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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* GEORGES-HENRI MOLL

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Appeal 2018-007001  
Application 13/025,820  
Technology Center 3600

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Before MURRIEL E. CRAWFORD, CYNTHIA L. MURPHY, and  
TARA L. HUTCHINGS, *Administrative Patent Judges*.

HUTCHINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant<sup>1</sup> appeals under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1, 2, and 4. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> We use the term "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Our decision references Appellant's Appeal Brief ("Appeal Br.," filed Mar. 19, 2018) and Reply Brief ("Reply Br.," filed June 27, 2018), and the Examiner's Answer ("Ans.," mailed Apr. 27, 2018), and Final Office Action ("Final Act.," mailed Oct. 17, 2017). Appellant identifies International Business Machines Corporation as the real party in interest. Appeal Br. 2.

### CLAIMED INVENTION

Claims 1 and 4 are the independent claims on appeal. Claim 1, reproduced below with bracketed notations added, is illustrative of the claimed subject matter:

1. A method of producing a product with improved efficiency due to improved machine logic based forecasting, the method comprising:

[(a)] invoking a machine logic based forecasting module in a production planning tool executing in memory of a computer upon demand data to compute data corresponding to a forecasting model;

[(b)] executing in the memory of the computer, a coupling manager that responds to an implementation of a stochastic linear programming (LP) relaxation module by providing the forecasting model computed by the forecasting module as input to the stochastic LP relaxation module instead of a classic LP relaxation module;

[(c)] retrieving, by the coupling manager a stochastic vector for the product from the computed forecasting model, the stochastic vector expressing a vector of expected values of demand for the product;

[(d)] linearizing, by the coupling manager the stochastic vector describing a linear model for demand of the product; and,

[(e)] providing by the coupling manager the linearized stochastic vector to a stochastic LP relaxation module of a planning module of the production planning tool as deterministic production decisions under resource constraints that maximize an expected value of a gain.

### REJECTIONS<sup>2</sup>

Claims 1, 2, and 4 are rejected under 35 U.S.C. § 112(a) as failing to comply with the written description requirement.

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<sup>2</sup> The Examiner has withdrawn the rejection of claims 1, 2, and 4 under 35 U.S.C. § 112(b). Ans. 10.

Claims 1, 2, and 4 are rejected under 35 U.S.C. § 101 as directed to a judicial exception without significantly more.

## ANALYSIS

### *Written Description*

In rejecting claims 1, 2, and 4 under § 112(a), the Examiner found that the Specification fails to provide adequate written description support for the phrase “producing a product,” as recited in the preamble of independent claim 1, and similarly recited in the preamble independent claim 4. Final Act. 11. In particular, the Examiner determined that “[t]he original disclosure does not make any mention of actually producing a product, thereby rendering this limitation new matter.” *Id.*

A Specification must convey with reasonable clarity to those skilled in the art that, as of the filing date, Appellant was in possession of the *claimed invention* in order to comply with the written description requirement. *Purdue Pharma L.P. v. Faulding, Inc.*, 230 F.3d 1320, 1323 (Fed. Cir. 2000). Here, the Specification describes that the claimed invention relates to “coupling forecasting and planning in a production planning tool.” *See e.g.*, Spec. ¶¶ 1, 6, 11–15. Appellant’s invention seeks to “address deficiencies . . . [with known methods and systems for] production planning” for a product. *Id.* ¶ 6 (“[T]he method also includes retrieving a stochastic vector from the computed forecasting model *for a product*, the stochastic vector expressing vector of expected values of demand *for the product*”) (emphasis added). In our view, one of ordinary skill in the art would understand with reasonable clarity that the Appellant, at the time of filing, was in possession of the claimed invention — namely, a forecasting and production planning tool for a product that was intended to be used to help produce the product

more efficiently, such as with improved forecasting regarding demand for the product.

Therefore, we do not sustain the Examiner's rejection of independent claims 1 and 4, and dependent claim 2 under 35 U.S.C. § 112(a).

*Patent-Ineligible Subject Matter*

Appellant argues claims 1, 2, and 4 as a group. Appeal Br. 9–22. We select independent claim 1 as representative. Claims 2 and 4 stand or fall with claim 1. *See* 37 C.F.R. §41.37(c)(1)(iv).

Under 35 U.S.C. § 101, 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 an implicit exception: “[l]aws of nature, natural phenomena, and abstract ideas” are not patentable. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014).

