.Y uses via its IC-UIE.Y its KR-UIE.Y, which in turn uses the knowledge stored by PTR-DS (Schindler 2013f, Schindler 2013k). Invoking a UIE.Y causes executing at least one of its "UIE.Y Steps", which executes at least one of its "UIE.Y Moves" (see FIG 1).

A LAC.Z, Z=1,2,3,..., may exist only in realtime-mode and represent the execution of at least one sequential UIE.Y. IES implementation specific, a LAC may be generated by executing several sequential UIE.Ys - which is vastly excluded, here, for simplicity of this paper. Thereby a LAC.Z may use a set of UIE.Ys, presenting this LAC.Z in different "argumentative logics"/"detailedness" and/or acoustical/graphical representations, as customized by an IES user in config-mode – between which a user may toggle, e.g. by invoking HI-UIE.Z by IC-UIEs configured to be available when generating LAC.Z (Schindler 2014j, Schindler 2014k).

I.e.: In IES config-mode, any AST is semi-automatically transformed such as to yield in realtime-mode a specific and then further customizable LAC.Z presentation, i.e. transformed into one or several L-UIE.Ys standing for various logics and/or multimedia presentations of this AST – as then needed by e.g. a judge, examiner, lawyer, inventor, investor - which then may toggle between these UIE.Ys for emphasizing and/or highlighting aspects of this LAC.Z.

FIG 1 shows a LAC.Z, its AST.Z, and its single sequential UIE.Zs, any UIE.Z comprising one or several sequential steps/moves - whereby the index set Z is different for objects of different types, as explained in the next Section. While an AST.Z and its one or several sequential UIE.Zs, once defined/generated semi-automatically in config-mode, exist permanently in the IES, its LAC.Z actually exists only when being invoked, as it is generated/customized only after invocation - but this flightiness is ignored in the sequel. What is said above about a UIE.Y applies also for its steps/moves, i.e. here for its HI-UIE.Zs, KR-UIE.Zs, and IC-UIE.Zs.

The question, where a set of all AST.Zs comes from - evidently there is no LAC.Z without its "peer" AST.Z, which provides the reason for the meaningfulness of LAC.Z - is elaborated on in the next Section. But it is emphasized already here that understanding the being of ASTs requires understanding the semantics and pragmatics of the FSTP-Test, as only this understanding enables defining this set. For the specific FFLN "35 USC §§ 112/101/102/103" FIG 2 shows the resp. FSTP-Test, as elaborated on in Section 2.

Concluding this introduction a remark is in place: As to the new technique of "scientifically unquestionable innovation evaluation" provided by the IES and arguing about this innovation - in particular its capability to automatically present in realtime all then relevant LACs. An exemplary situation is: While arguing about a claimed invention's SPL conformance, the IES is capable of providing anytime in realtime for any of its aspects all existing LACs, thus showing that and why it does pass the SPL test. I.e.: The IES does not only represent

- "yet another user interface" for an application specific data base system. The IES and its automatic AST generation described below - and its (semi-)automatic AST to LACs transformation capability in its config-mode - namely is a system for identifying/describing mathematical sub-physical truths about innovations (Schindler 2013b, Schindler 2012a, Schindler 2013c) as the US Supreme Court requires for deciding their deserving protection by IPRs.
- an endeavor successfully never undertaken before - could not have been successful, as the US Highest Courts' SPL precedents pre-*Mayo* didn't provide a scientific and clear basis on which to ground it (O'Malley 2013, Enbanq Hearing 2013, Bey & Cotropia 2009). But, this recent *KSR/Bilski/ Mayo/Myriad* line of US Supreme Court decisions - since *KSR* and especially by *Mayo* dramatically refining SPL precedents for meeting by it the emerging technology needs - enabled the FSTP project, being founded therefore indeed, to conduct a series of serious mathematical KR investigations of the equally emerging mental/intellectual problems encountered and hinted at by the US Highest Courts in these cases, which eventually lead to launching developing the IES.

