US COMPUTER PATENT PRACTICE
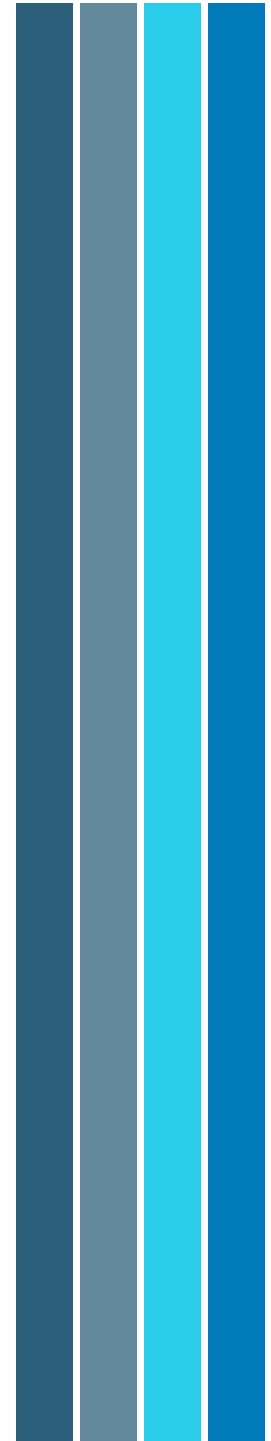Presented at
Ukrainian Intellectual Property Institute
Kiev, Ukraine
by
Jerome R. Smith, Registered US Patent Attorney
14 June 2019

Dr. Mark Friedman Ltd.
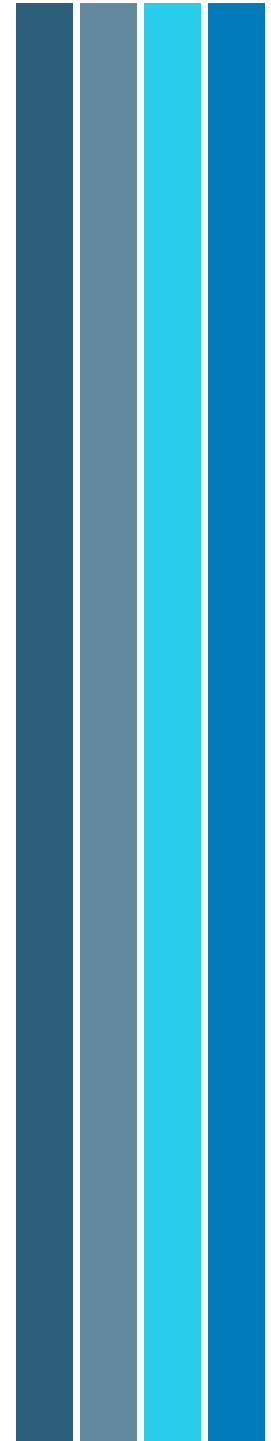Patent Attorneys

Patents

Patents are government granted rights for inventions. In exchange for the patent grant, for a limited period of time, the patentee has provided a complete disclosure of the technical information of the patent, which is available to the public.

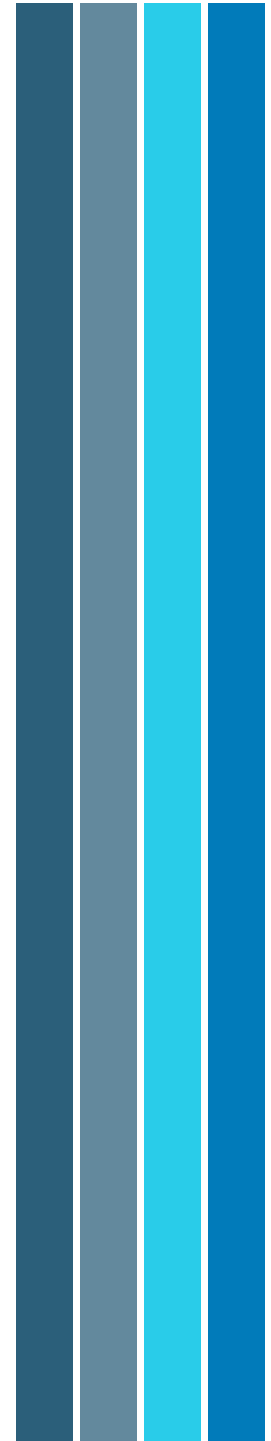**Dr. Mark Friedman Ltd.**
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Patent Protection

- Patents are a <u>negative</u> right- The right to exclude others from making, using and selling the patented technology, which is stated in the patent claims

- Patents DO NOT automatically allow the patentee to make, use and sell, the claimed patented invention

- Patent Term is 20 years from earliest filing date

    - 21 years in the case of a US Provisional Application

    - Term Extensions and Term Adjustments in limited circumstances

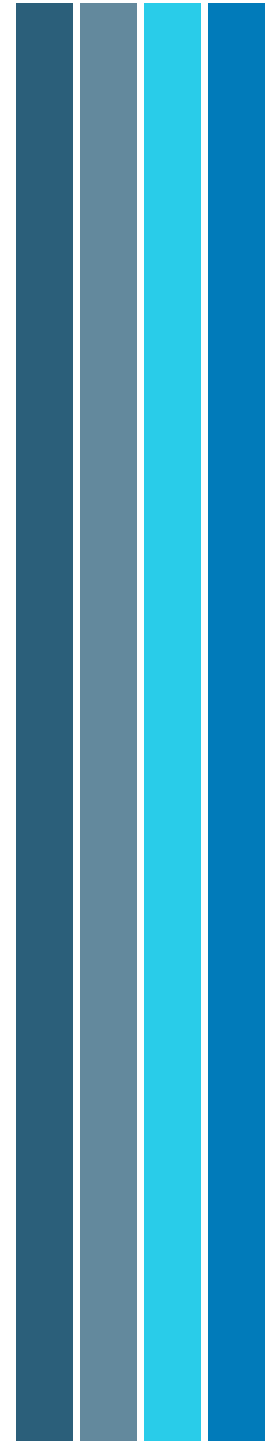**Dr. Mark Friedman Ltd.**
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THE LAW

The United States Constitution grants Congress broad power to legislate to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." Art. I, § 8, cl. 8.

35 U.S.C. § 101 - Inventions patentable. Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Section 101 lists patent eligible subject matter: 1. Processes, 2. Machines, 3. Articles of Manufacture, 4. Compositions of Matter, [5. Software Products], and 6. Improvements thereof.

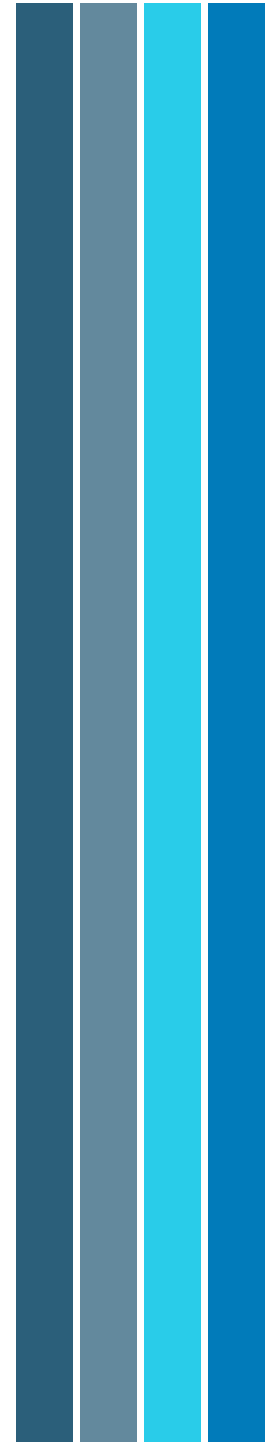**Dr. Mark Friedman Ltd.**
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COMPUTER/SOFTWARE/INTERNET PATENTS

Software <u>IS</u> Patentable

Software is a misnomer- The term is really "Computer Related Inventions"

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Where It All Began
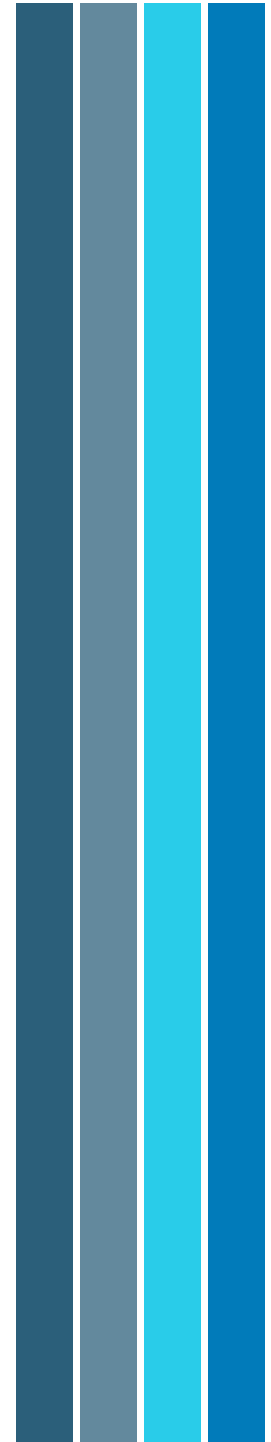
Diamond v. Chakrabarty, 447 U.S. 303 (1980)

Issue: May genetically modified organisms can be patented.

Answer: Yes

Anything under the sun made by man is patentable.

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The US Supreme Court Decisions
The Trilogy

- ***Gottschalk v. Benson***, 409 U.S. 63 (1972), A method for converting numerical information from binary-coded decimal numbers into pure binary numbers, for use in programming conventional general-purpose digital computers is merely a series of mathematical calculations or mental steps and is not a patentable "process" within the meaning of the Patent Act.

- ***Parker v. Flook***, 437 U.S. 584 (1978). A mathematical algorithm is not patentable if its application is not novel. Flook's method of calculating alarm limits by using a "smoothing algorithm" to make the system responsive to trends but not momentary fluctuations in process variables (such as temperature), was found to be not novel, and not patentable.

- ***Diamond v. Diehr***, 450 U.S. 175 (1981) Controlling the execution of a physical process, by running a computer program (which utilized the Arrhenius Equation) did not preclude patentability of the invention as a whole. The Court reiterated its earlier holdings that mathematical formulae in the abstract could not be patented, but it held that the mere presence of a software element did not make an otherwise patent-eligible machine or process patent ineligible.