The Supreme Court, in *Alice*, reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012), “for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts.” *Alice Corp.*, 573 U.S. at 217. The first step in that analysis is to “determine whether the claims at issue are directed to one of those patent-ineligible concepts.” *Id.* If the claims are not directed to a patent-ineligible concept, e.g., an abstract idea, the inquiry ends. Otherwise, the inquiry proceeds to the second step where the elements of the claims are considered “individually and ‘as an ordered combination’” to determine whether there are additional elements that “‘transform the nature of the claim’ into a patent-eligible application.” *Id.* (quoting *Mayo*,

566 U.S. at 79, 78). This is “a search for an ‘inventive concept’ — *i.e.*, an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’” *Id.* at 217–18 (alteration in original).

In rejecting the pending claims under 35 U.S.C. § 101, the Examiner determined that the claims are directed to “a mathematical algorithm that is used in a forecasting and planning environment,” *i.e.*, a mathematical concept, which the Examiner determined is an abstract idea. Final Act. 7. The Examiner further determined that claims 1 and 2 additionally recite “a machine logic based forecasting module in a production planning tool, a memory, a computer, various modules, and a coupling manager” and that claim 4 additionally recites “a computer with at least one processor and memory, a production planning tool, program code, a coupling manager, various modules, and machine logic.” However, the Examiner concluded that these additional elements that are not sufficient to amount to significantly more than the judicial exception. *Id.* at 7– 8.

In so doing, the Examiner notified Appellant of the reasons for the rejection under 35 U.S.C. § 101 in a sufficiently articulate and informative manner as to meet the notice requirement of 35 U.S.C. § 132, thereby establishing a *prima facie* case of patent ineligibility. *See In re Jung*, 637 F.3d 1356, 1362 (Fed. Cir. 2011) (holding that the USPTO carries its procedural burden of establishing a *prima facie* case when its rejection satisfies the notice requirements of 35 U.S.C. § 132 by notifying the applicant of the reasons for the rejection, “together with such information and references as may be useful in judging the propriety of continuing []

prosecution”). Appellant’s arguments to the contrary are unpersuasive. *See, e.g.,* Appeal Br. 19.

The U.S. Patent and Trademark Office (the “USPTO”) published revised guidance on January 7, 2019, for use by USPTO personnel in evaluating subject matter eligibility under 35 U.S.C. § 101. 2019 REVISED PATENT SUBJECT MATTER ELIGIBILITY GUIDANCE, 84 Fed. Reg. 50, 57 (Jan. 7, 2019) (the “Revised Guidance”). That guidance revised the USPTO’s examination procedure with respect to the first step of the *Mayo/Alice* framework by (1) “[p]roviding groupings of subject matter that [are] considered an abstract idea”; and (2) clarifying that a claim is not “directed to” a judicial exception if the judicial exception is integrated into a practical application of that exception. *Id.* at 50. The Revised Guidance, by its terms, applies to all applications, and to all patents resulting from applications, filed before, on, or after January 7, 2019. *Id.*

*Step One of the Mayo/Alice Framework (Revised Guidance, Step 2A, Prong One)*

The first step in the *Mayo/Alice* framework, as mentioned above, is to determine whether the claims at issue are “directed to” a patent-ineligible concept, e.g., an abstract idea. *Alice Corp.*, 573 U.S. at 217. This first step, as set forth in the 2019 Revised Guidance (i.e., Step 2A), is a two-prong test; in Step 2A, Prong One, we look to whether the claim recites a judicial exception, e.g., one of the following three groupings of abstract ideas: (1) mathematical concepts; (2) certain methods of organizing human activity, e.g., fundamental economic principles or practices, commercial or legal interactions; and (3) mental processes. 2019 Revised Guidance, 84 Fed. Reg. at 54; *see also id.* at 52 (identifying the three groupings). If so,

we next consider whether the claim includes additional elements, beyond the judicial exception, that “integrate the [judicial] exception into a practical application,” i.e., that apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the judicial exception (“Step 2A, Prong Two”). *Id.* at 54–55. Only if the claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application do we conclude that the claim is “directed to” the judicial exception, e.g., an abstract idea. *Id.*

The Federal Circuit has explained that “the ‘directed to’ inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether ‘their character as a whole is directed to excluded subject matter.’” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (quoting *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015)). It asks whether the focus of the claims is on a specific improvement in relevant technology or on a process that itself qualifies as an “abstract idea” for which computers are invoked merely as a tool. *See id.* at 1335–36. Here, it is clear from the Specification (including the claim language) that the claims focus on an abstract idea, and not on any improvement to technology and/or a technical field.

