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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte THOMAS FAY and DOMINICK PANISCOTTI

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Appeal 2017-010567[1]
Application 13/950,680
Technology Center 3600

_____

Before MURRIEL E. CRAWFORD, MICHAEL W. KIM, and
PHILIP J. HOFFMANN, *Administrative Patent Judges.*

CRAWFORD, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal from the final rejection of claims 1–6 and 8–17. We have jurisdiction to review the case under 35 U.S.C. §§ 134 and 6.

The invention relates generally to creating a high-speed feed of market data messages. Spec. 1 lines 6–9.

Claim 1 is illustrative:

1. A Field Programmable Gate Array (FPGA) circuit of an automated electronic exchange platform, the FPGA comprising:

_____

[1] The Appellants identify Nasdaq, Inc. as the real party in interest. Appeal Br. 3.

> a first hardware communications interface configured to receive a plurality of matching engine messages that have a source specific format from a matching engine of said automated electronic exchange platform;
>
> a data message memory buffer, which is part of electronic memory of the FPGA circuit, configured to stored electronic data messages;
>
> reconfigurable firmware logic circuitry configured to:
>
> > filter, upon reception by the first hardware communications interface, the received plurality of matching engine messages and, based on how the received plurality of matching engine messages are filtered, discard at least some of the received plurality of matching engine messages,
> >
> > store, to the data message memory buffer, at least some of the received plurality of matching engine messages that have not been filtered and discarded,
> >
> > convert matching engine data messages stored in the buffer from the source specific format into market data messages that are in a standardized market data message protocol format,
> >
> > generate, from the market data messages that are in a standardized market data message protocol format, a stream of market data messages having the standardized market data protocol format; and
> >
> > generate and maintain an order table that stores order data for orders that are open on the automated electronic exchange platform, where the order table is generated and maintained based on the received plurality of matching engine messages,
> >
> > a second hardware communications interface configured to transmit the stream of market data messages.

The Examiner rejected claims 1–6 and 8–17 under 35 U.S.C. § 101 as directed to ineligible subject matter in the form of abstract ideas.

The Examiner rejected claims 1, 2, 4, 5, and 8–11 under 35 U.S.C. § 103 as unpatentable over Parsons et al. (US 2008/0243675 A1, pub. Oct. 2, 2008) ("Parsons"), Littlewood (US 7,788,169 B1, iss. Aug. 31, 2010), and

Online Course on Embedded Systems, Module 12 – SPI Bus Interface, EE
Herald (Dec. 18, 2008) ("Herald"),
http://web.archive.org/web/20081218014028/http://www.eeherald.com:80/s
ection/design-guide/esmod12.html (last visited Dec. 22, 2018).

The Examiner rejected claims 3 and 12 under 35 U.S.C. § 103 as
unpatentable over Parsons, Littlewood, Herald, and Chapman et al.
(US 8,706,606 B2, iss. Apr. 22, 2014) ("Chapman").

The Examiner rejected claims 6 and 13 under 35 U.S.C. § 103 as
unpatentable over Parsons, Littlewood, Herald, and Edwards, III et al.
(US 7,676,606 B1, iss. Mar. 9, 2010) ("Edwards").

The Examiner rejected claims 14 and 15 under 35 U.S.C. § 103 as
unpatentable over Parsons, Littlewood, Herald, and Winbom et al.,
(US 2011/0264577 A1, pub. Oct. 27, 2011) ("Winbom").

The Examiner rejected claims 16 and 17 under 35 U.S.C. § 103 as
unpatentable over Parsons, Littlewood, Herald, and McPherson
(US 2010/0057608 A1, pub. Mar. 4, 2010).

We AFFIRM.

ANALYSIS

Patentable subject matter

An invention is patent-eligible if it claims a "new and useful process,
machine, manufacture, or composition of matter." 35 U.S.C. § 101. The
Supreme Court, however, has long interpreted § 101 to include implicit
exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are
not patentable. *E.g., Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct.
2347, 2354 (2014).

