

July 2015 Update Appendix 1: Examples

The following examples should be used in conjunction with the *2014 Interim Guidance on Subject Matter Eligibility* (2014 IEG). As the examples are intended to be illustrative only, they should be interpreted based on the fact patterns set forth below. Other fact patterns may have different eligibility outcomes. While some of the fact patterns draw from U.S. Supreme Court and U.S. Court of Appeals for the Federal Circuit decisions, each of the examples shows how claims should be analyzed under the 2014 IEG. All of the claims are analyzed for eligibility in accordance with their broadest reasonable interpretation.

Note that the examples herein are numbered consecutively beginning with number 21, because 20 examples were previously issued. A comprehensive index of all examples for use with the 2014 IEG is provided in Appendix 2 to the July 2015 Update.

21. Transmission Of Stock Quote Data

The following hypothetical claims and background are modeled after the technology in Google Inc. v. Simpleair, Inc., Covered Business Method Case No. CBM 2014-00170 (Jan. 22, 2015), but are revised to emphasize certain teaching points. The patent at issue was U.S. Patent No. 7,035,914 entitled "System and Method for Transmission of Data." Hypothetical claim 1 is directed to an abstract idea and does not have additional elements that amount to significantly more than the abstract idea. Hypothetical claim 2 also recites an abstract idea but does contain additional elements that amount to significantly more because there are meaningful limitations beyond generally linking the use of the abstract idea to a particular technological environment.

Background

The invention is directed to a stock quote alert subscription service where subscribers receive customizable stock quotes on their local computers from a remote data source. At the time of the invention, stock quote subscription services over the Internet were known in the art. However, existing services experienced challenges when attempting to notify a subscriber whose computer was offline (not connected to the Internet) at the time of the alert, since many stock quotes are time sensitive. Further, many previous subscription services simply transmitted all available stock quote information to the user at a given time, which required the subscriber to sort through large amounts of data to identify relevant stock quotes, and often sent information at an inconvenient time (*e.g.*, after the stock exchanges are closed). The stock quote alert subscription service of the present invention addresses these problems.

During enrollment to the subscription service, the subscriber provides preference information in the form of stocks of interest, stock price threshold (*e.g.*, when the price reaches \$100 per share), a destination address of a wireless device (*e.g.*, a number for a cellular phone, pager or PDA), preferred format of the alert, and a transmission schedule indicating the time/date that alerts should be sent. The subscription service uses a transmission server to receive data from a data source and send selected data to subscribers. The transmission server includes a memory, a transmitter, and a microprocessor. The subscription service provides a stock viewer application to subscribers for installation on their individual computers. After a subscriber enrolls, the service receives stock quote information sent from a data source to the transmission

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server. The server filters the stock quote information based upon the subscriber preference information that is stored in memory on the server. That is, the server compares the received stock quote information to the stored stocks of interest and stock price threshold preferences to determine which stock quotes to drop and which to further process. Next, a stock quote alert is built containing the filtered stocks' name and price information and a universal resource locator (URL) to a web page at the data source which contains further information on the stock quote. The alert is then formatted into data blocks based upon the alert format preference information. Subsequently, the formatted data blocks are transmitted to the subscriber's wireless device in accordance with the transmission schedule. After receiving the alert, the subscriber can connect the wireless device to the subscriber's computer. The alert causes the subscriber's computer to auto-launch the stock viewer application provided by the service to display the alert. When connected to the Internet, the subscriber may then click on the URL in the alert to use the stock viewer application to access more detailed information about the stock quote from the data source.

Claims

1. A method of distributing stock quotes over a network to a remote subscriber computer, the method comprising:

receiving stock quotes at a transmission server sent from a data source over the Internet, the transmission server comprising a microprocessor and memory that stores the remote subscriber's preferences for information format, destination address, specified stock price values, and transmission schedule, wherein the microprocessor

filters the received stock quotes by comparing the received stock quotes to the specified stock price values;

generates a stock quote alert from the filtered stock quotes that contains a stock name, stock price and a universal resource locator (URL), which specifies the location of the data source;

formats the stock quote alert into data blocks according to said information format; and

transmits the formatted stock quote alert to a computer of the remote subscriber based upon the destination address and transmission schedule.

2. A method of distributing stock quotes over a network to a remote subscriber computer, the method comprising:

providing a stock viewer application to a subscriber for installation on the remote subscriber computer;

receiving stock quotes at a transmission server sent from a data source over the Internet, the transmission server comprising a microprocessor and a memory that stores

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the remote subscriber's preferences for information format, destination address, specified stock price values, and transmission schedule, wherein the microprocessor

filters the received stock quotes by comparing the received stock quotes to the specified stock price values;

generates a stock quote alert from the filtered stock quotes that contains a stock name, stock price and a universal resource locator (URL), which specifies the location of the data source;

formats the stock quote alert into data blocks according to said information format; and

transmits the formatted stock quote alert over a wireless communication channel to a wireless device associated with a subscriber based upon the destination address and transmission schedule,

wherein the alert activates the stock viewer application to cause the stock quote alert to display on the remote subscriber computer and to enable connection via the URL to the data source over the Internet when the wireless device is locally connected to the remote subscriber computer and the remote subscriber computer comes online.

Analysis

Claim 1: Ineligible

The claim recites a series of acts for distributing stock quotes to selected remote devices. Thus, the claim is directed to a process, which is one of the statutory categories of invention (*Step 1: YES*).

Next, the claim is analyzed to determine whether it is directed to a judicial exception. The claim recites the steps of receiving, filtering, formatting and transmitting stock quote information. In other words, the claim recites comparing and formatting information for transmission. This is simply the organization and comparison of data which can be performed mentally and is an idea of itself. It is similar to other concepts that have been identified as abstract by the courts, such as using categories to organize, store and transmit information in *Cyberfone*, or comparing new and stored information and using rules to identify options in *SmartGene*. Therefore, the claim is directed to an abstract idea (*Step 2A: YES*).

