APPENDIX I:

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EXAMINATION GUIDELINES FOR COMPUTER SOFTWARERELATED INVENTIONS

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EXAMINATION GUIDELINES FOR

SPECIFIC TECHNICAL FIELDS

Part II

COMPUTER SOFTWARE-RELATED INVENTIONS

I. PREFACE

The Examination Guidelines for Computer-Related Inventions ("Guidelines") are based on the current Patent Law of the Republic of China ("Taiwan Patent Law") and Enforcement Rules of the Patent Law. The Guidelines are believed to be consistent with the General Examination Guidelines. The Guidelines were based on the Examination Guidelines of Computer-Related inventions of the United States while still complying with the spirit of the Japanese Guidelines.

In the past, computer software was not patentable according to the Taiwan Patent Law. For this reason, computer software could only be protected under copyright law in the past. However, copyrights protect only the author's artistic expression of an idea, not the idea itself. And copyrights do not impose exclusive rights on copyright holders and prevent the idea underlying the copyrighted work from being exploited. Due to the vigorous and intense competition in the software industry during the past few years, promoting the software industry by protecting computer software-related inventions under Patent Law has been a consensus among the leading countries in the world.

The Guidelines have been designed to assist examiners in analyzing the subject matter of computer software-related inventions. The examiner has to refer to the specification and figures of the invention to determine if the claimed subject matter belongs to the category of "product" or of "process." If the claimed subject matter is defined in terms of a combination of hardware and software, or in terms of process directly or indirectly executed by a computer, then the claimed subject matter is a computer software-related invention.

On the other hand, if the claimed subject matter cannot be identified as a "product" or a "process" in terms of the combination of software and hardware or the computer executable processes, then the claimed subject matter is a non-computer-software-related invention. In that case, the examiner can conduct the examination following the General Examination Guidelines.

Basically, computer software encompasses an algorithm. An algorithm may be a process for applying a law of nature, a scientific principle, mathematical operations, or even the rules of games or sports. An algorithm may refer to mental steps that have nothing to do with mathematics, or to inferences from physical phenomena. When determining if a computerrelated invention is patentable (as stated in section IV), the examiner has to view the claim as a whole and determine whether it is a creation of technological arts using natural laws. The examiner should not reject the application simply because the claim recites non-statutory subject matter as stated in the Article 21 of the Taiwan Patent Law. For example, the examiner should not reject the application merely because the claim recites mathematical formulas or operations. Nevertheless, if the claim recites nothing but mathematical formulas or operations (i.e., the mathematical formulas or operations per se) without describing how they are executed by a computer, then the claimed subject matter may be defined as a mathematical algorithm and is therefore unpatentable.

Furthermore, it has long been taken for granted that the claim of a computer software-related invention must recite a specific hardware as a limitation because the computer software is intangible and dependent on hardware to perform a specific function. Accordingly, the claims had to recite specific hardware for the concern of patentability even though the hardware is not required or even relevant to the invention. Now when claiming a computer software-related invention, no specific hardware limitation is required. Although software always involves hardware, a claimed subject matter is not limited to recite specific hardware in the claim to be patentable. Refer to section IV, subsection B of the Guidelines for details.

According to Article 19 of the Taiwan Patent Law, a patentable invention must be completed through the "utilization of natural laws." The functions of a computer software after being executed by a computer will result in physical transformations either within the computer or outside of the computer. Since such transformation is not made by man, it is a way of using the natural laws and therefore complies with the requirement as stated in the Article 19 of the Taiwan Patent Law. It should be emphasized that even though using a hardware resource can be counted as "using natural laws," it can be simply a use of a computer and not counted as a technological art when the claim is not defined in terms of the combination of specific hardware and software. Consequently, the examiner

would review the claim as a whole and determine its patentability by checking whether the underlying processes comply with "natural laws."

In addition, computer readable storage media were not patentable according to prior Taiwan Patent Law. However, computer readable storage media recited in the claims have been considered statutory subject matter in the patent offices of the United States and Japan. Following the trend, the Guidelines also include the computer readable storage media as statutory subject matter.

The Guidelines include flowcharts of the processes the examiner will follow in conducting examinations for computer software-related inventions.

The examples listed in the Guidelines are only designed for assisting the examiner in understanding the spirit of the Guidelines. These examples are not intended to be set as an example in claim drafting. Finally, the regulations specified in the Guidelines are only applicable for applications drawn to computer software-related inventions.

II. TERMINOLOGY

The terminology defined in this section is to clarify the language used in the Guidelines so as to prevent confusion or misunderstanding. Any occurrence of this terminology in the Guidelines refers to the meanings defined hereinafter. However, the definition for each term listed in this section is not a standard for claim drafting. For example, the meaning of step may be "a single step" or "a series of steps" in a specification.40_IDEA_343)_and_footnotes(n1);.FTNT n1 Thus, refer to section III, subsection B of the Guidelines for interpreting a term in light of the specification.

1. Computer software-related invention: an invention which requires software for its implementation.

2. Algorithm: a logical description of a method for solving a problem, including steps generated according to natural laws, scientific principles, physical phenomena, abstract ideas or human reasoning.

3. Computer: a concrete object which can generate results by executing algorithmic processes according to messages entered, programs stored, commands or data, for example: a calculator, a microprocessor, a single-chip microprocessor, or a central processing unit.

4. Software: a program, a procedure or a step related to the operations of a computer.

5. Program: a sequence of computer executable instructions for performing a particular process.

6. Program listings: program codes either printed on paper or displayed on a screen.

7. Command: a computer executable symbol or string.

8. Procedure: a sequence of processing steps or operations to reach a desired result.

9. Step: one of a sequence of the computer executable operations or acts to perform a specific function.

10. Operation or act: a single action of a computer.

11. Method: A series of acts, processes, operations or steps that are performed to generate concrete and tangible results.

12. Computer readable storage medium: a medium capable of carrying pieces of information which are retrievable by a computer.

13. Data structure: data arrangement having a logical structure for supporting program execution.

14. Hardware resources: physical devices or elements used for processing, operating or realizing a function. For example, a computer, a computer peripheral device, a machine operable in response to computer instructions, a machine for processing or providing message or energy to a computer, memory, or I/O device, and so on.

III. SPECIFICATION

For a person skilled in the art to understand and enable the invention, the applicant shall clearly specify and describe the related prior art, objects of the invention, preferred embodiments of the invention, and the features and utilities of the invention in the specification. The claims shall be defined by pointing out the subject matter, the technological arts, and features of the invention to comply with the requirements of the Taiwan Patent Law under Article 22, paragraphs 3 and 4.

To describe the objects of the invention, the claimed subject matter must have practical application. In other words, the invention must have real world value. In determining the patentability of an invention, the examiner should analyze the entire specification, including the detailed description of the invention, and any prior art disclosed, the scope of the claims, any claimed utility, to point out and understand the practical applications of the invention.40_IDEA_343)_and_footnotes(n2);.FTNT n2

To understand the technology, features and functionality of the invention, the examiner should review the detailed description of the specification and the embodiments of the invention so as to understand what has been invented. Then, the examiner shall conduct the examination for computer software-related inventions as follows:40_IDEA_343)_and_footnotes(n3);.FTNT n3

(1) determine what the programmed computer does according to the execution procedures of the software (i.e., the functionality of the programmed computer);40_IDEA_343)_and_footnotes(n4);.FTNT n4

(2) determine how the programmed computer is to be configured to provide such functions (i.e., the constituted elements of the programmed computer, and how these elements are configured and integrated to provide the specified functionality); and

(3) determine the relationship of the programmed computer to other subject matters outside the programmed computer that constitutes the invention (i.e., machines, devices, materials or process steps that are not completely or partially executed by the programmed computer).40_IDEA_343)_and_footnotes(n5);.FTNT n5

To understand the scope of the claims, the examiner should read each claim and cannot reject the application simply because part of the claims do not completely meet the patentability requirements. Each claim limitation should be defined and correlated to all portions of the specification that describe the claim limitation for supporting the claims.

A. Requirements of the Specification

Article 22, paragraph 3 of the Taiwan Patent Law states that

"the specification required under paragraph 1 shall also contain, in addition to the claims of the invention, the prior art, the purpose of the invention, the technical description, and characteristics and functions which would allow persons skilled in the art to understand the contents of and to practice the invention concerned."

1. Conceivable by a Person Skilled in the Art

The invention disclosure should enable a person skilled in the art to understand the invention. The so-called "person skilled in the art" refers to an ordinarily skilled person who is familiar with the technological arts disclosed in the invention.

2. Adequate Written Description

The disclosure in the specification may be sufficient to enable a person skilled in the art to perform the invention, but still not enough to comply with the written requirements of the specification.40_IDEA_343)_and_footnotes(n6);.FTNT n6 In the specification, the applicant must describe explicitly and clearly so that what has been invented and what has been claimed a person skilled in the art can understand the invention.40_IDEA_343)_and_footnotes(n7);.FTNT n7 Moreover, the written requirements of the specification must comply with the requirements as set forth in the General Examination Guidelines.

In many cases, the applicant may use functional block diagrams to describe the key elements of a computer. The examiner shall review the specification to ensure that along with the functional block diagram, the disclosure provides information that adequately describes each "element" in hardware, or hardware and its associated software, and how such elements are interrelated.