In determining whether a claim falls within the excluded category of abstract ideas, we are guided in our analysis by the Supreme Court's two-step framework, described in *Mayo* and *Alice*. *Id.* at 2355 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 76–78 (2012)). In accordance with that framework, we first determine whether the claim is "directed to" a patent-ineligible abstract idea. *Alice*, 134 S. Ct. at 2356 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk."); *Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk."); *Diamond v. Diehr*, 450 U.S. 175, 184 (1981) ("Analyzing respondents' claims according to the above statements from our cases, we think that a physical and chemical process for molding precision synthetic rubber products falls within the § 101 categories of possibly patentable subject matter."); *Parker v. Flook*, 437 U.S. 584, 594–95 (1978) ("Respondent's application simply provides a new and presumably better method for calculating alarm limit values."); *Gottschalk v. Benson*, 409 U.S. 63, 64 (1972) ("They claimed a method for converting binary-coded decimal (BCD) numerals into pure binary numerals.").

The patent-ineligible end of the spectrum includes fundamental economic practices, *Alice*, 134 S. Ct. at 2357; *Bilski*, 561 U.S. at 611; mathematical formulas, *Parker*, 437 U.S. at 594–95; and basic tools of scientific and technological work, *Gottschalk*, 409 U.S. at 69. On the patent-eligible side of the spectrum are physical and chemical processes, such as curing rubber, *Diamond*, 450 U.S. at 184 n.7, "tanning, dyeing, making

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waterproof cloth, vulcanizing India rubber, smelting ores," and a process for manufacturing flour, *Gottschalk*, 409 U.S. at 69.

If the claim is "directed to" a patent-ineligible abstract idea, we then consider the elements of the claim—both individually and as an ordered combination—to assess whether the additional elements transform the nature of the claim into a patent-eligible application of the abstract idea. *Alice*, 134 S. Ct. at 2355. This is a search for an "inventive concept"—an element or combination of elements sufficient to ensure that the claim amounts to "significantly more" than the abstract idea itself. *Id.*

In addition, the Federal Circuit has held that if a method can be performed by human thought alone, or by a human using pen and paper, it is merely an abstract idea and is not patent-eligible under § 101. *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011) ("[A] method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101.").

Claims that recite an improvement to a particular computer technology have been found patent eligible. *See, e.g., McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1314–15 (Fed. Cir. 2016) (determining claims not abstract because they "focused on a specific asserted improvement in computer animation").

Each of independent claims 1 and 8 recites steps to receive and filter data, convert the remaining data to a different format, and then store and transmit the data, using high-speed computer circuits programmed to execute the steps. The dependent claims recite that parameters and symbols are stored, that there are communications interfaces and logic to monitor and control the steps, and that data is stored outside of the execution circuitry.

The Examiner finds the pending claims are directed to generating a data market message stream by organizing and manipulating data (Final Act. 7; *see also id.* at 12), which the Examiner characterizes as "data organization, manipulation and transaction" (*id.* at 9). The Examiner further finds the converting of one format to another is similar to the claims found to be directed to ineligible subject matter in *Gottschalk v. Benson*, and the filtering and transmitting are similar to ineligible claims in *Cyberfone Sys., LLC v. CNN Interactive Grp. Inc.*, 558 F.App'x 988 (Fed. Cir. 2014). Answer 8–9.

The claims involve operations to inform trading parties within a financial market, and thus are directed to methods of organizing human activity, in that they are essentially performing advertising, marketing, or sales activities within the marketplace. For example, independent claim 1 recites an "automated electronic exchange platform" that "generate . . . a stream of market data messages" and "transmit the stream of market data messages." In addition, the claims do not improve the functioning of a computer, because FPGA circuits are not improved by the invention, and no other technology or field is improved by moving operations from software executing on traditional microprocessor-based computers to software operations programming into faster FPGA circuits. The claims do not effect a physical transformation. Therefore, the claims do not integrate the judicial exception of the abstract idea into a practical application.

The Appellants argue these cases do not persuasively indicate the claims at issue are directed to abstract ideas because *Cyberfone* is not a precedential case, *Benson* was decided in the 1970s, and neither case discusses field-programmable gate arrays ("FPGA"), as claimed. Appeal

Br. 11. These arguments, however, do not dissuade us from agreeing with the Examiner that the steps recited by the claims, and the abstract to which they are directed, are indeed similar to the steps in *Cyberfone* and *Benson*. For example, by filtering out messages from the received data, the claims divide incoming data into different categories and direct one of the categories to be stored and transmitted. This is similar to the method in *Cyberfone*, where data is directed based on category. *Cyberfone Sys.*, 558 F.App'x at 992 ("separating and transmitting that information according to its classification, is an abstract idea that is not patent-eligible."). One category in the claims here is data that is filtered out, which is not sent, and another category is data that is stored and transmitted. Further, converting data from one format to another is similar to converting binary-coded decimal numerals into pure binary numerals. *See Gottschalk*, 409 U.S. at 64.