Next, the claim as a whole is analyzed to determine whether any element, or combination of elements, is sufficient to ensure that the claim amounts to significantly more than the exception. The claim recites the additional limitations of using a transmission server with a memory that stores subscriber preferences, a transmitter that receives and sends information over the Internet, and a microprocessor that performs the generic functions of comparing and formatting information. The transmission server is recited at a high level of generality and its broadest reasonable interpretation comprises only a microprocessor, memory and transmitter to simply perform the generic computer functions of receiving, processing and transmitting information. Generic computers performing generic computer functions, alone, do not amount to significantly more than the abstract idea. Finally, the

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Internet limitations are simply a field of use that is an attempt to limit the abstract idea to a particular technological environment and, so do not add significantly more. Viewing the limitations as an ordered combination does not add anything further than looking at the limitations individually. When viewed either individually, or as an ordered combination, the additional limitations do not amount to a claim as a whole that is significantly more than the abstract idea (*Step 2B: NO*). The claim is not patent eligible.

A rejection of claim 1 should identify the exception by pointing to the filtering, generating and formatting steps and explain that the comparing and formatting of information is a mental process that is similar to the concepts that courts have previously found abstract. The rejection should also identify the additional limitations regarding the transmission server and explain why those limitations comprise only a generic computer performing generic computer functions that do not impose meaningful limits on the claimed method.

Claim 2: Eligible

The claim recites a series of acts for distributing stock quotes to selected remote devices. Thus, the claim is directed to a process, which is one of the statutory categories of invention (*Step 1: YES*).

The claim is then analyzed to determine if the claim is directed to a judicial exception. As discussed above, the recited steps of comparing and organizing data for transmission are a mental process and similar to other concepts found to be abstract by the courts. The claim is directed to an abstract idea (*Step 2A: YES*).

Next, the claim as a whole is evaluated to determine if there are additional limitations that amount to significantly more than the abstract idea. The claim recites the additional limitations of using a transmission server with a microprocessor and a memory to store subscriber preferences, transmitting a stock quote alert from the transmission server over a data channel to a wireless device, and providing a stock viewer application that causes the stock quote alert to display on the subscriber computer and enables a connection from the subscriber computer to the data source over the Internet when the subscriber computer comes online. It is noted that, as discussed above, some of the limitations when viewed individually do not amount to significantly more than the abstract idea (such as storing subscriber preferences or transmitting an alert). However, when looking at the additional limitations as an ordered combination, the invention as a whole amounts to significantly more than simply organizing and comparing data. The claimed invention addresses the Internet-centric challenge of alerting a subscriber with time sensitive information when the subscriber's computer is offline. This is addressed by transmitting the alert over a wireless communication channel to activate the stock viewer application, which causes the alert to display and enables the connection of the remote subscriber computer to the data source over the Internet when the remote subscriber computer comes online. These are meaningful limitations that add more than generally linking the use of the abstract idea (the general concept of organizing and comparing data) to the Internet, because they solve an Internet-centric problem with a claimed solution that is necessarily rooted in computer technology, similar to the additional elements in *DDR Holdings*. These limitations, when taken as an ordered combination, provide

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unconventional steps that confine the abstract idea to a particular useful application. Therefore, the claim recites patent eligible subject matter (*Step 2B: YES*).

If the examiner believes that the record would benefit from clarification, remarks could be added to an Office action or reasons for allowance indicating that the claim recites the abstract idea of comparing and organizing data for transmission. However, the claim is eligible because it recites additional limitations that when considered as an ordered combination demonstrates a technologically rooted solution to an Internet-centric problem and thus amounts to significantly more than comparing and organizing information for transmission.

22. Graphical User Interface For Meal Planning

The following claim was found ineligible by the Southern District of New York, and the judgment was affirmed by the Federal Circuit in Dietgoal Innovations LLC v. Bravo Media LLC, 599 Fed. Appx. 956 (Fed. Cir. Apr. 8, 2015). The patent at issue was U.S. Patent 6,585,516. The claim is directed to an abstract idea, and the additional elements do not amount to significantly more than the abstract idea, but merely implement the idea using generic computer technology. The exemplary analysis shows how an examiner would apply the 2014 IEG analysis to the claim when making a rejection.

Background

The invention addresses a way to solve the issue of obesity, specifically by using visuals to assist users to follow diet programs designed by health professionals for the purpose of modifying diet behavior. In particular, the invention is a computer system that “includes[s] a User Interface (UI), a Meal Database, a Food Database, Picture Menus and Meal Builder.” The UI functions to receive commands from the user and display results to the user. The Food and Meal Databases are databases of food information and preselected combinations of foods that have been compiled into a single repository. The Picture Menus display pictures of meals on the UI so the user can make a plan by mixing and matching foods to meet customized eating goals. The Meal Builder permits the user to design meals and view the impact of the food choices on customized eating goals in real time. In practice, the invention permits a user to choose meals for a particular day, as well as modify one or more of the meals to create new meals, while seeing the impact on their dietary plan. The object of the invention is to influence a person’s eating behavior.

Claim

2. A system of computerized meal planning, comprising:
 - a User Interface;
 - a Database of food objects; and
 - a Meal Builder, which displays on the User Interface meals from the Database and wherein a user can change content of said meals and view the resulting meals’ impact on customized eating goals.

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Analysis

Claim 2: Ineligible.

The broadest reasonable interpretation of the claim encompasses a computer system (*e.g.*, hardware such as a processor and memory) that implements a user interface, a database, and a food data selection program. The system comprises a device or set of devices and, therefore, is directed to a machine, which is a statutory category of invention (*Step 1: YES*).

The claim is then analyzed to determine if the claim is directed to a judicial exception. The claim recites a system for selecting and modifying meals based upon dietary goals. In other words, the claim describes a process of meal planning. Meal planning is the organization and comparison of information to develop a guideline for eating. It is a mental process of managing behavior that could be performed in the human mind, or by a human using a pen and paper. Such a basic concept is similar to other mental processes found abstract by the courts such as comparing new and stored information and using rules to identify options in *SmartGene*, and obtaining and comparing intangible data in *Cybersource*. Therefore, claim 2 is directed to an abstract idea (*Step 2A: YES*).

