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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Nieboer et al. U.S. Patent No. 6,418,419 Issued July 9, 2002 Based on U.S. App. No: 09/359,686 Filed: July 23, 1999 For Automated System for Conditional Order Transactions in Securities or Other Items in Commerce	)	Attorney Docket No: 4672-902

PETITION FOR COVERED BUSINESS METHOD PATENT REVIEW OF UNITED STATES PATENT NO. 6,418,419 PURSUANT TO 35 U.S.C. § 321, 37 C.F.R. § 42.304

Pursuant to 35 U.S.C. § 321 and 37 C.F.R. § 42.304, the undersigned, on behalf of and acting in a representative capacity for petitioner, Chicago Mercantile Exchange, Inc. ("Petitioner" and real party-in-interest), hereby petitions for review under the transitional program for covered business method patents of claims 1-23 and 41-49 (all claims) of U.S. Pat. No. 6,418,419, enclosed as Exhibit 1001, ("the '419 Patent"), issued to Fifth Market, Inc. ("Patent Owner"). Petitioner hereby asserts that it is more likely than not that at least one of the challenged claims is unpatentable under 35 U.S.C. §§ 112, 101 and 103.

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I. INTRODUCTION

The ’419 patent fails to comply with the definiteness requirement under 35 U.S.C. § 112, second paragraph, for computer-implemented subject matter claimed in means-plus-function form. The ’419 patent is unpatentable pursuant to § 101 because it is directed to an abstract idea. Further, the references cited in this Petition teach the limitation of the ’419 patent claims found to be missing by the Examiner during *ex parte* reexamination of the ’419 patent, and accordingly, the claims of the ’419 patent are obvious under 35 U.S.C. § 103(a). Therefore, it is more likely than not that, pursuant to 35 U.S.C. § 324(a), at least one of the claims of the ’419 patent is unpatentable.

The ’419 patent is generally directed to an electronic trading system for the trading of multiple security instruments using an algorithm having constraints, with one of the constraints being provided by an external price feed. More specifically, claims 1-23 and 41-49[1] of the ’419 patent each recite a “means for matching,” or

[1] During *ex parte* reexamination of the ’419 patent, Patent Owner cancelled claims 24-40 and added new claims 44-49. *See* Exhibit 1002, p. 00927, *Ex Parte* Reexamination Certificate issued February 21, 2013.

"means for matching or comparing," buy and sell orders through the use of an external data source or an external price feed.

Claims 1-23 and 41-49 of the '419 patent are unpatentable under 35 U.S.C. § 112, second paragraph, as being indefinite for failure to disclose an algorithm corresponding to the "means for matching" and "means for matching or comparing" limitations. Section 112, second paragraph, requires that the specification of a computer implemented invention "disclose the algorithm for performing the claimed function . . ." of a means-plus-function limitation. M.P.E.P § 2181.II.B; *see also Noah Systems Inc. v. Intuit Inc.*, 675 F.3d 1302, 1312 (Fed. Cir. 2012). Failure to do so renders the claim indefinite. *Id*. The specification of the '419 patent fails to disclose an algorithm for performing the claimed "matching" and "matching or comparing" functions.

Claims 1-23 and 41-49 of the '419 patent are also unpatentable under 35 U.S.C. § 101 because they cover the abstract idea of determining a price using external data sources without adding "significantly more." *See Mayo v. Prometheus*, 132 S. Ct. 1289, 1294 (2012).

Claims 1-23 and 41-49 of the '419 patent are unpatentable under 35 U.S.C. § 103(a) as being obvious over the prior art combinations discussed herein. During *ex parte* reexamination of the '419 patent the Examiner found that every limitation of the claims was found in the prior art with the exception of an "external price

feed depicting prices of various securities and contracts from external multiple exchanges which may be used as an independent variable of the algorithm or an input to a constraint variable." *See* Ex. 1002, p. 00920. Indeed, during reexamination of the '419 patent, every claim that did not originally recite the "external price feed" limitation was either cancelled or amended to include an "external price feed."

This Petition cites new references that fill the alleged gap identified by the Examiner, namely the Miller and Lupien references, which each teach the allegedly missing "external price feed" limitation. When combined with the CFTC reference applied by the Examiner during *ex parte* reexamination of the '419 patent, these references (and others that are relevant to specific features of the dependent claims) render obvious claims 1-23 and 41-49 of the '419 patent. Accordingly, all of the claims of the '419 patent are unpatentable under 35 U.S.C. § 103(a) as being obvious over the prior art combinations cited herein.

For these reasons, and as discussed in more detail below, Petitioner submits that each claim of the '419 patent is invalid under 35 U.S.C. §§ 112, 101 and 103, and that therefore it is more likely than not that at least one of the claims of the '419 patent is unpatentable. Petitioner accordingly requests that this Petition for Covered Business Method Patent Review of the '419 Patent be granted.

II. GROUNDS FOR STANDING

A. At Least One Challenged Claim Is Unpatentable

As further detailed below, claims 1-23 and 41-49 of the ’419 patent are invalid under one or more of 35 U.S.C. §§ 112, 101 and 103. Thus, it is “more likely than not that at least one of the claims of the ’419 patent is unpatentable.” 35 U.S.C. § 324(a).

B. The ’419 Patent Is a Covered Business Method Patent

The ’419 Patent is a “covered business method patent” under § 18(d)(1) of the Leahy-Smith America Invents Act, Pub. L. 112-29 (“AIA”) and § 42.301. The AIA defines a covered business method (“CBM”) patent as “a patent that claims a method or corresponding apparatus for performing data processing or other operations used in the practice, administration, or management of a financial product or service . . . .” AIA § 18(d)(1). According to the USPTO, “patents subject to covered business method patent review are anticipated to be typically classifiable in Class 705.” Ex. 1003, 77 Fed. Reg. 48734, 48739 (Aug. 14, 2012). The USPTO noted that the AIA’s legislative history demonstrates that “financial product or service” should be “interpreted broadly,” encompassing patents “claiming activities that are financial in nature, incidental to a financial activity or complementary to a financial activity.” *Id*. at 48735.

The ’419 patent is classified in class 705. Additionally, a patent that recites an order transaction network that “matches or compares buy and sell orders for a

plurality of security instruments," is a CBM patent. *See, e.g.*, Ex. 1001, '419 patent, claim 1. The patent specification further demonstrates that the '419 patent is a CBM patent, such as being directed to a system "for contingency trading of securities such as convertible bond 'swaps,' risk arbitrage, and pairs in both listed and over-the-counter markets." *Id.* at 1:10-13. Accordingly, the '419 patent, which claims a transaction network directed to administration or management of a financial product or service, is a CBM patent subject to Section 18 review.

C. Claims 1-23 and 41-49 Are Not Directed to a "Technological Invention"

The '419 patent includes at least one claim not directed to a "technological invention" as defined under AIA § 18(d)(2) and 37 C.F.R. § 42.301(b). In fact, none of claims 1-23 or 41-49 of the '419 patent is directed to a technological invention.

The '419 patent claims fail to recite any technological feature that is novel and unobvious over the prior art as required by Section 301(b). Nor do the claimed transaction networks of the '419 patent solve a technical problem using a technical solution. The recitation of "a variable number of trader terminals," "a plurality of trader workstations," and "at least one controller computer" does not qualify as a technological invention. Even if these aspects of the claims could be characterized as "technical," the claims do not recite a technical feature that is novel and unobvious or provide a technical solution to a technical problem. For example, the

’419 patent does not claim any improvement in the “trader terminals,” the “trader workstations,” or in the “controller computers.” Accordingly, Covered Business Method Patent Review is appropriate for the ’419 patent.

D. Petitioner Has Been Sued for Infringement of the ’419 Patent and Is Not Estopped

The ’419 patent is one of two patents presently involved in the litigation styled *Fifth Market, Inc. v. CME Group Inc. et al*, Civil Action No. 08-0520 GMS, filed in the United States District Court for the District of Delaware on August 15, 2008.[2] The other patent asserted in the *Fifth Market* suit is U.S. Patent No. 7,024,387. Petitioner is not estopped from challenging the claims on the grounds identified in the petition because Petitioner has not been party to any other post-grant review of the challenged claims. 37 C.F.R. § 42.302(b).

III. MANDATORY NOTICES

Real Party-in-Interest: Chicago Mercantile Exchange, Inc.

Related Matters: 1) *Fifth Market, Inc. v. CME Group Inc. et al*, Civil Action No. 08-0520 GMS (D. Del. August 15, 2008); 2) *Ex parte* Reexamination Control

[2] Enclosed as Exhibit 1004 is the Third Amended Complaint filed January 10, 2011 in the *Fifth Market* suit.

Nos. 90/011,603 and 90/011,618 for the'419 patent; and 3) *Inter partes* Reexamination Control No. 95/002,032 for U.S. Pat. No. 7,024,387.[3]

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IV. STATEMENT OF PRECISE RELIEF REQUESTED FOR EACH CLAIM CHALLENGED

A. Claims for Which Review Is Requested

Petitioner petitions for review, under 35 U.S.C. § 321, of claims 1-23 and 41-49 of the '419 patent, and for the cancellation of these claims as unpatentable.

[3] U.S. Patent No. 7,024,387 is a continuation-in-part of the '419 patent.

B. Statutory Grounds of Challenge

Petitioner requests that claims 1-23 and 41-49 be cancelled as unpatentable on the following grounds: 35 U.S.C. §§ 112, second paragraph, 101, and 103. The claim construction, reasons for unpatentability and specific evidence supporting this request are detailed below.

C. Claim Construction

Pursuant to 37 C.F.R. § 42.300(b), in the present proceeding, a claim in an unexpired patent is to be given its broadest reasonable construction in light of the specification in which it appears. *SAP America, Inc. v. Versata Development Group, Inc.*, Case CBM2012-00001, Final Written Decision, p. 23 (P.T.A.B. June 11, 2013). The discussion below provides construction of certain terms of the ’419 patent claims, as supported by the Declaration of Dr. Craig Pirrong (Ex. 1005).

1. “means for matching”

Claims 1-23, 41-49 of the ’419 patent include a means-plus-function limitation where the recited function is matching algorithmic orders with other algorithmic or non-algorithmic orders.

A claim limitation expressed in means-plus-function language “shall be construed to cover the corresponding structure . . . described in the specification and equivalents thereof.” 35 U.S.C. § 112, Sixth Paragraph. The Federal Circuit held that if one employs means-plus-function language in a claim, one must set

forth in the specification an adequate disclosure showing what is meant by that language and that "[i]f an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112." *Noah Systems Inc.*, 675 F.3d at 1311-12 (quoting *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc)).

The specification of the '419 patent indicates that a "component" (i.e. a computer) could perform the matching function. *See* Ex. 1001, '419 Patent, 7:22-24 ("A server-side component charged with routing and matching orders . . ."). However, structure performing a function of a means-plus-function limitation must be more than simply a general purpose computer to avoid pure functional claiming in patents involving computer-implemented inventions. *Noah Systems Inc.*, 675 F.3d at 1312 (citation omitted).

