

ARTICLE OF MANUFACTURE  
CLAIMS FOR COMPUTER  
RELATED INVENTIONS

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## Table of Contents

<b>I. INTRODUCTION.....</b>	<b>5</b>
<b>II. DEFINING THE ARTICLE OF MANUFACTURE CLAIM FOR A SOFTWARE INVENTION.....</b>	<b>6</b>
<b>III. THE ADVANTAGES OF AN ARTICLE OF MANUFACTURE CLAIM FOR A SOFTWARE INVENTION.....</b>	<b>8</b>
A. Other Types of Claims.....	8
B. Drawbacks of the Process Claim and Apparatus Claim .....	9
C. Article of Manufacture Claims Overcome the Limitations of Apparatus and Process Claims.....	11
<b>IV. THE HISTORY OF ARTICLE OF MANUFACTURE CLAIMS FOR SOFTWARE INVENTIONS.....</b>	<b>11</b>
<b>V. THE REQUIREMENTS OF AN ARTICLE OF MANUFACTURE CLAIM FOR A SOFTWARE INVENTION.....</b>	<b>17</b>
A. Satisfying the Requirements of 35 U.S.C. § 101 .....	17
B. Satisfying the Requirements of 35 U.S.C. § 112 .....	19
C. Satisfying the Requirements of 35 U.S.C. §§ 102 and 103 .....	21
<b>VI. DRAFTING AN ARTICLE OF MANUFACTURE CLAIM FOR A SOFTWARE INVENTION.....</b>	<b>23</b>
A. Goals of Writing the Article of Manufacture Claim.....	23
1. Cover the Invention—Understand the Goal of the Invention.....	23
2. Claims Should be as Broad as Possible .....	23
3. Cover Competition .....	24
4. Avoid the Prior Art.....	25

5. No Unnecessary Limitations ..... 25

6. Use the Inventor’s Words..... 26

B. Writing the Claim ..... 26

C. Revising the Claim ..... 28

D. Draft Method and/or Apparatus Claims ..... 28

E. Copying the Method Claim Format ..... 30

**VII. EXAMPLES..... 32**

## **ARTICLE OF MANUFACTURE CLAIMS FOR COMPUTER RELATED INVENTIONS**

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### **I. INTRODUCTION**

The software industry is growing and becoming more important to the global economy. As a result, the number of software patent applications has increased dramatically. To maximize the value of software patents, it is important that the claims of such patents properly protect the invention. Typically, software patents include apparatus claims, method claims, and/or article of manufacture claims. Because of the nature of the software industry, for some inventions the article of manufacture claims may be the most important class of claims. Yet, many software patents do not include article of manufacture claims or include an incomplete set of article of manufacture claims as an afterthought.

This paper advocates a greater use of article of manufacture claims for software inventions. After identifying the structure of an article of manufacture claim, this paper explains the advantages of article of manufacture claims for software inventions and discusses the history of such claims. The remaining portions of this paper explain

the requirements for article of manufacture claims and provide guidance for drafting such claims.

## **II. DEFINING THE ARTICLE OF MANUFACTURE CLAIM FOR A SOFTWARE INVENTION**

The United States Constitution provides Congress with the power “to promote the progress of science and useful arts, by securing for limiting times to authors and inventors the exclusive right to their respective writings and discoveries.”<sup>1</sup> This constitutional provision does not require Congress to create such incentives, it merely empowers Congress to do so. Pursuant to that power, Congress has enacted 35 U.S.C. § 101 which states:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Thus, Congress has created four categories of inventions that can be patented: (1) processes, (2) machines, (3) manufactures, and (4) compositions of matter. The focus of this paper is on the third category, manufactures. The

Supreme Court has defined a manufacture, more commonly called an article of manufacture, as "the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand labor or by machinery."<sup>2</sup>

For software inventions, the article of manufacture claim includes a computer (or other machine) readable medium storing a software program designed to perform one or more tasks. Below, is an example of an article of manufacture claim for a software invention:

One or more processor readable storage devices having processor readable code embodied on said processor readable storage devices, said processor readable code for programming one or more processors to perform a method for determining a speed of a bat during a swing, the method comprising the steps of:

accessing radar data based on a set of one or more radars units; and

determining said speed of said bat during said swing based on said radar data.

The above clause "One or more processor readable ... comprising the steps of" includes the preamble that identifies the claim as being an article of manufacture claim. The body of the claim includes the steps performed by the software.

As will be demonstrated in Section VII below, there are many formats for article of manufacture claims reciting software inventions.

