

(/)



MENU



LINKS



SEARCH

Remarks by Director Iancu at the New York Intellectual Property Law Association

June 21, 2019

The Current State of Innovation within the U.S. Legal System – Views on Evolving Protection for Intellectual Property Rights in the United States from the USPTO and the Courts

Remarks delivered at the New York Intellectual Property Law Association (NYIPLA)

Director of the U.S. Patent and Trademark Office Andrei Iancu

March 22, 2019

New York Hilton Midtown

New York City

As published in the Journal of the Patent and Trademark Office Society (citation at bottom of transcript)

Good afternoon everyone! Thank you, Pete Thurlow, for that generous introduction. It's a great honor to open today's panel discussion on the current state of innovation within the U.S. legal system, and I appreciate NYIPLA's gracious invitation to be part of this outstanding annual event.

This very day 59 years ago, on March 22, 1960, the United States Patent Office issued patent number 2,929,922 to New York native Arthur Schawlow of Bell Labs and Charles Townes, a Columbia University professor and consultant to Bell Labs, for co-inventing the optical maser—now called a laser. While doing postdoctoral research at Columbia University, Schawlow met Townes, and together they sought ways to extend the maser principle of amplifying electromagnetic waves into the shorter wavelengths of infrared and visible light.

In 1958, the two scientists published a proposal for the invention in an issue of *Physical Review*, prompting an international competition to build a working laser. Today, of course, lasers have countless applications and make it possible to play CDs, correct eyesight, scan labels in a grocery store, enable autonomous vehicles, measure time precisely, survey planets and galaxies, and even witness the birth of stars.

Their invention changed the world.

Dr. Townes was inducted into the National Inventors Hall of Fame (NIHF) in 1976 and Dr. Schawlow [sic] joined him 20 years later. These two New Yorkers join a long list of Americans who, backed by our patent system for the last 229 years, have fueled human progress on a scale and at a pace that far exceeds

anything humanity has ever seen—at any time in the past, or anywhere else in the world. American heroes who—through their ingenuity, hard work, and perseverance—have improved the state of the human condition.

Just last June, we had occasion to celebrate the patent system’s contributions to the human condition, when the USPTO issued U.S. Patent Number 10 Million. As it happens, patent 10 million was on LIDAR technology. LIDAR is similar to RADAR, but it uses *Laser* instead of radio waves to measure distances to objects and the like. So in some sense, patent 10 million descended from the work done by Townes and Schaulow [sic] here in New York—some 60 years ago—and some 7 million patents earlier.

Beyond the specific technology, though, patent 10 million was a significant milestone for the United States. It marked, in a way, the unprecedented innovation that has taken place in this country since our founding. We commemorated that event with a signing ceremony at the White House, where President Trump in the Oval Office, along with Secretary of Commerce Wilbur Ross, and myself, signed patent 10 million.

You can view the original signed document the next time you visit the PTO. It is on display at the National Inventors Hall of Fame museum at our headquarters in Alexandria.

After the signing, we held a reception at George Washington’s Mount Vernon in Alexandria, Virginia, and specifically, at Washington’s Gristmill—just a few miles down the road from USPTO headquarters. You can also visit that the next time you come to Virginia.

Washington’s gristmill is still functional today. This is a milling system designed by Oliver Evans in the late 1700s. It’s also the invention behind the third U.S. patent issued in December 1790 and actually signed by George Washington himself.

Oliver Evans was born in Delaware and then moved to Philadelphia where he became the most prominent American steam engine engineer and inventor. When he was younger and after opening a store with his brother, Evans learned about the slow, inefficient, and labor-intensive nature of the traditional grist operation through his dealings with local millers. Back then, millers would have to transport freshly ground flour sacks up ladder-like stairways to the top floor of the mill. Using ropes, buckets and sacks, the miller would then dump the flour on the floor, where it was spread with a rake to cool and dry it. The flour often remained on the floor for hours as the moisture evaporated, and after it was dried and cooled, the flour would again be deposited in hoppers or bins to age and whiten.