Based on the lack of structure disclosed in the specification for the "means for matching" limitation, claims 1-23 and 41-49 are indefinite because they fail to particularly point out and distinctly claim the invention as required by 35 U.S.C. § 112, second paragraph.

Because claims 1-23 and 41-49 are indefinite, Petitioner is left to speculate how to construe "means for matching." For purposes of the *post grant review* only, and as required by 37 C.F.R. § 42.304(b)(3), Petitioner assumes that the

"means for matching" is hardware, software, or a hardware-software combination. S*ee* Ex. 1001, '419 patent, 7:22-24; Ex. 1005, ¶ 62. Nevertheless, as a matter of law this construction does not overcome the deficiencies discussed above resulting from failure to disclose an algorithm for performing the claimed "matching" function.

2. "means for matching or comparing"

Claims 1-23, 44-45 of the '419 patent include a means-plus-function limitation where the recited function is matching or comparing algorithmic buy/sell orders with algorithmic or non-algorithmic buy/sell orders through the use of external multiple data sources. For the reasons discussed above, the specification of the '419 patent fails to disclose any structure corresponding to the matching function. The specification of the '419 patent also fails to disclose any structure corresponding to the comparing function. Indeed, outside of the claims and the "Summary of the Invention" section, which merely parrots the claim language, the '419 patent never uses the words "compare" or "comparing" or equivalent terms.

Based on the lack of structure disclosed in the specification for the claimed "means for matching or comparing" limitation, Petitioner submits that claims 1-23 and 44-45 are unpatentable for failing to particularly point out and distinctly claim the invention as required by 35 U.S.C. § 112, second paragraph. For purposes of the *post grant* review only, and as required by 37 C.F.R. § 42.304(b)(3), Petitioner

assumes that the "means for matching or comparing" is hardware, software, or a hardware-software combination. S*ee* Ex. 1001, '419 patent, 7:22-24; Ex. 1005, Pirrong Decl., ¶ 67. Nevertheless, as a matter of law this construction does not overcome the deficiencies discussed above resulting from failure to disclose an algorithm for performing the claimed "matching or comparing" function.

3. "comparator for comparing all incoming orders relative to outgoing orders"

Claims 23 and 42 each recites "a comparator for comparing all incoming orders relative to outgoing orders." The term "comparator" should be construed under 35 U.S.C. § 112, sixth paragraph, based on the fact that it is a non-structural, generic term. 35 U.S.C. § 112, sixth paragraph, applies to certain claim limitations even if they lack the phrase "means for" or "step for." "[I]f the claim limitation is shown to use a non-structural term that is 'a nonce word or a verbal construct that is not recognized as the name of structure' but is merely a substitute for the term 'means for,' associated with functional language" than § 112, sixth paragraph, applies. M.P.E.P. § 2181, Section I (quoting *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1360 (Fed. Cir. 2004). "Comparator" is a non-structural term used not in its traditional context but as functional language to substitute for the term "means for."

The function associated with the term "comparator" is "comparing all incoming orders relative to outgoing orders." Claims 23 and 42 recite a computer

that includes the comparator; accordingly, one of ordinary skill in the art would recognize that a computer performs the claimed comparing function. Ex. 1005, Pirrong Decl., ¶ 70. For the reasons discussed above with respect to the "means for matching" and "means for matching or comparing" limitations, the "comparator for" limitation is indefinite for failure to disclose an algorithm or method for performing the claimed comparing function. Accordingly, Petitioner submits claims 23 and 42 are unpatentable for failing to particularly point out and distinctly claim the invention as required by 35 U.S.C. § 112, second paragraph.

For purposes of the *post grant* review only, and as required by 37 C.F.R. § 42.304(b)(3), Petitioner construes "a comparator for comparing all incoming orders relative to outgoing orders" to be hardware, software, or a hardware-software combination that compares incoming and outgoing orders. *See* Ex. 1005, Pirrong Decl., ¶ 72. Nevertheless, as a matter of law this construction does not overcome the deficiencies discussed above resulting from failure to disclose an algorithm for performing the claimed comparing function.

4. "external price feed"

Claim 1 recites an "external price feed depicting prices of various securities and contracts from external multiple exchanges." Independent claims 41 and 43 recite similar "external price feed" limitations. Petitioner submits that "external price feed" should be construed to mean "price data received from outside of the

electronic trading system." This is consistent with District of Delaware's Markman order that construed "external" to mean "located outside of the network." Ex. 1006, p. 00003. An electronic trading system (also called "market," "equity market," "auction market," "marketplace," "system," "network," or "computer network") refers to a computer system that facilitates trading of security instruments. Ex. 1005, Pirrong Decl. ¶ 74. Examples of such a system, market, or network are ACES, Instinet, etc. *See* Ex. 1001, '419 patent, 1:10-11, 41-55. A trading system may trade numerous different security instruments.

The '419 patent specification defines "external" consistent with the above definition. The '419 patent states that "[t]he number of items and the amount of cash that exchanges hands is determined programmatically in accordance with predefined constraints specified when orders are made and as a product of data originating *outside of the system*, i.e., external data sources, and provided to it by external agents." *Id*. at 2:64-3:2 (emphasis added). "The system" refers to the electronic trading system (also called "market," "equity market," "auction market," "marketplace," "system," "network," or "computer network"). Ex. 1005, ¶ 75. The disclosed "external" data sources must be located outside of the electronic trading system because the data needs to be pulled into the system and redistributed within the system. Ex. 1001, at 5:56-60 ("The CORE Central Systems 10 receive data, from some *external* source, that needs to be redistributed

internally.") (emphasis added); *see also* Ex. 1005, ¶ 75. In other words, an "external price feed" refers to "price data received from outside of the electronic trading system."

This construction of "external price feed" is also supported by Patent Owner's arguments during *ex parte* reexamination. During *ex parte* reexamination Patent Owner stated that in the CFTC prior art reference, which discloses the NYMEX ACCESS electronic trading system, "[t]here is no indication of an outside-NYMEX (extra-network) link for real-time, continuous trade execution . . . ." *See* Ex. 1002, pp. 00849-50, ¶ 10. In other words, Patent Owner argued that the NYMEX ACCESS trading system allegedly lacks the claimed external price feed because there is no link from outside the NYMEX ACCESS system. Patent Owner's argument is consistent an interpretation of "external price feed" as being price data received from outside of the electronic trading system, *e.g.*, outside of the NYMEX ACCESS system. Ex. 1005, Pirrong Decl. ¶ 76.

Based on the specification of the '419 patent and on Patent Owner's admissions during *ex parte* reexamination, "external price feed" should be construed to mean "price data received from outside of the electronic trading system (network)."

5. "controller computer means"

Claims 41-43 and 46-49 include the "controller computer means" limitation. The controller computer means in claims 41-42 and 46-47 receives each algorithm as inputs. The controller computer means in claims 43 and 48-49 also receives at least one external price feed. The disclosed structure for performing the "receiving" function is merely a general purpose computer. Ex. 1001, '419 patent, 4:5-6; 5:38-39, 56-57; *see also* Ex. 1005, Pirrong Decl. ¶ 79.

V. CLAIMS 1-23 AND 41-49 ARE UNPATENTABLE

A. All Claims Are Unpatentable Under 35 U.S.C. § 112, Second Paragraph, for Failing to Comply with the Definiteness Requirement for Computer-Implemented Subject Matter

1. Claims 1-23 and 41-49 fail to disclose an algorithm corresponding to the "means for matching" and "means for matching or comparing" limitations

The '419 patent fails to comply with the definiteness requirement under 35 U.S.C. § 112, second paragraph, for computer-implemented subject matter claimed in means-plus-function form. The '419 patent is generally directed to an electronic trading system for trading multiple security instruments using an algorithm having constraints, with one of the constraints or independent variable being provided by an external price feed. More specifically, claims 1-23 and 41-49 of the '419 patent each recite a "means for matching," or "means for matching or comparing," buy and sell orders through the use of external data sources (i.e. external price feed).

For a computer-implemented, means-plus-function claim limitation that invokes 35 U.S.C. § 112, sixth paragraph, the specification must "disclose the algorithm for performing the claimed function . . . ." M.P.E.P. § 2181.II.B (citations omitted); *see also Noah Systems Inc.*, 675 F.3d at 1312; *Ergo Licensing LLC and UVO Holscher v. Carefusion 303 Inc*., 673 F.3d 1361, 1365 (Fed. Cir. 2012). Failure to do so renders the claim indefinite. *Id*.

In *Ergo*, the Federal Circuit affirmed the district court's grant of summary judgment of invalidity due to indefiniteness for failure to disclose an algorithm associated with a "control means for . . . controlling said adjusting means" and a "programmable control means . . . for controlling said adjusting means."[4] *Ergo*, 673 F.3d at 1365. The patent owner in *Ergo* argued that the structure corresponding to the "control means . . . for controlling said adjusting means" is a "control device" recited in the specification. *Id*. at 1363. The patent owner argued that a "control device" is synonymous with a general-purpose computer, which can perform the claimed function. *Id.* The court disagreed. The court reasoned that "[t]he recitation of 'control device' provides no more structure than the term 'control means' itself, rather it merely replaces the word 'means' with the generic

[4] The "adjusting means" recited in the claims at issue in *Ergo* is "for acting on said fluid flow sources to influence fluid flow of said fluid flow sources." *Id*. at 1366.

term ‘device.’ *Id.* at 1363-64. The court further noted that “even if we were to accept that one skilled in the art would understand a control device to be a general-purpose computer, the specification fails to disclose a corresponding algorithm required by our precedent.” *Id.* at 1364. In particular, the court found that “there is no algorithm described in any form for the function of ‘controlling the adjusting means.’ The specification merely provides functional language and does not contain any step-by-step process for controlling the adjusting means.” *Id*. at 1365.

The specification of the ’419 patent fails to disclose an algorithm for performing the claimed “matching” and “matching or comparing” functions. Ex. 1005, ¶ 92. The ’419 patent discloses that a “server-side component” is responsible for performing the claimed matching function. *See* Ex. 1001, 7:22-24. With respect to the comparing function, the specification of the ’419 patent provides even less disclosure. Outside of the claims and the “Summary of the Invention” section which merely parrots the original claim language, the ’419 patent does not even recite the words “compare” or “comparing,” let alone disclose an algorithm for performing the comparing function.

Similar to the Federal Circuit finding in *Ergo* with respect to the term “control device,” the recitation in the ’419 patent of a “server-side component charged with routing and matching orders” provides no more structure than the term “means for matching” itself. The specification of the ’419 patent fails to

disclose any algorithm for performing the claimed matching, or matching or comparing, functions. Ex. 1005, Pirrong Decl. ¶ 92.

Based on the lack of structure disclosed in the specification for the claimed "means for matching" and "means for matching or comparing" limitations, Petitioner submits claims 1-23 and 41-49 are invalid under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the invention. Ex. 1005, Pirrong Decl. ¶ 94. Accordingly, it is more likely than not that at least one of the claims of the '419 patent is unpatentable.

