A KR Based Innovation Expert System (IES), Using US Substantive Patent Law Precedents

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Abstract—The paper terminates by outlining the multimedia UI of a prototype of the KR based Innovation Expert System (IES), which tests a claimed – classical as well as emerging – technology invention under the Substantive Patent Law (SPL) of any National Patent System (NPS), in particular under the 4 §§ 101/102/103/112 of 35 USC, as interpreted by the Supreme Courts' *KSR/Bilski/Mayo* decisions. Already this IES prototype is capable of indicating the amazing power of the "Patent Technology" induced by this US Highest Courts' SPL precedents as to such tests for a claimed invention. It works semi-automated when testing in explorative mode and fully automated/real-time when testing in confirmative mode. Developing this powerful Patent Technology has been enabled by performing substantial Mathematical KR research about recent US Highest Courts' patent precedents – published by Mathematical KR research papers and amicus briefs submitted to the US Supreme Court and CAFC as to KR insights so obtained into the problems of SPL precedents, e.g. when dealing with claimed emerging technology inventions.

Index Terms—SPL (Substantive Patent Law) and KR based claimed inventions' tests, a KR based IES prototype and its UI, emerging technologies inventions, the Supreme Court's *KSR/Bilski/Mayo* decisions and their notions of "inventive concept"/"preemptivity"/"abstract idea", the CAFC's recent precedents

I. Introduction

Internationally and nationally inconsistencies in SPL precedents have increased with the advent of claimed inventions dealing with subject matter in emerging technologies areas. As compared to classical technologies SPL precedents and its allegedly clearly understood pragmatics, applying SPL on emerging technologies inventions encounters new kinds of pragmatics not yet understood. Inconsistencies arise, as these new pragmatics of emerging technology inventions come together with their and their subject matters being intangible and invisible. This requires replacing both by a purely mental model, the invention and its base of notions (= functionality provider). They then are called "model based".

Classical SPL precedents is not really applicable to model based claimed inventions, as its classical claim construction assumes a tangible/visible subject matter, hence allegedly patent-eligible. I.e., there no need existed to separate patent-eligible from non- eligible inventive concepts – existing with intangible/invisible emerging technologies' subject matters. For dependably achieving this separation and understanding its implications, a refined claim construction is indispensable, as shown by the inconsistencies evolved already. Yet, defining this refined claim construction precisely and completely – as required and clearly outlined by the Supreme Court's *Mayo* decision, though with a broad brush only – involves serious intricacies. Removing them dependably is possible by KR Technology, partly by only "Mathematical KR", as shown in [1].

To put this quite unmistakably: The fact that KR Technology indeed managed to identify the reasons for the notional inconsistencies of recent SPL precedents and to remove them by defining for a claimed invention – be it of classical or of emerging technologies – the refined claim construction precisely and completely, is probably hitherto the most important contribution of KR Technology to solving an otherwise seemingly unsolvable basic problem of technology depending societies. Anyway, the amazingly powerful "Patent Technology" outlined by this paper could not have developed without this Mathematical KR (Technology) – or the US Highest Courts' SPL precedents.

II. On Substantive Patent Law (SPL)

The *Mayo* decision [2] showed that describing a model based claimed invention by its "inventive concepts" facilitates isolating/recognizing its new pragmatics in spite of its new mental problems due to its and its service provider's intangibility/invisibility. The term/notion of "concept" is similarly used since ever in advanced IT[1] [3], [4]. I.e.: The far reaching potentials of the term/notion of "concept" is commonly known and fundamental in probably all branches of advanced IT since dozens of years. But there this term/notion has been developed to a degree of sophistication completely clouding its potential usefulness for SPL precedents. But, the *Mayo* decision shows that only the next to trivial kernel of this notion is used by the notion of "inventive concept", which makes it apt for SPL.

Thus: Here the US SPL is taken exemplarily, i.e. the 4 §§ 101/102/103/112 of 35 USC, but any other National Patent System's (NPS) SPL could have been taken also, e.g. in the EU the §§ 52-57, 69 of the EPC. The inconsis-

[1] "Advanced IT" is a generic term for IT areas such as AI, Semantics, KR, DL, NL.

tencies in the US SPL precedents indispensably imply reconsidering in all NPSes their "claim construction alikes" for emerging technologies' inventions.