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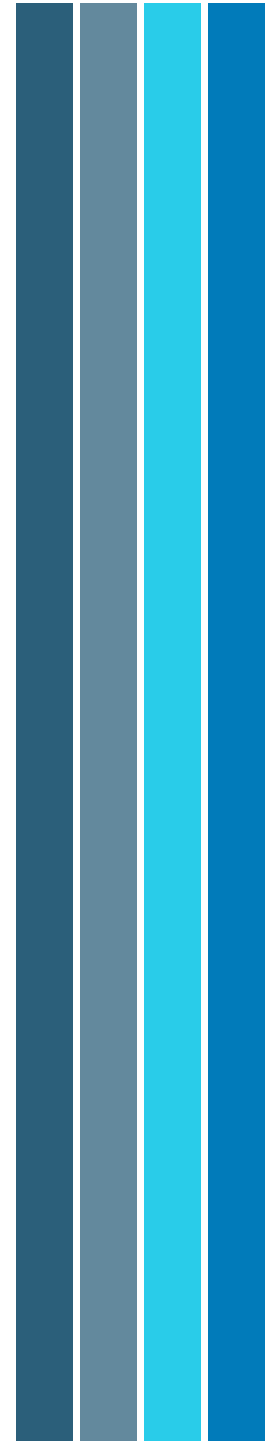
Moving Forward-The Transition
-A "useful, concrete, and tangible result" test

- **In re Alappat**, 33 F.3d 1541 (Fed. Cir. 1994)(en banc). A claim directed to an apparatus, a rasterizer, that performed an algorithm for converting vector list data into anti-aliased pixel illumination intensity data to be displayed on a display means, was more than an abstract idea. The claimed invention as a whole was directed toward forming a specific machine that produced a useful, concrete, and tangible result of a smooth waveform display. 33 F.3d at 1544.

- **State Street Bank & Trust Co. v. Signature Financial Group, Inc.**, 149 F.3d 1368 (Fed. Cir. 1998). The claim at issue was directed to "[a] data processing system" comprising "computer processing means", "storage means" and other "means" for implementing an investment structure where mutual funds pool their assets in an investment portfolio organized as a partnership. The CAFC found that the claimed process was eligible for patent protection provided it produced a "useful, concrete and tangible" result, a final share price monetarily fixed for recording and reporting purposes.

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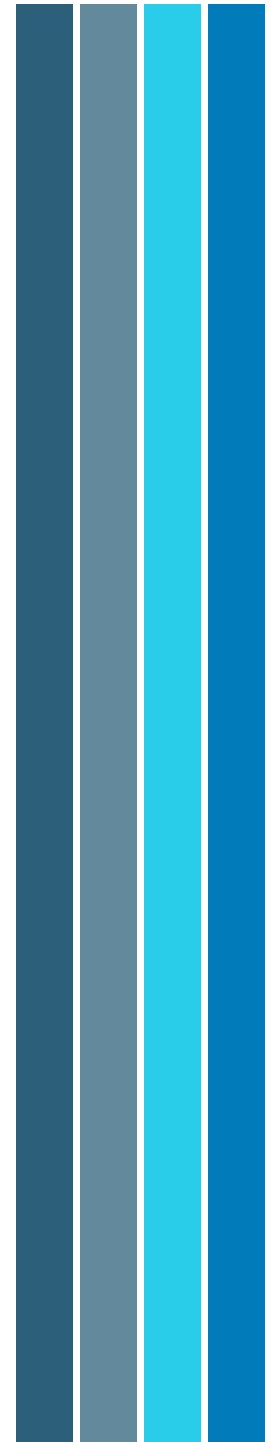
Back To The US Supreme Court

- ***Bilski v. Kappos***, 561 U.S. 593 (2010)– Bilski's claimed hedging is a fundamental economic practice, is an abstract idea and not patentable subject matter. The Court also held that the "machine-or-transformation" test is not the sole test for determining the patent eligibility of a process, but rather "a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101."

- ***Mayo Collaborative Services. v. Prometheus Labs., Inc.,*** 566 U.S. 66 (2012)- A process that focuses upon the use of a natural law must also contain other elements or a combination of elements sufficient to ensure that the patent in practice amounts to **significantly more** than a patent upon the natural law itself.

- ***Alice Corp. Pty. Ltd. v. CLS Bank International***, 573 U.S. 208 (2014) – The use of a third party to mediate settlement risk is a "fundamental economic practice" and thus an abstract idea.

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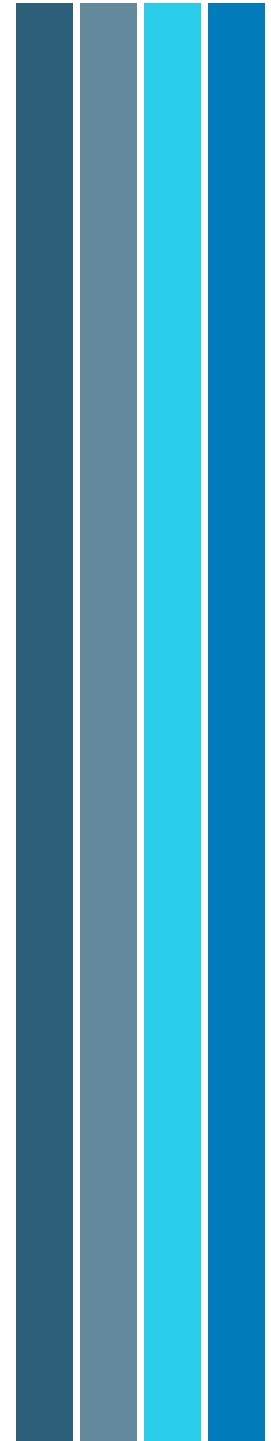Patent Attorneys
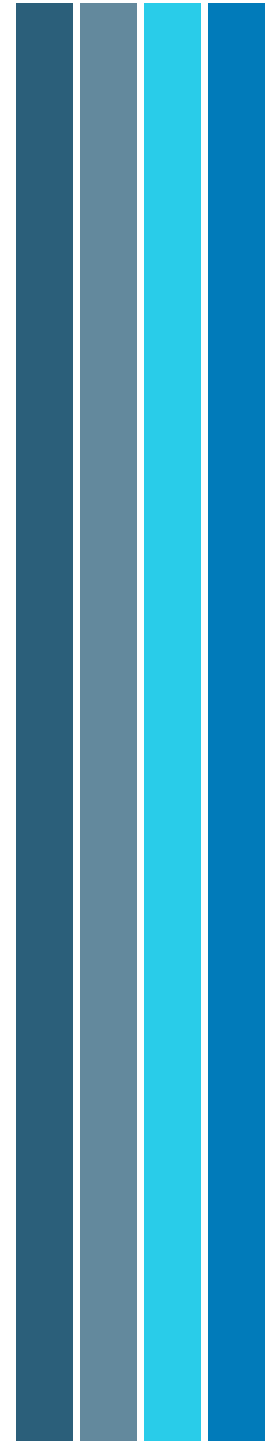
The Alice-Mayo Test Became The Standard For Patent Eligibility Under 35 U.S.C. § 101

- Two Prong Test

- **PRONG 1 – The Judicial Exception** - Does the claim recite a law of nature, natural phenomenon or "Abstract Idea"

- **PRONG 2 – Significantly More** - If YES to PART 1, does the claim recite additional elements that amount to "**significantly more**" than the judicial exception?

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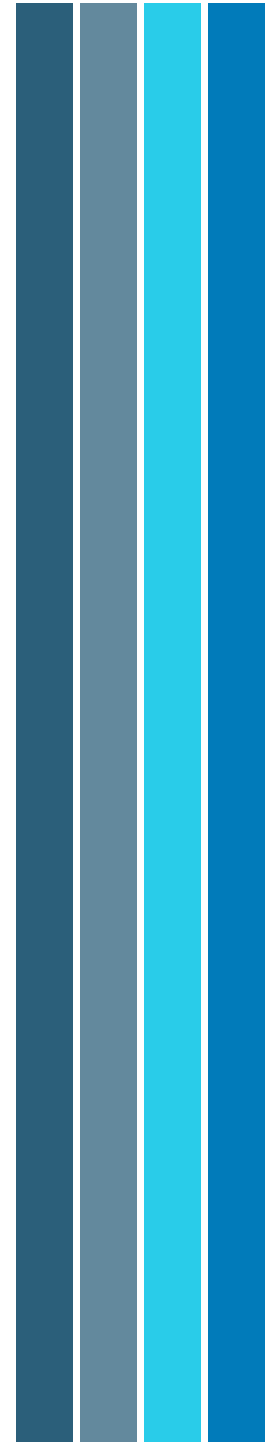# ABSTRACT IDEAS

- Mathematical Concepts

- Certain Methods of Organizing Human Activity

- Mental Processes

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US Standards-Abstract Ideas Under 35 USC § 101

Can NOT be an "abstract idea"

- Something that could be done by "pencil and paper"

- Something that could be performed mentally (within reason)

- Simply electrifying a known process is not enough, e.g., on-line
store displaying graphics of sweaters

- ***Invention must be functionally rooted in computer technology and solve
or otherwise overcome a problem in the computer technology***

  - Must involve a data manipulation performable only by a
computer

  - The data manipulation must go to the core of the invention-
It can not be "data gathering" and "extra solution activity"

- Claim with a "processor and a memory" is probably not enough.

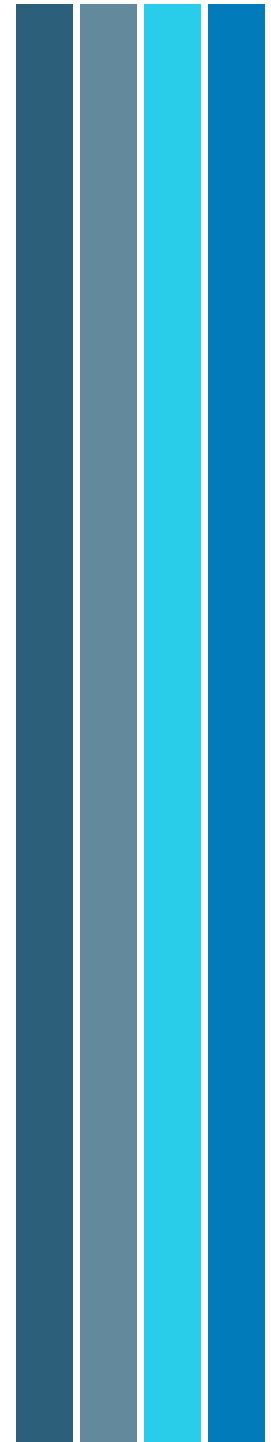**Dr. Mark Friedman Ltd.**
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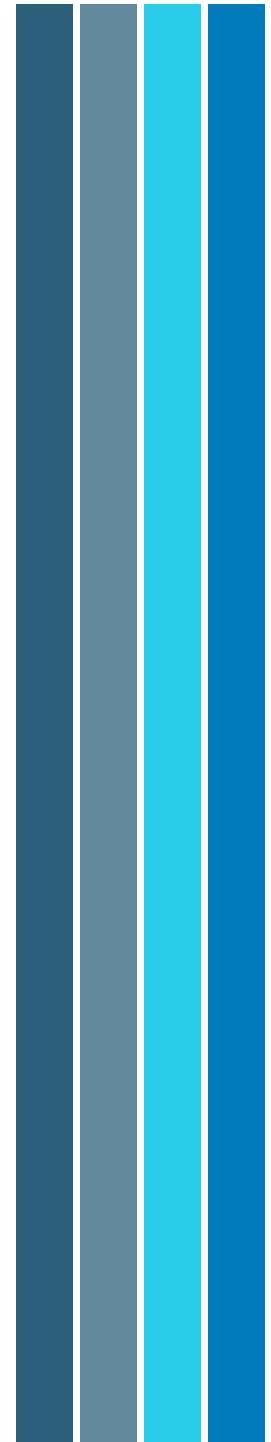
Focus on how the computer is being used

– The focus of the claims must be to improve the computer as a tool, and NOT just use the computer as a tool. *Electric Power Group, LLC, v. Alstrom S.A.*, 830 F.3d 1350 (Fed. Cir. 2016).

