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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

STRYKER CORPORATION
Requester, Respondent, and Cross-Appellant

v.

HILL-ROM SERVICES, INC.
Patent Owner, Appellant, and Cross-Respondent

Appeal 2015-007927
Reexamination Control 95/002,055
Patent 7,669,263 B2
Technology Center 3900

Before RICHARD M. LEBOVITZ, JEFFREY B. ROBERTSON, and STEPHEN C. SIU,[1] *Administrative Patent Judges*.

LEBOVITZ, *Administrative Patent Judge*.

DECISION ON REMAND

The Decision on Appeal in the above-identified *inter partes* reexamination of US 7,669,263 ("the '263 patent") was entered April 1, 2016 ("DOA"). The Decision on Appeal was appealed to the United States Court of Appeal for Federal Circuit ("CAFC"). The CAFC reversed-in-part, vacated-in-part, and remanded the case back to the Patent Trial and Appeal Board ("the Board") as to claims 31 and

[1] Judge Siu replaced Judge Dillon from the original panel, who has since retired from PTAB.

32 for proceedings consistent with its decision. *Hill-Rom Services, Inc., v. Joseph Matal*, 2017 WL 6418928 (decided Dec. 15, 2017) (hereinafter, "*Hill-Rom Services*.") This is a decision on remand of *Hill-Rom Services* to the Board.

As explained in more detail below, pursuant to 37 C.F.R. § 41.77(b), this Decision on Remand includes the following two new grounds of rejection:

1. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as obvious in view of Kummer,[2] Zeltwanger (1999),[3] and Etschberger (2001).[4]

2. Claim 1 is rejected under 35 U.S.C. 103(a) as obvious in view of Kummer and Etschberger (2001), and DeviceNet.[5]

CLAIMS 31 AND 32

The CAFC vacated the rejection of claims 31 and 32 and remanded to the Board "to set 'out its reasoning in sufficient detail to permit meaningful appellate review' under the proper interpretation of the master module limitation." *Hill-Rom Services* at *8. We therefore begin our discussion with these claims.

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[2] Kummer et al., US 5,771,511, issued Jun. 30, 1998 (hereinafter, "Kummer").
[3] H. Zeltwanger, "Designing Devices Using CAN and CANopen Buses for Networking," Fall (1999) (hereinafter "Zeltwanger (1999)").
[4] K. Etschberger, Controller Area Network - Basics, Protocols, Chips and Applications, (2001) (hereinafter "Etschberger (2001)"). Patent Owner had attempted to antedate Etschberger (2001). DOA 28. However, the Decision on Appeal found the evidence insufficient to antedate the publication. DOA 34, 36. The CAFC did not address the Board's determination with respect to Etschberger (2001). Consequently, the Decision stands with regard to the determination that by Patent Owner failed to antedate Etschberger (2001) and no further evidence on this issue will be considered.
[5] DeviceNet™ Technical Overview, Open DeviceNet Vendor Association, Inc., 1999.

Claims 31 and 32 are not original claims, but were added by Patent Owner during the reexamination proceeding. Patent Owner Amendment and Remarks (entered Nov. 16, 2016).

In the Decision on Appeal, the rejection of dependent claims 31 and 32 had been rejected under 35 U.S.C. § 103(a) as obvious in view of Kummer[6] and Zeltwanger (1999). DOA 17–18; Patent Owner Appeal Br. 17–18. Claims 31 and 32 had also been rejected on other combinations of publications, but Patent Owner relied on the same arguments as they did for Kummer and Zeltwanger (1999). Appeal Br. 19, 28, 29. Patent Owner did not argue claim 32 separately in the Appeal Brief, but rather argued claims 31 and 32 as a group. Appeal Br. 17–18, 19, 28, and 29.

Claims 31 and 32 depend from claim 2. The Decision on Appeal affirmed the obviousness rejections of claim 2. DOA 11 ("B. Obviousness of combining Kummer with CAN networks"), 27. The CAFC did not address claim 2 in their opinion. Consequently, the rejection of it stands and no further evidence on its patentability will be considered.