Appellant’s Specification is titled “COUPLING DEMAND FORECASTING AND PRODUCTION PLANNING WITH CHOLESKY DECOMPOSITION AND JACOBIAN LINEARIZATION,” and describes that the invention “relates to production planning pattern management and[,] more particularly[,] to coupling demand forecasting and production planning in a production planning tool.” Spec. ¶ 1; *see also id.* ¶ 14. Prior art

production planning included a stochastic, forecast module 110 and a deterministic, planning module 120. *See id.* ¶ 3, Fig. 1. As shown in Figure 1 of Appellant’s Specification, planning module 120 comprised an LP relaxation module 125 and a heuristic module 130. *See id.* ¶ 3. Forecasting module 110 coupled with the planning tool’s LP relaxation module 125, resulting in an early separation of the stochastic side and deterministic side at a stochastic frontier, which negatively impacts forecasted demand. *See id.* ¶¶ 4–5, Fig. 1.

Appellant’s production planning module addresses the problem of early separation of the stochastic side and the deterministic side, by adding stochastic LP pre-processing module 225 to the planning module, and coupling output from the stochastic, forecast module to the input of the stochastic LP pre-processing module 225 (instead of to the input of the deterministic LP module). *See id.* ¶¶ 5, 15, Fig. 2. In this way, as shown in Figure 2 of the Specification, Appellant’s invention pushes back the stochastic frontier 275 and improves the forecasted demand of the product. *See id.*; see also *id.* ¶ 6. An issue with Appellant’s modification to product planning “is how to fit the output of forecasting module 210 into the input of the stochastic LP pre-processing module 225.” *Id.* ¶15; see also *id.* ¶ 25 (“[m]atching the forecasting output and stochastic LP [pre-processing] input is a[n] important consideration”).

Consistent with this disclosure, claim 1 recites a method of producing a product with improved efficiency by performing the following steps: “invoking a . . . forecasting module in a production planning tool . . . upon demand data to compute data corresponding to a forecasting model” (limitation (a)); “executing . . . a coupling manager that responds to an

implementation of a stochastic linear programming (LP) relaxation module by providing the forecasting model computed by the forecasting module as input to the stochastic LP relaxation module instead of a classic LP relaxation module” (limitation (b)); “retrieving, by the coupling manager a stochastic vector for the product from the computed forecasting model, the stochastic vector expressing a vector of expected values of demand for the product” (limitation (c)); “linearizing, by the coupling manager the stochastic vector describing a linear model for demand of the product” (limitation (d)); and “providing by the coupling manager the linearized stochastic vector to a stochastic LP relaxation module of a planning module of the production planning tool as deterministic production decisions under resource constraints that maximize an expected value of a gain” (limitation (e)). These limitations, thus, recite a method in a production planning tool for providing the output of an executed forecasting model (the output being a stochastic vector expressing a vector of expected values of demand for a product) as input to a stochastic LP relaxation module of a planning module after linearizing the stochastic vector. When given its broadest reasonable interpretation, claim 1 recites a method for coupling a demand forecasting model and a stochastic LP relaxation module in a production planning tool using mathematical relationships and/or mathematical calculations. Put simply, claim 1 recites a mathematical concept and, therefore, an abstract idea. *See* 2019 Revised Guidance, 84 Fed. Reg. at 52.

The Federal Circuit has held similar concepts to be abstract. For example, the Federal Circuit has held that claims directed to a “process of organizing information through mathematical correlations” are directed to an

abstract idea. *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014); *see also SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1163 (Fed. Cir. 2018) (holding that claims to “a series of mathematical calculations based on selected information” are directed to an abstract idea). The court also has held that abstract ideas include the concepts of collecting data, analyzing the data, and reporting the results of the collection and analysis, including when limited to particular content. *See, e.g., Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1340 (Fed. Cir. 2017) (identifying the abstract idea of collecting, displaying, and manipulating data); *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) (characterizing collecting information, analyzing information by steps people go through in their minds, or by mathematical algorithms, and presenting the results of collecting and analyzing information, without more, as matters within the realm of abstract ideas).