By the time the flour was sifted and re-sacked, the flour had been—as Evans recalled—“*mixed with a great quantity of dirt... from the dirty feet of every one who trampled in it, trailing it over the whole mill and wasting much.*” So Evans decided to automate the process.

In Evans’ automated flour mill, all the work was done not by manual labor, but rather, by a system of interconnected machines geared to the same water wheel. The Gristmill is effectively a multi-storied building with gears, pulleys and elevators, filters, and the like, for processing grain and making flour. Only two men were needed, one to empty bags of wheat at one end of the machine, and one to close and roll away barrels of flour at the other end.

Evans’ process proved so efficient that over time, mill owners in the Delaware Valley began to replace their older, laborious mills with Evans’ automated system. Later, while on a trip in Wilmington, Delaware, President Washington visited one of Evans’ mills and after seeing it in action, decided to install one at Mount Vernon.

As I said, it is still there and it is still working.

I think about this and similar stories as we contemplate some of the thorniest issues that face us today. For example, I suspect nobody ever thought—back then or now—that Evans' automated manufacturing method (and machine) for processing flour would be abstract and, therefore, ineligible to be patented under Section 101 of the Patent Code.

I suspect nobody would argue that "collecting, analyzing and manipulating" the grain is an abstract idea! Or that automating this process, which was previously done by hand, is insufficient to render it eligible. These seem easy decisions.

But when it comes to modern technologies, the decisions are somehow no longer easy. *Why?*

At the time of Evans' invention, the United States was an agricultural society and we were at the beginning stages of the original industrial revolution. Machines that processed grain, and that *automated* the processing of grain, were then at the heart of our growing economy.

Since then, we've been processing and automating much more than agricultural products. For example, in addition to grain, we now process data and DNA. And as we now enter what some have called a "Fourth Industrial Revolution," we are automating much more than flour mills. For example, our scientists and engineers are working at forever faster rates to make advancements in artificial intelligence (AI), robotics, biotechnology, autonomous vehicles, quantum computing, and so much more.

We are today in a globally-competitive innovation race, and, for us to maintain our technological leadership, the United States must incentivize and protect our inventors as they work in these new areas. Among other things, we must be careful not to decide that the automation that is at the heart of the technologies of the future is somehow not eligible for patenting.

Sure, there are differences between the Fourth Industrial Revolution and the technologies of the past. But just because we are no longer automating using large machines that are tangible and easy to see and feel, does not mean that today's machines and processes should be any less worthy of patent protection. Let me say it differently: Just because we are no longer focused on processing grain, and are instead processing data and DNA, does not mean that today's machines and processes are somehow not the "useful arts" worthy of patent protection as contemplated by the American Constitution.

Unfortunately, however, our patent system has gotten bogged down in recent years, and we are now having a difficult time deciding whether some of the matter at the heart of the Fourth Industrial Revolution is eligible for patenting. The PTO is working to clarify this area of law for our examiners and applicants and all others who come before us.

Some argue that recent Supreme Court cases on Section 101 have created our current predicament. Perhaps. But to some extent, I wonder whether some may have been over-reading these recent cases.

For example, the *Alice* case dealt with an escrow transaction that was performed on a general purpose computer. The Supreme Court held that escrow transactions are abstract, and therefore not eligible for patenting. Further, the Court said that simply doing this activity on a general purpose computer—automating it, if you will—does not render it less abstract.

From this, some have concluded that "doing it on a computer" is not eligible for patenting, without any reference to what the "it" might be. But the Court didn't go that far. The claim in *Alice* was ineligible because the invention dealt with a fundamental economic principle—escrow transactions. Just like the Court found hedging abstract in *Bilski*.