  • In *Electric Power*, US Courts are moving toward the European Standard (Technical solution to a technical problem)

  • *Use of the computer as a tool - Planet Bingo, LLC v. VKGS, LLC*, 2013-1663 (Fed. Cir. 2014), interprets *Alice*, "[I]f a patent's recitation of a computer amounts to a mere instruction to 'implemen[t]' an abstract idea 'on . . a computer,' . . . that addition cannot impart patent eligibility." quoting *Alice, 134 S. Ct. at 2358 (quoting Mayo, 132* S. Ct. at 1301).
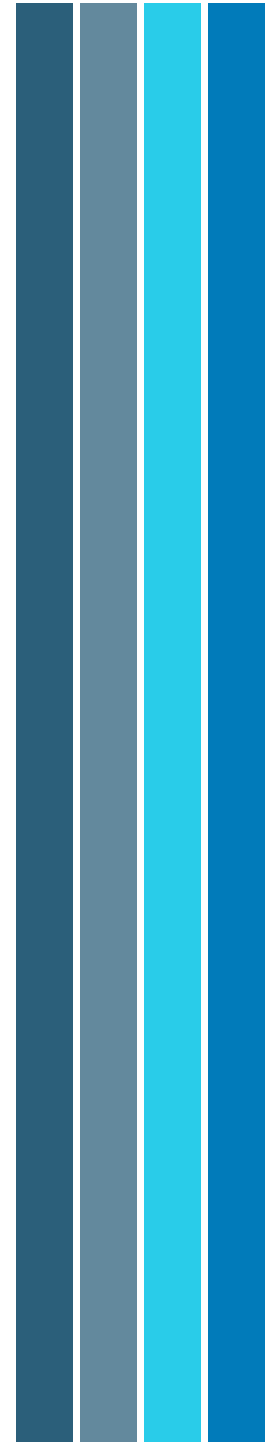
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Looks like the EPO standard?
Technical Solution to a Technical Problem

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Patent Eligibility-US and Europe

- US – The invention (as claimed) qualifies as Statutory Subject Matter under 35 USC § 101, in accordance with *Alice Corporation Pty Ltd. V. CLS Bank International*, 573 US __, 134 S.Ct. 2347 (2014) (*Alice*)

  - *Alice* defined patent ineligible subject matter outside of 35 USC § 101 as, laws of nature (e.g., gravity), natural phenomenon ($e=mc^2$), or an abstract idea. These are known as "**Judicial Exceptions**."

  - Patent-eligible concepts, The *Alice-Mayo* Two Prong Test

    Not an "abstract idea" (subject mater that is not one of five patent-eligible types: process, machine, manufacture, composition of matter, any new and useful improvement thereof, and, software product (not explicit in 35 USC § 101))

    OR

    "Abstract Idea" (Judicial Exception) + "Significantly More" – "Significantly More" is undefined and extremely subjective, typically decided on a case by case basis

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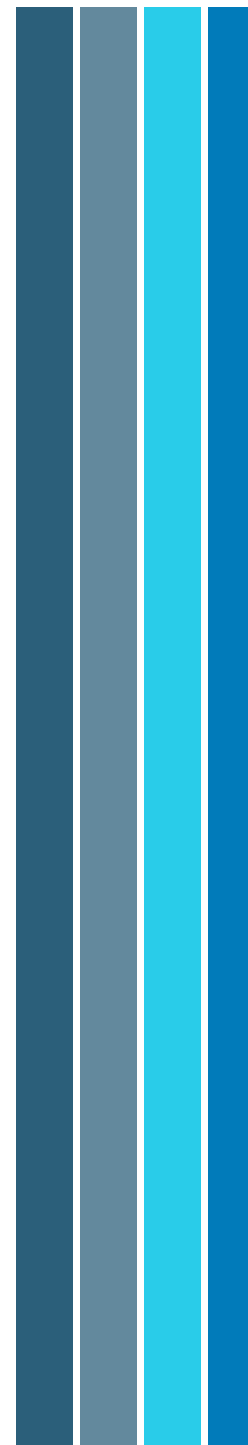
Patent Eligibility-US and Europe

- Europe has more rigid standards

- Invention must be a TECHNICAL solution to a TECHNICAL problem

  - Known as a "Problem-Solution" approach

  - Computer performs process better or faster then is currently known

    - Computer provides optimized results based on computer-determined parameters

  - Saving of computer resources, e.g., storage/memory

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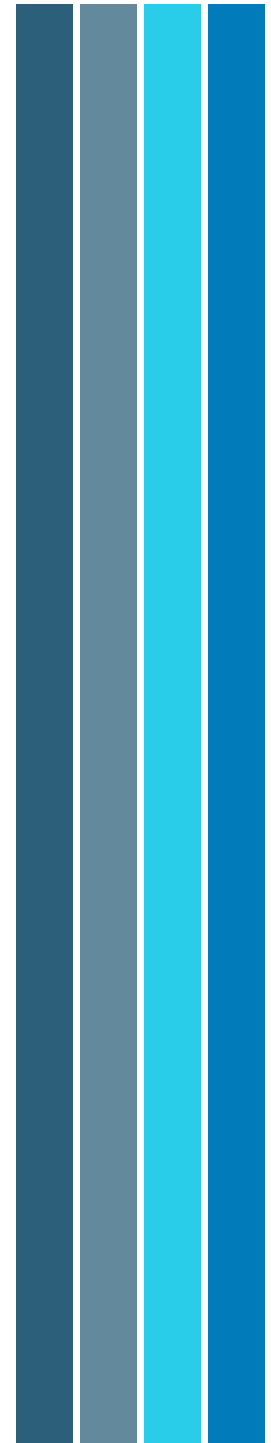
EPO Patent Eligible Claim Computer Optimization

Computerized Shopping Method

Method of facilitating shopping on a mobile device wherein:

(a) the user selects two or more products to be purchased;

(b) the mobile device transmits the selected products data and the device location to a server;

(c) the server accesses a database of venders to identify venders offering at least one of the selected products;

(d) _the server determines_, on the basis of the device location and the identified vendors, an **optimal** _shopping tour for purchasing the selected products_ by accessing a cache memory in which optimal shopping tours determined for previous requests are stored; and

(e) the server transmits the optimal shopping tour to the mobile device for displaying.
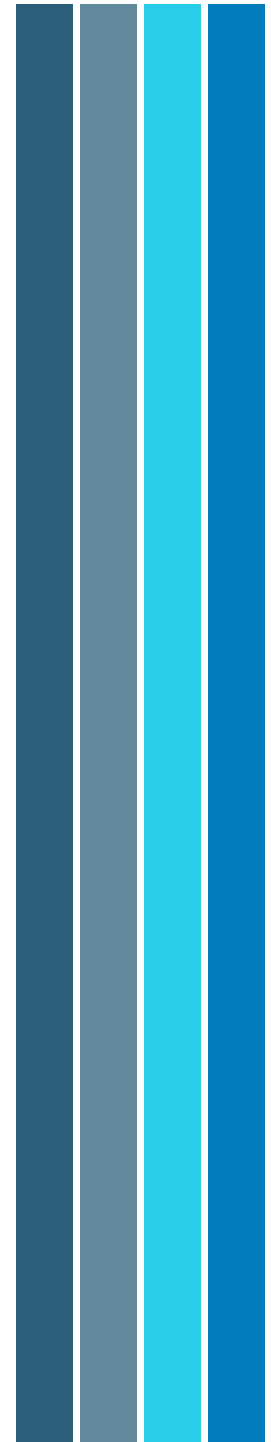
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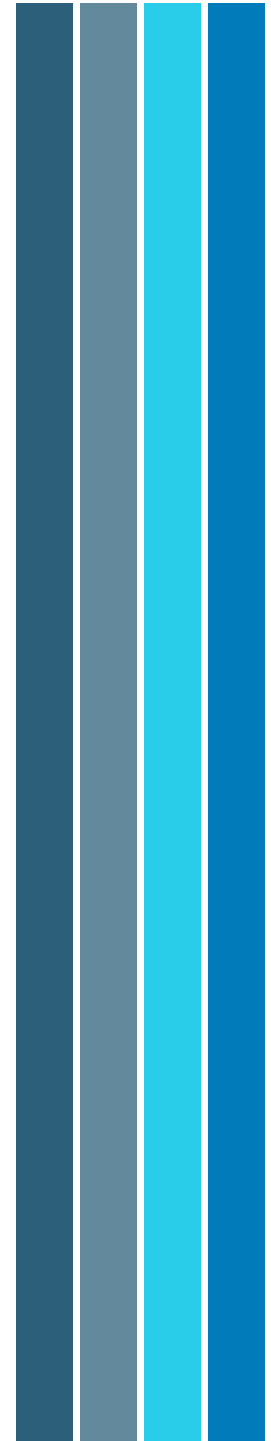
Overcoming an Rejection Under 35 U.S.C. § 101 in the USPTO-Claim is NOT an "Abstract Idea"
Alice-Mayo Test - Prong 1 -Claim is NOT an "Abstract Idea"

- The claim is analogous to a technology previously determined NOT to be an "abstract idea"

- The claim is specifically directed to the operation of the computer, e.g., Cybersecurity, Malware Detection

- The claim recites an improvement to computer operation

    – Computer now operates faster/better than conventionally known

    – Claim recites saving or optimizing computer resources, e.g., storage media/memory

- The claim recites an improvement to a computerized technical process, e.g., optimizes a process based on computer-obtained parameters
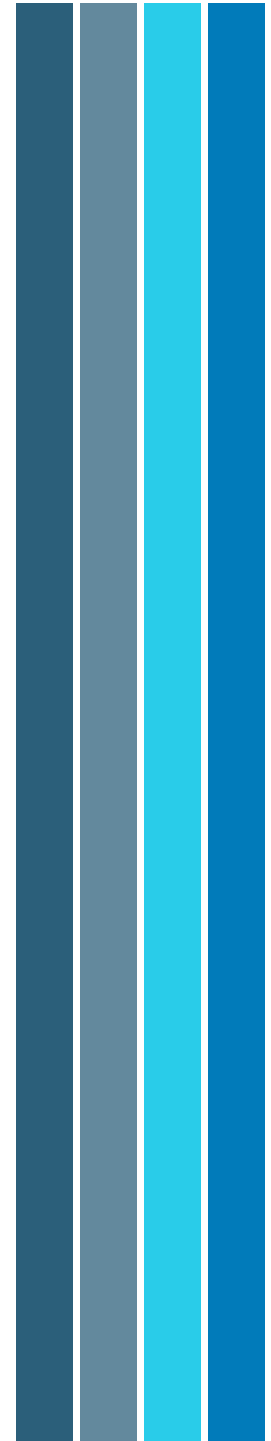
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Overcoming an Rejection Under 35 U.S.C. § 101 in the USPTO-Claim is NOT an "Abstract Idea"

- The claim requires computer/network/technical implementation in order to operate – The invention would not make sense/would not be operable, without a computer.

