Patents and the Creativity Requirement

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Robert J. Marks:

Welcome to Mind Matters News. I'm your non-copyrightable host, Robert J. Marks. We are talking to attorney and author, Richard W. Stevens, about artificial intelligence and patents. Richard, welcome.

Richard W. Stevens:

Thank you very much, Bob.

Robert J. Marks:

One of the things that you talked about last time was the criterion for patentability, and one of them was non-obvious. I would translate that maybe into the idea of creativity. There has to be evidence of creativity for a patent. How do we define creativity or this non-obviousness for patents?

Richard W. Stevens:

That's one of the interesting things, non-obviousness. There are a few ways to try to describe it. In our last broadcast, we talked a little bit about how it's a subjective matter; but the courts, the patent office, and the powers that be, have tried to coalesce around a few definitions, and they provide a guide. For example, to decide whether or not there's enough creativity, the courts may ask whether the invention results from, this is a quote, whether the invention results from "inferences and creative steps that a person of ordinary skill in the art would employ, or something else that's better," so that's it at one level. Is this something that somebody who works in this area would have said, "Well, that's obvious. Duh. Anybody would do that"? And then it would not be non-obvious because somebody would testify it's obvious and be able to show, "Yeah. We do this all the time," or "We almost do the exact same thing," and yours is just a tiny variation on what everybody else does. That's one way to draw the line.

Another way to say it is that a new invention has to produce unexpected or surprising new results that were not anticipated by the existing technology, or what we call the prior art, is the term, prior art. So a non-obvious invention is unexpected by a person who has ordinary skill in that area. For example, the telephone, invented by Alexander Graham Bell, was not obvious to engineers and scientists of that day.

Robert J. Marks:

I see. Boy, you used some words there that I want to unpack a little bit. As a person that plays around with AI, I claim that creativity is noncomputable, and therefore artificial intelligence doesn't have the ability to do anything creative; because creativity, I believe, is noncomutable. But AI can generate unexpected and surprising results, and it does it all the time. I'm thinking about Lee Sedol, who was the world champion in the board game of Go, was defeated by AI. At one point, the program made this incredible move, and all of the people watching said, "Whoa. That's a really interesting move. Nobody would have done that." It was unexpected and it was surprising. And so this happens in artificial intelligence, but it doesn't pass the muster of creativity.

In artificial intelligence, we define this as the Lovelace test, which is due to Selmer Bringsjord at Rensselaer. He says that computers are going to be said to creative if they generate something outside the explanation or the expectation of the programmer or somebody of equivalent skills; and those

results can be, and I've used the word, unexpected and surprising. Do we have a conflict here? If AI generates this stuff, do we have a difference in meaning between unexpected and surprising?

Richard W. Stevens:

Ask yourself the question, "What does unexpected mean?" This is where you have the subjective, but it's not just subjective; it's even more than that. It goes to the very heart of what it means to be human or what it means to be conscious. All of this stuff starts to tie into that really interesting stuff. And so if you say something's unexpected, there were some interesting formulae that I learned when I was studying in school learning about calculus and, "Oh, wow. I didn't know that it would do that." Well, does that make it patentable? Does that make it unexpected? Or is it just something I didn't know about yet? And so there's that whole problem of trying to decide: if you're surprised, does that make it creative or that just means you're surprised?

I have six grandkids that live nearby, and I've had the privilege of being able to watch them grow from zero to wherever they are today, and they've been surprised by all kinds of things, but that didn't mean that it was somehow unexpected in the grand sense; it was unexpected to them. So for me, the test to say whether it's unexpected, doesn't have a lot of content all by itself.

Robert J. Marks:

I see. Okay. So unexpected and surprising, would that pass the muster of the patent office if AI did something like that?

Richard W. Stevens:

Well, unexpected and surprising... I guess if someone wanted to say, "Well, it wasn't obvious," that the result wasn't obvious, and it was also useful, and the rest: I guess if it's not obvious, the argument might be though, would somebody who was writing software expect something like this to occur? And so in the case of large search engines, software, and things of that nature, they've gotten patents. Well, why? They've gotten patents because they were not obvious. Meaning somebody who's just writing software for a living wouldn't necessarily have come up with the algorithms, would have necessarily come up with the whole presentation of the software. So it's not obvious in that way, in that the person who works in that area wouldn't have just said, "Oh, yeah. I would have done that," so that's a little different from being unexpected. It's more creative. It's like a new way of thinking about a problem, and the new way is what makes us human.

Robert J. Marks:

I see. We did an experiment one time in swarm intelligence where we had a computer program where a bunch of predators attacked a bunch of prey, and they were little dots in a little room, and they would run around. And what we wanted to do was we wanted to perform evolution on these, computer evolution, to see what strategy the prey should use to last the longest, and we ran this and it optimized to something which was incredibly surprising, and that surprising result was that the prey exercised self-sacrifice; it displayed self-sacrifice. What happened is one little prey, we call them dweebs, would run around; while the predator, which we call bullies, would chase this dweeb around, while all of the other prey would cower in a corner. And pretty soon, that one prey would sacrifice itself, and then another one would come out and take its place. This was totally unexpected, the idea of self-sacrifice. But we looked at the program and we finally said, "We searched through a bunch of different results and here's the result that performs the self-sacrifice. I can see where that came from," and so that did not pass the

Lovelace test in terms of creativity because we were able to look at the software and explain why it did what it did.

Richard W. Stevens:

Okay. But you can look at any algorithm and do that. I mean if you have the definition of the algorithm, then you can know what it does. I forget who it was that said basically, if you have a pen and paper, you can solve any computer problem given enough time.

