

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUNIPER NETWORKS, INC.,
Petitioner,

v.

SWARM TECHNOLOGY LLC,
Patent Owner.

IPR2021-01317
Patent 9,146,777 B2

Before MICHAEL R. ZECHER, GREGG I. ANDERSON, and
SCOTT B. HOWARD, *Administrative Patent Judges*.

HOWARD, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

INTRODUCTION

A. Background and Summary

Juniper Networks, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–14 of U.S. Patent No. 9,146,777 B2 (Ex. 1001, “the ’777 patent”). Paper 1 (“Pet.”). Swarm Technology LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization, Petitioner filed a Preliminary Reply and Patent Owner filed a Preliminary Sur-reply. Paper 11; Paper 13.

We have authority, acting on the designation of the Director, to determine whether to institute an *inter partes* review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a). *Inter partes* review may not be instituted unless “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). “When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a) (2021).

B. Real Parties in Interest

Petitioner identifies itself as the real party in interest. Paper 3, 1 (Petitioner’s Updated Mandatory Notices).¹ Patent Owner identifies itself as the real party in interest. Paper 5, 5 (Patent Owner’s Mandatory Notices).

¹ Petitioner originally identified Amazon.com as an additional real party in interest. Pet. ix. In its Updated Mandatory notices, Petitioner states that “[l]isting Amazon.com, Inc. in the Petition (page ix) was due to a clerical error.” Paper 3, 1 n.1.

C. Related Matters

The parties identify the following district court proceedings involving the '777 patent: (1) *Juniper Networks, Inc. v. Swarm Technology LLC*, No. 3:20-cv-03137-JD (N.D. Cal.) and (2) *Swarm Technology, LLC v Amazon.com, Inc.*, 2:21-cv-00438-DJH (D. Az.). Pet. ix; Paper 5, 5. Patent owner also identifies a number of patents and patent applications that claim or may claim the benefit of the filing date of the '777 patent. Paper 5, 5–6.

D. The '777 Patent

The '777 patent is titled “Parallel Processing with Solidarity Cells by Proactively Retrieving from a Task Pool a Matching Task for the Solidarity Cell to Process” and is generally directed to “a method and apparatus that facilitates parallel processing of computing tasks using autonomous co-processors that proactively seek tasks to perform.” Ex. 1001, code (54), 1:9–13.

According to the '777 patent, “[p]arallel processing is a computational approach that breaks a large computational requirement into a group of smaller computations for concurrent resolution across the computer’s processing resources.” Ex. 1001, 1:17–20. A central processing unit (“CPU”) “divides the large requirement into tasks that contain segments of executable code” which it then distributes to co-processors. *Id.* at 1:20–28. “Completed threads are reported to the CPU, which continues to distribute threads until the primary processing is complete.” *Id.* at 1:28–30.

The '777 patent identifies two major drawback associated with that typical multiprocessing framework. Ex. 1001, 1:31–45. “First, a significant amount of the CPU’s processing time is consumed in managing the co-processing tasks.” *Id.* at 1:33–35. “Second, a co-processor will remain idle as it waits for a thread to be assigned to it by the CPU.” *Id.* at 1:41–42. The

'777 patent addresses those problems by using autonomous co-processors that proactively searches a task pool to acquire tasks for the co-processor to perform. *Id.* at 1:46–55.

Figure 1 of the '777 patent is reproduced below.

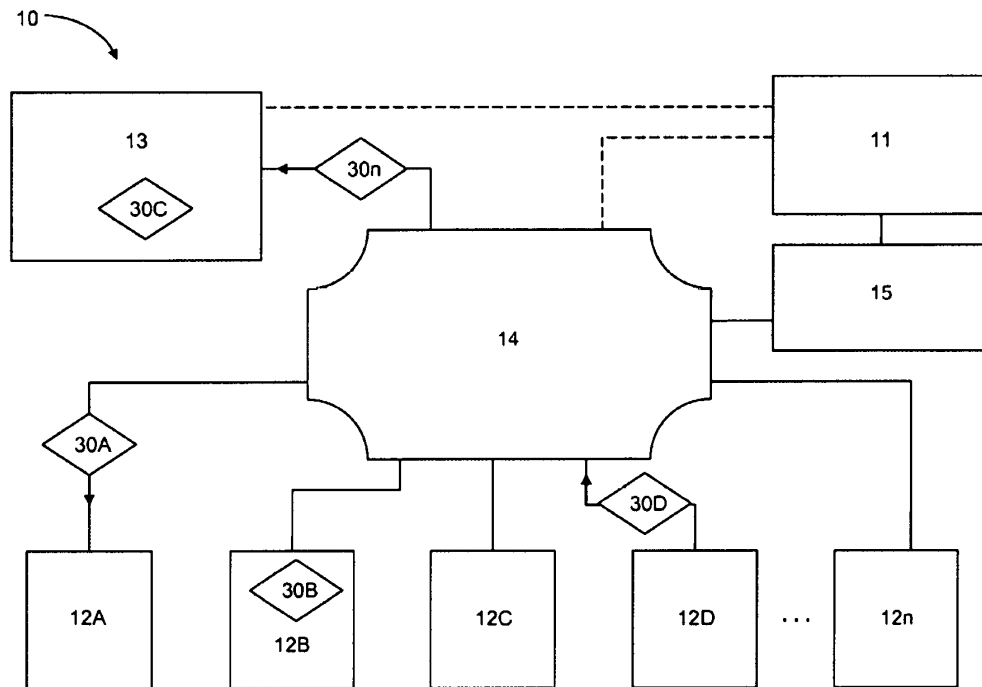


FIG. 1

Figure 1 “is illustrated the preferred embodiment of a parallel processing system 10 for performing computing tasks, such as data-intensive computations and complex programs and algorithms.” Ex. 1001, 2:29–32.

“The system 10 has at least one CPU 11 and one or more solidarity cells 12A, B, C, D . . . n, hereinafter referred to collectively as solidarity cells 12A . . . n to indicate that the system 10 may have any number n of solidarity cells, that cooperate to perform the computing tasks ascribed to the system 10.” *Id.* at 2:47–52. “The solidarity cells 12A . . . n communicate with a task pool 13, preferably through a switching fabric 14. The solidarity

cells 12A . . . n may further communicate with each other through the switching fabric 14 or through a separate cell bus (not shown).” *Id.* at 2:52–56. “The CPU 11 may communicate with the task pool 13 directly or through the switching fabric 14 as shown. One or more memory units 15 contain data and instructions to perform computations.” *Id.* at 2:56–59.

E. Illustrative Claim

Claims 1 and 14 are independent. Claim 1, reproduced below, is illustrative of the claimed invention.

1. An apparatus for parallel processing of a large computing requirement, the apparatus comprising:

a central processing unit (“CPU”);

a task pool in electronic communication with the CPU; and

a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, without requiring an instruction from the CPU, a matching task for the solidarity cell to process;

wherein the CPU populates the task pool by dividing the requirement into one or more threads and placing the threads in the task pool, each thread comprising one or more tasks, and the matching task being one of the tasks;

wherein each task comprises a descriptor, the descriptor containing at least:

a function to be executed; and

a memory location of data upon which the function is to be executed;

wherein the first agent is a data frame comprising: a source address, a destination address and a payload;

wherein the first agent retrieves the matching task by:

being dispatched by the first solidarity cell to the task pool, during which the source address is the first solidarity cell's address, the destination address is the task pool's address, and the payload comprises a list of functions the first solidarity cell is configured to perform;

searching the task pool for a task that is ready to be processed and has a function that the first solidarity cell can perform; and

returning to the first solidarity cell, during which the source address is the task pool's address, the destination address is the first solidarity cell's address, and the payload comprises the descriptor of the matching task.

Ex. 1001, 7:41–8:9

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–14 would have been unpatentable based on the following grounds:

Claim(s) Challenged	35 U.S.C. §²	Reference(s)/Basis
1–14	103(a)	Leong ³
1–14	103(a)	Leong, Ethernet Specification ⁴
2	103(a)	Leong, Bates ⁵
2	103(a)	Leong, Ethernet Specification, Bates

² The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Because the ’777 patent issued from an application filed before March 16, 2013, we apply the pre-AIA versions of the statutory bases for unpatentability. *See* Ex. 1001, codes (21), (22) (application filed Jan. 25, 2013).

³ US 6,006,249, issued Dec. 21, 1999 (Ex. 1005).

⁴ The Ethernet, A Local Area Network, Data Link Layer and Physical Layer Specifications, dates Sept. 30, 1980 (Ex. 1006). All citations are to the native pagination.

⁵ US 2007/0074207, published Mar. 29, 2007 (Ex. 1007).

Petitioner also relies on the testimony of Dr. Jon B. Weissman (Ex. 1003 (Declaration of Dr. Weissman In Support of Petition)).

ANALYSIS

A. Legal Standards

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under 35 U.S.C. § 103 that requires consideration of four factors: (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) if in evidence, “secondary considerations” of non-obviousness such as “commercial success, long-felt but unsolved needs, failure of others, etc.” *Id.* at 17–18. “While the sequence of these questions might be reordered in any particular case,” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the U.S. Court of Appeals for the Federal Circuit has repeatedly emphasized that “it is error to reach a conclusion of obviousness until all those factors are considered,” *WBIP v. Kohler*, 829 F.3d 1317, 1328 (Fed. Cir. 2016).

B. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The “person having ordinary skill in the art” is a hypothetical construct, from whose vantage point obviousness is assessed. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998).

Factors pertinent to a determination of the level of ordinary skill in the art include “(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.” *Envtl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). “Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case.” *Id.*

Petitioner argues that a person having ordinary skill in the art “would have had a bachelor’s degree in computer science, electrical engineering, computer engineering, or a closely related field, and one or more years of experience in the design and development of parallel and distributed processing systems.” Pet. 12 (citing. Ex. 1003 ¶¶ 58–63). Petitioner alternatively argues that a person having ordinary skill in the art “would have a master’s degree or similar post-graduate work in computer science, electrical engineering, computer engineering, or a closely related field, and less design and development experience.” *Id.* (citing. Ex. 1003 ¶¶ 58–63).

Patent Owner does not address the level of skill in the art. *See* Prelim. Resp.

Accordingly, for purposes of this Decision, we adopt Petitioner’s proposed formulation of the level of ordinary skill in the art, except that we delete the qualifier “or more” to eliminate vagueness as to the amount of practical experience. The qualifier expands the range indefinitely without an upper bound, and thus, precludes a meaningful indication of the level of ordinary skill in the art.

C. Claim Construction

We apply the same claim construction standard used in the federal courts, in other words, the claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b), which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). See 37 C.F.R. § 42.100(b). Under the *Phillips* standard, the “words of a claim ‘are generally given their ordinary and customary meaning,’” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1312–13.

Petitioner proposes construction for the terms “solidarity cell” and “thread(s).” Pet. 12–17.

Patent Owner does not address claim construction. See Prelim. Resp.

For purposes of this Decision, we need not expressly construe any claim terms. See *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Asserted Obviousness in View of Leong

Petitioner argues that claims 1–14 would have been obvious over Leong. See Pet. 17–84. Based on the current record, we are not sufficiently persuaded that Petitioner has established a reasonable likelihood of prevailing on this asserted obviousness ground with respect to any of claims 1–14.

1. *Summary of Leong*

Leong is titled “Method and Apparatus for Concurrent Data Processing” and is directed “to multi-tasking systems employing networked stand alone and independently operating micro-processing units each of which perform one or more tasks for manipulating electronic data.”

Ex. 1005, code (54), 1:7–11. Leong states it is an improvement on prior art multi-tasking computing systems which used a CPU coupled to a plurality processing unites. *Id.* at 1:19–24, Fig. 1.

Leong Figure 2 is reproduced below.

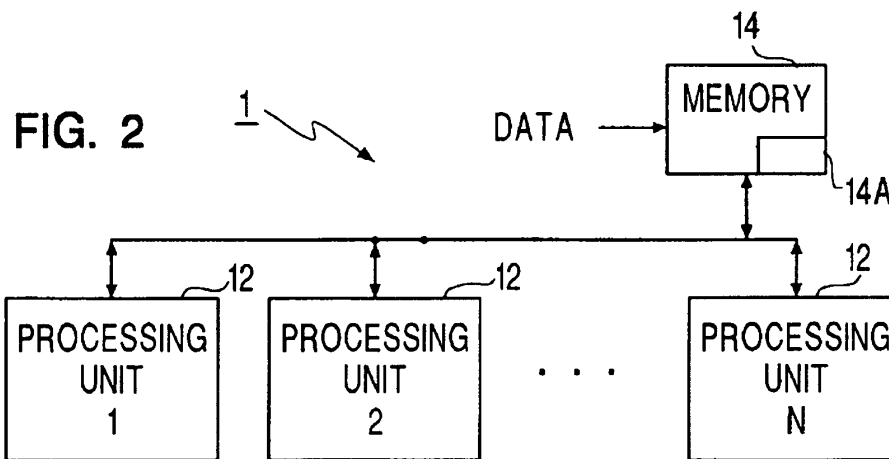


Figure 2 “is a block diagram of a multi-tasking computing system.”

Ex. 1001, 2:14–16. Unlike the prior art, each processing unit 12 “is self controlled using a software application running on its own operating system” and “there is no central management and/or control unit.” *Id.* at 2:43–48.

The one or more processing units 12 determine which tasks need to be performed and posts status information about the tasks on the bulletin board 14. *Id.* at 4:9–16. Additionally, each micro-processing unit 12 is capable of reading the tasks on the bulletin board and executing tasks that it is capable of performing. *Id.* at 3:6–18.

2. *Analysis of Claims 1–14*

Claim 1 recites, in relevant part, “*a central processing unit (“CPU”) and “a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, without requiring an instruction from the CPU, a matching task for the solidarity cell to process.”* Ex. 1001, 7:41–49. Claims 2–13 depend, directly or indirectly, from claim 1. *Id.* at 8:9–50. Independent claim 14 recites substantially the same limitations as recited above, and Petitioner relies on the same evidence and argument. *Id.* at 8:51–58; Pet. 81–82.

a) *Petitioner’s Arguments*

Petitioner maps the claimed CPU to Leong’s micro-processing units 12. Pet. 26–30, 37–41. For example, with regard to the CPU limitation, Petitioner states that “Leong discloses multiple processing units as standalone computers coupled over a standard network” and cites to Leong micro-processing units 12. Pet. 26 (citing Ex. 1005, 5:20–24, 8:34–43; Ex. 1003 ¶ 85); *see also* Ex. 1005, 5:20–24 (discussing micro-processing units 12), 8:34–43 (same). As another example, with regard to “a task pool in electronic communication with the CPU” limitation, Petitioner describes how the bulletin board—which Petitioner maps to the task pool—is in communication with Leong’s processing units 12. Pet. 29–30 (citing Ex. 1005, 3:11–15; Ex. 1003 ¶ 93); *see also* Ex. 1005, 3:11–15 (describing how micro-processing units 12 read the tasks posted to the bulletin board). Similarly, with regard to “the CPU populates the task pool” limitation, Petitioner describes how Leong’s micro processing units 12 “determine which tasks need to be performed to accomplish the overall project, define the status information for each task, and post the status information to the

bulletin board.” Pet. 38 (referring back to arguments regarding the CPU and task pool limitations discussed above).

Petitioner also maps Leong’s micro-processing units 12 to the “first solidarity cell.” Pet. 30–37. Specifically, Petitioner states that “Leong’s processing units are disclosures of solidarity cells.” *Id.* at 30. Petitioner also identifies specific portions of Leong that discuss micro-processing 12. *See id.* at 31–32 citing (2:43–48, 3:6–18, 3:26–30, 4:18–35, 5:29–35, 5:66–6:6, 6:47–61, 7:34–50).

b) Patent Owner’s Argument

Patent Owner argues that claim 1 recites “the distinct and separate elements of ‘a Central Processing Unit (“CPU”)’ and ‘a first solidarity cell.’” Prelim. Resp. 40. Patent Owner further argues that the Petitioner identifies Leong micro-processing units 12 as teaching both elements: “Early on, the Petition takes the position that Leong’s ‘processing units’ correspond to the ‘Central Processing Unit’ of claim 1. (*See* Pet. 26-27). Later, the Petition takes the position that ‘Leong’s processing units are disclosures of solidarity cells.’” (*See* Pet. 31).” Prelim. Resp. 40. According to Patent Owner, “[t]he aforementioned positions are clearly contradictory as Leong’s processing units simply cannot simultaneously act as the ‘Central Processing Unit’ and as ‘solidarity cells’ which ‘don’t require instruction from the CPU.’” *Id.*

c) Our Analysis

Based on the current record and how Petitioner argues Leong teaches the relevant limitations, we are not sufficiently persuaded that Leong teaches both a “central processing unit” and a separate “first solidarity cell” as recited in claims 1 and 14.

Claims 1 and 14 each list three separate elements: (1) a CPU, (2) a task pool, and (3) a first solidarity cell. Ex. 1001, 7:41–49, 8:51–59.

“Where a claim lists elements separately, ‘the clear implication of the claim language’ is that those elements are ‘distinct component[s]’ of the patented invention.” *Becton Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (quoting *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004); *Engel Indus., Inc. v. Lockformer Co.*, 96 F.3d 1398, 1404–05 (Fed. Cir. 1996) (concluding that where a claim provides for two separate elements, a “second portion” and a “return portion,” these two elements “logically cannot be one and the same”). There is nothing in the asserted claims to suggest that the CPU and the first solidarity cell can be the same structure. See *CAE Screenplates, Inc. v. Heinrich Fiedler GmbH & Co.*, 224 F.3d 1308, 1317 (Fed.Cir.2000) (“In the absence of any evidence to the contrary, we must presume that the use of . . . different terms in the claims connotes different meanings.”).

Moreover, the specification of the ’777 patent confirms that the CPU and the first solidarity cell are two separate elements. Figure 1 of the ’777 patent shows CPU 11 as a distinct and separate element from solidarity cells 12A . . . n. Moreover, there is nothing in the specification to indicate that a solidarity cell can be used to populate the task pool by dividing the requirement into one or more threads and placing the threads in the task pool. See Ex. 1001, 4:21–28. In short, the specification comports with the plain language of the claims, fully supporting the conclusion that the CPU and the first solidarity cell are separate structural components of the patented invention. See *Astrazeneca AB v. Mut. Pharm. Co.*, 384 F.3d 1333, 1336 (Fed.Cir.2004) (“A long line of cases indicates that evidence intrinsic to the patent—particularly the patent’s specification, including the inventors’

statutorily-required written description of the invention—is the primary source for determining claim meaning.”); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996) (The specification is “is the single best guide to the meaning of a disputed [claim] term.”).

Because Petitioner relies on a single structural component—Leong’s micro-processing units 12A . . . n—to teach two different structural limitations of claims 1 and 14—the CPU and the first solidarity cell—based on the current record, Petitioner has not sufficiently shown how Leong teaches both of those limitations. Accordingly, Petitioner has not shown a reasonable likelihood of showing that claims 1 and 14 are unpatentable based on Leong.

Similarly, because claims 2–13 depend directly or indirectly from claim 1, Petitioner has not shown a reasonable likelihood of showing that claims 2–13 are unpatentable based on Leong. *See In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) (“[D]ependent claims are nonobvious if the independent claims from which they depend are nonobvious.”).

E. Asserted Obviousness in View of Leong and Ethernet Specification

Petitioner argues that claims 1–14 would have been obvious over Leong and Ethernet Specification. *See* Pet. 84–87. Based on the current record, we are not sufficiently persuaded that Petitioner has established a reasonable likelihood of prevailing on this asserted obviousness ground with respect to any of claims 1 through 14.

1. Ethernet Specification

Ethernet Specification “contains the specification of the Ethernet, a local area network.” Ex. 1006, i. Ethernet Specification “is intended as a design reference document, rather than an introduction or tutorial.” *Id.*

Relevant to Petitioner's argument, chapter 6 provides the "Ethernet Data Link Layer Specification." Ex. 1006, 19-44. Figure 6-1 is reproduced below.