We are also unpersuaded by the Appellants' arguments that, according to the Appellants, the claims are not directed to abstract ideas because they include, or are directed to, an FPGA, and, simultaneously, offer *something more* than an abstract idea by confining the functional steps to operation on an FPGA. *See* Appeal Br. 12–22; *see also* Reply Br. 2–4, 8. The Appellants even go so far as to assert they have invented a "new type of hardware" and a "new type of machine," which we take to mean an FPGA circuit programmed to perform the claimed functions. Appeal Br. 21–22.

The Appellants indicate that automated financial exchanges typically distribute received data on buy and sell orders to market participants. Spec. 1 lines 19–31. The Appellants further indicate that several platforms have already been developed for performing the quick distribution of bid, offer, and trade information to traders, such as those used by the NASDAQ

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exchange. *Id.* at 2 lines 1–6. Also, the Appellants describe FPGA technology has been applied to "trading," but not to "exchange matching," such as the NASDAQ market. *Id.* lines 21–29.

The fundamental issue here, thus, is whether confining a basically well-known process to the faster, less-common FPGA technology can transform the abstract process of generating filtered, financial-market-data messages, in a format different than as received, into eligible subject matter.

The Appellants do not purport to have improved the process of generating a market-data message stream. For example, the Appellants indicate trader systems already use different protocols and messages than the matching system, and must already be translated into the protocols of each trader to effectuate communication with each trader system. Spec. 6 lines 20–28. Thus the claimed receiving, converting, and transmission are not new steps. Further, filtering irrelevant messages out of the message stream is not described as a new function, unknown before in the practice of providing financial market data feeds, and filtering data is a step the ordinary artisan would recognize as common.

Indeed, the only improvement described by the Appellants is the use of faster FPGA circuits for the performance of the common message-handling tasks. More specifically, the Appellants describe faster hardware for the message-handling function, within an otherwise general-purpose matching system:

> An example embodiment of present invention, which is designed to accelerate financial trading through custom hardware and software, consists of a high speed circuit board, custom Integrated Circuit chips and custom driver and application software. FIG. 3 depicts an example embodiment of present invention and includes a financial market data message stream

> generator 300 constructed in reconfigurable logic and residing in
> an automated electronic exchange platform 140. Embodiments
> of this invention provide a many fold increase in market data
> speed over existing solutions.

Spec. 5 line 32 to 6 line 2 (emphasis omitted). The purported improvement

is thus the use of faster hardware for the message-handling function.

Although the Appellants recite using an FPGA circuit to perform the

method of claim 8, and in claim 1 recite the FPGA circuit itself, the

Specification does not describe how the FPGA circuit is designed,

manufactured, or programmed. Instead, the Specification describes that

"detailed descriptions of well-known circuits, components and/or modules

have been omitted so as not to obscure the description of the example with

unnecessary detail." Spec. 6 lines 6–8. The Specification thus insinuates

FPGA circuits are well-known, and describes the specific FPGA only

through functional description of the operations of the various parts:

communications interfaces that communicate and filter, logic that converts,

and memory that stores data. *Id.* at 6–8.

The FPGA circuit thus performs functions that general-purpose

computers do, when programmed with software functions, as is the case with

general-purpose computers. Indeed, the FPGA is not asked to perform acts

that a general-purpose computer could not accomplish. For example, the

claimed operations of storing, analyzing, receiving, and writing data are

primitive computer operations found in any computer system. *See In re Katz*

Interactive Call Processing Patent Litig., 639 F.3d 1303, 1316 (Fed.

Cir. 2011) ("Absent a possible narrower construction of the terms

'processing,' 'receiving,' and 'storing,' discussed below, those functions can

be achieved by any general purpose computer without special programming.").