2. Claims 23 and 42 fail to disclose an algorithm corresponding to the "comparator" limitation

Claims 23 and 42 of the '419 patent each recite "a comparator for comparing all incoming orders relative to outgoing orders." For the reasons discussed above in Section IV.C.3, the recited "comparator for" should be construed as a means-plus-function limitation pursuant to 35 U.S.C. § 112, sixth paragraph.

The specification of the '419 patent fails to discuss the function of comparing incoming and outgoing orders, let alone disclose any structure associated with that function. Claims 23 and 42 recite a computer that includes the comparator; accordingly, one of ordinary skill in the art would recognize that a computer performs the claimed comparing function. Ex. 1005, Pirrong Decl., ¶ 93. For a computer-implemented, means-plus-function claim limitation that invokes 35 U.S.C. § 112, sixth paragraph, the specification must "disclose the algorithm for

performing the claimed function . . . ." M.P.E.P § 2181.II.B (citations omitted). The specification of the '419 patent fails to disclose an algorithm for performing the claimed "comparing" function. Outside of the claims and the "Summary of the Invention" section which merely parrots the original claim language, the '419 patent does not even recite the words "compare" or "comparing," let alone disclose an algorithm for performing the comparing function.

Based on the lack of structure disclosed in the specification for the claimed "comparator for comparing all incoming orders relative to outgoing orders" limitation, Petitioner submits claims 23 and 42 are unpatentable under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the invention. Ex. 1005, Pirrong Decl. ¶ 94. Accordingly, it is more likely than not that at least one of claims 23 and 42 is unpatentable.

B. All Claims Are Unpatentable Under 35 U.S.C. § 101

Laws of nature, abstract ideas and natural phenomena cannot be patented. *Mayo*, 132 S. Ct. at 1293. When a claim is directed to an abstract idea, like determining a price using external data sources, as the '419 patent does, it must add "significantly more" to be patent-eligible. *Id.* at 1294; *Parker v. Flook*, 437 U.S. 584, 593-94 (1978). It is not sufficient to limit the claim to "a particular technological environment" or to add "insignificant post solution activity" or "well-understood, routine, conventional activity." *Bilski v. Kappos*, 130 S. Ct.

3218, 3230 (2010); *Mayo*, 132 S. Ct. at 1294. Instead, a claim involving an unpatentable abstract idea must contain "other elements or a combination of elements, sometimes referred to as the 'inventive concept,'" sufficient to prevent patenting the underlying concept itself. *Mayo*, 132 S. Ct. at 1294; *see also Flook*, 437 U.S. at 594. The '419 patent fails to satisfy 35 U.S.C. § 101 because it claims an abstract idea and fails to add other elements to the unpatentable abstract idea beyond routine, conventional elements and activities.

The '419 patent centers on the abstract idea of determining a price using external data sources. Ex. 1005, Pirrong Decl., ¶ 96. The '419 patent summarizes the abstract idea as the product of programmed calculations: "The number of items [that is, security instruments] and the amount of cash that exchanges hands is determined programmatically in accordance with predefined constraints specified when orders are made and as a product of data originating outside of the system, i.e., external data sources, and provided to it by external agents." Ex. 1001, '419 patent, 2:64 – 3:2. Mathematical calculations, even if they are innovative, are unpatentable abstract ideas. *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972); *Parker v. Flook*, 437 U.S. 584, 587-86 (1978). The '419 patent fails to disclose a single embodiment of the algorithm used to determine the price of the security from the external data sources, thus preempting the entire abstract idea. Ex. 1005, Pirrong Decl. ¶ 98. The claimed algorithm of the '419 patent that determines a price using

external data sources is an abstract idea that essentially amounts to a programmable calculation. *Id*. at ¶ 99.

The claims of the ’419 patent do not add anything to this abstract idea beyond “well-understood, routine, conventional activity.” *See Mayo*, 132 S. Ct. at 1294; *see also* Ex. 1005, Pirrong Decl. ¶ 100. The fact that the ’419 patent claims may be implemented on a computer, or a network of computers, (*see* Ex. 1001, 3:6-7; 7:22-23, 42-43), does not change this result. “[C]laims do not become patentable under § 101 simply for reciting a computer element.” *SAP America*, at p. 29 (citing *Benson*, 409 U.S. at 68).

The ’419 patent describes a primary improvement over the prior art the implementation of the invention through a “global computer network” that “has the advantage of increasing the efficiencies in the marketplace.” Ex. 1001, ’419 patent, 1:32-33; 3:3-10. However, an otherwise patent-ineligible claim cannot be salvaged by including a computer that merely performs the task more quickly than a human could. *See Bancorp Services, L.L.C. v. Sun Life Assurance Co. of Canada (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) (citations omitted).

The ’419 patent lacks specificity as to the hardware aspects of the computer-implemented invention, suggesting that the type of computer used is not the contribution of the ’419 patent. *See SAP America*, at p. 30. The claims of the ’419 patent recite a “controller computer” (claim 1), “computer” (claim 41), or

"controller computer means" (claim 43) ("the computer") that receives as inputs an algorithm with its corresponding constraints and a price feed from external data sources. Ex. 1002, pp. 00928-29. Receiving data as inputs is a routine computer function. Ex. 1005, Pirrong Decl., ¶ 102.

The claims further recite that the computer includes a "means for matching" algorithmic buy orders with algorithmic or non-algorithmic sell orders. Ex. 1002, pp. 00928-29. The '419 patent describes that the matching function is implemented by a "server-side component charged with routing and matching orders . . . ." Ex. 1001, '419 patent, 5:31-34. The "server-side component" is not specifically described or explained in the '419 patent. Ex. 1005, Pirrong Decl., ¶ 103. Accordingly, the '419 patent's "contribution to the arts lies not in the type of computing device or processing environment employed. This is consistent with the fact that the specification lacks specificity as to the hardware aspects of the invention." *See SAP America*, at p. 30. Thus, the recitation of generic computers in the claims "represents routine, well-understood conventional hardware that fails to narrow the claims relative to the abstract idea" of determining a price using external data sources. *See Id*. (citation omitted); *see also* Ex. 1005, Pirrong Decl. ¶ 103.

The dependent claims of the '419 patent do not recite additional limitations beyond routine, conventional activity. *Id*. at ¶ 104. For example, claims 3-5 define

the price used in the algorithm as yield, volatility or yield spread, respectively. Using yield, volatility or yield spread as price is an abstract idea related to the variables of the price algorithm and does not limit the claims in any meaningful way. *Id*. at ¶ 105.

Claims 9-18 recite that the algorithmic orders correspond to various security instruments, such as stocks, bonds, futures, etc. Using different types of security instruments for the price algorithm is an abstract idea that does not limit the claims in any meaningful way. *Id*. at ¶ 106. The limitations added by claims 2, 6, 8, 19-22, and 44-49 related to the variables or conditions of the algorithm for determining price. *Id*. at ¶ 107. Mathematical calculations are abstract ideas and adding limitations related to the variables or conditions of the mathematical calculation does not limit the claims in any meaningful way.

The limitations added by claims 23 and 42 cover routine, conventional activities related to the rearrangement of order information, that is, receiving, sorting, and comparing orders. *Id*. at ¶ 108. The rearrangement of order information as claimed (sorting and comparing orders) amounts to nothing more than post-solution activity done after the price is determined. *Id*. at ¶ 108. A claim that covers an abstract idea cannot be salvaged by limiting the claim to "insignificant post-solution activity." *See Bilski*, 130 S. Ct. at 3230.

Claim 7 similarly recites insignificant post-solution activity done after the price is determined. Claim 7 recites a "means for maintaining identity of a trader terminal on which the order was entered." The '419 patent does not specifically disclose any hardware or software for performing the "maintaining identity" function. Ex. 1005, Pirrong Decl. ¶ 109. Whether performed in hardware, software or manually, maintaining identity of a trader terminal does not limit the claims in a meaningful way so as to salvage claim 7 under § 101. *Id*. at ¶ 109.

For the forgoing reasons, Petitioner submits that the '419 patent claims is not patent-eligible because they cover an abstract idea without adding "significantly more." *See Mayo,* 132 S. Ct. at 1294. It is more likely than not that at least one claim of the'419 patent is unpatentable under § 101.

C. All Claims are Unpatentable Under 35 U.S.C. § 103(a)

1. Claims 1-2, 4, 6-8, 11, 15-16, 22-23 and 41-49 are invalid under 35 U.S.C. § 103(a) as being unpatentable over CFTC and Miller

During *ex parte* reexamination of the '419 patent the Examiner found that every limitation of independent claims 1, 41 and 43 was found in the CFTC reference, with the exception of an "external price feed depicting prices of various securities and contracts from external multiple exchanges which may be used as an independent variable of the algorithm or an input to a constraint variable." Indeed, during reexamination of the '419 patent, every claim that did not originally recite

the "external price feed" limitation was either cancelled or amended to include an "external price feed." Thus, the sole remaining issue is whether it would have been obvious, based on the prior art, to modify the system disclosed in the CFTC reference to include an "external price feed."

Miller discloses using an external price feed in a trading system that can handle an inter-market synthetic order, that is, an order for multiple securities traded on different markets. *See, e.g.*, Ex. 1007, Miller, p. 245, lines 25-27. Miller discloses a mechanism that processes orders for a synthetic security, which is "a security that is not traded directly on any market, but rather is implicitly created when two or more component securities are held simultaneously. Each component security is traded in its own market." *Id.* at 239, line 43 – p. 240, line 3; *see also* p. 245, lines 26-27 ("allow trade in synthetics that have components traded in two separate auction markets"). The "markets" in Miller refer to separate electronic trading systems that "work together through communications links." *See* Ex. 1007, Miller, p. 240, lines 30-32; *see also* Ex. 1005, Pirrong Decl. ¶ 112.

Miller further discloses that "the message (BOTH BID 60) is an order to buy the synthetic consisting of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought. This message is sent to both auctions and recorded on their books . . . ." Ex. 1007, Miller, p. 246, lines 5-8. Therefore, Miller discloses

that the order price of one of the component securities in a synthetic order is an independent variable to the other component security, and vice versa. Ex. 1005, Pirrong Decl. ¶ 113.

Miller also rebuts arguments presented by Patent Owner during *ex parte* reexamination of the '419 patent. During *ex parte* reexamination Patent Owner argued that CFTC, and the prior art cited in combination with CFTC, do not teach or suggest executing one security on a first market and a second security of the same algorithmic trade on an "external market."[5] *See* Ex. 1002, pp. 00849-50, ¶¶ 10, 12. Miller fills this alleged gap in the prior art by disclosing a mechanism for trading a synthetic security in which each component security, also called a leg, that forms the synthetic "is traded in its own market." Ex. 1007, Miller, p. 240, line 3; Ex. 1005, Pirrong Decl. ¶ 116. Put another way, Miller discloses "a mechanism for extending the [conventional auction mechanism] . . . . to allow trade[s] in synthetics that have components traded in two separate auction markets." Ex. 1007, Miller, 245, lines 25-27. Accordingly, Miller, combined with CFTC, discloses executing a trade of multiple securities in the same and diverse markets with a single order where the price of one security is responsive to

[5] Only independent claim 43 requires executing a trade on an external market.

dynamic changes in the price of another security, or other securities, in that order. Ex. 1005, Pirrong Decl. ¶ 116.