### **III. THE ADVANTAGES OF AN ARTICLE OF MANUFACTURE CLAIM FOR A SOFTWARE INVENTION**

#### **A. OTHER TYPES OF CLAIMS**

Typically, software patents include process claims, apparatus claims, and/or article of manufacture claims. Process claims typically recite a set of steps performed by the software. In some cases, a subset of the steps are performed by hardware or a human. Apparatus claims for software inventions can be written with structural elements or means-plus-function language. Apparatus claims with structural elements may describe an entire system, with one or more components being software. Alternatively, an apparatus claim with structural elements may describe a computer that is programmed to operate in a certain manner or a computer that includes a memory or storage element storing software for programming the computer to operate in a particular manner. A means-plus-function claim<sup>3</sup> will recite a set of functions, most likely corresponding to a programmed



computer or other machine, in a format according to 35 U.S.C. §112, ¶6.

## **B. DRAWBACKS OF THE PROCESS CLAIM AND APPARATUS CLAIM**

Apparatus claims and the process claims have limitations that prevent full exploitation of a patent for the computer software industry.

The process claim has several drawbacks. First, a process claim is only infringed by the operation of the claimed process. For software, that means only the end-user who actually uses the software is likely to be a direct infringer. In many cases, the end-user may be a customer of the patent holder. Patent holders are unlikely to want to sue customers or potential customers. Additionally, because of wide distribution of software, it may be very difficult to identify who the end-users are. Finally, multiple demands and multiple lawsuits can be very expensive and not very efficient.

One option for enforcing a process claim against a distributor or maker of the software is to allege contributory infringement. Contributory infringement is problematic and less efficient than asserting direct infringement. First, contributory infringement requires knowledge by the person being accused.<sup>4</sup> Second, additional evidence must be

submitted to prove the additional knowledge element. Finally, the patent holder must still prove direct infringement and that may include the arduous task of finding who the direct infringers are and proving that they directly infringed the claim.

Apparatus claims typically suffer from the same problems described above with respect to process claims. For example, an apparatus claim may recite a computer which includes software. Only vendors who sell software preloaded on a computer directly infringe such a claim and preloading the software is not the usual manner for distributing software. Typically, it is end-users who load the software on the computer and would be the direct infringers of an apparatus claim. An additional limitation or problem of the apparatus claim is that in a hardware system which may cost thousands of dollars, it may be difficult to ascertain damages with respect to a reasonable royalty for including the infringing software.<sup>5</sup> Additionally, protecting software inventions with hardware claims requires an unnecessary use of additional limitations that are not important for the software. For example, limitations about the hardware are included in the claims. This may provide some infringers with a safe harbor from infringement, even though the software implements the invention.

### **C. ARTICLE OF MANUFACTURE CLAIMS OVERCOME THE LIMITATIONS OF APPARATUS AND PROCESS CLAIMS**

In many cases, the article of manufacture claim is the preferred alternative for protecting software inventions. Typically, providers of software will distribute the software separately from a computer system. This distribution can be via floppy disk, CD-ROM, DVD, over the Internet, etc. In these cases, the only infringement of an apparatus claim or process claim is by the end-users. The article of manufacture claim, however, permits direct attack against a competitor's media based manufacturing and distribution activity. That is, the article of manufacture claim covers the CD-ROM sold at the computer store, a server on the Internet, etc.

More importantly, the article of manufacture claim is in a minimal claim format. That is, typically there are minimal (or no) limitations regarding hardware. In most cases, the patent holder will be able to successfully argue that software on a disk or memory device incorporated in the computer or separately distributed infringes the article of manufacture claim.

## **IV. THE HISTORY OF ARTICLE OF MANUFACTURE CLAIMS FOR SOFTWARE INVENTIONS**

To understand the meets and bounds of the article of manufacture claim, it is important to understand the history that led to the adoption of article of manufacture claims for software inventions. This history includes three cases heard and/or decided by the United States Court of Appeals for the Federal Circuit (“CAFC”): *In re Warmerdam*,<sup>6</sup> *In re Lowry*<sup>7</sup> and *In re Beauregard*.<sup>8</sup>

The patent application at issue in *Warmerdam* pertained to an improvement of prior art bubble systems that are used to control the motion of objects in robotic machines in order to avoid collision with other objects.<sup>9</sup> The positions of objects are determined by measuring the locations of artificial circular boundaries.<sup>10</sup> If a potential collision is detected, the claimed invention further refines the determination of the boundary position by replacing the spherical bubble zone with a set of a smaller, more refined bubble zones.<sup>11</sup> Claim six of the patent application was directed to a data structure:

6. A data structure generated by the method of any of claims 1 through 4.

Note that claims 1 through 4 were process claims that included the steps of locating the medial axis and creating a hierarchy of bubbles on the medial axis.

