APEX STANDARDS

US-8,224,282-B2: Invalidity Assessment using Knowledge Graph and Claim Construction

Case Study
Tech Report C20000242
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In March and April of this year, Ollnova Technologies, a non-practicing entity (NPE) based in Ireland, filed infringement lawsuits along the district courts of Texas and Florida against major household IoT companies including Resideo (a Honeywell spin-off), Emerson, Carrier Global, Ecobee, and Google. An allegedly infringed patent is US-8,224,282-B2, "Method and method to regulate power of wireless multi-sensor devices," which was originally owned by Siemens Industry.

Using this patent as an example, we illustrate an alternate prior art search strategy that enables stakeholders to evaluate the risk of a patent's validity from a visual, holistic standpoint.

The first step is to come up with a list of potential prior art candidates. We construct a citation network by utilizing the Apex Standards Knowledge Graph, with US-8,224,282-B2 serving as the seed patent, and pull out the other patents either citing or cited by the seed patent, both directly and indirectly. We track down these citation edges in search of root prior arts relevant specifically to the seed patent.
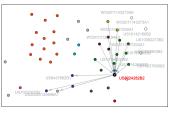

Figure 2. Call out - when a user clicks on a seed patent, only the citation links into and out of the seed patent are displayed, obscuring all other information. For example, the seed patent points to two purple nodes, indicating its backward citation relationship into StatSignal Systems patents US6437692B1 and US7053767B2, to its left. The other way around, multiple green and brown nodes points to the seed patent from the top, indicating their forward citation relationship, and, a potential upper hand over iControl's and Ucontrol's portfolios.

Visualizing the Seed Patent's Vicinity: a Citation Landscape Renders Clarity.

By visually examining Figure 1, we identify citation patterns stated in the caption. As illustrated in Figures 2-8, we can distinguish between patents in the hub and those in the periphery, and then explore based on our interest. In this induced network, we note that even

Figure 3. Step through - following onto one of the seed patent's citations, US6437692B1, we observe that it is pointed by virtually all of the other nodes in this network. This indicates that it demonstrates its position as an important stepping stone in the vicinity on which later inventions depend.

if certain prior art references were not cited by the seed patent, i.e., they were not considered by the USPTO examiner initially, they may nevertheless be relevant, either directly or indirectly.

Genghis Khan Prior Art: an Anticipatory Power Analysis

Certain highly cited patents may appear to be more anticipatory, as they may be traceable to the prior art of prior art, via the backward citation chains. Modern graph theory tools assign scores based on the degree of ancestry, such as an Authority Score, a Hub Score, a Centrality Score, or a PageRank score; heuristically, a patent would obtain a higher score if it is located in a hub and a lower score if it is located on the periphery. However, they may be black boxes that are not always explanable for legal practitioners, despite their seeming simplicity. For instance, if patent A receives a score of 8.8 and patent B receives a score of 8.7, and both are highly ranked, does that teach anything about their relative positioning, or is it possible to determine subject matter similarity to the seed patent, and how.

Figure 4. Beneath US6437692B1 is another purple node, representing another StatSignal art; this time, it is a pre-grant publication (PGPUB), US20060181406A. Clicking on it, we discover that it is also highly cited, with a crucial distinction, however, that it is not cited by the seed patent.

Figure 5. On the network's upper half, another widely cited patent art, US6914533B2, catches attention, which appears to be yet another StatSignal prior art, but under a slightly different entity name, "StatSignal IPC LLC." Neither is it cited by the seed patent.

Finally, "all" (most) post arts can be identified, selected, and prioritized by the citation network construction. As a result, it enables due diligence, i.e., it should identify as many relevant arts as possible to either invalidate the seed patent or provide confidence that the seed patent is robust and assertive enough to be used in an infringement case. As another example, the construction renders critical insight into high-dollar acquisition decisions that, if explored and understood, shall overcompensate the buyer.

Subject Matter Relevance and Invalidity Risk Exposure Analysis: Claim Construction Cross Checking

Following the selection of candidate prior arts, one begins to compare their subject matters. A researcher may arrive at various interpretations depending on his or her point of view. Multiple claim constructions can be performed so that feature terms are better matched and aligned, making comparison easier for the researcher. See Table 1 (Page 2).