[6] In addition to Kummer, the Examiner had cited Osborne and Weismiller '903. DOA 4. However, as explained in the Decision on Appeal: "Patent Owner provided specific arguments for the rejections based on Kummer. However, for Osborne, Patent Owner relied upon the same arguments as for Kummer. PO Appeal Br. 25. For Weismiller '903, Patent Owner relied on the same arguments as for Kummer, except for claims 23–25. *Id.* at 26-27. Accordingly, while our comments may be specifically directed to Kummer, they are applicable to Osborne and Weismiller '903. *To avoid repetition, we have focused on the specific issues argued, rather than address each of the rejections individually*." DOA 5 (emphasis added.)

We have considered the evidence in the record before us and, pursuant to 37 C.F.R. § 41.77(b), set forth a new grounds of rejection of claims 31 and 32 as follows:

Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as obvious in view of Kummer, Zeltwanger (1999), and Etschberger (2001).

Claims 31 and 32 are reproduced below, along with claim 2, from which they depend.

> 2. A patient-support apparatus comprising
>
> a control system including a serial data bus and a plurality of control modules coupled to the serial data bus, each control module including a microcontroller and a transceiver operable to communicate over the serial data bus by sending a message out on the serial data bus,
>
> wherein each of the modules is operable to monitor commutations [sic, communications?] on the serial data bus to determine whether to process a particular message,
>
> wherein the control system comprises a controller area network.
>
> 31. The patient-support apparatus of claim 2, wherein the control system further comprises a module that operates as a master for particular communications over the control system.
>
> 32. The patient-support apparatus of claim 31, wherein the module that operates as a master comprises a test module removably couplable to the control system, the test module, when coupled to the control system, performing tests related to operation of the control system.

Claim 31

The following findings of fact are pertinent to the new ground of rejection:

FF1.

> CAN open also distinguishes two basic data transmission mechanisms: the real-time-critical exchange of process data by so-called “process data objects” (PDOs) as well as the less time-critical

> access to entries of the object dictionary by so-called “service data objects” (SDOs). The latter are used specifically for transmitting parameters during configuration of the device as well as generally for transmitting longer data domains.

Etschberger (2001) 201.

> FF2.
>
> The network management function specified by CANopen offers two groups of services and related protocols:
> ● **Node control**: These services are used to control the initialization of nodes which want to take part in a distributed application. Thus, these services thus allow the simultaneous control of the communication state of a single node or of all nodes
> ● **Error control:** These services enable the continuous supervision of the the [sic] communication status of nodes. Two alternate methods (node guarding and heartbeat messaging) are available for this.
>
> Node control and node guarding takes place according to CAL. To save CAN identifiers, node control and node guarding are based on a logical master-slave model. One of the nodes in a CAL/CAN open network must therefore operate as the NMT master while all the other nodes operate as NMT slaves.

Etschberger (2001) 255 (citation omitted).

> FF3.
>
> 5.2.6.2 Node Monitoring
> Two optional mechanisms are available to monitor the operability of CAN open nodes.
> A node can be monitored by cyclical polling by the NMT master ("node guarding"[1]), or alternately, a node can broadcast its ability to communicate by cyclically transmitting a so-called "heartbeat" message.
> Node Guarding
> The node guarding protocol is shown in Figure 5.2.6-3. The NMT master polls every node ("NMT-slave") at regular intervals (‘node guard time’) with a node-specific remote transmission request frame.

> The NMT slave responds to this request by transmitting its communication status in a reply message.

Etschberger (2001) 258.

FF4.

> A superimposed network entity, the so-called "SDO-manager", is defined in [CIA-302] for this purpose. The function of the SDO-manager is to administrate and allocate SDO channels. In a system with an SDO manager, only this manager has the right to use the predefined SDO connection set. . . .
>
> . . . .
>
> A device that wants to establish a connection to another device first has to register at the SDO manager (1). . . .
>
> On receipt of this message, the SDO manager tries to identify the requesting device. To do this, it polls all of the devices which are not yet registered at it one after another (2). Because the SDO manager has a connection to every device via the pre-defined SDO channels, identification can be carried out by reading the object dictionary entry "Dynamic SDO Connection State" of all the devices which are not yet registered.