The Examiner rejected claim 6 for lack of statutory subject matter under 35 U.S.C. § 101. On appeal, the Board of Patent Appeals and Interferences (“USPTO Board”) determined that the claim failed to satisfy §101 because a “data structure” is not within one of the categories of patentable subject matter listed in §101.<sup>12</sup> On appeal, the CAFC held that claims 1-4 (the method claims) involved no more than the manipulation of abstract ideas and, therefore, were not directed to statutory subject matter.<sup>13</sup> In regard to claim 6, the court held that since the data structure of claim 6 “is nothing more than another way of describing the manipulation of ideas contained in claims 1-4, it suffers from the same fatal defect they do.”<sup>14</sup> Furthermore, the court also states that “contrary to Warmerdam’s assertion, the phrase does not imply a physical arrangement of the contents of a memory.”<sup>15</sup>

The second case, *In re Lowry*, also involved a data structure. The invention was based on an “attributive data object” (ADO) model which permits information about data to be extracted and described in terms of both its characteristics and its relationships with other data.<sup>16</sup> Claim 1 of the Lowry patent application recited a memory that contained a stored data structure:

1. A memory for storing data for access by an application program being executed on a data processing system, comprising:
  - a data structure stored in said memory, said data structure including information resident in a database used by said application program and including:
    - a plurality of attribute data objects stored in said memory ...;
    - a single holder attribute data object ...;
    - a reference attribute data object ...; and
    - an apex data object ...

The Examiner initially rejected Claim 1 under Section 101 as being non-statutory subject matter. On appeal, the USPTO Board reversed the rejection under §101 and found that Claim 1, directed to a memory, recited an article of manufacture and, therefore, was directed to statutory subject matter.<sup>17</sup> However, when evaluating patentability under §§102 and 103, the USPTO Board failed to give patentable weight to the claimed data structure. The USPTO Board analogized the data structure to printed matter. The CAFC reversed the printed matter rejection.<sup>18</sup> The importance of the *Lowry* case is that the USPTO Board agreed that the claim reciting a memory element was an article of manufacture and was statutory subject matter.

Although *Lowry* does not specifically involve a software program claimed on a computer readable media as an article of manufacture, several key points are relevant to

the article of manufacture claim. First, the CAFC panel did not object to the USPTO Board's characterization of the claim as an article of manufacture. Certainly the panel was aware of the effect under §101 of the USPTO Board's classification. Even though the issue was arguable not technically before the court, if the panel had been concerned about the issue it had ample opportunity to so indicate. Quite to the contrary, the panel's analysis, resting on the physical changes in the medium caused by the data structure, is entirely consistent with the classification of the claim as an article of manufacture.

Knowing that the *Lowry* data structure received different treatment than the ill-fated data structure claims in *Warmerdam*, the *Lowry* panel expressly indicated its willingness to find that data structures in memory are physical entities based on the electronic or magnetic arrangement in the computer memory, even though this physical structure is invisible to the eye. This makes it appear that the difficulty with *Warmerdam*'s data structure claim may have been *Warmerdam*'s failure to put it on an electronic storage medium.<sup>19</sup> Thus, under logic of *Lowry*, *Warmerdam*'s data structure claim could potentially have been transformed from the mere manipulation of abstract ideas into an article of manufacture claim by inclusion of a physical or electronic structure of the memory.<sup>20</sup>

The third case, *In re Beauregard*, presented the software invention as an article of manufacture claim directly by reciting an article “composed of a computer usable medium in which a program code is embodied...”<sup>21</sup> The case posed the question that if under *Lowry* a data structure on a computer readable media is patentable subject matter as an article of manufacture, why not a software program on computer readable media? The USPTO Board rejected the claims using a variant of the printed matter rejection also used in *Lowry*. The CAFC never heard the case. Faced with a decision in *Lowry*, the USPTO conceded that “computer programs embodied in a tangible medium, such as floppy diskettes, are patentable subject matter under 35 U.S.C. §101 and must be examined under 35 U.S.C. §§102 and 103.”<sup>22</sup> The CAFC, therefore, noted that the parties are in agreement and that no case or controversy existed.<sup>23</sup> Therefore, the CAFC vacated the USPTO Board’s decision and remanded for further proceedings in accordance with the Commissioners’ concessions.