Robert J. Marks:

Yes.

Richard W. Stevens:

And so that's the same here. If you know the algorithm, then you could iteratively or recursively figure out how that's going to run; and if you had to do it manually, you could do it. I mean it could do a solution. But actually, interestingly enough, the description of the dweebs and the predators is not surprising, as a matter of fact. It's in nature.

Robert J. Marks:

It is in nature. But the fact that our rules duplicated nature was pretty cool.

Richard W. Stevens:

Cool, yes. Cool, absolutely. But now I want to ask: is that non-obvious in the sense that that's exactly why fish swim in schools and why birds flock together? Exactly that reason. Because the weaker ones will feed the predators while the others can get away, and that saves the stock.

Robert J. Marks:

Well, I would say that the predator/prey problem would become creative if the prey all of a sudden turned to begin attacking the predators, but there was no flexibility in the software for that happening, so therefore that creative aspect would never happen. That would be an example of something which was creative, but the software was unable to do that because we didn't allow it to do that.

Richard W. Stevens:

Isn't that fascinating? That's a very interesting little line being drawn. That's fascinating. Yes. If your software wouldn't have thought of it, then your dweebs wouldn't have thought of it either.

Robert J. Marks:

Exactly. Because there just wasn't the ability in the software to do that.

Let's get back to US patents for a little bit. Currently, you've mentioned that only humans can be listed as inventors on US patents. Is there a reason behind that law?

Richard W. Stevens:

Well, yeah. The reason probably goes back to antiquity. The origin of patent law, as I have come to understand it, comes from two angles; I think it comes first, however, from the fact that somebody has made something special and devised a machine or a tool or a process way back in the day, and then

somebody else went and stole it, and built it and sold it, and they go, "Hey, wait a minute. I came up with that," and the other one says, "Yeah. And so what?" And so the notion that there's an intrinsic unfairness to taking the work product of a creative person, and that some derivative person just steals it and uses it as if it were their own, and makes all the money, there's just something wrong about taking that away. The notion of intellectual property is gut level, "Hey, I thought of that first. How come you're making a million and I'm still working in the back room here?" So there's that view.

And I don't know if it was ad hoc or just good thinking, but later on economists, and political economist kinds of people, looked at this and said, "Well, we can justify protecting the rights of a creator, of an inventor, in addition to the moral notion that, "Hey, they came up with it first. They ought to have the right to it, at least for a certain while," but they came up with an additional justification, and that is: if we protect patent rights, if we protect someone's time limited right, but nevertheless right, to exploit the results of their creativity and their ingenuity, that will stimulate people to do it because it won't be stolen. You don't have the free rider problem or you decrease the free rider problem. So if you can profit from it, then you're willing to invest more time, invest more money, corral more resources, hire more people to build new and fascinating things, if you know that you can actually recoup your income over time by basically having limited monopoly on it for 17, now 20 years, or 14, whatever it is.

That whole notion of, "It's a political economy thing," this is good for society that we will stimulate inventors to spend money in this way that actually helps everyone ultimately, or certainly anyone who wants to use this kind of product. And so you have those, what I see, are the two main justifications: one is the moral right of the inventor, and second is the social economy benefit of stimulating creativity and innovation.

Robert J. Marks:

We do have a number of different cases in technology where the best technology is not one. I'm thinking back to, for example, the war between Beta and VHS. Or Netscape, one of the first browsers being taken to court by Microsoft because there was a lawsuit that Microsoft was stealing some of the technology of Netscape. And I really liked Netscape back in the days because it let you actually write HTML software, it was really nice, and Explorer came along and wasn't quite as flexible. So the best guy doesn't always win, do they?

Richard W. Stevens:

No. But that's the nature of market in a lot of ways. For example, with VHS and Beta, I was a big proponent of Beta as well, and you had to pry those out of my cold dead fingers when they finally got rid of Beta. But I had Beta as long as anyone could have it because I had so many things on it. Nevertheless, as I understand it, you may know a ton more about it, but my understanding was that Sony basically refused to license out the Beta technology at any rate that anybody could afford. So they said, "Well, we're going to play this monopoly for all it's worth," and they had every right to do that. It's not a bad thing. And then people had Betamaxes, as I did, a couple of them.

But the guys that came up with the VHS format... which is different tape, different formatting, the way the machines worked internally was somewhat different... so you see you had the new, you have novel, you had useful, and you had the non-obvious; that is, it wasn't the same as Beta. Just because you knew Beta doesn't mean you'd know how to do VHS, so that gets a patent. But the market aspects were the guys that came up with that were willing to license that out, so there were I don't know how many different manufacturers were making machines that supported VHS tape, while Sony hung on tenaciously to their one and they were outsold.

Robert J. Marks:

Yeah. It was a product of the free enterprise system, which is incredibly resilient, isn't it?

Richard W. Stevens:

Yeah. Well, it's the buyers that decided that they would rather go with the one where there were all these other manufacturers, a lot more price competition. And as soon as the content creators were producing VHS, then there were so many more people using it. That's how it works. And there are a lot of proprietary, and you probably know this too, computer companies, "We've invented the best mouse trap ever and we're not going to license it," and they ended up going out of business with their best mouse trap.

Robert J. Marks:

Yeah. Thank you, Richard. This has been a fascinating talk. We've been talking to attorney and author, Richard W. Stevens. When we come back next week and talk about Mind Matters News, we're going to talk about a ruling in federal court that said that AI can't be issued patents, and we're going to peel that back and figure out what happened there. Until then, be of good cheer.

Announcer:

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