In total: The IES implements by its "FSTP-Test thinking" these trail blazing theoretical KR insights into the being and the way of unquestionably describing emerging technology innovations. Both would have been absolutely impossible to achieve, if it/they had not been induced by the US Highest Courts (by the German BGH (Schindler 2012a, Schindler 2013c) in an even earlier stage but far less completely). The IES thus is an incarnation of these mathematical KR insights, laying the ground for an innovation science/technology.

2 As to a set of all ASTs for an Invention’s SPL Test

This paper focuses on the question how to automatically generate a **"set of all ASTs, SoaAST"** for an invention's FFLN test, e.g. a claimed invention's SPL test. **Any** SoaAST is based on a hybrid argumentation-based model: Legally any of its ASTs is mathematically proven correct, with regard to its subject matter aspects the same AST is - currently - only confirmed to be correct, e.g. by the posc.

As the problem considered is of FFLN, by precondition, its FSTP-Test is finite, as shown by the SPL example of FIG 2 - being representative for all FFLN based FSTP tests.

Nevertheless, the FSTP-Test and even its component FSTP tests would in general be too complex for confirming them, e.g. by the posc, correct as a whole. Note that the legal correctness of any lexically/syntactically correct "**subtest, ST**" of the FSTP-Test is mathematically proven already by the location of this ST in the FSTP-Test. Thereby, as to the ASTs' legal correctness, their mathematical correctness proofs are independent of their I/O operations (towards a user or the PTR-DS), as these I/O operations' contents are transparent to the legal aspects of their ASTs.

I.e.: A SoaAST shall consist of as few as possible STs, called ASTs, being such that any meaningful ST of the FSTP-Test of the PTR is a legal and technical conjunction of such ASTs is as well as so simple as to enable any AST's immediate correctness confirmations by the posc. From the first one of these requirements follows: Any correct LAC* of a PTR's FSTP-Test is a conjunction of those LACs that are the KR transformations of the ASTs, the conjunction of which is the ST*, the KR transformation of which is LAC*.

There is no unique SoaAST. Yet, any one would provide a set of simple ASTs of the FSTP-Test, which are easily confirmable correct by the posc, such that holds for it: PTR satisfies FFLN iff it passes all ASTs from SoaAST.

This paper defines the SoaAST of a PTR-DS to comprise exactly any AST.Z that is the lexically and syntactically correct part of an FSTP test (of that PTR-DS) resulting from limiting it to one check of exactly one of the in-Cs of the PTR-DS - i.e. from removing from this FSTP test any multiple checks of this in-C and any check of another in-C than this in-C and thereby preserving its lexical and syntactical correctness.

Any so defined AST is either a whole FSTP test or simpler than the whole FSTP test comprising it. In the FIG 2 case, e.g. the FSTP test.2 may comprise several checks as to a single in-C, the FSTP test.4 comprises checking several in-Cs, just as most of the other FSTP tests,

The automatic generation of the set of all ASTs is possible only as the IES is PTR-DS based and the PTR is of a FFLN - which enables the IES, in its calibration in config-mode, to automatically derive all its AST.Zs from PTR-DS. The extremely simple, vastly context free syntax of the FSTP-Test namely enables automatically removing from any FSTP test those parts identified as not belonging into an AST.

Thereby all ASTs got to be passed by PTR on top of its finitely many and PTR-dependent BED-in-C subsets S' and S” (see FIG 2). For most existing PTRs only very few (1-4) such subset selections may exist, if any.

The next bullet points add some more and sometimes somewhat redundant details to what has been explained already.

- Any AST.Z is transformed into its peer LAC.Z (Schindler 2014j, Schindler 2014k) in potentially different presentations, i.e. linked to its potentially several UIE.Zs.

