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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/802,883	03/14/2013	Joseph A. Daniel	22976/04173	3301

115182 7590 08/27/2020
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EXAMINER	
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ART UNIT	PAPER NUMBER
4149	

NOTIFICATION DATE	DELIVERY MODE
08/27/2020	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JOSEPH A. DANIEL, DANIEL FLEMING, and JUDAH HENRY

Appeal 2020-001621
Application 13/802,883[1]
Technology Center 3700

Before MURRIEL E. CRAWFORD, JAMES P. CALVE, and
BRUCE T. WIEDER, *Administrative Patent Judges*.

WIEDER, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1, 4, 5, 20–25, and 32–41. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[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 Lincoln Global, Inc. (Appeal Br. 3.)

CLAIMED SUBJECT MATTER

Appellant's "invention relate[s] to welding work cells." (Spec. ¶ 2.)

Claims 1 and 20 are the independent claims on appeal. Claim 1 is illustrative. It recites (emphasis added):

> 1. A welder system, comprising:
>
> a processor; and
>
> a non-transitory computer readable medium storing instructions for the processor to execute, the instructions comprising:
>
> *a generate component that is configured to automatically create or edit a welding sequence based on welding procedure data from a weld performed before employing the welding sequence*;
>
> a welding job sequencer component that is configured to employ the welding sequence for a welding work cell to perform at least a first weld and a second weld, wherein the welding sequence defines at least:
>
> a first weld schedule having at least one first weld parameter; and
>
> a second weld schedule having at least one second weld parameter, wherein at least one of said second weld parameter is different from said first weld parameter; and
>
> the welder system configured to employ the welding sequence for the welding work cell to perform welds to assemble a workpiece by automatically adjusting parameters on a welding equipment within the welding work cell.

REJECTIONS

Claims 1, 4, 5, 20–25, 32, and 35–41 are rejected under 35 U.S.C. § 103(a) as unpatentable in view of Ivkovich (US 6,583,386 A1, iss. June 24, 2003) and Kaufman (US 2006/0131291 A1, pub. June 22, 2006), and alternatively, further in view of Asai (US 2009/0107969 A1, pub. Apr. 30, 2009).

Claims 33 and 34 are rejected under 35 U.S.C. § 103 as unpatentable in view of Ivkovich, Kaufman, and Kamiya (JP2010075954A, pub. Apr. 8, 2010), and alternatively, further in view of Asai.

ANALYSIS

Obviousness is a legal conclusion involving a determination of underlying facts.

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966)).

With regard to the scope and content of the prior art, the Examiner finds that Ivkovich discloses

> a generate component (CPU 334, PC display screen 336, and Computer Node 300 of Fig. 4, working together, represent the generate component) that is configured to automatically create or edit a welding sequence based on welding procedure data from a weld performed before employing the welding sequence (see col. 15, lines 6-11, emphasis added, which states "*Based on the expected weld to be next completed, the arc-weld monitoring with part-tracking system* <u>*automatically sets*</u> *the weld monitoring schedule, which comprises the expected weld process parameters and duration for each weld. Therefore, no external*

> *setting of weld schedules is required.*" Kaufman [sic, Ivkovich] does not explicitly talk about this claimed feature, but since this step of the disclosure is automatic, it is the Examiner's position that this section of the disclosure implies that a computer algorithm of the generate component of Ivkovich has to process "welding procedure data" that indicates a weld has been performed/completed before the subsequent welding sequence can be automatically set/created).

(Final Action 9–10.)

Appellant argues that "Ivkovich is directed to a weld monitoring schedule, not a welding sequence, as claimed." (Appeal Br. 12–13.) Appellant argues that the Examiner's "alleg[ation] that Ivkovich's use of the word 'process' in the phrase 'expected weld process parameters' implies that Ivkovich 'processes' prior weld data is completely unsupported by Ivkovich. Ivkovich is silent on how these monitoring parameters are determined or created." (*Id.* at 13.)

Ivkovich discloses "a weld monitoring system and method that monitors and automatically coordinates information on the quality of each weld in a workpiece having one or more welds." (Ivkovich, Abstract.) In relevant part, Ivkovich discloses:

> The welder begins a welding operation in a welding cell by putting or clamping one or more workpieces to be welded into a fixture, which positions the workpiece or workpieces in the proper orientation for welding. To create an individual weld, the welder positions the welding torch to the location on the workpiece or workpieces where the weld is to be begin, starts the power supply to create a welding arc, moves the welding torch to apply the weld to the location in a pre-specified manner, which takes into account duration of the weld application and the length of the weld, and then stops the welding process when the weld is complete. In a typical welding operation, one or more sequential welds are applied to a workpiece or workpieces. The welded

> assembly is then removed or unclamped from the fixture and transferred to the another [sic] welding cell for additional welding operations or into a holding area for welded assemblies.
>
> During the welding operation, the arc-weld monitoring with part-tracking system obtains information about the welding process from one or more weld sensor means including, but not limited to, weld sensors that measure current, voltage, wire feed, or gas flow, which are operably connected to a computer node. . . . The measurements from the voltage, current, gas, and wirefeed sensors can be used to identify different types of weld defects such as grounding problems, workpiece fitup and alignment problems, weld equipment problems, and gross porosity. Thus, analysis of the data from the weld sensors indicate whether a weld is satisfactory or faulty. The above weld sensor means are easily applied to any commercially available manual or robotic welding equipment.