Following the *Beauregard* case, the USPTO released a set of examination guidelines pertaining to software inventions.<sup>24</sup> These guidelines explained how to examine software patent applications. The guidelines were eventually incorporated into Section 2106 of the Manual of Patent Examining Procedure (“MPEP”). In the guidelines, the



USPTO affirmed its position that computer software on a computer readable medium constitutes an article of manufacture that is statutory subject matter:

a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory.<sup>25</sup>

## **V. THE REQUIREMENTS OF AN ARTICLE OF MANUFACTURE CLAIM FOR A SOFTWARE INVENTION**

To successfully draft an article of manufacture claim, it is beneficial to understand the requirements of such a claim imposed by the patent statutes and implemented by the USPTO. The discussion below describes the requirements of Sections 101, 102, 103 and 112 of the patent laws, as they relate to article of manufacture claims for software inventions.

### **A. SATISFYING THE REQUIREMENTS OF 35 U.S.C. § 101**

As quoted above, the USPTO has stated that a claimed computer readable medium encoded with a computer program is an article of manufacture that is statutory subject matter. However, to prevent applicants from attempting to patent otherwise non-statutory subject matter by using the form of a computer-readable medium, the USPTO has created a classification scheme based on the definition of "descriptive material:"

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component ... "Nonfunctional descriptive material" includes, but is not limited to music, literary works and a compilation or mere arrangement of data.

Both types of "descriptive material" are non-statutory when claimed as descriptive material per se. [citation omitted] When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. [citations omitted] When nonfunctional descriptive material is recorded on some computer-readable medium, it is not statutory since no requisite functionality is

present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material stored in a computer-readable medium does not make it statutory. Such a result would exalt form over substance. [citations omitted] Thus, non-statutory music is not a computer component and it does not become statutory by merely recording it on a compact disk.<sup>26</sup>

Thus, to be statutory subject matter, a claimed computer readable medium must include “functional descriptive material” such as a computer program or a data structure.

## **B. SATISFYING THE REQUIREMENTS OF 35 U.S.C. § 112**

The first paragraph of Section 112 requires that the disclosure in the patent application include an adequate written description to identify what the applicant has invented, to enable one skilled in the art to make and use the invention as claimed without undue experimentation and that discloses the best mode of carrying out the claimed invention. Typically, evidence that a patent application is deficient in these three areas is not before the patent office. Therefore, it is rare that rejections are made. As a practical note, many computer-related patent applications will include

one or more block diagrams of the various components of the software and/or hardware and a set of one or more flowcharts which describe the operation of the software. The flowcharts, in combination with the block diagrams, should be detailed enough so that an ordinary programmer in the relevant field can practice the invention.

The second paragraph in Section 112 requires that the claims particularly point out and distinctly claim the invention. This requirement is applied to article of manufacture claims in the same manner that it is applied to other types of claims. Thus, it is important that the applicant uses language specific enough so that the reader of the claim understands what the claim covers. Means-plus-function language is allowed to be used in article of manufacture claims.<sup>27</sup> Note that if means-plus-function language is used in an article of manufacture claim without corresponding disclosure of specific structures or materials that are not well known, the claim may fail to particularly point the claimed the invention.<sup>28</sup>

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, the application has not disclosed any 'structure' which corresponds to the claimed means. Office personnel should

reject such claims under 35 U.S.C. 112, 2<sup>nd</sup> paragraph.<sup>29</sup>

### **C. SATISFYING THE REQUIREMENTS OF 35 U.S.C. §§ 102 AND 103**

Assessment of a claimed software invention for compliance with Sections 102 and 103 begins with a comparison of the claimed subject matter to what is known in the prior art. If no differences are found between the claimed invention and the prior art, the claimed invention lacks novelty and is to be rejected under Section 102. Once distinctions are identified between the claimed invention and the prior art, those distinctions must be assessed and resolved in light of the knowledge possessed by a person of ordinary skill in the art. Against this backdrop, one must determine whether the invention would have been obvious at the time of invention was made. If not, the claimed invention satisfies Section 103.

In regard to a Section 103 analyses, the USPTO has provided the following two guidelines:

- Merely using a computer to automate a known process does not by itself impart non-obviousness to the invention.<sup>30</sup>
- If the differences between the prior art and the claimed invention is limited to

descriptive material stored on or employed by a machine, office personnel must determine whether the descriptive material is functional descriptive material or non-functional descriptive material, as described supra. Functional descriptive material is a limitation in the claim and must be considered and addressed in accessing patentability under 35 U.S.C. 103. Thus, a rejection of the claim as whole under 35 U.S.C. 103 is inappropriate unless the functional descriptive material would have been suggested by the prior art. Nonfunctional descriptive material cannot render non-obvious an invention that would have otherwise been obvious.<sup>31</sup>

## **VI. DRAFTING AN ARTICLE OF MANUFACTURE CLAIM FOR A SOFTWARE INVENTION**

### **A. GOALS OF WRITING THE ARTICLE OF MANUFACTURE CLAIM**

#### **1. Cover the Invention—Understand the Goal of the Invention**

Prior to drafting any claims it is important that the claim drafter understand the invention. The invention should be described in the drawings and in the written specification. The drafter should have a complete and full understanding of the invention. In addition to understanding the technology of the invention, the claim drafter should understand the goal of the invention. That is, why did the inventor invent such an invention and what problems are being solved?