- How a UIE.Z is composed and makes-up its LAC.Z is explained in (Schindler 2014k).
- Any IES implementation may provide a default definition of all ASTs, e.g. the above given one, and default-wise link them to default UIE.Ys. A user then may start from these defaults for identifying additional alleged ASTs as needed by it, in particular if an AST's peer LAC has additional presentation and presentation control requirements.
- Thereby the objective here is not limited to providing only LACs required for justifying the classical claim construction for a claimed invention – being only LACs necessary for showing that it may satisfy SPL – but comprises also all LACs sufficient to show its satisfying SPL whatever is being questioned. I.e.: The IES got to be able to provide, as to a claimed invention's patent-eligibility as well as to its patentability, the security of passing the resp. tests.
- The value set of the index "Z" of AST.Zs in general is independent of that of an UIE.Y, and this is different in general from that of its LACs, whereby the latter index set often is identical to that of ASTs. E.g.: This value set for ASTs may reflect any AST's location in the FSTP-Test. Then any AST.Z-value would be mapped onto that index subset of all the UIE.Y-values, which support this specific LAC.Z peer to this AST.Z – evidently there would be several such UIE.Y-values, in general.
- Visa versa, any such pair <AST.Z-value, LAC.Z-value> may be indexed by the index of all UIE.Z-values, which glue this AST to this specific LAC. Thus, for any AST.Z-value there is a set of triples <AST.Z-value, LAC.Z-value, UIE.Z-value>.
- These index sets, their structures into subsets, and their associations may be conveyed by the HI-UIEs of an IES implementation to its user(s), in an implementation specific way in total, or in part, or not at all. As to this index association, it is of no concern that any LAC.Z may be structured into its individual steps and moves – these are carried by the structure of the peer UIE.Ys and the peer AST.Z.
- For a PTR-DS its KR transformation into a set of all AST.Zs is evidently quite different from the "general argument recognition" problem (Ashley & Walker 2013): Here the LACs necessary and sufficient for deciding whether an invention satisfies an FFLN, are provided by the peer ASTs underlying the LACs, i.e. any LAC is derived from its peer AST, i.e. need not be recognized.
- The preceding elaborations hold also for any PTR^{FFLN}-DS based IES, i.e. not only for an e.g. SPL based FFLN. Then, all relevant relations between the finitely many legal norms alias requirements to be met by PTR's TT.0 (e.g. the SPL or SCL) and, in any PTR, between finitely many BED inventive concepts making up this TT.0, and between elements of both these types are of First Order Logic (Boolos & Burgess & Jeffrey 2007).

3 THE PRACTICAL USEFULNESS OF AN IES

For understanding the practical usefulness of an IES in an invention's test for its satisfying an FFLN/SPL, the understanding is needed what mental items are to be communicated by LACs - by what terms of this paper - between the IES and its user and what the purpose is of these mental/intellectual items communicated, encoded by these terms. This is explained in more detail in (Schindler 2014k) and recapitulated, here, for showing the enormous importance of knowing all ASTs of this invention, as explained in the preceding Section.

This communication is conducted by exchanging instantiations of the "KR-UIEs", "HI-UIEs", and "IC-UIEs", all communicating aspects of the claimed invention under test and its BED-in-Cs. The meanings of these (**"binary elementary disclosed, BED"**) inventive concepts (Ashley & Walker 2013, Schindler 2014e) and the claimed invention's here substantial properties based in them are defined to represent specific relations, referring in

- KR-UIEs to relations between ASTs and IC-UIEs,
- IC-UIEs to relations between IC-UIEs and HI-UIEs,
- HI-UIEs to relations of HI-UIEs to PTR-DS items.

The usefulness of the IES is outlined by the following bullet point list, which explains in what (exemplary) way the IES is supposed to support the IES user(s) in an arguing process.