- e.g., The invention <u>only</u> works because of a computer, such as in networks, the Internet, email, AI, AdTech, or other computerized operation

- The computer is inextricably bound to the invention
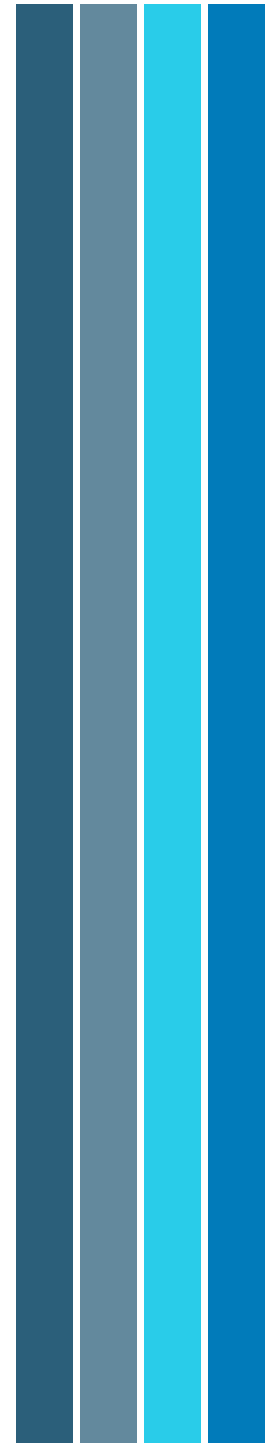
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Categories Presently Patent Eligible under *Alice-Mayo (Pre-Alice-Mayo)*

- Computer control of industrial processes
  - Use of computer applying Arrhenius Equation in rubber processing, *Diamond v. Diehr,* 450 U.S. 175 (1981)

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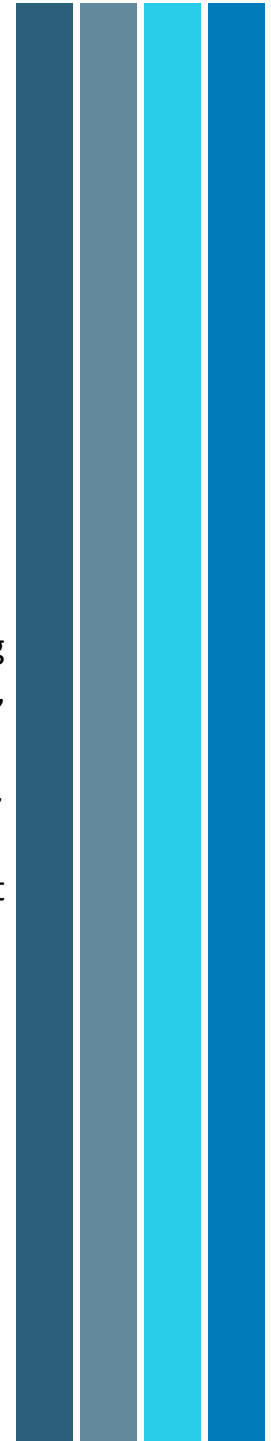# Categories Presently Patent Eligible under *Alice-Mayo (Continued)*

- Image processing*

- Geolocation using GPS hardware*

- Triggered retrieval of stock quotes**

- GUI that automatically relocates obscured information**

- Computer malware scanning and removal

  - For example, isolating and removing malicious code from email**

- A unique combination of inertial sensors and the use of a mathematical equation for calculating the location and orientation of an object relative to a moving platform. *Thales Visionix, Inc. v. US*, 850 F.3d 1343 (Fed. Cir. 2017)

- Methods for improving security of a computer communications network. *SRI International, Inc. v. Cisco Systems*, No. 2017-2223, 2019 US App. LEXIS 8249 (Fed. Cir. 2019)

- Other eligible categories – look to USPTO Guidance of July 2015 (Available at www.uspto.gov/sites/default/files/documents/ieg-july-2015-update.pdf)

 * Federal Register, Vol. 79, No. 241, Dec. 16, 2014

** USPTO Guidance of July 2015 (cited above)

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Categories Probably Patent Eligible under *Alice-Mayo (Continued)*

- Cyber Security and Computer Security Software – "improves the functioning of the computer itself"

- AdTech – By its very nature this technology is only possible with computers and networks (technology requires computers and/or networks to operate)

- Artificial Intelligence (AI) – Requires a computer to apply a model for training the system and improving operation after each operational iteration
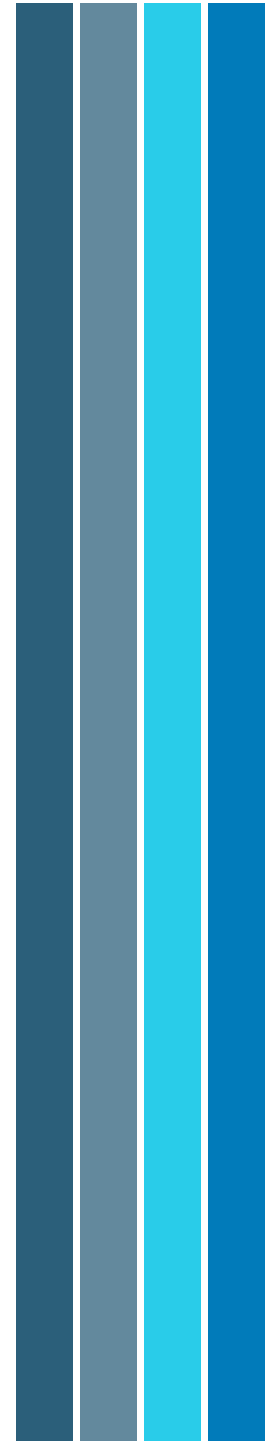
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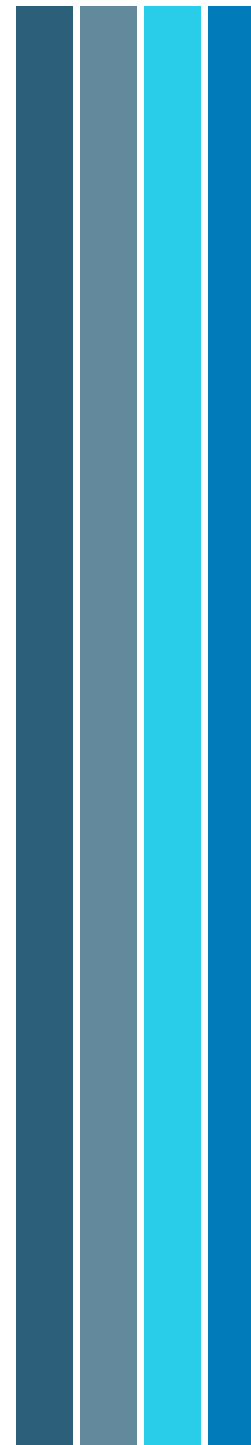
What is NOT an ABSTRACT IDEA

- Claims directed to an improvement in computing or other technology are not "abstract ideas" under the first prong of *Alice*. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016)

- Claims that recite a combined order of specific rules, that improved on existing technological processes are patent eligible. *McRO, Inc. v. Bandai Namco Games America, Inc.*, 837 F.3d 1299, 1315 (Fed. Cir. 2016)

- Claims that could be performed mentally are not abstract under prong one of *Alice* when performed by a computer if there is no evidence that the invention was previously performed mentally in the same fashion as the computer. *McRO*
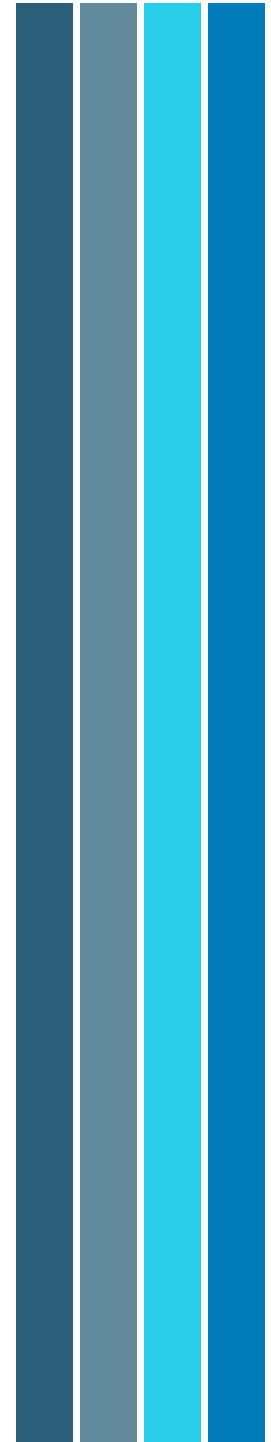
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What is NOT an ABSTRACT IDEA

Claims are not "abstract ideas" when reciting specific steps that accomplish a desired result. *Finjan, Inc. v. Blue Coat Systems, Inc.*, 879 F. 3d 1299 (Fed. Cir. 2018)

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Problems with Alice-Mayo

From the Courts – "At some level, all inventions embody, use, reflect, rest upon or apply laws of nature, natural phenomena, or abstract ideas". Reviewers should "tread carefully in constructing this exclusionary principle lest it swallow all patent law." USPTO 2019 Revised Patent Subject Matter Eligibility Guidance at Page 8 (citing *Alice,* 573 U.S. at 216 and *Mayo,* 566 U.S. at 71)

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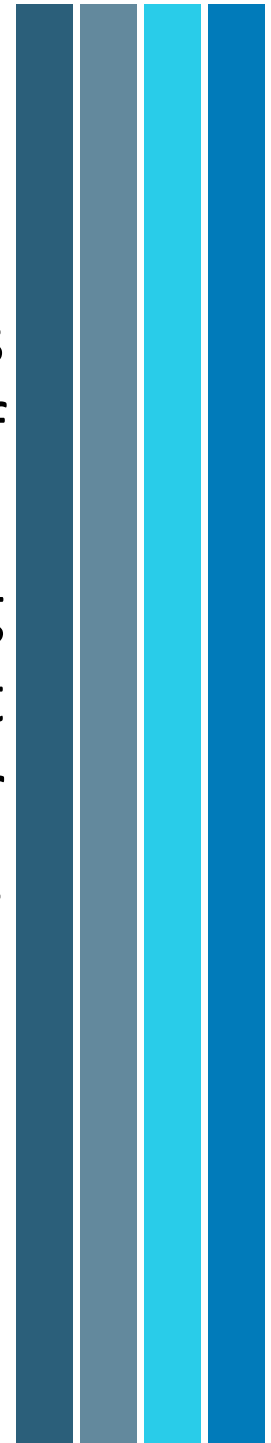
Problems with Alice-Mayo

From the USPTO – There are numerous Federal Circuit decisions identifying subject matter as abstract or non-abstract, and that number is continuously growing. In addition, similar subject matter has been described as both abstract and non-abstract in different cases. This has caused confusion among patent examiners, as they can not apply this legal precedent in a predictable way, which may cause different examiners in different technology centers to reach inconsistent results. USPTO 2019 Revised Patent Subject Matter Eligibility Guidance at Page 9.