(*Id.* at col. 13, ll. 32–64.)

Ivkovich further discloses:

> For the coordinated part-tracking function of the arc-weld monitoring with part-tracking system, the [computer processing unit] monitors the information for each weld for a fault by means of the one or more weld sensor means between the starting and terminating of the monitoring by the switch means and determines how that particular weld fits into the overall welding scheme or schedule for the workpiece being welded. Thus, in a coordinated and cooperative manner, the arc-weld monitoring with part-tracking system performs weld monitoring, part-tracking, reporting, and display of the resulting information to the operator of the welding operation, inspector of the welded assembly either during or at a time subsequent to the welding operation, or the manual welder performing the welding operation. Based on the expected weld to be next completed, the arc-weld monitoring with part-tracking system automatically sets the weld monitoring schedule, which comprises the expected weld process parameters and duration for each weld. Therefore, no external setting of weld schedules is required.

(*Id.* at col. 14, l. 60–col. 15, l. 11.)

It is clear from the above that the portions of Ivkovich relied on by the Examiner relate to monitoring information for each weld for a fault using information received from sensors. (*See id.* at col. 14, ll. 60–63.)

Claim 1 recites that a "welding sequence defines at least: a first weld schedule . . . ; and a second weld schedule . . .; and [a] welder system configured to employ the welding sequence for [a] welding work cell to perform welds to assemble a workpiece." In other words, in claim 1, a welding sequence is used by the welder system to assemble a workpiece, i.e., the welding sequence describes what the welder is to do.

The relied-on portions of Ivkovich, on the other hand, disclose what is to be monitored. And although Appellant's Specification discloses that in at least one embodiment, "the welding job sequencer can monitor quality measurables of a weld created by the operator," (Spec. ¶ 56), claim 1, as discussed above, recites that the welding sequence is employed "for the welding work cell to perform welds," i.e., to perform welds rather than to monitor a weld for a fault.

Ivkovich also discloses "automatically set[ting] the weld monitoring schedule." (Ivkovich, col. 15, ll. 6–10.) Based on this, the Examiner "implies that a computer algorithm of the generate component of Ivkovich has to process 'welding procedure data' that indicates a weld has been performed/completed <u>before</u> the subsequent welding sequence can be automatically set/created." (Final Action 9–10.) But Ivkovich explains that the automatic setting of the weld monitoring schedule is "[b]ased on the expected weld to be next completed." (Ivkovich, col. 15, ll. 6–10.)

The Examiner does not direct us to a disclosure in Ivkovich teaching that the expected weld to be next completed is more than the next weld on a predetermined schedule of welds to be performed, i.e., it is not clear how "the expected weld to be next completed" is related to the automatic creation or editing of a welding sequence. For example, it is not clear from the cited portions of Ivkovich why the automatic setting of the weld monitoring schedule based on the expected next weld would automatically create or edit a weld sequence (as recited in claim 1), as opposed to, e.g., simply go to the next weld in the same weld sequence. Indeed, Ivkovich's description of the monitoring system validating the quality of a weld "per the weld schedule" confirms that the system simply "sets the weld schedule for the next weld" in the existing weld schedule "[w]hen the weld is determined to be good per the weld schedule." (*Id.* at col. 18, ll. 12–19; *see* Answer 5–7.)

Even if the data collected by the monitoring system in Ivkovich is "welding procedure data" as recited in claim 1, there is no disclosure that this monitoring data is used to create or edit the weld schedule or a welding sequence. To the contrary, the system appears to simply go to the next weld in the predetermined sequence when a weld is determined to be good, until the last weld in the preset sequence has been made. (Ivkovich, col. 18, ll. 19–28.) If monitoring indicates that a weld fails, the welding operation can be stopped to correct the defective weld that caused the error. (*Id.* at col. 18, ll. 29–34.) In sum, in the cited passages, the system appears to simply increment the predetermined weld schedule for the next predetermined weld in the sequence without any indication that the current weld schedule or welding sequence was created or edited based on welding procedure data from a weld performed before using the welding sequence.

Therefore, we do not agree that the cited portions of Ivkovich disclose "a generate component that is configured to automatically create or edit a welding sequence based on welding procedure data from a weld performed before employing the welding sequence," as recited in claim 1.

The Examiner determines that Asai also discloses the generate component limitation of claim 1. (Final Action 12.) Specifically, the Examiner finds:

> Asai discloses an "arc welding robot control system," see the title, which automatically edits a weaving cycle based on data from a previous weaving cycle before employing the weaving cycle that follows it. See the abstract.
>
> This automated feature serves the advantage of enabling "continuous change of welding conditions" and "welding with high accuracy," as disclosed in the abstract.