The CFTC reference is a printed publication that also discloses trading synthetic orders (s*ee* Ex. 1009, CFTC, pp. 32-33) that was used in public prior to the July 23, 1999 filing date of the ’419 patent. It would have been obvious to modify the synthetic order trading features of the NYMEX ACCESS system described in CFTC to include the external price feed used for the synthetic order trading described in Miller. Ex. 1005, Pirrong Decl., ¶ 117.

For the foregoing reasons, and as shown below, Petitioner submits that it is more likely than not that claims 1-2, 4, 6-8, 11, 15-16, 22-23, 41-49 are unpatentable under § 103(a) over the combined teachings of CFTC and Miller.

’419 Patent Claims	**CFTC (Ex. 1009)**	**Miller (Ex. 1007)**
1. A conditional order transaction network that matches or compares buy and sell orders for a plurality of security instruments based upon conditions set forth within the order, including price represented as an algorithm with constraints thereon, the transaction network comprising:	CFTC discloses NYMEX ACCESS, an electronic order matching system: “The NYMEX ACCESS trade matching host is designed to accept limit orders, i.e., orders to buy and sell a particular number of futures or option contracts in a given commodity and month at a specified price, and spread orders at a differential.” (p. 19). The spread orders require adjusting the price of each security in the order when a price of another security in the order changes.	
a variable number	CFTC discloses that the orders	

of trader terminals for entering an order for a security instrument in a form of an algorithm with constraints thereon that represent a willingness to transact, where price of one security is a dependent variable of the algorithm within the constraints and dynamically changing price of another security is an independent variable thereof, the price as the dependent variable being continuously changeable responsive to changes in price of the independent variable, the algorithm representing a buy or sell order; and	are entered at a Trader Work Station (terminal) by terminal operators (pp. 4, 9). The order is in the form of an algorithm, i.e., including constraints such as quantity, limit price, strike price and put or call, and "any precondition for entry into the matching system (e.g., stop, market discretion, MIT or stop limit)." (pp. 20-21). CFTC discloses that the price of at least one security is dependent on the price of another security being traded in that the disclosed system would "generate implied spread bids and offers by calculating spread differentials based on the current best . . . prices . . ." in the market for each component (leg) in the order. (p. 28). CFTC also discloses that "the contingent bid or offer [for one security] would move correspondingly" if the price of the other security in the order changes. (p. 31). CFTC also discloses "chaining" spread bids or offers together to create a synthetic spread order equal in magnitude to the sum of the consecutive bids or offers. (p. 31). The price of the synthetic security is a dependent variable with the price of the individual "chained" spreads being	

	independent variables. (p. 32).	
at least one controller computer coupled to each of the variable number of trader terminals over a communications network and receiving as inputs,	A trade matching host (controller computer) is coupled to Trader Work Stations (trader terminals) over a communications network. (p. 4).	
a) each algorithm with its corresponding constraints and	A trade matching host (controller computer) receives orders (in the form of an algorithm with constraints) entered at a Trader Work Station (trader terminal). (p. 4).	
b) at least one external price feed depicting prices of various securities and contracts from external multiple exchanges which may be used as an independent variable of the algorithm or an input to a constraint variable, the controller computer comprising,		Miller discloses continuous trading in synthetic securities, i.e., two or more component securities on different markets, (pp. 239-240), which includes the use of an external price feed: "[T]he market system consists of a network of auctions that work together through communications links to create 'virtual markets' for synthetic securities." (p. 240, lines 30-32). The price of the securities from external markets is used as an independent variable or an input to a constraint variable:

		"the message (BOTH BID 60) is an order to buy the synthetic [product] consisting of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 3-8). Miller discloses that each component security resides and is traded on different markets. (pp. 240, line 3; 245, lines 25-27.
means for matching, in accordance with the constraints and the conditions, algorithmic buy orders with algorithmic sell orders, one of the conditions being a requirement that two or more securities are tradable contemporaneously as a contingent trade of those respective securities, and	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order in accordance with the constraints and conditions entered as part of the order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the securities are traded virtually simultaneously [that is, as a contingent trade]. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31).	
means for matching or comparing,	CFTC describes matching a spread order (algorithmic order	Miller describes matching a spread

in accordance with the constraints and the conditions, algorithmic buy/sell orders with algorithmic or non-algorithmic sell/buy orders through use of the external multiple data sources.	having constraints and conditions) with another spread order or with orders for the individual component securities (referred to as "underlying futures" or "outrights," i.e., non-algorithmic orders). (p. 28).	order (called a synthetic order, i.e., algorithmic order) and component securities (non-algorithmic orders) (p. 245)
2. The conditional order transaction network of claim 1 wherein the price, as represented in the form of the algorithm, includes an order quantity subject to another algorithm.	CFTC describes crack spreads for simultaneously trading multiple securities of specified quantities for each security. (p. 2).	
4. The conditional order transaction network of claim 2 wherein the price is a volatility.	The CFTC system can be set to display indicative and delta values based on current volatility. (p. 58).	
6. The conditional order transaction network of claim 1 wherein the controller computer matches/compares orders in real-time as each order is received at the controller computer and as each new price of each other underlying security is received at the controller computer.	The trade matching host (controller computer) receives orders entered at a Trader Work Station. (p. 4). "The conditional orders [that is, spread orders] . . . would adjust as the underlying markets [that is, the market for each component security] moves." (p. 29). "When such an implied order was matched with an express spread order, the system would execute simultaneously both legs in the underlying markets." (p. 28). "[B]ids and offers…would adjust as [that is, in real-time] the underlying markets moved. When a conditional bid or offer	

	was taken [that is, matched], the system immediately would complete the transaction by buying or selling a corresponding number of contracts in the second leg of the spread." (p. 29).	
7. The conditional order transaction network of claim 1 further comprising means for maintaining identity of a trader terminal on which the order was entered.	"[E]ach terminal operator, whether registered or not, would have to be identified to the Exchange". (p. 17). "[E]ach TWS [trader work station] would be assigned to a single ET [electronic trader], and that ET would be responsible for all activity on the TWS." (p. 18).	
8. The conditional order transaction network of claim 1 wherein the algorithm of the order can be represented as a line in two dimensional space with constraints having the price of one security as one axis and the price of another security as its other axis.	The relationship between the two securities in the spread order (a linear price difference) can inherently be represented graphically.	
11. The conditional order transaction network of claim 1 wherein the independent variable includes multiple independent variables.	CFTC describes the use of multiple independent variables with conditional orders, for example 1. first month bid, 2. second month offer, 3. first month offer and 4. second month bid: "The system would generate implied spread bids and offers by calculating spread differentials based on the current best underlying futures market price (e.g., first	

	month bid minus second month offer and first month offer minus second month bid)." (p. 28). "These conditional bids and offers, which would be placed only if they bettered the best bids and offers in the market, would adjust as the underlying markets moved." (p. 29). "NYMEX ACCESS would allow consecutive spread bids or offers to be 'chained' together across months to create a synthetic spread order equal in magnitude to the sum of the consecutive bids or offers." (p. 31). The price of the synthetic security is a dependent variable with the price of the individual "chained" spreads being independent variables. (p. 32).	
15. The conditional order transaction network of claim 1 wherein the security instrument for which the order is entered includes options.	An automated matching system for trading futures and options contracts. (pp. 2, 19).	
16. The conditional order transaction network of claim 1 wherein the security instrument for which the order is entered includes futures.	An automated matching system for trading futures and options contracts. (pp. 2, 19).	
22. The conditional order transaction	CFTC describes examples of linked/contingent/differential	

network of claim 1 wherein one of the conditions is the requirement that the orders be matched/compared without use of prices fed from said external multiple exchanges.	spread trades that do not require prices fed from external exchanges. (pp. 27-31).	
23. The conditional order transaction network of claim 1, further comprising: a plurality of trader workstations for trading and negotiating prospective trades for the security instruments referenced in the buy and sell orders, based upon conditions set forth in the buy and sell orders including price represented by an algorithm with constraints thereon, each trader workstation of the plurality of trader workstation comprising:	CFTC describes that the orders are entered at a Trader Work Station (terminal) by terminal operators (pp. 4, 9). The order is in the form of an algorithm, i.e., including constraints such as quantity, limit price, strike price and put or call, and "any precondition for entry into the matching system (e.g., stop, market discretion, MIT or stop limit)." (pp. 20-21).	
a display device for displaying selected parameters of buy and sell orders in a prioritized sequence in a descending order of favorability across a display field, with a most favorable order at one distal end and a least favorable order at the	CFTC discloses that "current market information concerning bids, offers, and trade executions would be displayed on NYMEX ACCESS screens." (p. 40). CFTC further discloses making buy and sell orders available in a prioritized sequence: "Terminal operators would	

other distal end;	have continuous access to the best bid and offer price and the available quantity at each such price, session high and low price, and the last-traded price and volume for each contract. Similar information would be available with regard to intra- and inter-commodity spreads. For options, the system could be set to display indicative and delta values based on current volatilities. A terminal operator also could access a "depth-of-market" feature, which would display all resting bids up to ten ticks below the best bid and all resting offers up to ten ticks above the best offer, along with the total available quantity at each price. In addition, the terminal operator could configure his trading screen so as to receive a real-time 'ticker' display containing best bids, best offers, and last trade prices, and their respective volumes for all contracts in a selected commodity." (p. 58).[6]	

[6] Given the teachings in CFTC to identify and present various "best" order parameters, it would have been obvious to one of ordinary skill in the art at the time of the invention to have displayed these collections of best bids and best offers (including the plurality within the specified ten ticks) in a sequenced order

an input device for entering outgoing orders to be traded or negotiated into the trader workstation; and	Orders are entered into NYMEX ACCESS through terminals called trader work stations (TWSs) at various remote locations. (p. 19).	
a computer for receiving the outgoing orders and incoming order information from the trader terminals, and for controlling the display device, said computer including	CFTC discloses that "NYMEX ACCESS terminal operators would enter orders into the system by means of a TWS [trader work station]. Orders would be routed to a trade matching host for execution based on an algorithm employing strict price/time priority." (p. 4). CFTC discloses that a terminal operator can "configure his trading screen so as to receive a real-time 'ticker' display" containing order information such as best bids, best offers and last trade prices. (p. 58).	
a comparator for comparing all incoming orders relative to outgoing orders, and	CFTC discloses that orders are entered (outgoing) at the Trader Work Station (p. 4) and the trading screen of a Trader Work Station can be configured to receive order information (incoming) such as best bids, best offers, and last	

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of favorability so that each identified order/parameter could be put into a relative favorability context as a sorted list on a screen.