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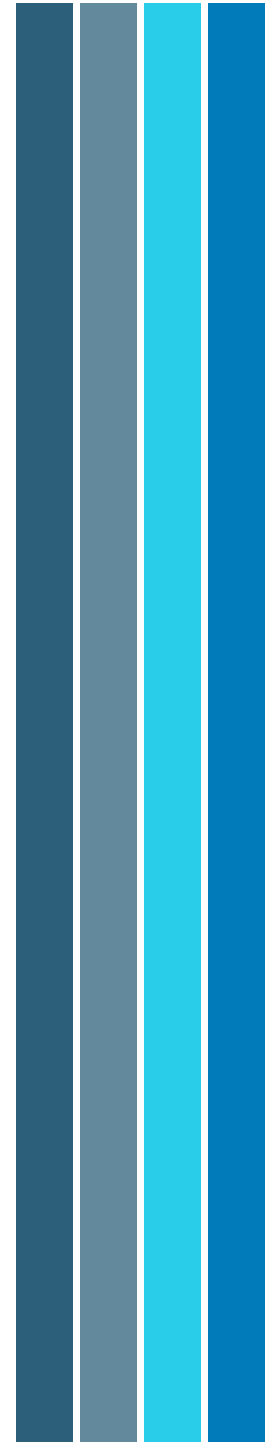
The Solution- New Step 2A to Prong 2 of the Alice-Mayo Test

- The "Integrated into a Practical Application" Test

- A claim that integrates a judicial exception into a **practical application** will apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the judicial exception. USPTO 2019 Revised Patent Subject Matter Eligibility Guidance at Page 18.

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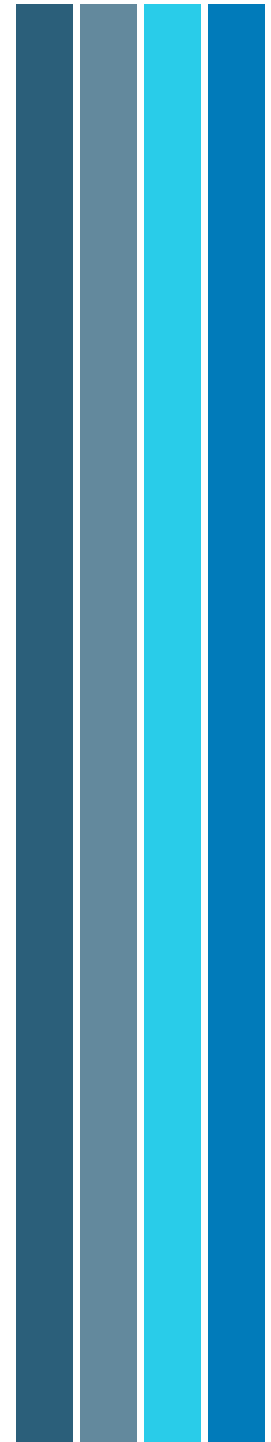
Example considerations which are indicative that an additional element (or combination of elements) may have integrated the exception into a practical application

- An additional element reflects an improvement in the functioning of a computer, or an improvement to other technology or technical field;

- an additional element that applies or uses a judicial exception to effect a particular treatment or prophylaxis for a disease or medical condition;

- an additional element implements a judicial exception with, or uses a judicial exception in conjunction with, a particular machine or manufacture that is integral to the claim;

- an additional element effects a transformation or reduction of a particular article to a different state or thing; and

- an additional element applies or uses the judicial exception in some other meaningful way beyond generally linking the use of the judicial exception to a particular technological environment, such that the claim as a whole is more than a drafting effort designed to monopolize the exception.

USPTO 2019 Revised Patent Subject Matter Eligibility Guidance at Pages 19-20.

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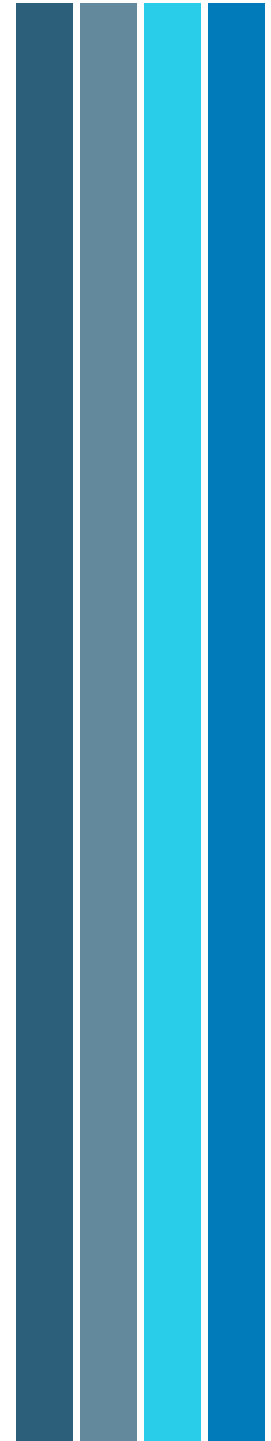
Court-identified examples in which a judicial exception has not been integrated into a practical application:

- An additional element merely recites the words "apply it" (or an equivalent) with the judicial exception, or merely includes instructions to implement an abstract idea on a computer, or merely uses a computer as a tool to perform an abstract idea;

- an additional element adds insignificant extra-solution activity to the judicial exception; and

- an additional element does no more than generally link the use of a judicial exception to a particular technological environment or field of use.

USPTO 2019 Revised Patent Subject Matter Eligibility Guidance at Page 20.

LOOKS LIKE THE PRE-STEP 2A ALICE-MAYO PRONG 2??????

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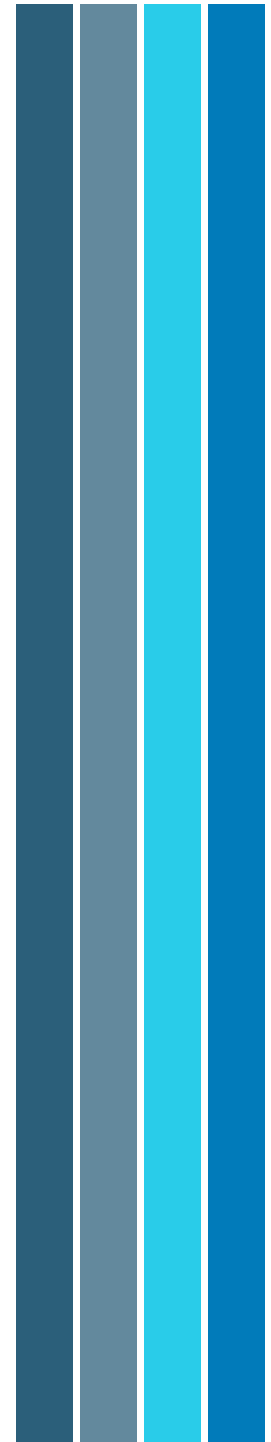
A Live Example

A computerized method for detecting malicious code from executable memory in the Kernel Space, comprising:

      providing a host for a memory system, the memory system comprising a guest user space and a guest kernel space, the host managing a branches buffer for each process operating in the memory system;

      analyzing, by the host, instructions for a process in a CPU buffer associated with the memory system; searching, by the host, for exploitation patterns in the instructions for the process, in the branches buffer;

      analyzing the exploitation patterns against predetermined malicious or potentially malicious patterns, to determine whether the exploitation patterns from the instructions is malicious or potentially malicious, and,

      <u>**if the exploitation pattern is malicious, issuing an alert for the exploitation pattern.**</u>

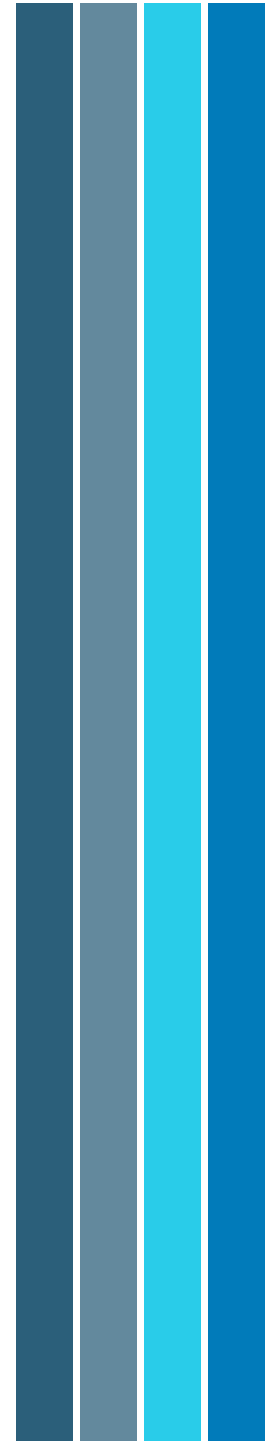**Dr. Mark Friedman Ltd.**
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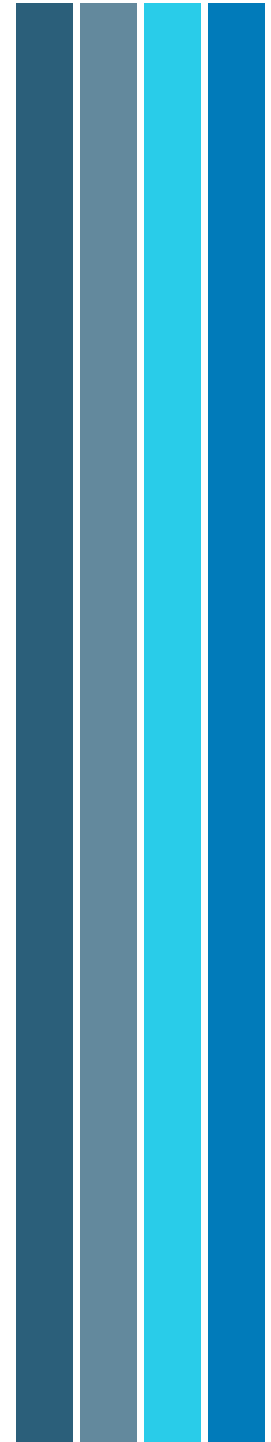
The "Integration into a practical application" Test (Prong 2, Step 2A) is met

- Examiner Stated: Based on the comparison of potential exploitation patterns with predetermined malicious patterns, an alert is sent when a malicious pattern is matched.

- Examiner Concluded: Claim is patent eligible
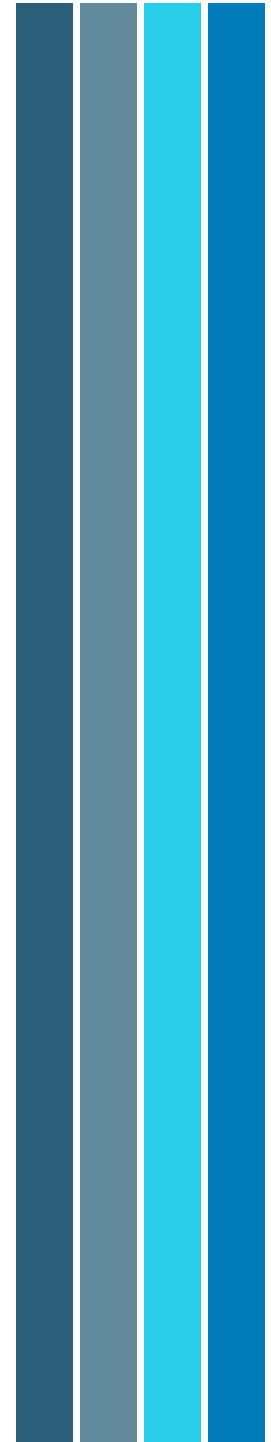
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Step 2B is Former Prong 2 of the Alice-Mayo Test

If Step 2A fails, a determination is made whether the additional claim elements go beyond well understood routine and conventional activity.