Etschberger (2001) 267.

FF5.

> Identification of the requesting device and establishment of a SDO channel between the requesting device (client) and the SDO-manager (server)

Etschberger (2001) 268.

FF6.

> To ensure that also the SDO channels occupied by a device which is switched off before it released its channels, every device newly admitted into the system is guarded by the NMT master respectively a corresponding heartbeat consumer after it is registered by the SDO manager (see Section 5.2.6.2)[2].

> [2] This necessitates the implementation of the SDO manager and NMT master respectively the corresponding heartbeat consumer entity on the same node.

Etschberger (2001) 268.

FF7. Etschberger (2001) also describes "plug-and-play capability of devices" in the CAN system. Etschberger (2001) 261.

FF8. Zeltwanger (1999) teaches "interchangeability of CANopen devices," indicating that modules can be interchanged in the network. Zeltwanger (1999) 67, 68 (Fig. 4).

Discussion

As explained in the Decision on Appeal, it would have been obvious to one of ordinary skill in the art to implement a CAN network in Kummer's hospital bed for its known advantages. DOA 13. Claim 31 further requires "a module that operates as a master for particular communications over the control system."

Etschberger (2001) teaches that one of the nodes in the CAN network can operate as an NMT (network management) master, while the other nodes serve as slaves. FF2. A node is a physical device.[7] We interpret module, consistent with the '263 patent, to be a physical structure or device. *Hill-Rom Services* at *6. Thus, the network master node of Etschberger (2001) satisfies the claimed requirement of master module because it is a "master" and a physical structure.

---

[7] "Any system or device connected to a network is also called a node. For example, if a network connects a file server, five computers, and two printers, there are eight nodes on the network. Each device on the network has a network address, such as a MAC address, which uniquely identifies each device. This helps keep track of where data is being transferred to and from on the network." *Node Definition*, TechTerms.com, https://techterms.com/definition/node (accessed Mar. 7, 2018).

Etschberger (2001) disclose that the "NMT master polls every node ('NMT-slave') at regular intervals ('node guard time') with a node-specific remote transmission request frame. FF3. We interpret a transmission request to constitute a communication as required by the claim because it imparts information, a hallmark of communication.[8] The node responds to the master "by transmitting its communication status in a reply message." FF3. Thus, we find that the NMT master "operates as a master for particular communications over the control system" because it initiates communication ("transmission request") with a "slave" node and the "slave" node responds by communicating its status. FF3.

It would have been obvious to one of ordinary skill in the art to have utilized Etschberger (2001)'s master module in Kummer because such network configuration is characteristics of CAN networks for the purpose of monitoring the function of the nodes. FF2, FF3.

When new claim 31 was added, Patent Owner cited the description in the '263 patent of SDOs as support for the claimed master module (Patent Owner Amendment and Comments entered Nov. 16, 2012 at 4.) Etschberger (2001) also describes an "SDO-manager" that can serve as a master module within the scope of the claim.

Etschberger teaches that CAN uses "service data objects" (SDOs) for transmitting data. FF1. We interpret the transmission of SDO to be a form of communication because it imparts information. An SDO-manager is used

[8] "the imparting or interchange of thoughts, opinions, or information by speech, writing, or signs" *Communication Definition*, Dictionary.com, http://www.dictionary.com/browse/communication (accessed Mar. 7, 2018).

to allocate SDO channels with other devices. FF4. The SDO-manager receives a message from the client device and then polls the devices for the origin of the message. FF4. Thus, the SDO-manager controls communication over the control system as required by the claim. The SDO-manager is specifically taught to be present on a server (FF5), which is a physical structure, and thus meets the claimed requirement of a module. Furthermore, Etschberger discloses that the SDO manager can be on the same node as NMT master, further indicating that it serves as "a module that operates as a master for particular communications over the control system." FF6.

It would have been obvious to one of ordinary skill to have used the SDO-manager as a master module in the CAN network because SDO's are one of the basic communication objects used by CAN networks (FF1) and the SDO manager serves to allocate the SDO channels in order for the network to effectively used the SDO's (FF4, FF6).

