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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BIJAN SAYYARRODSARI, KADIR LIANO, and
ALEXANDER B. SMITH¹

Appeal 2017-006290
Application 14/077,006
Technology Center 2100

Before CAROLYN D. THOMAS, JEREMY J. CURCURI, and
AMBER L. HAGY, *Administrative Patent Judges*.

THOMAS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek our review under 35 U.S.C. § 134(a) of the Examiner's Final Rejection of claims 1–20, all the pending claims in the present application. *See* Claims Appendix. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

¹Appellants name Rockwell Automation Technologies, Inc. as the real party in interest (App. Br. 2).

The present invention relates generally to using a database within a control system decision cycle. *See* Spec. ¶ 1.

Claims 1, 8, and 15 are illustrative:

1. A control method, comprising:
controlling, using a first controller in a control system, an industrial automation process;
receiving, using the first controller, configuration data from a database when the first controller is initially connected to the control system, wherein the configuration data comprises first holistic state data that describes characteristics, operation, or both of a second controller in the control system; and
selecting, using the first controller, the second controller from a plurality of controllers in the control system based at least in part on the configuration data, wherein the first controller utilizes the second controller to determine a first control action during control of the industrial automation process by the first controller;
wherein controlling operation of the industrial automation process comprises controlling operation based at least in part on the first control action.

8. A control method, comprising:
controlling, using a first controller in a control system, operation of an industrial automation process, wherein controlling operation of the process comprises:
performing a first optimization search to determine a branching search result;
pausing the first optimization search and instructing a second controller in the control system to perform a second optimization search to determine a first search result based at least in part on the branching search result;
resuming the first optimization search based at least in part on the first search result to determine a control action; and

implementing the control action to control operation of the industrial automation process.

15. A control system, comprising:

a plurality of controllers, wherein the plurality of controller comprise:

a first controller configured to control operation of an industrial automation process based at least in part on a control action; and

a second controller configured to determine first holistic state data, wherein the first holistic state data indicates type of operational parameters determined by the second controller, processing capabilities of the second controller, or both; and

a database communicatively coupled to the each of the plurality of controllers, wherein the database is configured to:

receive the first holistic state data from the second controller;

store the first holistic state data received from the second controller; and

transmit the first holistic state data to the first controller in response to a request from the first controller to enable the first controller to select the second controller from the plurality of controllers based at least in part on the first holistic state data, wherein the first controller utilizes the second controller to determine the control action during control of the industrial automation process by the first controller.

Appellants appeal the following rejections:

R1. Claims 15–20 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter;

R2. Claims 1–3 and 15–20 are rejected under 35 U.S.C. § 102(b) as being anticipated by Gould (US 2006/0265098 A1, Nov. 23, 2006);

R3. Claims 8–14 are rejected under 35 U.S.C. § 102(b) as being

anticipated by Attarwala (US 2005/0075738 A1, Apr. 7, 2005); and

R4. Claims 4–7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gould and Attarwala.

We review the appealed rejections for error based upon the issues identified by Appellants, and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential).

ANALYSIS

Rejection under § 101 Claims 15–20

Issue 1: Did the Examiner err in finding that the claims are directed to non-statutory subject matter?

Appellants contend that “although possibly including software, the [A]ppellants emphasize that the first controller, the second controller, and/or the database . . . include one or more devices. . . . [T]he database would at least include a computer store and/or a computer server[,] . . . thus, is directed to a machine” (App. Br. 11).

In response, the Examiner finds that “[a]ll controllers and database[s] as recited in the claim and Specification are software” (Ans. 4). We agree with the Examiner.

Specifically, we note that claim 15 fails to recite that the database is included in a “server.” Although Appellants’ Specification states that “the database 22 may be optionally located within a controller 14, the server 22, as a standalone module, or any combination thereof,” and “[t]he database 22 may utilize a storage device” (*see* ¶ 38), it clearly need not be contained in a server, or include a computer store, as highlighted by Appellants.

Therefore, we agree with the Examiner’s findings that the Specification does not limit the claimed controllers and database to a machine or apparatus. A claim that recites no more than software, logic, or a data structure (i.e., an abstraction) does not fall within any statutory category. *In re Warmerdam*, 33 F.3d 1354, 1361 (Fed. Cir. 1994). Significantly, “[a]bstract software code is an idea without physical embodiment.” *Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 449 (2007).

Accordingly, we affirm the Examiner’s rejection of claims 15–20 under 35 U.S.C. § 101.

Rejection under § 102 over Gould

Claims 1, 3, 15, and 17–20

Issue 2: Did the Examiner err in finding that Gould discloses configuration data, as set forth in claim 1?

Appellants contend that “Gould merely appears to describe a database that stores metrology results and prior controller states” (App. Br. 14), not configuration data, because “Gould appears to describe that the controller utilized is selected based on the *recipe*” (*id.* at 15).

In response, the Examiner finds the “Appellants ignore the explicit disclosure in Gould[‘s] ¶ 0036 in which a specific controller is selected from multiple controllers based on the specification that is specified in the recipe” (Ans. 5; *see also* Final Act. 4). We agree with the Examiner.

We refer to, rely on, and adopt the Examiner’s findings and conclusions set forth in the Answer. Our discussions here will be limited to the following points of emphasis.