- The HI-UIEs' realtime information representations of a LAC to a user, in response to e.g. the latter's enquiry about some detail of the PTR-DS, or an FSTP test, or a LAC, or a UIE instantiation, ... represents the functional kernel of the IES. It serves the purpose the IES has been developed for: To enable the IES by this LAC to react, in its response to this question, as if the response were provided by an all-knowing person.
- An acoustical answer may be represented as spoken by a default speaker or e.g. by the "front man user" or some "back office user" (see below), a graphical answer as actually drawn by one of them, a multimedia answer would combine both. To this end, 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 (IMR = interactive multimedia response). This "personalization" of the behavior of the claimed invention's IMR subsystem would comprise that several users may cooperate in jointly presenting a complex LAC by alternatively speaking or reacting on interposed questions by answering them immediately – such prompt reactions being configured to be interventions and/or accompanying illustrations under user control. (CAFC 2014, CAFC 2013b) are taken as examples of the clear advantages of such potential co-operations.
- The term LAC stands for what is commonly understood by it - its broad meaning is not limited in any other way. In particular, in config-mode any automatically generated LAC can be smoothened by a user, as to its logics as well as to its presentation, though the automatic version must not be destroyed - for preserving authenticity of the PTR, the posc, and the IES.
- The term "user" stands for several persons using the IES - evident in config-mode but true also in realtime-mode. The latter is explained by the scenario that a lawyer talking to a court during a hearing about the claimed invention is supported by its "back office user" watching the hearing for supporting this "front man user" in realtime by selecting from the sometimes many options the IES offers the one that at this point in time seems to be the most feasible to take, thus guiding the front man.
- The IES would execute in config-mode much in realtime-mode all of this whole process automatically – i.e. of: α) recognizing what enquiry is being asked, β)

identifying the set of possible answers, γ) compiling from the previously input fragments complete sequences of multimedia outputs controlled by HI-UIEs, which represent these answers, and thereby δ) recognize when to output which of these replies. Any one of these steps α) - δ) may require some interactions with a user or at least an invocation. These may be different when invoking a UIE instantiation in different modi, e.g. i) in explorative/calibrating mode, ii) in reply preparing mode, and iii) in reply mode, whereby this invocation may in between interact with the user iv) in some elaboration mode and thereafter v) in a consolidation mode.

- The IES implementation may provide HI-UIE defaults of all such user interactions α)-γ) in i)-v), as well as macros for the stereotypically recurring parts of 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 … 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 defaults' functioning is far from what a front man user ideally would like to use when actually arguing, e.g. in a court hearing, about testing a model based claimed invention for its satisfying SPL.
- The input and commands provided by the user to the IES must have, for being understandable by it, some before given – i.e. a priori defined or by calibrating of the IES – alphabet(vocabulary)/syntax/semantics/pragmatics.
- These general explanations of the working of the IES provide an idea of the above mentioned (semi-)automatic LAC generation by the IES, being a derivation from its peer AST and its further representation adaptation according to the directives of a user (Schindler 2014k).
- The content of a human interaction, i.e. its semantics, is currently transparent to the IES even if it is automatically derived by the IES from the AST at issue, occurring for very simple ASTs only.