The specification of computer software-related inventions may use figures for illustrating the technical features of the invention, including data flow diagrams, pseudo codes, block diagrams, flow charts, time charts, etcetera.

"Means-or step-plus-function" language40_IDEA_343)_and_footnotes(n8);.FTNT n8 is used in the combination type of claims where an element can be defined by the means or steps for performing a specific function without specifying its structure, material, or acts. "Means-or step-plus-function" language can therefore simplify the description of the terms used in claim drafting. However, when interpreting the scope of the means-or step-plus-function language in the claims, it should not cover all possible elements or steps capable of achieving the functions stated in the means-plus-function

terms. According to Article 56, paragraph 3 of Taiwan Patent Law, "The scope of a patentable invention shall be limited to the scope of claims in the specification. The specification and drawings of the invention may be referred to, if necessary." Accordingly, where means-plus-function language is used to define the characteristics of a machine or manufacture invention, claim limitations must be interpreted to read on only the structures or materials disclosed in the specification and "equivalents thereof." Moreover, an element defined in terms of meansplus-function language will be within the scope of the prior art under several conditions: if the prior art element can perform the same or similar functions as the means-plus-function element; if that prior art element has the similar structure, material or acts as the means-plusfunction element; or if the means-plus-function element can be easily substituted by the prior art element. In contrast, if the differences between the claimed element and a prior art element cannot be easily distinguished in the specification, then the means-plus-function element is beyond the scope of the prior art.

A means-plus-function limitation is distinctly claimed if the description makes it clear that the means corresponds to the well-defined structure of a computer or computer component implemented in either hardware or software and its associated hardware platform. Such means may be defined as:

(1) a programmed computer with a particular functionality implemented in hardware or hardware and software;

(2) a logic circuit or other component of a programmed computer that performs a series of operations specified by a computer program; or

(3) a computer readable storage medium carrying computer executable instructions which represent a computer program that can enable a computer to perform its functions in a particular manner.

Thus, when a claim is defined using means-plus-function language but no explanation as to the corresponding elements is provided in the specification to specify its feature, the claimed subject matter fails to particularly point out and distinctly claim the invention. For example, if the applicant discloses only the functions to be performed and provides no express, implied, or inherent disclosure of hardware or a combination of hardware and software that performs the functions, then the application has not disclosed any "structure" which corresponds to the claimed means. The examiner should reject such claims for insufficient disclosure. The rejection shifts the burden to the applicant to describe the specific structure or material that corresponds to the claimed means in question, and to identify the part in the specification where a description of an embodiment of that claimed means can be found. In contrast, if the corresponding structure is disclosed to be a memory or logic circuit that has been configured in some manner to perform that function (e.g., using a defined computer program), the application has disclosed "structure" which corresponds to the claimed means.

As to the disclosure in the specification, especially for the claims, applicants should functionally define the computer execution steps rather than simply recite source or

object code instructions. Nevertheless, under certain circumstances, so that people skilled in the art can understand the invention, properly employing self-documenting programming code40_IDEA_343)_and_footnotes(n9);.FTNT n9 in a claim, such as pseudo-code, would be permissible.

Moreover, the following examples may help to illustrate the situation when the software-related inventions are not sufficiently disclosed:40_IDEA_343)_and_footnotes(n10);.FTNT n10

(1) A specification contains uncommonly used technical terms, abbreviations, symbols, etc. which are not defined. The invention therefore cannot be practiced due to the unclear language used in the specification.

(2) In the specification, the claimed technical procedures or functions are described merely in an abstract manner so that it is unclear as to how the claimed procedures or functions can be implemented or realized by a hardware or a software. Consequently, the claimed invention cannot be practiced according to the specification.

(3) The claimed functions of the embodiment of a software or hardware are illustrated in functional block diagrams or flow charts in the specification without describing the detailed constituents of the hardware or software embodiment. As a result, the claimed invention cannot be practiced according to the specification.

(4) In the specification, the claims are defined in terms of a plurality of functions performed by the invention, but the detailed description contains only flow charts which cannot clearly be matched to the claimed functions. For this reason, the invention cannot be practiced according to the descriptions in the specification.

If any of the above situations occur, the specification is considered incomplete. The applicant would be requested to supply supplements for explanation or apply for amendment.

3. Enablement

A specification must enable a person skilled in the art to make and use the claimed invention.40_IDEA_343)_and_footnotes(n11);.FTNT n11 For a computer software-related invention, the specification must enable a person skilled in the art to configure the computer to possess the requisite functionality without undue experimentation. If applicable, the person skilled in the art would be able to interrelate the computer with other elements to yield the claimed invention without undue experiment.

For many computer software-related inventions, the claims often involve more than one field of technology. For such inventions, the disclosure must satisfy the enablement requirement for each aspect of the invention. For example, if the claimed subject matter is a programmed computer that determines and displays the three-dimensional structure of a chemical compound, the specification must:

(1) enable a person skilled in molecular modeling to understand and practice the underlying molecular modeling processes; and

(2) enable a person skilled in that art of computer programming to write such a program which directs a computer to generate and display the image representing the three-dimensional structure of the compound.

B. Claims

The claims define the property rights provided by a patent40_IDEA_343)_and_footnotes(n12);.FTNT n12 and thus should be examined carefully. The goal of claim analysis is to identify the boundaries of the protection sought by the applicant and to understand how the claims relate to and define what the applicant has indicated in the invention. The examiner must thoroughly analyze the language of a claim before determining if the claim complies with each requirement for patentability.

The analysis of the claim starts with defining the limitation of each claimed subject matter. For process claims, the scope of the claimed subject matter is limited to the underlying process or procedures. For product claims, the claimed subject matter is limited to concrete physical structures, including hardware, the combination of hardware and software, and the resulting products of software program execution.

The examiner shall correlate each claim limitation to all portions of the disclosure that describe the claim limitation even if the claimed invention is defined using means-or step-plus-function language. The correlation step will ensure that the examiner correctly interprets each claim limitation.

The subject matter of a properly construed claim is defined by the terms that limit its scope. It is this subject matter that must be examined. In general, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that suggests or makes it optional, but does not require steps to be performed or does not limit a claim to a particular structure, does not limit the scope of a claim or claim limitation.40_IDEA_343)_and_footnotes(n13);.FTNT n13

The examiner must rely on the applicant's disclosure of the specification to determine properly the meaning of terms used in the claims. If the term is a translation of a scientific term, the term written in original language should be indicated. If the National Compilation Committee has provided an official translation for that term, then the translation of the term should follow the official translation.40_IDEA_343)_and_footnotes(n14);.FTNT n14 An applicant is also entitled to be his or her own lexicographer and in many instances will provide an explicit definition for certain terms used in the claims. Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. The examiner should determine if the original specification provides a definition consistent with any assertions made by applicant.40_IDEA_343)_and_footnotes(n15);.FTNT n15 If an applicant does not define a term in the specification, that term will be given its "ordinary meaning."

The examiner must always use the perspective of one of ordinary skill in the art. Claims and disclosures are not to be evaluated in a vacuum. If elements of an invention are well-known in the art, the applicant does not have to provide a disclosure that describes those elements. In such a case, the elements will be construed as encompassing

any and every art-recognized hardware or combination of hardware and software technique for implementing the defined requisite functions.

While it is appropriate to use the specification to determine what the applicant intends a term to mean, a positive limitation from the specification cannot be read into a claim that does not impose that limitation. A claim should be given the reasonable interpretation.

Finally, when evaluating the scope of a claim, every limitation in the claim must be considered. The examiner may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole is to be considered.

IV. CLASSIFY THE CLAIM TO ITS PROPER STATUTORY CATEGORY

A. Non-Computer, Software-Related Inventions

Since computer software is widely applied in many technological fields, a claimed invention in those technological fields may involve computer software, in either the product or process statutory category. For this reason, when determining the patentability of the application drawn to computer software-related inventions, the examiner should review the technology involved in the claimed subject matter rather than the field of its application. For example, the claimed subject matter of a computer software implemented for the purpose of doing business or for medical treatments is not claiming the method of doing business or the method of medical treatment. For this reason, the claims should not be rejected simply because they are for an application in an unpatentable field. Instead, the patentability of the claimed computer program should be determined by referring to the technology defined by the claims.40_IDEA_343)_and_footnotes(n16);.FTNT n16 In other words, the patentable invention depends on the requirements stated in Article 19 of the Taiwan Patent Law.

An invention which does not comply with Article 19 of the Taiwan Patent Law is a non-statutory invention. (It should be emphasized that anything in this section characterized to a non- "nonstatutory invention" is not consequently statutory subject matter. The examination of such application should be conducted by classifying the invention into a proper statutory category, such as "product," "process," or "computer-readable storage media.") According to the explanation of the General Examination Guidelines, inventions that do not comply with the requirement of "using a law of nature" can be summarized as:

(1) Natural laws per se;

(2) Mere discovery;

(3) Claimed invention being against laws of nature; and

(4) Claimed invention not using laws of nature.40_IDEA_343)_and_footnotes(n17);.FTNT n17

In addition, owing to the characteristics of computer softwarerelated inventions, it may still be non-statutory even if it complies with the requirement of using laws of nature. For instance, if the claimed invention "simply uses a computer to process data," or "simply stores computer programs or data in a computer readable storage media" without involving any technological arts, then the claimed invention is still not a computer

software-related invention. This is because the claimed subject matter does not comply with the requirement of Article 19 of the Taiwan Patent Law.40_IDEA_343)_and_footnotes(n18);.FTNT n18

1. Computer Software-Related Inventions Not Relating to "Technological" Arts

(1) Mere Information Processing by Use of Computer:

Any claimed invention without directly or indirectly describing how to use computer hardware resources for information processing.

