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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HANNES GREIM

Appeal 2017-008242
Application 13/112,845[1]
Technology Center 3600

Before MARC S. HOFF, JOHN A. EVANS, and BETH Z. SHAW, *Administrative Patent Judges*.

HOFF, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from a Final Rejection of claims 1–23. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellant's invention is a method and system for matching buy and sell orders that maximize the number of shares matched while providing an even allocation of shares regardless of when a given order is received. An optimization function determines a price point at which a maximum number of shares can be matched using as inputs a set of buy and sell orders, market

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[1] The real party in interest is Citigroup Global Markets, Inc. (Br. 3).

spread, and participant-defined exclusion criteria. Shares are evenly allocated using, for example, and round-lot base allocation procedure. An anti-gaming function is also used, compressing multiple orders from a single participant into a single participant interest. *See* Abstract.

Claim 1 is reproduced below:

1. A method for matching buy and sell orders, comprising:

determining, using a microprocessor, an optimized price point within a market spread that maximizes the number of shares matched for a matching event given a plurality of buyer-side and seller-side orders wherein each order defines at least a number of shares and an acceptable price range criteria;

selecting, with the microprocessor, executable buyer-side and seller-side orders eligible to participate in a matching event, said selecting comprising filtering the plurality of buyer-side and seller-side orders based on the optimized price point and on any exclusion criteria defined in any of said buyer-side and seller side orders, said exclusion criteria comprising any of a specifically identified counterparty, a specifically identified counterparty business category, and a counterparty identified at least in part with reference to specifically identified trading behavior;

evenly allocating shares other than on a pro-rated or first-in-first-out basis between all of the executable buyer-side and seller-side orders, using the microprocessor, by mapping available shares between the seller-side and buyer-side orders based on a round-lot base allocation; and

distributing, using the microprocessor, the allocated shares from the seller-side orders to the buyer-side orders.

The Examiner relies upon the following prior art in rejecting the claims on appeal:

Lupien et al.	US 6,098,051	Aug. 1, 2000
Cushing	US 7,162,447 B1	Jan. 09, 2007

Greenberg et al.	US 2007/0150405 A1	June 28, 2007
Waelbroeck et al.	US 2009/0018947 A1	Jan. 15, 2009

Claim 1–23 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter.

Claims 1–8, 22, and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cushing, Lupien, and Waelbroeck.

Claims 9–14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cushing, Lupien, Waelbroeck, and Greenberg.

Throughout this decision, we make reference to the Appeal Brief ("Br.," filed Nov. 21, 2016), and the Examiner's Answer ("Ans.," mailed Mar. 03, 2017) for their respective details.

ISSUES

1. Is the claimed invention directed to a judicial exception?

2. Is the judicial exception integrated into a practical application?

3. Does the combination of Cushing, Lupien, and Waelbroeck disclose or suggest evenly allocating shares other than on a pro-rated or first-in-first-out basis between all executable buyer-side and seller-side orders, by mapping available shares between seller-side and buyer-side orders based on a round-lot base allocation?

PRINCIPLES OF LAW

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and

abstract ideas" are not patentable. *See, e.g.*, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court's two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *See Alice*, 573 U.S. at 219 ("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."); *see also 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.").

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. 175, 192 (1981)); "tanning, dyeing, making waterproof cloth, vulcanizing India rubber, smelting ores" (*id.* at 184 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that "[a] claim drawn to subject matter otherwise

statutory does not become nonstatutory simply because it uses a mathematical formula." *Diehr*, 450 at 176; *see also id.* at 192 ("We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula."). Having said that, the Supreme Court also indicated that a claim "seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* (citing *Benson* and *Flook*); *see, e.g.*, *id.* at 187 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

If the claim is "directed to" an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where "we must examine the elements of the claim to determine whether it contains an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application." *Alice*, 573 U.S. at 221 (quotation marks omitted). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Id.* (quoting *Mayo*, 566 U.S. at 77). "[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention." *Id.*

The PTO recently published revised guidance on the application of § 101. USPTO's January 7, 2019 Memorandum, *2019 Revised Patent Subject Matter Eligibility Guidance* ("Memorandum"). Under that guidance, we first look to whether the claim recites:

(1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human interactions such as a fundamental economic practice, or mental processes); and

(2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that are not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Memorandum.

ANALYSIS

SECTION 101 REJECTION

Independent claim 1 is directed to matching buy and seller orders by, inter alia, determining an optimized price point that maximizes the number of shares matched; selecting orders eligible to participate in a matching point including filtering orders based on the optimized price point and any exclusion criteria; evenly allocating shares other than on a pro-rated or first-in-first-out basis, by mapping available shares between seller-side orders and

buyer-side orders based on a round-lot base allocation; and distributing the allocated shares from the seller-side orders to the buyer-side orders. Independent claims 15, 22, and 23 recite analogous limitations. Appellant presents a unitary argument directed to all claims together. Accordingly, we select claim 1 for discussion as representative of the rejected claims. We refer to the rejected claims collectively herein as "the claims." See 37 C.F.R. § 41.37(c)(1)(iv); *In re King*, 801 F.2d 1324, 1325 (Fed. Cir. 1986).