Next, the claim is analyzed to determine if there are additional claim limitations that individually, or as an ordered combination, ensure that the claim amounts to significantly more than the abstract idea. The only additional limitations in the claim relate to computerization of meal planning with an interface, a database of food objects, and a “meal builder,” which is a computer program that allows selection and comparison of food data. The meal builder would require a processor and memory in order to perform basic computer functions of accepting user input, retrieving information from a database, manipulating that information and displaying the results. These components are not explicitly recited and therefore must be construed at the highest level of generality. The interface is also recited at a high level of generality with the only required function of displaying, which is a well-known routine function of interfaces. Further, the database performs only its basic function of storing information, which is common to all databases. Thus, the recited generic computer components perform no more than their basic computer functions. These additional elements are well-understood, routine and conventional limitations that amount to mere instructions to implement the abstract idea of meal planning on a computer. Taking these computer limitations as an ordered combination adds nothing that is not already present when the elements are taken individually. Therefore, the claim does not amount to significantly more than the recited abstract idea (*Step 2B: NO*). The claim is not patent eligible.

A rejection of this claim should identify the abstract idea of selecting meals for a customized eating goal, which is similar to concepts of obtaining and comparing data that were found to be abstract by the courts. The rejection should also identify the additional elements and explain the reasons why they amount to no more than merely implementing the idea of meal planning using generic computer components.

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23. Graphical User Interface For Relocating Obscured Textual Information

The following claims are hypothetical. Claim 1 demonstrates a claim that is not directed to an abstract idea. Claims 2 and 3 are directed to an abstract idea and do not recite significantly more. Claim 4 recites an abstract idea, but there are additional limitations in the claim that amount to significantly more than the abstract idea.

Background

The invention relates to a graphical user interface (GUI). A GUI manages the interaction between a computer system and a user through graphical elements such as windows on a display. Windows display various types of outputs for various computer processes and may contain controls to accept user input for those processes. In some instances, multiple windows are displayed at the same time; due to limited display space, however, the windows may overlap and obscure the content of underlying windows.

In the instant application, the inventor has improved upon previous GUIs by dynamically relocating obscured textual information of an underlying window to become automatically viewable to the user. In particular, in a graphical user interface that comprises multiple windows, the invention continuously monitors the boundaries of the windows to ascertain an overlap condition indicating that the windows overlap such that the textual information of an underlying window is obscured from a user's view by the overlapping window. Only when the textual information of the underlying window is detected to be obscured, the invention re-formats and moves the textual information in the underlying window to an unobscured portion of the underlying window so that the textual information is viewable by the user. When the overlap condition no longer exists, the textual information is returned to its original format and location.

The inventor's process is performed by modifying the vertical and horizontal margins of the underlying window in accordance with the overlap and utilizing a word wrap function to wrap the text around the obscured area based upon the new margins, and, where necessary, reducing the text size to permit the entirety of the textual information to be viewable in the unobscured portion. The textual information is scaled based upon a scaling factor that is calculated using a mathematical algorithm. First, an area of the underlying window and an area of the unobstructed portion of the underlying window are calculated. Next, the scaling factor is calculated which is proportional to the difference in area between the underlying window and the unobstructed portion of the underlying window. Finally, the font size of the textual information is changed in accordance with the scaling factor. The new scaled textual information is then moved as described above to the unobstructed portion of the underlying window. When the windows no longer overlap, the textual information is returned to its original format and location by resetting the vertical and horizontal margins of the window to their original values and no longer applying the scaling factor to the font size. By permitting textual information to be dynamically relocated based upon an overlap condition, the computer's ability to display information and interact with the user is improved.

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Claims

1. A computer-implemented method for dynamically relocating textual information within an underlying window displayed in a graphical user interface, the method comprising:

displaying a first window containing textual information in a first format within a graphical user interface on a computer screen;

displaying a second window within the graphical user interface;

constantly monitoring the boundaries of the first window and the second window to detect an overlap condition where the second window overlaps the first window such that the textual information in the first window is obscured from a user's view;

automatically relocating the textual information, by a processor, to an unobscured portion of the first window in a second format during an overlap condition so that the textual information is viewable on the computer screen by the user; and

automatically returning the relocated textual information, by the processor, to the first format within the first window when the overlap condition no longer exists.

2. A computer-implemented method of resizing textual information within a window displayed in a graphical user interface, the method comprising:

generating first data for describing the area of a first graphical element;

generating second data for describing the area of a second graphical element containing textual information; and

calculating a scaling factor for the textual information which is proportional to the difference between the first data and second data.

3. A computer-implemented method of resizing textual information within a window displayed in a graphical user interface, the method comprising:

generating first data for describing the area of a first graphical element;

generating second data for describing the area of a second graphical element containing textual information; and

calculating, by the computer, a scaling factor for the textual information which is proportional to the difference between the first data and second data.

4. A computer-implemented method for dynamically relocating textual information within an underlying window displayed in a graphical user interface, the method comprising:

displaying a first window containing textual information in a first format within a graphical user interface on a computer screen;

displaying a second window within the graphical user interface;

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constantly monitoring the boundaries of the first window and the second window to detect an overlap condition where the second window overlaps the first window such that the textual information in the first window is obscured from a user's view;

determining the textual information would not be completely viewable if relocated to an unobstructed portion of the first window;

calculating a first measure of the area of the first window and a second measure of the area of the unobstructed portion of the first window;

calculating a scaling factor which is proportional to the difference between the first measure and the second measure;

scaling the textual information based upon the scaling factor;

automatically relocating the scaled textual information, by a processor, to the unobscured portion of the first window in a second format during an overlap condition so that the entire scaled textual information is viewable on the computer screen by the user; and

automatically returning the relocated scaled textual information, by the processor, to the first format within the first window when the overlap condition no longer exists.

Analysis

Claim 1: Eligible.

The claim recites a series of steps for relocating textual information in an underlying window to an unobscured portion of the underlying window. Thus, the claim is directed to a process, which is one of the statutory categories of invention (*Step 1: YES*).