(2) Mere Recording a Program or Data on Computer-Readable Storage Medium:

The General Examination Guidelines40_IDEA_343)_and_footnotes(n19);.FTNT n19 defines three nontechnological arts, including: 1) skills, 2) mere presentation of information, and 3) mere artistic creation. Accordingly, the "mere presentation of information without involving any technological art is a non-statutory invention." For example, recording music on a compact disc is a non-statutory invention.

"But if the presentation of information (including the presentation per se, the means of presentation, or the way of presentation) involves technological arts, then it is a statutory invention."

Since computer programs or data are per se intangible, they must be carried on a storage media to be statutory subject matter. However, merely storing the computer programs or data in the computer-readable storage media without performing any concrete and tangible results would not make the claimed subject matter statutory. On the other hand, when the computer program or data is recorded on some computer-readable medium, and is structurally and functionally interrelated to the medium,40_IDEA_343)_and_footnotes(n20);.FTNT n20 then the examiner should further analyze the functionality or application of the claimed invention to determine its patentability.40_IDEA_343)_and_footnotes(n21);.FTNT n21

To determine if the content of the information disclosure belongs to "mere presentation of information" or "technological arts and features," refer to chapter IV, subsection D "Computer-Readable Storage Media" of the Guidelines.

(3) Mere Information Processing by use of Computer and Mere Recording a Program or Data on a Storage Medium

2. Computer Software-Related Invention Not Completed by Using "Laws of Nature"

a) Natural Laws per se

According to the General Examination Guidelines, "the invention should be a creation of technological arts using natural laws to solve technical problems and achieve the anticipated objects of the invention."40_IDEA_343)_and_footnotes(n22);.FTNT n22 Natural laws per se are existing truths that do not come from the creation of human beings. For this reason, natural laws per se cannot be the statutory subject matter of the claims as stated in Article 19 of Taiwan Patent Law. Accordingly, if a computer

software-related invention claims nothing but the laws of nature (such as E=mc2 or the law of gravitation), then it is a nonstatutory invention.

b) Mere Discovery

The General Examination Guidelines state:

Creation is the essence of an "invention." Mere discovery of a physical object, such as "rocks," and natural phenomena involves no creation, nor do any technological arts completed by using the laws of nature. For this reason, mere discovery is an action of merely finding something already in existence and is therefore a non-statutory invention.40_IDEA_343)_and_footnotes(n23);.FTNT n23

The natural objects and natural phenomena (such as electric currents, magnetic fields and astronomy, etcetera) are existing facts which are beyond human creation; therefore, if the claimed subject matter recites only natural phenomena per se, then it is classified as mere discovery.

However, "any natural phenomena discovered and transformed into a creation of technological arts for industrial applicability is an 'invention' rather than a mere discovery." Accordingly, a method of using hardware or the combination of hardware and software to extract some material, or using an expert system to dig out some rare lode is not an act of mere discovery.40_IDEA_343)_and_footnotes(n24);.FTNT n24 Moreover, an apparatus designed for discovering some natural objects or phenomena is also not an act of mere discovery. Such apparatus requires further requirements of patentability tests.40_IDEA_343)_and_footnotes(n25);.FTNT n25

Example 1:

Title of the invention: An apparatus for analyzing and displaying the three-dimensional structure of a chemical compound.

Claims:

1. A computer system for determining the three dimensional structure of a chemical compound comprising:

logic circuit means for converting a series of numbers representing values of a wavefunction equation for a chemical compound into values representing an image that conveys information about the three-dimensional structure of the compound determining the three dimensional structure of a compound;

means for generating said three dimensional structure of a compound according to said values output from said logic circuit means; and means for displaying the perspective of the three-dimensional structure of said compound.

Explanation:

Although the structure of a chemical compound is an existing fact, the claimed subject matter is about a special computer (or a special apparatus), which has nothing to

do with the method for discovering the structure of the chemical compound. So, the patentability of the claimed subject matter requires further examination.40_IDEA_343)_and_footnotes(n26);.FTNT n26

c) Claimed Invention Against Laws of Nature

The General Examination Guidelines states: "An invention is a creation of technological arts completed through the use of the laws of nature. Thus, if the claimed subject matter contains a technological art that is against the laws of nature, then it is a non-statutory invention."40_IDEA_343)_and_footnotes(n27);.FTNT n27 By the same token, if the claimed computer software is against the laws of nature, then it is a non-statutory invention.

For instance, it is known that avoiding the execution of the software from falling into an infinite loop is an important issue for software development. If a software invention claims a method for detecting an infinite loop occurring in a software program, then it is claiming a method which is against a law of nature. Thus, the claimed software invention is a nonstatutory invention and therefore unpatentable.40_IDEA_343)_and_footnotes(n28);.FTNT n28

d) Claimed Invention Not Using Laws of Nature

According to the General Examination Guidelines, "If the claimed subject matter is completed via other methods that do not belong to laws of nature, then it is a creation, but not an invention as defined in Article 19 of the Patent Law."40_IDEA_343)_and_footnotes(n29);.FTNT n29 For instance, if a computer program comprises nothing but economical rules, human determinations, or mental activities, then it is not a statutory invention.

However, if the claimed subject matter partially does not use laws of nature but the claim as a whole does, then the patentability of the claim is determined by the technological arts involved in the claim.

Example 2:

Title of invention: A game apparatus.

Claims:

1. A computerized card game machine, comprising: means for assigning specific points of a score to a set of cards dealt, according to the complexity of the hand involved.

2. A computerized card game machine, comprising: means for memorizing a data table for a scoring hand (i.e. a hand of cards dealt that scores points) in which a given set of cards is matched to specific scoring hand data, and a score data table in which the scoring hand data are matched to the score data; and means for assigning corresponding scoring hand data by retrieving said scoring hand data table based on a set of cards selected, assigning corresponding score data by retrieving the score data table on the basis of the applicable scoring hand data, and outputting all of the scoring hand data and total points scored.

Explanation:

In claim 1, "according to the complexity of the hand involved" is a step relating to human determination and thus does not use laws of nature. However, the claim also contains "means for assigning specific points of a score to a set of cards dealt," which is a step via use of natural laws. Thus, the claim 1 as a whole uses natural laws. Nonetheless, the claims do not directly or indirectly recite how to use the computer hardware resources for processing. In other words, the claim merely uses the computer for processing, which does not involve technological arts. For this reason, claim 1 is a non-statutory invention.

Although claim 2 also contains steps relating to human determinations, the claim as a whole teaches how to use the computer hardware resources for processing. It is therefore a technological art using laws of nature and not merely a use of the computer for processing. So, the patentability of claim 2 can be further examined.40_IDEA_343)_and_footnotes(n30);.FTNT n30

3. Non-statutory Subject Matter in Computer Software-Related Inventions

The first paragraph of Article 21 of Taiwan Patent Law lists six nonstatutory subject matters. Among these there are three items relating most closely to computer-related inventions, including:

(1) Scientific principles or mathematical theorems;

(2) Rules or methods of games and sports; and

(3) Methods or plans that can be implemented only by means of human reasoning and memory.

a) Scientific Principles or Mathematical Theorems

If a computer software comprises nothing but scientific principles (such as the law of gravitation) or mathematical theorems (one or a set of mathematical formula) per se, then the claimed computer software is a nonstatutory subject matter.

However, if the claimed software program uses scientific principles or mathematical theorems without preempting the scientific principles or mathematical theorems, then its patentability is determined by viewing the claim as a whole and considering the part which involves the technological arts and the uses of natural laws.

For example, an invention claims a method for converting BCD codes to binary codes. Since the claimed subject matter is the mathematical algorithm per se for converting the BCD codes to binary codes, and the claim as whole does not "directly or indirectly recite how to use the computer hardware resources for data processing," the invention is nonstatutory.40_IDEA_343)_and_footnotes(n31);.FTNT n31

Example 3:

Title of invention: Method and apparatus for computing taxi fare.

Claims:

1. A method for computing taxi fare comprising the steps of: calculating taxi fare according to a formula: 65+[(mileage*2)-2]*5; and displaying a computation result on a screen.

2. An apparatus for computing taxi fare comprising: detecting means for counting the rotation times of a wheel and generating data comprising said rotation times counted and a circumference of said wheel; first memory means for storing said rotation times; second memory means for storing said circumference of said wheel; multiplying means for multiplying said rotation times and said wheel circumference and generating a first computation result; third memory means for storing said computation result; a calculation module for reading said computation result stored in said third memory means, and multiplying said computation result by 2 and then subtracting by 2, and then times by 5 and then plus 65, and generating a second computation result; and means for displaying said second computation result.

Explanation:

Claim 1 does not "directly or indirectly recite how the hardware resource of the computer is used in the processing" except for computing the taxi fare according to a mathematical formula. Thus, the limitation of claim 1 is "merely using a computer." The claimed subject matter preempts the mathematical formula per se and is therefore non-statutory.