*Step One of the Mayo/Alice Framework (Revised Guidance, Step 2A, Prong Two)*

Having concluded that claim 1 recites a judicial exception, i.e., an abstract idea (Step 2A, Prong One), we next consider whether the claim recites additional elements that integrate the judicial exception into a practical application (Step 2A, Prong Two). *See Revised Guidance*, 84 Fed. Reg. at 54.

Beyond the abstract idea, claim 1 additionally recites that the forecasting module is “machine logic based”, and that the production planning tool and the coupling manager execute in a “memory” of a “computer.” However, Appellant’s Specification describes these elements at

a high degree of generality, i.e., as generic computer components. *See, e.g.*, Spec. ¶¶ 47 (“[a]ny combination of one or more computer readable mediums may be utilized”), 49 (“[c]omputer program code for carrying out operations for aspects of the present invention may be written in any combination of one or more programming languages”), 51 (“computer program instructions may be provided to a processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus”); *see also id.* ¶¶ 46, 48, 50, 52. *See DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1256 (Fed. Cir. 2014) (“[A]fter *Alice*, there can remain no doubt: recitation of generic computer limitations does not make an otherwise ineligible claim patent-eligible.”).

Appellant seemingly concedes that claim 1 pertains to “coupling demand forecasting production planning in a production planning tool.” Appeal Br. 13. However, Appellant argues that the steps of claim 1 “describe a particular solution to a program[,] or a particular way to achieve a desired outcome . . . , as opposed to merely claiming the idea of a solution or outcome[,] and the collection and manipulation of information. *Id.* at 14. Yet, a specific abstract idea is still an abstract idea. *See, e.g., Mayo*, 566 U.S. at 88–89 (citing *Parker v. Flook*, 437 U.S. 584 (1978) (holding a narrow mathematical formula unpatentable)); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1321 (Fed. Cir. 2016) (“A narrow claim directed to an abstract idea, however, is not necessarily patent-eligible.”); *BSG Tech LLC v. BuySeasons, Inc.*, 899 F.3d 1281, 1287 (Fed. Cir. 2018) (“[A] claim is not patent eligible merely because it applies an abstract idea in a narrow way.”)

Appellant asserts that claim 1 is directed to an improvement to computer-related technology and is, thus, directed to patent-eligible subject matter, pursuant to the holding in *Enfish*. Appeal Br. 15. Yet, Appellant does not direct us to what is alleged to be the improvement to computer-related technology. Nor does Appellant otherwise adequately explain how the court's ruling in *Enfish* impacts the patent-eligibility of the present claims. Unlike the claims at issue in *Enfish*, claim 1 appears to focus on an improvement to a process for forecasting using improved models (i.e., mathematical relationships). Put simply, Appellant's claim 1 focuses on an improvement to the abstract idea itself, rather than any improvement to computer functionality.

We also are not persuaded of Examiner error by Appellant's argument regarding preemption. See Appeal Br. 20–21. Although the Supreme Court has described “the concern that drives [the exclusion of abstract ideas from patent-eligible subject matter] as one of pre-emption,” *Alice Corp.*, 573 U.S. at 216, characterizing preemption as a driving concern for patent eligibility is not the same as characterizing preemption as the sole test for patent eligibility. “The Supreme Court has made clear that the principle of preemption is the basis for the judicial exceptions to patentability” and “[f]or this reason, questions on preemption are inherent in and resolved by the § 101 analysis.” *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015) (citing *Alice Corp.*, 573 U.S. at 216). “[P]reemption may signal patent ineligible subject matter, [but] the absence of complete preemption does not demonstrate patent eligibility.” *Id.*

We do not find anything of record that attributes an improvement in technology and/or a technical field to the claimed invention, or that

otherwise indicates that the claimed invention integrates the abstract idea into a “practical application,” as that phrase is used in the Revised Guidance.<sup>3</sup> For example, Appellant’s Specification does not indicate that claim 1 reflects an improvement in the functioning of a computer, or an improvement to other technology or technical field; implements the abstract idea with a particular machine; or reduces a transformation or reduction of a particular article to a different state or thing.

We conclude, for the reasons outlined above, that claim 1 recites a mathematical concept, i.e., an abstract idea, and that the additional elements recited in the claim do no more than use a computer as a tool to perform the abstract idea. Therefore, the additional elements do not integrate the abstract idea into a practical application. Accordingly, we agree with the Examiner that claim 1 is directed to an abstract idea.

*Step Two of the Mayo/Alice Framework (Revised Guidance, Step 2B)*

Having determined under step one of the *Mayo/Alice* framework that claim 1 is directed to an abstract idea, we next consider under Step 2B of the Revised Guidance, the second step of the *Mayo/Alice* framework, whether claim 1 includes additional elements or a combination of elements that provides an “inventive concept,” i.e., whether the additional elements amount to “significantly more” than the judicial exception itself. Revised

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<sup>3</sup> The Revised Guidance references MPEP § 2106.05(a)–(c) and (e) in describing the considerations that are indicative that an additional element or combination of elements integrates the judicial exception, e.g., the abstract idea, into a practical application. Revised Guidance, 84 Fed. Reg. at 55. If the recited judicial exception is integrated into a practical application, as determined under one or more of these MPEP sections, the claim is not “directed to” the judicial exception.

Guidance, 84 Fed. Reg. at 56. Here, we look at whether claim 1 adds any additional element or combination of elements that are not “well-understood, routine, conventional activity in the field, which is indicative that an inventive concept may be present.” *Id.*

Appellant contends that the Examiner erred at the second step of the *Mayo/Alice* framework, because the Examiner “only refers” to components such as a machine logic based forecasting module, a memory, and a computer, and does not refer to “the full compliment (sic) of limitations present in claim 1.” Appeal Br. 17 (quoting limitations (a)–(e) of claim 1). Yet, at step two we analyze whether any element or combination of elements *other* than the abstract idea provides an inventive concept. *See BSG Tech LLC v. BuySeasons, Inc.*, 899 F.3d 1281, 1290 (Fed. Cir. 2018) (“It has been clear since *Alice* that a claimed invention’s use of the ineligible concept to which it is directed cannot supply the inventive concept that renders the invention ‘significantly more’ than that ineligible concept.”) (internal citation omitted).

As described above, the only claim elements beyond the abstract idea here are that the forecasting module is “machine logic based”, and that the production planning tool and the coupling manager execute in a “memory” of a “computer,” i.e., generic computer components used to perform generic computer functions) — a determination amply supported by, and fully consistent with the Specification. *See, e.g.*, Spec. ¶¶ 46–52.<sup>4</sup> Appellant

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<sup>4</sup> The Office’s April 19, 2018 Memorandum to the Examining Corps from Deputy Commissioner for Patent Examination Policy, Robert W. Bahr, entitled, Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*), available at <https://www.uspto.gov/sites/default/files/documents/>

cannot reasonably contend, nor does Appellant, that there is a genuine issue of material fact regarding whether the operation of these components is well-understood, routine, or conventional, where, as here, there is nothing in the Specification to indicate that the operations recited in claim 1 require any specialized hardware or inventive computer components or that the claimed invention is implemented using other than a generic computer component to perform generic computer functions, e.g., receiving, storing, and processing information. Indeed, the Federal Circuit, in accordance with *Alice*, has “repeatedly recognized the absence of a genuine dispute as to eligibility” where claims have been defended as involving an inventive concept based “merely on the idea of using existing computers or the Internet to carry out conventional processes, with no alteration of computer functionality.” *Berkheimer*, 890 F.3d at 1373 (Moore, J., concurring) (internal citations omitted); *see also BSG Tech*, 899 F.3d at 1291 (“BSG Tech does not argue that other, non-abstract features of the claimed inventions, alone or in combination, are not well-understood, routine and conventional database structures and activities. Accordingly, the district court did not err in determining that the asserted claims lack an inventive concept.”).

We are not persuaded, on the present record, that the Examiner erred in rejecting independent claim 1 under 35 U.S.C. § 101. Therefore, we sustain the Examiner’s rejection of claim 1, and claims 2 and 4, which fall with claim 1.

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memo-berkheimer-20180419.PDF, expressly directs that an examiner may support the position that an additional element (or combination of elements) is well-understood, routine or conventional with “[a] citation to an express statement in the specification . . . that demonstrates the well-understood, routine, conventional nature of the additional element(s)” (*id.* at 3).

CONCLUSION

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 2, 4	101	Eligibility	1, 2, 4	
1, 2, 4	112(a)	Written Description		1, 2, 4
<b>Overall Outcome</b>			1, 2, 4	

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

AFFIRMED