	trade prices (p. 58).[7]	
a sorter that resequences the orders in real-time in the display field as each order is received to reflect changes in relative favorability of the orders responsive to changes in price of said another security as the independent variable.	"[T]he terminal operator could configure his trading screen so as to receive a real-time 'ticker' display containing best bids, best offers, and last trade prices, and their respective volumes for all contracts in a selected commodity." (p. 58). Further, CFTC discloses "terminal operators would have continuous [that is, real-time] access to best bid and offer price and the available quantity at each such price . . . ," as well as sorting bids and offers by displaying on the trading screen "all resting bids up to ten ticks below the best bid and all resting offers up to ten ticks above the best offer . . . ." (p. 58).	
41. A conditional order transaction network that matches buy and sell orders for a plurality of items based upon conditions set forth within an order for an item, including price	NYMEX ACCESS is an electronic order matching system. (p. 3). "The NYMEX ACCESS trade matching host is designed to accept limit orders, i.e., orders to buy and sell a particular number of futures or option contracts in a	

[7] Given that CFTC discloses incoming and outgoing orders at the Trade Work Station, it would have been obvious to one of ordinary skill in the art to compare the incoming and outgoing orders in order to provide a more accurate and up-to-date trading screen. Ex. 1005, Pirrong Decl., p. 52, n.10.

represented as an algorithm with constraints thereon, the conditional order transaction network comprising:	given commodity and month at a specified price, and spread orders at a differential." (p. 19). The spread orders require adjusting the price of each security in the order when a price of another security in the order changes.	
a variable number of trader terminals for entering the order for a traded item being an option in a form of an algorithm with constraints thereon that represent a willingness to transact, where price of the traded item is a dependent variable of the algorithm within the constraints and dynamically changing price of another item is an independent variable thereof, the price of the traded item as the dependent variable being continuously changeable responsive to changes in price of the another item as the independent variable, the algorithm representing a buy or sell order for said traded item;	CFTC discloses that the orders are entered at a Trader Work Station (trader terminal) by terminal operators (pp. 4, 9). The order is in the form of an algorithm, i.e., including constraints such as quantity, limit price, strike price and put or call, and "any precondition for entry into the matching system (e.g., stop, market discretion, MIT or stop limit)." (pp. 20-21). CFTC discloses that the price of at least one security is dependent on the price of another security being traded in that the disclosed system would "generate implied spread bids and offers by calculating spread differentials based on the current best . . . prices . . ." in the market for each component(leg) in the order. (p. 28). CFTC also discloses that "the contingent bid or offer [for one security] would move correspondingly" if the price of the other security in the order changes. (p. 31).	

	CFTC also discloses "chaining" spread bids or offers together to create a synthetic spread order equal in magnitude to the sum of the consecutive bids or offers. (p. 31). The price of the synthetic security is a dependent variable with the price of the individual "chained" spreads being independent variables. (p. 32).	
controller computer means coupled to each of the variable number of trader terminals over a communications network and receiving as inputs each algorithm with its corresponding constraints, and	A trade matching host (controller computer) is coupled to Trader Work Stations (trader terminals) over a communications network and receives as inputs the orders that contain an algorithm with constraints. (pp. 4, 20-21).	
at least one external price feed depicting at least one price of at least one item from at least one external network which is used as either the independent variable of the algorithm or an input to a constraint variable; and		Miller discloses continuous trading in synthetic securities, i.e., two or more component securities on different markets, (pp. 239-240), which includes the use of an external price feed: "[T]he market system consists of a network of auctions that work together through communications links to create 'virtual markets' for synthetic securities." (p. 240, lines 30-32).

		The price of the securities from external markets is used as an independent variable or an input to a constraint variable: "the message (BOTH BID 60) is an order to buy the synthetic [product] consisting of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 5-8). Miller discloses that each component security resides and is traded on different markets. (pp. 240, line 3; 245, lines 25-27. Thus the price feeds are external to the system.
means for matching, in accordance with the constraints and conditions, through use of the at least one external price feed from the at least one external network, at least one of algorithmic or non-algorithmic buy orders with algorithmic sell	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order in accordance with the constraints and conditions entered as part of the order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the	

orders, and non-algorithmic buy orders with algorithmic sell orders, one of the conditions being a requirement that two or more securities are tradable contemporaneously as a contingent trade of those respective securities responsive to changes in price of said another item as the independent variable.	securities are traded virtually simultaneously [that is, as a contingent trade]. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31). CFTC describes matching a spread order (algorithmic order having constraints and conditions) with another spread order or with orders for the individual component securities (referred to as "underlying futures" or "outrights," i.e., non-algorithmic orders). (p. 28).	
42. The conditional order transaction network of claim 41, further comprising: a plurality of trader workstations for trading and negotiating prospective trades for instruments referenced in the buy and sell orders, based upon the conditions set forth in the orders including price represented by an algorithm with constraints thereon, each trader workstation of the plurality of trader workstations including;	CFTC discloses that the orders are entered at a Trader Work Station (trader terminal) by terminal operators (pp. 4, 9). The order is in the form of an algorithm, i.e., including constraints such as quantity, limit price, strike price and put or call, and "any precondition for entry into the matching system (e.g., stop, market discretion, MIT or stop limit)." (pp. 20-21).	
a display device for displaying selected parameters of buy and	CFTC discloses that "current market information concerning bids, offers, and trade	

sell orders in a prioritized sequence in a descending order of favorability across a display field, with a most favorable order at one distal end and a least favorable at the other distal end;	executions would be displayed on NYMEX ACCESS screens." (p. 40). CFTC further discloses making buy and sell orders available in a prioritized sequence: "Terminal operators would have continuous access to the best bid and offer price and the available quantity at each such price, session high and low price, and the last-traded price and volume for each contract. Similar information would be available with regard to intra- and inter-commodity spreads. For options, the system could be set to display indicative and delta values based on current volatilities. A terminal operator also could access a "depth-of-market" feature, which would display all resting bids up to ten ticks below the best bid and all resting offers up to ten ticks above the best offer, along with the total available quantity at each price. In addition, the terminal operator could configure his trading screen so as to receive a real-time 'ticker' display containing best bids, best offers, and last trade prices, and their respective volumes for all contracts in a selected commodity." (p. 58).	
an input device for entering outgoing orders to be traded or	Orders are entered into NYMEX ACCESS through terminals called trader work	

negotiated into the trader workstation; and	stations (TWSs) at various remote locations. (p. 19).	
a computer for receiving the outgoing orders and incoming order information from the trader terminals, and for controlling the display device, said computer including,	CFTC discloses that "NYMEX ACCESS terminal operators would enter orders into the system by means of a TWS [trader work station]. Orders would be routed to a trade matching host for execution based on an algorithm employing strict price/time priority." (p. 4). CFTC discloses that a terminal operator can "configure his trading screen so as to receive a real-time 'ticker' display" containing order information such as best bids, best offers and last trade prices. (p. 58).	
a comparator for comparing all incoming orders relative to outgoing orders, and	CFTC discloses that orders are entered (outgoing) at the Trader Work Station (p. 4) and the trading screen of a Trader Work Station can be configured to receive order information (incoming) such as best bids, best offers, and last trade prices (p. 58). [8]	
a sorter that resequences the orders in	"[T]he terminal operator could configure his trading screen so	

[8] Given that CFTC discloses incoming and outgoing orders at the Trade Work Station, it would have been obvious to one of ordinary skill in the art to compare the incoming and outgoing orders in order to provide a more accurate and up-to-date trading screen. Ex. 1005, Pirrong Decl., p. 53, n.11.

real-time in the display field as each order is received to reflect changes in relative favorability of the orders responsive to changes in price of said another item as the independent variable.	as to receive a real-time 'ticker' display containing best bids, best offers, and last trade prices, and their respective volumes for all contracts in a selected commodity." (p. 58). Further, CFTC discloses "terminal operators would have continuous [that is, real-time] access to best bid and offer price and the available quantity at each such price . . . ," as well as sorting bids and offers by displaying on the trading screen "all resting bids up to ten ticks below the best bid and all resting offers up to ten ticks above the best offer . . . ." (p. 58).	
43. A conditional order transaction network that electronically matches buy and sell orders for a plurality of items from a same market and a diverse market based upon conditions set forth within an order for an item of the plurality of items, including price represented as an algorithm with constraints thereon, the conditional order transaction network comprising:	NYMEX ACCESS is an electronic order matching system. (p. 3). "The NYMEX ACCESS trade matching host is designed to accept limit orders, i.e., orders to buy and sell a particular number of futures or option contracts in a given commodity and month at a specified price, and spread orders at a differential." (p. 19). The spread orders require adjusting the price of each security in the order when a price of another security in the order changes.	
a variable number of trader terminals for entering the order for the item in a form of an	CFTC discloses that the orders are entered at a Trader Work Station (terminal) by terminal operators (pp. 4, 9). The order	

algorithm with constraints thereon that represent a willingness to transact, where dynamically changing price is a dependent variable of the algorithm within the constraints and price of another item is an independent variable, the price as the dependent variable being continuously changeable responsive to changes in price of the another item as the independent variable, the algorithm representing a buy or sell order;	is in the form of an algorithm, i.e., including constraints such as quantity, limit price, strike price and put or call, and "any precondition for entry into the matching system (e.g., stop, market discretion, MIT or stop limit)." (pp. 20-21). CFTC discloses that the price of at least one security is dependent on the price of another security being traded in that the disclosed system would "generate implied spread bids and offers by calculating spread differentials based on the current best . . . prices . . ." in the market for each component(leg) in the order. (p. 28). CFTC also discloses that "the contingent bid or offer [for one security] would move correspondingly" if the price of the other security in the order changes. (p. 31). CFTC also discloses "chaining" spread bids or offers together to create a synthetic spread order equal in magnitude to the sum of the consecutive bids or offers. (p. 31). The price of the synthetic security is a dependent variable with the price of the individual "chained" spreads being independent variables. (p. 32).	
controller computer means coupled	A trade matching host (controller computer) is	

to each of the variable number of trader terminals over a communications network and receiving as inputs, each algorithm with its corresponding constraints; and	coupled to Trader Work Stations (trader terminals) over a communications network and receives as inputs the orders that contain an algorithm with constraints. (pp. 4, 20-21).	
at least one external price feed of at least one item from said diverse market which is used as either the independent variable of the algorithm or an input to a constraint variable;		Miller discloses continuous trading in synthetic securities, i.e., two or more component securities on different markets, (pp. 239-240), which includes the use of an external price feed: "[T]he market system consists of a network of auctions that work together through communications links to create 'virtual markets' for synthetic securities." (p. 240, lines 30-32). The price of the securities from external markets is used as an independent variable or an input to a constraint variable: "the message (BOTH BID 60) is an order to buy the synthetic [product] consisting of both securities 1 and 2 at a total price

		of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 3-8). Miller discloses that each component security resides and is traded on different markets. (pp. 240, line 3; 245, lines 25-27. Thus the price feeds are external to the system.
means for matching, in accordance with the constraints and conditions, through use of said at least one external price feed from said diverse market, at least one of algorithmic buy orders with algorithmic or non-algorithmic sell orders, non-algorithmic buy orders with algorithmic sell orders, one of the conditions being a requirement that two or more items are tradable contemporaneously as a contingent trade of those respective items, and	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order in accordance with the constraints and conditions entered as part of the order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the securities are traded virtually simultaneously [that is, as a contingent trade]. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31). CFTC describes matching a spread order (algorithmic order having constraints and conditions) with another spread order or with orders for the	

