# UNITED STATES PATENT AND TRADEMARK OFFICE

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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* CYRIAC J. WEGMAN III[1]

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Appeal 2013-008168
Application 12/765,954
Technology Center 2100

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*Before* JOHN G. NEW, JEFFREY A. STEPHENS, and
NORMAN H. BEAMER, *Administrative Patent Judges.*

NEW, *Administrative Patent Judge.*

DECISION ON APPEAL

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[1] Appellant states the real party-in-interest is The Procter & Gamble Company of Cincinnati, Ohio. App. Br. 1.

SUMMARY

Appellant files this appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–15. Specifically, claims 1–5 and 8–14 stand rejected as unpatentable under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Claims 1–5 stand rejected as unpatentable under 35 U.S.C. § 102(b) as being anticipated by Korchinski (US 2007/0100475 A1, May 3, 2007) ("Korchinski").

Claims 6–15 stand rejected as unpatentable under 35 U.S.C. § 103(a) as being obvious over the combination of Korchinski and Levinson et al. (US 2005/0089923 A9, April 28, 2005) ("Levinson").

We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.


NATURE OF THE CLAIMED INVENTION

Appellant's invention is directed to a method for providing an empirical model of a defined space comprising steps of: (1) defining the desired space; (2) describing at least a portion of the defined space with multiple correlated dimensions; (3) reducing the dimensionality of the defined portion; (4) combining the described portion with the remaining portion of the defined space; (5) creating a hypothetical model of the defined space; (6) selecting points of interest in the combination; (7) producing real and/or virtual objects associated with at least a portion of the selected points, analyzing at least a portion of the produced objects; and (8) calculating coefficients for the hypothetical model according to the analysis. Abstract.

REPRESENTATIVE CLAIM

Claim 1 is representative of the claims on appeal and recites:

1.  A method for providing an empirical model of a defined space comprising steps of:

>  a. defining the desired space;
>
>  b. describing at least a portion of the defined space with multiple correlated dimensions;
>
>  c. reducing the dimensionality of the described portion;
>
>  d. combining the described portion with the remaining portion of the defined space;
>
>  e. creating a hypothetical model of the defined space; and
>
>  f. calculating coefficients for the hypothetical model according to an analysis of real and/or or virtual objects.

App. Br. 5.

ISSUES AND ANALYSES

*Issue 1*

Appellant argues the Examiner erred in finding claims 1–5 and 8–14 are unpatentable under 35 U.S.C. § 101 as being directed to nonstatutory subject matter. App. Br. 2.

*Analysis*

In the Final Rejection and in the Answer, the Examiner employs the Section 101 analysis set forth by the PTO subsequent to the Supreme

Court's decision in *Bilski v. Kappos*, 561 U.S. 593 (2010). *See* Final Act. 2
(citing *Interim Guidance for Determining Subject Matter Eligibility for
Process Claims in View of Bilski v. Kappos*, Federal Register, Vol. 75, No.
143, 43922-28). However, in the wake of the Supreme Court's more recent
decisions in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*,
132 S.Ct. 1289 (2012) and *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S.Ct.
2347 (2014), the Office has issued new interim guidelines with respect to
analyses of patentability under 35 U.S.C. § 101. *See Preliminary
Examination Instructions in view of the Supreme Court Decision in Alice
Corporation Ply. Ltd. v. CLS Bank International, et al.* (June 25, 2014),
*available at* http://www.uspto.gov/sites/default/files/patents/announce/
alice_pec_25jun2014.pdf (last visited September 4, 2015) (the
"Instructions"). We consequently apply this latter analytical framework in
determining whether claim 1 is directed to patentable subject matter.

The basic analysis remains the same as that set forth in MPEP § 2106:
first, determine whether the claimed invention is directed to one of the four
statutory categories of invention, i.e., process, machine, manufacture, or
composition of matter. Instructions 2. Next, if the claim does fall within
one of the statutory categories, determine whether the claim is directed to a
judicial exception (i.e., a law of nature, a natural phenomenon, and an
abstract idea) using the two-part analysis described *infra*. *Id.*

Appellant argues the Examiner finds claim 1 is directed toward a
method for providing an empirical model in which a hypothetical model is
created and coefficients are calculated for the model. Reply Br. 2–3.
Appellant construes this statement as the identification by the Office of the
fundamental idea towards which claim 1 is directed. *Id.* at 3.