Proceeding as the US Supreme Court's *KSR/Bilski/Mayo* decisions require is possible in all other national/regional SPLs, too. But this implies getting familiar with the "scientificity" to be used in testing a claimed invention this way, especially with the *Mayo* decision's new key terms/notions "inventive concepts" and "preemption"/"abstract idea" – as they facilitate separating in any SPL its concerns (= requirements) from each other [5], [6]. Additionally, they fully compensate the impossibility of graphically supporting the presentation of the properties of a model based claimed invention [7]. They thus enable showing/proving that these properties meet the separated SPL requirements/concerns.

The transition – from the classical claim construction to a refined claim construction by using these additional, new, and more purposeful terms/ notions in •) interpreting a SPL, •) describing the properties of the invention to be tested under this SPL, and •) showing these properties meet these requirements/concerns – is a "paradigm refinement", as explained in detail in [6].

Summarizing the message conveyed by this Section: This paper is focused on showing •) that the groundbreaking insights coming together with the Supreme Court introduced terms "inventive concept" and "preemption"/"abstract idea" just leverage on Mathematical KR [1] but completely avoid confronting a user with any Mathematics •) the huge advantages that the so by the US Highest Courts induced "Patent Technology" provides to every patent practitioner's professional life, by outlining the powerful functionalities of the IES.

III. On Patents and Innovations

"Patent/SPL Technology" and its refined claim construction – induced by the US Highest Courts' patent precedents – are intellectually only slightly more demanding than the hitherto allegedly sufficient classical claim construction. Nevertheless, its "post-*Mayo*" refined claim construction dramatically reduces by its "purposefulness" [8], [5], [6] the time for testing a claimed invention under 35 USC §§ 112/102/103/101, i.e. under US SPL – while the classical claim construction is oversimplistic and so creates confusion and invites misuse in many practical cases, e.g. in applying a strange BRI [9], [10].

Patent Technology is an administrative "cross-sectional technology" in that it impacts on decision making in all US institutions below the Supreme Court – but not on the top of this hierarchy, the AIA (as erroneously seen, due to its disaggregating the 4 compound legal requirement statements of its 4 §§ 101/102/103/112 into 10 SPL/FSTP tests) [5]. But this administrative view on Patent Technology ignores its impacts on everyday's patent business.

By performing this disaggregation of compound legal concerns/requirements – of the fictional but politically decisive "social contract" underlying SPL – Patent Technology implements the Supreme Court above interpretation of the §§ 101/102/103/112. It maps these §§'s 4 compound requirement statements onto (today) 10 "concerns separating" such statements, checked by 10 simple FSTP/SPL tests (for an invention to be patent-eligible and patentable).

I.e.: This logically correct mapping – of 4 compound onto 10 elementary legal concern/requirement statements – implies that these 10 simple tests are to be passed by a claimed invention if and only if it is patent-eligible and patentable under the SPL of 35 USC. But this mapping on to the 10 simple test exposes that the Supreme Court's *KSR/Bilski/Mayo* and CAFC decisions actually go far beyond their usual impacts on subordinate institutions' alike decisions – by even enforcing key insights as to basic questions arising in developing a much further reaching "Mathematical Innovation Theory" needed as a guide to finding/developing/financing/evaluating/ marketing/using useful innovations in all areas of social life with an efficiency unknown today, and of which the Patent Technology presented here is just a first step. I.e., these Highest Courts' hints pointed at and inspired starting developing what eventually may be called a "Practical Innovation Technology". Such fundamental technologies – earlier found ones are e.g. building an acre, or a state, or a wheel, or an academy, or an electric conductor, or a computer, … – once recognized are never forgotten.

IV. The IES User Interface

The only prerequisite for applying these 10 FSTP/SPL tests, either exploratively or reconstructively, is appropriately having marked-up all documents involved in a PTR^C's analysis [11] – [15].While this would only rarely happen with the doc.CTs, the needs of additional mark-ups in doc.i's are frequently encountered during an explorative FSTP test's iterative executions, in particular if the tested PTR's RS is expanded by a further doc.i or the definition of a cr-C is changed [13], [5], [15]. Such mark-ups will be based on some of the XML derivatives currently discussed to this end. Independently thereof, the IES'es UI concisely models the requirements of the NPS'es SPL, of its precedents, and also of some application area specificities (such as of communications, software system, lifecycle, DNA, nano, selfreplication, … technologies, including their above quoted pragmatics decisive for their social success).