	individual component securities (referred to as "underlying futures" or "outrights," i.e., non-algorithmic orders). (p. 28).	
simultaneously executing a trade of said items in the same and diverse markets as a single electronically matched trade responsive to dynamic changes in price of said another item as the independent variable.	CFTC discloses simultaneous execution of internally matched bids/offers. (p.28).	The price of one component security is a constraint variable on the order execution algorithm that is responsive to dynamic changes to the price of either of the component securities. When the single price for both component securities is met, each component security is purchased simultaneously. (pp. 239, lines 35-36; 246, lines 7-8). Miller also describes market systems that are distinct from each other when discussing the synthetic markets, stating, "The work described in this paper is closely related to a growing subfield within experiment economics concerning the design of 'smart' market systems for the allocation of resources in highly interdependent markets, e.g., markets

		for airport takeoff and landing slots . . ., space station resources . . ., and natural gas distribution networks." (p. 239, lines 20-25). "[M]atching a bid for a synthetic with an offer in one auction and a TAKE_BID for the matching component in the other auction is monitored by having each auction send reports of its changes in its best bid and offer to the other auctions." (p. 247, lines 12-15). If communications in one direction is slow such that an arriving offer from one auction is so slow that there is an effective bid price at or below the price of the best offer, (*see* p. 248, lines 29-31), Miller discloses a sequence of actions that take place if the effective bid price is driven above the best offer price in auction 1, including a lock on the best offer. Miller

		also discloses that if the effective bid price is driven above the best offer price in auction 2, the best offer would not be locked; instead, locking would begin with the synthetic bid and the best offer in auction 1. (p. 249, lines 1-6).
44. The conditional order transaction network according to claim 1, wherein the conditional order transaction network matches buy and sell orders for the plurality of security instruments, and	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the securities are traded virtually simultaneously. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31).	
at least one price depicted by at least one external price feed is used as the independent variable of the algorithm.		The price of one of the component securities in a synthetic order is an independent variable relative to the price of another component security in the synthetic order: "the message (BOTH BID 60) is an order to buy the synthetic [product] consisting

		of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 3-8).
45. The conditional order transaction network according to claim 1, wherein at least one price depicted by the at least one external price feed is used as the input to the constraint variable.		The price of one of the component securities in a synthetic order is an input to a constraint variable relative to the price of another component security in the synthetic order: "the message (BOTH BID 60) is an order to buy the synthetic [product] consisting of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 3-8).
46. The conditional order transaction network according to claim 41, wherein the conditional order transaction network matches buy and sell orders for the plurality of items, and	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the securities are	

	traded virtually simultaneously. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31).	
at least one price depicted by at least one external price feed is used as the independent variable of the algorithm.		The price of one of the component securities in a synthetic order is an independent variable relative to the price of another component security in the synthetic order: "the message (BOTH BID 60) is an order to buy the synthetic [product] consisting of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 3-8).
47. The conditional order transaction network according to claim 41, wherein at least one price depicted by the at least one external price feed is used as the input to the constraint variable.		The price of one of the component securities in a synthetic order is an input to a constraint variable relative to the price of another component security in the synthetic order: "the message (BOTH BID 60) is an order to buy the synthetic

		[product] consisting of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 3-8).
48. The conditional order transaction network according to claim 43, wherein at least one price depicted by the at least one external price feed is used as the independent variable of the algorithm.		The price of one of the component securities in a synthetic order is an independent variable relative to the price of another component security in the synthetic order: "the message (BOTH BID 60) is an order to buy the synthetic [product] consisting of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 3-8).
49. The conditional order transaction network according to claim 43, wherein at least one price depicted by the at least one external price feed is used as the input to the		The price of one of the component securities in a synthetic order is an input to a constraint variable relative to the price of another component security in

constraint variable.		the synthetic order: "the message (BOTH BID 60) is an order to buy the synthetic [product] consisting of both securities 1 and 2 at a total price of 60. The order for the synthetic does not authorize the purchase of only one security – either both or neither must be bought." (p. 246, lines 3-8).

2. Claims 1-2, 4, 6-8, 11, 15-16, 22-23 and 41-49 are invalid under 35 U.S.C. § 103(a) as being unpatentable over CFTC and Lupien

As discussed above, during reexamination every claim that did not originally recite the "external price feed" limitation was either cancelled or amended to include an "external price feed." The sole remaining issue is whether it would have been obvious, based on the prior art, to modify the system disclosed in the CFTC reference to include an "external price feed."

The CFTC reference is a printed publication that describes the NYMEX ACCESS electronic order matching system (Ex. 1009, CFTC, p. 3) that was used in public prior to the July 23, 1999 filing date of the '419 patent. Lupien discloses a trading system that includes an external price feed: "External market data is available to clients from securities information vendors." Ex. 1010, Lupien, 6:20-

22. The "external market data" discussed in Lupien includes external quotes, trades and other market data (*Id*. at 9:53-54), received from trading systems outside of the system disclosed in Lupien. Ex. 1005, Pirrong Decl. ¶ 120. Such trading systems disclosed in Lupien include INSTINET and the CINCINNATI Stock Exchange. Ex. 1010, Lupien, 6:61-63. Lupien also discloses an order matching system that generates buy and sell orders based on an algorithm operating on the client CPU or at the system's controller CPU: "Algorithms operating either at each client CPU 15 or at controller CPU 10 . . . create buy and sell orders for that client." *Id*. at 6:37-40. "As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities." *Id*. at 4:32-36. Accordingly, Lupien fills the gap identified by the Examiner during *ex parte* reexamination. Ex. 1005, Pirrong Decl. ¶ 121.

Lupien also rebuts arguments presented by Patent Owner during *ex parte* reexamination of the '419 patent. During *ex parte* reexamination Patent Owner argued that CFTC, and the prior art cited in combination with CFTC, do not teach or suggest executing one security on a first market and a second security of the same algorithmic trade on an "external market."[9] *See* Ex. 1002, pp. 00849-50, ¶¶

[9] Only independent claim 43 requires executing a trade on an external market.

10, 12. Lupien fills this alleged gap in the prior art by disclosing a system that "interacts with internal and external participants using the system of this invention for purposes of order matching." Ex. 1010, Lupien, 12:55-57. Lupien further states that the disclosed trading system "provides client users of the system an opportunity to execute sales and purchases external to the system rather than limiting them to transactions with other clients." *Id.* at 6:67 – 7:2. Lupien, combined with CFTC, discloses executing a trade of multiple securities in the same and diverse markets with a single order where the price of one security is responsive to dynamic changes in price of another security or other securities in that order. Ex. 1005, Pirrong Decl. ¶ 123.

It would have been obvious to one of ordinary skill in the art to modify the NYMEX ACCESS system described in CFTC, based on Lupien, to use external market data in calculating and matching purchase and sale orders. Ex. 1005, Pirrong Decl., ¶ 124.

For the foregoing reasons, and as shown below, Petitioner submits that it is more likely than not that claims 1-2, 4, 6-8, 11, 15-16, 22-23, 41-49[10] are unpatentable under § 103(a) over the combined teachings of CFTC and Lupien.

[10] CFTC is relied upon to disclose the features of dependent claims 2, 4, 6-8, 11, 15-16, 22-23 and 42 in the same manner shown above in the chart in Section V.C.1

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
1. A conditional order transaction network that matches or compares buy and sell orders for a plurality of security instruments based upon conditions set forth within the order, including price represented as an algorithm with constraints thereon, the transaction network comprising:	CFTC discloses NYMEX ACCESS, an electronic order matching system: "The NYMEX ACCESS trade matching host is designed to accept limit orders, i.e., orders to buy and sell a particular number of futures or option contracts in a given commodity and month at a specified price, and spread orders at a differential." (p. 19). The spread orders require adjusting the price of each security in the order when a price of another security in the order changes.	
a variable number of trader terminals for entering an order for a security instrument in a form of an algorithm with constraints thereon that represent a willingness to transact, where price of one security is a dependent variable of the algorithm within the constraints and dynamically changing price of another security is an independent variable thereof, the price as the	CFTC discloses that the orders are entered at a Trader Work Station (trader terminal) by terminal operators (pp. 4, 9). The order is in the form of an algorithm, i.e., including constraints such as quantity, limit price, strike price and put or call, and "any precondition for entry into the matching system (e.g., stop, market discretion, MIT or stop limit)." (pp. 20-21). CFTC discloses that the price	

of this Petition. Claims 2, 4, 6-8, 11, 15-16, 22-23 and 42 are not included in this chart to avoid repetition.

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
dependent variable being continuously changeable responsive to changes in price of the independent variable, the algorithm representing a buy or sell order; and	of at least one security is dependent on the price of another security being traded in that the disclosed system would "generate implied spread bids and offers by calculating spread differentials based on the current best . . . prices . . ." in the market for each component(leg) in the order. (p. 28). CFTC also discloses that "the contingent bid or offer [for one security] would move correspondingly" if the price of the other security in the order changes. (p. 31). CFTC also discloses "chaining" spread bids or offers together to create a synthetic spread order equal in magnitude to the sum of the consecutive bids or offers. (p. 31). The price of the synthetic security is a dependent variable with the price of the individual "chained" spreads being independent variables. (p. 32).	
at least one controller computer coupled to each of the variable number of trader terminals over a communications network and receiving as inputs,	A trade matching host (controller computer) is coupled to Trader Work Stations (trader terminals) over a communications network. (p. 4.)	
a) each algorithm	A trade matching host	

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
with its corresponding constraints and	(controller computer) receives orders (in the form of an algorithm with constraints) entered at a Trader Work Station (trader terminal). (p. 4).	
b) at least one external price feed depicting prices of various securities and contracts from external multiple exchanges which may be used as an independent variable of the algorithm or an input to a constraint variable, the controller computer comprising,		"External market data is available to clients from securities information vendors." (Col. 6, lines 20-22). "As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities." (Col. 4, lines 32-36).
means for matching, in accordance with the constraints and the conditions, algorithmic buy orders with algorithmic sell orders, one of the conditions being a requirement that two or more securities are tradable contemporaneously as a contingent trade of those respective securities, and	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order in accordance with the constraints and conditions entered as part of the order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the securities are traded virtually simultaneously [that is, as a	

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
	contingent trade]. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31).	
means for matching or comparing, in accordance with the constraints and the conditions, algorithmic buy/sell orders with algorithmic or non-algorithmic sell/buy orders through use of the external multiple data sources.	CFTC describes matching a spread order (algorithmic order having constraints and conditions) with another spread order or with orders for the individual component securities (referred to as "underlying futures" or "outrights," i.e., non-algorithmic orders). (p. 28).	
41. A conditional order transaction network that matches buy and sell orders for a plurality of items based upon conditions set forth within an order for an item, including price represented as an algorithm with constraints thereon, the conditional order transaction network comprising:	NYMEX ACCESS is an electronic order matching system. (p. 3). "The NYMEX ACCESS trade matching host is designed to accept limit orders, i.e., orders to buy and sell a particular number of futures or option contracts in a given commodity and month at a specified price, and spread orders at a differential." (p. 19). The spread orders require adjusting the price of each security in the order when a price of another security in the order changes.	
a variable number of trader terminals for entering the order for a traded item being an option in a form of an algorithm with constraints	CFTC discloses that the orders are entered at a Trader Work Station (trader terminal) by terminal operators (pp. 4, 9). The order is in the form of an	