As to claim 2, the claimed subject matter is processing information by using hardware resources and therefore is a creation of technological arts using natural laws. When viewing the claim as a whole, it explicitly recites how to process information by using hardware resources. It is not "merely processing information by using the computer" and does not preempt the mathematical formula per se. The claimed subject matter can therefore be further tested for patentability.

b) Rules or Methods of Games and Sports

According to the General Examination Guidelines, "the rules or methods of games and sports have nothing to do with the laws of nature. Instead, they must be completed via human reasoning, memory, skills, chance, and mental activities, etcetera. Hence, they are not considered as inventions completed by the application of natural laws."40_IDEA_343)_and_footnotes(n32);.FTNT n32

This means that the rules or methods of games and sports are per se non-statutory subject matter. However, if a video game or a computer software comprises the rules or methods of games or sports that encourage the participation of human reasoning, memory, skills, mental activities, etcetera, then the patentability of the claimed subject matter depends on the technological arts involved.40_IDEA_343)_and_footnotes(n33);.FTNT n33

For instance, the rules of scoring a shooting game are per se unpatentable. The skill to get higher scores of shooting is unpatentable as well. However, using infrared sensing means arranged as a grid on a target for measuring the coordinates of a gun shot, and then

converting the coordinates into scores would be patentable subject matter since it does not involve human reasoning, memory, skills, or mental activities, etcetera. Its patentability can be further tested.

c) Methods or Plans that Can Be Implemented Only by Means of Human Reasoning or Memory

An invention is a creation completed through the use of natural laws and capable of repetition to generate the same effects for providing industrial applicability. If a claimed software program must depend on human judgment or memory to complete the program execution, then its results will be uncertain and cannot repetitively generate the same effect. Thus, such a claim is non-statutory subject matter.40_IDEA_343)_and_footnotes(n34);.FTNT n34

The above mentioned unpatentable case is emphasized for the methods or plans that must be completed via human reasoning and memory. In contrast, the situation would be different if the part that requires human reasoning and memory is now implemented as a computer program to generate a decision in response to several predetermined conditions, such as a decision supporting system, or an automatic controlling system. Additionally, if the information that originally relies on human memory for program execution is now stored in a computer for the computer to retrieve, such as the database of an expert system, then its patentability must be further tested because the effects can be repetitively performed.

Again, take the previous application "Method for Encoding Chinese Characters" as an example. Although the invention partially relies on human reasoning and memory to key-in Chinese characters, the patentability of the claims should be determined by viewing the claims as a whole and from the technological arts of the claims that use the laws of nature.

B. Statutory "Product" Claims

1. Definition of "Product" Claims for Computer Software-related Inventions

A computer software-related invention is a statutory "product" if it is a creation of technological arts completed by using the laws of nature; is defined in terms of the combination of hardware and software; and has industrial applicability.40_IDEA_343)_and_footnotes(n35);.FTNT n35

2. Types of "Product" Claims in Computer Software-related Inventions

A product claim relating to computer software-related inventions can be classified into two types: 1) a claim that encompasses any and every machine for performing the underlying process or any and every manufacture that can cause a computer to perform the underlying process; or 2) a claim that defines a specific machine or manufacture. The examination of product claims shall be conducted by reviewing the claims and the technical features disclosed in the specification and by analyzing the product claims according to the types defined above. When a claim is of the first type, the examiner shall evaluate the underlying process the computer performs to determine the patentability of the product since it does not specify a specific hardware (refer to "Statutory Process Claim," subsection C, below for details). When a claim is of the second type, the

examiner should analyze the structure of the specific machine or manufacture to determine its patentability.

a) Claims that Encompass Any Machine or Manufacture Embodiment of a Process

The examiner must read the specification carefully and should not determine the category of the claimed subject matter from the hardware elements recited in the claims. If a hardware element is recited in a claim, it does not necessarily limit the claim to a specific machine or manufacture (the second type of product claims). Its patentability still need to be examined in light of the technical features specified in the specification. When the claims are read based on the specification, if the claims encompass any machine or manufacture embodiment of a process, they should be examined on the basis of the underlying process. Such claims can be recognized:

to define the physical characteristics of a computer or computer component exclusively as functions or steps to be performed on or by a computer; and

to encompass any and every product in the stated class (e.g., computer, computer-readable memory) configured in any manner to perform that process.

Any claim defined as such belongs to the first type of product claim. Since the claim encompasses any and every hardware or hardware platform and associated software implementation that performs the specified set of claimed functions, it is not limited to a specific machine or manufacture. The claim also does not define the structural elements of the computer for performing the program and how these elements correlate to specific hardware or software. Therefore, the claimed subject matter does not define a specific machine or manufacture. For such claims, the examiner can determine the claimed subject matter from the objects and solutions specified in the specification.

It should be noted that if a claim is found to encompass any and every product embodiment of the underlying process (the first type of product claims), the patentability relies on the underlying process. However, it does not follow that the underlying process alone is sufficient for a process claim. It only indicates that the claimed subject matter encompasses any and every hardware or hardware platform and associated software implementation that performs the specified set of claimed functions.

When the examiner has reviewed the claim as a whole and found that it is not limited to a specific machine or manufacture, he may determine that it belongs to the first type of product claim. If the applicant objects, the objection should explain how the claimed subject matter is limited to a specific machine or manufacture (i.e., the second type of product claims). Otherwise, the claimed subject matter will be viewed as the first type of product claims.

When a claim is identified as the first type of product claims, and if the underlying process is statutory, then the product claim should be classified as a statutory product. Correspondingly, if the underlying process invention is found to be non-statutory, the examiner should classify the product claim as non-statutory product and reject the claim.

b) Claims Directed to Specific Machines and Manufactures

A "specific machine" or "specific manufacture" refers to specialpurpose hardware or software. If a product claim does not belong to the first type of product claims, then it shall be construed as a product claim directed to specific machines and manufactures, i.e., the second type of product claims. Claims that define a computer software-related invention as a specific machine or specific article of manufacture must define the physical structure of the machine or manufacture in terms of its hardware or hardware and "specific software." The applicant may define the physical structure of a programmed computer or its hardware or software components in any manner that can be clearly understood by a person skilled in the relevant art. Generally, a claim related to a particular programmed computer should identify the elements of the computer and indicate how those elements are configured in either hardware or a combination of hardware and specific software.

To explicitly define the memory of a specific computer, the claim must clearly identify a general or specific memory and the specific software which provides the functionality stored in the memory.

A claim is statutory if it is limited to a specific machine or manufacture and has a practical application in the technological arts. If the claim or specification only briefly describes the specific machine or manufacture without further limitation and cannot enable a person of ordinary skilled in the art to implement the invention, then the claim is non-statutory.

Example 4:

(Two invention disclosures with the same titles and same claims but different in the disclosures to support the claims.)

Title of invention: Method and apparatus for analyzing and displaying the three dimensional structure of a chemical compound

Claims:

1. A process for determining and displaying the structure of a chemical compound comprising:

solving the wavefunction parameters for the compound to determine the structure of a compound; and displaying the structure of the compound determined in said step (a).

2. A computer system for determining the three dimensional structure of a chemical compound comprising: means for determining the three dimensional structure of a compound; and means for generating and displaying an image representing a threedimensional perspective of the compound.

Specification of applicant A:

The disclosure describes specific software, i.e., specific program code segments, that are to be employed to configure a general purpose microprocessor to create specific logic circuits. These circuits are indicated to be the "means" corresponding to the claimed means limitations.

Specification of applicant B:

The disclosure states that it would be a matter of routine skill to select an appropriate conventional computer system and implement the claimed process on that computer system. The disclosure does not have specific disclosure that corresponds to the two "means" limitations recited in the claim (i.e., no specific software or logic circuit). However, the disclosure does have an explanation as to how to solve the wavefunction equations of a chemical compound, and indicates that the solutions of those wavefunction equations can be employed to determine the physical structure of the corresponding compound.

Explanation:

Applicant A's disclosure describes specific software, i.e., specific program code segments, that are to be employed to configure a general purpose microprocessor to create specific logic circuits. In other words, the specification defines a specific machine or manufacture for performing the underlying process. Accordingly, the claim defines a specific computer. The patentability of the claim is independent from the process claim (the second type of product claims).

Applicant B's disclosure does not have specific disclosure that corresponds to the two "means" limitations recited in the claim. So, the computer is defined by the functions or process executed by the computer without distinctly describing the physical structure of the programmed computer, or its hardware or software. It does not specify the elements of the computer and indicate how those elements are configured in either hardware or a combination of hardware and specific software. In other words, the disclosure does not provide any information to distinguish the implementation of the process on a computer from the factors that will govern the patentability determination of the process per se. The patentability of the apparatus claim will stand with that of the process claim. Consequently, the claim is classified as a product claim directed to any and every computer or manufacture. Its patentability is determined by the underlying process (the first type of product claims).

C. Statutory "Process" Claims

1. Definition of "Process" Claims for Computer Software-Related Inventions

A claim that requires one or more acts, procedures, operations or steps to be performed by a computer and yielding concrete and tangible results defines a process for computer software-related inventions. In examining the process claims, the claimed invention should be viewed as a whole so as to understand what the invention is. The invention must rely on computer to perform the process, either via precomputer process activity or post-computer process activity, and have practical applications.