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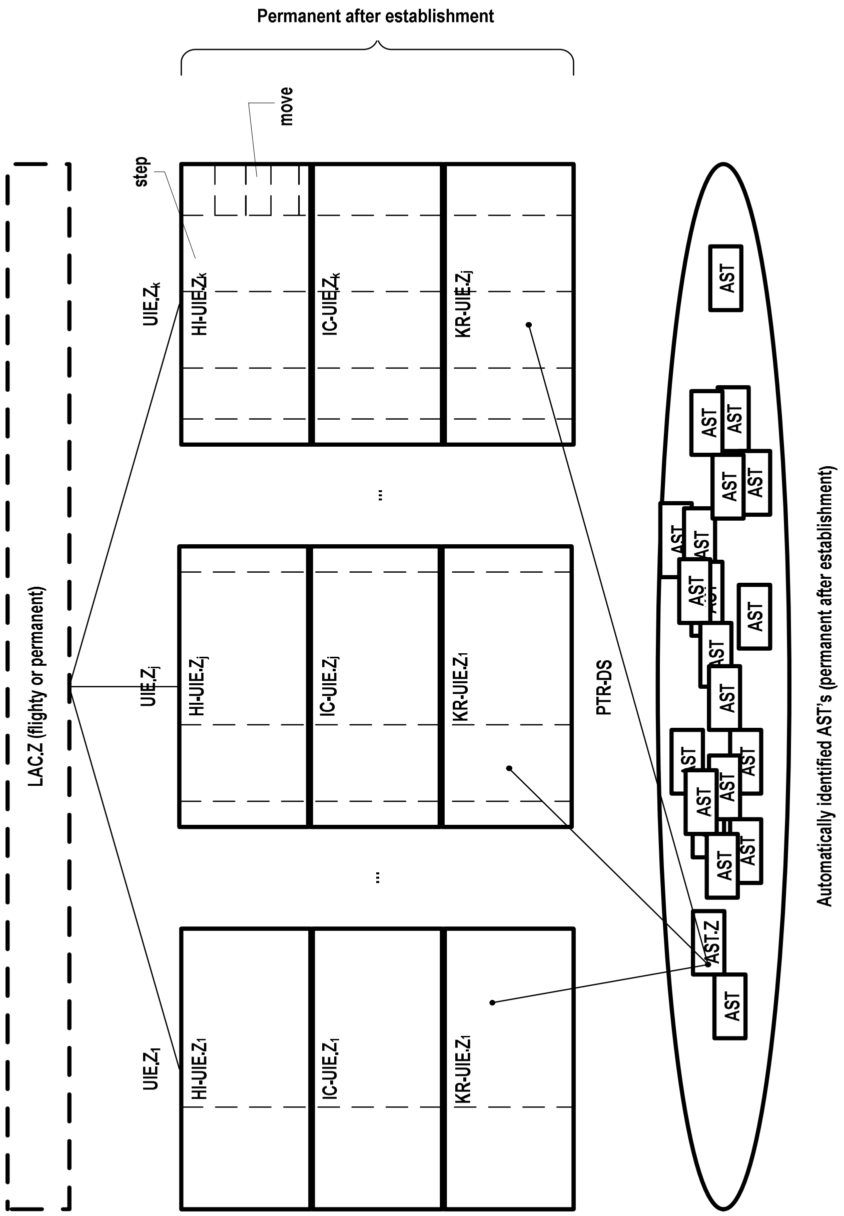

Figure 1 A LAC with k UIEs, any UIE subdivided into individual steps / moves.

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1) The FSTP-Test, expanding a data structure PTR^{CT}-DS, representing a given PTR^{CT} – in particular its claimed invention, TT0, its prior art reference set, RS, its problem, P0, and docCT comprised by doc0 and determining details of testing TT0 under CT's FFLN – in a memory for storing also the so expanded PTR^{CT}-DS as generated by executing this FSTP-Test on the compound creative concepts BAD-X0n and their mirror predicates BAD-$\underline{X}$0n of the elements X0n of the TT0^{CT}, 1≤n≤N,

the FSTP-Test starting by the **justified disaggregation** of these compound creative concepts and comprising the steps **(a)-(d)** and writing ∀ items generated by their execution into the memory, too, by

- **(a)** prompting the USER for this PTR^{CT} and copying it into memory;
- **(b)** prompting the USER for a R&S strategy of this FSTP-Test, being
  - **(b).1** either a R&S default strategy,
  - **(b).2** or a USER given alternative or complementary R&S strategy;
- **(c)** automatically identifying in PTR^{CT} ∀ doci-MUI ∧ BAD-$\underline{X}$in ∧ docCT-MUI;
- **(d)** automatically prompting it for a potentially viable set {BED-cr-C0k | 1≤k≤K};
- **(e)** automatically prompting it for posc justification, JUS^{posc}({BED-cr-C0k | 1≤k≤K});
- **(f)** automatically <JUS^{posc}({BED-cr-C0k||1≤k≤K})>{BED-cr-C0k|1≤k≤K};
- **(g)** automatically prompting it to disaggregate ∀BAD-$\underline{X}$0n **:** {BED-cr-$\underline{C}$0k^{n}| 1≤k^{n}≤K^{n}} ⊆ {BED-cr-$\underline{C}$0k|∀1≤k≤K} ∧ BAD-$\underline{X}$0n **::=** ∧$^{1≤kn≤Kn}$BED-cr-$\underline{C}$0k^{n}, 1≤n≤N ∧ BED-cr-$\underline{C}$0k^{n} ≠ BED-cr-$\underline{C}$0k$^{n'}$ ∀n≠n' ∧ ∑$^{1≤n≤N}$ K^{n} = K;
- **(h)** automatically prompting it ∀ BAD-$\underline{X}$0n a justification JUS^{da}(BAD-$\underline{X}$0n) by doc0-/ docCT-MUIs of its disaggregation into **Λ**$^{1≤kn≤Kn}$BED-cr-$\underline{C}$0k^{n};
- **(i)** automatically [JUS^{da}(BAD-$\underline{X}$0n),{BED-cr-C0k^{n}|1≤k^{n}≤K^{n}}]>BAD-$\underline{X}$0n, 1≤n≤N.