ABSTRACT IDEA – FUNDAMENTAL ECONOMIC PRACTICE

We conclude that the matching of buyer-side orders and seller-sider orders recited in independent claim 1 is directed to the abstract idea of a fundamental economic practice. *Alice,* 573 U.S. at 219–20 (concluding that use of a third party to mediate settlement risk is a ''fundamental economic practice'' and thus an abstract idea); *id.* (describing the concept of risk hedging identified as an abstract idea in *Bilski* as ''a method of organizing human activity''); *Bilski,* 561 U.S. at 611–612 (concluding that hedging is a ''fundamental economic practice'' and therefore an abstract idea); *Bancorp,* 687 F.3d at 1280 (concluding that ''managing a stable value protected life insurance policy by performing calculations and manipulating the results'' is an abstract idea); *Inventor Holdings, LLC* v. *Bed Bath & Beyond, Inc.,* 876 F.3d 1372, 1378–79 (Fed. Cir. 2017) (holding that concept of ''local processing of payments for remotely purchased goods'' is a ''fundamental economic practice, which *Alice* made clear is, without more, outside the patent system.''); *OIP Techs., Inc.* v. *Amazon.com, Inc.,* 788 F.3d 1359, 1362–63 (Fed. Cir. 2015) (concluding that claimed concept of ''offer-based price optimization'' is an abstract idea ''similar to other 'fundamental

economic concepts' found to be abstract ideas by the Supreme Court and this court'').

We determine that matching buy and sell orders for shares [of stock] is a core function of a stock market. We consider that the buying and selling of stock in a stock market is a fundamental economic practice (concepts demonstrated to be fundamental, long prevalent, well-known, and extensively used for many years) because of the worldwide proliferation of stock markets and because of stock markets' long-standing operation. Appellant, citing *Alice*, admit that "the use of a third-party intermediary (or 'clearing house') is also a building block of the modern economy," and that the Amsterdam Stock Exchange, established in 1602, employed a clearinghouse at least as early as the 17th Century. Br. 10; see *Alice*, 573 U.S. at 217–20. Appellant alleges that the "claimed invention is not a long-prevalent and fundamental practice," but offer no detailed refutation beyond contending that the Examiner has not supported the allegation that the claim is directed to an abstract idea. Br. 11.

ABSTRACT IDEA – MENTAL PROCESS

We further conclude that the claimed invention is directed to the abstract idea of a mental process. The claim steps recite matching buy and sell orders by determining an optimized price point that maximizes the number of shares matched; selecting orders eligible to participate in matching by filtering said orders by the optimized price point and exclusion criteria; evenly allocating orders between buyer-side and seller-side orders based on a round-lot base allocation. The claim recites "using a microprocessor" with regard to each step, without any further technological limitations. If a claim, under its broadest reasonable interpretation, covers

performance in the mind but for the recitation of generic computer components, then it is still in the mental processes category unless the claim cannot practically be performed in the mind.[2] We determine that but for the generic computer components recited ("using a microprocessor"), the claimed price-point determination, order selection, exclusion, and share allocation is capable of performance in the human mind.

INTEGRATED INTO A PRACTICAL APPLICATION

We determine that the identified abstract idea is not integrated into a practical application. The claimed invention does not constitute an improvement to the functioning of a computer; rather, it merely constitutes the adaptation of an abstract idea, previously performed mentally or

[2] *See Intellectual Ventures I LLC* v. *Symantec Corp.,* 838 F.3d 1307, 1318 (Fed. Cir. 2016) (''[W]ith the exception of generic computer-implemented steps, there is nothing in the claims themselves that foreclose them from being performed by a human, mentally or with pen and paper.''); *Mortg. Grader, Inc.* v. *First Choice Loan Servs. Inc.,* 811 F.3d. 1314, 1324 (Fed. Cir. 2016) (holding that computer-implemented method for ''anonymous loan shopping'' was an abstract idea because it could be ''performed by humans without a computer''); *Versata Dev. Grp.* v. *SAP Am., Inc.,* 793 F.3d 1306, 1335 (Fed. Cir. 2015) (''Courts have examined claims that required the use of a computer and still found that the underlying, patent-ineligible invention could be performed via pen and paper or in a person's mind.''); *CyberSource Corp.* v. *Retail Decisions, Inc.,* 654 F.3d 1366, 1375, 1372 (Fed. Cir. 2011) (holding that the incidental use of ''computer'' or ''computer readable medium'' does not make a claim otherwise directed to process that ''can be performed in the human mind, or by a human using a pen and paper'' patent eligible).

manually, to execution as steps performed by a computer. MPEP 2106.05(a).