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
thereon that represent a willingness to transact, where price of the traded item is a dependent variable of the algorithm within the constraints and dynamically changing price of another item is an independent variable thereof, the price of the traded item as the dependent variable being continuously changeable responsive to changes in price of the another item as the independent variable, the algorithm representing a buy or sell order for said traded item;	algorithm, i.e., including constraints such as quantity, limit price, strike price and put or call, and "any precondition for entry into the matching system (e.g., stop, market discretion, MIT or stop limit)." (pp. 20-21). CFTC discloses that the price of at least one security is dependent on the price of another security being traded in that the disclosed system would "generate implied spread bids and offers by calculating spread differentials based on the current best . . . prices . . ." in the market for each component(leg) in the order. (p. 28). CFTC also discloses that "the contingent bid or offer [for one security] would move correspondingly" if the price of the other security in the order changes. (p. 31). CFTC also discloses "chaining" spread bids or offers together to create a synthetic spread order equal in magnitude to the sum of the consecutive bids or offers. (p. 31). The price of the synthetic security is a dependent variable with the price of the individual "chained" spreads being	

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
	independent variables. (p. 32).	
controller computer means coupled to each of the variable number of trader terminals over a communications network and receiving as inputs each algorithm with its corresponding constraints, and	A trade matching host (controller computer) is coupled to Trader Work Stations (trader terminals) over a communications network and receives as inputs the orders that contain an algorithm with constraints. (pp. 4, 20-21).	
at least one external price feed depicting at least one price of at least one item from at least one external network which is used as either the independent variable of the algorithm or an input to a constraint variable; and		"External market data is available to clients from securities information vendors." (Col. 6, lines 20-22). "As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities." (Col. 4, lines 32-36).
means for matching, in accordance with the constraints and conditions, through use of the at least one external price feed from the at least one external network, at least one of algorithmic or non-algorithmic buy orders with algorithmic	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order in accordance with the constraints and conditions entered as part of the order. (p. 29). The risk of executing	

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
sell orders, and non-algorithmic buy orders with algorithmic sell orders, one of the conditions being a requirement that two or more securities are tradable contemporaneously as a contingent trade of those respective securities responsive to changes in price of said another item as the independent variable.	one security and not the other (legging risk) is eliminated because the securities are traded virtually simultaneously [that is, as a contingent trade]. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31). CFTC describes matching a spread order (algorithmic order having constraints and conditions) with another spread order or with orders for the individual component securities (referred to as "underlying futures" or "outrights," i.e., non-algorithmic orders). (p. 28).	
43. A conditional order transaction network that electronically matches buy and sell orders for a plurality of items from a same market and a diverse market based upon conditions set forth within an order for an item of the plurality of items, including price represented as an algorithm with constraints thereon, the conditional order transaction network comprising:	NYMEX ACCESS is an electronic order matching system. (p. 3). "The NYMEX ACCESS trade matching host is designed to accept limit orders, i.e., orders to buy and sell a particular number of futures or option contracts in a given commodity and month at a specified price, and spread orders at a differential." (p. 19). The spread orders require adjusting the price of each security in the order when a price of another security in the order changes.	
a variable number	CFTC discloses that the	

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
of trader terminals for entering the order for the item in a form of an algorithm with constraints thereon that represent a willingness to transact, where dynamically changing price is a dependent variable of the algorithm within the constraints and price of another item is an independent variable, the price as the dependent variable being continuously changeable responsive to changes in price of the another item as the independent variable, the algorithm representing a buy or sell order;	orders are entered at a Trader Work Station by terminal operators (pp. 4, 9). The order is in the form of an algorithm, i.e., including constraints such as quantity, limit price, strike price and put or call, and "any precondition for entry into the matching system (e.g., stop, market discretion, MIT or stop limit)." (pp. 20-21). CFTC discloses that the price of at least one security is dependent on the price of another security being traded in that the disclosed system would "generate implied spread bids and offers by calculating spread differentials based on the current best . . . prices . . ." in the market for each component(leg) in the order. (p. 28). CFTC also discloses that "the contingent bid or offer [for one security] would move correspondingly" if the price of the other security in the order changes. (p. 31). CFTC also discloses "chaining" spread bids or offers together to create a synthetic spread order equal in magnitude to the sum of the consecutive bids or offers. (p. 31). The price of the	

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
	synthetic security is a dependent variable with the price of the individual "chained" spreads being independent variables. (p. 32).	
controller computer means coupled to each of the variable number of trader terminals over a communications network and receiving as inputs, each algorithm with its corresponding constraints; and	A trade matching host (controller computer) is coupled to Trader Work Stations (trader terminals) over a communications network and receives as inputs the orders that contain an algorithm with constraints. (pp. 4, 20-21).	
at least one external price feed of at least one item from said diverse market which is used as either the independent variable of the algorithm or an input to a constraint variable;		"External market data is available to clients from securities information vendors." (Col. 6, lines 20-22). "As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities." (Col. 4, lines 32-36).
means for matching, in accordance with the constraints and conditions, through use of said at least one external price feed from said	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order in	

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
diverse market, at least one of algorithmic buy orders with algorithmic or non-algorithmic sell orders, non-algorithmic buy orders with algorithmic sell orders, one of the conditions being a requirement that two or more items are tradable contemporaneously as a contingent trade of those respective items, and	accordance with the constraints and conditions entered as part of the order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the securities are traded virtually simultaneously [that is, as a contingent trade]. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31). CFTC describes matching a spread order (algorithmic order having constraints and conditions) with another spread order or with orders for the individual component securities (referred to as "underlying futures" or "outrights," i.e., non-algorithmic orders). (p. 28).	
simultaneously executing a trade of said items in the same and diverse markets as a single electronically matched trade responsive to dynamic changes in price of said another item as the independent variable.	CFTC discloses simultaneous execution of internally matched bids/offers. (p.28).	
44. The conditional order transaction network according to claim 1, wherein the conditional	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of	

’419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
order transaction network matches buy and sell orders for the plurality of security instruments, and	contracts of the securities in the spread order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the securities are traded virtually simultaneously. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31).	
at least one price depicted by at least one external price feed is used as the independent variable of the algorithm.		“External market data is available to clients from securities information vendors.” (Col. 6, lines 20-22). “As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities.” (Col. 4, lines 32-36).
45. The conditional order transaction network according to claim 1, wherein at least one price depicted by the at least one external price feed is used as the input to the constraint variable.		“External market data is available to clients from securities information vendors.” (Col. 6, lines 20-22). “As orders are executed, market quotes change or trades occur in the

’419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
		markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities.” (Col. 4, lines 32-36).
46. The conditional order transaction network according to claim 41, wherein the conditional order transaction network matches buy and sell orders for the plurality of items, and	For a conditional bid or offer, the system immediately would buy or sell a corresponding number of contracts of the securities in the spread order. (p. 29). The risk of executing one security and not the other (legging risk) is eliminated because the securities are traded virtually simultaneously. (p. 29). Conditional bids and offers adjust as the prices of each security in the order move. (pp. 28-31).	
at least one price depicted by at least one external price feed is used as the independent variable of the algorithm.		“External market data is available to clients from securities information vendors.” (Col. 6, lines 20-22). “As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant

'419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
		securities." (Col. 4, lines 32-36).
47. The conditional order transaction network according to claim 41, wherein at least one price depicted by the at least one external price feed is used as the input to the constraint variable.		"External market data is available to clients from securities information vendors." (Col. 6, lines 20-22). "As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities." (Col. 4, lines 32-36).
48. The conditional order transaction network according to claim 43, wherein at least one price depicted by the at least one external price feed is used as the independent variable of the algorithm.		"External market data is available to clients from securities information vendors." (Col. 6, lines 20-22). "As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities." (Col. 4, lines 32-36).
49. The conditional order		"External market data

’419 Patent Claims	CFTC (Ex. 1009)	Lupien (Ex. 1010)
transaction network according to claim 43, wherein at least one price depicted by the at least one external price feed is used as the input to the constraint variable.		is available to clients from securities information vendors.” (Col. 6, lines 20-22). “As orders are executed, market quotes change or trades occur in the markets, the system which presents the present invention will . . . recalculate purchase and sale orders in all relevant securities.” (Col. 4, lines 32-36).

3. Claims 3 and 5 are invalid under 35 U.S.C. § 103(a) as being unpatentable over CFTC, Miller and Wilson, and over CFTC, Lupien and Wilson

As discussed above, the combined teachings of CFTC and Miller, as well as CFTC and Lupien, disclose all the limitations of claims 1 and 2, from which claims 3 and 5 depend. Wilson discloses a “comprehensive transaction system” called BondNet that allows a trader to trade on price, yield, or spreads. Ex. 1011, Wilson, p. 22; *see also* Ex. 1005, Pirrong Decl. ¶ 126. BondNet (disclosed by Wilson) and NYMEX (disclosed by CFTC) are both trading systems offering similar functions. As the Examiner found during reexamination of the ’419 patent, it would have been obvious to have provided trading disclosed in Wilson based on yield (claim 3)

or yield spread (claim 5) with that of the system disclosed in CFTC. *See* Ex. 1002, pp. 00647-48; Ex. 1005, Pirrong Decl. ¶ 127.

For the foregoing reasons, and as shown below, Petitioner submits that it is more likely than not that claims 3 and 5 are unpatentable under § 103(a) over the combined teachings of CFTC, Miller and Wilson, or of CFTC, Lupien and Wilson.

Claims 3 and 5	Wilson (Ex. 1011)
3. The conditional order transaction network of claim 2 wherein the price is a yield.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 2. Wilson discloses that BondNet Trading Systems allows a trader to trade on price, yield, or spreads. (p. 22).
5. The conditional order transaction network of claim 2 wherein the price is a yield spread.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 2. Wilson discloses that BondNet Trading Systems allows a trader to trade on price, yield, or spreads. (p. 22).

4. Claims 9-10, 12, 14 and 18 are invalid under 35 U.S.C. § 103(a) as being unpatentable over CFTC, Miller and Grody, and over CFTC, Lupien and Grody

As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose all the limitations of claim 1, from which claims 9-10, 12, 14 and 18 depend. Grody discloses electronic markets having features of contingent, or conditional, orders and trades based on price differences:

> Contingent orders rely on the value of an external parameter to be executed. An example is an order where execution is contingent upon the value of an underlying instrument, such as an option priced versus

> an underlying stock, or a parameter, such as volatility. . . . combination orders, which imply simultaneous executions like buying a futures contract in one month and selling the same contract in another month, or buying one security and selling another at a stated price difference.