Figure 6. On the right side of the network, the Diebold Nixdorf patent US7606767B1 (in red) just beneath the seed patent receives numerous citations. The seed patent does not cite it. Intriguingly, it is cited primarily by IControl patents (in green) and Bank of America patents (in blue), but neither by Rain Bird patents (in orange) nor StatSignal patents (in purple), signaling a possible subject matter dissection.
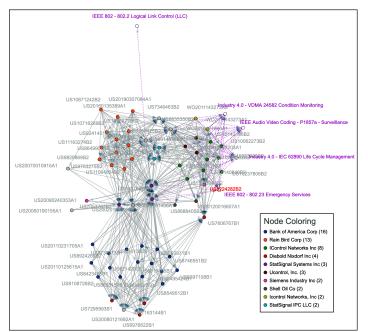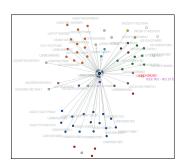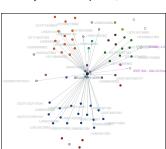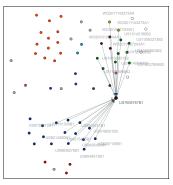

Figure 1. Apex Standards Knowledge Graph is constructed by using US-8,224,282-B2 as a seed patent (positioned at the center right and highlighted in red). In the upper right corner, the construction also incorporates industrial standards that are relevant to some of the network's patents, including the Industry 4.0 standards IEC 62890 Life Cycle Management and VDMA 24582 Condition Monitoring, IEEE P1857a Surveillance, and IEEE 802.23 Emergency Services. Along the citation edges, we spot root prior arts pertaining to the seed patent. By quantity, Bank of America appears to have the most patents in this construction, totaling 16, which are located in the lower half and colored in blue. Rain Bird has 13, located in the upper left corner and colored in orange, followed by iControl, with 8 patents in green, located in the upper right above the seed patent and near the industrial standard nodes in purple texts.

Node Coloring
- Bank of America Corp (16)
- Rain Bird Corp (13)
- IControl Networks Inc (8)
- Diebold Nixdorf Inc (4)
- StatSignal Systems Inc (3)
- Ucontrol, Inc. (3)
- Siemens Industry Inc (2)
- Shell Oil Co (2)
- Icontrol Networks, Inc (2)
- StatSignal IPC LLC (2)

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Knowledge is Power, When One Sees Both Broadly and Deeply at Once.

This enables one to keep clues close at hand while working through the multi-step reasoning problem, from prior art identification to selection to interpretation.

Such incremental reasoning allows for the decomposition of complex claim language into feature terms and intermediate steps that can be understood and connected individually, allowing for the complete picture to be seen while minimizing blindspots.

References

[1] Litigation records of US-8,224,282-B2
https://portal.unifiedpatents.com/litigation/caselist?patents=8224282

[2] Apex Standards Knowledge Graph
www.apexstandards.com/askgen.mp4
[3] Apex Standards Claim Construction
www.apexstandards.com/ascconst.pdf

No conflict of interest. Apex Standards is not involved in any manner in this or any relevant litigation proceedings pertaining to US-8,224,282-B2.
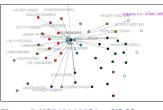
Figure 7. US7650425B2, a SIPCO patent, is cited by all Rain Bird patents (in orange), by two Icontrol patents (in grass green), by two Ucontrol patents (in brown), and, most notably, by three StatSignal patents (in purple). Neither the Bank of America cluster nor the seed patent cites it.
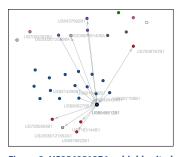

Figure 8. US8549512B1, a highly cited Bank of America patent (in blue): as one would ask how a financial firm invents in the IoT domain. The patent, along with the others in the Bank of America cluster, relates to self-service reporting and managements of an ATM server. Interestingly, it cites all three StatSignal patents (in purple) and all four Diebold Nixdorf patents (in red).