2. Types of "Process" Claims for Computer Software-Related Inventions

Basically, the types of the process claims for computer softwarerelated inventions can be classified according to whether the physical transformation or resulting acts occur inside or outside a computer by performing processes or steps. They can be classified as:

* pre-computer process activity: process that results in a physical transformation for information or signals;40_IDEA_343)_and_footnotes(n36);.FTNT n36

* post-computer process activity: process that involves controls or accompanying controls of hardware resources;40_IDEA_343)_and_footnotes(n37);.FTNT n37 and

* practical applications: process that is limited by the language in the claim to a practical application within the technological arts.40_IDEA_343)_and_footnotes(n38);.FTNT n38

a) Pre-Computer Process Activity

"Pre-computer process activity that results in a physical transformation on the information or signals" means that the claimed process invention requires data to be generated or processed by physical objects or actions before the execution of a computer. This type of invention usually requires a measurement to be transformed outside of the computer and into data executable by a computer, and to be capable of having technical characteristics. Such data will enable signals corresponding to physical objects or activities to have a physical transformation for the computer to use. Accordingly, such inventions usually have practical applications.

For instance, consider a Computerized Axial Tomography ("CAT") scan method which involves using a computer processor to receive data representing CAT scan images of a patient, and performing a calculation to determine the difference between a local value at a data point and an average value of the data in a region surrounding the point, and finally displaying the difference as a gray scale for each point in the image. In this example, the data is an intangible representation of a physical object, i.e., portions of the anatomy of a patient. The transformation occurs when the condition of the human body is measured with X-rays which are converted into electrical digital signals that represent the condition of the human body. The real world value of the invention lies in creating a new CAT scan image of body tissue without the presence of bones.

Take a seismic exploration method as another example. It involves using a computer processor to conduct seismic exploration, imparting spherical seismic energy waves into the earth from a seismic source, generating a plurality of reflected signals in response to the seismic energy waves at a set of receiver positions in an array, and summing the reflection signals to produce a signal simulating the reflection response of the earth to the seismic energy. In this example, the transformation occurs by converting the spherical seismic energy waves into electrical signals which provide a geophysical representation of formations below the earth's surface. The geophysical exploration of formations below the surface of the earth has real world value.

Example 5:

The invention is directed to the analysis of electrocardiograph signals from a heart failure patient to determine certain characteristics of the heart function. Heart activity is monitored by means of an electrocardiograph device, whereby electrodes attached to the patient's body detect the heart's electrical signals in accordance to the various phases of heart activity. The specification discloses selecting certain of the electrocardiograph signals (QRS segment) so as to convert them from analog to digital values, and a composite digital representation of the QRS segment is obtained by selecting and averaging a large number of the patient's QRS waveforms. The analog-to-digital converter for converting the electrocardiograph signals to digital values and the high pass

filter are well-known components to those of ordinary skill in the art. The anterior portion of the composite QRS waveform is isolated and then processed in reverse time to ascertain whether or not the patient is at high risk of heart failure. A programmed microprocessor controls the processing of the signals. The specific program, accompanied by a high level description and flowcharts of the program steps, is properly disclosed.

Claim:

1. A method for analyzing electrocardiograph signals to determine the presence or absence of a predetermined level of high frequency energy in the late QRS signal, comprising the steps of:

converting a series of QRS signals to time segments, each segment having a digital value equivalent to the analog value of said signals at said time;

applying a portion of said time segments in reverse time order to a high pass filter to determine an arithmetic value of the amplitude of the output of said high pass filter; and

comparing said arithmetic value of the amplitude of the output of said filter with said predetermined level of high frequency energy.

Explanation:

The invention uses a microprocessor for data processing. The claimed invention is for determining if a patient belongs to the high risk heart failure group by converting the QRS signals to digital signals which have technological characteristics and can be processed by a computer.

Thus, the claimed invention is a statutory process claim.

b) Post-Computer Process Activity

The claimed invention is a post-computer process activity that involves controls or accompanying controls of hardware resources. This type of invention creates independent and physical acts outside of the computer and usually has industrial applicability.

For instance, a method of curing rubber in a mold belongs to this type of invention. The method uses a computer for determining the best time to open the mode in curing rubber process. It involves determining a time period for curing the rubber, determining when the time period has been reached in the curing process, and opening the mold at that stage by controlling the computer outside the curing machine.

Also, a robot controlling method belongs to this type of invention.

The method relies on data representing various types of mechanical movements of the robot to control the motion of a robot. The data is stored in the computer for a computer processor to retrieve and calculate the positions of the robot in relation to given tasks to be performed by the robot. Accordingly, the movement and positions of the robot can be controlled based on the positions calculated by a computer.

Example 6:

This invention discloses a method for controlling the steering angle of a rear wheel of a four-wheel steering car. The disclosed controlling method comprises the steps of monitoring several parameters to calculate a proper rear wheel steering angle in response to the operating conditions of a car. The parameters include a front wheel steering thetaf and the speed of the vehicle v. They are performed according to a particular transfer function G(s) and the formula angler = [G(s) * K * thetaf] / v, where K is a steering coefficient.

Both the transfer function and the steering coefficient are properly defined in the specification. Each parameter represents the value of an electrical signal that is generated by a sensor and processed by a microprocessor. In particular, a required proper steering angle can be calculated via a specific program based on these parameters.

Claims:

1. A method for controlling the rear wheels of a fourwheel steering vehicle, comprising the steps of:

detecting a front wheel steering thetaf of said vehicle; detecting a speed of said vehicle v;

calculating a desired rear wheel steering thetar based on said front wheel steering thetaf and said vehicle speed according to thetar = [G(s) * K * thetaf] / v, where G(s) is a transfer function, and K a steering coefficient; and

steering the rear wheels to said desired rear wheel steering thetar.

Explanation:

The invention disclosed uses a computer system. Its technological arts involve obtaining the data by detecting the front wheel steering angles and the vehicle speed. Then, after being processed by the computer, these data can be used to control the rear wheel steering angle of a four-wheel steering car. An independent and physical control is performed outside the computer. Thus, the claimed invention is a statutory process invention.

c) Practical Applications

Computers manipulate data, so there is always some form of physical transformation within a computer because a computer acts on signals and transforms them during its operation, changing the state of its components during the execution of a process. Although the physical transformation occurs within a computer, such activity is not determinative of whether the process is statutory because such transformation alone does not distinguish a statutory computer process from a non-statutory computer process. Thus, what is determinative is not how the computer performs the process, but what the computer does to achieve a practical application.

A process that merely manipulates an abstract idea or performs a purely mathematical algorithm is non-statutory despite the fact that it might inherently have some usefulness.40_IDEA_343)_and_footnotes(n39);.FTNT n39 For such subject matter

to be statutory, the claimed process must be limited to a practical application of the abstract idea or mathematical algorithm in the technological arts. For example, a computer process that simply calculates a mathematical algorithm that models noise is non-statutory. However, a claimed process for digitally filtering noise employing the mathematical algorithm is statutory, such as Example 7 and the second claim of Example 9 below. In contrast, if the claimed process is not clearly limited to specific practical applications in some technological arts, then it is non-statutory, such as Example 8 and the first claim in Example 9 below.

Example 7:

This is a method of operating a computer by dynamically updating the definitions of a system I/O configuration, where those definitions are necessary for the configurations of the subsystem's input/output (hardware) and the operating system (software). In operation, the program generates a configuration file to be stored in a DRAM where the current state relating to the system I/O settings of the controlling blocks is defined. Then the program creates a future I/O configuration file (which could be the previous I/O configuration file). When changing from the current configuration to the future configuration, a comparison function will compare the definitions of these two configurations and then generate a configuration change block. The configuration change block represents the changes required for sufficiently converting the controlling blocks defined by hardware and/or software. Then, after completion, the system generates a finish signal for the underlying procedure.

This invention provides a method which dynamically changes the configuration of a system's hardware and/or software I/O for the convenience of data processing. The method involves generating definitions of a single I/O configuration, which in turn generates hardware and software definitions, and converts from the first I/O configuration to the second one. The invention has provided the feasibility of such a conversion.

The specification discloses ten detailed flowcharts concerning how to manipulate the configuration. The application also discloses the hardware block diagrams which provide an embodiment of the system operation in the best mode.

Claims:

1. A method of reconfiguring a computer system having a central processor, input/output units in an input/output subsystem attached to the central processor, and an operating system, a system for dynamic reconfiguration of one or more of said input/output units, comprising the steps of:

a. using a definition means for creating, on a configuration definitional file, one or more configuration instances, each configuration instance representing an associated configuration of said one or more of said input/output units;

b. creating by said definitional means, a current configuration instance, which represents a first associated configuration;

c. creating by said definitional means, a future configuration instance, which represents a second associated configuration;

d. initializing the system for said current configuration instance, one or more dynamically changeable software control blocks describing the first associated configuration to the input/output subsystem;

e. initializing the hardware from said current configuration instance, one or more dynamically changeable hardware control blocks describing the first associated configuration to the input/ output subsystem;

f. creating from said current configuration instance and said future configuration instance, a configuration change block describing changes to be made to said software control blocks and said hardware control blocks when changing from said first associated configuration to said second associated configuration; and

g. creating from said configuration change block, changes to said hardware control blocks and said software control blocks so that, if said creating changes is successful, said software control blocks describe the second associated configuration to the operating system, and said hardware control blocks describe the second associated configuration to input/output subsystem and if said creating changes is not successful, a change creation error indication is set.