Next, the claim must be analyzed to determine whether it is directed to a judicial exception. Here, the claimed method relates to addressing a problem with overlapping windows within a graphical user interface. In particular, the claim recites dynamically relocating textual information within a window displayed in a graphical user interface based upon a detected overlap condition. When the windows overlap, textual information is reformatted and relocated to an unobscured portion of the underlying window; when the windows no longer overlap, the textual information is returned to its original format and location. The claim does not recite a basic concept that is similar to any abstract idea previously identified by the courts. For example, the claim does not recite any mathematical concept or a mental process such as comparing or categorizing information that can be performed in the human mind, or by a human using a pen and paper. Accordingly, the claim does not set forth or describe an abstract idea. Instead, the claimed method is necessarily rooted in computer technology to overcome a problem specifically arising in graphical user interfaces. Additionally, the claim does not recite any other judicial exception. Therefore, the claim is not directed to a judicial exception (*Step 2A: NO*). The claim is patent eligible.

If the examiner believes that the record would benefit from clarification, remarks could be added to an Office action or reasons for allowance indicating that the claim is not directed to any judicial exception.

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Claim 2: Ineligible.

The claim is directed to a series of steps for calculating a scaling factor, and thus is a process which is a statutory category of invention (*Step 1: YES*).

The claim is then analyzed to determine whether it is directed to any judicial exceptions. The claim recites the steps of calculating a first area and a second area and using the areas to calculate a scaling factor. This concept is similar to the other types of basic concepts that have been found by the courts to be abstract. In particular, the courts have found mathematical algorithms to be abstract ideas (*e.g.*, a mathematical procedure for converting one form of numerical representation to another in *Benson*, or an algorithm for calculating parameters indicating an abnormal condition in *Grams*). Therefore, the claim is directed to an abstract idea (*Step 2A: YES*).

Next, the claim is analyzed to determine whether there are additional limitations recited in the claim that amount to significantly more than the abstract idea, either individually or as an ordered combination. The body of the claim does not recite any additional limitations besides the mathematical algorithm for calculating a scaling factor. However, the preamble of the claim does provide the additional limitations that the process is computer-implemented and textual information is contained in a window in a graphical user interface. These limitations indicate the claimed process is used in a graphical user interface environment. Where the preamble only states the purpose or the field of use of an invention, the preamble does not limit the scope of the claim. Such a limitation does not give “life, meaning and vitality to the claim.” (*See MPEP 2111.02.*) Therefore, the limitations in the preamble do not limit the claim and there are no additional limitations beyond the mathematical algorithm. Therefore, the claim does not amount to significantly more than the abstract idea itself (*Step 2B: NO*). The claim is not patent eligible.

A rejection of claim 2 should identify the exception by pointing to the generating and scaling steps and explain that the steps are a mathematical algorithm similar to those found by the courts to be abstract. The rejection should also note that the preamble does not limit the scope of the claim and, therefore, there are no additional limitations in the claim besides the abstract idea.

Claim 3: Ineligible.

The claim is directed to a series of steps for calculating a scaling factor, and thus is a process which is a statutory category of invention (*Step 1: YES*).

The claim is then analyzed to determine whether it is directed to any judicial exceptions. The claim recites the steps of calculating a first area and a second area and using the areas to calculate a scaling factor. As discussed above, these steps describe a mathematical algorithm which has been found by the courts to be an abstract idea. Therefore, the claim is directed to an abstract idea (*Step 2A: YES*).

The claim is then analyzed to determine whether it is directed to any judicial exceptions. The claim recites that the step of calculating a scaling factor is performed by “the computer” (referencing the computer recited in the preamble). Such a limitation gives “life, meaning and vitality” to the preamble and, therefore, the preamble is construed to further limit the claim. (*See MPEP 2111.02.*) Thus, the claim recites the additional limitations that

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the mathematical algorithm is implemented by a computer in a graphical user interface environment. However, the mere recitation of “computer-implemented” is akin to adding the words “apply it” in conjunction with the abstract idea. Such a limitation is not enough to qualify as significantly more. With regards to the graphical user interface limitation, the courts have found that simply limiting the use of the abstract idea to a particular technological environment is not significantly more. (*See, e.g., Flook.*) Even though the disclosed invention may improve computer technology, the claimed invention provides no meaningful limitations such that this improvement is realized. Therefore, the claim does not amount to significantly more than the abstract idea itself (*Step 2B: NO*). The claim is not patent eligible.

A rejection of claim 3 should identify the exception by pointing to the generating and scaling steps and explain that the steps are a mathematical algorithm similar to those found by the courts to be abstract. The rejection should also note that the preamble is limiting on the scope of the claim, but the additional limitations do not amount to significantly more because they merely require the abstract idea to be performed by a computer and in a particular technological environment.

Claim 4: Eligible.

As discussed above, the claim recites a series of acts and thus is a process (*Step 1: YES*).

Next, the claim is evaluated to determine if the claim is directed to a judicial exception. The claim recites similar steps to those recited in claim 2; notably calculating a first measure of the area of a first window and a second measure of the area of the unobstructed portion of the first window and calculating a scaling factor that is proportional to the difference between the first and second measure. As explained with regards to claim 2, the courts have previously found mathematical algorithms to be abstract ideas. Therefore, the claim is directed to an abstract idea (*Step 2A: YES*).

The claim must be analyzed to determine if the claim recites additional limitations that amount to significantly more than the abstract idea. The claim recites the additional limitations of a computer screen and processor. The recitation of the computer screen for displaying and the processor for moving data is not enough by itself to transform the exception into a patentable invention, because these limitations are generic computer components performing generic computer functions at a high level of generality. Merely using these generic computer components to perform the identified basic functions does not constitute meaningful limitations that would amount to significantly more than the abstract idea.

However, when viewing these computer limitations as an ordered combination with the remaining limitations, the claim amounts to significantly more than the abstract idea. The claim further recites the limitations of displaying a first and second window, detecting an overlap condition indicating the windows overlap such that textual information in the first window is obscured from view, determining the textual information is too large to fit in an unobstructed portion of the first window, scaling the textual information based upon the calculated scale factor, automatically relocating the scaled textual information to an unobstructed portion of the first window so that it is viewable by the user, and automatically returning the textual information to its original format when the overlap

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condition no longer exists. These limitations are not merely attempting to limit the mathematical algorithm to a particular technological environment. Instead, these claim limitations recite a specific application of the mathematical algorithm that improves the functioning of the basic display function of the computer itself. As discussed above, the scaling and relocating the textual information in overlapping windows improves the ability of the computer to display information and interact with the user.