For example, Gould discloses:

The process level controller **110** is operative to implement a recipe, . . . the recipe specifying which type a semiconductor processing tool **102** to use, what process should [be] performed . . . and what should be the initial state or set point of the control parameters of the selected controller **202**. . . . The recipe specifies which of these controllers **202** to utilize for the particular process.

(¶ 36). In other words, Gould discloses that the recipe includes a specification on what should be the *initial state or set point* of the control parameters of the selected controller. Appellants' arguments fail to distinguish the claimed "configuration data" from Gould's recipe and how the same is use to select a controller.

Appellants also contend that "the process . . . controller receives the recipe from an external source . . . the recipe is not stored in the database included in the process level controller" (App. Br. 16). We find that claim 1 fails to specify where the "database" is located, i.e., local database vs. an external database (*see* claim 1); therefore, the aforementioned contention is not commensurate with the scope of claim 1, nor similar claim 15.

Accordingly, we sustain the Examiner's rejection of claim 1. Appellants' arguments regarding the Examiner's rejection of independent claim 15 rely on the same arguments as for claim 1, and Appellants do not argue separate patentability for dependent claims 3 and 17–20 (*see* App. Br. 12–16). We, therefore, also sustain the Examiner's rejection of claims 3, 15, and 17–20.

Claims 2 and 16

Issue 3: Did the Examiner err in finding that Gould discloses holistic state data, as set forth in claim 2?

Appellants contend that “Gould does not appear to teach or suggest holistic state data [or] any combination of the specific fields recited in claims 2 or 16” (App. Br. 18).

In response, the Examiner finds that “only one field is required to be included in the holistic state data” (Ans. 7) and previously found in the Final Office Action that Gould discloses “a first model field” (Final Act. 4, *citing* Gould ¶ 22). We agree with the Examiner.

Although claim 2 lists nine different fields, claim 2 ends with the phrase – *or any combination thereof* (see claim 2), which reads on only one field being required, as noted by the Examiner. Thus, the Examiner is correct in that he/she needs only to show that Gould discloses one of the fields, and Appellants fail to rebut the Examiner’s specific findings in the Final Office Action regarding *the first model field*.

Accordingly, we sustain the Examiner’s rejection of claim 2, and claim 16 for similar reasons.

Rejection under § 102 over Attarwala

Claims 8–11, 13, and 14

Issue 4: Did the Examiner err in finding that Attarwala discloses pausing the first optimization search, as set forth in claim 8?

Appellants contend that “Attarwala does not appear to teach or suggest pausing a first optimization search . . . and resuming the first optimization search . . . Instead, Attarwala appears to describe a sequential

steady state optimizer that waits for a [pre]vious step to complete before proceeding to a subsequent step” (App. Br. 19–20).

The Examiner finds that “the optimization process in Attarwala, fig. 27 begins at 101, where only controlled variables are used for. . . the process branches in 102 . . . where manipulated variables are used; the controllers that are successful [continue] to the next level . . . [and] have to wait/pause for the result of the other controllers because the variables . . . are interconnected” (Ans. 7–8, citation omitted). We agree with the Examiner.

Although Appellants contend that “the Examiner’s contention does not appear to be supported by Attarwala” (Reply Br. 6), Appellants admit that in Attarwala “the integrated steady state optimizer combines steady state optimization operation of all the controllers” (*id.* at 8), i.e., that the operations are interconnected. Appellants further contend that in Attarwala “the integrated steady state optimizer would still be performing steady state operations associated with the other controller and, thus, not paused” (*id.*).

We find that such a response from Appellants fail to rebut the Examiner’s specific finding that the results in Attarwala are interconnected, necessitating a pause/wait feature until all results are completed. (Ans. 7–8.) Furthermore, we highlight that claim 8 merely requires “pausing the first optimization search,” not pausing all steady state operations, as argued by Appellants. Thus, we find unavailing Appellants’ contentions that Attarwala does not appear to teach or suggest pausing a first optimization search.

Accordingly, we sustain the Examiner’s rejection of claim 8, and claims 9–11, 13, and 14 for similar reasons.

Claim 12

Issue 5: Did the Examiner err in finding that Attarwala discloses selecting the second controller, as set forth in claim 12?

Appellants contend that “Attarwala does not appear to describe *selecting* controllers used to solve the optimization problem from multiple controllers – let alone based on holistic state data including any combination of the fields recited in claim[] 12” (App. Br. 22). In other words, Appellants’ emphasis appears to be that Attarwala fails to disclose “selecting” controllers.

In response, the Examiner finds that Appellants’ contention “is irrelevant because claim 12 only describes a holistic state data corresponding [to] at least one field” (Ans. 11) and Attarwala discloses “an objective function J with a set of variables and the economic price associated with each set of variables for selecting controllers whose performance are satisfactory” (*id.*, citing Attarwala ¶ 318).

In the Reply Brief, Appellants fail to rebut the Examiner’s specific findings that only one field is required in claim 12, and Attarwala discloses a set of variables and *selecting* controllers whose performance are satisfactory.

Accordingly, we sustain the Examiner’s rejection of claim 12.

Rejection under 103(a)
Claims 4–7

Because Appellants have not presented separate patentability arguments or have reiterated substantially the same arguments as those previously discussed for patentability of claim 1 above (*see* App. Br. 23), claims 4–7 fall therewith. *See* 37 C.F.R. § 41.37(c)(1)(vii).

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DECISION

We affirm the Examiner's § 101, § 102(a), and § 103(a) rejections R1–R4 of claims 1–20.

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