FIG 1 shows 4 separate windows of the IES'es UI, simultaneously mapped onto one or several screens, in total called "survey window". These 4 windows are identified by their names "o-doc.i", "facts.i", "plcs.i", and "tests" in their top left edges. They serve for the knowledge representations of/about primarily •) the original document.i's in o.doc.i, •) their "inventive concepts" on their o/BAD/BID-KR-levels in facts.i, •) their "patent logic carrying semantics" items on these levels in plcs.i, and •) the 10 FSTP/SPL tests. They may be arbitrarily zoomed, positioned, and overlapped within the survey window. The graphical items within these 4 windows basically represent inventive concepts and/or their components in these KRs. The lines between these items

represent their peering in any KR and indicate interrelations between them. Their arrowheads are exemplary for browsing between them – i.e. all lines may have two arrowheads.

This UI presents in its survey window – functionality top-down in telegram style – the following:

- The middle "tests" window provides access to the use of the claimed invention's inventive concepts by any FSTP test – skipped here but shown to the user on its request by the ANC matrix columns, represented by test specific matrix lines describing in short hand this use.
- On the left lower side, in the "o-doc.i" window, two stacks are shown: Of 3 peer doc.i's (their mark-ups comprising all potential cr-Cs' disclosures) and of doc.CTs (their mark-ups comprising all le-Cs, e.g. law/precedents items to be applied where appropriate, resp. additional information potentially belonging to it, such as explanations/confirmations/ warnings/…, all of them independent of the doc.i≠doc.CT, i.e. any pragmatics independent of the TT.i's).
- On the right lower side the "facts.i" window shows a stack of 3 doc.i's/TT.i's – for simplicity assuming doc.i comprised just a single claim, otherwise any claim would be one sub-plane. Per TT.i its elements' (= rectangles) properties (= ovals) are arranged on its plane in concentric "KR rings", delimited by dashed lines. The large/small ovals represent BAD/BED-in-Cs, o-in-Cs are parts of their elements' rectangles. A BED-in-C shows some of its relations to other in-Cs and what all their KR details are, e.g. where in a claim in "o-doc.i" or "test" it is involved in and where in the problem to be solved by TT.i in these windows. The encoding of all KR details and the tests is shown in "plcs.i".
- The "plcs.i" window on top is the IES "brain". It stores all in-Cs' peerings of all subject matter items (cr-Cs) with all legal items (le-C) and all their interrelations. It indeed shows everything the user's brain knows about the PTR: all its objects, as well as all potential and/or actual associations between them, and all the sophisticated structures potentially appended to them (not shown here for brevity).

I.e.: The quick and total overview about all the documents and their mark-ups of all subject-matter items resp. legal/pragmatic items resp. all to these mark-ups related in-Cs (in o-/BAD-/BID-KR) in doc.i is provided to the user – be it an inventor or patent lawyer or examiner or judge – by the two bottom windows, whereby these stacks' items may be presented nonoverlapping and then show the interrelations between their peer items.

The PTR independent counterparts to the cr-Cs, the le-Cs, potentially making cr-Cs to in-Cs are the items on the right of the top window. The resp. doc.CT's, their mark-ups, and their items in the plcs.i-window are absolutely the same for all PTRs (in particular for their TT.0s' claim constructions). For a given PTR, all such peerings and the explanations why they happened are the items on the left of the top window.

As usual, the user would access any item of interest in any window by clicking on it and zooming into one or several of its interrelations. Thereby simultaneously several of such interrelations as well as concatenations of them may stay displayed and zoomed as momentarily of interest for the user. What actually is – or ought to be – of interest to him may be determined by him or an additional application not elaborated on, here.

The "test" window, providing access to all FSTP tests (in all their various configurations), is highly configurable for the various needs of the user in particular in real-time confirmation mode for being able to appropriately guiding the user through a test.

In total: The survey window provides e.g.