The Supreme Court said that we should not give patents to such principles, no matter how original and important they might be. The Court did *not* say that “doing it on a computer” is always ineligible, no matter what the “it” might be. The Court simply said that the environment where the escrow or hedging transaction is performed—whether it is done in private with a handshake, or in a bank with pen and paper ledger, or automated on a computer—makes no difference. In other words, merely doing the excluded activity on a general purpose computer is not eligible for patent—but that’s because there was excluded activity in the first place.

Put differently, the Court never said that all automation with computers is *per se* not eligible. And why would it be? Why should we draw an eligibility line between automation with computers on one hand, and automation with other machines, on the other?

The key, therefore, is this: before determining whether “doing it on a computer” is problematic under Section 101, we should determine whether the claim at issue recites excluded matter in the first place. Because if it does not, Section 101 should not be implicated.

If the claim is about using a computer to automate a process that is not itself excluded, the patentability analysis should be left to Sections 102, 103 and 112. For example, automating a known, non-excluded process can be a classic obviousness combination of the old process plus the computer, and the traditional Section 103 analysis should be employed to determine whether doing that old process on a computer is worthy of a patent. We have decades of experience with the *Graham* factors, and we know how to do a 103 analysis. The automation analysis need not be done at 101, unless it involves excluded matter in the first place.

Separately, but also from recent Supreme Court cases, some have concluded that claims that are functional in nature and without the specificity necessary to recite how the claimed function is achieved may also be ineligible under Section 101. But where is that in the recent Supreme Court cases? Again, the claims in *Alice* were found to be ineligible because they were on a fundamental economic principle, not because they were functionally drafted.

That does not mean that functional claims are necessarily patentable. For example, the claims can be so broad and vague that they could be infringed just by thinking—just by doing mental processes. If so, we should reject under Section 101 for claiming a mental process. Plus, the claims must still pass muster under the other patent statutes, including Section 112 that deals squarely with the treatment of functional claiming. Let’s do that analysis under that statute, since we have decades of experience doing so and standards on how to do it.

Some argue that older cases, like the old Morse patent, for example, refused to grant a patent for functional claims. Perhaps. But even if true, that was before the 1952 Patent Act, which separated the bases for invalidity. Whether a claim is definite enough, recites sufficient structure, or is properly supported by the specification, should be dealt with under Section 112. Not Section 101.

The genius of the 1952 Patent Act was that it clearly categorized the conditions for patentability, in addition to and separate from the categories of invention. It separated in distinct statutes the issues raised by Sections 101, 102, 103 and 112. We should not mix them all up again.

In an attempt to untangle all this, the PTO in January issued revised patent subject matter eligibility guidance, which we believe will improve this situation in a few ways. Perhaps most importantly, the guidance provides an analytical framework to help focus the 101 discussion. This framework is a synthesis of, and is consistent with, Section 101 case law to date.

Under the framework, we first ask whether the subject matter at issue is itself eligible or not. Do the claims deal with matter that is *per se* problematic? In all Supreme Court cases, there was subject matter that was problematic *per se*. For example, fundamental economic principles in *Alice* and *Bilski*; natural phenomena in *Mayo* and *Myriad*; math in *Benson*, *Flook* and *Diehr*. And some of these also had mental processes.

I do not believe that a single Supreme Court case on Section 101 dealt with matter that is not *per se* ineligible. The Section 101 analysis should, therefore, start there. Start with a consideration of whether the claims recite matter that, on its own, is always ineligible—irrespective of how new, non-obvious or definite the claims might be.

I believe that this is what the case law is aimed at, but without structure, it's easy for the analysis to be confused. So the PTO's new analytical framework first lists specifically the categories of ineligible subject matter, as we have distilled from the cases:

- Laws of nature and natural products;
- Math;
- Certain methods of organizing human activity (such as fundamental economic principles and others); and
- Mental processes.

These are the subject matter categories identified by the courts as *per se* ineligible. We should not make up new ones. If the claims do not have excluded matter in one of these categories, they should not be subject to a subject matter exception.