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Overcoming a Rejection Under 35 U.S.C. § 101 in the USPTO
Alice-Mayo Test, Prong 2, Step 2B -Claim adds "Significantly More"

- This is an optional argument, provided you are satisfied that the claim is NOT an "abstract Idea" of the _Alice-Mayo_ Test Prong 1. Preferably, this argument should be presented.

- The computer has been improved, processes are performed better, faster, than is conventionally known

- Invention saves computer resources

- Look at technical improvements, as described in the specification

- Claims that incorporate a new arrangement of known, conventional elements are inventive under prong two of _Alice. Bascom Global Internet Services, Inc. v. AT&T Mobility, LLC_, 827 F3d 1341 (Fed. Cir. 2016)

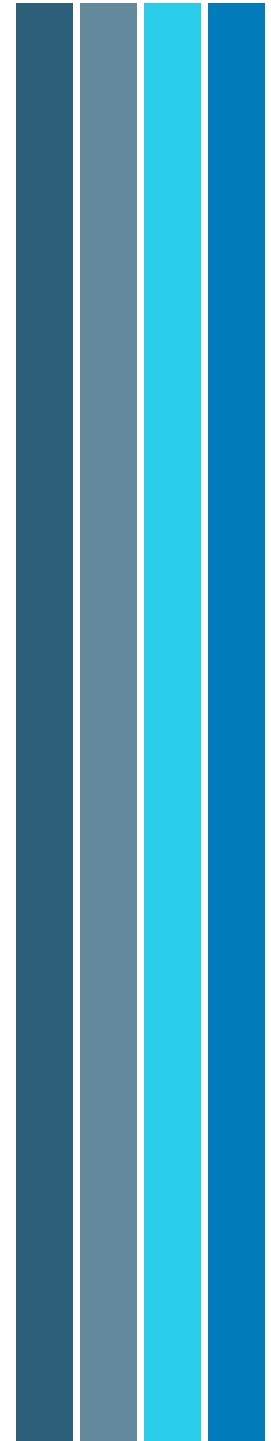**Dr. Mark Friedman Ltd.**
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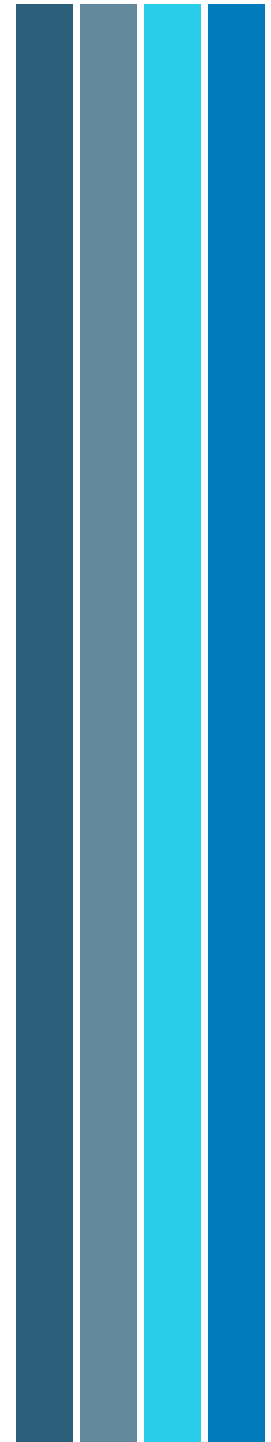
Overcoming *Alice-Mayo* – Claim is one of the four acceptable claim types, Streamlined Analysis, No Preemption

- Non-General Purpose computing device components added to the claim
  - The claim:

    A robotic arm assembly comprising:

    a robotic arm having an end effector that is capable of movement along a predetermined motion path,

    a sensor that obtains movement information about the end effector, and

    a control system that uses the movement information from the sensor to adjust the velocity of the end effector in order to achieve a smooth motion along the predetermined motion path.

  - Claim is a proper apparatus claim.
  - There is no preemption here. This claim does not prevent others from implementing the alleged abstract idea in other applications, such as applications not including any of the specific non-general computing device components .

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Computer Related Inventions -Patent Applications

1. Specification – written description tied to the drawings
   – Problem-Solution
   – Results based on computer

        Invention saves computer resources

        Computer makes invention faster

2. Drawings
   – System Environment Diagram – show an exemplary environment where your system is operating
   – Architecture Diagrams – show relations between components of your system
   – Database Diagrams
   – Flow Diagrams – Show processes and subprocesses
   – Screen Shots-for explaining processes of the Flow diagrams

3. Claims – Define the property right of the invention (single sentences at the end of the application)
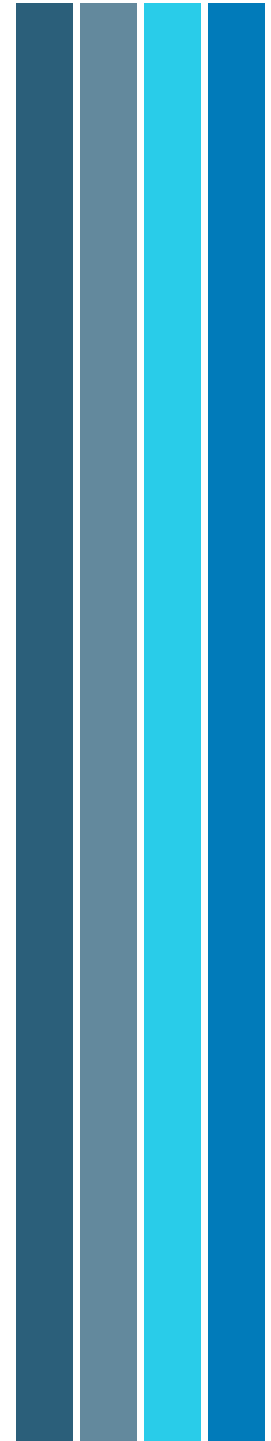
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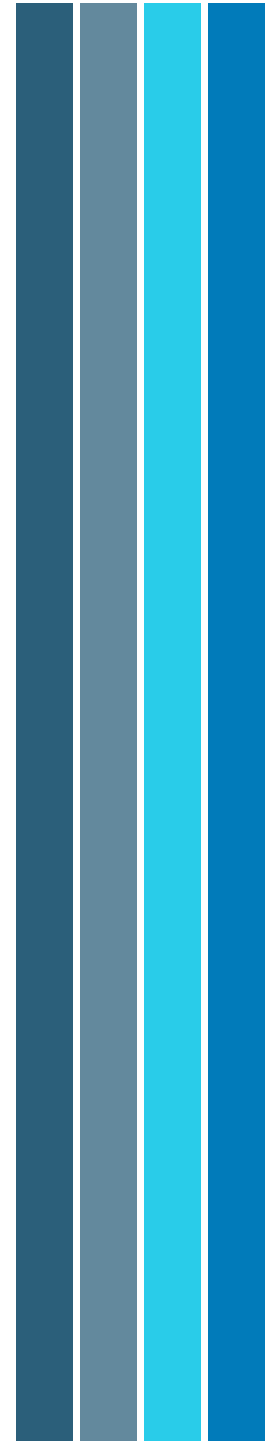
# Specification Drafting to Avoid *Alice* Issues

- Draft a Robust Specification

    – Describe the invention in technical detail, include specific statements concerning how the disclosed invention improves on the prior art. Explain the benefits resulting from specific structures of the invention. *Visual Memory v. NVIDIA*, No. 2016-2254 (Fed. Cir. Aug. 15, 2017)

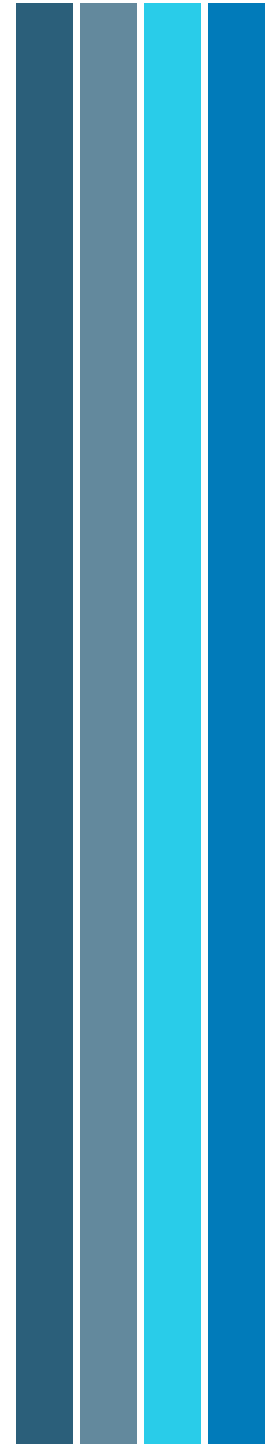   – Problem-Solution approach, similar to EP practice