#### **2. Claims Should be as Broad as Possible**

The scope of the claim should be as broad as possible. The claim should cover the inventor's concept as broadly as possible so that all variations of that concept are covered. The claims should also protect the specific disclosed

embodiments. Some claims should be sufficiently detailed so that even if the broad claims covering the inventor's concept are held invalid, anyone who copies any of the inventor's disclosed preferred embodiments would infringe a valid detailed claim. Broad coverage means not only that every particular preferred disclosed embodiment is protected in the claims, but that the claims cover all expected and unanticipated equivalents that competitors and others may later develop, and any intentional and unintentional copies of the claimed invention which embody the inventor's concept.

After a patent has issued, the inventor/client will typically compare a competitor's products with the disclosed embodiments. If the client sees similar structure and/or operation, that client will want to be able to use the patent to halt such infringement. Therefore, it is beneficial for long term client satisfaction to have written claims which cover what the attorney and the client thought of at the time of application and competitive products which neither the inventor nor the attorney thought of at that time.

### **3. Cover Competition**

As discussed in the previous paragraph, it is important that the claims are broad enough to cover competing products that will be developed in the future. At a



minimum, the claims should cover a product that is a copy of the disclosed embodiments of the patent. Additionally, the claims should cover a product that is similar and embodies the same concept. A top practitioner will understand the competition of the inventor and how the competition's technology can be modified to employ the concept of the invention. Claims should cover such modification of competitor's technology.

#### **4. Avoid the Prior Art**

The claim should be as broad as the prior art permits. If a search has been performed, the claim drafter should understand the metes and bounds of the references found in the search. If no search was performed, the claim drafter should inquire with the inventors as to any prior art known to them.

#### **5. No Unnecessary Limitations**

Coupled with the avoidance of the prior art is the avoidance of unnecessary limitations in the claims. The claims should only include limitations that are dictated by the prior art and required for proper form under the rules and practices of claim drafting. This particular claim drafting

goal (no extra limitations) is one of the bases for using article manufacture claims in addition to apparatus claims. That is, why include limitations about the hardware when the invention is really about software?

## **6. Use the Inventor's Words**

Typically, a patent application is drafted after a meeting with the inventor or after review of written materials from an inventor. During that meeting and/or in the documents, the inventor may use certain terms to describe the invention. It is recommended in appropriate cases that the claim drafter use the terms provided by the inventor. First, using the words of the client is likely to increase the chances that the client will be satisfied with the work product. Second, the law allows the patent applicant to be its own lexicographer. To the extent that new words are being introduced in the patent application, they should be the words defined by the inventor.

## **B. WRITING THE CLAIM**

When writing the article of manufacture claim for a software invention, the drafter must first set out the preamble, followed by the body of the claim. Typically, the

preamble will recite that the claim is directed to an article of manufacture. That is, the preamble will recite a computer readable storage device having code on that storage device for programming a computer. Additionally, the claim need not be limited to “computers.” Other programmable machines can also be included. Some practitioners use “processor” rather than computer.

When writing the claim, the drafter should observe a preferred embodiment of the invention. For example, keep a copy of a flow chart or block diagram in view during the claim drafting process. Throughout the claim drafting process, keep referring to the drawing. The claim should not be naming elements that are not disclosed. Additionally, the elements should be claimed accurately. The claim drafter is usually the specification writer and, thus, is in charge of amending the drawings. While writing the claims, the drafter may recognize that certain elements essential for inclusion in the claim are not in the drawings and, thus, the drawings can be edited accordingly. Hence, the claim-writing stage is also important to enable the claim drafter to assure that every element in a claim can be found in the drawings, as required by Rule 83(A).

It is important to recite sufficient functionality of the software so that the reader of the claim understands what is

being claimed and how the prior art is distinguished. The language used should keep in mind all the goals stated above.

### **C. REVISING THE CLAIM**

Because everyone makes mistakes, it is recommended to review the claim after it is written. Optimally, the claim should be reviewed on the following day or a few days later so that it is not completely fresh in the drafter's mind. Review each claim, limitation by limitation. Keep in mind the inventor's objective and the inventor's way of achieving that objective. Remove, especially from the broader claims, any limitations that are not essential for achieving that objective. Consider whether any set of cooperating elements or steps can be combined together into a more generically claimed element or step. Be sure that all necessary function limitations still remain so that the claim is understandable (§112) and avoids the prior art (§§102 and 103).