As a result, although Appellants assert they are claiming an FPGA, they are really claiming a process of handing financial market data messages merely implemented on an FPGA circuit, simply limited to an FPGA circuit only for the purpose of achieving higher speeds than a non-FPGA digital computer that commonly perform the same functions.

In addition, we are unpersuaded that the claims, considered as an ordered combination, recite more than an abstract idea. Reply Br. 3. *See Inventor Holdings, LLC v. Bed Bath & Beyond, Inc.*, 876 F.3d 1372, 1378 (Fed. Cir. 2017) (holding that considering claims reciting data retrieval, analysis, modification, generation, display, and transmission as an "ordered combination" reveals that they "amount to 'nothing significantly more' than an instruction to apply [an] abstract idea" using generic computer technology) (alteration in original).

The claims take part of a standard economic process, a market feed, in an existing market, and indicate it should be performed on a computer that is faster than commonly used. The Appellants did not invent the FPGA, as indicated by the Examiner and not challenged by Appellants. *See* Answer 8. Instead, the Appellants are claiming a standard, market process of providing market feeds, limited to being executed on an especially fast, though well-known circuit to achieve faster speeds. But merely speeding up a well-known process, even if done with well-known but uncommon hardware, does not transform the process from being an abstract idea into eligible subject matter. The FPGA claimed here simply acts as a faster version of a general-purpose computer, which does not change the abstract idea of

generating a financial market data message feed into patentable subject matter.

Finally, the Appellants argue the claims are not directed to abstract ideas because they do not preempt all ways of performing the abstract idea. Appeal Br. 22–23. "While preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015); *see also OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362–63 (Fed. Cir. 2015) ("[T]hat the claims do not preempt all price optimization or may be limited to price optimization in the ecommerce setting do not make them any less abstract."). And, "[w]here a patent's claims are deemed only to disclose patent ineligible subject matter under the *Mayo* framework, as they are in this case, preemption concerns are fully addressed and made moot." *Ariosa*, 788 F.3d at 1379.

For these reasons, the Appellants have not shown error in the Examiner's rejection of claims 1–6 and 8–17 as directed to ineligible abstract ideas. Therefore, we sustain the rejection under 35 U.S.C. § 101.

Obviousness of Claims 1, 2, and 5

The Appellants argue that Littlewood, upon which the Examiner relied as disclosing the filtering recited in independent claim 1, does not filter and cancel messages. Appeal Br. 23–24. We are not persuaded by the Appellants' argument. First, the Examiner finds Parsons discloses filtering, but relies on Littlewood as disclosing the "details on discarding/cancelling messages." Final Act. 20. Further, Parsons discloses the claimed filtering, in that Parsons explains "FAM **806** is preferably configured to perform message query filtering. Message query filters allow for certain messages to

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be excluded from the message flow." Parsons ¶ 105 (cited at Final Act. 19). The ordinary artisan would have recognized that this conforms to the claim language to filter incoming messages "and, based on how the received plurality of matching engine messages are filtered, discard at least some," because excluding a message is essentially the same as discarding it. Littlewood, therefore, is a cumulative reference.

We also are unpersuaded by the Appellants' argument that Parsons has a matching system, but does not discuss that this matching system is implemented in an FPGA that receives and processes messages from a matching engine. Appeal Br. 25. The argument thus means that Parsons' matching engine doesn't operate to match messages received from a matching engine. The claims do not, however, require this, because the claims only recite functions performed on messages *from* a matching engine, but not on what messages are fed into that matching engine. In addition, Parsons discloses a "ticker plant" implemented on "reconfigurable logic" (Parsons ¶ 14), one example of which is the FPGA (*id.* ¶ 10; *see also* ¶ 84). The ticker plant is implemented within a market data platform 600 (*id.* ¶ 56), on "device **604**" (*id.* ¶ 60), which includes "[f]eed handlers" that convert messages from one format to another (*id.* ¶ 61), and an order book (*id.* ¶ 71). The market data platform 600 also includes a matching engine. *Id.* ¶ 78. The matching system matches bids with offers and then messages about trades that are "then submitted to the appropriate reporting and settlement systems" (*id.*), on device 612 which implements the reporting functionality in Parsons (*id.* ¶ 80). Parsons also feeds messages to device 604 for distribution on wide area networks. *Id.* ¶ 60 ("feed handling/ticker plant"). Parsons thus discloses receiving and processing messages from a matching

engine, generating and maintaining an order table, and converting, generating, and transmitting messages from the matching engine, on FPGA circuitry, as claimed.