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SYSTEM ENVIRONMENT DIAGRAM

FIG. 1A
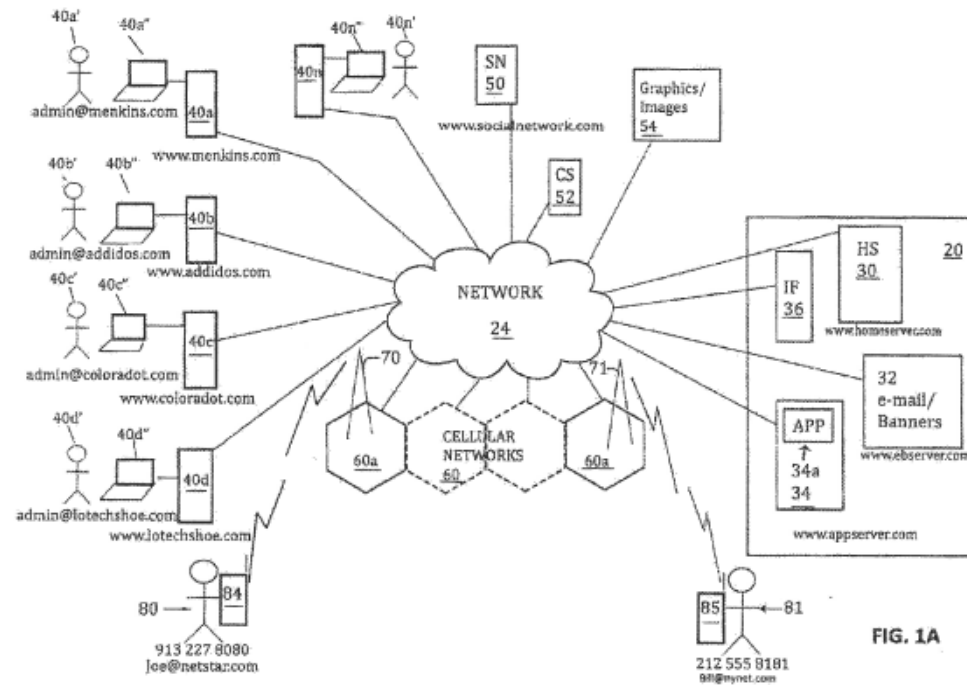
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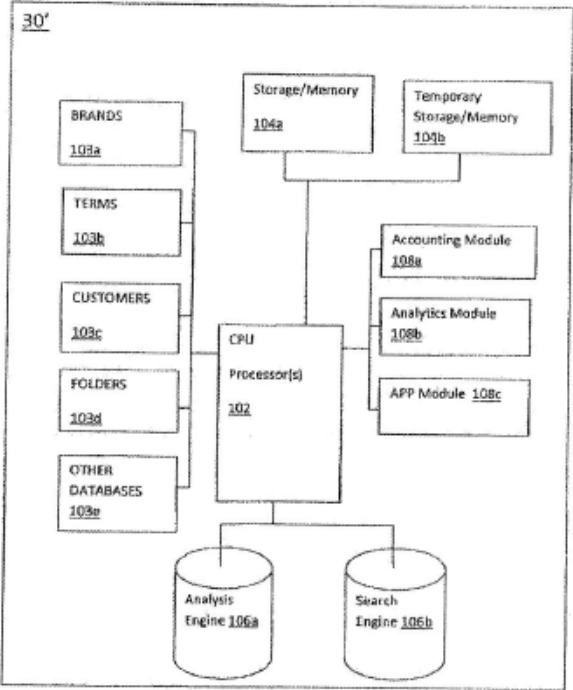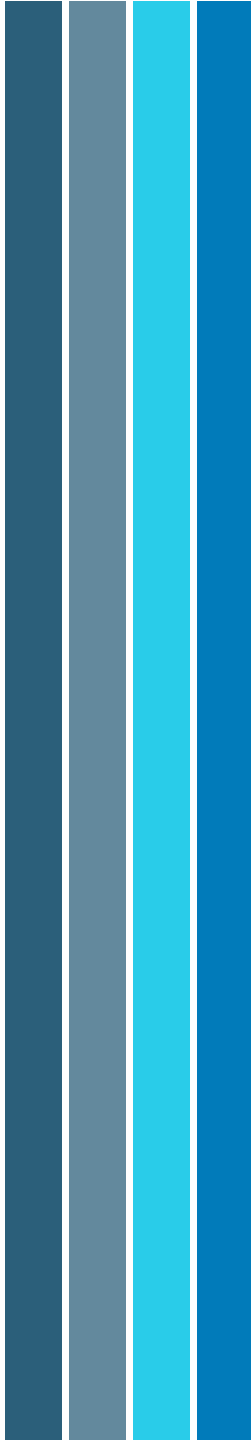Patent Attorneys

ARCHITECTURE DIAGRAM

FIG. 2A

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DATABASE DIAGRAMS

BRANDS DATABASE

103a

BRAND	URL/LINK	FOLDER ID	CPM($)	PREMIUM	
MENKINS	www.menkins.com	XP421CV	8.00	YES	103a-1

BRAND	URL/LINK	FOLDER ID	CPM($)	PREMIUM	
ADDIDOS	www.addidos.com	CX274PQ	9.00	NO	103a-2

		•			
		•			
		•			

BRAND	URL/LINK	FOLDER ID	CPM($)	PREMIUM	
BRAND n	www.Brandn.com	XX898XX	1.00	NO	103a-n

FIG. 2B

FOLDERS DATABASE

|	FOLDER ID	ENTITY	BRAND/TERM	
	XP421CV	MENKINS	BRAND	103d
	CX274PQ	ADDIDOS	BRAND/TERM	
	XXB98XX	BRAND n	BRAND	
	CV122XY	LO-TECH SHOES	TERM	
	PQB98RS	FEET LOCKER	TERM	
	RS277VV	BAUCONY SHOES	TERM	
	IL430XY	GALI SUPERSTORE	TERM	
	ZX641VX	PUMA	TERM	
	BH221YZ	KEDS	TERM	
	HE976AB	FREDS FEET	TERM	
	RX344ZN	SHOE BLOG	TERM	
	NN486XQ	COLORADO TOURISM	TERM	
	HPB99VN	HIKERS BLOG	TERM	
	VX737RP	HIKING COMPANY	TERM	
•	•	•	•	
•	•	•	•	
•	•	•	•	

FIG. 2E
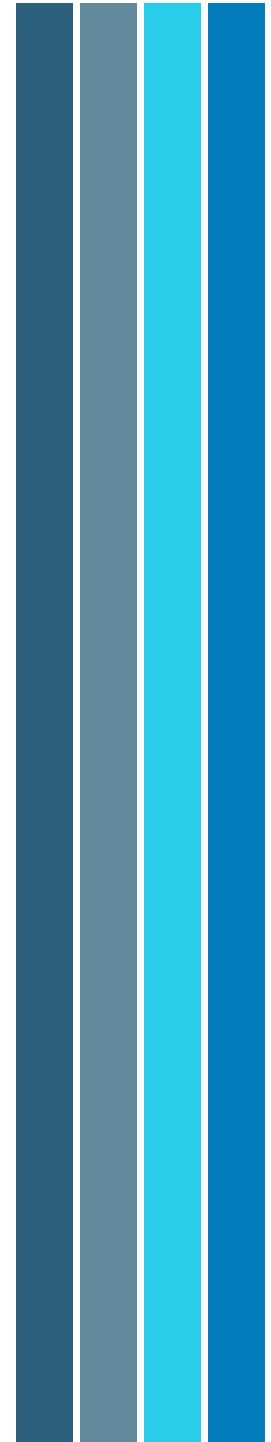
FLOW DIAGRAM

FIG. 3

FIG. 4A
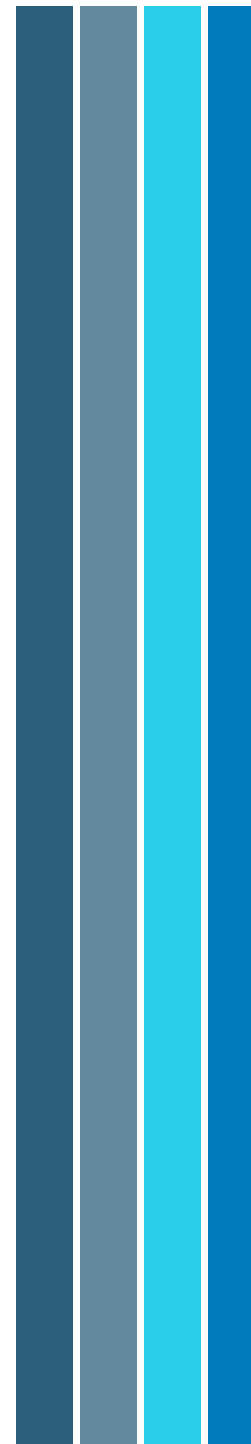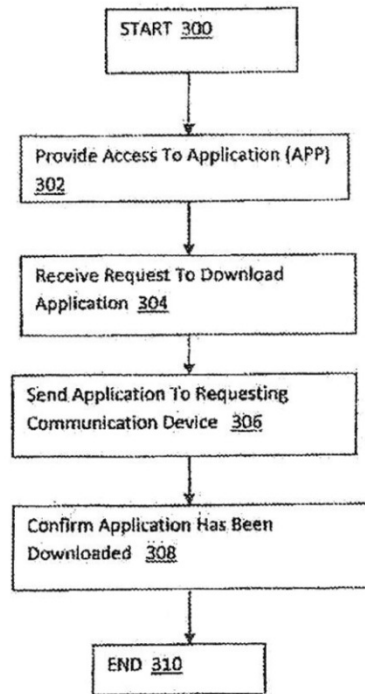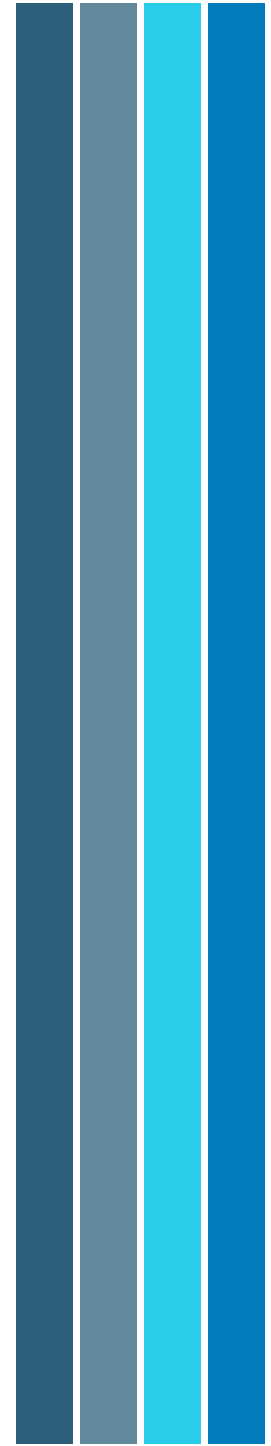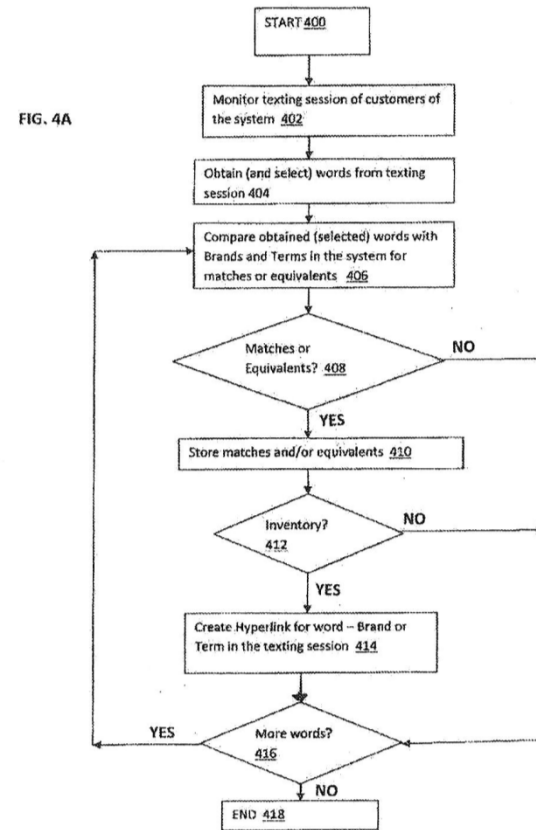
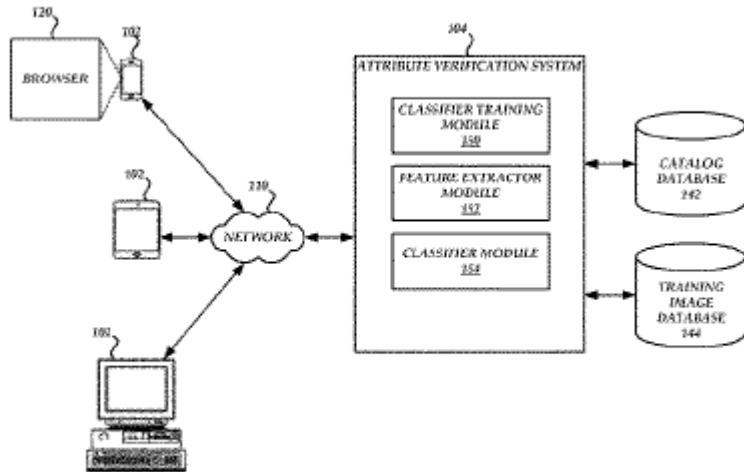# SCREENSHOT DIAGRAM
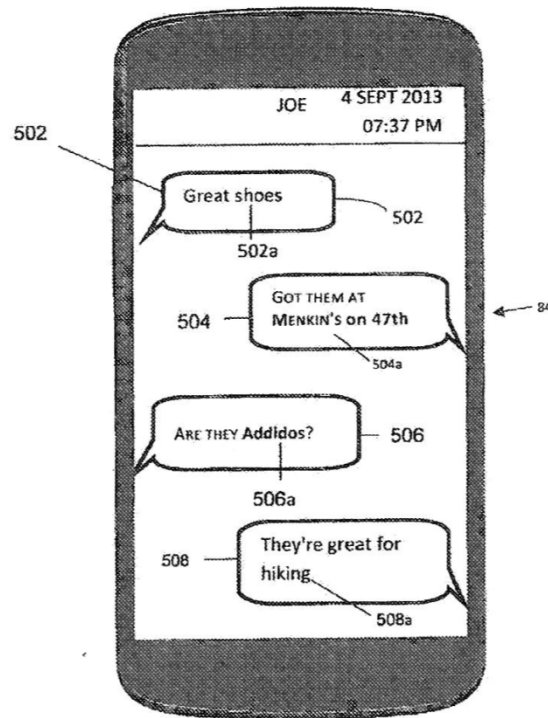
FIG. 5A