### **D. DRAFT METHOD AND/OR APPARATUS CLAIMS**

Although this article advocates the use of article of manufacture claims for software inventions, this article does not suggest the abandonment of apparatus or method claims.

The use for article of manufacture claims for software inventions is relatively new and untested. Furthermore, adoption of article of manufacture claims has not been completely accepted in all foreign countries. Therefore, it is necessary to have the invention fully claimed in at least another category of claims. Usually, process claims most effectively cover a software invention. Thus, it is recommend to protect the invention with process claims. In some instances, apparatus claims will also appropriately protect the invention. The author suggest including at least one apparatus claim to survive future challenges under Section 101 and to possibly increase royalty revenues. For example, a patentee may receive royalties based on a percentage of sales. That sales price may be higher for an apparatus than for an article of manufacture or process. Many practitioners will include process, apparatus and article of manufacture claims that properly protect the invention.

There are cases, however, when it is best to not include an apparatus claim or not include a process claim. The author also admits that there are situations when article of manufacture claims should not be utilized. Each situation must be evaluated based on its unique set of facts.

### **E. COPYING THE METHOD CLAIM FORMAT**

One efficient method for drafting article of manufacture claims is to first draft method claims. After the method claims are completed, they can be copied (e.g. cut and pasted with a word processor) and the copied claims can be edited to become article of manufacture claims. That is, the preamble “a method for . . .” can be replaced with “a processor readable storage medium containing processor readable code for programming a processor to perform a method comprising the steps of . . .” The steps of the method claim can be included in the body of the article of manufacture claim. This is a very efficient manner for including article of manufacture claims.

The following two claims are from U.S. Patent 6,292,130, “System For Determining the Speed and/or Timing Of An Object.

44. A method of determining a speed of a bat during a swing, comprising the steps of:  
accessing radar data based on a set of one or more radars units; and  
determining said speed of said bat during said swing based on said radar data.

59. One or more processor readable storage devices having processor readable code embodied on said processor readable storage devices, said processor readable code for programming one or more processors to perform a method of determining a speed of a bat during a swing, the method comprising the steps of:

accessing radar data based on a set of one or more radars units; and

determining said speed of said bat during said swing based on said radar data.

Claim 44 is a method claim that recites a set of steps used to determine the speed of a bat while the bat is swung, for example, while a baseball player is trying to hit a pitch. Claim 59 is an article of manufacture claim that recites the same set of steps.

While the above suggestion to copy the steps of a method claim into an article of manufacture claim is one suitable practice, other practices can also be used. Each situation must be evaluated based on its unique set of facts.

## VII. EXAMPLES

Below are examples of article of manufacture claims for computer related inventions. Each example is from an issued United States Patent.<sup>32</sup>

A. U.S. Patent 6,341,303, “System and Method For Scheduling A Resource According to a Preconfigured Plan.”

The following claim includes a preamble that recites a computer readable storage medium storing instructions that, when executed by a computer, cause the computer to perform a method. The body of the claim recites the steps of the method. The USPTO has stated in the MPEP that “When a computer program is recited in conjunction with a physical structure, such as a computer memory, office personnel should treat the claim as a product claim.”<sup>33</sup>

27. A computer readable storage medium storing instructions that, when executed by a computer, cause the computer to perform a method of scheduling a resource in a computer system, the method comprising:

- identifying a plurality of requested classes, each requester class including one or more requesters for the resource;
- activating a first preconfigured plan for allocating the resource among the plurality of requester classes;



associating a weight with each of the plurality of requester classes in the first preconfigured plan, the weight specifying a portion of the resource to be allocated to the requester class; and

scheduling the resource among the plurality of requester classes based on the weights in accordance with a first scheduling policy.

B. U.S. Patent 6,233,573, “System and Method For Selecting Rows From Dimensional Databases Having Temporal Dimension.”

The following claim is somewhat similar to the preceding claim format of reciting a method performed by the software; however, there is no explicit mention of a method.

5. A computer-readable medium whose contents cause a computer system to resolve temporal queries in a dimensional database by:

receiving a temporal query specifying a condition of the time-variable attribute and effective time;

accessing the dimensional database, the dimensional database comprising a time dimension table, a second dimension table, and a fact table, the time dimension table having rows that each represent a time and are each uniquely identified by a time key, the second dimension table having rows that each represent one state of a time-variable attribute

of a particular item, each row of the second dimension table containing an item identifier for the item, a time-variable attribute value, and a time key identifying a row of the time dimension table representing a time at which the time-variable attribute value is effective for the item, the fact table having rows that each contain an item identifier identifying an item to which the row relates;

using the time dimension table to identify rows of the second dimension table satisfying the condition;

generating an intermediate table comprising rows, each of said rows comprising an item identifier from an identified row of the second dimension table; and joining the intermediate table and the fact table.