Taking all the claim elements both individually and as an ordered combination, the claim as a whole amounts to significantly more than the mathematical algorithm of calculating a scaling factor (*Step 2B: YES*). Thus, the claim recites patent eligible subject matter.

If the examiner believes that the record would benefit from clarification, remarks could be added to an Office action or reasons for allowance indicating that the claim recites a mathematical algorithm which is an abstract idea. However, the claim is eligible because it recites additional limitations that when considered as an ordered combination demonstrate an improvement to the computer's basic ability to display information and interact with the user.

24. Updating Alarm Limits

The following claim was held ineligible by the Supreme Court in Parker v. Flook, 437 U.S. 584 (1978) (Flook). The claim is directed to an abstract idea, and has additional elements that do not amount to significantly more than the abstract idea. This exemplary analysis illustrates a rejection of the claim using the 2014 IEG analysis.

Background

Applicant has invented a method for updating alarm limits using mathematical formulae. An "alarm limit" is a number. During catalytic conversion processes, operating conditions such as temperature, pressure, and flow rates are constantly monitored. When any of these "process variables" exceeds a predetermined alarm limit, an alarm may signal the presence of an abnormal condition indicating either inefficiency or perhaps danger. At certain points in the catalytic conversion processes, it may be necessary to update the alarm limits periodically.

Applicant's patent application describes a method of updating alarm limits consisting of three steps that are known in the art: an initial step which merely measures the present value of the process variable (*e.g.*, the temperature); an intermediate step which calculates an updated alarm-limit value; and a final step in which the actual alarm limit is adjusted to the updated value. Applicant also describes mathematical formulae used to calculate the updated alarm-limit value in the second step, which were discovered by applicant and are expressed as

$B_1 = B_0(1.0 - F) + PVL(F)$, where B_1 is the new alarm base, B_0 is the current alarm base, F is a weighting factor greater than zero and less than 1.0, and PVL is the present value of a process variable (*e.g.*, temperature); and

$UAV = B_1 + K$, where UAV is the updated alarm limit, and K is a predetermined alarm offset that represents a margin of safety.

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Using the formulae, an operator can calculate an updated alarm limit once he knows the original alarm base, the appropriate margin of safety, the time interval that should elapse between each updating, the current temperature (or other process variable), and the appropriate weighting factor to be used to average the original alarm base and the current temperature. The formulae for updating alarm limits are used in a catalytic conversion processing system; however, applicant's specification contains no disclosure relating to that system, such as the chemical processes at work, the monitoring of process conditions, the determination of variables in the formulae from process conditions, or the means of setting off an alarm or adjusting an alarm system. Applicant's specification makes it clear that the method is implemented on a computer for automatic adjustment of alarm settings.

Claim

1. A method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons wherein said alarm limit has a current value of B_0+K wherein B_0 is the current alarm base and K is a predetermined alarm offset which comprises:

(1) Determining the present value of said process variable, said present value being defined as PVL;

(2) Determining a new alarm base B_1 , using the following equation:

$$B_1 = B_0(1.0-F) + PVL(F)$$

where F is a predetermined number greater than zero and less than 1.0;

(3) Determining an updated alarm limit which is defined as B_1+K ; and thereafter

(4) Adjusting said alarm limit to said updated alarm limit value.

Analysis

Claim 1: Ineligible.

The claim is analyzed for eligibility in accordance with its broadest reasonable interpretation, which here covers performance of the method by hand or by a computer.

The claim recites a series of acts including determining the value of a process variable, calculating a new alarm base and an updated alarm limit, and adjusting the alarm limit to the updated alarm limit value. Thus, the claim is directed to a process, which is one of the statutory categories of invention (*Step 1: YES*).

The claim is then analyzed to determine whether it is directed to any judicial exception. The claim recites a formula for updating alarm limits that comprises the limitations of calculating the alarm base using the mathematical formula $B_1 = B_0(1.0-F) + PVL(F)$, and then calculating the updated alarm limit (UAV) using the mathematical formula $UAV = B_1 + K$. These limitations set forth a judicial exception, because mathematical relationships have been characterized by the courts as abstract ideas (*e.g.*, the mathematical formula in

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Mackay Radio). It should be noted that in this case, the formula is novel, yet is an abstract idea. Thus, the claim is directed to an exception (*Step 2A: YES*).

Next, the claim as a whole is analyzed to determine whether any element, or combination of elements, is sufficient to ensure that the claim amounts to significantly more than the exception. The claim recites additional elements/steps of determining the value of an unspecified process variable involved in catalytic chemical conversion of hydrocarbons and adjusting the alarm limit to the calculated updated alarm limit value. The preamble specifies the field of use, which is catalytic conversion of hydrocarbons, but in this case imposes no limits on the process of calculating an alarm limit value using the specified equation.

Taken alone, none of the additional elements amounts to significantly more than the exception. Determining the value of an unspecified process variable is mere data gathering and the claimed adjusting the alarm limit to an updated limit is mere post-solution activity that could be attached to almost any formula. By failing to explain how the process variable is selected, integrate the formula into any specified chemical processes at work in the catalytic conversion, or specify the means of setting off an alarm or adjusting the alarm limit, the claim fails to improve the recited technological field. The steps merely calculate a result using a novel equation and do not add any meaningful limits on use of the equation. Taken alone or as an ordered combination, these additional elements do not amount to a claim as a whole that is significantly more than the exception. (*Step 2B: NO*). The claim is not eligible.

For purposes of discussion, it is noted that if the broadest reasonable interpretation of this claim were limited to a computer implementation, adding a generic computer to perform generic functions that are well-understood, routine and conventional, such as gathering data, performing calculations, and outputting a result would not transform the claim into eligible subject matter. Generic computer-implementation of the method is not a meaningful limitation that alone can amount to significantly more than the exception. Moreover, when viewed as a whole with such additional elements considered as an ordered combination, the claim modified by adding a generic computer would be nothing more than a purely conventional computerized implementation of applicant's formula in the general field of industrial chemical processing and would not provide significantly more than the judicial exception itself.