We are further unpersuaded by the Appellants' argument that the cited references fail to disclose an order book generated and maintained from messages received from a matching engine. Appeal Br. 25. Parsons discloses an "order book server" that "maintains a sorted list of the bids and offers associated with all outstanding orders for that instrument." Parsons ¶ 71. Parsons indicates that "order information for each instrument is received from a variety of different trading venues in stream **106** and is aggregated together to form one holistic view of the market for that particular instrument." *Id.* Because Parsons' order book is updated in real-time (*id.* ¶ 96), we interpret this to mean the order book in Parsons receives messages from the matching engine when matches on open bids and offers are made, so the order book reflects bids and offers that were matched and no longer outstanding, which meets the claim recitations.

For these reasons, we sustain the rejection under 35 U.S.C. § 103 of claim 1, as well as dependent claims 2 and 5, that were rejected along with claim 1 and not argued separately.

Obviousness Rejection of Claim 4

Dependent claim 4 recites "wherein the first hardware communications interface is further configured to transmit market data messages in the standardized market data protocol format."

We are not persuaded by the Appellants' argument that Parsons fails to disclose receiving and transmitting messages on one communications interface, and transmitting messages additionally on a second

communications interface. Appeal Br. 27. Parsons discloses feed handler device 604 communicating in-bound and out-bound messages to multiple networks. Parsons ¶ 59. For this reason, we sustain the rejection of claim 4 under 35 U.S.C. § 103.

Obviousness Rejections of Claims 3, 6, and 15

The Appellants' arguments are limited to asserting that the additional references relied upon do not cure alleged deficiencies in the rejection of claim 1. Appeal Br. 27–28. Because we found no shortcomings in the rejection of claim 1, we sustain the rejections of claims 3, 6, and 15 under 35 U.S.C. § 103.

Obviousness Rejection of Claim 16

Dependent claim 16 recites "wherein the market data messages that are in the standardized market data message protocol format include messages that are aggregated from plural ones of the at least some of the received plurality of matching engine messages that have not been filtered and discarded."

The Appellants argue the cited sections of Parsons and McPherson do not disclose aggregating order information from received messages. Appeal Br. 29. The argument does not persuade us, because Parsons discloses this function by stating that "order information for each instrument is received from a variety of different trading venues in stream **106** and is aggregated together to form one holistic view of the market for that particular instrument." ¶ 71. Thus, because Parsons meets the claim language, we sustain the rejection of claim 16 under 35 U.S.C. § 103.

Obviousness Rejection of Claims 8–10

The Appellants' arguments directed to independent claim 8 essentially repeat the arguments directed to claim 1. Appeal Br. 29–33. We determine they are unpersuasive for the same reasons as for claim 1. Therefore, we sustain the rejection of claim 8 under 35 U.S.C. § 103, as well as for claims 9 and 10 that were rejected along with claim 8 and not argued separately.

Obviousness Rejection of Claim 11

Dependent claim 11 recites language substantially identical to claim 4, and the arguments, related to communications interfaces, advanced are essentially the same as for claim 4. Appeal Br. 33–34. We determine they are unpersuasive for the same reasons as for claim 4. Thus, we sustain the rejection of claim 11 under 35 U.S.C. § 103.

Obviousness Rejections of Claims 12–14

The Appellants' arguments are limited to asserting that the additional references relied upon do not cure alleged deficiencies in the rejection of claim 8. Appeal Br. 34–35. Because we are unpersuaded of any shortcomings in the rejection of claim 8, we sustain the rejections of claims 12–14 under 35 U.S.C. § 103.

Obviousness Rejection of Claim 17

Dependent claim 17 recites language substantially identical to claim 16, and the arguments advanced, related to aggregating messages, are essentially the same as for claim 16. Appeal Br. 35–36. We determine they are unpersuasive for the same reasons as for claim 16. Thus, we sustain the rejection of claim 17 under 35 U.S.C. § 103.

DECISION

We affirm the rejection of claims 1–6 and 8–17 under 35 U.S.C. § 101.

We affirm the rejections of claims 1–6 and 8–17 under 35 U.S.C. § 103.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED