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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HOLLY DAIL and STEPHAN HOYER

Appeal 2018-008351
Application 14/681,886
Technology Center 2800

Before BRADLEY R. GARRIS, JEFFREY T. SMITH, and
BRIAN D. RANGE, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–19. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

Appellant claims a method performed by one or more computing devices comprising: using a data analysis module to determine historical

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Climate Corporation. Appeal Br. 1.

difference parameters representing differences between historical ensemble-based weather forecasts and corresponding historical weather observations; receiving raw ensemble-based weather forecasts comprising raw ensemble members; using a data extraction module to determine a series of correlations from the raw ensemble-based weather forecasts; using a distribution calibration module to create and store distributions from the raw ensemble members and applying the historical difference parameters to modify the distributions to create improved distributions; and using a reconstruction calibration module to create improved ensemble members from the improved distributions and the series of correlations and creating improved ensemble-based weather forecasts from the improved ensemble members (independent claim 1). Appellant also claims non-transitory storage media storing instructions which, when executed by one or more computing devices, cause performance of the method steps recited in claim 1 (remaining independent claim 11).

A copy of representative claim 1, taken from the Claims Appendix of the Appeal Brief, appears below.

1. A method comprising:

receiving over a computer network and storing in an ensemble database, electronic digital data representing a plurality of historical ensemble-based weather forecasts corresponding to one or more years of weather forecasts, each of the forecasts comprising a plurality of historical ensemble members, wherein each of the historical ensemble members comprise [sic, comprises] a set of forecasted weather conditions for a plurality of days;

receiving, over the computer network, a plurality of historical weather observations and storing the plurality of historical weather observations with the plurality of historical ensemble-based weather forecasts;

using a data analysis module, determining a plurality of historical difference parameters representing differences between the historical ensemble-based weather forecasts and the corresponding historical weather observations;

receiving, over the computer network, a plurality of raw ensemble-based weather forecasts comprising a plurality of raw ensemble members, wherein each of the plurality of raw ensemble members comprise [sic, comprises] a set of forecasted weather conditions for a plurality of days;

using a data extraction module, determining a series of correlations from the plurality of raw ensemble-based weather forecasts and storing the series of correlations in computer memory;

using a distribution calibration module, creating and storing one or more distributions from the plurality of raw ensemble members, and applying the plurality of historical difference parameters to modify the one or more distributions to create one or more improved distributions;

using a reconstruction calibration module, creating improved ensemble members from the one or more improved distributions and the series of correlations and creating improved ensemble-based weather forecasts from the improved ensemble members from the improved ensemble members [sic]²;

wherein the method is performed by one or more computing devices.

The Examiner rejects claims 1–19 under 35 U.S.C. § 101 “because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more” (Final Office Action (Final) 2). Specifically, the Examiner determines that the steps recited in the independent claims are directed to an abstract idea and that the additional elements recited in the independent claims are not

² Repetition of the phrase “from the improved ensemble members” appears to be an inadvertent oversight.

sufficient to make these claims as a whole amount to significantly more than the abstract idea itself (*id.* at 2–5).

ANALYSIS

In issues involving subject matter eligibility, our inquiry focuses on whether the claims satisfy the two-step test set forth by the Supreme Court in *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208 (2014). The Supreme Court instructs us to “first determine whether the claims at issue are directed to a patent-ineligible concept” (*id.* at 216–18), and, in this case, the inquiry centers on whether the claims are directed to a judicial exception. If the initial threshold is met, we then move to the second step, in which we “consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Id.* at 217 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 79, 78 (2012)). The Supreme Court describes the second step as 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.* (quoting *Mayo*, 566 U.S. at 72–73).

The USPTO recently published revised guidance on the application of § 101. USPTO’s Memorandum, *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Memorandum”). Under that guidance, we 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 activity 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 is 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.

The Memorandum guidance instructs us first to determine whether the claims recite any judicial exception to patent eligibility (i.e., Step 2A, Prong 1). The guidance identifies three judicially-excepted groupings: (1) mathematical concepts; (2) certain methods of organizing human behavior; and (3) mental processes. We focus here on the judicially-excepted grouping of mathematical concepts.