2) Continuing **1)** by **justifying** ∀ the **lawful disclosures** of ∀**BED-cr-C0k^{n}** by:

- **a** automatically prompting it, ∀BED-cr-$\underline{C}$0k^{n}, for a not yet used disclosure DIS'(BED-cr-C0k^{n}) **::=**{MUI.0s disclosing this BED-cr-C0k^{n} lawfully};
- **b** automatically prompting it for JUS^{dis}(DIS'(BED-cr-C0k^{n}));
- **c** automatically [{<items of **a**, items of **b**>]>BED-cr-C0k^{n}.

3) Continuing **2)** by **justifying** ∀ **BED-in-C0k$^{n'}$** its **definiteness**, by

- **a** automatically prompting it, ∀BED-in-$\underline{C}$0k$^{n'}$ used in a means-plus-function-clause, for a JUS^{def}(BED-in-C0k$^{n'}$) of its definiteness due to its DIS(BED-in-C0k$^{n'}$);
- **b** automatically <JUS^{def}(BED-in-C0k$^{n'}$)>BED-in-C0k$^{n'}$.

4) Continuing **3)** by **justifying** ∀ **BED-in-C0k$^{n'}$ its S'-enablement**, by

- **d** automatically prompting it for selecting a potentially viable S';
- **e** automatically prompting it, ∀ BED-in-$\underline{C}$0k$^{n'}$ ϵ S', for a JUS^{ena}(BED-in-C0k$^{n'}$, S') of its enablement in S' due to DIS(BED-cr-C0k$^{n'}$) of some BED-cr-C0k$^{n'}$ϵS';
- **f** automatically <JUS^{ena}(BED-in-C0k$^{n'}$, S')>BED-in-C0k$^{n'}$.

5) Continuing **4)** by **justifying** ∀ **BED-in-C0k$^{n'}$ its S'-independence**, by

- **a** automatically prompting it, ∀ BED-in-C0k$^{n'}$ ϵ S', for a JUS^{ind}(BED-in-C0k$^{n'}$, S'), holding due to BED-in-C0k$^{n'}$ not evidently derivable from S'\BED-in-C0k$^{n'}$;
- **b** automatically <JUS^{ind}(BED-in-C0k$^{n'}$, S')>BED-in-C0k$^{n'}$.

7) Continuing **5)** by **justifying ∀ BID-in-C0k** its **posc-nonequivalence**, by
$\forall\ 1 \leq k^n \leq K^n\ \wedge\ \forall\ 1 \leq n \leq N$:

- **a** if |RS|=0: automatically BED*-in-C0k ::= "dummy" ∧ automatically <BED*-in-Cik$^{\mathbf{n}}$, JUS$^{\mathbf{posc}}$(no_RS)>BED-in-C0k$^{\mathbf{n}}$,
- **b** else:: performing **c-f** ∀ 1≤i≤|RS|;
- **c** automatically prompt it to disaggregate ∀ BAD-Xin into $\wedge^{\mathbf{1 \leq kn \leq Kn}}$BED-in-Cik$^{\mathbf{n}}$;
- **d** automatically prompt it to define BED*-in-Cik$^{\mathbf{n}}$ ::= either BED-in-C0k$^{\mathbf{n}}$ if BED-in-Cik$^{\mathbf{n}}$ is = BED-in-C0k$^{\mathbf{n}}$ ∧ disclosed ∧ definite ∧ enabled, else "dummy(ik$^{\mathbf{n}}$)";
- **e** automatically prompt it for JUS$^{\mathbf{posc}}$(BED*-in-Cik$^{\mathbf{n}}$);
- **f** automatically <BED*-in-Cik$^{\mathbf{n}}$, JUS$^{\mathbf{posc}}$(BED*-in-Cik$^{\mathbf{n}}$)>BED-in-C0k$^{\mathbf{n}}$.

8) Continuing **6)** by **justifying TT.0 is not an abstract idea only**, by

- **a** automatically prompting it to invoke the NAIO test[1)] on the pair (S',P).
- **b** automatically [{JUS$^{\mathbf{NAIO}}$(S',P)|∀BED-cr-C0k$^{\mathbf{n}}$'∊S'}]>DIS$^{\mathbf{NAIO}}$(S',P)

9) Continuing **7)** by **justifying TT.0 is not natural phenomena solely**, by

- **a** automatically prompting it, ∀BED-cr-C0k$^{\mathbf{n}}$'∊S', for determining S"⊆S', whereby S" ::= {BED-cr-C0k$^{\mathbf{n}}$'| ∃JUS$^{\mathbf{NONPS}}$(BID-cr-C.0.k$^{\mathbf{n}}$')};
- **b** automatically <JUS$^{\mathbf{NONPS}}$(S") ::= NONPS arguments ∀∊S")>S';

10) Continuing **8)** by **justifying TT.0 is novel and nonobvious**, by

- **a** automatically prompting it to invoke the NANO test[2,)] for the pair (S', if |RS|=0:{BED*-in-C0k|1≤k≤K} else:{BED*-in-Cik|1≤k≤K ∧ 1≤i≤|RS|});
- **b** [performed by NANO test execution]: automatically <JUS$^{\mathbf{NANO}}$(S')::= arguments justifying the steps of the NANO test and evaluating the number Q$^{\mathbf{plcs}}$(S')>S'.

11) Continuing **9)** by **justifying TT.0 is not idempotent**, by

- **a** automatically prompting it to invoke the NANO test for the pair (S", if |RS|=0: {BED*-in-C0k|1≤k≤K}ΠS" else: {BED*-in-Cik|1≤k≤K∧1≤i≤|RS|}ΠS");
- **b** [performed by NANO test execution, exactly as in 7)].

Figure. 1. The FSTP-Test and its 10 FSTP tests

For FIG 2 please note: Separating dots in identifiers are omitted; often no distinction is made between identifiers of concepts and predicates mirroring each other; "automatically <…..>…" stands 1for2 "automatically appending <…..> to …"; all prompts address the user.

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1 For the NAIO test also see [Schindler 2013b]. As it embodies intricacies, its steps are here repeated: It

- **a** automatically prompts the USER to state the total usefulness of the claimed invention – denoted as "the problem, P" (to be) solved by it over S';
- **b** automatically prompts the USER to identify DIS$^{\mathbf{NAIO}}$(S',P) ::= {doc.0-MUIs describing/disclosing P (to be) solved by it over S'};
- **c** automatically [DIS$^{\mathbf{NAIO}}$(S',P)]> S';
- **d** automatically prompts the USER, ∀BED-cr-C0k$^{\mathbf{n}}$'∊S', through any doc.0-MUI, for justifying by JUS$^{\mathbf{NAIO}}$(S',P,BED-cr-C0k$^{\mathbf{n}}$') that the latter is indispensable in the claimed invention for enabling it to solve P; (as explained in [Schindler 2013b]);

2 For the NANO test see [Schindler 2013b]; its detailed explanation may be found in [Schindler 2012a].