Explanation:

The claim defines a series of steps for dynamically updating the system I/O of a computer system. The claim is limited to a practical application. For this reason, it is a statutory process claim.

Example 8:

A process for converting BCD codes to binary codes and providing an improved interface between a keyboard and a computer to facilitate the data input. The computer executes a series of steps of mathematical algorithms to perform the conversion. Each hardware element shown in the specification and the drawings is illustrated in terms of computer technology.

The specification does not disclose any specific computer program, but it does provide high-level descriptions and the associated flow charts, from which those skilled in the arts can understand how to practice the invention.

Claims:

1. A method of converting signals from binary coded decimal into binary comprising the steps of:

a. storing the binary coded decimal signals in a reentrant shift register;

b. shifting the signals to the right by at least three places, until there is a binary "1" in the second position of said register;

c. masking out said binary "1" in said second position of said register;

d. adding a binary "1" to the first position of said register;

e. shifting the signals to the left by two positions;

f. adding a "1" to said first position; and

g. shifting the signals to the right by at least three positions in preparation for a succeeding binary "1" in the second position of said register.

Explanation:

Although the claimed invention is a series of computer executable steps, the step (a) simply provides the data required for mathematical operations from steps (b) to step (g). This activity does not constitute the condition of "Pre-computer process activity."40_IDEA_343)_and_footnotes(n40);.FTNT n40 Steps (b) through (g) are simply a series of mathematical operations that convert BCD codes to binary codes. Therefore, in addition to claiming a mathematical algorithm per se, the claim as a whole is not limited to any practical application and thus is not statutory.

Example 9:

This is a method for bid competition in an auction (of real property). Sale items are confirmed by a record in a computer system that may offer bidding data of each item and each combination of sale items to potential bidders, allowing them to put his or her bids on the record of a computer, indexing those bids to determine the optimal profit gained from sale items, confirming the total value of all the superior bids, displaying successful bidding combinations to bidders, and accepting each legitimate bid by sending an acceptance signal to each bidder.

Claims:

1. A method of competitively bidding on a plurality of sale item data, comprising:

a. identifying a plurality of sale item data on a record in a computer system;

b. providing said plurality of sale item data to a plurality of potential bidder;

c. receiving bids from said bidders for both individual ones of said items and a plurality of groups of said items, each of said items and groups being any number of all of said individual ones and all of the possible combinations of said items;

d. entering said bids on said record in said computer system;

e. indexing each of said bid values of said individual ones or said groups of sale items; and

f. combining the bids of said sale item data and said group into a complete list which singles out a superior total value as the bid value for all the sale items and points out from the record every bid that complies with the superior total value.

2. A method of competitively bidding on a plurality of related parcels of real property comprising the steps of:

a. identifying a plurality of related parcels of real property in a record on a computer system;

b. offering said plurality of related parcels of real property to a plurality of potential bidders;

c. receiving bids from said bidders for both individual ones of said related parcels of real property and a plurality of groups of said related parcels of real property, each of said groups including one or more of said related parcels of real property, said related parcels of real property and groups being any number of all of said individual ones and all of the possible combinations of said related parcels of real property;

d. entering said bid in said record on said computer system;

e. indexing each of said bid to one of said individual ones or said groups of said related parcels of real property;

f. assembling a completion of all said bids on said related parcels of real property and groups in order to determine the maximum profit to be realized from the sales of said related parcels of real property at a prevailing total price, identifying in said record on said computer system all of said bids corresponding to said prevailing total price; and

g. displaying the winning combination of bids for the bidders whose bids represent a maximum of profit relative to all other submitted bids and said computer system simultaneously accepting the corresponding bids by sending an acceptance control signal to the identified bidders.

Explanation:

The claimed invention uses a general purpose computer for a real property auction. The object of the claimed invention is to find the most profitable bid value among several sale items. Steps (a) through (d) in claim 1 are data collection steps prepared for the steps from (e) to (f). However, such activity does not constitute the condition of "Precomputer process activity." And steps (e) through (f) simply convert a set of numbers to another set of numbers. Therefore, the claim as a whole is not limited to any practical application and thus is nonstatutory.

As to claim 2, although steps (a) through (f) are similar to those in claim 1, step (g) recites the process of outputting a plurality of numerical values calculated in steps (e) and (f). The result derived from the trade information output is not simply a mathematical algorithm. Instead, it has a practical application for evaluating bid values. Accordingly, the claim is limited to the practical applications of displaying bidding trade information and accepting real property bidding, and thus is statutory.

3. Tips for Determining the Statutory Process Claims

(1) If the claim manipulates only abstract ideas, such as numbers or signals, without being limited to or disclosing any practical application, then the patentability of the claim should be determined by viewing the claim as a whole and evaluating its operation steps.40_IDEA_343)_and_footnotes(n41);.FTNT n41

(2) In computer software-related method inventions, the operations concerning abstract ideas or mathematical algorithms within a computer must be limited to a

practical application of a technological art. For this reason, the examiner should be careful to properly interpret the claim language that simply specifies an intended use or field of use, especially when only presented in the claim preamble. Such language should be treated as non-limiting.40_IDEA_343)_and_footnotes(n42);.FTNT n42 For example, simply stating the terms like "applying in the field of chemistry" does not limit the practical application fields. The examiner should view the claim as a whole and define the invention by limiting to a practical application. Example 9, for instance, is not limited to only "bidding" or "real property bidding." Taking the preamble and the claim body as a whole, the claim is limited to the practical application that includes "real property bidding" and "displaying bidding trade information and accepting real property bidding." Thus, the scope of the claimed subject matter is limited to a practical application of a technological art.

(3) For pre-computer process activity, it should be noted that the activities of "collecting" or "selecting" data for use in a process consisting of mathematical operations or algorithms will be taken as merely determining values for the variables used in the mathematical formulae. It cannot be read as a limitation to the claim. Selecting a value from a set of arbitrarily measured positions is an example.

However, if a claim requires acts to be performed to create data that will then be used in a process representing a practical application of one or more mathematical operations, those acts must be treated as further limiting the claim beyond the mathematical operation(s) per se. Such acts are data gathering steps not dictated by the algorithm but by other limitations that require certain antecedent steps and as such constitute an independent limitation on the claim. Such claims are statutory process claims of pre-computer process activity type. An example is the aforementioned seismic exploration claim that requires generating and manipulating signals from seismic energy waves before summing the values represented by the signals.40_IDEA_343)_and_footnotes(n43);.FTNT n43

(4) For post-computer process activities, certain kinds of post-solution "acts" will not further limit a process claim beyond the performance of the preceding mathematical operation steps. In addition, the claimed acts represent some "significant use" of the solution rather than merely output the direct result of the mathematical operation. Those postcomputer process acts will invariably impose an independent limitation on the claim. For example, recording a natural phenomena, converting results of mathematical operations on a media, simply converting data to a different form, or converting computation results to electric signals, etcetera, cannot be seen as a post-computer process activity because they do not involve controls or accompanying controls of hardware resources.40_IDEA_343)_and_footnotes(n44);.FTNT n44

(5) Even though the statutory process claims for computer software-related inventions are related to fields that are categorized as non-statutory subject matter, such as mathematical algorithms, diagnostic methods, or games, the patentability of such claims should be determined by viewing the claims as a whole to discover whether the claimed subject matter is non-statutory. If not, its patentability should be further checked by determining whether it results in a physical transformation either inside or outside the computer via computer technology. The examination is then conducted by referring to the previously described guidelines.

D. Computer-Readable Storage Media

Information per se is a form of description or expression about an idea or message, which is intangible and therefore unpatentable. For this reason, the information must be carried on a storage media to enable a physical transformation of the information. In other words, intangible messages will be converted into signals in a format readable by a computer. In many cases, the computer-readable storage media can functionally and structurally correlate to a computer, and thus may be patentable subject matter.

Basically, information can be classified as the following two types:

1. Functional descriptive material:

"Functional descriptive material" consists of data structures and computer programs that impart functionality when encoded on a computerreadable medium.

2. Non-functional descriptive material:

"Non-functional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

Accordingly, non-functional descriptive material is just arrangement of data for reuse and output. The data is carried on a medium without functionally or structurally interrelating with a computer. Thus, it belongs to "mere information disclosure" of the non-technological arts and therefore is non-statutory.40_IDEA_343)_and_footnotes(n45);.FTNT n45

However, if the material is musical or image data, storing such material in a computer-readable storage medium usually involves the technology of data compression so as to save memory space and increase access speed. In such cases, the claimed subject matter will be the technology of recording rather than the non-functional descriptive material. If the claimed subject matter contains technical ideas and characteristics, then it is patentable.

In other words, the patentability of the claimed subject matter relating to computer-readable storage medium is determined by whether the computer-readable storage medium imparts functional or structural interrelation with a computer, whether the claimed subject matter is the information per se, or the process of the information per se.