Claim 32

Claim 32, depends from claim 31, and further recites "wherein the module that operates as a master comprises a test module removably couplable to the control system, the test module, when coupled to the control system, performing tests related to operation of the control system."

When this new claim was added, Patent Owner cited the following description in the '263 patent as support for it (Patent Owner Amendment and Comments entered Nov. 16, 2012 at 4)

> As indicated herein, control system 44 includes a master only when test device 558 is coupled to power supply module 514. In that case,

> SDOs allow test device 558 access to any object dictionary entry present in the other modules 512, 514, 516, 518, 520, 522, 524.

'263 patent, col. 34, ll. 8–13.

Thus, while the claim recites that the "master comprises a test module removably couplable to the control system," the support cited by Patent Owner does not identify a master module (as in claim 31) which "comprises" a further "test module," but rather references the same master module. The referenced support cites the SDO's as allowing the device to perform tests. As discussed above, Etschberger (2001) describes a master device, such as a server or other node, as comprising the SDO-manager. FF5, FF6. Thus, Etschberger describes the same structure (FF5, FF6) disclosed in the '263 patent for performing tests.

Etschberger (2001) also describes "plug-and-play capability of devices" in the CAN system. FF7. Based on this teaching, it would have been obvious to one of ordinary skill in the art to make the master module removably coupled, or a test device thereof, because plug-and-play is a general advantage of the CAN system.

Zeltwanger (1999) also teaches "interchangeability of CANopen devices," indicating that modules can be interchanged in the network. FF8. Thus, removable coupling appears to be a known feature of CANopen devices and obvious to implement for the advantage of facilitating the convenience of adding devices to the network.

In addition to this, we further note that NMT master also performs error control (FF2) which is a test to determine whether system is performing without error (*see also* FF3, FF6) as further evidence of the master module performing the required claimed tests. Zeltwanger (1999) also describes a master device that performs "error-control." Zeltwanger (1999) 71 (col. 1).

Requester also cited Kummer's description of a separate diagnostic tool as described in Kummer at column 8, lines 10–25, stating that it would have been obvious to have made "removable test module of Kummer '511 a module that operates as a master." Requester Comments (entered Dec. 12, 2013) 44–45. Requester cited of the original request for reexamination ("Request") as establishing that modules can be added or removed from the network as core feature of CAN networks, making it obvious to have made any CAN device plug-and-play. Requester Comments 45; Request 54.

CLAIMS 14 AND 15

The CAFC reversed the rejection of dependent claims 14 and 15 based on Kummer because the CAFC found the Board had interpreted the claim term "periodically" improperly and that Kummer did not describe periodic verification under its proper interpretation. *Hill-Rom Services* at *5, *8. However, claims 14 and 15 were also rejected by the Examiner based on the Etschberger (2001), DeviceNet, Johnson, and Owens publications, which were extensively discussed in the Decision on Appeal. DOA 18–24. The Examiner's rejection based on these publications was affirmed. *Id.* Nonetheless, the CAFC decision stated:

> Neither Hill-Rom nor the PTO addresses in meaningful detail any prior art references other than Kummer and Zeltwanger. Thus, because the other references are not before us on appeal, we *vacate* the Board's decision as to claims 1, 14–15, and 31–32 with respect to all prior art combinations other than those involving Kummer and Zeltwanger.

Id. at *8.

However, while the references might not have been before the CAFC on appeal, the additionally cited references of Etschberger (2001), DeviceNet,

Johnson, and Owens were addressed in "meaningful detail" in the Decision on Appeal, along with their applicability to claims 14 and 15 (DOA 18–24). **Consequently, while the Federal Circuit may have vacated the Board's decision with respect to such references, because the court did not substantively affirm or reverse the rejection based on these publications, we consider the Examiner's rejection of claims 14 and 15 based on these publications to still stand**.[9]

CLAIM 1

The CAFC reversed the anticipation and obviousness rejections based on Kummer because the court concluded the Decision on Appeal had erred in concluding that Kummer describes that "the control system periodically verifies the functionality of each module present" as recited in claim 1. *Hill-Rom Services* at *5, *8. However, claim 14 recites a similar limitation: "wherein the control system periodically verifies the functionality of each module present. The Decision on Appeal concluded that each of Etschberger (2001) and DeviceNet describe a "heartbeat" message function that meet this limitation of claim 14, and the further requirements of the claim. *Hill-Rom Services* specifically references the discussion in the '263 patent of heartbeat messages as examples of periodic verification as recited in claim 1. *Hill-Rom Services* at *4.