A rejection of claim 1 should identify the exception by pointing to the formula in the claim and explain that the formula is a mathematical relationship similar to those found by the courts to be abstract. The rejection should also identify the additional elements in the claim and explain why they do not amount to significantly more, in this case, because they merely add data gathering and a field of use.

25. Rubber Manufacturing

The following illustrates an exemplary analysis using the 2014 IEG for actual and hypothetical claims modeled after the technology in Diamond v. Diehr, 450 U.S. 175 (1981) (Diehr). As the claims in this example are eligible, no written analysis would be provided in an Office action. The application at issue was granted as U.S. Patent No. 4,344,142. Actual claim

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1 recites a method that is directed to a mathematical relationship and steps that could be performed mentally and has additional elements/steps that amount to significantly more than the abstract ideas because as a whole they transform a particular article to a different state or thing and use the abstract ideas to improve another technology/technical field, either of which can show eligibility. Claim 2 is a hypothetical claim in the form of computerized instructions. Claim 2, which also is directed to the mathematical relationship and steps that could be performed mentally, is eligible due to the additional elements/steps that use the abstract ideas to improve another technology/technical field.

Background

Applicant has invented a process of controlling a rubber molding press with a computer to precisely shape uncured material under heat and pressure and then cure the synthetic rubber in the mold to obtain a product that retains its shape. Raw (uncured) synthetic rubber comprises independent polymeric chains, *e.g.*, a mixture of isobutylene and isoprene polymers. Curing cross-links the polymeric chains together, thereby changing the rubber from its raw state into a more durable form that will retain a molded shape. Proper curing depends upon several factors including the thickness of the article to be molded, the temperature of the molding process, and the amount of time that the article is allowed to remain in the press.

At the time of applicant's invention, the usual way of operating rubber-molding presses is for the operator to load and close the press manually. Closure of the press operates a timer that is preset for an estimated cure time. Due to the manual operation, the actual mold temperature may vary, and result in overcured or undercured rubber because the preset time is not equivalent to the actual time required for proper curing.

In the instant application, applicant's process improves upon conventional molding processes by constantly measuring the actual temperature inside the mold using a thermocouple, and automatically feeding these temperature measurements into a standard digital computer that repeatedly recalculates the cure time by use of the Arrhenius equation. The Arrhenius equation has long been used to calculate the cure time in rubber-molding processes, and can be expressed as $\ln v = CZ + x$, where \ln is natural logarithm conversion data, v is the total required cure time, C is the activation energy constant unique to each batch of said compound being molded, Z is the temperature of the mold, and x is a constant dependent upon the geometry of the particular mold of the press. When the recalculated time equals the actual time that has elapsed since the press was closed, the computer signals a device to open the press. Applicant's process obtains uniformly accurate cures, which results in substantially reducing the number of defectively cured batches that must be discarded. The improved process also substantially reduces the amount of time in which the presses are closed unnecessarily, thereby resulting in more efficient employment of the mold and operator.

Claims

1. A method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer, comprising:

providing said computer with a data base for said press including at least, natural logarithm conversion data (\ln), the activation energy constant (C) unique to each batch of

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said compound being molded, and a constant (x) dependent upon the geometry of the particular mold of the press,

initiating an interval timer in said computer upon the closure of the press for monitoring the elapsed time of said closure,

constantly determining the temperature (Z) of the mold at a location closely adjacent to the mold cavity in the press during molding,

constantly providing the computer with the temperature (Z),

repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is $\ln v = CZ+x$, where v is the total required cure time,

repetitively comparing in the computer at said frequent intervals during the cure each said calculation of the total required cure time calculated with the Arrhenius equation and said elapsed time, and

opening the press automatically when a said comparison indicates equivalence.

2. A non-transitory computer readable medium with computer executable instructions stored thereon executed by a processor to perform the method of controlling a rubber-molding press having a mold with a cavity for precision molded compounds, the method comprising:

accessing a data base in the computer including at least, natural logarithm conversion data (ln), the activation energy constant (C) unique to each batch of said compound being molded, and a constant (x) dependent upon the geometry of the particular mold of the press,

initiating an interval timer in the computer upon the closure of the press for monitoring the elapsed time of the closure,

constantly receiving data relating to the temperature (Z) of the mold at a location closely adjacent to the mold cavity in the press during molding,

repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is $\ln v = CZ + x$ where v is the total required cure time,

repetitively comparing in the computer at the frequent intervals during the cure each calculation of the total required cure time calculated with the Arrhenius equation and the elapsed time, and

initiating a signal that controls the press to open when the comparison indicates equivalence, meaning that the molded product is cured.

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Analysis

Claim 1: Eligible.

The claim recites a series of acts including determining the temperature of the mold and providing that temperature to the computer. Thus, the claim is directed to a process, which is one of the statutory categories of invention (*Step 1: YES*).

The claim is then analyzed to determine whether it is directed to any judicial exception. The claim recites a limitation of repetitively calculating the Arrhenius equation (the mathematical formula: $\ln v = CZ+x$) for reaction time during the cure. This limitation sets forth a judicial exception, because calculating the reaction time using the Arrhenius equation is a mathematical relationship that the courts have held is representative of a law of nature (*e.g.*, the mathematical formula in *Flook*). Mathematical relationships such as this have also been characterized by the courts as abstract ideas. Additionally, the claim limitations of performing repetitive calculations and comparisons between the calculated time and the elapsed time could be performed by a human using mental steps or basic critical thinking, which are types of activities that have also been found by the courts to represent abstract ideas (*e.g.*, the mental comparison in *Ambry Genetics*). Thus, the claim is directed to at least one exception (*Step 2A: YES*).

Next, the claim as a whole is analyzed to determine whether any additional element, or combination of elements, is sufficient to ensure that the claim amounts to significantly more than the exceptions (the mathematical relationship and the critical thinking steps of calculating and comparing). Since there are multiple abstract ideas recited in the claim, the Step 2B analysis needs to be conducted for each abstract idea individually, until the analysis shows ineligibility for one or eligibility for all.