C. U.S. Patent 5,535,329, "Method and Apparatus For Modifying Relocatable Object Code File and Monitoring Programs."

Instead of listing the steps of a method, the body of the following claim recites two sets of computer code and a medium that stores the code.

7. A computer program product for generating machine instructions including memory access monitoring instructions, comprising:

computer code that receives as input a first set of machine instructions, said first set of machine instructions being specific to a computer processor with each machine instruction of said first set corresponding to an

instruction executable by said computer processor, said first set of machine instructions including memory access instructions that access a region of memory;

computer code that generates a second set of machine instructions from said first set of machine instructions and having additional machine instructions that are memory monitoring instructions, said memory monitoring instructions checking memory status information for said region of memory accessed by said memory access instructions, said memory status information including an allocated state and an unallocated state; and

a computer readable medium that stores the computer codes.

D. U.S. Patent 4,864,492, "System and Method For Network Configuration."

The body of the following claim recites the function of the computer program as means-plus-function elements. This claim will be interpreted in light of 35 U.S.C. §112, ¶6. Thus, the costs and benefits that are associated with 35 U.S.C. §112, ¶6, are likely to apply to this claim.

10. A computer program product having a computer readable medium having computer program logic recorded thereon for establishing a network configuration in accordance with a plurality of protocols of a network architecture, said computer program product comprising:

means for incorporating the protocols of the network architecture into a table of rules;

means for determining the validity of user input data with said table of rules; and

means for feeding back to the user at least one of said rules in said table of rules if said user input is determined to be valid.

E. U.S. Patent 6,275,942, "System, Method and Computer Program Product For Automatic Response to Computer System Misuse Using Active Response Modules."

This claim is similar to the format of the preceding claim. However, rather than using the generic means-plus-function language, the claim uses "computer readable program code means."

13. A computer program product comprising a computer usable medium having computer readable program code means embodied in said medium for causing an application program to execute on a computer that provides a system for use with an intrusion detection system that allows automatic responses to an instance of computer misuse, said computer readable program code means comprising:

a first computer readable program code means for causing the computer to provide a user with a list of a plurality of ARMs;

a second third computer readable program code means for causing the computer

to allow said user to configure each of said plurality of ARMs; and

a third computer readable program code means for causing the computer to allow said user to link at least one of said plurality of ARMs to a computer misuse.

F. U.S. Patent 6,349,322, “Fast Synchronization For Programs Written in the Java Programming Language.”

In the previous claims, the preamble recited the article of manufacture as a medium having code for programming a processor or computer. The preamble of the following claim only recites the article of manufacture. The recitation of the medium and the code is in the body of the claim. The elements of the body include “computer program devices.”

18. A computer program product comprising:

a computer usable medium having computer readable code embodied therein for synchronized thread execution in a multithread processor, wherein each synchronized thread refers to at least one object identified by an object identification (OID) that is shared among a plurality of synchronized threads, the computer program product comprising:

computer program devices operating in the computer system and configured to cause a computer to select one of the synchronized threads for execution;

computer program devices operating in the computer system and configured to cause a computer to indicate that the shared object should be locked by pushing its OID onto a lock stack upon entering the selected thread, the lock stack being accessible by all of the plurality of synchronized threads;

computer program devices operating in the computer system and configured to cause a computer to execute the operations defined by a selected thread; and

computer program devices operating in the computer system and configured to cause a computer to remove the indication by pushing the OID from the lock stack.

G. U.S. Patent 5,903,881, "Personal Online Banking With Integrated Online Statement and Checkbook User Interface."

The software stored in the memory produces a user interface. The body of the claim describes that user interface.

1. A computer readable memory storing a computer program executable by a processor, for producing a user interface of an online banking system, the user interface comprising:
  - a first display area for listing a plurality of transaction instructions in a user selected account to be sent to a financial institution for processing, each transaction

instruction including a description, and an amount;

second display area, visually distinguished from and concurrently displayed with the first display area, for listing a plurality of uncleared transactions in the user selected account that have been sent to a financial institution as transaction instructions for processing each uncleared transaction including a description and an amount;

an executable process that sends a transaction instruction in the first display area to a financial institution for processing, and removes the transaction instruction from the first display area and displays it in the second display area as an uncleared transaction;

third display area, visually distinguished from and concurrently displayed with the first and second display areas, for listing a plurality of cleared transactions for the user selected account, each cleared transaction including a description and an amount, each uncleared transaction in the second display area being removed therefrom and listed in the third display area as a cleared transaction at a time subsequent to the transaction being cleared by a financial institution; and

a first account balance for the cleared transaction in the user selected account, and a second account balance for both cleared and uncleared transactions in the user selected account, the first and second account balances updated in response to the transactions present in the second and third display areas, and concurrently displayed with the first, second, and third display areas.