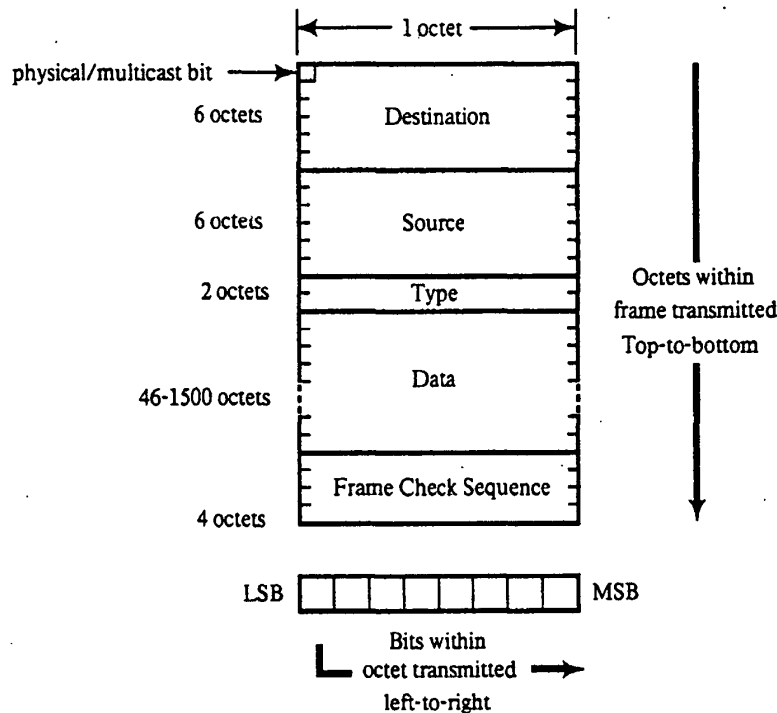


Figure 6-1: Data Link Layer Frame Format

Ex. 1006, 20. Figure 6-1 depicts a "Data Link Frame Format" which includes a destination, source, type, data, and frame check sequence. *Id.*

2. Analysis of Claims 1-14

Petitioner argues that, in the event Leong does not teach some of the limitations relating to the claimed "agent," Ethernet Specification teaches those limitations:

[O]ne may argue Leong lacks an express disclosure of the agent being a data frame comprising a source address, a destination address, and a payload, as set forth in claim element 1.7 (and claim element 14.6), and/or the specific values set in each of those data frame fields, as set forth in elements 1.8 and 1.10 (and claim elements 14.6, 14.7, 14.9). But as evidenced by the prior

art, this would have been obvious to a [person of ordinary skill in the art].

Pet. 85 (footnotes omitted). For all other limitations, including the “CPU” and “first solidarity cell,” Petitioner continues to rely on Leong. *See* Pet. 84–87.

For the same reasons discussed above when addressing the obviousness ground based on Leong alone, Petitioner has not shown a reasonable likelihood of showing that claims 1 through 14 are unpatentable based on Leong and Ethernet Specification.

F. Asserted Obviousness in View of (1) Leong and Bates and (2) Leong, Ethernet Specification, and Bates

Petitioner argues that claim 2 would have been obvious over (1) Leong and Bates and (2) Leong, Ethernet Specification, and Bates. *See* Pet. 87–92. Based on the current record, we are not sufficiently persuaded that Petitioner has established a reasonable likelihood of prevailing on either asserted obviousness ground with respect to claim 2.

1. Bates

Bates is titled “SPU [synergistic processing units] Task Manager for Cell Processor” and is generally directed “to parallel processing and more particularly to managing tasks in cell processors.” Ex. 1007, code (54), ¶ 6.

Bates teaches a “[c]ell processor task management in a cell processor having a main memory, one or more power processor units (PPU) and one or more synergistic processing units (SPU), each SPU having a processor and a local memory is described.” Ex. 1007, code (57). Both the PPU and SPU can add tasks to the task queue. *Id.* ¶ 36. The SPUs can automatically get more tasks whenever they run out. *Id.* ¶ 42.

2. *Analysis of Claim 2*

Petitioner relies on Bates to teach the additional limitation recited in claim 2. Pet. 87–92. Petitioner does not argue that Bates cures the deficiency identified above with regard to Leong alone or in combination with the Ethernet Specification. *See id.*

Because claim 2 depends from claim 1, Petitioner has not shown a reasonable likelihood of showing that claim 2 is unpatentable based on (1) Leong and Bates or (2) Leong, Ethernet Specification and Bates. *See Fritch*, 972 F.2d at 1266.

CONCLUSION

For the foregoing reasons, we determine that Petitioner fails to show a reasonable likelihood that it would prevail with respect to at least one of the claims challenged in the Petition. We, therefore, do not institute an *inter partes* review of the challenged claims based on the Petition.

ORDER

In consideration of the foregoing, it is hereby:

ORDERED that no *inter partes* review is instituted as to any claim of the '777 patent.

IPR2021-01317
Patent 9,146,777 B2

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/750,696	09/29/2015	9146777	64636-2	9485

129524 7590 09/09/2015
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ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 347 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Alfonso Íñiguez, Mesa, AZ;

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PART B - FEE(S) TRANSMITTAL

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129524 7590 06/29/2015
Jennings, Strouss and Salmon, PLC
One East Washington Street, Suite 1900
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Cynthia McMorrow (via EFS WEB)	(Depositor's name)
/Cynthia McMorrow/	(Signature)
August 27, 2015	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/750,696	01/25/2013	Alfonso Íñiguez	64636-2	9485

TITLE OF INVENTION: Parallel Processing with Proactive Solidarity Cells

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	09/29/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
RASHID, WISSAM	2195	718-102000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

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- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

- 1 Michael K. Kelly
- 2 Jennings, Strouss & Salmon PLC
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Swarm Technology LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Mesa, Arizona

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number **501234** (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Michael K. Kelly/

Date August 27, 2015

Typed or printed name Michael K. Kelly

Registration No. 32,848

Electronic Patent Application Fee Transmittal				
Application Number:		13750696		
Filing Date:		25-Jan-2013		
Title of Invention:		PARALLEL PROCESSING WITH SOLIDARITY CELLS BY PROACTIVELY RETRIEVING FROM A TASK POOL A MATCHING TASK FOR THE SOLIDARITY CELL TO PROCESS		
First Named Inventor/Applicant Name:		Alfonso Iñiguez		
Filer:		Michael K Kelly/Cynthia McMorro		
Attorney Docket Number:		64636-2		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				480

Electronic Acknowledgement Receipt	
EFS ID:	23330495
Application Number:	13750696
International Application Number:	
Confirmation Number:	9485
Title of Invention:	PARALLEL PROCESSING WITH SOLIDARITY CELLS BY PROACTIVELY RETRIEVING FROM A TASK POOL A MATCHING TASK FOR THE SOLIDARITY CELL TO PROCESS
First Named Inventor/Applicant Name:	Alfonso Íñiguez
Customer Number:	129524
Filer:	Michael K Kelly/Cynthia McMorro
Filer Authorized By:	Michael K Kelly
Attorney Docket Number:	64636-2
Receipt Date:	27-AUG-2015
Filing Date:	25-JAN-2013
Time Stamp:	16:34:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$480
RAM confirmation Number	3215
Deposit Account	501234
Authorized User	MCMORROW, CYNTHIA C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	IssueFeeTrans_SwarmTechnology_646362.pdf	129826 46d81ff13bab2fc633d8426986fb320df36bdd5e	no	1

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	31380 dea8cf39bb35790b15abfb3397aef896e98aa67	no	2
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Warnings:

Information:

Total Files Size (in bytes): 161206

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Application Number 	Application/Control No. 13/750,696	Applicant(s)/Patent under Reexamination ÍÑIGUEZ, ALFONSO	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 6/02/15	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

jean proctor



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO.	TOT CLAIMS	IND CLAIMS
13/750,696	01/25/2013	2195	533	64636-2	20	2

CONFIRMATION NO. 9485
CORRECTED FILING RECEIPT



129524
Jennings, Strouss and Salmon, PLC
One East Washington Street, Suite 1900
Phoenix, AZ 85004-2554

Date Mailed: 07/17/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Alfonso Íñiguez, Mesa, AZ;

Applicant(s)

Alfonso Íñiguez, Mesa, AZ;

Power of Attorney: The patent practitioners associated with Customer Number 129524

Domestic Applications for which benefit is claimed - None.

A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 02/15/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/750,696**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

PARALLEL PROCESSING WITH SOLIDARITY CELLS BY PROACTIVELY RETRIEVING FROM A TASK POOL A MATCHING TASK FOR THE SOLIDARITY CELL TO PROCESS

Preliminary Class

718

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

129524 7590 06/29/2015
Jennings, Strouss and Salmon, PLC
One East Washington Street, Suite 1900
Phoenix, AZ 85004-2554

EXAMINER

RASHID, WISSAM

ART UNIT

PAPER NUMBER

2195

DATE MAILED: 06/29/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/750,696	01/25/2013	Alfonso Íñiguez	64636-2	9485

TITLE OF INVENTION: Parallel Processing with Proactive Solidarity Cells

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	09/29/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

129524 7590 06/29/2015
Jennings, Strouss and Salmon, PLC
One East Washington Street, Suite 1900
Phoenix, AZ 85004-2554

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/750,696	01/25/2013	Alfonso Íñiguez	64636-2	9485

TITLE OF INVENTION: Parallel Processing with Proactive Solidarity Cells

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	09/29/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
RASHID, WISSAM	2195	718-102000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/750,696	01/25/2013	Alfonso Íñiguez	64636-2	9485
129524 7590 06/29/2015 Jennings, Strouss and Salmon, PLC One East Washington Street, Suite 1900 Phoenix, AZ 85004-2554			EXAMINER RASHID, WISSAM	
			ART UNIT	PAPER NUMBER

2195

DATE MAILED: 06/29/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

<i>Examiner-Initiated Interview Summary</i>	Application No.		Applicant(s)	
	13/750,696		ÍÑIGUEZ, ALFONSO	
	Examiner		Art Unit	
	WISSAM RASHID		2195	

All participants (applicant, applicant's representative, PTO personnel):

(1) WISSAM RASHID. (3)_____.

(2) MICHAEL K. KELLY. (4)_____.

Date of Interview: 18 June 2015.

Type: ☒ Telephonic ☐ Video Conference
 ☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
 If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
 (For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 14 and 19.

Identification of prior art discussed: None.

Substance of Interview
 (For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Examiner informed applicant's representative, Mr. Kelly, that the amendment was not in conformance with what was indicated as allowable subject matter in the non-final rejection mailed on 03/11/2015. Namely, intervening claim 13 was not included in the independent form of claim 14. Examiner also suggested cancelling independent claim 1 or amending claim 1 to include limitations of claims 2, 3, 8, 13 and 14 (the intervening claims and the limitations of claims 14 itself) for claims to recite allowable subject matter, examiner also suggested cancelling recitations of the alphabetical designations of each limitations and Mr. Kelly authorized an examiner's amendment to fix the issues and any outstanding antecedent issues that may arise due to the amendments.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/WISSAM RASHID/ Examiner, Art Unit 2195	/MENG AN/ Supervisory Patent Examiner, Art Unit 2195
--	---

Notice of Allowability	Application No. 13/750,696	Applicant(s) ÍNIGUEZ, ALFONSO	
	Examiner WISSAM RASHID	Art Unit 2195	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 05/29/2015 and interview on 06/18/2015.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1, 4-7, 9-12 and 15-19 now renumbered as 1-14. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
Certified copies:
a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
* Certified copies not received: _____.

Applicant has **THREE MONTHS FROM THE "MAILING DATE"** of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in **ABANDONMENT** of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>05/29/2015</u> 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material 4. ☒ Interview Summary (PTO-413), Paper No./Mail Date <u>20150622</u> .	5. ☒ Examiner's Amendment/Comment 6. ☐ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____.
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/WISSAM RASHID/ Examiner, Art Unit 2195	/MENG AN/ Supervisory Patent Examiner, Art Unit 2195
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1. The present application is being examined under the pre-AIA first to invent provisions.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Pursuant MPEP 606.01 the title will be amended to the following:

**--PARALLEL PROCESSING WITH SOLIDARITY CELLS BY PROACTIVELY
RETRIEVING FROM A TASK POOL A MATCHING TASK FOR THE SOLIDARITY
CELL TO PROCESS--**

Authorization for this examiner's amendment was given in a telephone interview with Mr. Michael K. Kelly, Registration No. 32,848, on 06/18/2015.

The following claim listing will replace all prior versions of claim listings:

1. (Currently Amended) An apparatus for parallel processing of a large computing requirement, the apparatus comprising:
 - a) a central processing unit ("CPU");
 - b) a task pool in electronic communication with the CPU; and

e) a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, without requiring an instruction from the CPU, a matching task for the solidarity cell to process;

wherein the CPU populates the task pool by dividing the requirement into one or more threads and placing the threads in the task pool, each thread comprising one or more tasks, and the matching task being one of the tasks;

wherein each task comprises a descriptor, the descriptor containing at least:
a function to be executed; and
a memory location of data upon which the function is to be executed;
wherein the first agent is a data frame comprising: a source address, a destination address and a payload;

wherein the first agent retrieves the matching task by:
being dispatched by the first solidarity cell to the task pool, during which
the source address is the first solidarity cell's address, the destination address is
the task pool's address, and the payload comprises a list of functions the first
solidarity cell is configured to perform;
searching the task pool for a task that is ready to be processed and has a
function that the first solidarity cell can perform; and
returning to the first solidarity cell, during which the source address is the
task pool's address, the destination address is the first solidarity cell's address,

and the payload comprises the descriptor of the matching task.

2. (Cancelled)

3. (Cancelled)

4. (Currently Amended) The apparatus of claim 3 1 wherein the task pool notifies the CPU when the tasks of a thread are completed.

5. (Currently Amended) The apparatus of claim 3 1 wherein the tasks each comprise a task type selected from a set of task types, and wherein the first solidarity cell is configured to perform tasks of one or more of the task types.

6. (Original) The apparatus of claim 5 wherein the matching task is a task that is ready to be processed and has a task type that the first solidarity cell can perform.

7. (Currently Amended) The apparatus of claim 6 wherein the first agent retrieves the matching task by:

- a) searching the task pool for a task that is ready to be processed and has a task type that the first solidarity cell can perform; and
- b) identifying the matching task.

8. (Cancelled)

9. (Currently Amended) The apparatus of claim ~~8~~ 1 wherein the matching task is a task that is ready to be processed and the function of the matching task can be performed by the first solidarity cell.

10. (Original) The apparatus of claim 9 wherein the first agent retrieves the matching task by searching the task pool for a task that is ready to be processed and has a function that the first solidarity cell can perform, and identifying the matching task.

11. (Currently Amended) The apparatus of claim ~~8~~ 1 wherein the descriptor further contains a memory location where processed data is to be stored.

12. (Currently Amended) The apparatus of claim ~~8~~ 1 wherein the descriptor is a data structure and the task contains a reference to the memory location of the descriptor.

13. (Cancelled)

14. (Cancelled)

15. (Currently Amended) The apparatus of claim ~~14~~ 1 wherein the task pool occupies a region of physical memory.

16. (Original) The apparatus of claim 15 wherein the task pool is disposed in a hardware block dedicated to the task pool.

17. (Original) The apparatus of claim 1 further comprising a second solidarity cell comprising a second agent that proactively retrieves matching tasks from the task pool for the second solidarity cell to process, wherein the matching task for each solidarity cell is a task in the task pool that is ready to be processed and can be performed by the solidarity cell.

18. (Original) The apparatus of claim 17 wherein each solidarity cell sends its agent to the task pool when the solidarity cell does not have a matching task to process.

19. (Currently Amended) An apparatus for parallel processing of a large computing requirement, the apparatus comprising:

- a) a central processing unit ("CPU");
- b) a task pool in electronic communication with the CPU;
- c) first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, a matching task for the solidarity cell to process; and
- d) a second solidarity cell comprising a second agent that proactively retrieves matching tasks from the task pool for the second solidarity cell to process, wherein

the matching task for each solidarity cell is a task in the task pool that is ready to be processed and can be performed by the solidarity cell;

wherein each solidarity cell sends its agent to the task pool when the solidarity cell does not have a matching task to process; and

wherein each agent comprises a source address, a destination address, and a payload, and wherein each agent retrieves a matching task by:

a) being dispatched by its solidarity cell to the task pool, during which the source address is its solidarity cell's address, the destination address is the task pool's address, and the payload comprises a list of functions the agent's solidarity cell is configured to perform;

b) searching the task pool for a task that is ready to be processed and has a function that the agent's solidarity cell can perform; and

c) returning to its solidarity cell, during which the source address is the task pool's address, the destination address is the agent's solidarity cell's address, and the payload comprises a descriptor of the matching task.

20. (Canceled)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WISSAM RASHID whose telephone number is

Application/Control Number: 13/750,696
Art Unit: 2195

Page 8

(571)270-3758. The examiner can normally be reached on Monday through Friday,
7:30 - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MENG AN/
Supervisory Patent Examiner, Art Unit 2195

/WISSAM RASHID/
Examiner, Art Unit 2195

Examiner-Initiated Interview Summary	Application No.		Applicant(s)	
	13/750,696		ÍÑIGUEZ, ALFONSO	
	Examiner		Art Unit	
	WISSAM RASHID		2195	

All participants (applicant, applicant's representative, PTO personnel):

(1) WISSAM RASHID. (3)_____.

(2) MICHAEL K. KELLY. (4)_____.

Date of Interview: 18 June 2015.

Type: ☒ Telephonic ☐ Video Conference
 ☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
 If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
 (For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 14 and 19.

Identification of prior art discussed: None.

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☐ Attachment

/WISSAM RASHID/ Examiner, Art Unit 2195	/MENG AN/ Supervisory Patent Examiner, Art Unit 2195
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BIB DATA SHEET

CONFIRMATION NO. 9485

SERIAL NUMBER 13/750,696	FILING or 371(c) DATE 01/25/2013 RULE	CLASS 718	GROUP ART UNIT 2195	ATTORNEY DOCKET NO. 64636-2		
APPLICANTS INVENTORS Alfonso Iñiguez, Mesa, AZ; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED *** SMALL ENTITY ** 02/15/2013						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and /WISSAM RASHID/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY AZ	SHEETS DRAWINGS 2	TOTAL CLAIMS 14 ~~20~~	INDEPENDENT CLAIMS 2
ADDRESS Jennings, Strouss and Salmon, PLC One East Washington Street, Suite 1900 Phoenix, AZ 85004-2554 UNITED STATES						
TITLE Parallel Processing with Proactive Solidarity Cells						
FILING FEE RECEIVED 533	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees			
			☐ 1.16 Fees (Filing)			
			☐ 1.17 Fees (Processing Ext. of time)			
			☐ 1.18 Fees (Issue)			
			☐ Other _____			
			☐ Credit			

Xtremweb: A generic global computing system

G Fedak, C Germain, V Neri... - Cluster Computing and ..., 2001 - [ieeexplore.ieee.org](#)

... At the end of the computation the worker sends back results to the specified **address**, through the ... in two parts: Dispatcher The dispatcher selects a bunch of tasks from the **task pool** and distributes ... When a worker requests a work the scheduler first selects the **task** that may be run ...

Cited by 420 Related articles All 13 versions Cite Save

Adaptive **task** pools: efficiently balancing large number of tasks on shared-address spaces

R Hoffmann, T Rauber - International Journal of Parallel Programming, 2011 - Springer

... For a distributed **address** space, **task** granularity cannot be too fine-grained because of the use ... we describe the proposed data structure and the operations to insert, **retrieve**, and steal ... The adaptive **task pool** implementation described in the following section is done in this level. ...

Cited by 6 Related articles All 7 versions Cite Save

Website **task** performance by older adults

L Priest, L Nayak, I Stuart-Hamilton - Behaviour & Information ..., 2007 - Taylor & Francis

... Three websites were selected randomly out of a **pool** of 10. ... 2.6 **Website task** procedure. The participants were provided with a **website** Uniform Resource Locator (URL) and instructed to **retrieve** information regarding indigestion from each of the three websites. ...

Cited by 19 Related articles All 5 versions Cite Save

Distributed Parallel Processing Based on Master/Worker Model in Heterogeneous Computing Environment.