The Step 2B analysis is first conducted for the mathematical relationship. Besides the mathematical relationship, the claim recites additional elements of providing a digital computer with a data base of values, initiating an interval timer, constantly determining the temperature of the mold, constantly providing the computer with the temperature, using the computer to perform the calculations and comparisons, and opening the press automatically when the comparison indicates equivalence. Some of the additional elements/steps, such as accessing a database and using a computer to perform calculations and comparisons, are routine computer activities or generic functions performed by a computer that taken alone do not add significantly more to the process instructions in the claim. By themselves, these limitations are recited at a high level of generality and perform the basic functions of a computer that are well-understood, routine and conventional (*e.g.*, accessing a data base to receive and store data, and performing mathematical operations on a computer). Likewise, initiating a timer and determining a temperature, taken alone, are mere data gathering steps to obtain data necessary to calculate the time using the Arrhenius equation.

However, when viewing the claim as a whole, the combination of all these steps taken together, including the constant determination of the temperature of the mold, the repetitive calculations and comparisons, and the opening of the press based on the calculations, amount to significantly more than simply calculating the mold time using the Arrhenius equation because they add meaningful limits on use of the equation. The claim

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does not merely recite the equation in isolation, but integrates these ideas into the molding process. The additional steps specifically relate to the particular variables used, how the variables are gathered, the process by which the rubber is molded and cured, and how the result of the cure time calculation is used. The totality of the steps act in concert to improve another technical field, specifically the field of precision rubber molding, by controlling the operation of the mold. In addition, the claimed steps taken as a combination effect a transformation of the raw, uncured synthetic rubber into a different state or thing, *i.e.*, a cured and molded rubber product. Thus, the claim amounts to significantly more than the mathematical relationship (*i.e.*, the abstract idea of the Arrhenius equation).

Because the claim is eligible with respect to the first abstract idea, it is expected that the additional limitations will amount to significantly more than the second abstract idea (the critical thinking steps of calculating and comparing). This is true in this example. The additional limitations discussed above are significantly more than the critical thinking skills of calculating and comparing results. As previously stated, evaluating the additional limitations both individually and as an ordered combination demonstrates that the claim improves the technical field of precision rubber molding and transforms the raw, uncured synthetic rubber into a different state or thing. Taking all the claim elements both individually and as an ordered combination, the claim as a whole amounts to significantly more than the abstract ideas (*Step 2B: YES*). The claim recites patent eligible subject matter.

If the examiner believes that the record would benefit from clarification, remarks could be added to an Office action or reasons for allowance indicating that the claim recites exceptions including the Arrhenius equation, which is a law of nature or abstract idea. However, the claim is eligible because it recites additional limitations that when considered as an ordered combination provide meaningful limits on the use of the equation and improve the technical field of precision rubber molding.

Claim 2: Eligible.

The claim recites a non-transitory computer-readable medium with stored instructions that are used to control a rubber molding press. The claim is directed to a manufacture (an article produced from materials), which is a statutory category of invention (*Step 1: YES*). Note that the term “non-transitory” ensures the claim does not encompass signals and other non-statutory transitory forms of signal transmission.

The claim recites the same steps of performing repetitive calculations of the reaction time using the Arrhenius equation and comparing the results as claim 1, albeit in the form of computer executable instructions. Therefore, the claim is directed to the same abstract ideas identified in claim 1 (*Step 2A: YES*).

Conducting the Step 2B analysis for the first abstract idea (the Arrhenius equation), the claim recites additional elements including computer instructions to access a database, initiate an interval timer, constantly receive data, and initiate a signal to control the press. The steps also include computer instructions to implement the equation. While some of the elements taken alone are well-understood, routine and conventional use of a computer, or mere data gathering, the combination of the additional elements when the claim is viewed as a whole amounts to significantly more than simply calculating the mold time using the

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Arrhenius equation. The totality of the steps governed by the claimed instructions provides software that improves another technical field, specifically the field of precision rubber molding, through controlling the operation of the mold by initiating a signal to control the press to open when the comparison indicates equivalence and the molded product is cured. This software enhances the ability of a specific rubber molding device to open the press at the optimal time for curing the rubber therein. This process does not merely link the Arrhenius equation to a technical field, but adds meaningful limitations on the use of the mathematical relationship by specifying the types of variables used (temperature and time), how they are selected (their relationship to the reaction time), how the process uses the variables in rubber molding, and how the result is employed to improve the operation of the press. For at least these reasons, the elements/steps recited in addition to the mathematical formula, particularly taken in combination, show that claim 2 is not directed to instructions to use the formula in isolation, but rather integrate the concept into an eligible control scheme to improve another technological process.

Similarly, the claim recites additional limitations that when viewed as an ordered combination amount to significantly more than the second abstract idea (the critical thinking steps of calculating and comparing the timing data). As already discussed, these additional limitations demonstrate an improvement in the field of precision rubber molding technology and amount to more than simple instructions to perform the calculating/comparing steps in isolation. Thus, the claim amounts to significantly more than the judicial exceptions (*Step 2B: YES*). The claim recites patent eligible subject matter.

If the examiner believes that the record would benefit from clarification, remarks could be added to an Office action or reasons for allowance indicating that the claim recites exceptions including the Arrhenius equation, which is a law of nature or abstract idea. However, the claim is eligible because it recites additional limitations that when considered as an ordered combination provide meaningful limits on the use of the equation and improve the technical field of precision rubber molding.

26. Internal Combustion Engine

This hypothetical example demonstrates the use of the streamlined analysis. The claim below is based on the technology from U.S. Pat. 5,533,489. As a streamlined analysis would not result in a written rejection, the discussion sets forth exemplary reasoning an examiner might use in drawing a conclusion of eligibility.

Background

Nitrogen oxides are constituents of exhaust gas that are produced during the operation of an internal combustion engine. It is generally understood that nitrogen oxides are harmful to our atmosphere and cause air pollution. The amount of nitrogen oxides produced in the exhaust gas is relative to the temperature that the fuel and air mixture burns in the engine. Therefore, exhaust gas recirculation (EGR) has been developed to recirculate the exhaust gas back to the air intake, which reduces the amount of oxygen in the combustion mixture and causes it to burn at a lower temperature, thereby reducing the amount of nitrogen oxides produced. However, as the amount of EGR increases there may be a resulting decline in engine performance (*e.g.*, a decrease in power output).