Because the limitation of claim 14 has the same periodic verification limitation that claim 1 does, and because the CAFC in *Hill-Rom Services*

[9] The apparent confusion over the rejections may have arisen because there were over 50 rejections adopted by the Examiner, and Patent Owner, rather than addressing each rejection individually, chose only specific references within the rejections to discuss. DOA 4.

referenced the heartbeat in interpreting the same term in claim 1, we feel obligated pursuant to our authority under 37 C.F.R. § 41.77(b) to make a new ground of rejection of claim 1 based on the teachings in Etschberger (2001) and DeviceNet of a CAN network comprising a heartbeat function. *See Q.I. Press Controls, B.V. v. Lee*, 752 F.3d 1371, 1383 (Fed. Cir. 2014) ("Here, when all these references were before the Board, and this court, an obligation is owed to the public not to permit inconsistent results when a proper challenge to that inconsistency is made on appeal.")

The new ground of rejection is as follows:

Claim 1 is rejected under 35 U.S.C. §103(a) as obvious in view of Kummer and Etschberger (2001), and DeviceNet.

The reasoning for implementing a CAN network having a heartbeat message is the same as for claim 2 as discussed in the Decision on Appeal on page 19, 21, namely, to confirm the proper orientation and status of all the control modules in the network.

TIME PERIOD

This decision contains a NEW GROUND OF REJECTION under 37 C.F.R. § 41.77(b). Section 41.77(b) provides that "[a] new ground of rejection . . . shall not be considered final for judicial review." That section also provides that Patent Owner, WITHIN ONE MONTH FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the NEW GROUNDS OF REJECTION to avoid termination of the appeal proceeding as to the rejected claims:

> (1) *Reopen prosecution.* The owner may file a response requesting reopening of prosecution before the examiner. Such a response must be

> either an amendment of the claims so rejected or new evidence relating to the claims so rejected, or both.
>
> (2) *Request rehearing*. The owner may request that the proceeding be reheard under § 41.79 by the Board upon the same record. The request for rehearing must address any new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in entering the new ground of rejection and also state all other grounds upon which rehearing is sought.

In accordance with 37 C.F.R. § 41.79(a)(1), the "[p]arties to the appeal may file a request for rehearing of the decision within one month of the date of: . . . [t]he original decision of the Board under § 41.77(a)." A request for rehearing must be in compliance with 37 C.F.R. § 41.79(b). Comments in opposition to the request and additional requests for rehearing must be in accordance with 37 C.F.R. § 41.79(c)-(d), respectively. Under 37 C.F.R. § 41.79(e), the times for requesting rehearing under paragraph (a) of this section, for requesting further rehearing under paragraph (c) of this section, and for submitting comments under paragraph (b) of this section may not be extended.

An appeal to the United States Court of Appeals for the Federal Circuit under 35 U.S.C. §§ 141–144 and 315 and 37 C.F.R. § 1.983 for an *inter partes* reexamination proceeding "commenced" on or after November 2, 2002 may not be taken "until all parties' rights to request rehearing have been exhausted, at which time the decision of the Board is final and appealable by any party to the appeal to the Board." 37 C.F.R. § 41.81. *See also* MPEP § 2682 (8th ed., Rev. 8, July 2010).

Requests for extensions of time in this *inter partes* reexamination proceeding are governed by 37 C.F.R. § 1.956. *See* 37 C.F.R. § 41.79.

In the event neither party files a request for rehearing within the time

provided in 37 C.F.R. § 41.79, and this decision becomes final and appealable under 37 C.F.R. § 41.81, a party seeking judicial review must timely serve notice on the Director of the United States Patent and Trademark Office. *See* 37 C.F.R. §§ 90.1 and 1.983.

37 C.F.R. § 41.77(b)

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