Ex. 1012, Grody, p. 21.

Grody also discloses contingent orders for stocks, corporate bonds, and government bonds, options on equities, options on indexes, futures, warrants, swaps, and short sells. *Id*. at 8. CFTC discloses the NYMEX system used for trading several types of security instruments. As found by the Examiner during reexamination of the '419 patent, "[i]t would have been obvious to one of ordinary skill at the time of the invention to have offered such typical products to be traded by the system of CFTC." *See* Ex. 1002, pp. 00645-47; Ex. 1005, ¶ 131.

For the foregoing reasons, and as shown in the following chart, Petitioner submits that it is more likely than not that claims 9-10, 12, 14 and 18 are unpatentable under § 103(a) over the combined teachings of CFTC, Miller and Grody, or of CFTC, Lupien and Grody.

Claims 9-10, 12, 14 and 18	**Grody (Ex. 1012)**
9. The conditional order transaction network of claim 1 wherein the security instrument for which the order is	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. Grody discloses electronic trading of bonds. (p. 8).

entered includes bonds.	
10. The conditional order transaction network of claim 1 wherein the security instrument for which the order is entered includes warrants.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. Grody discloses electronic trading of warrants. (p. 8).
12. The conditional order transaction network of claim 1 wherein the sell order includes a sell short order.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. Grody discloses electronic trading of short sells. (p. 21).
14. The conditional order transaction network of claim 1 wherein the security instrument for which the order is entered includes stocks.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. Grody discloses electronic trading of stocks. (p. 8).
18. The conditional order transaction network of claim 1 wherein the security instrument for which the order is entered includes swap contracts.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. Grody discloses electronic trading of swaps contracts. (p. 8).

5. Claims 13 and 17 are invalid under 35 U.S.C. § 103(a) as being unpatentable over CFTC, Miller and Dictionary, and over CFTC, Lupien and Dictionary

As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose all the limitations of claim 1, from which claims 13 and 17 depend. With respect to claim 13, the "Dictionary" reference, p. 111

(enclosed as Ex. 1013), provides a definition of conventional financial term convertible securities. As the Examiner found during reexamination of the '419 patent, "[g]iven the electronic trading system disclosed in CFTC, it would have been obvious to one of ordinary skill at the time of the invention to have included other conventional products such as Dictionary's convertible securities with the trading capabilities of CFTC." *See* Ex. 1002, pp. 00647-48; Ex. 1005, Pirrong Decl. ¶ 134.

With respect to claim 17, CFTC explicitly discloses futures contracts: "trading certain NYMEX futures and options contracts." CFTC, p. 1. As the Examiner found during reexamination of the '419 patent, the Dictionary reference "teaches the conventional use of forward contracts as associated with futures contracts," as well as that "[g]iven the definition provided for forward contract, it would have been obvious to one of ordinary skill in the art at the time of the invention to have considered the use of forward contracts with the trading system of CFTC." *See* Ex. 1002, p. 00648; Ex. 1005, Pirrong Decl. ¶ 135.

For the foregoing reasons, and as shown below, Petitioner submits that it is more likely than not that claims 13 and 17 are unpatentable under § 103(a) over the combined teachings of CFTC, Miller and Dictionary, or of CFTC, Lupien and Dictionary.

Claims 13 and 17	Dictionary (Ex. 1013)
13. The conditional	As discussed above, the combined teachings of CFTC

order transaction network of claim 1 wherein the security instrument for which the order is entered includes convertible securities.	and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. The "Dictionary" reference, p. 111, discloses convertible securities.
17. The conditional order transaction network of claim 1 wherein the security instrument for which the order is entered includes forward contracts.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. The "Dictionary" reference discloses forward contracts: "FORWARD CONTRACT purchase or sale of a specific quantity of a commodity, government security, foreign currency, or other financial instrument at the current or SPOT PRICE, with delivery and settlement at a specified future date. Because it is a completed contract-as opposed to an options contract, where the owner has the choice of completing or not completing---a forward contract can be a COVER for the sale of a FUTURES CONTRACT." (p. 205).

6. Claims 19-21 are invalid under 35 U.S.C. § 103(a) as being unpatentable over CFTC, Miller and Globex User Guide, and over CFTC, Lupien and Globex User Guide

As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose all the limitations of claim 1, from which claims 19-21 depend. Globex User Guide (pp. 217, 219, 221) (enclosed as Ex. 1014), discloses, *inter alia*, determining whether a price is above or below set limits, as recited in claims 19-21. As the Examiner found during reexamination of the '419 patent, the Globex User Guide discloses the limitations added by claims 19-21, and it would

have been obvious to modify the orders of CFTC based on the teachings of Globex User Guide. *See* Ex. 1002, pp. 00648-51; Ex. 1005, Pirrong Decl. ¶ 137.

For the foregoing reasons, and as shown in the following chart, Petitioner submits that it is more likely than not that claims 19-21 are unpatentable under § 103(a) over the combined teachings of CFTC, Miller and Globex User Guide, or of CFTC, Lupien and Globex User Guide.

Claims 19-21	Globex User Guide (Ex. 1014)
19. The conditional order transaction network of claim 1 wherein one of the conditions is that no transaction can occur when the independent variable price is above or below set limits.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. Globex User Guide (pp. 217, 219, 221), discloses determining whether a price is above or below set limits. "For each Delta Neutral order entered, there will exist a valid order trading range (VOTR) which is defined as the range in ticks (up and down) on the underlying Future price at which the Delta Neutral order is eligible for trading." (p. 219) "The current Future LTP [Last Trade Price] is compared to the VOTR high and low limits for the Delta Neutral order. If this range is exceeded (greater than high limit or lower than low limit), the order is rejected." (p. 221).
20. The conditional order transaction network of claim 1 wherein one of the conditions is that the price is not to exceed a specified level regardless of the results	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. Globex User Guide (pp. 217, 219, 221), discloses determining whether a price is above or below set limits.

produced by the algorithm.	"For each Delta Neutral order entered, there will exist a valid order trading range (VOTR) which is defined as the range in ticks (up and down) on the underlying Future price at which the Delta Neutral order is eligible for trading." (p. 219) "The current Future LTP [Last Trade Price] is compared to the VOTR high and low limits for the Delta Neutral order. If this range is exceeded (greater than high limit or lower than low limit), the order is rejected." (p. 221).
21. The conditional order transaction network of claim 1 wherein one of the conditions is that the price is not to be less than a specified level regardless of the results produced by the algorithm.	As discussed above, the combined teachings of CFTC and Miller, or of CFTC and Lupien, disclose the conditional order transaction network of claim 1. Globex User Guide (pp. 217, 219, 221), discloses determining whether a price is above or below set limits. "For each Delta Neutral order entered, there will exist a valid order trading range (VOTR) which is defined as the range in ticks (up and down) on the underlying Future price at which the Delta Neutral order is eligible for trading." (p. 219) "The current Future LTP [Last Trade Price] is compared to the VOTR high and low limits for the Delta Neutral order. If this range is exceeded (greater than high limit or lower than low limit), the order is rejected." (p. 221).

7. Claims 1-2, 4, 6-12, 14-16, 18, 22-23, 41-42 and 44-47 are invalid under 35 U.S.C. § 103(a) as being unpatentable over CFTC and Grody

As discussed above, during reexamination every claim that did not originally recite the "external price feed" limitation was either cancelled or amended to include an "external price feed." The sole remaining issue is whether it would

have been obvious, based on the prior art, to modify the system disclosed in the CFTC reference to include an "external price feed."

The CFTC reference is a printed publication that describes the NYMEX ACCESS electronic order matching system (Ex. 1009, CFTC, p. 3) that was used in public prior to the July 23, 1999 filing date of the '419 patent. The charts in Sections V.C.1-2 demonstrate that CFTC discloses each of the limitations of claims 1-2, 4, 6-9, 11, 15-16, 22-23, 41-42, and 44-47 with the exception of the external price feed limitation.

Grody discloses trading systems that include external price feeds used in electronic order trading systems. An external price feed is a price feed that is from a different trading system or network. Ex. 1005, Pirrong Decl. ¶ 142. Such trading systems in Grody include INSTINET, AUTEX, COMEX, CATS, and NYMEX ACCESS. Ex. 1012, Grody, pp. 9, 16; *see also* p. 12. Grody discloses the use of external price information: "Contingent orders rely on the value of an external parameter to be executed. An example is an order where execution is contingent upon the value of an underlying instrument, such as an option priced versus an underlying stock, or a parameter, such as volatility." *Id*. at 21. Grody's

contingent, or conditional,[11] orders "rely on information which may be external *to the system*." *Id*. (emphasis added). Grody discloses that the electronic trading system may be implemented on "a specific machine, a series of machines or centralized on one host," and performs functions including "order placement, order monitoring, order matching, trade execution, trade reporting, administrative query messaging, and market information (price, volume, quotes, etc.) dissemination." *Id.* at 14. In other words, Grody teaches and suggests using parameters, such as price, from an external system that is outside the electronic trading system to execute contingent orders. Ex. 1005, Pirrong Decl. ¶ 142.

Grody also teaches that the disclosed contingent orders include orders to buy or sell that include constraints such as market direction, simultaneous execution, the value of an underlying instrument and volatility. *Id*. at 21. Grody also discloses that buy and sell orders are matched at a price that satisfies both parties. *Id*. at 18. Accordingly, Grody fills the gap identified by the Examiner during *ex parte* reexamination. Ex. 1005, Pirrong Decl. ¶¶ 142-44. Further, as shown in the chart in Section V.C.4, Grody teaches the limitations added by dependent claims 9-10, 12, 14 and 18.

[11] The contingent orders discussed in Grody correspond to the claimed conditional orders. *See* Exhibit 1001, '419 patent, 3:22.

CFTC discloses contingent orders. Ex. 1009, CFTC, pp. 19, 31. It would have been obvious to modify the NYMEX ACCESS system described in CFTC, based on Grody, to use an external price feed "to ensure the maximum available liquidity for orders." Ex. 1012, Grody, p. 9. As the Examiner found during reexamination of the '419 patent, it would have been obvious to one of ordinary skill in the art to modify the teachings of CFTC based on Grody. *See* Ex. 1002, pp. 00645-47; Ex. 1005, Pirrong Decl. ¶ 146.

For the foregoing reasons Petitioner submits that it is more likely than not that claims 1-2, 4, 6-12, 14-16, 18, 22-23, 41-42 and 44-47 are unpatentable under § 103(a) over the combined teachings of CFTC and Grody.

VI. CONCLUSION

Based on the above, it is more likely than not that at least one of claims 1-23 and 41-49 of the '419 patent are unpatentable. Accordingly, Petitioner requests that the Petition for review of the covered business method '419 patent be granted.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing PETITION FOR COVERED BUSINESS METHOD PATENT REVIEW OF UNITED STATES PATENT NO. 6,418,419 and supporting materials (Exhibits 1001-1020 and Power of Attorney) was served in its entirety this 18th day of June, 2013, by Express Mail on:

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