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The invention is an internal combustion engine that solves this problem by automatically modifying the amount of EGR based upon current engine operations. In particular, the inventor has discovered that engine performance can be optimized by turning off the EGR during acceleration, which permits the engine to operate at maximum power output while retaining the reduction in nitrogen oxides. Therefore, the invention uses a control system to control the opening and closing of an exhaust gas recirculation valve based upon a rate of change of the engine throttle, in order to modify the amount of EGR.

Claim

1. An internal combustion engine providing exhaust gas recirculation comprising:

an air intake manifold;

an exhaust manifold;

a combustion chamber to receive air from the air intake manifold, combust a combination of the received air and fuel to turn a drive shaft, and output resulting exhaust gas to the exhaust manifold;

a throttle position sensor to detect the position of an engine throttle;

an exhaust gas recirculation valve to regulate the flow of exhaust gas from the exhaust manifold to the air intake manifold; and

a control system, comprising a processor and memory, to receive the engine throttle position from the throttle position sensor, calculate a position of the exhaust gas recirculation valve based upon the rate of change of the engine throttle position and change the position of the exhaust gas recirculation valve to the calculated position.

Analysis

Claim 1: Eligible.

The claim recites an internal combustion engine with an intake manifold, exhaust manifold, combustion chamber, throttle position sensor, exhaust gas recirculation valve and a control system comprising a processor and memory. Thus, the claim is directed to a machine (a combination of mechanical parts), which is one of the statutory categories of invention (*Step 1: YES*).

Next, the claim must be evaluated to determine if the claim is directed to a law of nature, natural phenomenon or abstract idea. But when the claim is reviewed, it is immediately evident that although the claim operates by calculating the rate of change, which is a mathematical relationship describing how a variable changes over a specific period of time, the claim clearly does not seek to tie up this mathematical relationship so that others cannot practice it. In particular, the claim's description of an internal combustion engine having manifolds, valves, and sensors forming a specific structure that uses the control system to optimize exhaust gas recirculation makes it clear that the claim as a whole would clearly amount to significantly more than any recited exception. The claim as a whole adds meaningful limitations to the use of the mathematical relationship. Additionally, use of the mathematical relationship improves engine technology. Thus, eligibility of the claim is self-

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evident, and there is no need to perform the full eligibility analysis (*e.g.*, Steps 2A and 2B). The claim is patent eligible.

If the examiner believes that the record would benefit from clarification, remarks could be added to an Office action or reasons for allowance indicating that while the claim may recite a mathematical relationship, the claim clearly amounts to significantly more than the rate of change by providing meaningful limitations to the mathematical relationship and improving engine technology.

27. System Software - BIOS

This example demonstrates the use of the streamlined analysis. The claim below is taken from U.S. Pat. 5,230,052 and was suggested as an example by comments received in response to the June 2014 Preliminary Examination Instructions. As a streamlined analysis would not result in a written rejection, the discussion sets forth exemplary reasoning an examiner might use in drawing a conclusion of eligibility.

Background

BIOS is an acronym that stands for Basic Input/Output System. When a computer is powered on, BIOS code runs to initialize and test the hardware components. BIOS also acts as an insulation layer between the hardware and software of a computer, by providing an interface between the application program/operating system and the hardware devices. At the time of the invention, conventional computers stored BIOS code in non-volatile read only memory (ROM) on the computer's motherboard. However, as computers have grown more sophisticated, two disadvantages have arisen. First, the size of the BIOS code has increased such that it exceeds the memory space in ROM. Second, storing BIOS code in ROM also makes it difficult to modify or rewrite the code as new input/output devices are added.

In order to overcome these disadvantages, the inventors utilize a local area network (LAN) to store the BIOS code remotely from the computer. Upon startup, a computer connected to the LAN loads code to initialize and test only those system components and functions necessary to load the BIOS from a remote computer. Subsequently, the computer requests a remote memory location, which is also connected to the LAN, for the BIOS code. In response to the request, the remote system builds the appropriate BIOS for that computer including a master boot record and transmits the BIOS to the local computer system. The local computer system stores the received BIOS code in random access memory (RAM), and uses the master boot record to load and execute the BIOS.

Claim

15. A method for loading BIOS into a local computer system which has a system processor and volatile memory and non-volatile memory, the method comprising the steps of:

(a) responding to powering up of the local computer system by requesting from a memory location remote from the local computer system the transfer to and storage in the

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volatile memory of the local computer system of BIOS configured for effective use of the local computer system,

(b) transferring and storing such BIOS, and

(c) transferring control of the local computer system to such BIOS.

Analysis

Claim 15: Eligible.

The claim recites a series of steps for loading BIOS on a local computer system from a remote storage location. Thus, the claim is directed to a process, which is one of the statutory categories of invention (*Step 1: YES*).

Next, the claim must be evaluated to determine if the claim is directed to a law of nature, natural phenomenon or abstract idea. But when the claim is reviewed, it is immediately evident that even if the claim did recite a judicial exception, the claim is not attempting to tie up any such exception so that others cannot practice it. In particular, the claim's description of initializing a local computer system using BIOS code stored at a remote memory location, by triggering the processor to transfer BIOS code between two memory locations upon a powering up of the computer and transferring control of the processor operations to that BIOS code, makes it clear that the claim as a whole would clearly amount to significantly more than any potential recited exception. Thus, eligibility of the claim is self-evident in the streamlined analysis, without needing to perform the full eligibility analysis (*e.g.*, Steps 2A and 2B). The claim is patent eligible.

It is important to point out as well that there is no apparent exception recited in the claim, which alone would be sufficient for eligibility. While computers operate on mathematical theory, that underlying operation should not trigger an eligibility analysis – computers and computer operations are not automatically subjected to an eligibility analysis. The cases in which courts find mathematical relationships to represent abstract ideas (thus raising eligibility issues) are those in which the mathematical relationship is recited in the claim as part of the invention, such as a method of performing a mathematical calculation to obtain a result. Courts have found computers and computer implemented processes to be ineligible when generic computer functions are merely used to implement an abstract idea, such as an idea that could be done by human analog (*i.e.*, by hand or by merely thinking).

If the examiner believes that the record would benefit from clarification, remarks could be added to an Office action or reasons for allowance, indicating that the claim is not directed to any judicial exception.