	Litigated Patent	Reference 1	Reference 2	Reference 3	Reference 4	Reference 5
Patent No	US-8224282-B2	US-6437692-B1	US-20060181406-A1	US-6914533-B2	US-7606767-B1	US-7650425-B2
Title	... manage power of wireless multi-sensor devices	... monitoring and controlling remote devices	... monitoring and controlling remote devices	... accessing residential monitoring devices	Cash dispensing automated banking machine ...	... controlling ... between a host computer and communication devices ...
Position	Figure 2	Figure 3	Figure 4	Figure 5	Figure 6	Figure 7
Original Assignee	Siemens Industry	StatSignal Systems	StatSignal Systems	StatSignal IPC LLC	Diebold Nixdorf	Sipco
Current Assignee	Ollnova Tech	Sipco	Sipco	Sipco	Diebold Nixdorf	Sipco
Considered by USPTO examiner		Yes	No	No	No	No
Apex Standards Claim Construction	www.apexstandards.com/pcc/US8224282B2_construction/	www.apexstandards.com/pcc/US6437692B1_construction/	www.apexstandards.com/pcc/US20060181406A1_construction/	www.apexstandards.com/pcc/US6914533B2_construction/	www.apexstandards.com/pcc/US7606767B1_construction/	www.apexstandards.com/pcc/US7650425B2_construction/
[Feature] and Construction Subject Matter Cross Matching	[automation component] intelligent automation component configured to control sensor data in response to sensor control information	[wireless system] for remote data collection and assembly and storage for use in an industrial process control environment	[wireless sensor network] wireless transceiver devices configured to wirelessly transmit select information and identification information to and from sensors in an automated manner	[multi sensor smoke alarm system] sensor housing having an opening for receiving an indicator of the smoke condition	[banking transaction management] for providing an application markup language document to an ATM in response to configuration data	[site controller] for controlling communication with remote devices and communicating devices
	[building automation system] home automation system and configured to control the home automation system in response to sensor control information	[remote data collection] control of an electronic device by wireless transmission of select information to the electronic device for subsequent processing	[monitoring of sensors for calibration] transmission of select information from remote locations to central locations for processing and storage to facilitate data collection	[alarm signal] upon detecting the smoke condition or receiving an alarm signal from an intended receiving communication device	[sever computer] capable of receiving from at least one remote computing device	[host computer] with at least one remote device in an industrial environment having the site controller that is to be monitored and controlled by the host computer
	[sensor package] plurality of sensors configured to communicate with the building automation system wirelessly	[collection assembly] transmission and storage of select information from remote locations to remote locations for retrieval upon demand for collection and transmission	[data processing and analysis] analysis and reporting of sensors electrically interface with wireless transceiver devices and configured to perform data format conversion	[indication of the alarm signal] event notification signal to the remote monitoring device in response to the alarm signal and transmitting indicative information	[configuration data] associated with at least one application markup language document for sending to at least one of a plurality of ATMs	[interconnected remote devices] site controllers connected to the first communication network and to the host computer via one or more of communication devices
	[control] communication with the building automation system in response to an event which is detected	[demand from a remotely located device] command from the computer that formats and stores transceiver identification information for retrieval upon command from the computer	[a plurality of transceivers dispersed geographically] transceiver interface coupled to the WAN and configured to communicate with sensors distant from one another located in the environment	[sending a command indicator] serial number of the smoke detector and an identification number of the intended receiving communication device	[application instructions] an Application Program Interface for the ATM and includes at least one portion of application instructions that are adapted to be executed by at least one computer in the ATM	[target communication device] first communication network to identify the target communication device to which the host computer is connected
35 U.S.C. § 102		Anticipation teaches a remote control system for controlling remotely electronic equipment connected via ...	Anticipation discloses a mobile device incorporating a position reporting device, comprising a receiver configured to receive location signals from at least two known locations	Anticipation N/A	Anticipation N/A	Anticipation disclose an electric smart meter enabling demand response comprising a memory stored with a power rate system
35 U.S.C. § 103		Obviousness discloses a thermostat IO comprising a temperature sensor transceiver interface with energy provider	Obviousness teaches performing data accesses according to a predetermined schedule a queue and a priority scheme paragraphs	Obviousness discloses a method system for accessing residential monitoring devices	Obviousness N/A	Obviousness teaches discovering active sensors and opening a communication session over a network between the first and the second devices
35 U.S.C. § 325		Deniable	N/A	N/A	N/A	N/A

Table 1. After candidate prior arts are selected, feature terms are automatically interpreted and compared, allowing legal grounds to be inferred for further evaluation.