Representative claim 1 recites “using a data analysis module, determining a plurality of historical difference parameters representing differences between the historical ensemble-based weather forecasts and the corresponding historical weather observations.” The historical difference parameters can be derived mathematically from the difference between historical forecasts and corresponding historical observations (e.g., the

difference between historical forecasted and observed temperatures (*see, e.g.*, Figs. 3A–3C)). The historical difference parameters are applied to distributions to correct for errors or bias (Spec. ¶ 43).

Claim 1 also recites “using a distribution calibration module, creating and storing one or more distributions from the plurality of raw ensemble members, and applying the plurality of historical difference parameters to modify the one or more distributions to create one or more improved distributions.” The distribution calibration module is based on a chosen calibration approach for creating a probability distribution (*id.* ¶ 47) such as a left-censored generalized extreme value distribution (*id.* ¶ 52). The Specification explicitly discloses that the left-censored generalized extreme value distribution utilizes mathematical equations and relationships (*id.* ¶¶ 71–77). Thus, the Specification supports a determination that the quoted step of using a distribution calibration module creates distributions utilizing mathematical equations and relationships and applies the mathematically derived historical difference parameters to modify these distributions to create improved distributions.

Our determination that the previously quoted limitations of claim 1 recite the judicially-accepted grouping of mathematical concepts is supported by *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014) (holding that claims to a “process of organizing information through mathematical correlations” are directed to an abstract idea). *See also* Memorandum, n. 12. We observe that the

Examiner’s abstract idea determination regarding the above quoted and other limitations of claim 1 relies on *Digitech* (Final 4).³

Appellant argues “[t]here is no abstract idea ‘recited in or described by’ the claims” (Appeal Br. 5).

However, the proposition that claim 1 does not recite the judicial exception of mathematical concepts is undermined by our earlier analysis of the quoted claim limitations and Appellant’s Specification. Therefore, we maintain our determination that, under Step 2A, Prong 1 of the Memorandum, claim 1 recites the judicial exception of mathematical concepts.

Having determined that claim 1 recites a judicial exception, our analysis under Step 2A, Prong 2 of the Memorandum now turns to whether there are additional elements that integrate the judicial exception into a practical application. *See* MPEP § 2106.05(a)–(c), (e)–(h) (9th ed., rev. 08.2017 (Jan. 2018)).

Claim 1 recites additional limitations that focus on addressing problems arising from modern forecasting models such as biased weather forecasts generated by use of a coarse grid at a generalized, rather than locally tailored, scale (*see, e.g.*, Spec. ¶¶ 8–9). These additional limitations

³ The Examiner’s abstract idea determination also appears to rely on the belief that claim 1 “could be carried out as a purely mental process, at least in principle” (Final 5). Appellant persuasively explains that the method steps recited in the independent claims “cannot be performed in the human mind or on paper and are inextricably tied to the ability of the computing device to perform the sampling” (Appeal Br. 11). We observe that the Examiner acknowledges but does not disagree with Appellant’s explanation (Ans. 5).

include “using a reconstruction calibration module, creating improved ensemble members from the one or more improved distributions and the series of correlations and creating improved ensemble-based weather forecasts from the improved ensemble members.” The quoted limitations create improved ensemble-based weather forecasts that are described as significantly improved for accuracy and granularity (e.g., more accurate predictions, increased accuracy based on seasonal dependence of weather, and predictions at a field location level which are otherwise not available from public and/or commercial weather data sources) (Spec. ¶ 129).

We conclude that these limitations integrate the recited judicial exception of mathematical concepts into a practical application. In particular, the above quoted limitations apply the recited mathematical concepts to create significantly improved ensemble-based weather forecasts that overcome problems of modern forecasting models (*id.* ¶¶ 8–9, 129). In this way, the recited mathematical concepts are used to improve meaningfully the technology of weather forecasting (*see, e.g.*, MPEP § 2106.05(a)(II) (“The courts have also found that improvements in technology beyond computer functionality may demonstrate patent eligibility”)).

Ultimately, we conclude that Appellant’s claimed invention is integrated into a practical application, and under the guidance provided in the Memorandum, claims 1–19 have not been shown to be patent-ineligible because they are not “directed to” a judicial exception.

We reverse the Examiner’s rejection under 35 U.S.C. § 101 of claims 1–19.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1-19	101	Eligibility		1-19

REVERSED