The invention is directed to the use of the computer as merely a tool to perform an existing process, in this case, matching and allocating shares between buy and sell orders. *See* Ans. 7. Appellant's Specification makes clear that the object of the invention is to provide "a matching engine that optimizes a price point and provides an in-line single pass optimization at the time of matching and identifies those orders, in advance, that are able to interact with one another to generate the maximum number of shares matched, while at the same time minimizing gaming of the process by participants." Spec. 1. Appellant concedes that the claimed invention "does not purport to provide a faster microprocessor for a computer or better computer memory or any other improvement to the computer per se." Br. 14. Appellant claimed invention may "maximize[] efficiency and eliminate[] manipulation of the processing," but we regard these touted advantages as an improvement to the underlying abstract idea, using the computer merely as a tool. *Id.*

Appellant argues that the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks. Br. 15–16; *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014). We are not persuaded that the claimed invention "recites specific processing that integrates specifically identified components in order to solve specific legacy crossing engine problems." Br. 16. Rather, we agree with the Examiner that the claims

provide a generic computer-implemented solution to a business-related problem. *See* Ans. 9.

Turning to the other options under the Guidelines for integration of an abstract idea into a practical application, the claimed invention is not applied with, or by use of, a particular machine. MPEP 2106.05(b). Appellant's invention does not effect the transformation or reduction of a particular article to a different state or thing. MPEP 2106.05(c). We determine, rather, that Appellant's invention constitutes mere instructions to implement an abstract idea on a computer. MPEP 2106.05(f). We consider that the claimed distribution of allocated shares from the seller-side orders to the buyer-side orders amounts to insignificant extra-solution activity. *See* MPEP 2106.05(g).

In response to Appellant's argument that the claims do not pre-empt or entirely tie up the "abstract idea of evenly allocat[ing] and distribut[ing] the shares between buyer and seller order" (Br. 18), we agree with the Examiner that lack of preemption will not demonstrate patent eligibility. Ans. 7. "Where 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 Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015).

WELL-UNDERSTOOD, ROUTINE, CONVENTIONAL

Having determined that the claims recite a judicial exception, and do not integrate that exception into a practical application, we consider whether the claim adds a specific limitation beyond the judicial exception that is not "well understood, routine, and conventional" in the field. USPTO, 2019

Revised Patent Subject Matter Eligibility Guidance, 84(4) Fed. Reg. 50, 56 (January 7, 2019) ("Revised Guidance").

Appellant recites, at several points in independent claim 1, that several steps are to be performed "using a microprocessor."

Appellant's Specification discloses that the invention is to be performed by a personal computer, or across a plurality of platforms. Embodiments may employ client devices that include random access memory coupled to a processor. Spec. ¶ 57. Such processors may include "a microprocessor, an application specific integrated circuit (ASIC), and or (sic) state machines." *Id.* As Appellant have not disclosed any features of the claimed microprocessor that would be considered as other than "well-understood, routine, and conventional," these claim limitations fail to indicate the presence of an inventive concept. We further find that Appellant's disclosure of the claimed "microprocessor" is specified at a high level of generality.

We conclude that none of the claim limitations, viewed "both individually and as an ordered combination," amount to significantly more than the judicial exception in order to sufficiently transform the nature of the claims into patent-eligible subject matter. See *Alice*, 571 U.S. at 217. Accordingly, we sustain the Examiner's 35 U.S.C. § 101 rejection of claims 1–23.

SECTION 103 REJECTIONS

CLAIMS 1–8, 22, AND 23

Independent claim 1 recites, inter alia, "evenly allocating shares other than on a pro-rated or first-in-first-out basis between all of the executable buyer-side and seller-side orders . . . by mapping available shares between

the seller-side and buyer-side orders based on a round-lot base allocation." Independent claims 22 and 23 recite analogous limitations.

The Examiner effectively concedes that the cited combination of Cushing, Lupien, and Waelbroeck fails to map available shares based on round-lot based allocations, stating that this feature "is disclosed by cited prior art of Greenberg . . . as described on page 19–20 of the Final Rejection (claims 9–14) from which the Appeal Brief was filed." Ans. 11. Because Greenberg is not applied against these claims, the asserted combination of references fails to disclose all the limitations of claims 1–8, 22, and 23. We do not sustain the Examiner's § 103(a) rejection.

CLAIMS 9–14

We agree with the Examiner's finding that Greenberg discloses mapping available shares between seller-side and buyer-side orders based on round-lot based allocations. Greenberg ¶¶ 36–39; Ans. 11; Final Act. 19–20. Contrary to Appellant's allegation that Greenberg fails to remedy the deficiencies of Cushing, Lupien, and Waelbroeck (Br. 20), we find that Greenberg thus discloses the limitation missing from the Examiner's combination with respect to independent claim 1, from which these claims depend. We sustain the Examiner's § 103(a) rejection of claims 9–14.

CONCLUSIONS

1. The claimed invention is directed to a judicial exception.

2. The judicial exception is not integrated into a practical application.

3. The combination of Cushing, Lupien, and Waelbroeck does not disclose or suggest evenly allocating shares other than on a pro-rated or first-in-first-out basis between all executable buyer-side and seller-side orders, by

mapping available shares between seller-side and buyer-side orders based on a round-lot base allocation.

ORDER

The Examiner's decision to reject claims 1–23 under 35 U.S.C. § 101 is affirmed. The Examiner's decision to reject claims 1–8, 22, and 23 under 35 U.S.C. § 103(a) is reversed. The Examiner's decision to reject claims 9–14 under 35 U.S.C. § 103(a) is affirmed.

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).

AFFIRMED