L Wang, YZ Huang, SZ Guo - Advances in Information ..., 2012 - [search.ebscohost.com](#)

... Access **task pool** in polling scheme **Retrieve Task** Resolving **task** configuration ... Step 2.2.1: If the access is unsuccessful The Wi executes the **task** and sets the attributes: $E_i = E_i + 1$, $I_i = W_i(\text{IP address})$ Step 3: Results returning The WNs put the **task** results back to the **task pool**. ...

Cited by 8 Related articles All 2 versions Cite Save

Latent learning in a swimming **pool** place **task** by rats: Evidence for the use of associative and not cognitive mapping processes

IQ Whishaw - The Quarterly Journal of Experimental Psychology, 1991 - Taylor & Francis

... In an initial demonstration of latent learning in the swimming **pool**, Sutherland and Linggard (1982) allowed their rats to swim in the **pool** with the ... (1989a, 1989b) attempted to **address** this question by pretraining rats on the procedural features of the **task** (searching for a ...

Cited by 83 Related articles All 5 versions Cite Save

A characterization of performance by men and women in a virtual Morris water **task**:: A large and reliable sex difference

RS Astur, ML Ortiz, RJ Sutherland - Behavioural brain research, 1998 - Elsevier

... In this paper, an attempt is made to **address** two questions: (1) can a version of the ... be successfully used to test humans, and (2) will this kind of spatial learning **task** reveal any ... computerized 3D graphics, 20 male and 20 female undergraduates were placed in a circular **pool** in a ...

Cited by 389 Related articles All 13 versions Cite Save

ShARe/CLEF eHealth Evaluation Lab 2013, **Task** 3: Information retrieval to **address** patients' questions when reading clinical reports

L Goeuriot, GJF Jones, L Kelly, J Leveling... - CLEF 2013 Online ..., 2013 - [doras.dcu.ie](#)

... **Task** 3: Information Retrieval to **Address** ... With this approach, five training and fifty test queries have been generated for use in the **task**. ... For each query, an IR system that implements a standard BM25 weighting scheme [16] has been used to **retrieve** a shallow **pool** of documents. ...

Cited by 19 Related articles All 9 versions Cite Save

Optimization techniques for implementing parallel skeletons in grid environments

M Aldinucci, M Danelutto, J D nnweber... - Proc. of CMPP: Intl. ..., 2004 - Citeseer

... instance of RemoteReference has a reference to a RemoteValue instance, which is used to **retrieve** an object ... When getValue() is invoked, it first checks if the IP **address** is the **address** of the local ... which means that a server will not have to **get** back to the **task pool** manager every ...

Cited by 22 Related articles All 6 versions Cite Save More

Lithium: A Structured Parallel Programming Environment inJa va

M Danelutto, P Teti - Computational Science-----ICCS 2002, 2002 - Springer

... The Java programming environment includes features that can be naturally used to **address** network and ... parallel computation, by just issuing an evaluator parDo() method call; 5. **retrieve** the final ... on each one of the processing elements available and a **task pool** manager on ...

Cited by 40 Related articles All 6 versions Cite Save

Using an authentication server to obtain dial-out information on a network

DL Blair - US Patent 6,141,687, 2000 - Google Patents

... It would be preferable to offload this process to another device. Currently, however, there are no network devices designed to perform this **task** other than an access server. ... IP **address** allocation in a network environment. ... IP **pool** management utilizing an IP **pool** MIB. ...

Cited by 102 Related articles All 2 versions Cite Save

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number. Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)				Complete if Known <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Application Number</td> <td>13/750,696</td> </tr> <tr> <td>Filing Date</td> <td>January 25, 2013</td> </tr> <tr> <td>First Named Inventor</td> <td>Alfonso Iniguez</td> </tr> <tr> <td>Art Unit</td> <td>2195</td> </tr> <tr> <td>Examiner Name</td> <td>Wissam Rashid</td> </tr> <tr> <td>Attorney Docket Number</td> <td>64636-2</td> </tr> </table>		Application Number	13/750,696	Filing Date	January 25, 2013	First Named Inventor	Alfonso Iniguez	Art Unit	2195	Examiner Name	Wissam Rashid	Attorney Docket Number	64636-2
Application Number	13/750,696																
Filing Date	January 25, 2013																
First Named Inventor	Alfonso Iniguez																
Art Unit	2195																
Examiner Name	Wissam Rashid																
Attorney Docket Number	64636-2																
Sheet	1	of	1														

[illegible][illegible]

Examiner Signature	/Wissam Rashid/	Date Considered	06/22/2015
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Issue Classification 	Application/Control No. 13750696	Applicant(s)/Patent Under Reexamination ÍÑIGUEZ, ALFONSO	
	Examiner WISSAM RASHID	Art Unit 2195	

CPC					
Symbol				Type	Version
G06F		9	4843	F	2013-01-01
G06F		9	54	I	2013-01-01
G06F		9	5044	I	2013-01-01
G06F		9	544	I	2013-01-01
G06F		2209	5017	A	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

/WISSAM RASHID/ Examiner.Art Unit 2195 (Assistant Examiner)	6/22/2015 (Date)	Total Claims Allowed: 14	
/MENG AN/ Supervisory Patent Examiner.Art Unit 2195 (Primary Examiner)	06/25/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Issue Classification 	Application/Control No. 13750696	Applicant(s)/Patent Under Reexamination ÍÑIGUEZ, ALFONSO
	Examiner WISSAM RASHID	Art Unit 2195

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION													
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED								
718			102			G	0	6	F	9 / 46 (2006.01.01)									
CROSS REFERENCE(S)																			
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																		

/WISSAM RASHID/ Examiner.Art Unit 2195 (Assistant Examiner)	6/22/2015 (Date)	Total Claims Allowed: 14	
/MENG AN/ Supervisory Patent Examiner.Art Unit 2195 (Primary Examiner)	06/25/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Issue Classification 	Application/Control No. 13750696	Applicant(s)/Patent Under Reexamination ÍÑIGUEZ, ALFONSO
	Examiner WISSAM RASHID	Art Unit 2195

☐ Claims renumbered in the same order as presented by applicant								☐ CPA		☒ T.D.		☐ R.1.47			
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	12	17												
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/WISSAM RASHID/ Examiner.Art Unit 2195 (Assistant Examiner)	6/22/2015 (Date)	Total Claims Allowed: 14	
/MENG AN/ Supervisory Patent Examiner.Art Unit 2195 (Primary Examiner)	06/25/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	10	(data near2 frame) same source same destination same address same payload same (task near2 type)	US-PGPUB; USPAT	OR	ON	2015/06/22 11:10
L2	4	alfonso and (task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/06/22 11:10
L5	4	((("7159215") or ("8209702") or ("8533729") or ("8732713")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/06/22 11:16
S1	4	((("6330583") or ("7082604") or ("7174381") or ("8284206")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/25 23:19
S2	5	((("20070074207") or ("8209702") or ("20030005029") or ("20100146516") or ("20120110586")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 15:25
S3	4	fetch\$4 with task near2 pool	US-PGPUB; USPAT	OR	ON	2015/02/26 16:01
S4	1	(13/750696).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 16:06
S5	26	("2007/0074207").URPN.	USPAT	OR	ON	2015/02/26 20:32
S6	2	(router (network near2 switch)) and (task near2 pool) same (fetch\$4 pool) same (CPU coprocessor cell)	USPAT	OR	ON	2015/02/26 20:36
S7	5	(router (network near2 switch)) and (task near2 pool) same (fetch\$4 pool) same (CPU coprocessor cell)	US-PGPUB; USPAT	OR	ON	2015/02/26 20:36
S8	5	(router (network near2 switch)) and (task near2 pool) same (CPU coprocessor cell)	US-PGPUB; USPAT	OR	ON	2015/02/26 20:38
S9	9	(router (crossbar near2 switch) crossbar) and (task near2 pool) same (CPU coprocessor cell)	US-PGPUB; USPAT	OR	ON	2015/02/26 20:39
S10	31	(bus) and (task near2 pool) same (CPU coprocessor cell)	US-PGPUB; USPAT	OR	ON	2015/02/26 20:41
S11	2	(11/257761).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 20:49
S12	2	(11/238086).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 20:51
S13	4	((11/238095) or (11/238087)).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 20:55
S14	1	("7386586").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 21:33

S15	51	(process\$4 with cell) and wireless and (task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/02/26 21:54
S16	222	task near2 type same (processor cpu) near2 type	US-PGPUB; USPAT	OR	ON	2015/02/26 21:59
S17	2	search\$4 with (task near2 pool) same type	US-PGPUB; USPAT	OR	ON	2015/02/26 22:16
S18	45	search\$4 with (task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/02/26 22:16
S19	3911	task with address same type	US-PGPUB; USPAT	OR	ON	2015/02/26 22:28
S20	1339	task with address same type same (server processor cell coprocessor multiprocessor)	US-PGPUB; USPAT	OR	ON	2015/02/26 22:28
S21	18	task with address same type same (server processor cell coprocessor multiprocessor) same descriptor	US-PGPUB; USPAT	OR	ON	2015/02/26 22:28
S22	0	task near2 (pool queue) same retrieve with type	US-PGPUB; USPAT	OR	ON	2015/02/26 22:34
S24	26	("2007/0074207").URPN.	USPAT	OR	ON	2015/02/26 22:37
S25	731	(data near2 frame) same source same destination same address same payload	US-PGPUB; USPAT	OR	ON	2015/02/26 23:07
S26	10	(data near2 frame) same source same destination same address same payload same (task near2 type)	US-PGPUB; USPAT	OR	ON	2015/02/26 23:08
S27	30290	(processor cell) with communicat\$4 same frame	US-PGPUB; USPAT	OR	ON	2015/02/27 12:39
S28	47	(processor cell) with communicat\$4 same frame same (retriev\$4 fetch\$4 pull\$4 select\$4) with (task job)	US-PGPUB; USPAT	OR	ON	2015/02/27 12:40
S29	935	agent same data near2 frame	US-PGPUB; USPAT	OR	ON	2015/02/27 13:12
S30	131	agent same data near2 frame same address	US-PGPUB; USPAT	OR	ON	2015/02/27 13:13
S31	5486	(retriev\$4 fetch\$4 load\$4) with task same2 wireless	US-PGPUB; USPAT	OR	ON	2015/02/27 13:27
S32	7133	destination with source with payload	US-PGPUB; USPAT	OR	ON	2015/02/27 13:44
S33	5279	destination with source with payload same (task code data)	US-PGPUB; USPAT	OR	ON	2015/02/27 13:44
S34	2	destination with source with payload same (task job) near2 pool	US-PGPUB; USPAT	OR	ON	2015/02/27 13:45
S35	30	destination with source with payload same (memory near2 location)	US-PGPUB; USPAT	OR	ON	2015/02/27 13:46
S36	3	(task with pool) same divid\$4 with parallel	US-PGPUB; USPAT	OR	ON	2015/03/02 10:15
S37	1423	(internet near2 things)	US-PGPUB; USPAT	OR	ON	2015/03/02 15:46
S38	46	(internet near2 things) and (retriev\$4 pull\$4 fetch) with (task job)	US-PGPUB; USPAT	OR	ON	2015/03/02 15:46
S39	485	(send\$4 with agent) same (search\$4 retriev\$4) same (task job)	US-PGPUB; USPAT	OR	ON	2015/03/02 15:48
S40	97	(internet near2 things) and (data near2 frame)	US-PGPUB; USPAT	OR	ON	2015/03/02 15:50

EAST Search History

S41	158	(send\$4 with agent) same (search\$4 retriev\$4) same (task job) same (network wireless)	US-PGPUB; USPAT	OR	ON	2015/03/02 20:46
S42	39	(send\$4 receiv\$4) with file near1 transfer same (data near1 frame)	US-PGPUB; USPAT	OR	ON	2015/03/02 20:55
S43	7504	source near2 address same destination near2 address same payload	US-PGPUB; USPAT	OR	ON	2015/03/03 09:49
S44	8	(source near2 address same destination near2 address same payload) and SPU	US-PGPUB; USPAT	OR	ON	2015/03/03 09:50
S45	1	(13/750696).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/03 11:04
S46	1	S45 and (thread same task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/03/03 11:04
S47	132	dispatch\$4 with agent with (retriev\$4 fetch\$4 pull\$4 get\$4)	US-PGPUB; USPAT	OR	ON	2015/03/03 12:42
S48	33	task near2 (pool queue) same retriev\$4 with type	US-PGPUB; USPAT	OR	ON	2015/03/03 12:49
S49	26	task near2 (pool queue) same (prefetch\$4 pre-fetch\$4 (pre near1 fetch\$4))	US-PGPUB; USPAT	OR	ON	2015/03/03 12:54
S50	6689	(G06F12/0862 G06F2212/251 G06F9/3885 G06F9/5033).CPC.	US-PGPUB; USPAT	OR	ON	2015/03/03 12:58
S51	1425	internet near2 thing	US-PGPUB; USPAT	OR	ON	2015/03/03 12:58
S52	0	internet near2 thing and S50	US-PGPUB; USPAT	OR	ON	2015/03/03 12:59
S53	1425	internet near2 thing	US-PGPUB; USPAT	OR	ON	2015/03/03 12:59
S54	1500	H04W4/005.CPC.	US-PGPUB; USPAT	OR	ON	2015/03/03 13:03
S55	0	S54 and (task job) with (queue pool) with (get\$4 fetch\$4 retriev\$4 pull\$4)	US-PGPUB; USPAT	OR	ON	2015/03/03 13:04
S56	108	S53 and S54	US-PGPUB; USPAT	OR	ON	2015/03/03 13:04
S57	4	alfonso and (task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/03/03 13:05

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	8043	(G06F9/4843 G06F9/54 G06F9/5044 G06F9/544 G06F2209/5017).CPC.	US-PGPUB; USPAT; UPAD	OR	ON	2015/06/22 11:11
L4	1	L3 AND (task near2 pool same address same3 payload).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2015/06/22 11:12

6/22/2015 11:18:05 AM

C:\Users\wrashid\Documents\EAST\Workspaces\13750696.wsp

Search Notes 	Application/Control No. 13750696	Applicant(s)/Patent Under Reexamination ÍNIGUEZ, ALFONSO
	Examiner WISSAM RASHID	Art Unit 2195

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST PGPUB and USPAT database search	3/3/2015	WR
EAST and PALM inventor double patenting search	3/3/2015	WR
NPL Google Scholar search	3/3/2015	WR
CPC search G06F12/0862 G06F2212/251 G06F9/3885 G06F9/5033 H04W4/005 (limited text search)	3/3/2015	WR
EAST updated PGPUB and USPAT database search	6/22/2015	WR
EAST inventor double patenting search	6/22/2015	WR
NPL Google Scholar search	6/22/2015	WR
CPC search G06F9/4843, G06F9/54, G06F9/5044, G06F9/544, G06F2209/5017 (limited text search)	6/22/2015	WR

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
G06F	9/4843	6/22/2015	WR
G06F	9/54	6/22/2015	WR

/WISSAM RASHID/ Examiner.Art Unit 2195	
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INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
G06F	9/5044	6/22/2015	WR
G06F	9/544	6/22/2015	WR
G06F	2209/5017	6/22/2015	WR

/WISSAM RASHID/ Examiner.Art Unit 2195	
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**TERMINAL DISCLAIMER TO OBTAIN A PROVISIONAL DOUBLE PATENTING
REJECTION OVER A PENDING "REFERENCE" APPLICATION**

Docket Number (Optional)
64636-2

In re Application of: Alfonso Iniguez

Application No.: 13/750,696

Filed: January 25, 2013

For: SYSTEMS AND METHODS FOR PARALLEL PROCESSING WITH PROACTIVE SOLIDARITY CELLS

The applicant, Alfonso Iniguez, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 14/340,332, filed, July 24, 2014, as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent granted on the pending **reference** application expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 32,848

/Michael K. Kelly/ Signature	6/2/2015 Date
Michael K. Kelly Typed or printed name	
Attorney for Applicant Title	602-262-5824 Telephone Number

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Electronic Patent Application Fee Transmittal				
Application Number:		13750696		
Filing Date:		25-Jan-2013		
Title of Invention:		Parallel Processing with Proactive Solidarity Cells		
First Named Inventor/Applicant Name:		Alfonso Iñiguez		
Filer:		Michael K Kelly/Cynthia McMorro		
Attorney Docket Number:		64636-2		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Statutory or Terminal Disclaimer	1814	1	160	160

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Electronic Acknowledgement Receipt	
EFS ID:	22507113
Application Number:	13750696
International Application Number:	
Confirmation Number:	9485
Title of Invention:	Parallel Processing with Proactive Solidarity Cells
First Named Inventor/Applicant Name:	Alfonso Íñiguez
Customer Number:	129524
Filer:	Michael K Kelly
Filer Authorized By:	
Attorney Docket Number:	64636-2
Receipt Date:	02-JUN-2015
Filing Date:	25-JAN-2013
Time Stamp:	12:38:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$160
RAM confirmation Number	9478
Deposit Account	501234
Authorized User	MCMORROW, CYNTHIA C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer Filed	TerminalDisclaimer_SwarmTech_646362.pdf	190002 c3c759aeffb08646dbfb71fa6fb8c769743e0c5	no	1

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30366 34e43fc6aeccda069985dd16d9e73b057ee a1da8	no	2
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

I hereby certify that this correspondence is being filed via EFS-
Web with the United States Patent and Trademark Office on
May 29, 2015.

By: /Cynthia McMorrow/
Cynthia McMorrow

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	)	Customer No.: 129524
	)	
Alfonso Iniguez	)	Group Art Unit: 2195
	)	
Serial No.: 13/750,696	)	Examiner: Wissam Rashid
	)	
Filed: January 25, 2013	)	Confirmation No.: 9485
	)	
	)	
For: SYSTEMS AND METHODS FOR PARALLEL PROCESSING WITH PROACTIVE SOLIDARITY CELLS		

Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

RESPONSE PURSUANT TO 37 CFR 1.111

Honorable Commissioner:

In Response to the Non-Final Office Action dated March 11, 2015, please amend the
above-identified application as follows:

Amendments to the Title begin at Page 2 of this Paper;

Amendments to the Specification begin at Page 3 of this Paper;

Amendments to the Claims are reflected in the Listing of the Claims which
begins on Page 4 of this Paper; and

Remarks begin on Page 8 of this Paper.

AMENDMENTS TO THE TITLE

Please amend the title as follows:

Systems and Methods for Parallel Processing With Proactive Solidarity Cells

AMENDMENTS TO THE SPECIFICATION

Please amend Paragraph [0011] as follows:

[0011] Referring to FIGS. 1 and 2, the task pool **13** preferably occupies a region of physical memory that is addressable by the CPU **11**. Preferably, the task pool **13** is also addressable by the cells **12A . . . n**. Preferably, the task pool **13** is disposed in a dedicated hardware block to provide maximum access speed by the CPU **11** and cells **12A . . . n**. Alternatively, the task pool **13** may be software based. In this embodiment, the contents of the task pool **13** are stored in memory, as in the hardware-based embodiment, but are represented by data structures. The task pool **13** contains one or more task threads **21**. A task thread **21** represents a computational task that a component of the larger requirement imposed on the CPU **11**. In one embodiment, the CPU **11** may initialize and then populate the task pool **13** by dividing the large requirement into concurrently executable threads **21** and places the threads **21** in the task pool **13**. A thread **21** is composed of one or more tasks **22**. A task **22** may have a task type and a descriptor. The task type is an indicator that describes which solidarity cells **12A . . . n** are capable of performing the task **22**. The task pool **13** may also use the task type to prioritize tasks **22** having the same type. In one embodiment, which may be advantageous for a large-scale system **10**, the task pool **13** may maintain a prioritization table (not shown) that documents the solidarity cells **12A . . . n** present in the system **10**, the types of tasks **22** each is capable of performing, and whether or not each cell **12A . . . n** is presently processing a task **22**. The task pool **13** may use the prioritization table to determine which of the eligible tasks **22** to assign to a requesting cell **12A . . . n** as described below.

AMENDMENTS TO THE CLAIMS

Listing of the Claims:

1. **(Amended)** An apparatus for parallel processing of a large computing requirement, the apparatus comprising:
 - a) a central processing unit ("CPU");
 - b) a task pool in electronic communication with the CPU; and
 - c) a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve from the task pool, without requiring an instruction from the CPU, a matching task for the solidarity cell to process.
2. **(Original)** The apparatus of claim 1 wherein the CPU populates the task pool.
3. **(Original)** The apparatus of claim 2 wherein the CPU populates the task pool by dividing the requirement into one or more threads and placing the threads in the task pool, each thread comprising one or more tasks, and the matching task being one of the tasks.
4. **(Original)** The apparatus of claim 3 wherein the task pool notifies the CPU when the tasks of a thread are completed.
5. **(Original)** The apparatus of claim 3 wherein the tasks each comprise a task type selected from a set of task types, and wherein the first solidarity cell is configured to perform tasks of one or more of the task types.
6. **(Original)** The apparatus of claim 5 wherein the matching task is a task that is ready to be processed and has a task type that the first solidarity cell can perform.
7. **(Original)** The apparatus of claim 6 wherein the first agent retrieves the matching task by:
 - a) searching the task pool for a task that is ready to be processed and has a task type that the first solidarity cell can perform; and
 - b) identifying the matching task.
8. **(Original)** The apparatus of claim 3 wherein each task comprises a descriptor, the

- descriptor containing at least:
- a) a function to be executed; and
 - b) a memory location of data upon which the function is to be executed.
9. **(Original)** The apparatus of claim 8 wherein the matching task is a task that is ready to be processed and the function of the matching task can be performed by the first solidarity cell.
10. **(Original)** The apparatus of claim 9 wherein the first agent retrieves the matching task by searching the task pool for a task that is ready to be processed and has a function that the first solidarity cell can perform, and identifying the matching task.
11. **(Original)** The apparatus of claim 8 wherein the descriptor further contains a memory location where processed data is to be stored.
12. **(Original)** The apparatus of claim 8 wherein the descriptor is a data structure and the task contains a reference to the memory location of the descriptor.
13. **(Original)** The apparatus of claim 8 wherein the first agent is a data frame comprising:
- a) a source address;
 - b) a destination address; and
 - c) a payload.
14. **(Amended)** An apparatus for parallel processing of a large computing requirement, the apparatus comprising:
- a) a central processing unit ("CPU");
 - b) a task pool in electronic communication with the CPU; and
 - c) a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, a matching task for the solidarity cell to process;
- wherein the CPU populates the task pool by dividing the requirement into one or more threads and placing the threads in the task pool, each thread comprising one or more tasks, and the matching task being one of the tasks;
- wherein each task comprises a descriptor, the descriptor containing at least:
- a) a function to be executed; and
 - b) a memory location of data upon which the function is to be executed; and

wherein the first agent retrieves the matching task by:

- a) being dispatched by the first solidarity cell to the task pool, during which the source address is the first solidarity cell's address, the destination address is the task pool's address, and the payload comprises a list of functions the first solidarity cell is configured to perform;
 - b) searching the task pool for a task that is ready to be processed and has a function that the first solidarity cell can perform; and
 - c) returning to the first solidarity cell, during which the source address is the task pool's address, the destination address is the first solidarity cell's address, and the payload comprises the descriptor of the matching task.
15. **(Amended)** The apparatus of claim 14 wherein the task pool occupies a region of physical memory.
16. **(Original)** The apparatus of claim 15 wherein the task pool is disposed in a hardware block dedicated to the task pool.
17. **(Original)** The apparatus of claim 1 further comprising a second solidarity cell comprising a second agent that proactively retrieves matching tasks from the task pool for the second solidarity cell to process, wherein the matching task for each solidarity cell is a task in the task pool that is ready to be processed and can be performed by the solidarity cell.
18. **(Original)** The apparatus of claim 17 wherein each solidarity cell sends its agent to the task pool when the solidarity cell does not have a matching task to process.
19. **(Amended)** An apparatus for parallel processing of a large computing requirement, the apparatus comprising:
- a) a central processing unit ("CPU");
 - b) a task pool in electronic communication with the CPU;
 - c) first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, a matching task for the solidarity cell to process; and
 - d) a second solidarity cell comprising a second agent that proactively retrieves matching tasks from the task pool for the second solidarity cell to process, wherein the matching

task for each solidarity cell is a task in the task pool that is ready to be processed and can be performed by the solidarity cell;

wherein each solidarity cell sends its agent to the task pool when the solidarity cell does not have a matching task to process; and

wherein each agent comprises a source address, a destination address, and a payload, and wherein each agent retrieves a matching task by:

- a) being dispatched by its solidarity cell to the task pool, during which the source address is its solidarity cell's address, the destination address is the task pool's address, and the payload comprises a list of functions the agent's solidarity cell is configured to perform;
- b) searching the task pool for a task that is ready to be processed and has a function that the agent's solidarity cell can perform; and
- c) returning to its solidarity cell, during which the source address is the task pool's address, the destination address is the agent's solidarity cell's address, and the payload comprises a descriptor of the matching task.

20. *(Canceled)*

REMARKS

This is a complete and timely response to the non-final Office Action dated March 11, 2015. Claims 1 - 19 remain pending in the application. Claims 14 and 19 are indicated as allowable, and Claims 1-13 and 15-18 are rejected. By this Amendment, Claims 14, 15, and 19 are amended, and Claim 20 is canceled without prejudice or disclaimer. Reconsideration of Claims 1- 19 is respectfully requested in view of the foregoing amendments and the following Remarks.

I. Allowable Subject Matter

Applicant thanks Examiner Rachid for indicating that Claims 14 and 19 would be allowable if rewritten in independent form to include all of the limitations of the base and intervening claims. Claims 14 and 19 are amended herein as suggested by the Examiner, and Claim 15 is amended to depend from Claim 14. Accordingly, Claims 14, 15, 16, and 19 are now allowable.

II. Interview Summary

The undersigned thanks Examiner Rachid for the courtesies extended during the brief telephone interview conducted March 2, 2015, during which Group I (Claims 1- 19) was elected for initial prosecution. Election of Group I is hereby confirmed. Claim 20 is canceled, without prejudice or disclaimer

III. Double Patenting

At Page 6 the Office Action provisionally rejects Claim 1 on the ground of nonstatutory obviousness-type double patenting as being upatentable over Claim 1 of copending Application No. 14/340,332 in view of Bates U.S. Publication 2007/0074207. The rejection is respectfully traversed. Nonetheless, in order to advance prosecution, a terminal disclaimer in compliance with 37 CFR 1.321(c) is included herewith.

IV. Claim Rejections Under 35 U.S.C. 103

At Page 9, the Office Action rejects Claims 1-12 and 15-18 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bates U.S. Publication. 2007/0074207. At Page 16, the Office Action rejects Claim 13 under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bates in view of Sikdar U.S. Publication 2006/0026377. The rejections are respectfully traversed.

Presently known multiprocessing paradigms suffer from two major drawbacks caused by the architectural requirement that the CPU divide and distribute coprocessing threads. First, a significant amount of the CPU's processing time is consumed in managing the co-processing tasks. Second, a co-processor will remain idle as it waits for a thread to be assigned to it by the CPU. The present invention provides a multiprocessor system that alleviates the management workload on the CPU and keeps the co-processors busy by using co-processors that proactively and autonomously seek threads to process; that is, the co-processors retrieve tasks from the task pool without requiring an instruction from the CPU to do so. For example, each co-processor may include an agent that is dispatched by the co-processor to searches a task pool and acquire a task for the co-processor to perform.

FIG. 1 of the pending application is reproduced below for convenience:

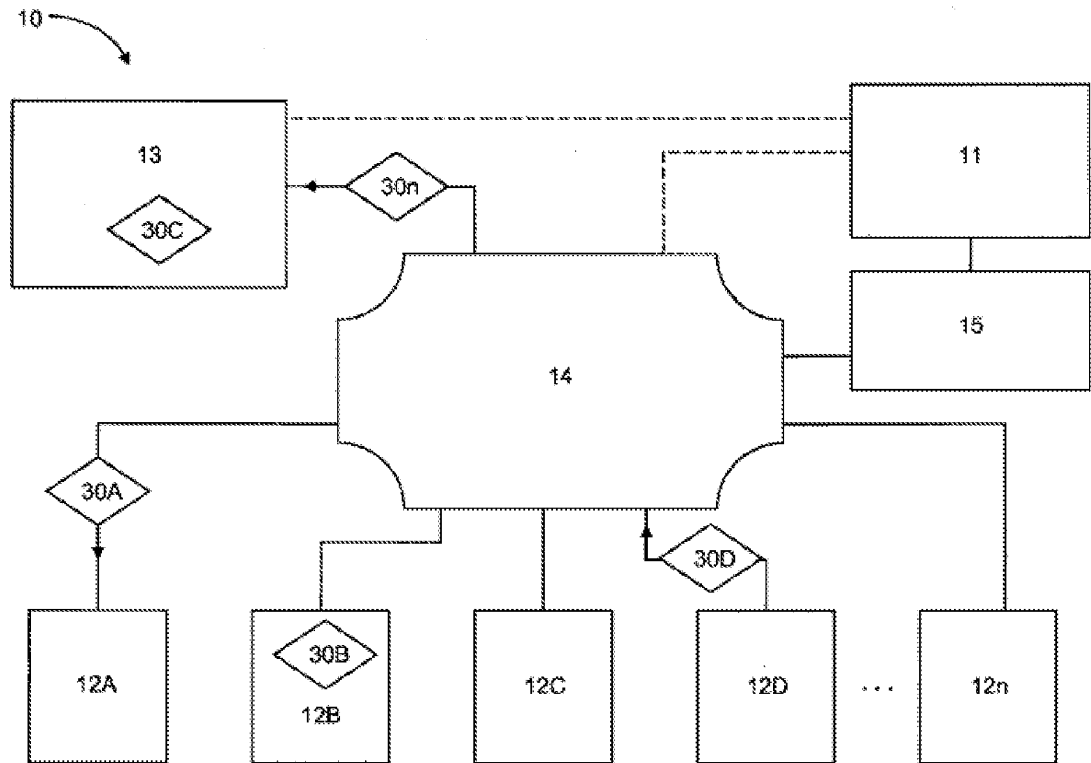


FIG. 1

In particular, a processing system 10 includes a CPU 11 and any number of solidarity cells 12. The cells 12 communicate with a task pool 13 through a switching fabric 14. The CPU 11 may also communicate with the task pool through the switching fabric. Significantly, the cells 12 act *autonomously*; that is, they may act independently of the CPU 11 or any other co-processor. In particular, *the cells 12 do not require an instruction from the CPU 11 to act*. The cells also act *proactively* in that they seek a task from the task pool *as soon as a cell becomes available to do further processing*. In an embodiment, a cell may acquire a task by sending an agent 30 to the task pool 13 to search for and retrieve an available task 22 that requires completion, is not locked, and has a task type that can be performed by the cell 12. (Applicant's Specification, Paragraph [0014]).

Each agent 30 is an autonomous representative of its corresponding solidarity cell 12. That is, an agent may be dispatched by its corresponding cell to retrieve a task any time the cell is

idle or capable of performing additional processing. In this manner, *the cells are not forced to wait idly for an instruction from the CPU 11*. This makes the system **10** more efficient than traditional computer architectures in which auxiliary modules and co-processors are dependent on instructions from the main CPU. (Applicant's Specification, Paragraph [0015]).

In contrast, Bates describes a typical prior art coprocessing regime in which the coprocessors are controlled by the main processor. FIG. 1 of Bates is reproduced below for reference:

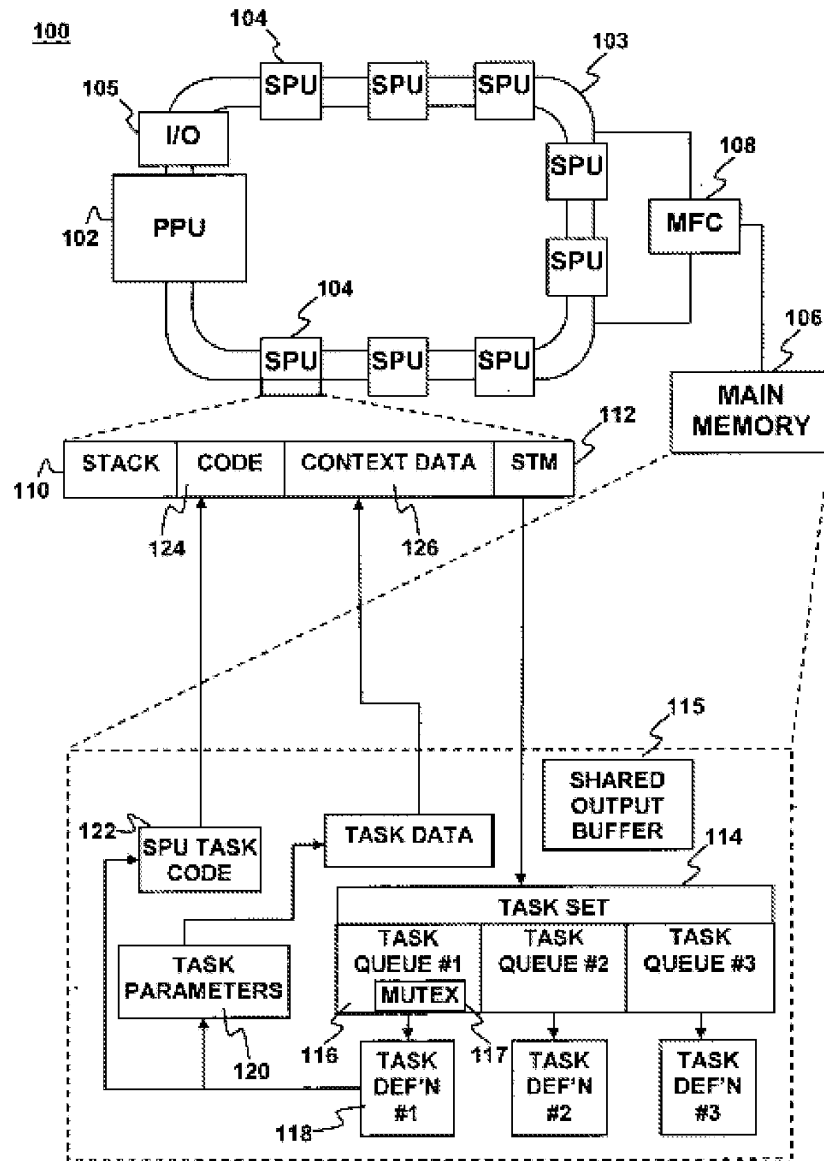


FIG. 1

The cell processor 100 includes a power processor unit (PPU) 102 and several synergistic processing units (SPU) 104. Paragraph [0033] of Bates specifically states that the “PPU 102 acts as a controller for the SPUs 104.” Moreover, when an SPU 104 has completed processing a task it may notify the PPU that a given task has been completed by either: i) assigning an ID to a task or barrier that can later be polled for completion from the PPU 102; or ii) configuring SPU

tasks to send a PPU interrupt upon finishing. Both methods involve direct communication between the PPU and SPU. (Bates, Paragraph [0059]).

As amended herein, Claim 1 specifically recites that agent is configured to proactively retrieve a task from the task pool “without requiring an instruction from the CPU.” Support for this element may be found, *inter alia*, at Paragraph [0015] of Applicant’s originally filed application (U.S. Publication 2014/0215470) Nowhere is this feature disclosed or suggested in Bates. To the contrary, the Bates task management system requires direct coordination and control of the STUs by the PPU.

With regard to the foregoing rejection under 35 U.S.C. 103, Section 2141.02 of the Manual of Patent Examining Procedure (MPEP) states that when determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983).

Neither Bates nor the other references of record, alone or in combination, disclose or suggest various elements of the pending claims including, *inter alia*:

a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve from the task pool, without requiring an instruction from the CPU, a matching task for the solidarity cell to process

as called for in Claim 1 (and Claims 2 – 13 and 17 – 18 which variously depend therefrom).

V. Conclusion

In view of the foregoing, Applicant respectfully submits that Claims 1- 19 are now in condition for allowance, and a Notice of Allowance is therefore earnestly solicited. Should the Examiner have any questions, the Examiner is encouraged to contact the undersigned at (602) 262-5824. In addition, The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. 501234 (Docket No. 64636-2).

Respectfully submitted,

Date: May 29, 2015

/Michael K. Kelly/
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I hereby certify that this correspondence is being filed via EFS-Web with the United States Patent and Trademark Office on May 29, 2015.

By: /Cynthia McMorrow/
Cynthia McMorrow

PATENT
Attorney Docket No. 64636-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	)	Customer No.: 129524
	)	
Alfonso Iniguez	)	Group Art Unit: 2195
	)	
Serial No.: 13/750,696	)	Examiner: Wissam Rashid
	)	
Filed: January 25, 2013	)	Confirmation No.: 9485
	)	
	)	
For: SYSTEMS AND METHODS FOR PARALLEL PROCESSING WITH PROACTIVE SOLIDARITY CELLS		

SUPPLEMENTAL
INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Honorable Commissioner:

Each item of information listed in the attached PTO/SB/08a, may be material to the examination of the above-identified application and is, therefore, submitted in compliance with the duty of disclosure defined in 37 CFR §§ 1.56, 1.97 and 1.98. The Examiner is requested to make these items of official record in this application.

This Information Disclosure Statement under 37 CFR §§ 1.56, 1.97 and 1.98 is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that any one or more of these items constitutes prior art.

I

This statement is filed pursuant to:

() **37 C.F.R. § 1.97(b).**

This information disclosure statement is filed either (1) within three months of the filing date of the national applications; (2) within three months of the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in an international application; or (3) before the mailing date of a first office action on the merits, whichever event occurs last.

Accordingly, this information disclosure statement requires no fee and no certification.

(XX) **37 C.F.R. §1.97(c).**

This information disclosure statement is filed after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of either (1) a final action under 37 C.F.R. §1.113 or (2) a notice of allowance under 37 C.F.R. §1.311.

Accordingly, this information disclosure statement requires either the fee specified in 37 C.F.R. §1.17(p) for submission of an information disclosure statement under 37 C.F.R. §1.97(c) (\$180), or a certification according to 37 C.F.R. §1.97(e).

() **37 C.F.R. §1.97(d).**

This information disclosure statement is filed after the period specified in 37 C.F.R. §1.97(c).

Accordingly, this information disclosure statement requires the petition fee specified in 37 C.F.R. §1.17(i) (1) to consider an information disclosure statement under 37 C.F.R. §1.97(d) (\$140), a certification according to 37 C.F.R. §1.97(e), and a petition requesting consideration of the information disclosure statement.

If this statement crossed in the mail with an Office Action, or is otherwise not in the indicated category of 37 C.F.R. §1.97, it is respectfully requested that this statement be treated in the next appropriate category and made of record. To the extent required, please treat this paper as a conditional petition for acceptance of the information disclosure statement.

II

☐ No fee is due.

☒ The fee specified in 37 C.F.R. §1.17(p) for submission of an information disclosure statement under 37 C.F.R. §1.97(c) is enclosed (\$180).

☐ The petition fee specified in 37 C.F.R. §1.17(i) (1) to consider an information disclosure statement under 37 C.F.R. §1.97(d) is enclosed (\$140).

Please charge any additional required fee or credit any overpayment to our Deposit Account Number 501234.

III

Pursuant to 37 C.F.R. §1.97(e), I certify:

☒ No certification is necessary.

☐ Each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the statement.

☐ No item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, or, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. §1.56(c), more than three months prior to the filing of the statement.

Respectfully submitted,

Date: May 29, 2015

/Michael K. Kelly
Michael K. Kelly
Registration No. 32,848

Jennings, Strouss and Salmon, PLC
One East Washington Street, Suite 1900
Phoenix, AZ 85004
Tel: 602.262.5824
Fax: 602.495.2625

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>				Complete if Known	
				Application Number	13/750,696
				Filing Date	January 25, 2013
				First Named Inventor	Alfonso Iniguez
				Art Unit	2195
				Examiner Name	Wissam Rashid
				Attorney Docket Number	64636-2
Sheet	1	of	1		

[illegible][illegible]

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.¹ Applicant's unique citation designation number (optional).² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04.³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document.⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible.⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND**

TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Electronic Patent Application Fee Transmittal				
Application Number:		13750696		
Filing Date:		25-Jan-2013		
Title of Invention:		Parallel Processing with Proactive Solidarity Cells		
First Named Inventor/Applicant Name:		Alfonso Iñiguez		
Filer:		Michael K Kelly/Cynthia McMorro		
Attorney Docket Number:		64636-2		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Total in USD (\$)				180

Electronic Acknowledgement Receipt	
EFS ID:	22482652
Application Number:	13750696
International Application Number:	
Confirmation Number:	9485
Title of Invention:	Parallel Processing with Proactive Solidarity Cells
First Named Inventor/Applicant Name:	Alfonso Íñiguez
Customer Number:	129524
Filer:	Michael K Kelly/Cynthia McMorrow
Filer Authorized By:	Michael K Kelly
Attorney Docket Number:	64636-2
Receipt Date:	29-MAY-2015
Filing Date:	25-JAN-2013
Time Stamp:	16:13:44
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$180
RAM confirmation Number	2925
Deposit Account	501234
Authorized User	MCMORROW, CYNTHIA C
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	
Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment Copy Claims/Response to Suggested Claims	ResponseOA_Swarm_Tech_646362.pdf	122714	no	14
			516a7dc498ba998d3b08653cff3554b0fc65fe52		
Warnings:					
Information:					
2	Transmittal Letter	Suppl_IDS_SwarmTech_646362.pdf	35313	no	3
			e01f2b6495725a3b16c3f140f876a95c1319514e		
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	SB08a_SwarmTechnology_646362.pdf	125303	no	1
			e39dab98b41635b03386f84d2f6592fd027ea716		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Fee Worksheet (SB06)	fee-info.pdf	30474	no	2
			10efd366bb5d72e3a1febcd69526580471577192		
Warnings:					
Information:					
Total Files Size (in bytes):			313804		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 13/750,696		Filing Date 01/25/2013		☐ To be Mailed				
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO												
APPLICATION AS FILED – PART I												
(Column 1)		(Column 2)										
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)				
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A						
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A						
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A						
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =						
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).										
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))												
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL						
APPLICATION AS AMENDED – PART II												
(Column 1)		(Column 2)		(Column 3)								
AMENDMENT	05/29/2015		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		* 19		Minus ** 20		= 0		X \$40 =		0	
	Independent (37 CFR 1.16(h))		* 3		Minus *** 3		= 0		X \$210 =		0	
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
	TOTAL ADD'L FEE										0	
(Column 1)		(Column 2)		(Column 3)								
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		*		Minus **		=		X \$ =			
	Independent (37 CFR 1.16(h))		*		Minus ***		=		X \$ =			
	☐ Application Size Fee (37 CFR 1.16(s))											
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))											
	TOTAL ADD'L FEE											
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										LIE /ADRIENE SELLMAN/		

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 13/750,696		Filing Date 01/25/2013		☐ To be Mailed	
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO										
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)							
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A	N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =	*		X \$ =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*		X \$ =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)			(Column 3)				
AMENDMENT	05/29/2015		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		* 19	Minus	** 20	= 0	X \$40 =		0	
	Independent (37 CFR 1.16(h))		* 3	Minus	***3	= 0	X \$210 =		0	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
							TOTAL ADD'L FEE		0	
(Column 1)			(Column 2)			(Column 3)				
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))		*	Minus	**	=	X \$ =			
	Independent (37 CFR 1.16(h))		*	Minus	***	=	X \$ =			
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
							TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/750,696	01/25/2013	Alfonso Íñiguez	221.0001

29906
INGRASSIA FISHER & LORENZ, P.C.
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253

CONFIRMATION NO. 9485
POWER OF ATTORNEY NOTICE



Date Mailed: 03/17/2015

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/04/2015.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/hsarwari/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/750,696	01/25/2013	Alfonso Iniguez	64636-2

CONFIRMATION NO. 9485

POA ACCEPTANCE LETTER

129524
Jennings, Strauss and Salmon, PLC
One East Washington Street, Suite 1900
Phoenix, AZ 85004-2554



Date Mailed: 03/17/2015

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/04/2015.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/hsarwari/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/750,696	01/25/2013	Alfonso Íñiguez	221.0001	9485
29906 7590 03/11/2015 INGRASSIA FISHER & LORENZ, P.C. 7010 E. COCHISE ROAD SCOTTSDALE, AZ 85253			EXAMINER RASHID, WISSAM	
			ART UNIT 2195	PAPER NUMBER
			NOTIFICATION DATE 03/11/2015	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 13/750,696	Applicant(s) INIGUEZ, ALFONSO	
	Examiner WISSAM RASHID	Art Unit 2195	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08/18/2014.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☒ An election was made by the applicant in response to a restriction requirement set forth during the interview on 02 March 2015; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 1-20 is/are pending in the application.
5a) Of the above claim(s) 20 is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-13 and 15-18 is/are rejected.
- 8) ☒ Claim(s) 14 and 19 is/are objected to.
- 9) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☒ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 1/25/2013 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) ☒ Notice of References Cited (PTO-892) | 3) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u>20150302</u> . |
| 2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date <u>1/25/2013</u> . | 4) ☐ Other: ____. |

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

2. Claims 1-20 are pending.

Election/Restrictions

3. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-19, drawn to an apparatus for parallel processing using a central processing unit and a task pool from which an agent of a solidarity cell proactively retrieves a matching task for the solidarity cell to process, classified in class 718, subclass 102.

II. Claim 20, drawn to an apparatus with a CPU, plurality of solidarity cells, a switching fabric in electronic communication with the CPU and in wireless communication with the solidarity cells and one or more of the solidarity cells is a special purpose coprocessor and the task pool prioritizes threads to be processed, classified in class 718, subclass 102.

4. During a telephone conversation with applicant's representative, Mr. Michael K. Kelley, on 03/02/2015, a provisional election was made without traverse to prosecute the invention of Group I, claims 1-19. Affirmation of this election must be made by applicant in replying to this Office action. Claim 20 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Inventions Group I and Group II are related as combination and subcombination.

Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination as claimed of Group I does not need the limitations of Group II for patentability. Specifically, the combination as claimed of Group I does not require the solidarity cells to be wireless connected to a switching fabric nor does it need the CPU to be in communication with the task pool via a switching fabric. The subcombination has separate utility such as a switching fabric in electronic communication with a CPU and in wireless communication with solidarity cells and one or more of the solidarity cells is a special purpose coprocessor and the task pool prioritizes threads to be processed.

6. The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

7. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

8. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

9. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Title

10. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Specification

11. The disclosure is objected to because of the following informalities: In paragraph [0011] of the specification, line 11 should presumably recite "...composed of ~~of~~ one or more...".

Appropriate correction is required.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

13. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

14. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

15. **Claim 1** is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claim 1 of copending Application No. 14/340332 (hereinafter ‘332) in view of Bates et al. (U.S. Pat. App. Pub. 2007/0074207, hereinafter “Bates”).

Examiner respectfully submits the relevant portions of MPEP §§ 804(II)(B)(1) and 804(II)(B)(1)(a) with emphasis added for purposes of convenience in discussion and illustration:

MPEP § 804(II)(B)(1) Obviousness-Type

Any obviousness-type double patenting rejection should make clear:

- (A) The differences between the inventions defined by the conflicting claims — a claim in the patent compared to a claim in the application; and
- (B) The reasons why a person of ordinary skill in the art would conclude that the invention defined in the claim at issue >is anticipated by, or< would have been an obvious variation of >,< the invention defined in a claim in the patent.

MPEP § 804(II)(B)(1)(a) One-Way Obviousness

If the application at issue is the later filed application or both are filed on the same day, only a one-way determination of obviousness is needed in resolving the issue of double patenting, i.e., whether the invention defined in a claim in the application would have been >anticipated by, or< an obvious variation of >,< the invention defined in a claim in the patent. See, e.g., *In re Berg*, 140 F.3d 1438, 46 USPQ2d 1226 (Fed. Cir. 1998) (the court applied a one-way test where both applications were filed the same day). If a claimed invention in the application would have been obvious over a claimed invention in the patent, there would be an unjustified timewise extension of the patent and an obvious-type double patenting rejection is proper. Unless a claimed invention in the application would have been >anticipated by, or< obvious over a claimed

invention in the patent, no double patenting rejection of the obvious-type should be made, but this does not necessarily preclude a rejection based on another type of nonstatutory double patenting (see MPEP § 804, paragraph II.B.2. below).

It is noted that the instant application is a parent application ‘332. The differences between the claimed inventions encompass replacement of the recitation of the limitations in the claims and they appear to be substantially the same or duplicate or in some instances obvious variations over one another. Specifically, the main difference between the inventions defined by the conflicting claims is that the claim of the instant application is claiming an apparatus for parallel processing of a large computing requirement that comprises a central processing unit (CPU) in communication with a task pool, whereas the claim of ‘332 is claiming a processing system where a controller populates the task pool with a first task. It is well-known in the art that an apparatus claims and system claim are both hardware and when the limitations between the two claims are similar would be obvious to implement as a system or apparatus as they are both either machines or manufacture. Also, Bates teaches **“a large computing requirement”** as well as a **“controller configured to populate the task pool with a first task”** (*paragraph [0033] lines 1-2 where the PPU acts as the "controller", paragraph [0036] lines 6-10, where tasks are added to the task queue, the task queue corresponding to "task pool", paragraph [0010] lines 1-6, where the program is designed so that parts of it can run concurrently corresponds to "large computing requirement"*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bates into ‘332 to include a controller to populate a task pool with a task. The modification would be obvious because one of ordinary skill in the art would be motivated to queue the tasks that have been designed to run concurrently

in task queues so that as processors become available they can retrieve the tasks from the queue thereby providing an efficient task allocation.

Therefore, the functions performed by Claim 1 of the instant application are obvious over Claim 1 of '332 and as such are unpatentable for obviousness-type double patenting.

It is also noted that Claims 2 and 5 of the instant application and certain limitations of Claims 1 and 3 of '332 are substantially identical.

Claim 1 of the instant application is shown in the table below with Claim 1 of '332 with the differences boldfaced for the Applicant's convenience.

Copending Application 14/340332	Instant Application 13/750696
1. A processing system, comprising: a task pool; a controller configured to populate the task pool with a first task; and a first co-processor configured to proactively retrieve the first task from the task pool.	1. An apparatus for parallel processing of a large computing requirement, the apparatus comprising: a) a central processing unit ("CPU"); b) a task pool in electronic communication with the CPU; and c) a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, a matching task for the solidarity

	cell to process.
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This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

16. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 1-12 and 15-18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bates et al. (U.S. Pat. App. Pub. 2007/0074207).

18. With respect to Claim 1, Bates substantially teaches the invention as claimed including: an apparatus for parallel processing (*Abstract, paragraph [0052] lines 1-4, 13-15*), the apparatus comprising:

a) a central processing unit ("CPU") (*paragraph [0033] and Fig. 1 label 102, where the PPU corresponds to the "CPU"*);

b) a task pool in electronic communication with the CPU (*paragraph [0036] lines 2-4, where each task queue corresponds to “a task pool” and paragraph [0034] lines 1-3 where the CPU communicates with main memory over an EIB bus, the EIB bus corresponding to the “electronic communication”, the task queue resides in the main memory, paragraph [0036] lines 15-18 where the PPU polls the task queue to check completion of tasks. The polling occurs over the EIB bus*); and

c) a first solidarity cell in electronic communication with the task pool (*paragraph [0034] lines 1-3, paragraph [0035] lines 1-4, paragraph [0041] lines 1-3, the SPU corresponds to “a first solidarity cell”, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, a matching task for the solidarity cell to process (paragraph [0035] lines 4-6, paragraph [0042] lines 5-6, paragraph [0057], where the SPU Task Manager (STM) corresponds to the “first agent”, the STM retrieves a number of Task Definitions from the task queue, the STM searches a matching task that has code affinity with the SPU, i.e., an affinity with SPU code already loaded. The matching task is then selected and processed*).

Bates does not specifically disclose a large computing requirement.

However, Bates teaches a prior art technique of designing programs with threaded parts that can execute concurrently and independent of each other (*paragraph [0010] lines 1-6, hereinafter “Prior Art”*).

One of ordinary skill in the art at the time the invention was made would have recognized the ability to utilize the teachings of the Prior Art system for designing programs that can execute parts of the program independently and threaded such that the parts can run concurrently. The

teachings of the Prior Art, when implemented in the Bates system, will allow one of ordinary skill in the art to enable the PPU's to populate the separate task queues with the parts of the program that can run concurrently. One of ordinary skill in the art would be motivated to utilize the teachings of the Prior Art in the Bates system in order to efficiently execute tasks by concurrently running tasks in SPU's by allowing the SPU's to retrieve tasks from task queues that have the tasks prioritized in order of their concurrency. Therefore, the examiner concludes it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to arrive at the above-claimed invention.

19. With respect to Claim 2, Bates teaches: wherein the CPU populates the task pool (*paragraph [0036] lines 9-10, where the PPU corresponds to the CPU, and task queue corresponds to "task pool" and the tasks added to the task queue corresponds to "populates the task pool"*).

20. With respect to Claim 3, Bates teaches: wherein the CPU populates the task pool placing the task in the task pool and the matching task being one of the tasks (*paragraph [0036], the task queue elements corresponds to "tasks", paragraph [0038] lines 1-3 and [0057] where the task definitions are searched by the STM to check if there is code affinity with a code that is currently loaded in the SPU, i.e., a task that has code affinity with the SPU than it is a matched task*)

Bates does not specifically teach dividing the requirement into one or more threads and placing the threads in the task pool and each thread has one or more tasks.

However, Bates teaches a prior art technique of dividing the requirement into one or more threads and each thread has parts that can execute independently of other parts (*paragraph [0010] lines 1-6, hereinafter "Prior Art2"*). Bates further teaches placing tasks in a task queue (*paragraph [0036] lines 9-10*)

One of ordinary skill in the art at the time the invention was made would have recognized the ability to utilize the teachings of the Prior Art2 system for designing programs that can execute parts of the program independently and place them in task pools. One of ordinary skill in the art would be motivated to utilize the teachings of the Prior Art2 system in the Bates system of placing tasks in a task queue in order to efficiently manage task by concurrently running tasks in SPU's by allowing the SPU's to retrieve tasks from task queues that have the tasks prioritized in order of their concurrency. Therefore, the examiner concludes it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to arrive at the above-claimed invention.

21. With respect to Claim 4, Bates teaches: wherein the task pool notifies the CPU when the tasks of a thread are completed (*paragraph [0059], [0053] lines 7-9, where the memory barrier resides in the task queue, that memory barrier is polled by the PPU to check for completion*).

22. With respect to Claim 5, Bates teaches: wherein the tasks each comprise a task type selected from a set of task types, and wherein the first solidarity cell is configured to perform tasks of one or more of the task types (*paragraph [0046] lines 1-3, paragraph [0038] lines 1-12, where each tasks specifies different I/O sizes and SPU task code requirements, paragraph*

[0057], where a SPU code that is already loaded in the local store of the SPU configures the SPU/solidarity cell to perform a task from the task queue that requires that same SPU code, for efficiencies realized by implementing code affinity techniques a task that matches the SPU's ability with respect to which code is loaded in its local store will be selected).

23. With respect to Claim 6, Bates teaches: wherein the matching task is a task that is ready to be processed and has a task type that the first solidarity cell can perform (*paragraph [0057], paragraph [0039] lines 10-13, where tasks in the queue are ready to be processed*).

24. With respect to Claim 7, Bates teaches: wherein the first agent retrieves the matching task by:

a) searching the task pool for a task that is ready to be processed and has a task type that the first solidarity cell can perform (*paragraph [0057], for efficiencies realized by code affinity practices, the STM searches the task definitions for tasks that require code that is already loaded in the SPU local store, paragraph [0039] lines 10-13, tasks in queues are ready to be processed, the priority dictates the "readiness" with respect to a lower priority task to be processed. i.e., the higher the priority the more "ready" the task is to be processed*); and b) identifying the matching task (*paragraph [0057], paragraph [0039] lines 10-13*).

25. With respect to Claim 8, Bates teaches: wherein each task comprises a descriptor (*paragraph [0036] lines 4-6, where the task element corresponds to "task" and the task definition corresponds to "descriptor"*), the descriptor containing at least:

- a) a function to be executed (*paragraph [0038] lines 2-3, 11-12, where SPU code corresponds to the “function” to be executed*); and
- b) a memory location of data upon which the function is to be executed (*paragraph [0038] lines 1-2, 7-8, 11-12, where the input address of task data is specified, the SPU code processes the task data*).

26. With respect to Claim 9, Bates teaches: wherein the matching task is a task that is ready to be processed and the function of the matching task can be performed by the first solidarity cell (*paragraph [0057], [0039] lines 10-12, tasks in higher priority tasks queue that require the same SPU code loaded in the local store of the SPU are matching tasks for “code affinity” efficiency realization purposes. The tasks are in the task queue, they are ready for processing.*).

27. With respect to Claim 10, Bates teaches: wherein the first agent retrieves the matching task by searching the task pool for a task that is ready to be processed and has a function that the first solidarity cell can perform, and identifying the matching task (*id.*).

28. With respect to Claim 11, Bates teaches: wherein the descriptor further contains a memory location where processed data is to be stored (*paragraph [0038] lines 1-3, 5-8, where the address of output data is included in the task definition as a task parameter*).

29. With respect to Claim 12, Bates teaches: wherein the descriptor is a data structure (*paragraph [0040] lines 1-3 and Table 1, task definition corresponds to “descriptor”*) and the

task contains a reference to the memory location of the descriptor (*paragraph [0036] lines 4-5, the task queue elements corresponds to "tasks" and they include pointers to the task definitions, the task definitions corresponds to the "descriptor"*).

30. With respect to Claim 15, Bates teaches: wherein the task pool occupies a region of physical memory (*Fig. 1 and paragraph [0036] lines 1-4 where the task queues reside in main memory*).

31. With respect to Claim 16, Bates teaches: wherein the task pool is disposed in a hardware block dedicated to the task pool (*id. where the task set corresponds to the "hardware block" dedicated to the task pool, each task queue resides in the task set portion of the main memory, therefore the task set is the "hardware block" that is dedicated to the task queue*).

32. With respect to Claim 17, Bates teaches: a second solidarity cell comprising a second agent that proactively retrieves matching tasks from the task pool for the second solidarity cell to process, wherein the matching task for each solidarity cell is a task in the task pool that is ready to be processed and can be performed by the solidarity cell (*Fig. 1 illustrates a plurality of SPUs, a SPU corresponds to a "solidarity cell", paragraph [0035] lines 1-6 where each SPU have their own SPU Task Manager (STM), the STM corresponds to the "agent". Considering a plurality of SPU's are described, there resides a first, second-N number of solidarity cells and agents. Each agent can retrieve matching tasks from the task pool, see e.g. paragraph [0041] lines 1-3, [0057] and [0039] lines 10-12 where the ready tasks are in the task queues, and the task that*

requires a code that is already loaded in the SPU is selected. The SPUs retrieve tasks when they run out, paragraph [0042] lines 5-7. Furthermore, with independent tasks, the performance scales linearly with the number of SPUs (paragraph [0042] lines 1-5. The SPU also skips task definitions that have already been taken by other SPUs, see e.g. paragraph [0044] lines 4-5. Therefore, each SPU is retrieving, matching tasks.).

33. With respect to Claim 18, Bates teaches wherein each solidarity cell sends its agent to the task pool when the solidarity cell does not have a matching task to process (*paragraph [0041] lines 1-3 and paragraph [0058]*).

34. Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bates et al. (U.S. Pat. App. Pub. 2007/0074207) in view of Sikdar et al. (U.S. Pat. App. Pub. 2006/0026377).

35. With respect to Claim 13, Bates teaches a first agent (*paragraph [0035], the STM corresponds to first agent*). Bates does not specifically teach: a data frame comprising:

- a) a source address;
- b) a destination address; and
- c) a payload.

However, Sikdar teaches: a data frame (*paragraph [0095] line 3 where TCP packet corresponds to "data frame"*) comprising:

- a) a source address (*paragraph [0095] line 6*) ;

- b) a destination address (*paragraph [0095] line 7*); and
- c) a payload (*paragraph [0095] lines 8-9*).

One of ordinary skill in the art at the time the invention was made would have recognized the ability to utilize the teachings of Sikdar for including source and destination addresses to data frame packets with payloads. The teachings of Sikdar, when implemented in the Bates system, will allow one of ordinary skill in the art to incorporate a network enabled communication system where SPU's are connected to task queues and PPU's via a network. One of ordinary skill in the art would be motivated to utilize the teachings of Sikdar in the Bates system in order to take advantage of processing resources that are distributed in a network and not just the ones constrained in one physical machine thereby improving processing efficiency by allowing SPU's in the network to load tasks in another machine that matches a code affinity criteria for the SPU. Therefore, the examiner concludes it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to arrive at the above-claimed invention.

Allowable Subject Matter

36. Claims 14 and 19 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

Citation of Pertinent Art

37. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Inoue et al. (U.S. Pat. App. Pub. 2005/0188372): A processor and sub processing

units that each have local memory and invokes a task copy from shared memory to local memory of the sub-processing unit.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WISSAM RASHID whose telephone number is (571)270-3758. The examiner can normally be reached on Monday through Friday, 7:30 - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WISSAM RASHID/
Examiner, Art Unit 2195

Notice of References Cited	Application/Control No. 13/750,696	Applicant(s)/Patent Under Reexamination IÑIGUEZ, ALFONSO	
	Examiner WISSAM RASHID	Art Unit 2195	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0188372	08-2005	Inoue et al.	718/100
*	B	US-2007/0074207	03-2007	Bates et al.	718/001
*	C	US-2006/0026377	02-2006	Sikdar et al.	711/170
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
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	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
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	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Xtremweb: A generic global **computing** system

G Fedak, C Germain, V Neri... - ... **Computing** and the Grid, ..., 2001 - [ieeexplore.ieee.org](#)
 ... **task** identifier refers the **task** for all the subsequent operations (scheduling, accounting, and result **retrieving**). ... Scheduler The scheduler has the responsibility of **get-**ting a bag of **tasks** done ...
 a Web interface : to submit **tasks**, follow the progression of the **tasks**, **retrieve** the results ...
 Cited by 410 Related articles All 15 versions Cite Save

PVM: Parallel virtual machine: a users' guide and tutorial for networked parallel **computing**

A Geist - 1994 - [books.google.com](#)
 ... electronic or mechanical means (including photocopying, recording, or information storage and **retrieval**) without permission ... To **retrieve** the postscript file you can use one of the following methods:
 • anonymous ... edge turn to MPPs and parallel processing in order to **get** the most ...
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An enabling framework for master-worker applications on the **computational** grid

JP Goux, S Kulkarni, J Linderoth... - ... Distributed **Computing**, ..., 2000 - [ieeexplore.ieee.org](#)
 ... resource management software to signal changes in the state of the **computational** resources ...
 the resource management facilities provided by the Condor high-throughput **computing** system
 [19 ... 0 **get-userinfo** (int argc, char *argv []) - Processes arguments and does basic setup ...
 Cited by 291 Related articles All 15 versions Cite Save

Cloud **computing** and grid **computing** 360-degree compared

I Foster, Y Zhao, I Raicu, S Lu - Grid **Computing** Environments ..., 2008 - [ieeexplore.ieee.org](#)
 ... usage while at the same time, ensuring that data element information can be **retrieved** fast and ...
 Nimbus provides two levels of guarantees: 1) quality of life: users **get** exactly the (software ... For
 instance, Linda [1] defines a set of coordination primitives to put and **retrieve** tuples from ...
 Cited by 2232 Related articles All 7 versions Cite Save

The effects of interruptions, **task** complexity, and information presentation on **computer-**supported decision-making performance

C Speier, I Vessey, JS Valacich - Decision Sciences, 2003 - Wiley Online Library
 ... The problem area for simple **tasks** involved capacity planning over a six-month time horizon (see Umanath, Scamell, & Das, 1990). Each simple **task** consisted of six questions presented as separate screens within a **computer** simulation. ...
 Cited by 274 Related articles All 8 versions Cite Save

Overview of the ImageCLEF 2006 photographic **retrieval** and object annotation **tasks**

P Clough, M Grubinger, T Deselaers, A Hanbury... - ... Information Retrieval, 2007 - Springer
 ... support for spatial queries was provided), the level of semantic knowledge required to **retrieve** relevant images ... The **retrieved** images at higher ranks appeared random and further relevant images were only found by ... Overview of the ImageCLEF 2006 Photographic **Retrieval** 591 ...
 Cited by 66 Related articles All 19 versions Cite Save

Apparatus and method for optimizing the performance of **computer tasks** using multiple intelligent agents having varied degrees of domain knowledge

JP Bigus, BJ Cragun, HR Delp - US Patent 6,192,354, 2001 - Google Patents
 ... The apparatus of claim 11, wherein the agent manager is configured to **retrieve** information for ...
 For data mining applications, the **computer tasks** may be the indexing or **retrieval** of desired ...
 configured to handle a common general **computer task** (eg, "buy a car", "**get** me everything ...
 Cited by 94 Related articles All 2 versions Cite Save

Task-technology fit and individual performance

DL Goodhue, RL Thompson - MIS quarterly, 1995 - JSTOR
 ... found that even though they have positive attitudes toward Personal **Computers** (PCs) and ... Characteristics of the individual (training, **computer** experience, motivation) could affect how easily ... new dimensions addressing the extent to which IS meets user **task** needs: having ...
 Cited by 2937 Related articles All 11 versions Cite Save

A characterization of performance by men and women in a virtual Morris water **task**:: A large and reliable sex difference

RS Astur, ML Ortiz, RJ Sutherland - Behavioural brain research, 1998 - Elsevier

... Moreover, there is evidence that species which utilize spatial memory to **retrieve** food or eggs ... are not due to motivational, sensory, or motor differences interacting with the **computer** program. ...

A black and white picture of the computerized Morris water **task** with the virtual **pool** in ...

Cited by 381 Related articles All 12 versions Cite Save

QoS guided min-min heuristic for grid **task** scheduling

XS He, XH Sun, G Von Laszewski - ... of Computer Science and Technology, 2003 - Springer

... The scheduler in the Grid environment needs to consider application and QoS constraints to **get** a better match between applications and resources. ... CT_{ij} is the expected **computing** time of **task** i on host j . $CT_{\sim j}$ can be computed or we assume that it can be **retrieved** from some ...

Cited by 417 Related articles All 14 versions Cite Save

Search Notes 	Application/Control No. 13750696	Applicant(s)/Patent Under Reexamination ÍNIGUEZ, ALFONSO
	Examiner WISSAM RASHID	Art Unit 2195

CPC- SEARCHED		
Symbol	Date	Examiner
G06F12/0862	3/10/2015	WR
G06F2212/251	3/3/2015	WR
G06F9/3885	3/3/2015	WR
G06F9/5033	3/3/2015	WR
H04W4/005	3/3/2015	WR

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST PGPUB and USPAT database search	3/3/2015	WR
EAST and PALM inventor double patenting search	3/3/2015	WR
NPL Google Scholar search	3/3/2015	WR
CPC search G06F12/0862 G06F2212/251 G06F9/3885 G06F9/5033 H04W4/005 (limited text search)	3/3/2015	WR

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/WISSAM RASHID/ Examiner.Art Unit 2195	
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L7	7504	source near2 address same destination near2 address same payload	US-PGPUB; USPAT	OR	ON	2015/03/03 09:49
L8	8	(source near2 address same destination near2 address same payload) and SPU	US-PGPUB; USPAT	OR	ON	2015/03/03 09:50
L9	1	(13/750696).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/03/03 11:04
L10	1	L9 and (thread same task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/03/03 11:04
L11	132	dispatch\$4 with agent with (retriev\$4 fetch\$4 pull\$4 get\$4)	US-PGPUB; USPAT	OR	ON	2015/03/03 12:42
L12	33	task near2 (pool queue) same retriev\$4 with type	US-PGPUB; USPAT	OR	ON	2015/03/03 12:49
L13	26	task near2 (pool queue) same (prefetch\$4 pre-fetch\$4 (pre near1 fetch\$4))	US-PGPUB; USPAT	OR	ON	2015/03/03 12:54
L14	6689	(G06F12/0862 G06F2212/251 G06F9/3885 G06F9/5033).CPC.	US-PGPUB; USPAT	OR	ON	2015/03/03 12:58
L16	1425	internet near2 thing	US-PGPUB; USPAT	OR	ON	2015/03/03 12:58
L17	0	internet near2 thing and l14	US-PGPUB; USPAT	OR	ON	2015/03/03 12:59
L18	1425	internet near2 thing	US-PGPUB; USPAT	OR	ON	2015/03/03 12:59
L20	1500	H04W4/005.CPC.	US-PGPUB; USPAT	OR	ON	2015/03/03 13:03
L21	0	l20 and (task job) with (queue pool) with (get\$4 fetch\$4 retriev\$4 pull\$4)	US-PGPUB; USPAT	OR	ON	2015/03/03 13:04
L22	108	l18 and l20	US-PGPUB; USPAT	OR	ON	2015/03/03 13:04
L23	4	alfonso and (task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/03/03 13:05
S1	4	((("6330583") or ("7082604") or ("7174381") or ("8284206"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/25 23:19
S2	5	((("20070074207") or ("8209702") or ("20030005029") or ("20100146516") or ("20120110586"))).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 15:25
S3	4	fetch\$4 with task near2 pool	US-PGPUB; USPAT	OR	ON	2015/02/26 16:01
S4	1	(13/750696).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 16:06
S5	26	("2007/0074207").URPN.	USPAT	OR	ON	2015/02/26 20:32

S6	2	(router (network near2 switch)) and (task near2 pool) same (fetch\$4 pool) same (CPU coprocessor cell)	USPAT	OR	ON	2015/02/26 20:36
S7	5	(router (network near2 switch)) and (task near2 pool) same (fetch\$4 pool) same (CPU coprocessor cell)	US-PGPUB; USPAT	OR	ON	2015/02/26 20:36
S8	5	(router (network near2 switch)) and (task near2 pool) same (CPU coprocessor cell)	US-PGPUB; USPAT	OR	ON	2015/02/26 20:38
S9	9	(router (crossbar near2 switch) crossbar) and (task near2 pool) same (CPU coprocessor cell)	US-PGPUB; USPAT	OR	ON	2015/02/26 20:39
S10	31	(bus) and (task near2 pool) same (CPU coprocessor cell)	US-PGPUB; USPAT	OR	ON	2015/02/26 20:41
S11	2	(11/257761).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 20:49
S12	2	(11/238086).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 20:51
S13	4	((11/238095) or (11/238087)).APP.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 20:55
S14	1	("7386586").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2015/02/26 21:33
S15	51	(process\$4 with cell) and wireless and (task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/02/26 21:54
S16	222	task near2 type same (processor cpu) near2 type	US-PGPUB; USPAT	OR	ON	2015/02/26 21:59
S17	2	search\$4 with (task near2 pool) same type	US-PGPUB; USPAT	OR	ON	2015/02/26 22:16
S18	45	search\$4 with (task near2 pool)	US-PGPUB; USPAT	OR	ON	2015/02/26 22:16
S19	3911	task with address same type	US-PGPUB; USPAT	OR	ON	2015/02/26 22:28
S20	1339	task with address same type same (server processor cell coprocessor multiprocessor)	US-PGPUB; USPAT	OR	ON	2015/02/26 22:28
S21	18	task with address same type same (server processor cell coprocessor multiprocessor) same descriptor	US-PGPUB; USPAT	OR	ON	2015/02/26 22:28
S22	0	task near2 (pool queue) same retrieve with type	US-PGPUB; USPAT	OR	ON	2015/02/26 22:34
S24	26	("2007/0074207").URPN.	USPAT	OR	ON	2015/02/26 22:37
S25	731	(data near2 frame) same source same destination same address same payload	US-PGPUB; USPAT	OR	ON	2015/02/26 23:07
S26	10	(data near2 frame) same source same destination same address same payload same (task near2 type)	US-PGPUB; USPAT	OR	ON	2015/02/26 23:08
S27	30290	(processor cell) with communicat\$4 same frame	US-PGPUB; USPAT	OR	ON	2015/02/27 12:39
S28	47	(processor cell) with communicat\$4 same frame same (retriev\$4 fetch\$4 pull\$4 select\$4) with (task job)	US-PGPUB; USPAT	OR	ON	2015/02/27 12:40
S29	935	agent same data near2 frame	US-PGPUB;	OR	ON	2015/02/27

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			USPAT			13:12
S30	131	agent same data near2 frame same address	US-PGPUB; USPAT	OR	ON	2015/02/27 13:13
S31	5486	(retriev\$4 fetch\$4 load\$4) with task same2 wireless	US-PGPUB; USPAT	OR	ON	2015/02/27 13:27
S32	7133	destination with source with payload	US-PGPUB; USPAT	OR	ON	2015/02/27 13:44
S33	5279	destination with source with payload same (task code data)	US-PGPUB; USPAT	OR	ON	2015/02/27 13:44
S34	2	destination with source with payload same (task job) near2 pool	US-PGPUB; USPAT	OR	ON	2015/02/27 13:45
S35	30	destination with source with payload same (memory near2 location)	US-PGPUB; USPAT	OR	ON	2015/02/27 13:46
S36	3	(task with pool) same divid\$4 with parallel	US-PGPUB; USPAT	OR	ON	2015/03/02 10:15
S37	1423	(internet near2 things)	US-PGPUB; USPAT	OR	ON	2015/03/02 15:46
S38	46	(internet near2 things) and (retriev\$4 pull\$4 fetch) with (task job)	US-PGPUB; USPAT	OR	ON	2015/03/02 15:46
S39	485	(send\$4 with agent) same (search\$4 retriev\$4) same (task job)	US-PGPUB; USPAT	OR	ON	2015/03/02 15:48
S40	97	(internet near2 things) and (data near2 frame)	US-PGPUB; USPAT	OR	ON	2015/03/02 15:50
S41	158	(send\$4 with agent) same (search\$4 retriev\$4) same (task job) same (network wireless)	US-PGPUB; USPAT	OR	ON	2015/03/02 20:46
S42	39	(send\$4 receiv\$4) with file near1 transfer same (data near1 frame)	US-PGPUB; USPAT	OR	ON	2015/03/02 20:55

EAST Search History (Interference)

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3/ 3/ 2015 1:07:50 PM

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Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

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	Filing Date			
	First Named Inventor			
	Art Unit		2195	
	Examiner Name		Wissam Rashid	
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/W.R./	2	7082604		2006-07-25	Schneiderman			
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	First Named Inventor			
	Art Unit		2195	
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(Not for submission under 37 CFR 1.99)

Application Number	13750696
Filing Date	
First Named Inventor	
Art Unit	2195
Examiner Name	Wissam Rashid
Attorney Docket Number	

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<i>Index of Claims</i> 	Application/Control No. 13750696	Applicant(s)/Patent Under Reexamination ÍÑIGUEZ, ALFONSO
	Examiner WISSAM RASHID	Art Unit 2195

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant			☐ CPA			☐ T.D.			☐ R.1.47		
CLAIM		DATE									
Final	Original	03/03/2015									
	1	✓									
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CONFIRMATION NO. 9485

SERIAL NUMBER 13/750,696	FILING or 371(c) DATE 01/25/2013 RULE	CLASS 718	GROUP ART UNIT 2195	ATTORNEY DOCKET NO. 221.0001	
APPLICANTS INVENTORS Alfonso Iñiguez, Mesa, AZ; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED *** SMALL ENTITY ** 02/15/2013					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and /WISSAM RASHID/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY AZ	SHEETS DRAWINGS 2	TOTAL CLAIMS 20 INDEPENDENT CLAIMS 2
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TITLE Parallel Processing with Proactive Solidarity Cells					
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Application Number	13/750,696
Filing Date	25 January 2013
First Named Inventor	Alfonso Iniguez
Title	Parallel Processing With Proactive Solidarity Cells
Art Unit	2195
Examiner Name	Rashid, Wissam
Attorney Docket Number	64636-2

SIGNATURE of Applicant or Patent Practitioner

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Name	Michael K. Kelly	Registration Number	32,848
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Firm or Individual Name				
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City	State	Zip		
Country				
Telephone	Email			

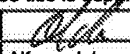
I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

--

- ☐ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☐ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	3/2/2015
Name	Alfonso Iniguez		
Title	Inventor		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☒ Total of 2 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	21674066
Application Number:	13750696
International Application Number:	
Confirmation Number:	9485
Title of Invention:	Parallel Processing with Proactive Solidarity Cells
First Named Inventor/Applicant Name:	Alfonso Íñiguez
Customer Number:	29906
Filer:	Michael K Kelly/Cynthia McMorro
Filer Authorized By:	Michael K Kelly
Attorney Docket Number:	221.0001
Receipt Date:	04-MAR-2015
Filing Date:	25-JAN-2013
Time Stamp:	15:15:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	TransPOA_AlfonsoIniguez_646362.pdf	194377 36bb59a47fc73b08b3e3d3f4fbbd7342da59e0c7	no	2

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	13/750,696
Filing Date	25 January 2013
First Named Inventor	Alfonso Iniguez
Title	Parallel Processing With Proactive Solidarity Cells
Art Unit	2195
Examiner Name	Rashid, Wissam
Attorney Docket Number	64636-2

SIGNATURE of Applicant or Patent Practitioner

Signature	/Michael K. Kelly/	Date (Optional)	4 March 2015
Name	Michael K. Kelly	Registration Number	32,848
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



*Total of 2 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

13/750,696

25 January 2013

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)



I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

129524

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



The address associated with the above-mentioned Customer Number

OR



The address associated with Customer Number:

OR

Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):



Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

3/2/2015

Name

Afonso Iniguez

Title

Inventor

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.



Total of 2 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	21674484
Application Number:	13750696
International Application Number:	
Confirmation Number:	9485
Title of Invention:	Parallel Processing with Proactive Solidarity Cells
First Named Inventor/Applicant Name:	Alfonso Íñiguez
Customer Number:	29906
Filer:	Michael K Kelly/Cynthia McMorro
Filer Authorized By:	Michael K Kelly
Attorney Docket Number:	221.0001
Receipt Date:	04-MAR-2015
Filing Date:	25-JAN-2013
Time Stamp:	15:29:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	TransPOA_AlfonsoIniguez_646362.pdf	267579 96484789bbclacdb56bea612e3b6b2f7b9fa1919	no	2

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

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UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/750,696	01/25/2013	Alfonso Iniguez	221.0001

29906
INGRASSIA FISHER & LORENZ, P.C.
7010 E. COCHISE ROAD
SCOTTSDALE, AZ 85253

CONFIRMATION NO. 9485
POA ACCEPTANCE LETTER



Date Mailed: 08/25/2014

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/18/2014.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/masfaw/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/750,696	01/25/2013	Alfonso Iniguez	149350.00003

CONFIRMATION NO. 9485

POWER OF ATTORNEY NOTICE



26707
QUARLES & BRADY LLP
Attn: IP Docket
RENAISSANCE ONE
TWO NORTH CENTRAL AVENUE
PHOENIX, AZ 85004-2391

Date Mailed: 08/25/2014

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 08/18/2014.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/masfaw/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	13/750,696
Filing Date	2013-01-25
First Named Inventor	Alfonso Iniguez
Title	Parallel Processing with Proactive Solidarity Cells
Art Unit	2195
Examiner Name	Wissam Rashid
Attorney Docket Number	221.0001

SIGNATURE of Applicant or Patent Practitioner

Signature	/MICHAEL K. KELLY/	Date (Optional)	2014-08-18
Name	Michael K. Kelly	Registration Number	32,848
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			
NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.			
☒ *Total of <u>2</u> forms are submitted.			

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

- ☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:
- OR**
- ☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

- ☒ The address associated with the above-mentioned Customer Number
- OR**

- ☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

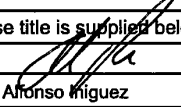
I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Alfonso Iniguez

- ☒ Inventor or Joint Inventor (title not required below)
- ☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- ☐ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- ☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	8/13/14
Name	Alfonso Iniguez		
Title	Inventor		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☒ Total of 2 forms are submitted.

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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	19887319
Application Number:	13750696
International Application Number:	
Confirmation Number:	9485
Title of Invention:	Parallel Processing with Proactive Solidarity Cells
First Named Inventor/Applicant Name:	Alfonso Íñiguez
Customer Number:	26707
Filer:	Michael K Kelly/Caron Poole
Filer Authorized By:	Michael K Kelly
Attorney Docket Number:	149350.00003
Receipt Date:	18-AUG-2014
Filing Date:	25-JAN-2013
Time Stamp:	17:05:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	20140818_POA_2210001.pdf	232083 0592ff531a88d933aa0bbe8e9b422863b252b153	no	2

Warnings:

Information:

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New International Application Filed with the USPTO as a Receiving Office

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/750,696	01/25/2013	Alfonso Ifiguez	149350.00003

CONFIRMATION NO. 9485

26707

QUARLES & BRADY LLP

Attn: IP Docket

RENAISSANCE ONE

TWO NORTH CENTRAL AVENUE

PHOENIX, AZ 85004-2391

PUBLICATION NOTICE



OC000000069930938

Title:Parallel Processing with Proactive Solidarity Cells

Publication No.US-2014-0215470-A1

Publication Date:07/31/2014

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/750,696	01/25/2013	Alfonso Iniguez	149350.00003

CONFIRMATION NO. 9485

POA ACCEPTANCE LETTER

26707
QUARLES & BRADY LLP
Attn: IP Docket
RENAISSANCE ONE
TWO NORTH CENTRAL AVENUE
PHOENIX, AZ 85004-2391



Date Mailed: 05/06/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/25/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/snguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/750,696	01/25/2013	Alfonso Iniguez	724-002

33354
ETHERTON LAW GROUP, LLC
2010 E. University Drive, Suite 25
Tempe, AZ 85281

CONFIRMATION NO. 9485
POWER OF ATTORNEY NOTICE



Date Mailed: 05/06/2013

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/25/2013.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/snguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Print Form

PTO/SB/61 (11-08)

Approved for use through 11/30/2011. OMB 0651-0035

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	13/750,696
	Filing Date	January 25, 2013
	First Named Inventor	Alfonso INIGUEZ
	Title	Parallel Processing with Proactive Solidarity Cells
	Art Unit	2183
	Examiner Name	TBA
	Attorney Docket Number	149350.00003

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

26707

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified application to:

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OR

☐ The address associated with Customer Number:

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Address

City

State

Zip

Country

Telephone

Email

I am the:

☒ Applicant/Inventor.

OR

☐ Assignee of record of the entire interest. See 37 CFR 3.71.

Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature		Date	4/25/2013
Name	Alfonso Iniguez	Telephone	480 734 3071
Title and Company	Inventor		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☒ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	15612035
Application Number:	13750696
International Application Number:	
Confirmation Number:	9485
Title of Invention:	Parallel Processing with Proactive Solidarity Cells
First Named Inventor/Applicant Name:	Alfonso Íñiguez
Customer Number:	33354
Filer:	Benjamin David Tietgen/Cheryl Bobb
Filer Authorized By:	Benjamin David Tietgen
Attorney Docket Number:	724-002
Receipt Date:	25-APR-2013
Filing Date:	25-JAN-2013
Time Stamp:	14:28:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	POA.pdf	64462 19a326b0ca8c86f95caf3f2d2cb65178eebe4a5c	no	1

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/750,696	01/25/2013	Alfonso A#A±iguez	724-002

33354
ETHERTON LAW GROUP, LLC
2010 E. University Drive, Suite 25
Tempe, AZ 85281

CONFIRMATION NO. 9485
POA ACCEPTANCE LETTER



Date Mailed: 02/22/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/25/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/eerido/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 13/750,696				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	98		N/A				
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	310		N/A				
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	125		N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	20	minus 20 = *	x 31	= 0.00	OR					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *	x 125	= 0.00						
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00						
			TOTAL	533		TOTAL				
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										



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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
13/750,696	01/25/2013	2183	533	724-002	20	2

CONFIRMATION NO. 9485

33354
ETHERTON LAW GROUP, LLC
2010 E. University Drive, Suite 25
Tempe, AZ 85281

FILING RECEIPT



OC000000059364315

Date Mailed: 02/22/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Alfonso Íñiguez, Mesa, AZ;

Applicant(s)

Alfonso Íñiguez, Mesa, AZ;

Power of Attorney: The patent practitioners associated with Customer Number 33354

Domestic Applications for which benefit is claimed - None.

A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 02/15/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/750,696**

Projected Publication Date: 07/31/2014

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Parallel Processing with Proactive Solidarity Cells

Preliminary Class

712

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER**Title 35, United States Code, Section 184****Title 37, Code of Federal Regulations, 5.11 & 5.15****GRANTED**

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set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PTO/AIA/01 (06-12)

Approved for use through 01/31/2014. OMB 0651-0032

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Parallel Processing with Active Solidarity Cells
--------------------	--

As the below named inventor, I hereby declare that:

This declaration is directed to: ☒ The attached application, or ☐ United States application or PCT international application number _____ filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

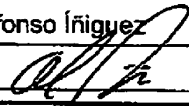
I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Alfonso Iniguez Date (Optional): 01/21/2013

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor		
	Art Unit		
	Examiner Name		
	Attorney Docket Number		

U.S.PATENTS							Remove	
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	6330583		2001-12-11	Reiffin			
	2	7082604		2006-07-25	Schneiderman			
	3	7174381		2007-02-06	Gulko et al.			
	4	8284206		2012-10-09	State			
If you wish to add additional U.S. Patent citation information please click the Add button.							Add	
U.S.PATENT APPLICATION PUBLICATIONS							Remove	
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Published Application citation information please click the Add button.							Add	
FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² j	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor			
	Art Unit			
	Examiner Name			
	Attorney Docket Number			

	1							☐
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If you wish to add additional Foreign Patent Document citation information please click the Add button **Add**

NON-PATENT LITERATURE DOCUMENTS								Remove
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
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	1		☐
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If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE			
---------------------------	--	--	--

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	
Art Unit	
Examiner Name	
Attorney Docket Number	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

- ☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	
Name/Print		Registration Number	

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		Parallel Processing with Proactive Solidarity Cells		
First Named Inventor/Applicant Name:		Alfonso Iñiguez		
Filer:		Benjamin David Tietgen		
Attorney Docket Number:		724-002		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	98	98
Utility Search Fee	2111	1	310	310
Utility Examination Fee	2311	1	125	125
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				533

Electronic Acknowledgement Receipt	
EFS ID:	14798026
Application Number:	13750696
International Application Number:	
Confirmation Number:	9485
Title of Invention:	Parallel Processing with Proactive Solidarity Cells
First Named Inventor/Applicant Name:	Alfonso Íñiguez
Customer Number:	33354
Filer:	Benjamin David Tietgen
Filer Authorized By:	
Attorney Docket Number:	724-002
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Application Data Sheet	724-002_ADS.pdf	1442134 413958196e68cb806e983462a890435821a db9db	no	6
Warnings:					
Information:					
2		724-002_Full_App.pdf	105932 d040ec6610ab10c59deb36acb5f9f7d1167c 2aa5	yes	14
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	10	
	Claims		11	13	
	Abstract		14	14	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	724-002_Figs.pdf	59243 8c9a9000928e49b223c478deb0db68b38a 65ac48	no	2
Warnings:					
Information:					
4	Oath or Declaration filed	724-002_Declaration_Signed. pdf	79484 822d991628df6dda6dbb7c798393870a9f b04d4	no	1
Warnings:					
Information:					
5	Power of Attorney	724-002_POA.pdf	116872 a7c0ddf659fa39a25962b46f6accdc03a783 54d5	no	2
Warnings:					
Information:					
6	Information Disclosure Statement (IDS) Form (SB08)	724-002_IDS.pdf	611477 c953786d630b5d2cc4f4f79b0e69c5b5cda8 a13a	no	4
Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	32690 f742d6902d7ab3e439d371aaf4edbe2c17d 44cbb	no	2
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	724-002
		Application Number	
Title of Invention	Parallel Processing with Proactive Solidarity Cells		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

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Application Information:

Title of the Invention	Parallel Processing with Proactive Solidarity Cells		
Attorney Docket Number	724-002	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	2	Suggested Figure for Publication (if any)	1

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	724-002
		Application Number	
Title of Invention	Parallel Processing with Proactive Solidarity Cells		

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☐	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐	Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Prior Application Status		Remove	
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	724-002
		Application Number	
Title of Invention	Parallel Processing with Proactive Solidarity Cells		

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	724-002
		Application Number	
Title of Invention	Parallel Processing with Proactive Solidarity Cells		

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	724-002
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Title of Invention	Parallel Processing with Proactive Solidarity Cells		

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TITLE

Parallel Processing with Proactive Solidarity Cells

FIELD OF INVENTION

[0001] This invention relates to parallel-process computing. This invention relates particularly to a method and apparatus that facilitates parallel processing of computing tasks using autonomous co-processors that proactively seek tasks to perform.

BACKGROUND

[0002] Parallel processing is a computational approach that breaks a large computational requirement into a group of smaller computations for concurrent resolution across the computer's processing resources. A computer that uses task parallelism divides the large requirement into tasks that contain segments of executable code. The tasks are then executed concurrently or sequentially according to their needs, until the large requirement has been fully processed. In a multiprocessor system, the computer includes a central processing unit ("CPU") that is tasked with performing the large requirement. The CPU divides the requirement into tasks and distributes the tasks to co-processors. Completed threads are reported to the CPU, which continues to distribute threads until the primary processing is complete.

[0003] This typical multiprocessing framework suffers from two major drawbacks, both caused by the architectural requirement that the CPU divide and distribute the threads. First, a significant amount of the CPU's processing time is consumed in managing the co-processing tasks. The management may include: distributing the tasks, in sequential order when needed, to co-processors according to their capabilities; waiting for tasks to be completed before distributing result-dependent threads; responding to interrupts from co-processors every time a task is completed; and responding to other messages from co-processors. Second, a co-processor will remain idle as it waits for a thread to be assigned to it by the CPU. A multiprocessor system that alleviates the management workload on the CPU while keeping the co-processors busy is needed.

[0004] Therefore, it is an object of this invention to provide an apparatus and method for parallel processing in a multiprocessor system using co-processors that

proactively seek threads to process. It is a further object that the co-processors be capable of acting autonomously. It is a further object that the co-processors include an agent that searches a task pool to acquire tasks for the co-processors to perform. It is a further object that the co-processors work in solidarity to complete a large computational requirement by processing threads and subtasks.

SUMMARY OF THE INVENTION

[0005] A method and apparatus for processing information in parallel uses autonomous computer processing units, referred to herein as solidarity cells, to process instructions intended to be executed by a central processing unit ("CPU"). A solidarity cell may be a general- or special-purpose processor, and therefore may have the same or different instruction set architecture and microarchitecture compared to the CPU and other solidarity cells in the apparatus. As with any computer system, the information to be processed is contained within one or more memory units. The CPU divides the information into one or more tasks. A task may include task threads, which each contain one or more subtasks to be performed. The CPU transmits the tasks to a task pool. Each solidarity cell in the system is connected, physically or wirelessly, to the task pool through a switching fabric. The switching fabric facilitates connections for data transfer and arbitration between all system resources. Each solidarity cell is proactive, in that it obtains a task to perform by sending its agent to the task pool when the solidarity cell has no processing to perform. The agent is a software module that searches the task pool for available tasks that match the cell's instruction set architecture. The solidarity cells may execute the task threads sequentially or in parallel, and independently or collaboratively, depending on recipes provided by the CPU. Interdependent tasks within the task pool may be logically combined as needed by the recipe. The task pool notifies the CPU when a task thread is completed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Fig. 1 is a diagram of the preferred embodiment of the present inventive apparatus.

[0007] Fig. 2 is a diagram of a task pool implemented according to the preferred embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0008] Referring to Fig. 1, there is illustrated the preferred embodiment of a parallel processing system 10 for performing computing tasks, such as data-intensive computations and complex programs and algorithms. Examples of data-intensive computations include, without limitation: data encryption functions; graphic processing; direct memory access; mathematical computations; ethernet packet processing, including construction, reception and transmission of data to the outside world; processes within search engines and other web applications; and execution of internal or external software programs. The system 10 may be implemented in any present or later-developed computer architecture, with the below-described inventive aspects incorporated into or supplemented by parallel processing strategies and solutions currently known in the art. For example, common parallel processing concerns such as synchronization, cache coherency, and main processor interrupts may be adequately addressed as is known in the art without compromise to the inventive system 10. The system 10 has at least one CPU 11 and one or more solidarity cells 12A, B, C, D...n, hereinafter referred to collectively as solidarity cells 12A...n to indicate that the system 10 may have any number n of solidarity cells, that cooperate to perform the computing tasks ascribed to the system 10. The solidarity cells 12A...n communicate with a task pool 13, preferably through a switching fabric 14. The solidarity cells 12A...n may further communicate with each other through the switching fabric 14 or through a separate cell bus (not shown). The CPU 11 may communicate with the task pool 13 directly or through the switching fabric 14 as shown. One or more memory units 15 contain data and instructions to perform computations. The memory units 15 may be connected to the switching fabric 14 so they may be accessed by the CPU 11 and solidarity cells 12A...n. The CPU 11 may access the memory units 15 directly, without going through the switching fabric 14.

The CPU 11 may be any CPU conventionally used to satisfy the computing needs of the environment in which the system 10 is implemented. That is, the system 10 may be implemented on a personal computer, in which case the CPU 11 may be any personal computer central processor or processor cluster, such as an Intel® Pentium® or multi-core processor. Or, the system 10 may be implemented on a supercomputer and the CPU 11 may be a reduced instruction set computer ("RISC") processor or a microcontroller. Or, the

system 10 may be implemented on a locally connected series of personal computers, such as a Beowulf cluster, in which case the CPU 11 may include the central processors of all, a subset, or one of the networked computers. Or, the system 10 may be implemented on a network of remotely connected computers, in which case the CPU 11 may be now known or later developed central processor for a server or mainframe. The ability of the CPU 11 to perform the inventive parallel processing methods within the presently described system 10 depends on the CPU's 11 operating system. Specifically, the CPU 11 is a suitable CPU for the system 10 if its operating system may be programmed to recognize and communicate with the task pool 13 and divide computing requirements into threads as described below. The system 10 implementations described herein are therefore not limiting. In fact, it is contemplated that the system 10 may be implemented, even retroactively, on any computer or computer network having an operating system that may be modified to perform the described functions. As is known in the art, the information to be processed is contained within the memory units 15, which may be addressed regions of random access or read-only memory, cache memory for the CPU 11, or other forms of data storage such as flash memory and magnetic storage. The memory units 15 contain the data to be processed as well as the location to place the results of the processed data.

[0009] A solidarity cell 12A...n is an independent computational unit capable of executing one or more tasks. The solidarity cell 12A...n may be a microcontroller, a microprocessor, or a standalone computer such as a machine in a Beowulf cluster. Preferably, the solidarity cell 12A...n is a general- or special-purpose coprocessor configured to supplement the functions of the CPU 11. A general-purpose coprocessor may be capable of performing all of the functions of the CPU 11, and may perform all of the functions or a limited range of functions as needed by the architecture of the system 10. A special-purpose processor may be a dedicated hardware module designed to perform a specialized task, or it may be a general-purpose processor configured to perform specialized tasks such as graphics processing, floating-point arithmetic, or data encryption. In the preferred embodiment, any solidarity cell 12A...n that is a special-purpose processor is also configured to access and write to memory and execute descriptors, as described below, as well as other software programs. Most preferably, there is a plurality of solidarity cells 12A...n, and there may be any number of solidarity

cells 12A...n, that creates a heterogeneous computing environment populated by different types of specialized co-processors that may not be directly compatible, such as if the co-processors have differing instruction set architectures, but are utilized by the system 10 to most efficiently process the large requirement.

[0010] Each cell 12A...n is capable of performing one or a set of specialized tasks. The system 10 may include a plurality of cells capable of performing the same tasks, to create redundancy in the system 10. The set of tasks performed by a given cell 12A...n may be a subset of the set of tasks performed by another cell in the system. For example, in Fig. 1, the system 10 divides a computing problem into tasks of a first type, a second type, and a third type; a first cell 12A is capable of performing only tasks of the first type; a second cell 12B can perform tasks of the second type; a third cell 12C can perform tasks of the third type; a fourth cell 12D can perform tasks of the second or third types; and a fifth cell 12N can perform all three task types. The system 10 may be configured with this redundancy so that if a given cell is removed from the system 10, the system 10 will continue to function seamlessly. Furthermore, if a given cell is dynamically added to the system 10, then the system 10 will continue to functions seamlessly with the benefit of increased performance, assuming that the added cell is capable of performing task types in the system 10. The cells 12A...n are capable of autonomously fetching, moving, and processing data contained in the memory units 15.

[0011] Referring to Figs. 1 and 2, the task pool 13 preferably occupies a region of physical memory that is addressable by the CPU 11. Preferably, the task pool 13 is also addressable by the cells 12A...n. Preferably, the task pool 13 is disposed in a dedicated hardware block to provide maximum access speed by the CPU 11 and cells 12A...n. Alternatively, the task pool 13 may be software based. In this embodiment, the contents of the task pool 13 are stored in memory, as in the hardware-based embodiment, but are represented by data structures. The task pool 13 contains one or more task threads 21. A task thread 21 represents a computational task that a component of the larger requirement imposed on the CPU 11. In one embodiment, the CPU 11 may initialize and then populate the task pool 13 by dividing the large requirement into concurrently executable threads 21 and places the threads 21 in the task pool 13. A thread 21 is composed of one or more tasks 22. A task 22 may have a task type and a descriptor. The task type is an indicator

that describes which solidarity cells 12A...n are capable of performing the task 22. The task pool 13 may also use the task type to prioritize tasks 22 having the same type. In one embodiment, which may be advantageous for a large-scale system 10, the task pool 13 may maintain a prioritization table (not shown) that documents the solidarity cells 12A...n present in the system 10, the types of tasks 22 each is capable of performing, and whether or not each cell 12A...n is presently processing a task 22. The task pool 13 may use the prioritization table to determine which of the eligible tasks 22 to assign to a requesting cell 12A...n as described below.

[0012] The descriptor may contain one or more of a specific instruction to be executed, a mode of execution, the location of the data to be processed, and the location for placement of the results, if any. The location for placement of results is optional, such as in the case of animation and multimedia tasks that simply present results to a display rather than storing them in memory units 15. Task 22 descriptors may be chained together, as in a linked list, so that the data to be processed may be accessed with fewer memory calls than if the descriptors were not chained together. In the preferred embodiment, the descriptor is a data structure containing a header and a plurality of reference pointers to memory locations, and the task 22 includes the memory address of the data structure. The header defines the function or instruction to execute. A first pointer references the location of the data to be processed. A second, optional pointer references the location for placement of processed data. If the descriptor is linked to another descriptor to be sequentially executed, the descriptor includes a third pointer that references the next descriptor. In an alternative embodiment where the descriptor is a data structure, the task 22 may include the full data structure.

[0013] A thread 21 may further comprise a "recipe" describing the order in which the tasks 22 should be performed and any conditions that affect the order of performance. According to the recipe, the tasks 22 may be executed sequentially, concurrently, interdependently, or conditionally according to Boolean operations. For example, in Fig. 2 thread 21A comprises four tasks: a first task 22A must be completed before a second task 22B and a third task 22C can begin; according to the recipe, once either the second task 22B or third task 22C is complete, the fourth task 22D may begin. Threads 21 may also be interdependent. For example, in Fig. 2, due to the Boolean operation in thread 21B, a

completed task 22C may allow processing of tasks in thread 21B to continue. The task pool 13 may lock a task 22 while the task 22 is waiting for completion of another task 22 on which it depends. When a task 22 is locked, it cannot be acquired by a solidarity cell 12A...n as described below. When the tasks 22 of a thread 21 are completed, the task pool 13 may notify the CPU 11 of the completion. It is then the CPU's 11 responsibility to advance processing beyond the completed thread 21.

[0014] The cells 12A...n maintain solidarity with each other and with the CPU 11, in that the cells 12A...n are capable of helping the system 10 perform complex computations by autonomously and proactively seeking labor within the task pool 13. The cells 12A...n act autonomously in that they may act independently of the CPU 11 or any other co-processor. In particular, the cells 12A...n do not require an instruction from the CPU 11 to act. The cells 12A...n act proactively in that they seek a task 22 from the task pool 13 as soon as the cells 12A...n become available to do further processing. To acquire a task 22, a cell 12A sends an agent 30A to the task pool 13 to search for and retrieve an available task 22 that requires completion, is not locked, and has a task type that can be performed by the cell 12A. An agent 30A, B, C, D...n, hereinafter collectively referred to as agent 30A...n to indicate that the system 10 has the same number of agents as solidarity cells 12A...n, may be considered a data frame in the networking sense. It contains a source address, a destination address, and a payload. The source and destination addresses may serve two functions. First, the addresses guide transmission of the agent 30A...n. The destination address is the address of the task pool 13 when the agent 30A...n is seeking a task 22, and is the address of the corresponding cell 12A...n when the agent 30A...n is returning with a task 22. Correspondingly, the source address is the address of the cell 12A...n when the agent 30A...n is seeking a task 22, and is the address of the task pool 13 when the agent 30A...n is returning with a task 22. Second, the addresses may serve the purpose of frame synchronization. That is, the system 10 may include a method, such as those known in the art, to unequivocally differentiate addresses from payload data, so that when the contents of the agent 30A...n are read, the destination address indicates the beginning of the frame and the source address indicates the end of the frame, or vice versa. This allows the payload to vary in size when it is physically placed between the addresses. In another embodiment of a variable-size payload, the agent 30A...n may

include a header that indicates the payload size. The header information may be compared to the payload to verify the data integrity. In still another embodiment, the payload may be a fixed length. When the agent 30A...n is dispatched to the task pool 13, the payload contains identifying information of the types of tasks the corresponding cell 12A...n can perform. When the agent 30A...n returns from the task pool 13, the payload contains the descriptor of the task 22, either in the form of a memory location or the full descriptor data structure.

[0015] The agents 30A...n are autonomous representatives of their corresponding solidarity cells 12A...n. That is, the agents 30A...n may be dispatched by their corresponding cells 12A...n to retrieve a task 22 any time the cell is idle or capable of performing additional processing. In this manner, the solidarity cells 12A...n are not forced to wait idly for an instruction from the CPU 11. This makes the system 10 more efficient than traditional computer architectures in which auxiliary modules and co-processors are dependent on instructions from the main CPU. Further, the solidarity cells 12A...n are not concerned about the composition of the thread 21 itself. An agent is only concerned about finding a match between the capabilities of its corresponding cell and the available tasks 22 to be completed in the task pool 13. As long as there are available tasks 22 in the task pool 13, and an available task 22 matches the capability of the cell, then the cell will always be working. The solidarity cells 12A...n may work fully independently of each other, or may communicate with each other directly, through the switching fabric 14, or through the task pool 13, to invoke another solidarity cell to post-process, move, or transmit data.

[0016] In one embodiment, the agent 30A may search for a match between the task type of the ready tasks 22 and the set of tasks that the cell 12A is able to perform. However, this architecture requires a particular hard-coding of the types of tasks that the CPU 11 will create. Thus, if the task pool 13 contains three types of tasks 22, and the large requirement include a task of a fourth type, this task may not be placed in the task pool 13 even if a cell capable of performing tasks of the fourth type is included in or added to the system 10. In this embodiment, the CPU 11 must be taught to create tasks of the fourth type in order to utilize all available resources in the system. In another embodiment, the agent 30A searches the task 22 descriptors for an executable instruction that matches one of the instructions that that cell 12A is capable of executing. When a matching task 22 is

found, the agent 30A delivers the descriptor of the matching task 22 to the cell 12A, which begins to process the task 22. In the preferred embodiment, the agent 30A delivers the memory address of the descriptor, and the cell 12A retrieves the data structure from memory. Alternatively, where the descriptor's entire data structure is contained in the task 22, the agent 30A may deliver the complete data structure to the cell 12A for processing. The descriptor tells the cell 12A which instruction to execute, the location in memory units 15 of the data to be processed, and the location in memory units 15 for placing the results. Upon completion of the task 22, the cell 12A notifies the task pool 13 to change the status of the selected task 22 from 'to be completed' to 'completed.' Further, once the cell 12A finishes a task 22, it dispatches its agent 30A to the task pool 13 to seek another task 22.

[0017] Agents 30A...n travel through the system 10 by wire or wirelessly, such as by a wi-fi network or Bluetooth® pairing, according to the system 10 architecture. The agent 30A...n may reach the task pool 13 wirelessly provided that the task pool 13 includes a receptor and the solidarity cell 12A...n includes a transmitter. Similarly, the task pool 13 may answer wirelessly to the solidarity cells 12A...n provided that the task pool 13 includes a transmitter and the solidarity cell 12A...n includes a receiver. In this manner, it is conceivable to have a system 10 in which the cells 12A...n communicate wirelessly with the task pool 13 with or without the switching fabric 14. Preferably, however, a switching fabric 14 is used. The switching fabric 14 facilitates connections for data transfer and arbitration between all system 10 resources. The switching fabric 14 may be a router or crossbar switch that provides connectivity between each solidarity cell 12A...n and the task pool 13. The switching fabric 14 may further provide connectivity between each solidarity cell 12A...n and system resources such as the CPU 11, memory units 15, and traditional system components including, without limitation: direct memory access units, transmitters, hard disks and their controllers, display and other input/output devices, and other co-processors. The cells 12A...n may be connected physically to the switching fabric 14, or the cells 12A...n may be connected wirelessly provided the cells 12A...n and switching fabric 14 are equipped with transmitters and receivers as described above.

[0018] The wireless connection of cells 12A...n into the system 10 allows the dynamic incorporation or removal of cells for use in the system 10. For example, the CPU 11 may recruit cells from other solidarity cell systems, allowing for dynamic expansion and

increased performance. In this manner, two or more solidarity cell systems may share solidarity cells. In one embodiment, a solidarity cell that becomes idle may look for another system that has available processing tasks to be completed. Similarly, the system 10 may expand performance by incorporating clusters of additional cells for a particular task. For example, the system 10 increases performance of an encryption function by incorporating a nearby idle set of encryption-computation solidarity cells. In an alternative embodiment, the solidarity cells 12A...n may connect directly to the task pool 13, such as by a wired configuration that does not require a switching fabric 14 to handle communications. The wired connection of cells 12A...n may also allow for expansion and contraction of the system 10, although not as dynamically as with a wireless configuration because the system 10 components must be physically integrated or extracted. In either case, scalability of the system is greatly enhanced over conventional parallel processing schemes, as co-processors may be added and removed without reprogramming the CPU 11 to account for the changes to the system 10.

[0019] While there has been illustrated and described what is at present considered to be the preferred embodiment of the present invention, it will be understood by those skilled in the art that various changes and modifications may be made and equivalents may be substituted for elements thereof without departing from the true scope of the invention. Therefore, it is intended that this invention not be limited to the particular embodiment disclosed, but that the invention will include all embodiments falling within the scope of the appended claims.

CLAIMS

I claim:

1. An apparatus for parallel processing of a large computing requirement, the apparatus comprising:
 - a) a central processing unit ("CPU");
 - b) a task pool in electronic communication with the CPU; and
 - c) a first solidarity cell in electronic communication with the task pool, the first solidarity cell comprising a first agent configured to proactively retrieve, from the task pool, a matching task for the solidarity cell to process.
2. The apparatus of claim 1 wherein the CPU populates the task pool.
3. The apparatus of claim 2 wherein the CPU populates the task pool by dividing the requirement into one or more threads and placing the threads in the task pool, each thread comprising one or more tasks, and the matching task being one of the tasks.
4. The apparatus of claim 3 wherein the task pool notifies the CPU when the tasks of a thread are completed.
5. The apparatus of claim 3 wherein the tasks each comprise a task type selected from a set of task types, and wherein the first solidarity cell is configured to perform tasks of one or more of the task types.
6. The apparatus of claim 5 wherein the matching task is a task that is ready to be processed and has a task type that the first solidarity cell can perform.
7. The apparatus of claim 6 wherein the first agent retrieves the matching task by:
 - a) searching the task pool for a task that is ready to be processed and has a task type that the first solidarity cell can perform; and
 - b) identifying the matching task.
8. The apparatus of claim 3 wherein each task comprises a descriptor, the descriptor containing at least:
 - a) a function to be executed; and
 - b) a memory location of data upon which the function is to be executed.

9. The apparatus of claim 8 wherein the matching task is a task that is ready to be processed and the function of the matching task can be performed by the first solidarity cell.
10. The apparatus of claim 9 wherein the first agent retrieves the matching task by searching the task pool for a task that is ready to be processed and has a function that the first solidarity cell can perform, and identifying the matching task.
11. The apparatus of claim 8 wherein the descriptor further contains a memory location where processed data is to be stored.
12. The apparatus of claim 8 wherein the descriptor is a data structure and the task contains a reference to the memory location of the descriptor.
13. The apparatus of claim 8 wherein the first agent is a data frame comprising:
 - a) a source address;
 - b) a destination address; and
 - c) a payload.
14. The apparatus of claim 13 wherein the first agent retrieves the matching task by:
 - a) being dispatched by the first solidarity cell to the task pool, during which the source address is the first solidarity cell's address, the destination address is the task pool's address, and the payload comprises a list of functions the first solidarity cell is configured to perform;
 - b) searching the task pool for a task that is ready to be processed and has a function that the first solidarity cell can perform; and
 - c) returning to the first solidarity cell, during which the source address is the task pool's address, the destination address is the first solidarity cell's address, and the payload comprises the descriptor of the matching task.
15. The apparatus of claim 1 wherein the task pool occupies a region of physical memory.
16. The apparatus of claim 15 wherein the task pool is disposed in a hardware block dedicated to the task pool.
17. The apparatus of claim 1 further comprising a second solidarity cell comprising a second agent that proactively retrieves matching tasks from the task pool for the

second solidarity cell to process, wherein the matching task for each solidarity cell is a task in the task pool that is ready to be processed and can be performed by the solidarity cell.

18. The apparatus of claim 17 wherein each solidarity cell sends its agent to the task pool when the solidarity cell does not have a matching task to process.
19. The apparatus of claim 18 wherein each agent comprises a source address, a destination address, and a payload, and wherein each agent retrieves a matching task by:
 - a) being dispatched by its solidarity cell to the task pool, during which the source address is its solidarity cell's address, the destination address is the task pool's address, and the payload comprises a list of functions the agent's solidarity cell is configured to perform;
 - b) searching the task pool for a task that is ready to be processed and has a function that the agent's solidarity cell can perform; and
 - c) returning to its solidarity cell, during which the source address is the task pool's address, the destination address is the agent's solidarity cell's address, and the payload comprises a descriptor of the matching task.
20. An apparatus for parallel processing of a large computing requirement, the apparatus comprising:
 - a) a central processing unit ("CPU");
 - b) a switching fabric in electronic communication with the CPU;
 - c) one or more memory units in electronic communication with the switching fabric;
 - d) a task pool in electronic communication with the switching fabric and configured to receive, from the CPU, and prioritize threads to be processed, the threads comprising one or more tasks; and
 - e) a plurality of solidarity cells in wireless electronic communication with the switching fabric, each solidarity cell comprising an agent configured to retrieve, from the task pool, a task that matches the solidarity cell's capabilities when the solidarity cell has no processing to perform;wherein one or more of the solidarity cells further comprises a special-purpose coprocessor.

ABSTRACT

A method and apparatus for processing information in parallel uses autonomous computer processing cells to perform tasks needed by a central processing unit. Each cell in the system is connected through a switching fabric, which facilitates connections for data transfer and arbitration between all system resources. A cell has an agent, which is a software module that may be transferred through the switching fabric to a task pool containing the tasks. The agent searches within the task pool for available tasks that match the cell's instruction type. A task may be broken into threads that are to be executed sequentially or independently depending on recipes constructed by the central processing unit. Interdependent tasks within the task pool may be logically combined as needed by the recipe. A notification is sent from the task pool to the central processing unit when a task or task thread is completed.

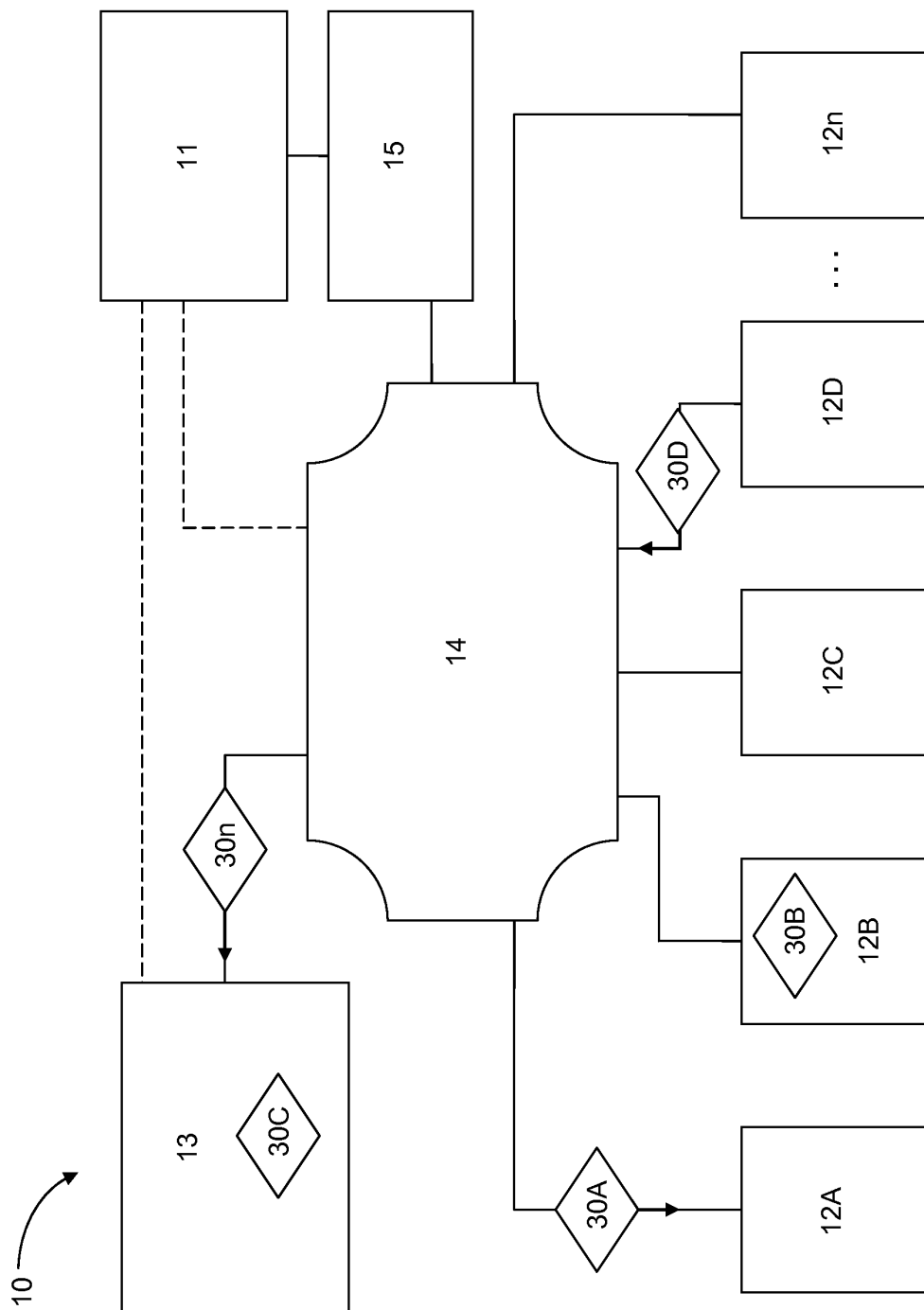
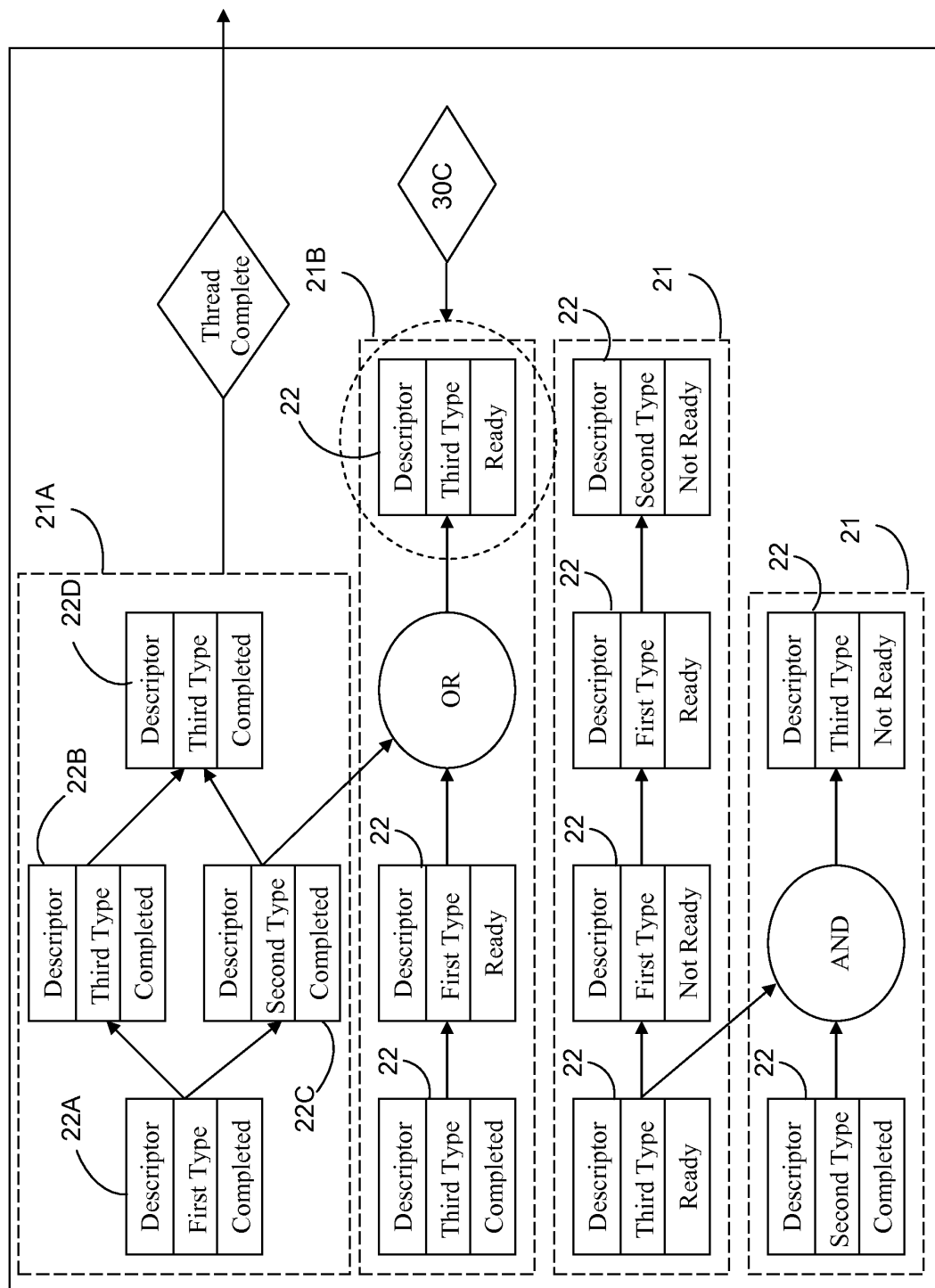


FIG. 1



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Application Number	
Filing Date	January 25, 2013
First Named Inventor	INIGUEZ, Alfonso
Title	Parallel Processing with Proactive Solidarity Cells
Art Unit	
Examiner Name	
Attorney Docket Number	724-002

SIGNATURE of Applicant or Patent Practitioner

Signature	/bdt61826/	Date	Jan. 25, 2013
Name	Benjamin D. Tietgen	Telephone	602-681-3331
Registration Number	61826		

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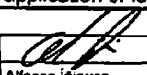
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SIGNATURE of Applicant for Patent

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