Of course, the claims may be so broad and so vague that they could encompass excluded matter in these categories, even if the claim is otherwise technological. If so, it is of course appropriate to reject under 101.

Now even if the claims do have excluded subject matter, they are not automatically ineligible. After all, nearly all innovation is built on some basic tool of science or technology. So the new guidance further explains that, consistent with over 200 years of case law, "practical applications" of otherwise excluded matter should be eligible. And so, if the claims do have excluded matter, we need to see whether they're really about the excluded matter *per se*, or are they about the application of that matter to a practical end?

But let me go back to the categories of excluded matter, and why we believe that categorization under current law is so important. Let me give you an example that seems troubling to folks analyzing some modern technologies: data manipulation or processing. Interestingly, while virtually nobody has trouble with the eligibility of grain processing as in Washington's gristmill, folks struggle with the manipulation and analysis of data or information.

But why is that? What really is the difference—from an eligibility perspective—between grain processing in the First industrial revolution, and data processing in the Fourth? After all, neither grain nor information *per se* is statutorily eligible by itself. But how about the *processing* of that grain or information? Why would the processing of grain be eligible, but the processing of information not? I believe that our guidance helps to frame this analysis.

First, is data processing *per se* ineligible? That is, is it always ineligible when presented on its own? This is an important question. After all, the vast majority of what a computer does is data processing. And by the way, as grain processing was at the heart of our agricultural economy during the first industrial revolution, data and DNA processing are key to some of the technologies, and the economy, of the future.

In any event, I don't believe that the Supreme Court ever held that data processing on its own is ineligible, no matter what data we are processing. *Alice*, *Bilsky* [sic], *Benson* and *Flook* all dealt with math or economic principles—matter that is excluded *per se*, not technology and the like. Why should we add an entirely new

category of excluded matter?

And here is the critically important part: None of this is to say that claims on data processing are always *eligible*. Given the nature of data—intangible, ephemeral, often cerebral—such claims are at times indeed problematic. And maybe this is the difference between the processing of information and the processing of grain, and maybe why some find data processing claims more troublesome.

But this does not mean that all information processing claims are problematic. And in order to figure out which ones are problematic, we need to expressly identify the *real* problem.

For example, many claims on information processing are so broad and vague that they can be infringed by performing them in one's head. In other words, they do not require technology. If so, they would be in the mental steps category. Indeed, the Federal Circuit pointed directly to "mental processes, whose implicit exclusion from § 101 undergirds the information-based category of abstract ideas." So if that's what is happening in a claim, we should say so. Or, much information processing is just pure math with no practical application. If so, they would be in the "pure math" category of exclusion. Or, some claims about information gathering and the like are actually basic methods of organizing human activities, technology-free, in which case they are in *that* category.

On the other hand, if a claim on data processing does not recite matter in one of these exempted categories, why would it not be eligible for patent? Put differently, if a claim recites a *technological* process for the gathering, analysis, manipulation or display of data—a process that is not and cannot be performed mentally, for example—why would such a claim not be considered part of the "useful arts" and eligible for patenting?

So to sort all this out and keep the analysis consistent and predictable, we now ask our examiners and APJs to first identify the actual problem with the claim—to first consider whether the claims recite matter that, on its own, is *per se* ineligible. Without knowing the categories of matter that is *per se* excluded, it is very difficult to determine if a computer process—in the many thousands of claims we see every year at the PTO—is eligible or not. And the same is true with all other areas of technology.

With the new guidance, because we now know what we're looking for, this is a much more predictable and consistent approach. Virtually all of our examiners and judges have been trained on the new guidance, and they've welcomed the new approach. It drastically improves the analysis. It streamlines the process, clarifies the approach, and leads to more consistent results.

And the public agrees.

The public comment period for the new guidance has now closed. We have received lots of comments, and we are still reviewing them. The overwhelming majority of comments we received from companies and organizations are very supportive. (We also received hundreds of letters from individuals that follow two or three scripts. It appears that a couple of entities organized form-letter campaigns. So let me leave these aside for now, other than to say that they are both pro and against.)