- immediate access to ALL information/knowledge existing in any one FSTP/SPL test of the claimed invention.
- immediate and instant crossovers between ALL KRs of ANY ONE subject matter and/or legal item.
- immediate crossover from ANY ONE subject matter item to ANY ONE of its relation – and back.
- immediate crossover from ANY ONE relation to its peer in any TT.i – and back.
- immediate crossover from ANY ONE test using an item or relation to any test and its use thereof.
- immediate information about the impact of a change performed in one of the 4 windows on the other ones.

and all these services instantly, i.e. in "dialog real-time", i.e. necessarily automatically.

V. Conclusion

No system like the IES exists today – or could only have been thought of without the insights of Mathematical KR presented in [1] and the informal KR ex- or implicitly used in our publications addressing the community of patent law professionals. The kind of KR induced primarily by the US Highest Courts SPL precedents enabled transforming it into this advanced IT system. While the current IES is only a prototype, even its final version would not yet be capable of acting as an autonomous innovations tracing system, but will be able only of supporting such tracing activities. It is designed as just as a versatile evaluation system of innovations completely identified and specified already – though an amazingly powerful one.

References

[1] S. Schindler, "Mathematically modelling Substantive Patent Law (SPL) top-down vs. bottom-up", in *Proc. JURISIN 2013*, Yokohama, Japan, October 27 – 28, 2013, pp. 79-92.

[2] Supreme Court Decision, "Mayo collaborative servs. v. Prometheus labs Inc", No. 10-1150, 2012.

[3] R. Brachman and H. Levesque, "*Knowledge Representation and Reasoning",* 1st ed. Morgan Kaufmann, 2004.

[4] F. Baader, D. Calvanese, D. McGuinness, D. Nardi and P. Patel-Schneider, "*The Description Logic Handbook*", 2nd ed. Cambridge University Press, 2010.

[5] S. Schindler, "Amicus Brief in LBC v. Phillips", amicus brief to CAFC, 2013.

[6] S. Schindler, "Amicus brief in Alice v. CLS", amicus brief to US Supreme Court, 2013.

[7] S. Schindler, “Amicus brief in WildTang. v. Ultramercial”, amicus brief to US Supreme Court, 2013.
[8] S. Schindler, “US Highest Courts’ Patent Precedents in Mayo/ - Myriad/CLS/Ultramercial/LBC: ‘Inventive Concepts’ Accepted – ‘Abstract Idea’ Next? Emerging Technology Patents: Intricacies Overcome.” 2013, available: http://www.fstp-expert-system.com.
[9] USPTO/MPEP, “2111 Claim interpretation; Broadest Reasonable Interpretation, BRI- [R-9]”.
[10] K. O'Malley, “Keynote Address”, presented at the IPO 2013, Boston, Massachusetts, September 17, 2013.
[11] S. Schindler, “FSTP Expert System“, US 2013/0006908 A1, January 03, 2013.
[12] S. Schindler, “Innovation Expert System, IES, and its PTR Data Structure, PTR-DS”, US 2013/0179386 A1, July 11, 2013.
[13] J. Schulze, “*Tech. Rep. #1.V1 on the ‘882 PTR and UI of the IES prototype*”, to become available: http://www.fstp-expert-system.com.
[14] S. Schindler, “*Patent Business – Before Shake-Up*”, Marketing Brochure, 2013, Available from Author.
[15] S. Schindler, “Inventive Concepts Enabled Semi-Automatic Tests of Patents”, Patent Application US 13/923,630, June 21, 2013.

Sigram Schindler was born 1936 in Lodz (Poland). He received German nationality in 1939 and resides in Germany since 1945. His **Academic Career** started in 1956 at the Technical University of Berlin (TUB) (applied mathematics, theoretical physics, abstract mathematics, several arts), concluded with a diploma degree. From 1971 on he was a member of the German Federal Government's board for Computer Sciences. Since 1972 he was a professor and since 1974 full professor of operating systems (later also of communication systems) in the Department of Computer Sciences at the TUB. From 1971 to 1998 he acted as chairman of a number of committees for various Computer Sciences programs at the TUB. From 1976 to 1994 he was a member of national, European and international associations for development, promotion and standardization of future IT technologies. In 2001 he retired as emeritus of TUB. His ongoing **Research Interests/Activities** focus on Advanced IT based analysis of innovation and development of a respective patent law technology, in particular for emerging technologies inventions.