(*Id.*) Additionally, the Examiner determines that Asai

> discloses (emphasis added) "a weaving operation controlling device <u>that outputs a signal of completion of one weaving cycle every time when a welding torch completes to perform one weaving cycle</u> of a predetermined moving pattern."
>
> Therefore, Ivkovich's welder system, modified in view of Kaufman and Asai, would result in outputted signals occurring at the completion of a prior weld, such as from a prior welding sequence, i.e. reading on the limitation of claim 1, "based on welding procedure data from a weld performed before employing the welding sequence." Subsequently, Ivkovich, modified in view of Kaufman and Assai [sic], would automatically edit (the parameters) of the following welding sequence.

(Answer 11.)

Appellant argues that "Asai clearly discloses that the welding parameters are <u>calculated before welding and based on an equation to yield an accurate transition between points</u>, not from 'welding procedure data from a weld performed before employing the welding sequence,' as described in detail in the Appeal Brief." (Reply Br. 7.)

Asai discloses "[a]n arc welding robot control system." (Asai, Abstract.) In describing the "[c]alculation of to-be-changed welding conditions," Asai discloses modifying/editing of a welding sequence based on an equation applied to the welding sequence.[2] (*See id.* ¶¶ 47–48.) Asai discloses that

> [i]n the equation (1), a to-be-changed welding condition is denoted as CWC1, an entire distance is denoted as ED, a remaining distance is denoted as RD, a welding condition difference is denoted as DWC, and a welding condition at a welding condition changing start point is denoted as SWC. The term {(ED-RD)/ED}xDWC becomes a correction value corresponding to the distance from the welding condition changing start point to the travelling position, and the welding condition calculating device **33** determines to-be-changed welding conditions at the travelling position by adding this correction value to the welding conditions at the welding condition changing start point.

(*Id.* ¶ 48.) For example,

> if the welding speed of welding conditions at a welding condition changing start point is 30 cm/min, the welding speed of welding conditions at a welding condition changing finish point is 60 cm/min, the entire distance . . . is 100 mm and the remaining distance . . . is 50 mm, the welding speed at the travelling point becomes 45 cm/min, as follows.
>
> 45 cm/min={(100-50)/100}x(60-30)+30

(*Id.* ¶ 50.)

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[2] More particularly, Asai discloses modifying a "welding condition." Asai discloses that "[a]mong to-be-changed welding conditions at a travelling position, a welding speed, a weaving cycle and a weaving amplitude." (Asai ¶ 48.) Such welding conditions are part of a welding sequence, hence the welding sequence would be modified.

In other words, paragraph 48 of Asai discloses that the predetermined or preset welding sequence includes different sets of welding parameters (similar to the claimed first and second weld schedule) and the predetermined or preset sequence includes an equation used to control a robot as it transitions between these two preprogrammed sets of welding parameters. (*See id.* ¶ 48; *see also id.* Fig. 4.) The controlled transition between two different preprogrammed weld schedules accomplished by modifying the welding sequence itself, i.e., modifying SWC based on the equation, does not teach that this transitional welding sequence is based on welding procedure data from a weld performed before the welding sequence was employed. At best, it might change a welding sequence based on a weld performed during the same sequence. However, the Examiner does not explain how the welding sequence itself can be the source of "data from a weld performed *before employing the welding sequence*," as recited in claim 1. (Emphasis added.) We next ask if the equation itself is "based on welding procedure data from a weld performed before employing the welding sequence." But Asai is silent on this point.

> The Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 . . . (2007), explained that, "because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known," "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *Id.* at 418–19.

Personal Web Techs., LLC v. Apple, Inc., 848 F.3d 987, 991–92 (Fed. Cir. 2017). The Examiner does not sufficiently explain the reasoning with rational underpinnings why the edited welding sequence is "based on welding procedure data from a weld performed before employing the welding sequence," as recited in claim 1.

Therefore, we will reverse the rejection of claim 1. Independent claim 20 contains similar language and for similar reasons we will reverse the rejection of claim 20. For the same reasons, we will also reverse the rejection of dependent claims 4, 5, 21–25, 32, and 35–41.

With regard to dependent claim 33 and 34, the Examiner does not rely on Kamiya to cure the above discussed deficiency. (*See* Final Action 21.) Therefore, we will also reverse the rejection of claims 33 and 34.

CONCLUSION

The Examiner's rejections of claims 1, 4, 5, 20–25, and 32–41 under 35 U.S.C. § 103(a) are reversed.

Specifically:

Claims Rejected	**35 U.S.C. §**	**Reference(s)/Basis**	**Affirmed**	**Reversed**
1, 4, 5, 20–25, 32, 35–41	103(a)	Ivkovich, Kaufman, alternatively, Asai		1, 4, 5, 20–25, 32, 35–41
33, 34	103(a)	Ivkovich, Kaufman, Kamiya, alternatively, Asai		33, 34
Overall Outcome				1, 4, 5, 20–25, 32–41

REVERSED