An invention of a computer-readable storage media is not a direct approach for solving a problem. Instead, it relies on a computer to read the data stored in the medium for solving a problem. The data may be a program or a data structure. Thus, if an invention of a computer program carried on a medium is an "indirect" means for solving a problem, then an invention of a data structure carried by a medium is an indirect means for solving a problem indirectly. So it should be emphasized that the patentability of an invention relating to a computer-readable storage medium is determined not only by the recorded computer programs or data structures but also by their structural and functional interrelations with the computer.

Basically, the examination for the invention relating to computerreadable storage media can be conducted by following the flowchart as illustrated. First, determine if the data carried by the storage medium is functional or non-functional descriptive material. If it is functional descriptive material, then view the claims as a whole and determine if it is

statutory from the solution provided by the claimed subject matter. If it satisfies the above-mentioned conditions, then it is statutory subject matter. Otherwise, it is non-statutory subject matter.

Furthermore, since functional descriptive material can be classified into computer programs and data structures concerning patentability, the examination on these two categories can be described as follows:

. Examination for computer-readable storage media containing computer programs is described in the flowchart:

First, view the claims as a whole and find out the specific process (process claim) or apparatus for performing specific functions (product claim) according to the performance of the computer programs recited in the claims. Then, if the claims comply with the statutory requirements of the product or process claim, the claimed subject matter is statutory.

. Examination for computer-readable storage media containing data structures is also described in the flowchart:

First, view the claims as a whole and find out if the claimed data structure can be employed to perform a specific function for a specific process or to enable an apparatus to execute a specific process when being executed by a computer. Then, if the process or apparatus complies with the statutory requirements of the process claim or product claim, and has a practical application, the claimed subject matter is statutory.

Examples of claiming a computer-readable storage media as subject matter are listed as follows:

Case 1: A computer-readable storage media comprising a program for the computer to execute procedure A, procedure B and procedure C.

Case 2: A computer-readable storage media comprising a program for the computer to achieve the functionalities of apparatus A, apparatus B and apparatus C.

Case 3: A computer-readable storage media comprising a program for the computer to provide function A, function B and function C.

Case 4: A computer-readable storage media comprising data structure A, data structure B and data structure C.

Again, it should be emphasized that cases 1 to 4 as stated above are not sufficient to satisfy the requirements of patentability. Patentability should be examined by referring to the flowchart.

. PATENTABILITY REQUIREMENTS

The three basic requirements of patentability include industrial applicability, novelty, and inventive step or non-obviousness. Due to the special characteristics of computer software-related inventions, when conducting the examination following the General Examination Guidelines, the requirements should be reiterated as follows:

A. Industrial Applicability

As mentioned above, since computer software is widely applied in many technological fields, problems occurring in various fields may seek software as a solution. For this reason, when determining the industrial applicability of the application relating to a computer software-related invention, the examiner should investigate the technical field described in the specification.

B. Novelty

For statutory subject matter, the examiner should compare the claimed subject matter with the prior art to determine its novelty. If they are equivalent, then the claims should be rejected for not complying with the novelty requirement according to the cited prior art.

C. Inventive Step or Non-Obviousness

When the claimed subject matter and the prior art are not equivalent, the examiner should determine, according to the technical levels at the time that the application was filed, whether a person skilled in the art could have readily achieved the invention as defined by the claims. If it could not be done easily, then the claimed subject matter complies with the nonobviousness requirement and therefore should be patentable. On the other hand, if it could be done easily, then the claimed subject matter will be rejected for being obvious over the cited prior art.

1. Application in Other Fields

Application software programs usually have the same procedures or structures and provide the same functions and effects even though they are applied in different fields. In such cases, it would be obvious for a person skilled in the art to use a procedure or structure of a computer softwarerelated invention in another field. For example, the functions and effects of a "file retrieval system" can be applied to a "medical retrieval system" to provide the medical retrieval system with the same functions and effects. Even if the data contents of these two systems are different, they still do not comply with the requirement of non-obviousness, nor does applying the data structure of "a computer-readable storage media which stores students' academic records" to "a computer-readable storage media which stores the health management data of trained horses."40_IDEA_343)_and_footnotes(n46);.FTNT n46

2. Obvious Supplement or Replacement

Computer software-related inventions are often realized as a system which integrates hardware and software. For this reason, it is obvious for a person skilled in the art to replace a well-known constituent part with another part which can perform the equivalent functions. For example, an input mechanism for a computer system can be implemented as a touch screen input device or as a bar code reading device for reading numeral codes.40_IDEA_343)_and_footnotes(n47);.FTNT n47

3. Software Implementation to Provide the Functions Otherwise Performed Hard-Hardware

A person skilled in the art of computer software is likely to implement a software program that can perform the same functions as a hardware device. For instance, a

software function module can be implemented to simulate the logic circuitry of hardware.40_IDEA_343)_and_footnotes(n48);.FTNT n48

4. Computerization of Human Transaction

It is within the exercise of ordinary creative ability expected by a person skilled in the art to systematize transactions in an applied field by means of a computer, if the transactions can be realized by a conventional technology of system analysis and system design.

For example, developing a system is normally performed through a process including design planning, system analysis, and system design. In the stages of system analysis and system design, for example, the existing human transactions in some fields can be analyzed for systematization, e.g., systematization of the procedure of clerical ledger work. In view of the actual process of such a system development, it is within the ordinary creative ability of a person skilled in the art.40_IDEA_343)_and_footnotes(n49);.FTNT n49

5. Claims with the Limitation of "Computerreadable Storage Media"

If the difference between claimed invention and cited prior art is readily conceivable within the ordinary creative ability of a person skilled in the art, then the claimed invention does not contain any inventive step even if the claim is limited to "recording computer programs or data on a computer-readable storage media."40_IDEA_343)_and_footnotes(n50);.FTNT n50

6. General Effects Accompanying Computerization

General effects such as "can be processed quickly," "can process a large amount of data," "can minimize errors," "can obtain uniform results," etcetera, are often obtained as a result of computerization. Normally they are considered as foreseeable results from the knowledge of the state of the art.40_IDEA_343)_and_footnotes(n51);.FTNT n51

Example 10:

(Case for determination of inventive step, "systematization of human transaction")40_IDEA_343)_and_footnotes(n52);.FTNT n52

This invention is related to the business of invoice preparation at the counter of a bank. According to the regulations of the bank, the invoice was conventionally prepared by the cashier for obtaining approval from a superior for a transaction of a large amount of money. The disadvantages for this procedure is that the cashier has to leave the counter for delivering the invoice to the supervisor. During this time, the cashier will not be able to concentrate on other paperwork, especially when his supervisor is busy and cannot give him an instant response. An object of the invention is to provide a computer system for obtaining an approval from the supervisor via computer networks. The cashier would not have to leave his desk just for obtaining the supervisor's signature. At the same time, a notice of receiving an invoice waiting for approval is indicated on the screen so that the invoice does not need to be checked again. In addition, the approval data is entered using an ID card (for individual identification), so that only the person with the approval authority can input the approval data. Consequently, the computer system of the present

invention can improve the efficiency of the procedure of invoice processing when compared to the conventional procedure.

This example assumes the state of the art (a cited reference, well-known art, etcetera) as follows:

(1) Procedure of invoice processing

i. A cashier's work includes:

1) preparing an invoice by writing the invoice data on the invoice form;

2) handing over the invoice requiring approval to the approver; and

3) completing the invoice preparation by receiving the invoice from the approver.

ii. An approver's work includes:

1) receiving the invoice from the cashier;

2) checking the invoice received from the cashier and then signing for approval; and

3) handing over the approved invoice to the cashier.

(2) Computer technology

i. Common knowledge in the field of computer technology includes:

1) installing a computer with I/O device for each person, connecting each computer via a computer network and a communication control device, and then transmitting/ receiving data via the computer network;

2) editing the document on a computer and then displaying it or printing it out according to the format required for the document;

3) displaying the data received on the screen; and

4) inputting a person's ID code via the ID card for data processing.

ii. Technology disclosed in a publication distributed prior to the filing of the application:

1) checking and transmitting the input data only if necessary.

Title of invention: An invoice approval system

Claims:

1. An invoice approval system comprising an invoice input preparation device which has the first input module for inputting the invoice data, the first output module which displays and prints out the invoice based on the data input to said first input module, the first communication control module, and the first control module which controls the entire device; and an invoice approval device which has a second output module which

displays the invoice, the second input module for the approval data, the second communication control module, and the second control module which controls the entire device, characterized in that:

said first control module obtains the data for each item on the invoice from said first input module, checks each item on the invoice data obtained, transmits the invoice data requiring approval from said first communication control module to said invoice approval device, receives the approved invoice data transmitted from said invoice approval device via said first communication control module, and outputs from said first output module; and

said second control module receives via said second communication control module the invoice data requiring approval transmitted from said invoice input preparation device, inputs the approval data to be approved or disapproved from said second input module, and transmits the invoice data including said approval data from said second communication control module to said invoice input preparation device.

2. The invoice approval system of claim 1, characterized in that said second output module has a display screen and a means for automatically indicating information that an incoming invoice has been received in a part of said display screen when an invoice requiring approval is received.

3. An invoice approval system of claim 1 or claim 2, characterized in that said first input module has an ID card reader.

Explanation:

Examination is conducted by determining whether the claimed invention would be easy for a person skilled in the art to computerize invoice approval processing according to the functions required for invoice preparation, approval, and paper work in the procedure of invoice processing.