We agree with Appellant that claim 1 is directed to a method (i.e., a process) for "providing an empirical model of a defined space" by a series of steps. We consequently move to the two-step analysis set forth in the Instructions to determine whether claim 1 is directed to a judicial exception. Instructions 2.

The Instructions require the Office to first determine whether the claim is directed to an abstract idea. Instructions 2. *Alice* provides several broad examples of what might constitute an "abstract idea," including: (1) fundamental economic practices; (2) certain methods of organizing human activities; (3) "an idea of itself"; and (4) mathematical relationships or formulae. *Id.* (citing *Alice*, 134 S.Ct. at 2350; 2356; 2350; 2350). Although by no means exhaustive, these examples provide a broad outline within which to frame our analysis.

Appellant argues claim 1 is much more specific than the broad abstract idea stated by the Examiner. Reply Br. 3. Appellant asserts claim 1 further requires the description of a portion of a defined space using multiple correlated dimensions: the described portion of the space is then altered in terms of the dimensionality of the description of the space. *Id.* Appellant argues the altered description of that portion is then combined with any remaining portion of the original space and a model is created. *Id.* According to Appellant, nothing in these steps may be considered necessary, routine, or conventional in terms of the fundamental abstraction set forth by the Examiner. *Id.*

We agree with Appellant. Claim 1 not only sets forth the steps emphasized by the Examiner, it further requires "calculating coefficients for the hypothetical model according to an analysis of real and/or or virtual

objects." In other words, the method of claim 1 requires performing an analysis of objects, either actual or virtual, and calculating coefficients for the model based upon that analysis. We find that these steps are sufficiently concrete as to set them outside the broad definition of abstract idea as set forth in *Alice*. Consequently, because we agree with Appellant that claim 1 is not directed to an abstract idea, we reverse the rejection of claims 1–5 and 8–14 as being unpatentable under 35 U.S.C. § 101.

*Issue 2*

Appellant argues the Examiner erred in finding Korchinski discloses the limitation of claim 1 reciting: "describing at least a portion of the defined space with multiple correlated dimensions; reducing the dimensionality of the described portion; and combining the described portion with the remaining portion of the defined space." App. Br. 3.

*Analysis*

Appellant argues that although Korchinski discloses multiple independent variables and the number of independent variables is then reduced, there is no mention or suggestion of multiple correlated dimensions or the reduction of such dimensions. App. Br. 3. According to Appellant, Korchinski is silent with regard to the claimed description of the defined space, and is also silent with regard to combining the described portion of the space with the remainder of the defined space. *Id.* Consequently, Appellant argues, Korchinski does not anticipate claim 1. *Id.*

The Examiner finds Appellant's Specification does not explicitly define the claim term "dimension," and, therefore adopts the broadest

reasonable interpretation of the claim term consistent with the Specification. Ans. 4. The Examiner finds the Specification discloses: "[i]n this embodiment, principal component analysis may be used to reduce the dimensionality of the candidate description from the 140 molecular descriptors to about 34 descriptors without an undue loss of accuracy in describing the candidates." *Id.* at 4–5 (citing Spec. 5). Consequently, the Examiner interprets a "dimension" as recited in the claim as being a "variable." *Id.* at 5.

Claim 1 recites step b of "describing at least a portion of the defined space with multiple correlated dimensions." The Examiner finds the Specification does not explicitly define the claim term "correlate" and adopts the dictionary definition of correlate as "a phenomenon that accompanies another phenomenon and is related in some way to it." Ans. 5 (citing Merriam-Webster).