H. U.S. Patent 6,233,573, "System and Method For Selecting Rows From Dimensional Databases Having Temporal Dimension."

This claim recites a data structure (as opposed to a computer program) stored in a memory.

1. One or more computer memories collectively containing a dimensional database data structure for resolving temporal queries, comprising:

a time dimension table whose rows each represent a time and are each uniquely identified by a time key;

a second dimension table whose rows each represent one state of a time-variable attribute of a particular item, each row containing an item identifier for the item, a time-variable attribute value, and a time key identifying a row of the time dimension table representing a time at which the time-variable attribute value is effective for the item; and

a fact table whose rows each contain an item identifier identifying an item to which the row relates, such that a temporal query specifying a condition of the time-variable attribute and effective time may be resolved by using the time dimension table to identify rows of the second dimension table satisfying the condition, generating an intermediate table whose rows each contain an item identifier from an identified row of the second dimension table, and joining the intermediate table and the fact table.



I. U.S. Patent 6,360,364, “System and Method For Installing an Application on a Portable Computer.”

This is a product-by-process claim. The independent claim, claim 1, is a method claim.

11. One or more computer-reliable memories containing a computer program that is executable by a processor to perform the method recited in claim 1.

## VIII. CONCLUSION

Article of manufacture claims can offer advantages over apparatus and process claims, including providing an easier mechanism for enforcement of the patent. With the above described knowledge, patent practitioners can efficiently draft appropriate article of manufacture claims to more effectively protect software inventions.

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<sup>1</sup> U.S. Const. art. I, §8, cl. 8.

<sup>2</sup> *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980).

<sup>3</sup> See 35 U.S.C. §112, ¶6.

<sup>4</sup> See 35 U.S.C. §271(c).

<sup>5</sup> Damages for patent infringement shall be “adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer . . .” 35 U.S.C. §284.

<sup>6</sup> *In re Warmerdam*, 33 F. 3d. 1354 (Fed. Cir. 1994).

<sup>7</sup> *In re Lowry*, 33 F. 3d. 1579 (Fed. Cir. 1994).

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<sup>8</sup> *In re Beauregard*, 53 F. 3d. 1583 (Fed. Cir. 1995).

<sup>9</sup> *In re Warmerdam*, 33 F.3d. at 1356-7.

<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*, at 1358.

<sup>13</sup> *Id.*, at 1360.

<sup>14</sup> *Id.*, at 1362.

<sup>15</sup> *Id.*

<sup>16</sup> *In re Lowry*, 32 F.3d at 1580-1581.

<sup>17</sup> *Id.*, at 1582.

<sup>18</sup> *Id.*, at 1584-5.

<sup>19</sup> Patentability of Computer Software Instruction as an Article of Manufacture: Software As Such the Right Stuff, Vincent Chiapetta, 17 J. Marshall J. Computer & Info I. 89 (1998) (hereinafter “Chiapetta”).

<sup>20</sup> *Id.*

<sup>21</sup> PTO Board of Patent Appeals and Interferences, Appeal No. 93-0378, heard June 17th, 1993, at 1-2 (cited in Chiapetta).

<sup>22</sup> *In re Beauregard*, 53 F.3d at 1584.

<sup>23</sup> *Id.*

<sup>24</sup> Examination Guidelines for Computer-Related Inventions, 61Fed. Reg. 7,478 (1996).

<sup>25</sup> MPEP § 2106, p. 2100-13 (August 2001).

<sup>26</sup> MPEP §2106, p. 2100-11,12.

<sup>27</sup> *Id.*, at p. 2100-19.

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

<sup>30</sup> *Id.*, at p. 2100-21.

<sup>31</sup> *Id.*

<sup>32</sup> The examples are provided to expose the reader to different formats used for drafting article of manufacture claims for computer related inventions. The author makes no guarantees that any of the example claims are valid, enforceable or capable of withstanding litigation. Furthermore, the author makes no recommendations regarding the benefits or drawbacks of any of the formats or styles appearing in any of the example claims.

<sup>33</sup> MPEP §2106, at p. 2100-13.