As to claim 1, it is clear from the analysis of the invoice preparation that data I/O modules are necessary for invoice preparation, and a communication means is necessary for transmitting the invoice data requiring approval to the supervisor. For approving the invoices, both the I/O module and the communication means are also necessary. Accordingly, from the computer technology of the state-of-the-art stated above in (2)(i)(1), it would have been easily conceivable by a person skilled in the art to implement such a system using hardware resources and computer technology.

Moreover, the function of each module, such as "obtains the data for each item on the invoice from said first input module, checks each item on the invoice data obtained, transmits the invoice data requiring approval from said first communication control module to said invoice approval device, receives the approved invoice data transmitted from said invoice approval device via said first communication control module, and outputs from said first output module," and "receives via said second communication control module the invoice data requiring approval transmitted from said invoice input preparation device, inputs the approval data to be approved or disapproved from said second input module, and transmits the invoice data including said approval data from said second communication control module to said invoice input preparation device," is

implemented by software, but would have been easily conceivable by a person skilled in the art from the computer technologies (2)(i)(1), (2)(i)(2), and (2)(ii)(1) to implement a computer system as claimed in claim 1. For this reason, claim 1 does not contain any inventive step.

As to claim 2 and claim 3, showing the information about any incoming data on the screen, and entering a personal ID code via an ID card are well-known computer technologies, as shown in (2)(i)(3) and (2)(i)(4) of the above-mentioned state-of-the-art.

Furthermore, implementing an automatic display means for indicating any incoming invoice requiring approval, or adding an ID card reader for data input are also conceivable by a person skilled in the art according to (2)(i)(3) and (2)(i)(4) of the above-mentioned state-of-the-art.

Besides, although the applicant asserts remarkable effects in the specification, the effects are nothing but natural results (improvement in the efficiency) accompanying the use of a computer that can be easily conceived by a person skilled in the art. Thus, there are no other facts to support the assertion that the invention contains any inventive step.

In summary, as stated above, claims 1, 2 and 3 would be easily accomplished by a skilled artisan in the field, and therefore do not show any inventive step. DIAGRAM 1
[SEE TABLE IN ORIGINAL]
 DIAGRAM 2
[SEE TABLE IN ORIGINAL]
 DIAGRAM 3
[SEE TABLE IN ORIGINAL]

n1 "Step" may also refer to an action or a series of functionally defined actions, such "stepplus-function."

n2 See generally PATENT & TRADEMARK OFFICE, DEPARTMENT OF COMMERCE, Examination Guidelines for Computer-Related Inventions, II. A. (visited Jan. 20, 2000) <http://www.uspto.gov/web/offices/pac/dapp/oppd/pdf/ciig.pdf> reprinted in PATENT & TRADEMARK OFFICE, DEPARTMENT OF COMMERCE, MANUAL OF PATENT EXAMINING PROCEDURE, § 2106 (orig. 7th ed. 1998) [hereinafter U.S. COMPUTER-RELATED GUIDELINES].

n3 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, II.B.(2).

n4 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, at n.9; *Arrhythmia Research Tech., Inc. v. Corazonix Corp., 958 F.2d at 1057, 22 U.S.P.Q.2d (BNA) at 1036* (quoting *Diamond v. Bradley, 450 U.S. 381 (1981)* ("It is of course true that a modern digital computer manipulates data, usually in binary form, by performing mathematical operations, such as addition, subtraction, multiplication, division, or bit shifting, on the data. But this is only how the computer does what it does. Of importance is the significance of the data and their manipulation in the real world, i.e., what the computer is doing.").

n5 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, at n.10:

"Many computer-related inventions do not consist solely of a computer. Thus, Office personnel should identify those claimed elements of the computer software-related invention that are not part of the programmed computer, and determine how those elements relate to the programmed computer. Office personnel should look for specific information that explains the role of the programmed computer in the overall process or machine and how the programmed computer is to be integrated with the other elements of the apparatus or used in the process."

Id.

n6 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, V.A.(2).

n7 See id. V.B. (1).

n8 Since there is no explanation about how to interpret the means-plus-function claim language in Taiwanese law, it would be necessary to provide a regulation for using such claim language to avoid confusion.

n9 Most program codes consist of instruction symbols or variables commonly used or defined in the computer software. This type of code is considered "self-documenting" and is comprehensible for people skilled in the field of computer software. For this reason, the use of self-documenting program code in the claims does not violate the requirements of Article 14 of the Enforcement Rules of the Patent Law.

n10 See JAPAN PATENT OFFICE, IMPLEMENTING GUIDELINES FOR INVENTIONS IN SPECIFIC FIELDS, ch. 1, § 1.2.1 (Feb. 27, 1997) (Chapter 1 is entitled Computer Software Related Inventions), available at <http://www.jpo-miti.go.jp/infoe/sisine.htm>.

n11 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, V.B.(2).

n12 See id. at II.C.

n13 See id. at n.12: "Examples of language that may raise a question as to the limiting effect of the language in a claim:

(a) statements of intended use or field of use;

(b) "adapted to" or "adapted for" clauses;

(c) "wherein" clauses; or

(d) "whereby" clauses.

This list of examples is not intended to be exhaustive."

n14 See Enforcement Rules of the Taiwan Patent Law, art. 14 (1994).

n15 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, at 2100-7:

See, e.g., *In re Paulsen, 30 F.3d 1475, 1480, 31 U.S.P.Q.2d (BNA) 1671, 1674 (Fed. Cir. 1994)* (inventor may define specific terms used to describe invention, but must do so "with reasonable clarity, deliberateness, and precision" and, if done, must "'set out his uncommon definition in some manner within the patent disclosure' so as to give one of ordinary skill in the art notice of the change" in meaning) (quoting *Intellicall, Inc. v.*

Phonometrics, Inc., 952 F.2d 1384, 1387-88, 21 U.S.P.Q.2d (BNA) 1383, 1386 (Fed. Cir. 1992))."

Id.

n16 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, I.(5).

n17 See NATIONAL BUREAU OF STANDARDS, MINISTRY OF ECONOMIC AFFAIRS, GENERAL EXAMINATION GUIDELINES OF PATENT APPLICATION, pt. I, ch. 1, § 2 (Oct. 1994).

n18 See IMPLEMENTING GUIDELINES FOR INVENTIONS IN SPECIFIC FIELDS, supra note 10, ch. 1, § 2.2.1.

n19 See GENERAL EXAMINATION GUIDELINES OF PATENT APPLICATION, supra note 17, ch. 1, § 1.

n20 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, IV.B.1.a.(1), IV.B.1.a.(2).

n21 See infra Part IV.D.

n22 See GENERAL EXAMINATION GUIDELINES OF PATENT APPLICATION, supra note 17, ch. 1, § 1.

n23 See id.

n24 See infra Part IV.C.

n25 Basically, natural objects and phenomena per se are non-statutory subject matter. However, the method or apparatus that uses the natural objects or phenomena are not explicitly non-statutory subject matter.

n26 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, IV.B.2.a.(iii).

n27 See GENERAL EXAMINATION GUIDELINES OF PATENT APPLICATION, supra note 17, ch. 1, § 1.

n28 This example is similar to the invention of a perpetual motion machine.

n29 See GENERAL EXAMINATION GUIDELINES OF PATENT APPLICATION, supra note 17, ch. 1, § 1.

n30 See IMPLEMENTING GUIDELINES FOR INVENTIONS IN SPECIFIC FIELDS, supra note 10, ch. 1, § 3.

n31 *Gottschalk v. Bensen, 409 U.S. 63, 72, 175 U.S.P.Q. (BNA) 673, 682 (1972).*

n32 See GENERAL EXAMINATION GUIDELINES OF PATENT APPLICATION, supra note 17, ch. 1, § 1.

n33 See supra Example 2, a game apparatus, at 360.

n34 See GENERAL EXAMINATION GUIDELINES OF PATENT APPLICATION, supra note 17, ch. 1, § 1.

n35 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, IV.B.2.

n36 See id. at IV.B.2.b.(i).

n37 See id.

n38 See id. at IV.B.2.b.(ii).

n39 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, at n.45:

In *Sarkar, 588 F.2d at 1335, 200 U.S.P.Q. (BNA) at 139,* the court explained why this approach must be followed:

No mathematical equation can be used, as a practical matter, without establishing and substituting values for the variables expressed therein. Substitution of values dictated by the formula has thus been viewed as a form of mathematical step. If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to patenting as a "process" under § 101. Consideration of whe ther the substitution of specific values is enough to convert the disembodied ideas present in the formula into an embodiment of those ideas, or into an application of the formula, is foreclosed by the current state of the law.

Id.

n40 See supra Part IV.C.3.

n41 See U.S. COMPUTER-RELATED GUIDELINES, supra note 2, IV.B.2.c.

n42 See id. at IV.B.2.d.(i).

n43 See id. at IV.B.2.d.(ii).

n44 See id. at IV.B.2.d.(iii).

n45 See id. at IV.B.1.

n46 See IMPLEMENTING GUIDELINES FOR INVENTIONS IN SPECIFIC FIELDS, supra note 10, ch. 1, § 2.3.

n47 See id.

n48 See id.

n49 See id.

n50 See id.

n51 See id.

n52 See IMPLEMENTING GUIDELINES FOR INVENTIONS IN SPECIFICFIELDS, supra note 10, ch. 1, § 3.