Sigram Schindler started his **Business Career** by founding TELES GmbH in 1983, of which he was the sole owner and general manager until he took the company public; since then he serves as CEO of TELES AG.

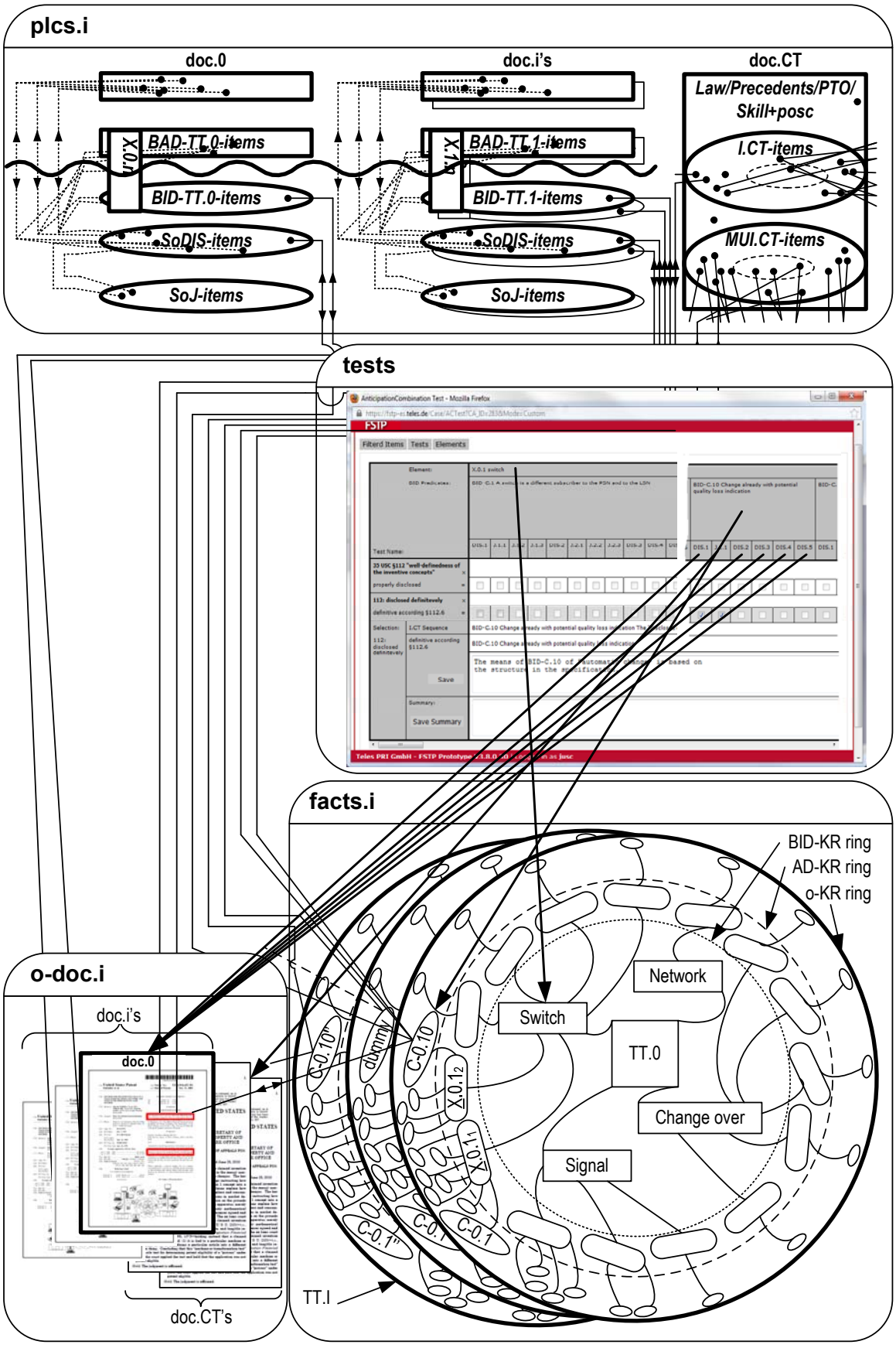

FIG 1 4 separate UI windows of the IES