The Examiner finds Korchinski discloses a first-principles model which uses known equations to construct heat, mass, and component balance relationships. Ans. 5 (citing Korchinski ¶ 29). As such, the Examiner finds, Korchinski discloses multiple heat, mass, and component variables that are correlated because they are related to each other by way of the known equations. *Id.* The Examiner further finds that, in the process of reducing a model and its dimensionalities, whether or not the variables are correlated is a factor with regards to whether or not that variable will be dropped. *Id.* (citing Korchinski ¶ 99) ("The residuals are compared against independent variables ... using ... cross correlation. Where significant relationships are suspected between the residuals and independent variables, these independent variables are included as additional terms in the dependent

variable equations" (emphasis omitted)). Therefore, the Examiner finds, Korchinski discloses multiple correlated dimensions.

The Examiner further construes the claim limitation "reducing the dimensionality of the described portion" as meaning reducing the number of variables used in a model to describe a space. Ans. 5 (citing Spec. 5). The Examiner finds Korchinski discloses going from a complex first-principles model to a reduced model in which only certain variables will be selected. *Id.* (citing Korchinski ¶¶ 78, 99) ("variables may be dropped from the equations" (emphasis omitted)). The Examiner therefore finds Korchinski teaches reduction of variables, which are the dimensions in a model. *Id.*

Appellant replies that independent variables, as disclosed by Korchinski, are not necessarily analogous to correlated dimensions, hence the use of "independent" in the description. Reply Br. 3. Moreover, Appellant argues that although Korchinski teaches determining a residual value, values for the dependent variables are then evaluated using a statistical cross-correlation to identify relationships. *Id.* Appellant asserts that such a disclosure has nothing to do with defining a space in terms of multiple correlated dimensions, because it has nothing to do with defining a space. *Id.*

Finally, Appellant contends the independent variables, upon which Korchinski's model is constructed, are not equivalent to the multiple dimensions of the Applicant's model. Reply Br. 4. Appellant asserts that dropping non-equivalent variables, as disclosed by Korchinski, does not disclose reducing the dimensionality of the defined space as the definition of the space is not disclosed. *Id.*

We are not persuaded by Appellant's arguments. As an initial matter, we agree with the Examiner that the Examiner's definition of "dimension" as meaning "variable" is broadly reasonable in view of Appellant's Specification. *See In re Am. Acad. Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) ("During examination, 'claims … are to be given their broadest reasonable interpretation consistent with the specification"). Similarly, we agree with the Examiner's adoption of the definition of "a phenomenon that accompanies another phenomenon and is related in some way to it." *See* Ans. 5.

Furthermore, we agree with the Examiner's remaining reasoning and adopt it as our own. Appellant argues that Korchinski does not disclose defining space, but is rather directed to oil-refinery operations. *See* Reply Br. 4. However, Korchinski discloses, in general, methods and apparatus for generating a reduced nonlinear model, whose significant properties include accuracy, compact size, reliability, and speed. Korchinski, Abstract. Furthermore, Korchinski discloses that linear state space models for use in real-time predictive control are known in the art, and that Korchinski's model would prove advantageous in such operations. Korchinski ¶¶ 35, 44–45.

We consequently agree with the Examiner that Korchinski discloses the disputed limitations of claim 1 and we affirm the rejection of claims 1–5 under 35 U.S.C. § 102(b).

*Issue 3*

Appellant argues the Examiner erred in finding the combination of Korchinski and Levinson teach or suggest "describing at least a portion of

the defined space with multiple correlated dimensions, or describing candidate materials in terms of multiple correlated dimensions; reducing the dimensionality of the described portion or material; and combining the described portion or material with the remaining portion of the defined space." App. Br. 3–4.

*Analysis*

For claims 6–15, Appellant repeats the arguments made with respect to claim 1 *supra*, and argues further that Levinson fails to cure the deficiencies of Korchinski. App. Br. 4.

We have related *supra* our reasoning as to why we are not persuaded by Appellant's arguments, and we incorporate that reasoning by reference here. We consequently affirm the Examiner's rejection of claims 6–15 under 35 U.S.C. § 103(a).

## DECISION

The Examiner's rejection of claims 1–5 and 8–14 as unpatentable under 35 U.S.C. § 101 is reversed.

The Examiner's rejection of claims 1–5 as unpatentable under 35 U.S.C. § 102(b) is affirmed.

The Examiner's rejection of claims 6–15 as unpatentable 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)(iv).

## AFFIRMED

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