Not everyone, of course, agrees with everything in the guidance. Some have suggestions for improving the listing of items in our categories. Or to add or subtract categories. Some would like more examples. And some, while believing that the guidance is a good approach under current law, would still prefer a legislative fix to effectively overrule current law.

But most importantly, the majority of companies and organizations that submitted comments believes that our *framework* is correct under current law. And this general consensus cuts across industries. This is great news. We can continue to discuss the best way to frame the categories, as long as we have an agreed-upon

framework. And having a consistent analytical *framework* will go a long way towards resolving our quandary on Section 101.

This remains the most important issue in patent law today, and I believe that we now have a path to resolution. So I hope that other authorities will help us, as we all work together to bring predictability to this area of law. It's critically important.

Our patent system fueled America's technological leadership for more than two centuries. It will do the same as we enter the next technological revolution—if we let it.

A scientific publication written in 1878 said that Thomas Edison, "with his marvelous inventions, is pushing the whole world ahead in its march to the highest civilization."

This is what American inventors do—from Oliver Evans to Townes and Schaulow [sic], from Thomas Edison to those currently tinkering on the inventions of the future. With their creations, inventors help us march to the highest civilization. We owe them and the public a system of laws that they can understand, that they can predict, and that they can rely upon.

Thank you for the invitation to be here today, and I look forward to the panel discussion with Judges Chen, Andrews and Castillo.

This speech was originally published in the Journal of the Patent and Trademark Office Society on April 30, 2019.

Suggested citation:

Iancu, Andrei. 2019. "The Current State of Innovation within the U.S. Legal System." Speech, New York City, March 22, 2019. *Journal of the Patent and Trademark Office Society* 101, no. 1 (2019): 11-18.



(/)

BROWSE BY TOPIC

[Patents \(/patent\)](#)

[Trademarks \(/trademark\)](#)

[Learning & Resources \(/learning-resources\)](#)

[About the USPTO \(/about-us\)](#)

[Jobs \(https://www.uspto.gov/jobs\)](https://www.uspto.gov/jobs)

[Contact Us \(/about-us/contact-us\)](#)

ABOUT THIS SITE

[Accessibility \(/using-usptogov/accessibility-uspto-website\)](#)

[Privacy Policy \(/privacy-policy\)](#)

[Terms of Use \(/terms-use-uspto-websites\)](#)

[Security \(/about-us/security\)](#)

[Systems Status \(https://www.uspto.gov/blog/ebiz/\)](https://www.uspto.gov/blog/ebiz/)

USPTO BACKGROUND

[Performance and Planning \(/about-us/performance-and-planning\)](#)

[Freedom of Information Act \(/learning-and-resources/ip-policy/electronic-freedom-information-act-e-foia\)](#)

[Information Quality Guidelines \(/learning-and-resources/information-quality-guidelines\)](#)

FEDERAL GOVERNMENT

[Regulations.gov \(https://www.regulations.gov\)](https://www.regulations.gov)

[StopFakes.gov \(https://www.stopfakes.gov\)](https://www.stopfakes.gov)

[USA.gov \(https://www.usa.gov\)](https://www.usa.gov)

[Department of Commerce \(https://www.commerce.gov\)](https://www.commerce.gov)

[Strategy Targeting Organized Piracy \(/learning-and-resources/ip-policy/enforcement/strategy-targeting-organized-piracy-stop\)](#)

Subscribe to updates  [\(/subscribe\)](#)

FOLLOW US

[\(/https://www.facebook.com\)](https://www.facebook.com)



[\(/https://twitter.com/uspto\)](https://twitter.com/uspto)

[\(/https://www.youtube.com\)](https://www.youtube.com)

This page is owned by **Office of the Chief Communications Officer**.

Published on: Jun 21, 2019 04:09 PM EDT

Last Modified: Jun 25, 2019 12:21 PM EDT