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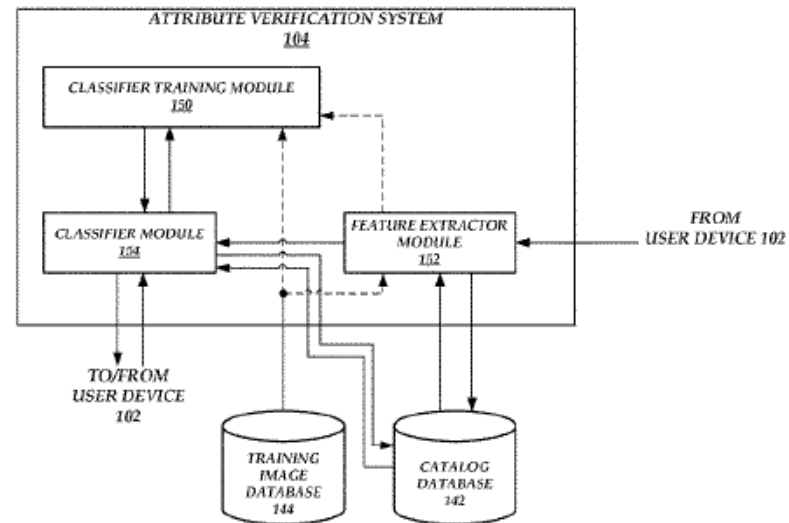Patent Attorneys

AI - Show the System and the Subsystem that runs the Model

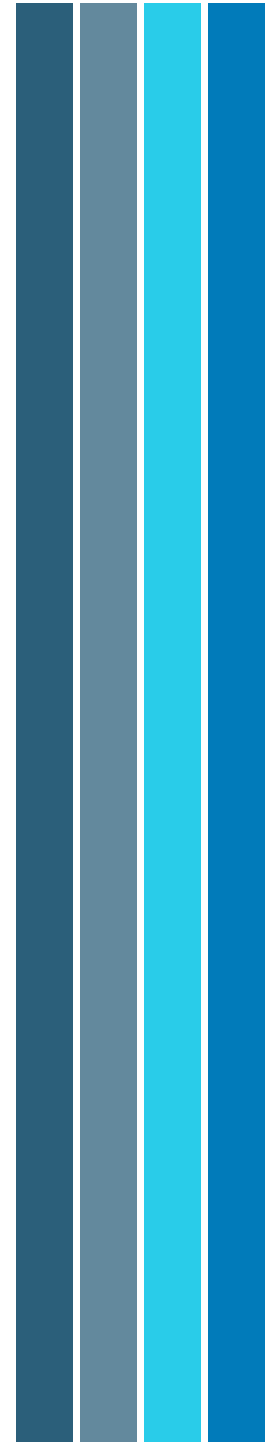From US Patent No. 9,892,133

SYSTEM

SUBSYSTEM

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Claim Drafting for Cyber Security Patents

- Avoid overly broad claims (e.g., provide context in a claim for how algorithm or process will be used)

- Focus on how a security process interacts with the software and hardware platforms/networks it protects

- Craft claims and specifications that show how security processes improve the functionality of computing devices and/or networks

  From, "Thoughts on the Impact of Alice v. CLS Bank on Security Software Patents," http://www.uspto.gov/sites/default/files/documents/nov2014-cybersecurity-partnership-presentation_0.pdf

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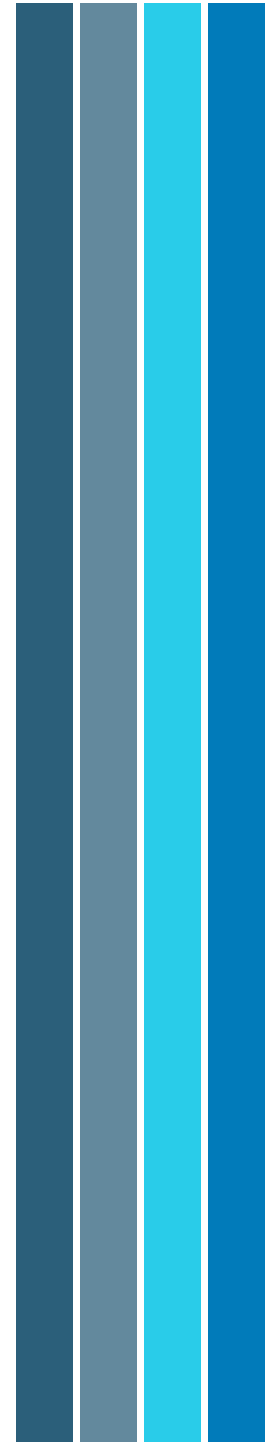
Claim Drafting to Avoid *Alice-Mayo* Issues

Draft claims which recite specific steps that accomplish a desired result.

1. A method comprising:

receiving by an inspector a Downloadable;

generating by the inspector a first Downloadable security profile that identifies suspicious code in the received Downloadable; and

linking by the inspector the first Downloadable security profile to the Downloadable before a web server makes the Downloadable available to web clients.

- "Downloadable" meant "an executable application program, which is downloaded from a source computer and run on the destination computer."
- "Downloadable security profile that identifies suspicious code in the received Downloadable" meant "a profile that identifies code in the received Downloadable that performs hostile or potentially hostile operations."

From *Finjan*

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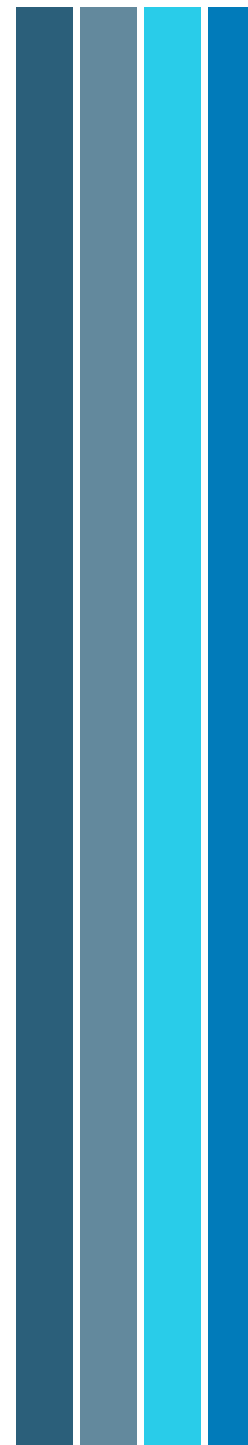
Example Claim – US Patent No. 10,291,634

1. A method of using a particular computer to isolate certain events indicative of an attack on a computerized end point, comprising:

using the particular computer to generate an attack tree corresponding to an attack on a computerized end point, the attack tree comprising events based on processes performed by the computerized end point associated with the attack;

using the particular computer to analyze the events of the attack tree by:

   a)   isolating primary events, from the events of the attack tree, associated with the attack on the   computerized end point, including events of the attack tree:

      1) where at least one of data, applications, and credentials, associated with the computerized end point, are at least one of maliciously: manipulated, altered or compromised; or,

      2) indicative of abnormal process behavior or known behaviors common to malicious activity;

   b)   wherein each isolated primary event is unique from every other isolated primary event;

   c)   isolating secondary events, from the remaining events of the attack tree, associated with the attack on the computerized end point including at least one of: network events, file   create/delete/modify/rename/copy events, registry modification events, predefined events associated with potential malicious behaviors of interest, and, hook and code injections; and,

   d)   wherein each isolated secondary event is unique from every other isolated primary event and every other isolated secondary event; and,

using the particular computer to provide a description of the attack on the computerized end point by selectively using the unique isolated primary and unique isolated secondary events.

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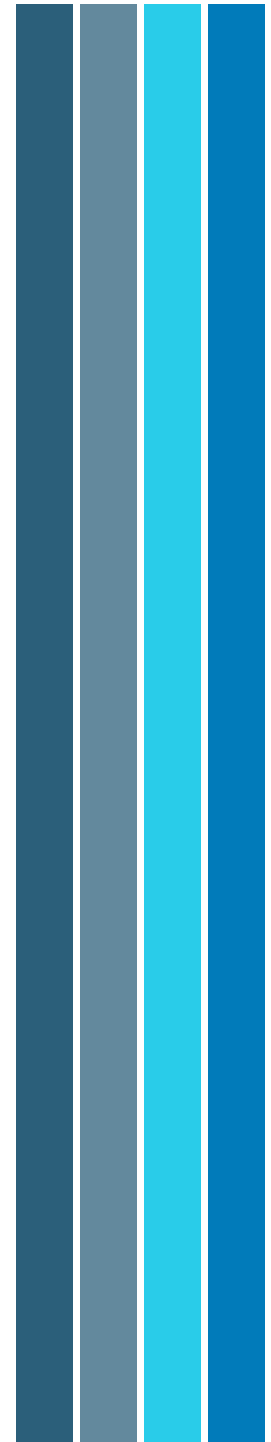
Thank You

Jerome R. Smith

Registered US Patent Attorney*

Partner

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